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WORK PROJECTS ADMINISTRATION

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OF

A E R O N A U T I C S

Part 42 - Plastic Materials

Part 43 - Metals and Light Alloys

Compiled from the

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## ABBREVIATIONS

- A.R.C. R. & M. - Great Britain. Aeronautical research committee. Reports and Memoranda.
- A.S.M.E. - American society of mechanical engineers, New York.
- Atti Assoc. ital. aerotecn. - Atti dell'Associazione italiana di aerotecnica. Roma.
- C.A.H.I. - Central aero-hydrodynamical institute, Moscow.
- C.I.N.A. - Commission internationale de navigation aérienne, Genève.
- C. R. Acad. sci. - Comptes rendus hebdomadaires des séances de l'Académie des sciences, Paris.
- D.V.L. - Deutsche versuchsanstalt für luftfahrt, Berlin.
- F.A.I. - Fédération aéronautique internationale, Paris.
- H.M. Stat. off. - His Majesty's Stationery office, London.
- N.A.A. - National aeronautic association, Washington.
- N.A.C.A. - National advisory committee for aeronautics, Washington.
- N.P.L. - National physical laboratory, Teddington, England.
- Pub. scient. tech. Min. de l'air. - Publications scientifiques et techniques du Ministère de l'air. Service des recherches de l'aéronautique, Paris.
- R.A.F. - Royal air force (Great Britain)
- R.A.S. - Royal aeronautical society (Great Britain)
- Rend. Istituto sper. aer. - Rendiconto dell'Istituto sperimentale aeronautico, Roma.
- S.A.E. - Society of automotive engineers, New York.
- U.S. Govt. print. off. - U.S. Government printing office, Washington.
- V.D.I. - Verein deutscher ingenieure, Berlin.
- W.G.L. - Wissenschaftliche gesellschaft für luftfahrt, Berlin.
- Z.A.M.M. - Zeitschrift für angewandte mathematik und mechanik, Berlin.
- Z.F.M. - Zeitschrift für flugtechnik und motorluftschiffahrt, München.

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## ARTICLES, BOOKS AND PAMPHLETS

- Modern use of plastics in various parts of the airplane. *Flight*, London, Feb. 8, 1940, v. 37, no. 1624, p. 142.
- Airplane dopes, by Frank W. Reinhart and Gordon M. Kline. *Industrial and engineering chemistry*, Washington, Feb. 1940, v. 32, no. 2, p. 185-93. diags., tables.
- The Nature of adhesion, by N. A. De Bruyne. *Flight*, London, Jan. 11, 1940, v. 37, no. 1620, p. 39-40. (Also *Aircraft engineering*, London, Dec. 28, 1939, v. 36, no. 1618, p. 51-54)
- New research on the use of hardening plastics for aircraft construction, by Wilhelm Kuch. *Journal of the R.A.S.*, London, Jan. 1940, v. 349, no. 44, p. 43-73. illus., tables.
- Timm two-place trainer. *Aviation*, New York, Jan. 1940, v. 39, no. 1, p. 53. illus.
- Einfluss der pressbedingungen und des aufbaues auf die eigenschaften geschichteter kunstharzpresstoffe, von Wilhelm Kuch. *Zeitschrift des V.D.I.*, Berlin, Dec. 30, 1939, v. 83, no. 52, p. 1309-16. diags., illus., tables.
- Plastics and the aeroplane. *Aeroplane*, London, Dec. 8, 1939, v. 57, no. 1489, p. 708-09. illus.
- Film-forming plastics, by Frank W. Reinhart and Gordon M. Kline. *Industrial and engineering chemistry*, Washington, Dec. 1939, v. 31, no. 12, p. 1522-29.
- Plastics for aircraft, by J. Taylor. *Canadian chemistry and process*, Toronto, Dec. 1939, v. 23, p. 604.
- Timm ready to fly plastic trainer. *Aero digest*, New York, Dec. 1939, v. 35, no. 6, p. 77-78. (Also *U. S. Air services*, Washington, Dec. 1939, v. 24, no. 12, p. 37. illus.)
- World's industry employs plastics. *Plastics*, London, Dec. 1939, v. 3, no. 31, p. 358.
- Kampfflugzeuge aus bakelitstoff. *Z. W. Informationsdienst*, Berlin, Nov. 29, 1939, no. 48, p. 800-01.
- V.D.I. richtlinien für gleitlager aus kunstharzpresstoff. *Zeitschrift des V.D.I.*, Berlin, Oct. 28, 1939, v. 83, no. 43, p. 1162-63. illus., tables.
- Fundamental characteristics of moldable plastics, by Gordon Brown. *S.A.E. journal*, New York, Oct. 1939, v. 45, no. 4, p. 9-12. illus., tables.

## PLASTIC MATERIALS

- Molding and fabricating. Modern plastics, New York, Oct. 1939, v. 17, no. 2, p. 294. illus.
- Photograph of Martin bomber equipped with plexiglas, by D. S. Frederick. Modern plastics, New York, Oct. 1939, v. 17, no. 2, p. 22. illus.
- World's industry employs plastics. Plastics, London, Oct. 1939, v. 3, no. 29, p. 310.
- Festigkeitseigenschaften von hochfesten kunstharzpresstoffen, von A. Thum und H. R. Jacobi. Zeitschrift des V.D.I., Berlin, Sep. 16, 1939, v. 83, no. 37, p. 1044-48.
- Vliegtuigen van bakeliet? Een nieuw procédé-niet de eenige. Vliegwereld, Haarlem, Sep. 14, 1939, v. 5, no. 33, p. 571. illus.
- Structural considerations favoring plastics in aircraft **structures**, by C. F. Marschner. Modern plastics, New York, Sep. 1939, v. 17, no. 1, p. 41-42, 44, 68, 70. illus., tables.
- New acetate hoods for Cygnet aeroplane. Plastics, London, Aug. 1939, v. 3, no. 27, p. 249. illus.
- Verpressen härtpbarer pressmassen, von H. Rupprecht. Zeitschrift des V.D.I., Berlin, July 29, 1939, v. 83, no. 30, p. 885-86. illus., tables.
- Kunstharzpresstoffe, von E. Matuscheck. Fördertechnik, Berlin, July 5, 1939, v. 32, no. 14, p. 261-69. illus.
- Airplanes, unlimited! Moulded fuselages and wings make possible mass production; use of Duramold in Clark 46, by F. Davis. Scientific american, New York, July 1939, v. 161, p. 15-17. illus.
- Duramold for aircraft structure. British plastics, London, July 1939, v. 11, no. 122, p. 82-83. illus., tables. (Also Plastics, London, Nov. 1939, v. 3, no. 30, p. 331-33)
- Low density structural material; Duramold, by V. E. Clark. Aero digest, New York, July 1939, v. 35, p. 101-02, 105. diagsr., illus., tables.
- Les Matières plastiques dans la construction aéronautique. Revue générale des matières plastiques, Paris, July 1939, v. 15, no. 7, p. 199-203. diagsr., tables.
- Plastic airplane, by V. E. Clark. Mechanical engineering, New York, July 1939, v. 61, no. 7, p. 546.
- Plastics in airplanes. Product engineering, New York, July 1939, v. 10, no. 7, p. 280-84. illus.

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## PLASTIC MATERIALS

- The Processing of plastics. American machinist, New York, June 28, 1939, v. 83, no. 13, p. 483-94. diags., illus., tables.
- Composite wood and plastic propeller blades, by F. E. Weick. S.A.E. journal, New York, June 1939, v. 44, p. 252-58. illus. (Abstract Modern plastics, New York, July 1939, v. 16, no. 11, p. 54)
- Doped fabrics for aircraft. British plastics, London, June 1939, v. 11, no. 121, p. 19.
- Four outstanding achievements. Material press mould article. British plastics, London, June 1939, v. 11, no. 121, p. 10-13. illus.
- Goggles of Crystalate. British plastics, London, June 1939, v. 11, no. 121, p. 40. illus.
- New Clark plastic plane with Ranger engine to tour coast. Western flying, Los Angeles, Cal., June 1939, v. 19, no. 6, p. 28. illus.
- New safety plate hailed as plastic age achievement. British plastics, London, June 1939, v. 11, no. 121, p. 31-32, 34. illus.
- Tankee Clipper, by Howard Ketcham. Modern plastics, New York, June 1939, v. 16, no. 10, p. 23-25, 68. illus.
- Plastics, by A. J. Weith. Industrial and engineering chemistry, Washington, May 1939, v. 31, no. 5, p. 557-62. diags., illus.
- Liquid resin-plywood adhesive; liquid resin in aircraft plywood, by Karl Kopplin. Modern plastics, New York, Apr. 1939, v. 16, no. 8, p. 48. tables.
- Les Matières plastiques - 1<sup>ère</sup> partie: Aperçu historique et scientifique; 2<sup>e</sup> partie: Leurs principales applications, par M. Louis et M. Durr. Mémoires de la Société des ingénieurs civils, Paris, Mar.-Apr. 1939, v. 92, no. 9, p. 287-322. diags.
- More about the Bristol industrial fair. Flight, London, Mar. 2, 1939, v. 35, no. 1575, p. 225-26. illus.
- The Plastic airplane. Modern plastics, New York, Mar. 1939, v. 16, no. 7, p. 41, 66, 68. illus.
- Resin-bonded plywood in american aircraft and other industries. British plastics, London, Mar. 1939, v. 10, no. 118, p. 582-84. diags., illus.

## PLASTIC MATERIALS

- Use of plastics in aircraft, by E. P. King. Aircraft engineering London, Mar. 1939, v. 11, no. 121, p. 96-100. illus., table
- Wood plastic propeller blades. Mechanical engineering, New York, Mar. 1939, v. 61, no. 3, p. 232.
- Walzenzapfenlager aus kunstharzpresstoffen, von J. Arens. Stahl und eisen, Düsseldorf, Feb. 23, 1939, v. 59, no. 7, p. 213-24. diags., illus.
- Towards the moulded airplane. Aeroplane, London, Feb. 22, 1939, v. 56, no. 1448, p. 241.
- Towards an ideal. Flight, London, Feb. 16, 1939, v. 35, no. 1573 p. 150.
- Eigenschaften warmgepresster kunstharzpresstoffe nach DIN 7701, von R. Nitsche. Zeitschrift des V.D.I., Berlin, Feb. 11, 1939, v. 83, no. 6, p. 161-64. illus., tables.
- Moulded structures, by M. Langley. Aeroplane, London, Feb. 8, 1939, v. 56, no. 1446, p. 185-86. illus.
- Rhodoid acetate sheets for aircraft. Aeroplane, London, Feb. 1, 1939, v. 56, no. 1445, p. 148.
- Plastic materials for aircraft construction, by N. A. De Bruyne. British plastics, London, Feb. 1939, v. 10, no. 117, p. 515-19. illus.
- The Swelling of wood, by N. A. De Bruyne. Aircraft engineering, London, Feb. 1939, v. 11, no. 120, p. 44-46. illus., tables.
- A Jointing problem tackled. (Bakelite F5522). Flight, London, Jan. 12, 1939, v. 35, no. 1568, p. 36. illus.
- Plastic progress, by N. A. De Bruyne. Flight, London, Jan. 12, 1939, v. 35, no. 1568, p. 38a-38c. illus., tables.
- Plastic materials, by A. H. Tiltmann and A. E. Ellison. Aircraft production, London, Jan. 1939, v. 1, no. 3, p. 79-83. diags. illus. (Abstract Kunststoffe, München und Berlin, May 1939, v. 20, no. 5, p. 150)
- Reinforced synthetic resins, their application to some elementary constructions, by H. Tiltmann and A. E. Ellison. Aircraft production, London, Jan. 1939, 5 p. diags., illus.
- Ein Neuer kunststoff für den flugzeugbau. Deutsche luftwacht, ausgabe luftwissen, Berlin, 1939, v. 6, no. 8, p. 244.
- Physical properties of resin materials, by M. Fishbein. Washington 1939. 18 p. diags., illus. (N.A.C.A. Technical notes no. 694)

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## PLASTIC MATERIALS

- Plastic industry in America. Thomas publishing company, New York, 1939. 46 p. diags., illus.
- Pressspritzen härtbarer kunstharz-presmassen, von W. Tochtermann. Zeitschrift des V.D.I., Berlin, 1939, v. 83, no. 40, p. 1103-05. illus.
- Resistance of transparent plastics to impact, by Benjamin A. Axilrod and Gordon M. Kline. Washington, 1939. 20 p. diagr., illus., tables. (N.A.C.A. Technical notes no. 718)
- Wood-faced laminated material. Engineer, London, Dec. 30, 1938, v. 166, no. 4329, p. 742. illus.
- Plastics in America. Aeroplane, London, Dec. 28, 1938, v. 55, no. 1440, p. 354. illus.
- Plastometry of synthetic resins, by R. Houwink and P. N. Heinze. Industrial and engineering chemistry, Washington, Dec. 1, 15, 1938, v. 10, no. 12, p. 680-83. illus.
- Fortschritte auf dem gebiete der kunstharzleimverfahren, von W. Küch. Deutsche luftwacht, ausgabe luftwissen, Berlin, Dec. 1938, v. 5, no. 12, p. 427-31. illus., tables.
- New structural materials, by A. H. Tiltman and A. E. Ellison. Aircraft production, London, Dec. 1938, v. 1, no. 2, p. 52-58. illus., tables.
- Production notes and comment. Plastics, London, Dec. 1938, v. 11, no. 19, p. 408. illus.
- Shaped laminated bakelite sheet. Machinery, London, Nov. 17, 1938, v. 53, no. 1362, p. 189. illus.
- The De Haviland Albatross. (Partial use of plastics). Aeroplane, London, Nov. 16, 1938, v. 55, no. 1434, p. 620-24. diags., illus.
- Plastics and production, by S. C. Hart-Still. Aeroplane, London, Nov. 9, 1938, v. 55, no. 1433, p. 580-82. diags., illus., tables.
- Aircraft possibilities of cellulose acetate plastics, by Alexander Klemin. Aero digest, New York, Nov. 1938, v. 33, no. 5, p. 59-60, 63, 64. illus.
- American methods of aircraft production, by T. P. Wright. Journal of the R.A.S. London, Nov. 1938, v. 42, no. 335, p. 88. illus.
- Bakelite resins. Plastics, London, Nov. 1938, v. 2, no. 18, p. 364-71. illus.

## PLASTIC MATERIALS

- Materials for aircraft construction, by H. J. Gough. Journal of the R.A.S., LONDON, NOV. 1938, v. 42, p. 922-31. diagrs., illus. (Also British plastics, London, Aug. 1938, v. 10, no. 111, p. 145)
- Protein plastics from soybean products, by G. H. Brother and L. L. McKinney. Industrial and engineering chemistry, Washington, Nov. 1938, v. 30, no. 11, p. 1236-40. illus., tables.
- Les Usines allemandes construisent-elles des avions moulés en resine synthétique? par Maurice Victor. Les Ailes, Paris, Oct. 20, 1938, v. 18, no. 905, p. 7.
- Plastic aircraft construction in Germany, by M. Langley. Aeroplane, London, Oct. 12, 1938, v. 55, no. 1429, p. 443-45. illus.
- How laminates are made, by George H. Clark. Modern plastics, New York, Oct. 1938, v. 16, no. 2, p. 260-61, 272. illus.
- Laminates for industrial uses, by P. B. Leverette. Modern plastics, New York, Oct. 1938, v. 16, no. 2, p. 262-63, 276. illus.
- Pendelstoss-maschine zur untersuchung von kunststoffen, von W. Moser. Kunststoffe, München, Oct. 1938, v. 28, no. 10, p. 267-70. illus.
- Plastics in aircraft construction, by G. M. Kline. Mechanical engineering, New York, Oct. 1938, v. 60, p. 770-71.
- Plastic probe chart - 1938. Modern plastics, New York, Oct. 1938, v. 16, no. 2, p. 173.
- Verwendung von kunststoffen im flugzeugbau, von W. KÜch. Kunststoffe, München, Aug., Oct. 1938, v. 28, no. 8, 10, p. 202-07, 262-67. diagrs., tables. (Also Materie plastique, Milano, Jan.-Feb. 1938, v. 6, no. 1, p. 29-34)
- Moulded wood. Flight, London, Sep. 29, 1938, v. 34, p. 278. illus.
- A Plastic application. Aeroplane, London, Sep. 14, 1938, v. 55, no. 1425, p. 22. illus.
- Logical unconventionality? (De Bruyne-Moss ladybird airplane). Flight, London, Sep. 8, 1938, v. 34, no. 1550, p. 204. illus.
- Plastics abroad. Aeroplane, London, Sep. 7, 1938, v. 55, no. 1424, p. 288.
- The Dielectric properties of cellulose acetate, by L. Hartshorn and E. Rushton. Journal of the Institution of electrical engineers, London, Sep. 1938, v. 83, no. 501, p. 315-32. diagrs., illus.

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- Plastics as structural materials for aircraft, by Gordon M. Kline. Modern plastics, New York, Aug.-Sep. 1938, v. 15, 16, no. 12, 1, p. 35-36, 62; 44-46, 66. diags., illus. (Also Journal of the Aeronautical sciences, New York, Aug. 1938, v. 5, no. 10, p. 391-96)
- Plywood airplane. Aviation, New York, Sep. 1938, v. 37, no. 9, p. 40. illus., tables. (Also Western flying, Los Angeles, Cal., Sep. 1938, v. 18, no. 9, p. 21)
- Konstruktionseinzelheiten. Flugsport, Frankfurt A/M, Aug. 31, 1938, v. 30, p. 482-85. illus.
- German plastic progress in 1938. British plastics, London, Aug. 1938, v. 10, no. 11, p. 124.
- Ein Neues prüfverfahren für gehärtete phenolharz-presstoffe zur analyse und gefügeermittlung, von Wilhelm Esch und Rudolf Nitsche. Wissenschaft und technik, Berlin, Aug. 1938, v. 8, no. 8, p. 249-50, 252-53. illus.
- Bonded plywood. Flight, London, July 7, 1938, v. 34, no. 1541, p. 29.
- To turn out airplanes from molds. Canadian engineering, Ottawa, July 5, 1938, v. 75, no. 1, p. 14.
- Airplanes made from plastic-bonded plywood. Science news letter, Washington, July 2, 1938, v. 34, no. 1, p. 8.
- The Impact testing of plastics, by R. Burns and W. W. Werring. American society for testing materials, Philadelphia, July 1, 1938, no. 34, p. 1-14. (Also Modern plastics, New York, Aug. 1938, v. 15, no. 12, p. 37-41, 52, 54, 56)
- The Behavior of plastics under various service conditions, by R. P. Cartwright. Transactions of the Institution of plastics industry, London, July 1938, v. 7, no. 14, p. 79-96, 101. illus.
- Experiments with plastics. Canadian aviation, Toronto, July 1938, v. 11, no. 7, p. 4.
- Synthetic rubber substitutes, by T. L. Garner. Aircraft engineering, London, July 1938, v. 10, no. 113, p. 212. tables.
- Cord bakelite air screw blades. Flight, London, June 9, 1938, v. 33, no. 1537, p. 584.
- Materials used in aeronautical construction; plastics and compressed wood; propellers with hollow bakelite blades. Flight, London, June 2, 9, 1938, v. 33, no. 1536, 1537, p. 552-53, 568a-568g. illus., tables.

## PLASTIC MATERIALS

- For rapid assembly, by H. White. Modern plastics, New York, June 1938, v. 15, no. 10, p. 32-33, 60.
- Improved acetate plastics. Aviation, New York, June 1938, v. 37, no. 6, p. 49.
- Matériaux transparents plastiques pour la construction aéronautique par A. Verdurand. Revue de l'armée de l'air, Paris, June 1938, v. 10, no. 107, p. 667-88. illus., tables.
- Right on the nose; Plexiglas shields directional right loop antenn on Northwestern airlines sky zephyrs. Modern plastics, New York, June 1938, v. 15, no. 10, p. 28-29. illus.
- Weatherproof plywood siding. Veneers and plywood, Indianapolis, Ind., June 1938, v. 32, no. 6, p. 15.
- Versuch an kunststoffen für den flugzeugbau, von K. Riechers. Zeitschrift des V.D.I., Berlin, May 28, 1938, v. 82, no. 22, p. 665-71. illus., tables.
- True soya bean plastic. Automotive industries, Philadelphia, May 21, 1938, v. 78, no. 21, p. 695-96.
- The Newspapers discover plastics. Aeroplane, London, May 18, 1938 v. 54, p. 610.
- A New plastic material. (Catalan). Aeroplane, London, May 11, 1938, v. 54, p. 590.
- Evaluation of plastics, by T. Smith Taylor. India rubber world, New York, May 1, 1938, v. 98, no. 2, p. 41-42, 53. diagrs., illus.
- Aircraft and motorcars. Plastics, London, May 1938, v. 2, no. 12, p. 147.
- Eigenschaften der kunststoffe, von A. Imhof. Schweizer archiv, Solothurn, Switzerland, Apr.-May 1938, v. 4, no. 4, 5, p. 99-103, 117-27. illus., tables.
- I Materiali sintetici nell'aviazione, di Beniamino Posniak. L'Ala d'Italia, Milano, May 1938, v. 16, p. 58-63. illus.
- Molds for phenol resinoids, by T. E. Cassey. Modern plastics, New York, Mar.-May 1938, v. 15, no. 7-9, p. 44, 46, 66-68; 50, 52, 78; 44, 72-73. diagrs., tables.
- More aircraft mouldings. Plastics, London, May 1938, v. 2, no. 12, p. 148.
- Natural resins in plastics, by C. L. Mantell. Modern plastics, New York, May 1938, v. 15, no. 9, p. 43.

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## PLASTIC MATERIALS

- Permanence of plastics, by G. M. Kline. Modern plastics, New York, Apr.-May 1938, v. 15, no. 8, 9, p. 47-49; 46. illus., tables. (Also American society for testing materials, preprint, Philadelphia, Mar. 9, 1938, p. 35-55)
- Plastics as structural materials for aircraft, by G. M. Kline. Journal of the Franklin institute, Philadelphia, May 1938, v. 225, no. 5, p. 594-96. illus.
- Suitability of various plastics for use in airplane dopes, by G. M. Kline and Cyrus G. Malmberg. Washington, U. S. Govt. print. off., Journal of research of the National bureau of standards, May 1938, v. 20, no. 5, p. 651-71. diagsr., illus., tables.
- Die messung der härte von kunstharzpresstoffen, von S. Erk und W. Holzmüller. Kunststoffe, München, May 1938, v. 28, no. 5, p. 109-13. illus., tables.
- Old trade and new knowledge. Aeroplane, London, Apr. 20, 1938, v. 54, p. 486-87. illus.
- Plastic moulding, by G. Dring. Automobile engineer, London, Mar.-Apr. 1938, v. 28, no. 369, 370, p. 95-96; 114. diagsr., tables.
- Plastics and national socialism, by T. H. Grant. Chemistry and industry journal, London, Mar. 19, 1938, v. 57, no. 12, p. 263-66. diagsr.
- Discussion of testing methods for the determination and comparison of the strength properties of various organic plastics, by H. M. Richardson. American society for testing materials, preprint, Philadelphia, Mar. 9, 1938, p. 9-12.
- Flow relations of thermo-plastic materials, by C. H. Penning and L. W. A. Meyer. American society for testing materials, preprint, Philadelphia, Mar. 9, 1938, p. 23-29. illus.
- Hardness as applied in the plastic industry, by J. C. Pitzer. American society for testing materials, preprint, Philadelphia, Mar. 9, 1938, p. 31-35.
- The Properties of an ideal plastic, by A. F. Randolph. American society for testing materials, preprint, Philadelphia, Mar. 9, 1938, p. 1-8. illus., tables.
- Phenol-formaldehyde resin as a plywood adhesive, by L. E. Stout and W. B. Brew. Modern plastics, New York, Mar. 1938, v. 15, no. 7, p. 39-40, 42, 68. diagsr., tables.
- Spanlose formgebung von leichtmetallen und kunststoffen im werk Sömmerda, von H. Walbert. Rheinmetall-borsig-mitteilungen, Berlin, Mar. 1938, no. 6, p. 31-37. illus.

## PLASTIC MATERIALS

- Developments in plastic molding equipment, by L. F. Rahm. Mechanical engineering, New York, Feb. 1938, v. 60, no. 2, p. 117-22. illus.
- Machining and polishing plastics on production basis. Canadian machinery, Toronto, Feb. 1938, v. 49, no. 2, p. 32-33, 56. illus.
- Raw materials of plastics industry, by Gustavus J. Esselen and Frederick S. Bacon. Industrial and engineering chemistry, Washington, Feb. 1938, v. 30, no. 2, p. 125-30. diags., illus., tables.
- Selecting plastics by properties, by F. S. Bacon. Modern plastics New York, Feb. 1938, v. 15, no. 6, p. 41-42, 46. illus.
- Shaping plastics from sheet. Plastics, London, Feb. 1938, v. 11, no. 9, p. 42-44. illus.
- A Review of production and technical progress in the plastic industry, by Harry Barron. Chemical age, London, Jan. 1, 1938, v. 38, no. 966, p. 7-8.
- New molding plant. Western flying, Los Angeles, Cal., Jan. 1938, v. 18, no. 1, p. 32.
- Plastic aircraft material for wing construction. Mechanical engineering, New York, Jan. 1938, v. 60, no. 1, p. 63-64. diags. illus.
- Preheating thermosetting molding materials, by D. M. Buchanan. Modern plastics, New York, Jan. 1938, v. 15, no. 5, p. 45-46, 60-62. diags., illus.
- The Trend of research in plastic materials, by Gilbert Morgan. Transactions of the Institute of plastic industry, London, Jan. 1938, v. 7, no. 13, p. 28-47. illus., tables.
- Application and testing of transparent plastics used in airplane construction, by K. Riechers and J. Olms. Washington, 1938. 12 p. diags., illus., tables. (N.A.C.A. Technical memorandum no. 881) (From Deutsche luftwacht, ausgabe luftwissen, Berlin June 1938, v. 5, no. 6, p. 197-202)
- Creep in strip and ring specimens of bonded fabric material, by R. Livingston and A. S. T. Thompson. Journal of the Royal technical college, Glasgow, 1938, v. 4, p. 376-83. illus., tables.
- Neuere untersuchungen über die verwendung härtpbarer plastischer massen im flugzeugbau, von Wilhelm Küch. (In Jahrbuch der deutschen luftfahrtforschung, Berlin, 1938, v. 1, p. 561-73. illus.)

## PLASTIC MATERIALS

- Synthetic resin. (Phenolic) moulding. British standard institution, London, Jan. 1938, no. 771, p. 1-32. diags., illus., table.
- A Ready reverence for plastics. Boonton, N. J., Boonton moulding company, 1938. 26 p. diags.
- Versuche an kunststoffen für den flugzeugbau, von K. Riechers. Zeitschrift des V.D.I., Berlin, 1938, v. 82, no. 22, p. 665-71. illus., tables.
- Verwendung und prüfung durchsichtiger werkstoffe im flugzeugbau, von K. Riechers und J. Olms. Deutsche luftwacht, ausgabe luftwissen, Berlin, 1938, v. 5, no. 6, p. 197-202. illus., tables.
- Vorrichtungen und werkzeuge aus geschichtetem kunstharzpresstoff, von R. Ribcke. Arado-Bote, Arado flugzeugwerke, Brandenburg, 1938, v. 2, no. 1, p. 10-11. illus.
- Veredlungsverfahren für synthetische werkstoffe, von Bruno Waeser. Chemische apparatur, Berlin, Dec. 25, 1937, v. 42, no. 24, p. 397-99. tables. (Abstract Holz, Berlin, Feb. 1939, v. 2, no. 2, p. 89)
- Plastics in aircraft, by M. Langley. Aeroplane, London, Dec. 15, 1937, v. 53, no. 1386, p. 749-50. illus.
- Synthetic plastics in aircraft construction, by C. Y. Hopkins. Engineering journal, London, Dec. 1937, v. 20, no. 12, p. 858-59.
- Vorrichtungen und werkzeuge aus künstlichen harzen zum gebrauch im metallflugzeugbau, von R. Ribcke. Deutsche luftwacht, ausgabe luftwissen, Berlin, Dec. 1937, v. 4, no. 12, p. 359-62. illus.
- N.A.C.A. studies plastic for aircraft windshields. Automotive industries, Philadelphia, Nov. 20, 1937, v. 77, no. 20, p. 744-45.
- Bellanca 28.92 equipped with Plexiglas windshield. Modern plastics, New York, Nov. 1937, v. 15, no. 3, p. 16, 30. illus.
- Resin impregnated wood. Plastics, London, Nov. 1937, v. 1, no. 6, p. 204. illus.
- Transparent plastics for aircraft windows. Journal of the Franklin institute, Philadelphia, Nov. 1937, v. 224, no. 5, p. 649-52. diags., illus.
- Plastics in aircraft industry, by G. P. Young. Iron age, New York, Oct. 28, 1937, v. 140, no. 18, p. 118.

## PLASTIC MATERIALS

- Towards an ideal (Jicwood, Jicglue). *Aeroplane*, London, Oct. 6, 1937, v. 53, no. 1376, p. 431-32. illus.
- Condensed review of some recently developed materials. *Machinery*, New York, Oct. 1937, v. 44, no. 2, p. 129-30, 135. illus.
- Materials, catalog directory. *Modern plastics*, New York, Oct. 1937, v. 15, no. 2, p. 74.
- Les Matières à base de résines synthétiques et la construction aéronautique, par R. Hamard. *L'Aéronautique*, Paris, Oct. 1937, v. 19, no. 221, p. 231-35. table.
- Plastics aloft, by D. S. Frederick. *Modern plastics*, New York, Oct. 1937, v. 15, no. 2, p. 302-03, 318. illus.
- Resin-impregnated wood. *Plastics*, London, Oct. 1937, v. 1, no. 5, p. 166-68. illus.
- Study of transparent plastics for use on aircraft, by Benjamin M. Axilrod and Gordon M. Kline. Washington, U. S. Govt. print. off., *Journal of research of the National bureau of standards*, Oct. 1937, v. 19, no. 4, p. 367-400. illus., tables.
- An Aircraft plastic. Tufnol. *Aeroplane*, London, Sep. 22, 1937, v. 53, no. 1374, p. 374.
- German synthetic resins and their essential properties. *Industrial and engineering chemistry*, Washington, Sep. 20, 1937, v. 15, no. 18, p. 411-17. table.
- Casting resins in rubber molds, by J. Mayer. *Modern plastics*, New York, Sep. 1937, v. 15, no. 1, p. 22-23, 62. illus.
- Perspex - the new transparent resin. *Plastics*, London, Sep. 1937, v. 1, no. 4, p. 134-35. illus., tables.
- Plastics in aircraft construction, by M. Langley. *British plastics*, London, June-Sep. 1937, v. 9, no. 97-100, p. 5-8, 55-58; 185-90. illus., tables.
- Recent progress in the use of synthetic plastics in engineering. *Engineering*, London, Aug. 6, 20, 1937, v. 144, no. 3734, 3736, p. 144-46, 201-03. illus., tables.
- Synthetic rubber materials, by T. L. Garner. *Aircraft engineering*, London, Aug. 1937, v. 9, no. 102, p. 209-11. diags., tables.
- Wing construction in plastics. *Plastics*, London, Aug. 1937, v. 1, no. 3, p. 108. diags.
- An Interesting form of wing construction employing wood spars, metal and plastics. *Flight*, London, July 22, 1937, v. 32, no. 1491, p. 100. illus.



## PLASTIC MATERIALS

- Use of plastics in wing construction. *Aeroplane*, London, July 21, 1937, v. 53, no. 1365, p. 75-76. diagsr.
- Plastic progress. Plastic airscrew blades. *Aeroplane*, London, July 14, 1937, v. 53, no. 1364, p. 61.
- The Future of aircraft construction. *Plastics*, London, July 1937, v. 1, no. 2, p. 41.
- Permeability of organic polysulfide resins to hydrogen-resin treatment to impede passage of gases through airplane fabrics, by Theron P. Sager. *Industrial and engineering, chemistry*, Washington, July 1937, v. 29, no. 7, p. 747-49. diagsr., tables.
- Plastics in aircraft construction, by T. James. *Plastics*, London, July 1937, v. 1, no. 2, p. 44-47. illus.
- Plastic materials for aircraft construction; bakelite and aerolite, by N.A. De Bruyne. *Journal of the R.A.S.*, London, July 1937, v. 41, no. 319, p. 523-90. diagsr., illus. (Also *Engineering*, London, Feb. 19, 1937, v. 143, p. 210-11)
- Uses for plastics. *Aeroplane*, London, June 2, 1937, v. 52, no. 1358, p. 681.
- New plastics of aeronautical interest. *Modern plastics*, New York, June 1937, v. 14, no. 10, p. 42, 75.
- Transparent materials in airplane construction. *Scientific american*, New York, June 1937, v. 156, no. 6, p. 387.
- Criteria of structural efficiency. (Tensile strength and density of plastics), by F. R. Shanley. *Aeroplane*, London, May 26, 1937, v. 52, no. 1357, p. 654.
- Plastics, by H. Chase. *Automotive industries*, Philadelphia, May 15, 1937, v. 76, no. 20, p. 722-30, 38. illus., tables.
- Possibilities for plastics, by A. F. C. Boys. *Aeroplane*, London, May 12, 1937, v. 52, no. 1355, p. 598.
- Filled resins and aircraft construction, by G. De Haviland. *Modern plastics*, New York, Mar. 1937, v. 14, no. 7, p. 46, 78, 79. tables. (Also *Journal of the Aeronautical sciences*, New York, Aug. 1936, v. 3, no. 10, p. 356-57)
- Improving the creep stress of plastics. *Modern plastics*, New York, Mar. 1937, v. 14, no. 7, p. 44-45, 75. diagsr., illus.
- Plastic and things at Olympia. *Aeroplane*, London, Feb. 24, 1937, v. 52, no. 1344, p. 235-36.
- Plastic materials for aircraft construction. *Engineering*, London, Feb. 19, 1937, v. 143, no. 3710, p. 210.

## PLASTIC MATERIALS

- Plastics at Hatfield, by E. P. King. *Aeroplane*, London, Feb. 17, 1937, v. 52, no. 1343, p. 195-97. diags., illus., tables.
- Synthetic material for aircraft construction, by N. A. De Bruyne. *Flight*, London, Feb. 4, 11, 1937, v. 31, no. 1467, 1468, p. 121-23, 151-53. (Also *Aeroplane*, London, Feb. 3, 1937, v. 52, no. 1341, p. 142-45)
- More about plastics. *Aeroplane*, London, Feb. 10, 1937, v. 52, no. 1342, p. 169-70.
- Permeability to moisture of synthetic resin finished for aircraft, by G. M. Kline. Washington, U. S. Govt. print. off., *Journal of research of the National bureau of standards*, Feb. 1937, v. 18, no. 2, p. 243-49. illus., tables.
- Plexiglas in aircraft, by G. P. Young. *Aero digest*, New York, Feb. 1937, v. 30, no. 2, p. 50. illus.
- The Problem of the phenol resinoids, by T. E. Cassey. *Journal of the American society of naval engineers*, Washington, Feb. 1937, v. 49, no. 1, p. 65-76. illus.
- Impact strength of moldings increased. *Industrial and engineering chemistry*, Washington, Jan. 20, 1937, v. 29, no. 1, p. 43.
- Die Deutschen kunstharze. *Der Farbenchemiker*, Berlin, Jan. 1937, v. 8, no. 1, p. 16-25. diags., illus.
- Methods of testing plastics, by G. M. Kline and B. A. Axilrod. *Modern plastics*, New York, Jan. 1937, v. 14, no. 5, p. 35-37, 61-63. illus., tables.
- Deutsches jahrbuch für die industrie der plastischen massen, von Van der Werth und W. Pansegrau. Berlin, W. Pansegrau, 1937. 320 p. illus.
- Physical properties; working properties, and uses of plastics in aeronautics, by George F. Titterton. (In his *Aircraft materials and processes*. London; New York, Isaac Pitman and son, 1937. p. 287-91. tables)
- Plastics as structural materials for aircraft, by G. M. Kline. Washington, 1937. 24 p. diags., tables. (N.A.C.A. Technical notes no. 628)
- Synthetic resins in aircraft construction - their composition, properties, present state of development and application to light structures, by K. Riechers. Washington, 1937. 12 p. diags., illus., tables. (N.A.C.A. Technical memorandums no. 841) (From *Deutsche luftwacht, ausgabe luftwissen*, Berlin, Aug. 1937, v. 4, no. 21, p. 235-42)

## PLASTIC MATERIALS

- Transparent plastics: Pyralin, Plastecel, Plexiglas, Lucite - (used for aircraft windshields and cabin enclosures), by George F. Titterton. (In his Aircraft materials and processes. London; New York, Isaac Pitman and son, 1937. p. 294-96. tables)
- The Latest about plastics, by H. V. Potter. Aeroplane, London, Dec. 30, 1936, v. 51, no. 1336, p. 843.
- Entwicklung, umfang, bedeutung und chemie der kunststoffe, von G. Kränzlein. Angewandte chemie, Berlin, Dec. 24, 1936, v. 7, no. 12, p. 462-64.
- Improved phevurlic plastics, their properties and uses, by F. E. Brill. Production engineering, New York, Dec. 1936, v. 7, no. 12, p. 462-64.
- The National bureau and the plastic industry. Technical news bulletin, National bureau of standards, Washington, Dec. 1936, no. 236, p. 117-18.
- Resin film as a plywood adhesive, by Thomas D. Perry. Modern plastics, New York, Dec. 1936, v. 14, no. 4, p. 18-19, 64-68. illus., tables.
- Development in plastics. Engineering, London, Nov. 27, 1936, v. 142, no. 3698, p. 587-88.
- The Technology of plastics, by H. W. Rowell. Industrial and engineering chemistry, Washington, Nov. 20, 1936, v. 28, no. 34, p. 457.
- Plastics appear on aircraft, by J. Delmonte. Journal of the Aeronautical sciences, New York, Nov. 1936, v. 4, no. 1, p. 12-18. illus., tables. (Abstract L'Aerotecnica, Roma, Apr. 1937, v. 17, no. 4, p. 361)
- Verwendungsmöglichkeiten von kunstharzpresstofflagern, von O. Achilles. Zeitschrift des V.D.I., Berlin, Oct. 31, 1936, v. 80, no. 44, p. 1317-20. illus., tables.
- Plastic materials in aeronautics. Engineering, London, Oct. 9, 1936, v. 142, no. 3691, p. 389.
- Private aeronautical research works; investigation of synthetic resins. Engineer, London, Oct. 9, 1936, v. 162, no. 4213, p. 386.
- A Property of synthetic resins, by N. A. De Bruyne and J. N. Maas. Aircraft engineering, London, Oct. 1936, v. 8, no. 92, p. 289-90. diagrs., illus.

## PLASTIC MATERIALS

- Methods of testing plastics, by Gordon M. Kline and B. A. Axilrod. Technical news bulletin, National bureau of standards, Washington, Oct. 1935, no. 234, p. 89. (Also Industrial and engineering chemistry, Washington, Oct. 1936, v. 28, no. 10, p. 1170-73. illus., tables)
- Plastics in the aeronautical industry. British plastics, London, Oct. 1936, v. 8, no. 89, p. 203.
- Tailoring the long molecule - plastics, by Carleton Ellis. Industrial and engineering chemistry, Washington, Oct. 1936, v. 28, no. 10, p. 1130-44. diags., illus., tables.
- The Behaviour of a brittle material at failure. Journal of Applied mechanics, New York, Sep. 1936, v. 3, no. 3, p. 99-103. diags., illus.
- Plastics in instrument design, by H. W. Rowell. Journal of scientific instruments, London, Sep. 1936, v. 6, no. 8, p. 276-79. illus.
- Properties and applications of artificial resin products, by R. Houwink. Philips technical review, Eindhoven, Netherlands, Sep. 1936, v. 1, no. 9, p. 257-63. diags., illus., tables.
- Entwurf eines flugzeugflügels aus plastischem werkstoff. Plastische massen, Köln, Aug. 1936, v. 6, no. 8, p. 276-79. illus.
- Increasing applications of plastics, by H. Pennington. Aero digest, New York, July 1936, v. 29, no. 1, p. 30-31, 112. illus.
- Organic plastics. Technical news bulletin, National bureau of standards, Washington, July 1936, no. 231, p. 59-60. diagr., illus.
- The Hindenburg. Modern plastics, New York, June 1936, v. 13, no. 10, p. 22-23. illus.
- Light and safe for aircraft. Need and development of safety glass and resinous glass, by J. Delmonte. Modern plastics, New York, May 1936, v. 13, no. 9, p. 15-16, 60-62. illus.
- Matière plastique transparente pour fenêtres d'avions. Revue générale des matières plastiques, Paris, May 1936, v. 12, no. 5, p. 158. diags.
- More plastic parts, by H. Chase. Automotive industries, Philadelphia, Apr. 18, 1936, v. 74, no. 16, p. 560.
- Production of synthetic resin parts on standard machine tools. (Catalin), by L. M. Waite. Iron age, New York, Apr. 9, 1936, v. 137, no. 15, p. 34-37. illus.

## PLASTIC MATERIALS

- Synthetic plastics. India rubber world, New York, Apr. 1, 1936, v. 94, no. 1, p. 37.
- Transparent thermoplastics. Flight, London, Mar. 26, 1936, v. 29, no. 1422, p. 19.
- Plastics - competitor or ally, by F. E. Brill. Iron age, New York, Mar. 19, 1936, v. 136, no. 12, p. 32-35. illus.
- A Remarkable plastic. Flight, London, Mar. 19, 1936, v. 29, no. 1421, p. 304. illus.
- Design for a plastic wing, by S. Ireland. Aeroplane, London, Mar. 18, 1936, v. 50, no. 1395, p. 345-46. diags.
- Acrylic resins. Plexiglas, Plexite, etc., by H. T. Neher. Industrial and engineering chemistry, Washington, Mar. 1936, v. 28, no. 3, p. 267-71. illus.
- High-impact bakelite materials. Mechanical engineering, New York, Mar. 1936, v. 58, no. 3, p. 180.
- A New plastic material - AXF, by S. D. Shinkle, A. E. Brooks and G. H. Cady. Industrial and engineering chemistry, Washington, Mar. 1936, v. 28, no. 3, p. 275-80. illus.
- Plastics, by H. E. Chase. Electronics, New York, Mar. 1936, v. 9, no. 3, p. 10.
- Transparent plastic for aircraft windows. Glass industry, New York, Mar. 1936, v. 17, no. 3, p. 79.
- Le Verre transparent dans la construction aéronautique. Revue générale des matières plastiques, Paris, Mar. 1936, v. 12, no. 3, p. 76-78. illus.
- Improving the creep stress of plastics. Aeroplane, London, Feb. 19, 1936, v. 50, no. 1291, p. 231-32.
- Airplanes of plastic materials? Scientific american, New York, Feb. 1936, v. 154, no. 2, p. 105-06.
- Plaskon. Mechanical engineering, New York, Feb. 1936, v. 58, no. 2, p. 116. (Also Machinery, New York, Nov. 1935, v. 42, no. 3, p. 169-74)
- Plastics in aviation, by Blaine Stubblefield. Modern plastics, New York, Feb. 1936, v. 13, no. 6, p. 17, 58-59. illus.
- Plastics. Aeroplane, London, Jan. 1, 1936, v. 40, no. 1284, p. 16-17.
- The Versatility of plastics. Rhodoid. Aeroplane, London, Jan. 1, 1936, v. 50, no. 1284, p. 28.

## PLASTIC MATERIALS

- Expanding aircraft industry and its possible uses for plastics, by C. C. Walker. Transactions of the Institute of plastic industry, London, Jan. 1936, v. 5, no. 9, p. 65-72. illus. (Also Journal of the Society of chemical industries, London, Dec. 27, 1935, v. 54, no. 52, p. 1112-13)
- Die Prüfung von fertigtücken aus isolierpressstoffen auf werkstoff-eigenschaften, von A. Schob, R. Nitsche und E. Salewski. Plastische massen, Köln, Dec. 1935, Jan. 1936, v. 5, 6, no. 12, 1, p. 353-58; 1-5. diags., illus., tables
- Transparent plastics for aircraft windows, by G. M. Kline. Modern plastics, New York, Jan. 1936, v. 13, no. 5, p. 17, 55. (Also Industrial and engineering chemistry, Washington, Dec. 20, 1935, v. 13, no. 24, p. 479)
- Betriebserforschungen mit kunstharzpressstoffen, von A. Bantzer. Elektrizitäts-wirtschaft, Berlin, 1936, v. 35, no. 26, p. 670-72. illus.
- The Making and moulding of plastics, by L. M. T. Bell. London, Hutchinson's scientific and technical publications, 1936. 238 p. diags., illus., tables.
- Prüfung und bewertung von kunstharzerzeugnissen, von W. Roehrs. Kunststoffe, München, 1936, v. 52, no. 3, p. 47-54. illus.
- Versuche mit pressstofflagern, von E. Lehr. Kunststoffe, München, 1936, v. 28, no. 7, p. 161-70. illus., tables.
- Plastics and aviation. Flight, London, Dec. 19, 1935, v. 28, no. 1408, p. 653.
- Moulding the plastic mind. Aeroplane, London, Dec. 18, 1935, v. 49, no. 1282, p. 747-50. illus.
- More plasticity. Aeroplane, London, Dec. 11, 1935, v. 49, no. 1280, p. 734.
- Plastics this week. Aeroplane, London, Dec. 11, 1935, v. 49, no. 1280, p. 709.
- Plastics and aircraft. British plastics, London, Nov. 1935, v. 7, no. 78, p. 235.
- Recherches soviétiques sur les matières plastiques, par M. Précoul. L'Aérophile, Paris, Nov. 1935, v. 43, no. 11, p. 338-39.
- Plastic materials for aircraft construction. Plastics and aviation, by Marcus Langley. Aeroplane, London, Oct. 9, 1935, v. 49, no. 1272, p. 441-46, 529-32. (Also Flight, London, v. 28, no. 1408, p. 653-55)

## PLASTIC MATERIALS

- Towards the moulded aeroplane. *Aeroplane*, London, Oct. 9, 1935, v. 49, no. 1272, p. 432.
- Commercial aircraft, by G. De Havilland. *Journal of the R.A.S.*, London, Oct. 1935, v. 39, no. 298, p. 963-83. diags., illus.
- Deutsche technik und rohstoffwirtschaft. Kunstharzpressstoff für gleitlager, von W. Ostermann. *Zeitschrift des V.D.I.*, Berlin, Sep. 21, 1935, v. 79, no. 38, p. 1131-36. diags., illus.
- Atwood plane completed. Use of Duply. *Aviation*, New York, July 1935, v. 34, no. 7, p. 64.
- Modern giants of the airways. *Bakelite review*, New York, July 1935, v. 7, no. 2, p. 3. illus.
- Cast plastics, by H. Chase. *American machinist*, New York, May 22, 1935, v. 79, no. 11, p. 390-91.
- Directory of plastics. *Machine design*, Cleveland, O., Feb. 1935, v. 7, no. 2, p. 34-36. illus.
- Aufbau der kunstharzpressstoffe für die anfertigung von gleitlagern, von W. Stodt. *Stahl und eisen*, Düsseldorf, Jan. 1935, v. 55, no. 7, p. 183-85. table.
- Aircraft; materials and testing, by L. B. Tuckerman. *American society for testing materials*, Philadelphia, 1935, v. 35, p. 3-46. illus.
- The Expanding aircraft industry and its possible uses for plastics, by C. C. Walker. *Chemistry and industry review*, London, 1935, v. 54, p. 1112-13.
- Koroseal - a new plastic, by S. L. Brous and W. L. Semon. *Industrial and engineering chemistry*, Washington, 1935, v. 27, p. 667.
- Methods of shaping and bending of wood, the plasticity of bakelite for construction of parts used in aeronautics, by R. Kurowski. *Institute of technical research in aeronautics*, Moscow, 1935, v. 7, no. 70, p. 5-12. illus.
- Aero research. *Aeroplane*, London, June 6, 1934, v. 46, no. 23, p. 901-04. diags., illus.
- Kunstharzstoffe und ihre entwicklung zum flugzeugbaustoff, von Otto Krämar. *Z.F.M.*, München, July 28, Aug. 14, 1933, v. 24, no. 14, 15, p. 387-93, 420-26. (Also *Jahrbuch der D.V.L.*, München, 1933, p. 69-81)
- Bakelite in aviation, by A. V. H. Mory. *Aviation engineering*, New York, June 1933, v. 8, no. 6, p. 15-16, 20. illus.

## PLASTIC MATERIALS

- Die Auswirkung neuer erkenntnisse der werkstoffforschung auf den luftfahrzeugbau, von Paul Brenner. Z.F.M., München, 1933, v. 27, no. 18, p. 497-505. illus.
- Die Dämpfungseigenschaften von nichtmetallen, von G. Parzich. Forschung, Berlin, 1933, v. 1, p. 8-10.
- Plastische massen in der technik, von Wilhelm Röhrs. Zeitschrift des V.D.I., Berlin, Dec. 17, 1932, v. 76, no. 51, p. 1233-39. illus., tables.
- To the question of application of artificial tar and plastic masses in airplane making, by N. F. Bocharov. Teknika vozdušnovo flota, Moscow, Nov.-Dec. 1932, no. 11, 12, p. 68-81. tables.
- Bakelite mouldings. Flight, London, Sep. 9, 1932, v. 24, no. 1237, p. 859.
- Bakelite and articles made out of it for aviation, by D. A. Kostyliov. Teknika vozdušnovo flota, Moscow, Aug.-Sep. 1932, no. 8-9, p. 824-29. tables.
- Data on the strength of aircraft materials, by Joseph Newall. Aviation engineering, New York, Mar. 1932, v. 6, no. 3, p. 11-14. diags., illus.
- Phenol-resin moulding technique, by Leon V. Quigley. (In British plastics year book, London, 1932, p. 112-13, 119. illus., tables)
- Damping capacity of materials, by G. S. von Heydekampf. American society for testing materials, Philadelphia, 1931, v. 31, p. 157-71. diags., tables.
- Kunstharzpressstoffe, von K. Hesse. Maschinenbau, Berlin, 1931, v. 10, no. 16, p. 540-41.
- The Aeronautical use of bakelite and similar products, by J. F. Hardecker. Aviation, New York, Jan. 25, 1930, v. 28, no. 4, p. 144-48. illus.
- The Airplane industry uses molded products for strength and lightness. Plastics, London, June 1929, v. 5, no. 6, p. 349. illus.
- Making micarta airplane propellers, by R. L. Knight. Machinery, London, Feb. 1929, v. 35, no. 6, p. 409-11. illus.
- How micarta propellers are made. Aero digest, New York, Jan. 1929, v. 14, no. 1, p. 72.
- Consolidated to use bakelite cases for instruments. Aero digest, New York, Aug. 1928, v. 13, no. 2, p. 272.



## PLASTIC MATERIALS

- A Micarta propeller for the OX-5 engine. Aero digest, New York, Apr. 1928, v. 12, no. 4, p. 603.
- Westinghouse micarta propeller. Aviation, New York, Aug. 8, 1927, v. 23, p. 317-18. illus.
- Micarta propellers. Scientific american, New York, Jan. 1925, v. 132, p. 551.
- Hélices d'aéronautique construite en bakelite agglomérée, ou micarta. Le Génie civil, Paris, May 10, 1924, v. 84, p. 458.
- Micarta propellers. I-IV, by Frank Walker Caldwell and N. S. Clay. Washington, 1924. 4 v. diags., illus. (N.A.C.A. Technical notes no. 198, 199, 200, 201) (From Z.F.M., München, Feb. 28, 1925, v. 16, no. 4, p. 104-05)
- Molded-fabric airplane propeller is warp proof. Popular mechanics, Chicago, July 1921, v. 36, p. 39-40.
- Bakelite for aeroplane propellers. Aeronautics, London, Feb. 3, 1921, n.s., v. 20, no. 381, p. 84.
- Bakelite for airplane propellers. Scientific american, New York, Jan. 8, 1921, v. 124, p. 34. illus.
- New propeller gives good results in army test, molded bakelite construction. Automotive industries, Philadelphia, June 17, 1920, v. 42, p. 1407.
- Bakelite micarta propellers, by N. S. Clay. Aviation, New York, June 1, 1920, v. 8, no. 9, p. 354-57. illus., tables. (Also Electric journal, New York, Nov. 1919, v. 16, p. 482-84)
- Micarta propellers under test. Aeronautics, London, May 27, 1920, v. 18, no. 345, p. 418-19.
- Micarta airplane propellers. Aviation, New York, Jan. 1, 1920, v. 7, no. 11, p. 480. illus.
- Micarta Liberty propeller. Manufactured by Westinghouse electric and manufacturing company. Destructive whirling test no. 261. Washington, U. S. Govt. print. off., 1920. 7 p. illus.
- Molded airplane propellers. Scientific american, New York, Jan. 4, 1919, v. 120, p. 11. illus.
- Bakelite propellers under tests. New modeling method of construction requiring no machining. Comparison with wood and results of tests. Bulletin of the Air corp engineering department, Dayton, O., July 1918, v. 1, no. 2, p. 105-13. illus.

## Section II

## BOOKS AND PAMPHLETS

- Dictionary of metals and their alloys; their composition and characteristics, by F. J. Camm. New York, Chemical publishing company, 1940. 248 p. diagsr., illus.
- Die Aluminiumecke des dreistoffsystems: aluminium-eisen-mangan, von Erich Degischer. Berlin, Aluminum zentrale, 1939. 75 p. illus.
- Anleitungsblätter für das schweissen und löten von leichtmetallen, von A. Matting. Berlin, Zeitschrift des V.D.I., 1939. 113 p. diagsr., illus., tables.
- Les Barres de connexion en aluminium. Paris, Société l'aluminium français, 1939. 23 p. illus.
- The Effect of continuous weathering on light metal alloys used in aircraft, by Willard Mutchler. Washington, U. S. Govt. print. off., 1939. 27 p. diagsr., tables. (N.A.C.A. Report no. 663)
- Effect of service stress on impact resistance, x-ray diffraction patterns, and microstructure of 25S aluminum alloy, by J. A. Kies and G. W. Quick. Washington, U. S. Govt. print. off., 1939. 22 p. diagsr., illus., tables. (N.A.C.A. Report no. 659)
- Flugzeug - leichtmetallbau, von K. Krieger. Berlin, M. Matthiesen und co., 1939. 168 p. diagsr., illus., tables.
- Der Flugzeugschweisser, von R. Hoffmann. (In his Der Facharbeiter im flugzeugbau. Berlin, C. J. E. Volckmann, 1939. 98 p. illus.)
- Herstellung hochwertiger metallüberzüge, von Walter Eckardt und Oskar Krämer. Leipzig, G. Leuze, 1939. 168 p. diagsr., illus., tables.
- Korrosion, passivität und oberflächenschutz von metallen, von U. Evans und E. Pietsch. Berlin, J. Springer, 1939. 742 p. diagsr., illus., tables.
- Leichtmetallbearbeitung, von A. Wallich und R. Wallich. München, Carl Hansen, 1939. 102 p. diagr., illus., tables.
- Leichtmetalle, von F. Höhne. Leipzig, J. J. Arndt, 1939. 78 p. diagsr., illus., tables.
- Magnesium and its alloys, by J. L. Haughton and W. E. Prytherch. New York, American chemical publishing company, 1939. 100 p. diagsr., illus., tables.

## METALS AND LIGHT ALLOYS

- Nicht-eisenmetalle, von F. Höhne. Leipzig, J. J. Arndt, 1939. 62 p. illus.
- The Back method for compressive tests of thin specimens of materials used in thin wall structures, by C. S. Aitchison and L. B. Tuckerman. Washington, U. S. Govt. print. off., 1939. 11 p. (N.A.C.A. Report no. 649)
- Schweisskonstruktionen, von R. Hunchen. Berlin, J. Springer, 1939. 123 p. diags., illus., tables.
- Spannungszustand und bruchausbildung, von A. Thum und K. Federn. Berlin, J. Springer, 1939. 78 p. illus.
- Steel and its heat treatment, by Denison Kingsley Bullens. London, John Wiley and sons, 1938-1939. v. 1, 2; 445 p., 491 p. diags., illus., tables.
- Steel and its heat treatment, by D. K. Bullens and Battelle. New York, John Wiley and sons, 1939. v 1; 250 p. diags., illus., tables.
- Technologie der maschinen baustoffe, von Franz Halla. Leipzig, S. Kirzel, 1939. 505 p. illus., tables.
- Technologie des aluminiums und seiner leichtlegierungen. Leipzig, Akademische verlagsgesellschaft, 1939. 449 p. diagr., illus., tables.
- Tensile elastic properties of 18:8 chromium-nickel-steel as affected by plastic deformation, by D. J. Adam and R. W. Mebs. Washington, U. S. Govt. print. off., 1939. 48 p. diags., tables. (N.A.C.A. Report no. 670)
- Tidewater and weather exposure tests on metals used in aircraft, by W. Mutchler and W. G. Galvin. Washington, 1939. 27 p. diags., tables. (N.A.C.A. Technical notes no. 736)
- Torsional stability of aluminum alloy seamless tubing, by R. L. Moore and D. A. Paul. Washington, 1939. 13 p. diags., tables. (N.A.C.A. Technical notes no. 696)
- Welding aluminum and its alloys. Pittsburgh, Aluminum company of America, 1939. 48 p. diags., illus., tables.
- The Welding and cutting year book. London, Tensbank publishing company, 1939. 240 p. diags., illus., tables.
- Welding engineers pocketbook. New York, Chemical publishing company, 1939. 240 p. diags., illus., tables.
- The Welding of inconel and inconel clad steel. New York, International nickel company, 1939. 11 p. diags., illus., tables.

## BOOKS AND PAMPHLETS

- Zerspannung der leichtmetalle, von A. E. Wallich's. München, Karl Hauser, 1939. 102 p. diags., illus.
- Aircraft structures; materials, heat treatment, inspection, by J. B. Johnson. (In Welding handbook. New York, American welding society, 1938. p. 1042-64. diags., illus.)
- Alloys of aluminum and magnesium, by E. H. Dix, Sr. (In Symposium on high-strength constructional metals. Philadelphia, American society for testing materials, 1938. 150 p. illus.)
- Alloys of iron and nickel, by J. S. Marsh. New York, McGraw-Hill book company, 1938. 593 p. diags., illus., tables.
- Chemische analysen methoden für aluminium und seine legierungen, von K. Steinhäuser und P. Urech. Berlin, Aluminium-zentrale, 1938. 275 p. diags., illus., tables.
- A Compilation of high temperature creep characteristics of metals and alloys. New York, American society for testing materials; and American society of mechanical engineers, 1938. 860 p. diags.
- Corrosion - fatigue properties of duralumin with and without protective coatings, by I. J. Gerard and H. Sutton. London, H. M. Stat. off., 1938. p. 2-3. (A.R.C. R. & M. no. 1828)
- The Crinkling strength and the bending strength of round aircraft tubing, by William R. Osgood. Washington, U. S. Govt. print. off., 1938. 15 p. diags. (N.A.C.A. Report no. 632)
- Die Darstellung der metalle im laboratorium, von Herbert Funk. Stuttgart, Ferdinand Enke, 1938. 183 p. diags., illus., tables.
- The Deflexion of unsupported beams under variable loads, by R. A. Fairthorne. London, H. M. Stat. off., 1938. p. 18. (A.R.C. R. & M. no. 1828)
- Die Elektrolytische oxydation des aluminiums und seiner legierungen, von A. Jenny. Dresden, Theodor Steinkopff, 1938. 224 p. diags., illus., tables.
- Fluxes for use in soft soldering, by J. W. Willstrop, A. J. Sidney and H. Sutton. London, H. M. Stat. off., 1938. p. 8-9. (A.R.C. R. & M. no. 1828)
- Fortschritte auf dem gebiete der leichtmetalle 1936-1937, von F. Blank. Berlin, G. Lüttke, 1938. 38 p. diags., illus., tables.
- Härten und vergüten des stahles, von Hugo Herders. Berlin, J. Springer, 1938. 68 p. diags., illus., tables.

## METALS AND LIGHT ALLOYS

- Die Korrosion von nichteisenmetallen und deren legierungen, von Otto Kröhnke. Leipzig, G. Hirzels, 1938. 901 p. diagr., illus., tables.
- Leichtmetallbearbeitung, von H. Hornauer. München, Carl Hansen, 1938. 64 p. illus.
- Metallschutz, von W. Wiederholt. Leipzig und Berlin, Verlag Teubner, 1938. 106 p. illus., tables.
- Les Métaux légers, par H. S. C. Deville. Paris, Gauthier Villars, 1938. 167 p. diagrs., illus., tables.
- Le Module d'élasticité des alliages légers et sa variation avec la température, par Jacqueline Pierette Chailloux. Paris, E. Blondel La Rougery, 1938. 30 p. diagrs., illus., tables. (Pub. scient. tech. Min. de l'air no. 122)
- Note on pickling or etching baths for duralumin, by H. Sutton and T. J. Peake. London, H. M. Stat. off., 1938. p. 10-11. (A.R.C. R. & M. no. 1828)
- A Note on the influence of salt-bath heat-treatment on the corrosion-resistance of duralumin sheet, by A. J. Sidery and B. Evans. London, H. M. Stat. off., 1938. p. 12-15. table. (A.R.C. R. & M. no. 1828)
- On the response of a vane anemometer to an air-stream of pulsating speed, by E. Ower. London, H. M. Stat. off., 1938. p. 20. (A.R.C. R. & M. no. 1828)
- On the torsion of conical shells, by R. V. Southwell. London, H. M. Stat. off., 1938. p. 19. (A.R.C. R. & M. no. 1828)
- The Performance of coil ignition systems with particular reference to double contact-breakers and the effects of variation of the period of open circuit, by W. R. Debenham. London, H. M. Stat. off., 1938. p. 16-17. (A.R.C. R. & M. no. 1828)
- Praktische flugmotorenkunde, von Carl Walther Vogelsang. Berlin, R. C. Schmidt, 1938. 229 p. diagrs., illus.
- The Protection of magnesium alloys against corrosion, by H. Sutton and L. F. Le Brocq. London, H. M. Stat. off., 1938. p. 4-7. (A.R.C. R. & M. no. 1828)
- The Protection of magnesium alloy sheets against corrosion by the use of enamels containing high purity chromates, by L. F. Le Brocq. London, H. M. Stat. off., 1938. 24 p. tables. (A.R.C. R. & M. no. 1845)
- Werkstoff magnesium. Berlin, V.D.I.-Verlag, 1938. 149 p. diagr., illus., tables.

## BOOKS AND PAMPHLETS

- Working and heat treating of steel, by Robert H. Harcourt. Stanford, Cal., Stanford university press, 1938. 261 p. diags., illus.
- Anodizing of aluminum alloys in chromic acid solutions of different concentration, by R. W. Buzzard. Journal of research, U. S. Bureau of standards; Washington, U. S. Govt. print. off., 1937, v. 18, no. 3, p. 257. diags.
- Application de l'analyse spectrographique à l'étude des alliages, par Henri Triché. Paris, Collection des publications du Ministère de l'air, 1937. 68 p. diags., illus.
- Beitrag zur normung der kerbschlagprobe, von V. Jares. Prag, Tschechische normungsgesellschaft, 1937. 55 p. diagr., illus.
- Bending tests of circular cylinders for corrugated aluminum alloy sheet, by Alfred S. Niles, J. C. Buckwalter and Warren D. Reed. Washington, 1937. 20 p. (N.A.C.A. Technical notes no. 595)
- La Corrosion en métallurgie, par C. Grard. Paris, Berger-Levrault, 1937. 345 p. diags., illus.
- La Corrosione dei metalli, di G. Guidi e G. Guzzoni. Milano, Ulrico Hoepli, 1937. 373 p. diags., illus.
- Duralumin and its heat treatment, by P. T. Litherland. London, Charles Griffin and son, 1937. 115 p. illus., tables.
- Einfache lehrversuche mit aluminium und seinen legierungen, von H. Pricks. Berlin, Aluminum-Zentrale, 1937. diagr., illus., tables.
- Einführung in die leichtmetallkunde, von R. Debar. Leipzig, Max Jänecke, 1937. 159 p. diags., illus.
- Galvanotechnik, von H. Krause. Leipzig, Max Jänecke, 1937. 275 p. diagr., illus., tables.
- Increasing the strength of aluminum-alloy columns by prestressing, by E. C. Hartmann and M. Holt. Washington, 1937. 16 p. illus., table. (N.A.C.A. Technical notes no. 618)
- Kurzgefasstes handbuch aller legierungen, von E. Jänecke. Leipzig, O. Spamer, 1937. 493 p. diags., illus., tables.
- Der Leichtmetallschweisser, von H. Holler. Halle, Carl Marhold, 1937. 102 p. diags., illus., tables.
- Magnesium and its alloys, by J. L. Haughton and W. E. Prytherch. London, H. M. Stat. off., 1937. 100 p. diags., illus. (Department of scientific and industrial research)

## METALS AND LIGHT ALLOYS

- Magnesiumlegierungen, von C. Götz, G. Apel und A. Grützner.  
Berlin, Chemie, 1937. 192 p. diags., illus., tables.
- Mechanical properties of aluminum alloy rivets, by William C. Brueggeman. Washington, 1937. 11 p. (N.A.C.A. Technical notes no. 585)
- Metallfärbung· die wichtigsten verfahren zur oberflächenfärbung und zum schutz von metallgegenständen, von Hugo Krause.  
Berlin, J. Springer, 1937. 183 p. diags., illus., tables.
- Metallic corrosion, passivity and protection, by U. R. Evans.  
London, Edward Arnold company, 1937. 720 p. diags., illus., tables.
- Metallkundliche untersuchungen über die natürliche alterung an widerstandgeschweissten und genieteten aluminium-knetlegierungen, von Wolfgang Dietze. München, Carl Hansen, 1937. 96 p. diagr., illus., tables.
- Metallografia dei bronzi d'alluminio, di C. Panseri. Milano, Ulrico Hoepli, 1937. p. 614. illus., tables.
- The Non-ferrous metals, by W. Gowland. London, Charles Griffin and son, 1937. 663 p. illus., tables.
- Die Praxis des metallflugzeugbauers, von K. Liebig. Berlin, M. Mathiesen, 1937. 108 p. illus., tables.
- Protective anodized coating on magnesium, by R. W. Buzzard and J. H. Wilson. U. S. Bureau of standards, journal of research, Washington, 1937, v. 18, no. 3, p. 83. diags., illus.
- Strength of welded aircraft joints, by William C. Brueggeman. Washington, U. S. Govt. print. off., 1937. 32 p. diags., (N.A.C.A. Report no. 584)
- Studien über den gefügeaufbau der zweistoff-aluminiumbronzen, von Guido Koch. München, Carl Hansen, 1937. 71 p. diagr., illus., tables.
- The Welding and riveting of aluminum. London, Northern aluminum company, 1937. 61 p. illus.
- Werkstoff-handbuch: stahl und eisen, von Karl Daeves. Düsseldorf, Verlag stahl und eisen, 1937. 652 p. diags., illus., tables.
- Aero-case for case hardening and heat treating steel. New York, American cyanamid and chemical corporation, 1936. 11 p.
- Aircraft tubing data. Bridgeport, Pa., Summerill tubing company, 1936. 40 p. diags., tables.

## BOOKS AND PAMPHLETS

- Der Aufbau der zweistofflegierungen, von M. Hansen. Berlin, J. Springer, 1936. 1100 p. diags., illus., tables.
- The Case hardening of steel, by H. Brearley. New York, Longmans Green and company, 1936. 207 p. diags., illus., tables.
- Comparison of corrosion resistant steel (18 percent chromium - 8 percent nickel) and aluminum alloy (23 ST), by J. E. Sullivan. Washington, 1936. 12 p. illus. (N.A.C.A. Technical notes no. 560)
- Corrosion resistance of metals and alloys, by Robert J. McKay and Robert Worthington. New York, Reinhold publishing corporation, 1936. 492 p. diags., illus., tables.
- Engineering alloys, names properties and uses, by N. E. Woldman and A. J. Dornblatt. Cleveland, O., American society for metals, 1936. 500 p. diags., illus., tables.
- Der Flugzeugschweisser, von Richard Hoffmann. Halle a/s, C. Marhold, 1936. 89 p. illus., tables.
- The Metallurgist's manual, by T. G. Bamford and H. Harris. London, Chapman and Hall, 1936. 255 p. diags., illus., tables.
- Les Métaux légers et leurs alliages, par Léon Guillet. Paris, Dunod, 1936. 429 p. diagr., illus., tables.
- Les Méthodes d'essai de corrosion des métaux et alliages, par E. Herzog. Paris, Hermann et co., 1936. 74 p. diags., illus., tables.
- Observations sur le laminage des alliages magnésium-aluminium, par L. Doussin et F. Fournier. Paris, E. Blondel La Rougery, 1936. 22 p. diags., illus., tables. (Pub. scient. tech. Min. de l'air, no. 85)
- Procedure handbook of arc welding design and practice. Cleveland, O., Lincoln electric company, 1936. 586 p. illus., tables.
- Properties of metals at elevated temperatures, by C. L. Clark and A. E. White. Ann Arbor, Mich., University of Michigan, 1936. 102 p. diags., tables. (Engineering research bulletin no. 27)
- Steel physical properties atlas, by Charles N. Dawes. Cleveland, O., American society for metals, 1936. 87 p. diags., tables.
- Sublimation et distillation du magnésium et du calcium, par Jean Herenguel. Paris, E. Blondel La Rougery, 1938. 63 p. diags., illus. (Pub. scient. tech. Min. de l'air no. 93)



## METALS AND LIGHT ALLOYS

- Technology of aluminum and its light alloys, by A. Zeerleder. New York, G. Fock, 1936. 301 p. diags., illus., tables.
- The Working of aluminum, by Edgar T. Painton. New York, Longmans Green and company, 1936. 233 p. diags., illus.
- Aircraft; materials and testing, by Louis B. Tuckerman. Proceedings of the American society for testing materials, Philadelphia, 1935, v. 35, pt. 2, p. 3-46. diags., illus., tables.
- The Book of stainless steels, by M. A. Hunter. Cleveland, O., American society for metals, 1935. 502 p. diags., illus., tables.
- The Column properties of corrugated aluminum alloy sheet, by C. F. Greene and C. G. Brown. Washington, U. S. Govt. print. off., 1935. 19 p. diags., illus., tables. (Air corps information circular no. 699)
- Contribution à l'étude de la corrosion, par N. Goldowski. Paris, E. Blondel La Rougery, 1935. 138 p. diags., illus., tables. (Pub. scient. tech. Min. de l'air no. 64)
- Durehete creep-resisting steel; free from temperature - strain - age embrittlement. Sheffield, England, Samuel Fox and company, 1935. 68 p. diags., tables.
- Forging, stamping and general smithing, by B. Saunders. London, E. and F. N. Spon, 1935. 428 p. diags., illus., tables.
- Heat treatment and metallography of steel, by H. C. Knerr. Philadelphia, Temple university, 1935. 161 p. diags., illus., tables.
- The Influence of pinkling on the fatigue strength of duralumin, by H. Sutton and W. J. Taylor. London, H. M. Stat. off., 1935. 4 p. diags. (A.R.C. R. & M. no. 1647)
- Le Magnésium dans les constructions aéronautiques, par R. de Fleury. Paris, E. Blondel La Rougery, 1935. 112 p. diags., illus., tables. (Pub. scient. tech. Min. de l'air no. 75)
- Modern uses of non-ferrous metals, by C. H. Mathewson. New York, American institute of mining and metallurgical engineers, 1935. 427 p. diags., illus., tables.
- Properties, classification and protection of metals against corrosion, by J. E. Younger, R. H. Rice and N. F. Ward. (In their Structural design of metal airplanes. New York, McGraw-Hill book company, 1935. p. 33-74. diags., illus.)
- Recherches sur la résistance à la fatigue des aciers au carbone, par M. Ogee. Paris, E. Blondel La Rougery, 1935. 78 p.

## BOOKS AND PAMPHLETS

- Sonderstahlkunde, von E. Houdremont. Berlin, J. Springer, 1935. 500 p. diags., illus., tables.
- Stainless steel, by E. E. Thum. Cleveland, O., American society for metals, 1935. 787 p. diags., illus., tables.
- Strength of materials, by James E. Boyd. London, McGraw-Hill book company, 1935. 564 p. diags., illus., tables.
- Strength tests of thin-walled duralumin cylinders of elliptic section, by E. E. Lundquist and W. F. Burke. Washington, 1935. 23 p. (N.A.C.A. Technical notes no. 527)
- Summary of the present state of knowledge regarding sheet metal construction, by H. L. Cox. London, H. M. Stat. off., 1935. 10 p. (A.R.C. R. & M. no. 1553)
- Symposium on the welding of iron and steel. London, Iron and steel institute, 1935. v. 1, 2; 1650 p. diags., illus., tables.
- The Torsional stiffness of thin duralumin shells subjected to large torques, by Paul Kuhn. Washington, 1935. 7 p. (N.A.C.A. Technical notes no. 500)
- Weldability of high tensile steels from experience in airplane construction, with special reference to welding crack susceptibility, by J. Müller. Washington, 1935. 25 p. diags., illus. (N.A.C.A. Technical memorandums no. 779) (From Luftfahrtforschung, München, Oct. 1, 1934, v. 11, no. 4, p. 93-103)
- Welding practice and technique, including welding apparatus. The metallurgy of welding, specification, inspection, testing, and safety aspects of welding. London, Iron and steel institute, 1935. 194 p. illus.
- The Working, heat treating and welding of steel, by H. L. Campbell. New York, John Wiley and sons, 1935. 185 p. illus., tables.
- The Working of aluminum, by Edgar T. Painton. New York, Longmans Green and company, 1935. 223 p. diags., illus., tables.
- Aluminum; its manufacture, properties and uses, by H. Sainte-Claire Deville. London, Chapman and Hall, 1934. 204 p. illus., tables.
- The Constitution of the magnesium rich alloys of magnesium and nickel, by J. L. Haughton and R. J. M. Payne. London, H. M. Stat. off., 1934. 1 p. (A.R.C. R. & M. no. 1608)
- Electric arc and oxy-acetylene welding, by E. A. Atkins. London; New York, Isaac Pitman and son, 1934. 324 p. diags., illus., tables.

## METALS AND LIGHT ALLOYS

- Etat actuel de l'essai de fragilité des métaux, par P. DeJean et S. Gerszonwicz. Paris, Dunod, 1934. 103 p. diagrs., illus., tables.
- Fatigue strength of airplane and engine materials, by Kurt Matthaes. Washington, 1934. 31 p. (N.A.C.A. Technical memorandums no, 743) (From Z.F.M., München, Nov. 28, 1933, v. 24, no. 22, p. 620-26)
- La Fonderia d'alluminio, di Carlo Panseri. Milano, Ulrico Hoepli, 1934. 582 p. illus., tables.
- Hardness of metals and its measurement, by H. O'Neill. London, Chapman and Hall, 1934. 292 p. illus.
- Heat conductivity of metals and alloys, by N. D. Tomashov and J. B. Fridman. Moscow, The Peoples' commissariat for heavy industry of united aircraft industries, 1934. 20 p. diagrs., illus., tables. (Transaction of the Scientific research institute for aircraft materials no. 8)
- Manufacture of seamless tubes, ferrous and non-ferrous, by Gilbert Evans. London, H. F. and G. Witherby, 1934. 187 p. diagrs., illus.
- Materials, specifications and corrosion, by Marcus Langley. (In his Metal aircraft construction. London; New York, Isaac Pitman and son, 1934. p. 6-24, 289-95. diagrs., illus., table)
- Metals for the aviation industry and their thermal treatment, by J. M. Lachtin. Moscow and Leningrad, Gosmaschmetisdat, 1934. 319 p. diagrs., illus.
- Metallographie des aluminiums und seiner legierungen, von V. Fuss. Berlin, J. Springer, 1934. 219 p. diagrs., illus., tables.
- Sand cast aluminum alloy-- transverse tests, by C. E. Philips and J. D. Grogan. London, H. M. Stat. off., 1934. 1 p. (A.R.C. R. & M. no. 1620)
- Spot welding and its application to aircraft structures, by C. L. Hibert. Washington, U. S. Govt. print. off., 1934. 25 p. diagrs., illus., tables. (Air corps technical report no. 3901)
- Strength tests of thin walled duralumin cylinders in compression, by Eugene E. Lundquist. Washington, U. S. Govt. print. off., 1934. 18 p. (N.A.C.A. Report no. 473)
- Study of the strength of stainless and heat resisting steels at high temperatures, by M. Hunter and A. K. Robertson. Pittsburgh, Pa., Carnegie institute of technology, 1934. 64 p. diagrs., illus.

## BOOKS AND PAMPHLETS

- Utmattningshall fasthet hos kallvalsat staal för flygplan, utaf Otto F. Forsman. Stockholm, Ingeniers vetenskaps akademien, 1934. no. 127; 16 p. diagsr.
- Weathering of aluminum alloy material used in aircraft, by W. Mutchler. Washington, U. S. Govt. print, off., 1934. 12 p. diagsr. (N.A.C.A. Report no. 490)
- Aluminum and its alloys, by N. F. Budgen. London; New York, Isaac Pitman and son, 1933. 278 p. diagsr., illus., tables.
- Assemblage par rivets en duralumin, par A. Grzędzielski. Bulletin de l'Institut des recherches de l'aéronautique, Varsovie, 1933, no. 12, 21 p. diagsr., illus.
- Heat treatment and annealing of aluminum and its alloys, by N. F. Budgen. Cleveland, O., Sherwood press, 1933. 341 p. diagr., illus.
- Heat treatment of metals, by Orin W. McMullan. Scranton, Pa., International textbook company, 1933. v. 1, 2; 137 p. diagsr., illus.
- Introduction to aeronautical engineering, by J. D. Haddon. London; New York, Isaac Pitman and son, 1933. 177 p. diagsr., illus., tables.
- Materials of aircraft construction, by F. T. Hill. London; New York, Isaac Pitman and son, 1933. 432 p. diagsr., illus., tables.
- Les Méthodes d'étude des alliages métalliques, par Leon Guillet. Paris, Dunod, 1933. 859 p. diagsr., illus.
- Principles of metallurgy, by Donald M. Liddell and G. E. Doan. London, McGraw-Hill book company, 1933. 626 p. illus., tables.
- Scaling of steel at heat-treating temperatures, by C. Upthegrove. Ann Arbor, Mich., University of Michigan, 1933. 36 p. (Engineering research bulletin no. 25)
- Stability of thin-walled tubes under torsion, by L. H. Donnell. Washington, U. S. Govt. print. off., 1933. 21 p. diagsr., tables. (N.A.C.A. Report no. 479)
- A Study of some properties of light rollable alloys, by A. F. Bielow. New York, Bookniga corporation, 1933. 48 p. diagsr., illus.
- Summary of present state of knowledge regarding sheet metal construction, by H. L. Cox. London, H. M. Stat. off., 1933. 20 p. (A.R.C. R. & M. no. 1553)

## METALS AND LIGHT ALLOYS

- Tensile strength of several types of duralumin, by I. G. Shulgin. Trudi centralnovo aero hydrodynamicheskovo instituta, Moscow, 1933. 38 p. diagrs. (no. 143)
- Les Aciers spéciaux, par G. Mars. Paris, Dunod, 1932. 548 p. diagrs., illus.
- The Age-hardening of some aluminum alloys of high purity, by M. L. V. Galyler and G. D. Preston. London, H. M. Stat. off., 1931-1932. 19 p. diagrs., illus. (A.R.C. R. & M. no. 1431)
- Alcoa aluminum and its alloys. Pittsburgh, Pa., Aluminum company of America, 1932. 73 p. illus., tables.
- Comprehensive strength of duralumin columns of equal angle section, by Eugene E. Lundquist. Washington, 1932. 12 p. diagrs., tables. (N.A.C.A. Technical notes no. 413)
- Corrosion of magnesium alloys, by G. Kostylev and W. Kroenig. Moscow, Transaction of the Central aero-dynamic institute, 1932. no. 128; 40 p. diagrs., illus.
- Dimensional stability of heat-treated aluminum alloys, by J. D. Grogan and D. Clayton. London, H. M. Stat. off., 1932. 14 p. diagrs. (A.R.C. R. & M. no. 1435)
- Effect of heat treatment on the physical properties of stainless steel, by G. A. Holderness and W. C. France. Pittsburgh, Pa., Carnegie institute of technology, 1932. 16 p. diagrs.
- Electrochemical protection from corrosion of the aluminum alloy cooling systems, by G. W. Akimov and N. A. Shamin. Moscow, Transaction of the Central aero-Hydrodynamical institute, 1932. no. 136; 15 p. diagrs.
- The Heat treatment and annealing of aluminum and its alloys, by N. F. Budgen. London, Chapman and Hall, 1932. 341 p. diagrs., illus.
- Houghton on quenching; a treatise on the quenching of steel, by E. F. Houghton. Philadelphia, E. F. Houghton and company, 1932. 69 p. diagrs., illus.
- Impact properties of austenitic chromium nickel steels, by Roy W. Tindula. Pittsburgh, Pa., Carnegie institute of technology, 1932. 58 p. diagrs., illus.
- The Influence of titanium tetrachloride on cast aluminum alloys, by W. Rosenhain and J. D. Grogan. London, H. M. Stat. off., 1932. 10 p. illus., tables. (A.R.C. R. & M. no. 1386)
- An Investigation of alclad, by G. W. Akimov and W. O. Kroenig. Moscow, Transaction of the Central aero-hydrodynamical institute, 1932. no. 135; 35 p. diagrs., illus.

## BOOKS AND PAMPHLETS

- Investigations on the elastic and plastic deformation of the bending duralumin sheets, by I. G. Shulgin. Moscow, Transaction of the Central aero-hydrodynamical institute, 1932. no. 114; 36 p. diags., illus., tables.
- A Corrosion test of heat resisting steel, 18-8 type, with various additions, by Vasili Kuznetzoff and Ivan Liferenko. Pittsburgh, Pa., Carnegie institute of technology, 1932. 24 p. diags.
- Material problems in airplane construction, by P. Brenner. Washington, 1932. 25 p. (N.A.C.A. Technical memorandums no. 658) (From Z.F.M., München, Nov. 14, 1931, v. 22, no. 21, p. 637-48)
- The Metals, their alloys, amalgams and compounds, by A. F. Collins. New York, D. Appleton and company, 1932. 310 p. diags., illus.
- Protective films on metals, by E. S. Hedges. New York, W. Van Nostrand company, 1932. 276 p. diags., illus.
- Rapid chemical test for identification of chromium - molybdenum steel aircraft tubing, by J. C. Redmond. Washington, 1932. 3 p. (N.A.C.A. Technical notes no. 411)
- Stressless corrosion followed by fatigue tests to destruction on aluminum crystal, by H. J. Gough and G. Forrest. London, H. M. Stat. off., 1932. 11 p. (A.R.C. R. & M. no. 1476)
- Symposium on effect of temperature on metals. Philadelphia, American society for testing metals, 1932. 829 p. diags., illus., tables.
- Die Technischen werkstoffe, ihre eigenschaften, fehler und prüfung, von Otto Schwarz. Leipzig, J. A. Barth, 1932. 222 p. diagr., illus.
- Über die festigkeitseigenschaften von unvergüteten und vergüteten aluminum - sandgusslegierungen im vergleich mit gusseisen und stahlguss, von Alfred Evers. München, Technische hochschule, 1932. 63 p. diags., illus.
- Advantages of oxide films as bases for aluminum pigmented surface coatings for aluminum alloys, by R. W. Buzzard and W. H. Mutchler. Washington, 1931. 16 p. (N.A.C.A. Technical notes no. 400)
- Beiträge zur kenntniss der lagermetalle auf blei - zinn- basis, von A. Demmer. Dissertation, Universität Bonn., 1931. p. 1840-1910.
- Lavorazione e tempera degli acciai, di A. Massenz. Milano, Ulrico Hoepli, 1931. 252 p. illus., tables.

## METALS AND LIGHT ALLOYS

- Comparison of weights of 17 ST and steel tubular structural members used in aircraft construction, by E. C. Hartmann. Washington, 1931. 17 p. diags., illus. (N.A.C.A. Technical notes no. 378)
- Creep of metals, by H. J. Tapsell. London, Oxford university press, 1931. 285 p. illus., tables.
- Effect of gases and stress on 18 percent chromium, 8 percent nickel steels at elevated temperature, by Allesandro Reggiori. Pittsburgh, Pa., Carnegie institute of technology, 1931. 12 p. diags.
- The Effect of various annealing temperatures on cold-worked low carbon steel, by H. E. Publow, C. M. Heath and R. A. Gezelius. Ann Arbor, Michigan state college, 1931. 17 p. illus. (Engineering experimental station, bulletin no. 35)
- Endurance and other properties at low temperatures of some alloys for aircraft use, by H. W. Russel and W. A. Welcker, Jr. Washington, 1931. 26 p. diags. (N.A.C.A. Technical notes no. 381)
- Metallurgy of nickel, by V. Y. Mostowitch. New York, Bookniga corporation, 1931. 105 p. diags., illus.
- Nichteisenmetalle, von R. Hinzmann. Berlin, J. Springer, 1931. 56 p. diags., illus.
- On the manufacture and the mechanical properties of the Al-Cu-Si light alloys, by M. Goto, S. Fukuta, S. Horiguchi and T. Nagai. Tokyo, Tokyo imperial university, 1931. 76 p. diags., illus. (Aeronautical research institute report no. 73)
- Secondary aluminum, by Robert J. Anderson. Cleveland, O., Sherwood press, 1931. 563 p. diags., illus., tables.
- Stainless iron and steel, by J. H. C. Monypenny. New York, John Wiley and sons, 1931. 575 p. diags., illus.
- The Use of elektron metal in airplane construction, by E. I. de Ridder. Washington, 1931. 22 p. illus., tables. (N.A.C.A. Technical memorandums no. 608)
- Werkstoffe; physikalische eigenschaften und korrosion, von E. Rabold. Leipzig, Otto Spamer, 1931. v. 1; 976 p. illus.
- Airplane welding, by J. B. Johnson. Chicago, Goodheart-Willcox company, 1930. 295 p. diags., illus.
- L'Alluminio-i metalli leggeri e le loro leghe, di E. Koelliker e U. Magnani. Milano, Ulrico Hoepli, 1930. 468 p. diags., illus., tables.

## BOOKS AND PAMPHLETS

- Aluminum in aircraft. Pittsburgh, Pa., Aluminum company of America, 1930. 159 p. diagrs., illus.
- The Aluminum industry, by J. D. Edwards, F. C. Frary and Zay Jefferies. New York, McGraw-Hill book company, 1930. v. 1, 2, 358 p., 870 p. diagrs., illus., tables.
- Corrosion fatigue test on aluminum crystal, by H. J. Gough and D. G. Sopwith. London, H. M. Stat. off., 1930. 30 p. diagrs., illus. (A.R.C. R. & M. no. 1433)
- Engineering materials; v. 1, Ferrous, v. 2, Non-ferrous and organic, v. 3, Theory of testing, by Arthur W. Judge. London; New York, Isaac Pitman and son, 1930. 672 p., 833 p., 498 p. diagrs., illus., tables.
- Gas removal and grain refinement in aluminum alloys, by W. Rosenhain, J. D. Grogan and T. H. Schofield. London, H. M. Stat. off., 1930. 8 p. diagrs. (A.R.C. R. & M. no. 1387)
- Identification of aircraft tubing by Rockwell test, by Horace C. Knerr. Washington, 1930. 8 p. illus. (N.A.C.A. Technical notes no. 342)
- Impurities in metals, their influence on structure and properties, by Colvin J. Smithells. New York, John Wiley and son, 1930. 190 p. illus., tables.
- Instructions for finishing naval aircraft. Washington, U. S. Govt. print. off., 1930. (U. S. Navy department, Bureau of aeronautics SR-15)
- Lectures on steel and its treatment, by John F. Keller. Cleveland, O., American society for metals, 1930. 329 p. illus., tables.
- Materialprüfungswesen, von K. Memmler. Berlin, Walter de Gruyter und co., 1930. 246 p. illus., tables.
- The Metallurgy of the non-ferrous metals, by William Gowland. London, Charles Griffin and company, 1930. 633 p. diagrs., illus., tables.
- Methods for the identification of aircraft tubing of plain carbon steel and chromium - molybdenum steel, by W. H. Mutchler and R. W. Buzzard. Washington, 1930. 27 p. illus., tables. (N.A.C.A. Technical notes no. 350)
- Neue untersuchungen über den einfluss von Fe, Si und Mn auf die duraluminveredelung, von Karl Leo Meissner. (In Jahrbuch 1930 der D.V.L., München, 1930. p. 341-46. diagrs., illus.)
- The Protection of magnesium alloys against corrosion, by H. Sutton and L. F. Le Brocq. London, H. M. Stat. off., 1930. 22 p. tables. (A.R.C. R. & M. no. 1390)



## METALS AND LIGHT ALLOYS

- Rohstoffprobleme der deutschen aluminiumindustrie im Rahmen ihrer wirtschaftlichen entwicklung, von A. Czimatis. Dresden, Paul Wetzels, 1930. 126 p. diags., illus.
- Steel, chromium-molybdenum medium carbon; bars and billets for aircraft use. Washington, U. S. Govt. print. off., 1930. 18 p. (U. S. Navy department specification no. 46S.23)
- Steel, unfinished steel and cast iron in aeroplane construction, by N. A. Minkevich. Moscow and Leningrad, V.V.D., 1930. 829 p. diags., illus., tables.
- Steels and alloys. (In Air annual of the British Empire London, 1930. p. 572-605. diags., illus.)
- Strength in sheer of thin curved sheets of alclad, by G. M. Smith. Washington, 1930. 12 p. diags. (N.A.C.A. Technical notes no. 343)
- A Study of slip lines, strain lines and cracks in metals under repeated stress, by Herbert F. Moore and Tibor Ver. Urbana, Ill., University of Illinois, 1930. 62 p. diags., illus. (Engineering experimental station, bulletin no. 208)
- Weldless steel tubes and their uses, by W. W. Hackett. (In Air annual of the British empire, London, 1930. p. 268-72. illus.)
- Airplane welding, by J. B. Johnson. Chicago, Goodheart Wilcox company, 1929. 295 p. diags., illus., tables.
- Aluminium, die leichtmetalle und ihre legierungen, von P. Melchior. Berlin, V.D.I., Verlag, 1929. 280 p. diags., illus.
- Autogenous welding in airplane construction, by Ludwig Kuchel. Washington, 1929. 8 p. illus. (N.A.C.A. Technical memorandums no. 523)
- Buckling tests for light metal tubes, by August Schroeder. Washington, 1929. 12 p. diags., illus., tables. (N.A.C.A. Technical memorandums no. 525)
- Corrosion embrittlement of duralumin. V. Results of weather-exposure tests; VI. The effect of corrosion, accompanied by stress on the tensile properties of sheet duralumin, by Henry S. Rawdon. Washington, 1929. 26 p. illus., tables. (N.A.C.A. Technical notes nos. 304, 305)
- The Creep of steel at high temperatures, by Frederick Harwood Norton. London, McGraw-Hill book company, 1929. 90 p. diags., illus., tables.
- Curves showing column strength of a steel and duralumin tubing, by O. E. Ross. Washington, 1929. 12 p. diags. (N.A.C.A. Technical notes no. 306)

## BOOKS AND PAMPHLETS

- Déformations permanentes et ruptures des aciers; les causes prévues; les accidents, par P. Régnault. Paris, Dunod, 1929. 92 p. illus.
- Electrochemical protection of the light aluminum alloys against corrosion by means of zinc, by G. W. Akimov. Moscow, Scientific technical department of the Supreme council of national economy, 1929. 20 p. diags., illus., tables. (C.A.H.I. Transactions no. 46)
- Heat treatment, uses and properties of steel, by H. B. Knowlton. Cleveland, O., American society for metals, 1929. 437 p. illus., tables.
- High frequency fatigue, by C. F. Jenkins and G. D. Lehman. London, H. M. Stat. off., 1929. 34 p. diags. (A.R.C. R. & M. no. 1222)
- The Influence of titanium tetrachloride on cast aluminum alloys, by W. Rosenhain, J. D. Grogan and T. H. Schofield. London, H. M. Stat. off., 1929. 10 p. illus. (A.R.C. R. & M. no. 1386)
- Materials and methods of construction in light construction, by A. A. Rohrbach. Washington, 1929. 22 p. (N.A.C.A. Technical memorandums no. 515)
- Materials handbook, by George S. Brady. New York, McGraw-Hill book company, 1929. 428 p. diags., illus., tables.
- Mechanical properties of pure magnesium and certain magnesium alloys in the wrought condition, by S. L. Archbutt and J. W. Jenkin. London, H. M. Stat. off., 1929. 15 p. illus., tables. (A.R.C. R. & M. no. 1287)
- Researches on springs. Static and endurance tests of laminated springs made of carbon and alloy steels, by R. G. Batson and J. Bradley. London, H. M. Stat. off., 1929. 33 p. diags. (Department of scientific and industrial research, engineering research special report no. 13)
- Strength of tubing under combined axial and transverse loading, by L. B. Tuckerman, S. N. Petrenko and C. D. Johnson. Washington, 1929. 17 p. illus. (N.A.C.A. Technical notes no. 307)
- Welding of stainless materials, by H. Bull and L. Johnson. Washington, 1929. 43 p. illus. (N.A.C.A. Technical memorandums no. 532)
- Welding rustproof steels, by W. Hoffman. Washington, 1929. 9 p. diags., illus., tables. (N.A.C.A. Technical memorandums no. 531) (From Autogene metallbearbeitung, Berlin, Dec. 15, 1927, v. 20, p. 27)

## METALS AND LIGHT ALLOYS

- Die Bestimmung der dauerfestigkeit der knetbaren, veredelbaren leichtmetalllegierungen, von R. Wagner. Berlin, J. Springer, 1928. 64 p. diags., illus.
- Corrosion embrittlement of duralumin. I-Practical aspects of the problem. II-Accelerated corrosion tests and the behavior of high strength aluminum alloys of different compositions. III-Effect of the previous treatment of sheet material on the susceptibility to this type of corrosion. IV-The use of protective coating, by Henry S. Rawdon. Washington, 1928. 11 p., 38 p., 24 p., 31 p. diags., illus., table. (N.A.C.A. Technical notes nos. 282, 283, 284, 285)
- Mechanical properties of pure magnesium and certain magnesium alloys in the wrought condition, by S. L. Archbutt and J. W. Jenkin. London, H. M. Stat. off., 1928. 12 p. diags. (A.R.C. R. & M. no. 1037)
- Steel for aircraft construction, by Edward Adams Richardson. New York, American institute of mining and metallurgical engineers, 1928. 19 p. diags.
- Tensile strength of welded steel tubes. First series of experiments, by A. Rechtlich. Washington, 1928. 20 p. illus. (N.A.C.A. Technical memorandums no. 445) (From Z.F.M., Berlin, Sep. 14, 1927, v. 18, no. 17, p. 393-99)
- Trempe, recuit, revenu. V.I. Théorie; V.II. Pratique; V.III. Résultats, par Léon Guillet. Paris, Dunod, 1927-1928. 308 p., 296 p., 490 p. diags., illus., tables.
- Welding in airplane construction, by A. Rechtlich and M. Schren. Washington, 1928. 28 p. illus. (N.A.C.A. Technical memorandums no. 453)
- Welding of high chromium steels, by W. B. Miller. Washington, 1928. 13 p. illus. (N.A.C.A. Technical notes no. 290)
- Werkstoffprüfung, von P. Riebensahm und L. Traeger. Berlin, V.D.I. Verlag, 1928. 68 p. diags., illus.
- Alclad, a new corrosion resistant aluminum product, by E. H. Dix, Jr. Washington, 1927. 13 p. illus. (N.A.C.A. Technical notes no. 259)
- Duralumin welding, by William Nelson. Washington, 1927. 13 p. (N.A.C.A. Technical memorandums no. 399) (From Aviation, New York, Aug. 28, 1927, v. 22, no. 3, p. 130-32. illus.)
- The Heat treatment of duralumin, by William Nelson. Washington, 1927. 18 p. diags. (N.A.C.A. Technical memorandums no. 401) (From Aviation, New York, Feb. 21, 1927, v. 22, no. 8, p. 362-65)

## BOOKS AND PAMPHLETS

- Light metals and alloys - aluminum and magnesium. U. S. Bureau of standards, Washington, 1927. 397 p. diags., illus. (Circular no. 346)
- Properties and testing of magnetic materials, by T. Spooner. New York, McGraw-Hill book company, 1927. 385 p. diags., illus.
- The Protection of duralumin from corrosion, by William Nelson. Washington, 1927. 24 p. illus. (N.A.C.A. Technical memorandums no. 404)
- Steel, light alloys and wood in aeroplane construction, by V. A. Liekoshin. Leningrad, V.V.D., 1927. 275 p. diags., illus., tables.
- Steel thermal treatment, by John W. Urquhart. London, Technical press, 1927. 350 p. illus., tables.
- Alloys and their industrial application, by E. F. Law. London, Charles Griffin and company, 1926. 412 p. diags., illus.
- Aluminum, the metal and its alloys, by M. G. Corson. New York, D. Van Nostrand company, 1926. 311 p. diags., tables.
- The Fatigue of metals, by H. J. Gough. New York, D. Van Nostrand company, 1926. 324 p. diags., illus.
- Handbook of non-ferrous metallurgy, by Donald M. Liddell. New York, McGraw-Hill book company, 1926. 1500 p. diags., illus., tables.
- Large uses of steel in small ways. Cleveland, O., Penton publishing company, 1926. 2 v., 126 p. diags., illus.
- Metallurgy of the common metals, by Leonard S. Austin. New York, John Wiley and sons, 1926. 658 p. illus., tables.
- Study of dural and steel for airplane structures, by J. A. Roche. Washington, U. S. Govt. print. off., 1926. 7 p. diags. (Air corps information circular no. 568)
- Trempe, recuit et cémentation des aciers, par L. Grenet. Paris, Librairie polytechnique Charles Béranger, 1926. 658 p. diags., illus.
- Alloys similar to duralumin made in other countries than Germany, by K. L. Meissner. Washington, 1925. 7 p. (N.A.C.A. Technical memorandums no. 314) (From Zeitschrift für metallkunde, Feb. 1925, v. 17, no. 2, p. 64-65)
- Die Brinell härteprobe und ihre praktische anwendung bei werkstoff-untersuchungen, von P. W. Döhmer. Berlin, J. Springer, 1925. 180 p. illus.

## METALS AND LIGHT ALLOYS

- The Investigation of colchugaluminum, by I. I. Sidorin. Moscow, Scientific technical department of the Supreme council of national economy, 1925. 46 p. diagrs., illus., tables. (C.A.H.I. Transactions no. 15)
- Metallurgy in aircraft construction, by Samuel Daniels and F. T. Sisco. Dayton, O., Engineering division, U. S. Army air service, 1925. 262 p. diagrs., illus., tables.
- Metallurgy of aluminum and aluminum alloys, by Robert J. Anderson. New York, Norman W. Henley publishing company, 1925. 928 p. diagrs., illus., tables.
- Molybdenum, cerium and related alloy steels, by H. W. Gillett and E. L. Mack. New York, Reinhold publishing corporation, 1925. 299 p. illus., tables.
- Thermal expansion of aluminum and various important aluminum alloys, by P. Hidnert. Washington, U. S. Govt. print. off., Bureau of standards, 1925. 29 p. diagrs. (Scientific papers no. 497)
- Aluminium und aluminium legierungen, von M. Berg. Frankfurt A/M, H. Berchold, 1924. 150 p. illus.
- Causes and prevention of corrosion, by A. A. Pollitt. London, Ernest Benn, 1924. 230 p. diagrs., illus.
- Cours de connaissance des matériaux. Les métaux et les bois, par H. Rabozee. Paris, Dunod, 1924. 293 p. diagrs., illus., tables.
- Duralumin, its properties and uses, by R. Beck. Washington, 1924. 8 p. (N.A.C.A. Technical memorandums no. 284) (From Zeitschrift für metallkunde, Apr. 1924, v. 16, no. 4, p. 122-27)
- Elastizität und festigkeit, von C. Bach und R. Baumann. Berlin, J. Springer, 1924. 687 p. diagrs., illus., tables.
- Lagermetalle und ihre technologische bewertung, von J. Czochralski und G. Welter. Berlin, J. Springer, 1924. 117 p. diagrs., illus., tables.
- The Science of metals, by Zay Jefferies. New York, McGraw-Hill book company, 1924. 500 p. diagrs., illus.
- Torsional strength of tubing dural and nickel, by N. S. Otey. Washington, 1924. 29 p. diagrs. (N.A.C.A. Technical notes no. 189)
- Ultra light alloys, by A. M. Portevin and R. De Fleury. Washington, 1924. 31 p. (N.A.C.A. Technical memorandums no. 262) (From International air congress, London, 1923, p. 152-174.

## BOOKS AND PAMPHLETS

- Aeronautics, metallurgy, general index, by R. Glazebrook. London, MacMillan, 1923.
- Aircraft steels and material, by Bagnall Wild, Ralph Kirby, Leslie Aitchison, A. A. Remington, A. J. Rowledge and W. A. Thain. London, Constable and company, 1923. 209 p. illus.
- Engineering non-ferrous metals and alloys, by L. Aitchison and W. R. Barclay. London, Oxford university press, 1923. 320 p. diags., illus.
- Magnesium. Handbook of information relating to the use of magnesium and magnesium alloys. New York, American magnesium corporation, 1923. 170 p. diags., illus.
- Metals and their alloys, by C. Vickers. New York, H. C. Baird and company, 1923. 767 p. diags., illus.
- Tests of dural riveted joints, by H. F. Rettew and G. Thumin. Washington, 1923. 11 p. (N.A.C.A. Technical notes no. 165)
- Aircraft steels and material, by W. Ripper. London, Constable and company, 1922. 209 p. diags., illus., tables.
- Development of stainless steel; its properties and uses. Sheffield, England, Thomas Firth and sons, 1922. 82 p. diags., illus., tables.
- Non-ferrous alloys, by Frederick Ibbotson and Leslie Aitchison. New York, Longmans Green and company, 1922. 255 p.
- Report of the effects of overheating and repeated melting of aluminum, by W. Rosenhain and J. D. Grogan. London, H. M. Stat. off., 1922. 11 p. (A.R.C. R. & M. no. 783)
- Thermal expansion of nickel, monel metal, stellite, stainless steel and aluminum, by Wilmer H. Sonder and Peter Hidnert. Washington, U. S. Govt. print. off., Bureau of standards, 1922. 23 p. (Scientific paper no. 426)
- L'Aluminium dans l'industrie, par J. Escard. Paris, Dunod, 1921. 424 p. diags., tables.
- Aluminum and its alloys, by A. M. Grard. London, Constable and company, 1921. 184 p. illus.
- The Case-hardening of steel, by Harry Brearley. London, Longmans Green and company, 1921. 218 p. illus.
- Engineering steel an exposition of the properties of steel for engineers to secure economy in working and efficiency of result, by Leslie Aitchison. London, MacDonal and Evans, 1921. 396 p. diags., illus., tables.

## METALS AND LIGHT ALLOYS

- Heat treatment of soft and medium steels, by F. Giolitti, E. E. Thum and D. G. Vernaci. New York, McGraw-Hill book company, 1921. 374 p. illus., tables.
- Les Matériaux des constuctions mécaniques et aéronautiques, par Edward Marcotte et E. Berehare. Paris, Dunod, 1921. 414 p. illus., tables.
- Metallography; metals and their common alloys, by S. Hoyt. New York, McGraw-Hill book company, 1921. 462 p. diagsr., illus.
- Working of steel; annealing, heat treatment and hardening of carbon and alloy steel, by F. H. Colvin and K. A. Juthe. New York, McGraw-Hill book company, 1921. 245 p. illus., tables.
- L'Acier; aviation, automobilisme, constructions mécaniques, sanctions de la guerre, par Charles A. M. Grard. Paris, Berger-Levrault, 1921. 364 p. illus., tables.
- Stainless steel; its properties and uses. Sheffield, England, Brown Bayley's steel works, 1921. 5 p. diagsr.
- Aircraft and automobile materials of construction, by Arthur W. Judge. London; New York, Isaac Pitman and sons, 1920. 739 p. diagsr., illus.
- British standard schedule of cold worked steels for aircraft. London, C. Lockwood and son, 1920. 16 p. diagsr.
- British standard schedule of wrought steels for aircraft. London, C. Lockwood and sons, 1920. 27 p. diagsr.
- Duralumin, by E. Unger and E. Schmidt. Washington, 1920. 10 p. diagsr. (N.A.C.A. Technical notes no. 8) (From Technische berichte, Berlin, 1918, v. 3, p. 229-34.
- Aluminum and its light alloys, by Paul D. Merica. Washington, U. S. Govt. print. off., 1919. 8 p. (N.A.C.A. Report no. 34)
- Aluminum sheet and sections in automobile and aircraft construction. London, British aluminum company, 1919.
- Hardening, tempering, annealing and forging of steel, by J. V. Woodworth. New York, Norman W. Henley publishing company, 1919. 321 p. diagsr., illus.
- Manufacture and uses of alloy steels, by Henry D. Hibbard. New York, John Wiley and sons, 1919. 96 p. illus.
- Some tests of light aluminum casting alloys; effect of heat treatment, by P. D. Merica and C. P. Karr. Washington, U. S. Govt. print. off., Bureau of standards, 1919. 29 p. diagsr. (Technical papers no. 139)

## Section III

## ARTICLES, BOOKS AND PAMPHLETS - CLASSIFIED

## ALCLAD

- Ten years service experience with alclad materials in aircraft, by F. C. Pyne. S.A.E. journal, New York, May 1939, v. 44, no. 5, p. 221-28. illus., tables.
- The Use of vedel or alclad, by R. Le Coeuvre. Journal of the R.A.S., London, Apr. 1939, v. 43, no. 340, p. 294.
- Alclad in aircraft. Automotive industries, Philadelphia, Oct. 29, 1938, v. 79, p. 530.
- Oberflächenkorrosion und ihre vermeidung, von E. Ruppel. Aluminium, Berlin, Feb. 1938, v. 20, no. 2, p. 94-106. illus., tables.
- Vergleichende untersuchung über das korrosionsverhalten von al 99.99 und al 99.99 plattierten blechen, von H. U. von Vogel. Aluminium, Berlin, Feb. 1938, v. 20, p. 85-94. illus.
- Plattierte leichtmetalle, von F. Grahl. Werkstatt und betrieb, München, Dec. 1937, v. 70, no. 24, p. 309-11. illus.
- Über die fernschutzwirkung der deckschicht plattierter leichtmetalle, von P. Brenner und W. Roth. Zeitschrift für metallkunde, Berlin, Oct. 1937, v. 29, no. 10, p. 334-37. illus.
- Schutz durch metallische Überzüge, von A. Kutzelnigg. Korrosion und metallschutz, Berlin, July-Aug. 1937, v. 13, no. 7, 8, p. 221-41; 29-32. illus, tables.
- Aluminium plattierung, von H. G. Heine. Apparatebau, Hannover, June 1937, v. 49, no. 13, 13 p. diags., illus., tables.
- Resistance of alclad to hot rolling, by J. S. Gallay and N. N. Ge. Metalurg (Metallurgist), Moscow, May 1937, no. 5, p. 109-13.
- Zur oberflächenverbesserung von leichtmetallen durch diffusion, von W. Bungardt. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, p. 204-08. illus.
- Aircraft spot welding, by B. Burns. S.A.E. journal, New York, Mar. 1937, v. 40, no. 3, p. 103. illus.
- Notes on the construction of integral fuel tanks for airplanes, by Horace J. Alter. Journal of the Aeronautical sciences, New York, Mar. 1937, v. 4, no. 3, p. 100-06. diags., illus.
- Plattierte leichtmetall-werkstoffe, von Walter Roth. Apparatebau, Hannover, Mar. 1937, v. 49, no. 7, 4 p. diags., illus.



## METALS AND LIGHT ALLOYS

- Honeycomb metal wing features new eight-passenger airplane, by William F. Sherman. Iron age, New York, 1937, v. 140, no. 1, p. 22-25. diags., illus.
- Clad aluminum alloys. Metallurgist, London, Dec. 25, 1936, v. 12, no. 52, p. 183-84. illus.
- Metal-aircraft construction, by Fred W. Herman. S.A.E. journal, New York, Oct. 1936, v. 39, no. 4, p. 395, 399. diags.
- Neuere plattierte aluminium - kupfer - magnesium - werkstoffe, von P. Brenner. Zeitschrift für metallkunde, Berlin, Sep. 1936, v. 28, p. 276-80. illus.
- Diffusion of magnesium and silicon into aluminum; investigation on alclad materials, by H. R. Freche. American institute of mining and metallurgical engineers, New York, June 1936, no. 714, p. 3-13. illus. (Also Metal industry, New York, Mar. 1936, v. 34, p. 90)
- Protection of aluminum alloys. Alclad sheets, by F. C. Pyne and W. L. Fink. Aviation, New York, Feb. 1936, v. 35, no. 2, p. 30-33. illus., tables.
- Alclad 17S: Al-coated duralumin, by Norman E. Woldman and Albert J. Dornblatt. (In their Engineering alloys. Cleveland, O., American society for metals, 1936. p. 92)
- Besondere verfahren für den oberflächenschutz von metallen, von R. Mitsche. Berg und hüttenmännisches jahrbuch, Wien, 1936, v. 84, no. 3, p. 116-24. illus.
- Die Zerspanbarkeit der werkstoffe, von H. Krekeler. Berlin, J. Springer, 1936. 59 p. diags., illus.
- Kupferdiffusion in plattierschichten vergütbarer aluminiumlegierungen, von A. Burkhardt und G. Sachs. Metallwirtschaft, Berlin, Jan. 4, 1935, v. 14, no. 1, p. 1-3. illus.
- Protection from corrosion of aluminum and its alloys, by N. D. Pullen. Metal industry, London, Feb. 2, 16, 1934, v. 44, no. 5, 7, p. 133-36, 187-88. illus., tables. (Also Chemical age, London, Mar. 3, 1934, v. 30, no. 766, p. 13-14)
- La Corrosione dei metalli, cause ed effetti, di G. Guzzoni. L'Aerotecnica, Roma, June 1933, v. 13, no. 6, p. 714-44. diags., illus.
- Trattamento termico delle leghe rivestite di alluminio, di G. Guidi. Alluminio, Milano, 1933, v. 2, p. 323-26. illus.
- Neues metallschutzverfahren, von W. Wiederholt. Der Werksleiter, München, Dec. 1932, p. 288-91. illus.

## ALCLAD

- Development in aluminum alloys in relation to economics in aircraft, by C. F. Nagel, Jr. and G. O. Noglund. New York, A.S.M.E., June 1932. 6 p. illus.
- An Investigation of alclad, by G. W. Akimov and W. O. Kroenig. Moscow, Scientific technical department of the Supreme council of national economy, 1932. 35 p. illus. (C.A.H.I. Transactions no. 135)
- Requirements of airplane coatings, by J. M. McCloud. Industrial and engineering chemistry, Washington, Dec. 1, 1931, v. 23, no. 12, p. 1334-39. diags., illus., tables.
- Korrosion bei metallseeflugzeugen, von G. Guidi. Metallwirtschaft, Berlin, Aug. 14, 1931, v. 10, p. 645-46. illus.
- La Protection des alliages d'aluminium et l'alclad. L'Aéronautique, Paris, Jan. 1931, v. 13, no. 140, p. 32-33. illus.
- Aluminiumlegierungen unter besonderer berücksichtigung von alclad, von P. M. Haenni. Korrosion und metallschutz, Berlin, Sep. 1930, v. 6, p. 205.
- Strength in shear of thin curved sheets of alclad, by G. M. Smith. Washington, 1930. 12 p. illus. (N.A.C.A. Technical notes no. 343)
- Testing of corrosion - resistance in alclad, by H. S. Rawdon. Metals and alloys, New York, Nov. 1929, v. 1, p. 235-36. diags.
- Service characteristics of light alloys, by E. H. Dix, Jr. American machinist, New York, Sep. 12, 1929, v. 71, no. 11, p. 441-44. illus., tables.
- Untersuchung der korrosionstabilität in alclad, von E. Rackwitz und E. K. O. Schmidt. Korrosion und metallschutz, Berlin, June 1929, v. 5, p. 130-41. illus., tables.
- Physikalische eigenschaften (einschliesslich haltbarkeit) der alcladblechen, von K. Matthaes. Luftfahrtforschung, München, May 29, 1929, v. 3, p. 153-60. illus.
- Application of alclad to aircraft, by E. H. Dix, Jr. Aviation, New York, Dec. 22, 1928, v. 25, p. 2034-35, 2062, 2064, 2066, 2068. diags., illus.
- Aluminum coated duralumin proves durable aircraft material; alclad - sheet metal, by T. W. Downes. Automotive industries, Philadelphia, Aug. 18, 1928, v. 5, p. 238-41. illus.
- Alclad; a new corrosion resistant aluminum product, by E. H. Dix, Jr. Washington, 1927. 13 p. illus. (N.A.C.A. Technical notes no. 259)

## METALS AND LIGHT ALLOYS

## ALUMINUM CORROSION

- Protective coats and colorations for exposed aluminum parts. Automobile, New York, Jan. 27, 1940, v. 30, p. 267.
- The Struggle against corrosion. Aeroplane, London, Dec. 8, 1939, v. 57, no. 1489, p. 716-17. illus.
- Die Spannungskorrosion gehämmerter aluminium-magnesium-legierungen, von A. Mühlenbruch und H. J. Seeman. Zeitschrift für metallkunde, Berlin, Sep. 1939, v. 31, no. 9, p. 293-99. illus.
- Corrosion resistance of aluminum cylinder heads, by L. W. Kempf and M. W. Daugherty. Automotive industries, Philadelphia, Aug. 15, 1939, v. 81, no. 4, p. 156-59, 169. illus.
- Anodic coating of aluminum - behavior of alloy constituents, by John F. Keller, G. W. Wilcox, M. Tosterud and C. J. Slunder. Metals and alloys, New York, July 1939, v. 10, no. 7, p. 219-25. illus., table.
- The Anodic oxidation of aluminum, by J. W. Cuthbertson. Journal of the Institute of metals, London, July 1939, v. 56, p. 303-25. illus., tables.
- The Influence of static stress and heat treatment on the inter-crystalline corrosion of some wrought aluminum alloys, by J. D. Grogan and R. J. Pleasance. Aircraft production, London, June 1939, v. 1, no. 8, p. 272-73.
- Über den einfluss der wärmebehandlung auf das korrosionsverhalten der aluminium - magnesium - silizium - legierungen, von P. Brenner und W. Feldman. Zeitschrift für metallkunde, Berlin, Apr. 1939, v. 31, no. 4, p. 97-101. diagrs., illus., tables.
- Combating corrosion in design and construction, by R. S. Barnaby. Journal of the R.A.S., London, Mar. 1939, v. 6, no. 5, p. 211-15. diagrs., illus.
- Sullo studio delle corrosioni, dei metalli impiegati nella tecnica, di O. Searpa. Alluminio, Milano, Jan.-Feb. 1939, v. 8, no. 1, p. 1-4.
- Sur la corrosion des assemblages soudés d'alliages légers, par J. Cournot et M. Baudrand. C. R. Acad. sci., Paris, Jan. 23, 1939, v. 208, no. 4, p. 280-82. tables.
- Anodising aluminum and its alloys, by V. F. Henley. Aircraft production, London, Jan. 1939, v. 1, no. 3, p. 106-09. illus.
- The Effect of continuous weathering on light metal alloys used in aircraft, by W. Mutchler. Washington, U. S. Govt. print. off., 1939. 27 p. diagrs. (N.A.C.A. Report no. 663)

## ALUMINUM CORROSION

- Metallische und oxydische schutzüberzüge auf aluminium und aluminiumlegierungen, von Eugen Werner. München, Carl Hanser, 1939. 106 p. diagrs., illus., tables.
- Protection of aluminum and its alloys against corrosion, by W. L. Fink. (In Metals handbook. American society for metals, Cleveland, O., 1939, p. 1323-25)
- Tide water and weather exposure tests on metals used in aircraft, by W. Mutchler and W. G. Galvin. Washington, 1939. 27 p. diagrs., illus. (N.A.C.A. Technical notes no. 736)
- Korrosionsschutz von aluminium-magnesium-legierungen durch plattieren, von P. Brenner. Metallwirtschaft, Berlin, Dec. 2, 1938, v. 17, no. 48, p. 1272-76. illus.
- Einfluss der kaltverformung auf die festigkeitseigenschaften und korrosionsbeständigkeit einer aluminium-legierung mit 7% magnesium, von K. Bungardt. Metallwirtschaft, Berlin, Dec. 1938, v. 17, no. 26, p. 707-08. illus., tables.
- Korrosionsschutz von Al-Cu-Mg-legierungen mit hilfe durchdiffundierter deckschichten, von H. Kostron. Aluminium, Berlin, Nov. 1938, v. 20, no. 11, p. 775-84. illus.
- Untersuchungen über die korrosionsermüdung von aluminum und magnesium knotlegierungen, von F. Bollenrath und E. Schiedt. Zeitschrift für metallkunde, Berlin, Oct. 1938, v. 30, no. 10, p. 357. tables.
- Corrosion-resisting materials, by Francis A. Fox. Flight, London, July 28, 1938, v. 34, no. 1544, p. 82.
- Chemischer oberflächenschutz von leichtmetallen, von W. Simmank. Werkstatt und betrieb, München, July 1938, v. 71, no. 14, p. 177-79. illus.
- Corrosion resistance tests of alluminum and its alloys, by J. W. Smith. Metropolitan vickers, London, May 20, 1938, p. 15. (Tech. bulletin no. 611)
- Anodic oxidation of aluminum and its alloys, by J. D. Craig. Journal of the R.A.S., London, May 1938, v. 42, no. 55, p. 603-12. illus.
- Versuche über die korrosion von leichtmetallen durch aggressive wässer, von W. Mialki. Aluminium, Berlin, May 1938, v. 20, no. 5, p. 315-20. diagrs.
- Photomicrography of light alloys, by W. Mutchler and H. O. Willier. American society for metals, Cleveland, O., Mar. 1938, v. 24, no. 1, p. 279-85. illus.

## METALS AND LIGHT ALLOYS

- Oberflächenkorrosion und ihre Vermeidung, von E. Ruppel. Aluminium, Berlin, Feb. 1938, v. 20, no. 2, p. 94-106. diags., illus.
- Beitrag zur Kenntnis der Spannungskorrosion bei Knetlegierungen, von Friedrich Carl Althof. Luftfahrtforschung, München, Jan. 20, 1938, v. 15, p. 60-82. diags., illus.
- Die Kontaktkorrosion von Aluminium-Legierungen, von K. Matthaes. und W. Schulz. Luftfahrtforschung, München, Jan. 1938, v. 15, no. 1, p. 54-59. illus.
- Corrosion of aluminium, by H. Lichtenberg. Metal Industry, New York, Dec. 10, 1937, v. 51, no. 24, p. 574.
- Über die Normung der Korrosionsprüfverfahren für Leichtmetalle, von P. Brenner. Chemische Fabrik, Berlin, Nov. 24, 1937, v. 10, no. 47, 48, p. 486-91. illus.
- Corrosion probability; aluminum, by R. B. Mears and R. H. Brown. Industrial and Engineering Chemistry, Washington, Oct. 1937, v. 29, no. 10, p. 1087-91.
- Permanent surface protection for aluminum, by D. C. Mandeville. Engineer, London, Aug. 27, 1937, v. 11, p. 58-61. tables.
- A Correlated abstract on corrosion and corrosion resistant metals and alloys, by V. V. Kendall. Metals and Alloys, New York, Aug. 1937, v. 8, no. 11, 12, p. 313-19, 355-60.
- Testing oxide coatings on aluminum. Metal Industry, New York, July 23, 1937, v. 51, no. 4, p. 91-93.
- Einwirkung von Salzsprühnebeln auf Aluminiumlegierungen bei gleichzeitiger statischer Beanspruchung, von R. Irmann und W. Müller. Schweizer Archiv, Solothurn, Switzerland, June 1937, no. 6, p. 158-66. illus., tables.
- Mechanische Oberflächenbehandlung von Aluminium und seinen Legierungen, von A. Zeerleder und E. Zurbrugg. Aluminium, Berlin, June 1937, v. 19, no. 6, p. 366-71. illus., tables.
- Über die Seewasserbeständigkeit der Aluminium-Knetlegierungen des Flugzeugbaus, von F. Bollenrath und H. Görber. Aluminium, Berlin, June 1937, v. 19, no. 6, p. 349-58. illus., tables.
- Oberflächenangriffe bei Leichtmetallen, von H. A. J. Stelljes. Aluminium, Berlin, May 1937, v. 19, no. 5, p. 291-98. illus.
- Oberflächenschutz von Leichtmetallen, von A. Koppenhofer. Aluminium, Berlin, May 1937, v. 19, no. 5, p. 315-18. illus.
- Aluminum alloys protected by plating. Industrial and Engineering Chemistry, Washington, Apr. 20, 1937, v. 15, no. 8, p. 169.

## ALUMINUM CORROSION

- Corrosion resisting aluminum casting alloys. Metal industry, London, Apr. 16, 1937, v. 50, no. 16, p. 464.
- Zur Oberflächenbehandlung von leichtmetallen durch diffusion, von W. Bungardt. Luftfahrtforschung, München, Apr. 1937, v. 14, no. 4, 5, p. 204-08. illus.
- Protection of light alloys, by E. C. J. Marsh and E. Mills. Aircraft engineering, London, Apr. 1937, v. 9, no. 98, p. 97-102. illus., tables.
- Über die anwendung von potentialmessungen zum studium des korrosiven verhaltens der metalle, von L. Guitton. Korrosion und metallschutz, Berlin, Apr. 1937, v. 13, no. 4, 5, p. 131-44. diagr., illus., tables.
- Anodizing of aluminum alloys in chromic acid solutions, by R. W. Buzzard. Automotive industries, Philadelphia, Mar. 20, 1937, v. 76, no. 12, p. 463-64. illus.
- Anodic treatments prior to plating on aluminum. Metal industry, London, Mar. 19, 1937, v. 50, no. 12, p. 37.
- Anodizing of aluminum alloys in chromic acid solutions of different concentrations, by R. W. Buzzard. U. S. Bureau of standards, Journal of research, Washington, Mar. 1937, v. 18, no. 3, p. 251-57. diagrs.
- La Corrosione dei metalli, di G. Guidi e G. Guzzoni. Milano, Ulrico Hoepli, 1937. 373 p. diagrs., illus., tables.
- Le Développement actuel des études sur la corrosion et leur avenir, par R. Le Coeuvre. La Technique aéronautique, Paris, 1937, v. 28, no. 146, p. 255-66. diagrs., illus.
- Report on methods of testing oxide coatings on aluminum, by J. D. Edwards. American society for testing materials, Philadelphia, 1937, v. 37, p. 261-72. illus., tables.
- Anodic oxidation of aluminum and its alloys. Engineer, London, Dec. 25, 1936, v. 162, p. 182-83.
- Korrosionsbeständige aluminium-gusslegierungen, von Richard Sterner-Rainer. Aluminium, Berlin, Sep. 1936, v. 18, no. 9, p. 408-15. illus.
- Beitrag zur frage der schutzschichtbildung auf magnesiumhaltigem aluminium, von W. Celler. Zeitschrift für metallkunde, Berlin, July 1936, v. 28, no. 7, p. 192-94. diagrs.
- The Strength of the oxide film on aluminum. Metallurgist, London, June 26, 1936, v. 10, p. 130. diagrs.

## METALS AND LIGHT ALLOYS

- Oberflächenbehandlung von aluminium und magnesium. Zeitschrift für metallkunde, Berlin, May 10, 1936, v. 17, no. 5, p. 21-23. diagsr.
- Oxydation für aluminium und Al-legierungen, von K. Altmannsberger. Technisches zentralblatt für praktische metallbearbeitung, Berlin, Apr. 1936, v. 46, no. 7, 8, p. 295-97. illus., table.
- Surface treatment of aluminum and its alloys. Metal industry, London, Mar. 13, 1936, v. 48, no. 11, p. 339.
- Wirksamer korrosionsschutz durch eloxalschichten auf kupferhaltigen aluminiumlegierungen, von A. Jenny. Aluminium, Berlin, Mar. 1936, v. 18, no. 3, p. 97-99. illus.
- Light alloy practice, by H. G. Warrington. Metal industry, London, Jan. 24, 31, Feb. 7, 1936, v. 48, no. 3-5, p. 136-40, 160-66, 187-88. illus., tables.
- Protection of aluminum alloys, by W. L. Fink and F. C. Pyne. Aviation, New York, Feb. 1936, v. 35, no. 2, p. 30-33. diagsr., illus.
- Korrosionsschutz für aluminiumlegierungen. Automobiltechnische zeitschrift, Berlin, Jan. 25, 1936, v. 39, no. 2, p. 30. illus.
- Pylumin process for the protection of aluminum. Engineering, London, Jan. 3, 1936, v. 141, no. 3651, p. 20.
- Aluminum and its alloys in the design of corrosion-resistant material, by E. H. Dix, Sr., and R. B. Mears. Mechanical engineer, London, 1936, v. 58, p. 784-92. diagsr., illus.
- Über den oberflächenschutz von aluminium und aluminiumlegierungen, von Walter Birett. Maschinenbau, Berlin, Nov. 1935, v. 14, no. 21, 22, p. 615-18. illus.
- Über die seewasserbeständigkeit der aluminiumlegierungen, von H. Roehrig und W. Nicolini. Aluminium, Berlin, Oct. 1935, v. 17, no. 10, p. 519-29. diagsr., tables.
- Aluminiumplattierung, von H. G. Heine. Aluminium, Berlin, Sep. 1935, v. 17, no. 9, p. 467-76. illus., tables.
- Eine neue oberflächenprüfmethode im dienste des korrosionsschutzes, von A. Kufferath. Korrosion und metallschutz, Berlin, June 1935, v. 11, no. 6, p. 133-36. illus.
- Untersuchung der gefügekorrosion der aluminiumlegierungen, von G. W. Akimov und A. S. Oleschko. Korrosion und metallschutz, Berlin, June 1935, v. 11, no. 6, p. 125-32. illus.

## ALUMINUM - CORROSION

- Sea water's action on aluminum. Notes on aluminum alloys exposed to sea water, by Fererico Giolitti. Metal progress, Cleveland, O., May 1935, v. 27, no. 5, p. 62, 78. diagsr.
- Betrachtungen über die möglichkeiten des korrosionsschutzes von metallen, von M. Straumanis. Korrosion und metallschutz, Berlin, Mar. 1935, v. 11, no. 3, p. 49-52. illus., tables.
- Galvanisierung von aluminium, von J. Fischer. Siemens zeitschrift, Berlin, Mar. 1935, v. 15, no. 3, p. 83-84. illus.
- Elektrolytische oberflächenbehandlung von leichtmetall im rahmen der rohstofffrage, von H. Fischer. Zeitschrift für metallkunde, Berlin, Feb. 1935, v. 27, no. 2, p. 25-32. diagsr., illus., tables.
- Anodic oxidation of aluminum, by A. Miyata. Institute of physical and chemical research, Tokyo, 1935, v. 14, no. 8, p. 651-78. illus., tables.
- Zyanidlösungen als grundüberzüge auf aluminium. Metallwirtschaft, Berlin, 1935, v. 14, no. 21, p. 416-17. illus.
- Das Eloxalverfahren. Die elektrolytische oxydation des aluminiums und seiner legierungen, eigenschaften und verwendung, von H. Schmidt, A. Jenny und G. Eissner. Zeitschrift des V.D.I., Berlin, Dec. 29, 1934, v. 78, no. 52, p. 1499-1506. diagsr., illus., tables.
- Das Eloxalverfahren als ein schutzmittel gegen korrosion von aluminium und seiner legierungen, von H. Schmidt und L. Lux. Aluminium, Berlin, Dec. 1934, v. 17, no. 12, p. 191-95. diagsr.
- Effect of heat treatment on corrosion of high purity aluminum, by F. A. Rohrman. Electrochemical society, New York, Sep. 27, 1934, v. 66, p. 229-36. illus.
- Influence of tropical climates on airplanes, by I. W. Miller. Aero digest, New York, May 1934, v. 24, no. 5, p. 30-31. illus.
- Leichtmetalle im luftfahrzeugbau, von H. Mann. Werkstattstechnik, Berlin, Jan. 15, Feb. 1, 1934, v. 28, no. 2, 3, p. 21-24, 49-52.
- Inactive state of the formation of anodic film of aluminum and its application to the prevention of corrosion, by A. Miyata. Institute of physical and chemical research, Tokyo, 1934, v. 13, no. 11, p. 530-34. illus.
- Issledovanie strukturnoy korozii aluminievych splavov, by G. W. Akimov and A. S. Oleshko. Journal of Physical chemistry, Moscow, 1934, v. 5, p. 434-45. diagsr., illus., tables.



## METALS AND LIGHT ALLOYS

- The Weathering of aluminum alloy sheet materials used in aircraft, by Willard Mutchler. Washington, U. S. Govt. print. off., 1934. 35 p. illus., tables. (N.A.C.A. Report no. 490)
- La Corrosione dei metalli cause ed effetti, di G. Guzzoni. L'Aeroteca, Roma, June 1933, v. 13, no. 6, p. 714-44. diagsr., illus.
- Der Einfluss der wärmebehandlung auf die korrosion von aluminium-walzlegierungen, von H. Mann. Z.F.M., München, May 29, 1933, v. 24, no. 10, p. 284-85. diagsr.
- Tätigkeiten der abteilung für werkstoffuntersuchung der D.V.L: Korrosion bei leichtmetallen. Luftwacht, Berlin, Oct. 1932, no. 10, p. 435-36. diagsr.
- Protezione delle leghe di alluminio con cromo elettrolitico, di G. Gallo e D. Corbi. L'Aeroteca, Roma, Sep. 1932, v. 12, no. 9, p. 1145-74. diagsr., illus.
- Developments in aluminum alloys, by C. F. Nagel, Jr., and G. O. Hoglund. A.S.M.E., New York, June 8, 1932, v. 55, p. 75-78. illus., tables.
- Sur la détermination de la perte de poids dans les essais de corrosion, par J. M. Chaussain. C. R. Acad. sci., Paris, May 23, 1932, v. 194, no. 21, p. 1823-24.
- Korrosionsschutz von aluminiumlegierungen mittels metallischer Überzüge, von G. Akimov und W. Kroenig. Korrosion und metallschutz, Berlin, May 1932, v. 8, no. 5, p. 115-19. diagsr., illus., tables.
- La Protection de l'aluminium et de ses alliages par le nouveau procédé Protal, par J. Bary. L'Aéronautique, Paris, May 1932, v. 14, no. 156, p. 151-52.
- Protezione dell'alluminio e duralluminio con rivestimenti elettrolitici di zinco e di cadmio, di Mario Gambioli. L'Aeroteca, Roma, Mar. 1932, v. 12, no. 3, p. 314-20. illus.
- Electrochemical protection from corrosion of the aluminum alloy cooling systems, by G. Akimov and N. A. Shamin. Moscow, Scientific technical department of the supreme council of national economy, 1932, v. 135, 15 p. diagsr., illus. (C.A.H.I. Transactions no. 136)
- Stressless corrosion followed by fatigue test to destruction on aluminum crystal, by H. J. Gough and G. Forrest. London, H. M. Stat. off., 1932. 11 p. illus. (A.R.C. R. & M. no. 1476)

## ALUMINUM - CORROSION

- La Protection des alliages légers contre la corrosion, par M. Pubellier. *Aciers spéciaux métaux*, Paris, Nov. 1931, v. 6, no. 75, p. 575-85. diags., illus.
- Surface treatment of aluminum and its alloys. *Chemical age*, London, Aug. 1, 1931, v. 25, p. 7-8. diags.
- Corrosion tests in Germany, by George Goldbach. *Aircraft engineering*, London, Aug. 1931, v. 3, no. 30, p. 195, 196. illus.
- Seewasserbeständigkeit galvanischer Überzüge auf Eisen und Leichtmetallen, von E. K. O. Schmidt. *Z.F.M.*, München, Mar. 14, 1931, v. 22, no. 5, p. 141-47. illus., tables.
- La Corrosione dei materiali impiegati nelle costruzioni aeronautiche, di G. Guidi. *Ingegnere*, Roma, Mar. 1931, v. 5, no. 3, p. 153-63. illus.
- La Corrosione dei metalli e leghe usati in aeronautica, di G. Guzzoni e E. Nardi. *L'Aerotecnica*, Roma, Jan. 1931, v. 11, no. 1, p. 50-77. diags., illus., tables.
- Corrosion of light and extra light metals and alloys. *Mechanical engineering*, New York, Jan. 1931, v. 53, no. 1, p. 55-56.
- La Protection des alliages d'aluminium et l'alclad. *L'Aéronautique*, Paris, Jan. 1931, v. 13, no. 140, p. 32-33. illus.
- Corrosion of light and ultra light metals and alloys, by R. Gazaud. *Society of chemical industry*, New York, Nov. 28, 1930, v. 49, p. 1072-73.
- Korrosion und korrosionsschutz von aluminiumlegierungen im flugzeugbau, von P. Brenner. *Zeitschrift für angewandte chemie*, Berlin, July 12, 1930, v. 43, p. 644-45. illus.
- Protecting flying boats against corrosion, by W. Nelson. *Airway age*, New York, May 1930, v. 11, p. 650-53. diags.
- Proposed revision of present specifications and report on protective coatings for aluminum. *S.A.E. journal*, New York, Mar. 1930, v. 26, p. 379-82. illus., tables.
- Combating corrosion of aircraft metal parts, by J. E. Sullivan. *Aviation*, New York, Feb. 1, 1930, v. 28, no. 5, p. 201-04. illus.
- Aluminum and its alloys as corrosion resistant materials, by S. Gill. *American petroleum institute*, New York, Jan. 2, 1930, v. 11, p. 142-49. diags. (Abstracts Chemical and metallurgical engineering, New York, Aug. 1930, v. 37, p. 483 and Oil and gas journal, Tulsa, Okla., Dec. 5, 1929, v. 28, p. 47)

## METALS AND LIGHT ALLOYS

- Corrosion fatigue test on aluminum crystal, by H. J. Gough and D. G. Sopwith. London, H. M. Stat. off., 1930. 30 p. diags., illus. (A.R.C. R. & M. no. 1433)
- Protective coatings of aluminum and its alloys, by H. Sutton. Engineer, London, Dec. 27, 1929, v. 148, p. 188-89. illus. (Also Chemical age, London, Dec. 7, 1929, v. 21, p. 39-40; Brass world, New York, Dec. 1929, v. 257, p. 287-88 and Electrical review, London, Nov. 22, 1929, v. 105, p. 925-26)
- Treating aluminum. Airway age, New York, Sep. 1929, v. 10, p. 1409. illus.
- Rust-proofing steel and aluminum aircraft parts. Iron age, New York, Aug. 15, 1929, v. 124, p. 409.
- La Corrosione delle leghe leggere. L'Ala d'Italia, Milano, Aug. 1929, v. 8, no. 8, p. 768.
- Corrosion resistance of aluminum alloys, by H. S. Rawdon. American machinist, New York, Apr. 11, 1929, v. 70, p. 601-02. diags. (Also Metal industry, New York, Mar. 29, 1929, v. 27, p. 114-15; Iron age, New York, Mar. 7, 1929, v. 123, p. 667 and Mining and metallurgy, New York, Feb. 1929, v. 10, p. 93)
- Protecting aluminum and its alloys from corrosion, by H. J. Huester. American machinist, New York, Feb. 21, 1929, v. 70, p. 331. diags.
- The Use of light alloys in aircraft from the point of view of corrosion, by H. Sutton. Journal of the R.A.S., London, Jan. 1929, v. 33, no. 217, p. 38-74. illus. (Also Notiziario tecnico di aeronautica, Roma, June 1929, v. 7, no. 6, p. 62-83)
- Electrochemical protection of the light aluminum alloys against corrosion by means of zinc, by G. W. Akimov. Moscow, Scientific technical department of the Supreme council of national economy, 1929. 20 p. diags., illus., tables. (C.A.H.I. Transactions no. 46)
- Korrosionsfrage des aluminiums, von W. Guertler. Zeitschrift für metallkunde, Berlin, Mar. 1928, v. 20, no. 3, p. 104-12. illus.
- Protecting aluminum by anodic oxidation, by P. Hagen. Chemical and metallurgical engineering, New York, Nov. 1927, v. 34, p. 698. illus.
- Protecting aluminum and its alloys against corrosion, by H. Sutton and A. J. Sidery. Engineering, London, Sep. 16, 1927, v. 124, p. 376-77. diags. (Also Canadian chemistry and metallurgy, Toronto, Dec. 1927, v. 11, p. 313)

## ALUMINUM - CORROSION

- Effect of atmospheric exposure on light aluminum alloys, by E. Wilson. Proceedings of the Physical society, London, Dec. 15, 1926, v. 39, no. 216, p. 15-25. illus., tables.
- Fundamental factors in corrosion, by M. Enos. Industrial and engineering chemistry, Washington, Aug. 1925, v. 17, no. 8, p. 793-97. illus.
- Korrosionserscheinungen am aluminium, von E. Maass und W. Wiederholt. Zeitschrift für metallkunde, Berlin, Apr. 1925, v. 17, no. 4, p. 115-21. illus., tables.
- Protective coatings for aluminum, by C. Commentz. Chemical and metallurgy engineering, New York, Nov. 3, 1924, v. 31, p. 698.
- Recent observations regarding the corrosion, cleansing and protection of aluminum, by H. A. Gardner. Mechanical engineering, New York, Apr. 1924, v. 46, p. 206-07. diags.
- Resistance of various aluminum alloys to salt water corrosion, by D. Basch and M. F. Sayere. Mechanical engineering, New York, Apr. 1924, v. 46, p. 199-205. illus.
- Corrosion, by W. R. Douglas Shaw. Beama, London, Aug. 1923, v. 13, no. 64, p. 100-03. illus.
- Protection of aluminum. Chemical and metallurgical engineering, New York, Aug. 23, 1922, v. 27, no. 8, p. 349. diags.

## ALUMINUM - FABRICATION

- Brazing aluminum alloy parts, by G. O. Hoglund. Iron age, New York, Jan. 11, 1940, v. 145, no. 2, p. 34-36, 59. illus., tables.
- Spray quenching of light metal parts; its use in the aircraft industry, by K. Scherzer. Metal industry, London, Dec. 22, 1939, v. 55, no. 25, p. 523-25. illus.
- Light alloys and production. Aeroplane, London, Dec. 8, 1939, v. 57, no. 1489, p. 704-07. illus.
- Spot-welding of aluminum. Aeroplane, London, Dec. 8, 1939, v. 57, no. 1789, p. 713-15. illus., tables.
- The Deep-drawing of aluminum, by A. G. C. Gwyer and P. C. Varley. Metal industry, London, Dec. 1, 1939, v. 55, p. 465-69. illus., tables.
- Aluminum alloys die castings. Light metals, London, Dec. 1939, 3 p. diags., illus.

## METALS AND LIGHT ALLOYS

- The Properties of light metal welds, by P. Brenner. Metal industry, London, Nov. 10, 17, 1939, v. 55, no. 19-20, p. 405-08, 429-33. diags., illus., tables.
- Die Mikro- und makroskopische untersuchung von leichtmetallpress- teilen, insbesondere für die flugzeugindustrie, von E. Hoffmann-Möckel. Aluminium, Berlin, Nov. 1939, v. 21, no. 11, p. 759-66. illus.
- The Production of aluminum-alloy sand castings. Light metals, London, Nov. 1939, p. 361-64. illus.
- Über das zusammenwirken von kaltverformung und raumtemperatur- aushärtung bei aluminium-kupfer-magnesium-legierungen, von Hans Kostron. Zeitschrift für metallkunde, Berlin, Nov. 1939, v. 31, no. 11, p. 329-34. diags.
- British progress in forging aluminum alloys, by J. T. Robinson. Heat treating and forging, Pittsburgh, Pa., Oct. 1939, v. 25, no. 10, p. 489-92, 504. illus.
- Das Löten von leichtmetallen, von R. Schulze. Aluminium, Berlin, Oct. 1939, v. 21, no. 10, p. 710-12. illus.
- Modern methods of die-casting. Western flying, Los Angeles, Cal., Oct. 1939, v. 19, no. 10, p. 16-18. illus.
- Prüfung der kantbarkeit von leichtmetallen, von G. Goldbach. Aluminium, Berlin, Oct. 1939, v. 21, no. 10, p. 707-10. illus.
- Machining of aluminum and its alloys, by J. H. Dickin and G. A. Anderson. Metal industry, London, Sep. 8, 1939, v. 55, p. 221-26. illus.
- Spot welding of aluminum and its alloys with low current welders, by G. Lobue. Journal of the American welding society, New York, Sep. 1939, v. 18, no. 9, p. 521-22. diags., illus., tables.
- Sulla corretta interpretazione di taluni fenomeni che si possono verificare durante il trattamento delle leghe di alluminio, di Carlo Panseri e Marcella Monticel. Alluminio, Milano, July-Aug. 1939, v. 8, no. 4, p. 183-91. illus.
- Heat treatment of aluminum alloys; equipment and procedure for castings, by R. Irmann. Metal industry, London, June 23, 1939, v. 54, p. 663-66. illus., tables.
- Der Einfluss der zahl der abschreckungen und der glühdauer auf das aushärten von Al-Cu-Mg-Legierungen, von P. Brenner und H. Kostron. Luftfahrtforschung, München, June 1939, v. 16, no. 7, p. 362-69. diags., illus.

## ALUMINUM - FABRICATION

- Soudure électrique par points des alliages légers. La Pratique des industries mécaniques, Paris, June 1939, v. 22, no. 3, p. 105-08. diagrs., illus., tables.
- Neuere entwicklungsrichtungen beim nieten und schweissen von leichtmetallen, von E. Rajakovics. Zeitschrift für metallkunde, Berlin, May 31, 1939, no. 5, p. 137-40. diagrs., illus.
- Spot-welding of light metals in a german aircraft works, by K. Reichel. Journal of the American welding society, New York, May 1939, v. 18, no. 5, p. 182-84. diagrs., illus., tables.
- The Rolling of light alloys, by H. Sedlachek, H. Zapp and B. Stockbauer. Metal industry, London, Apr. 28, 1939, v. 54, no. 17, p. 459-62. illus.
- Cold-worked aluminum alloys, by L. W. Eastwood, R. W. James and R. F. Bell. Metal industry, London, Apr. 14, 1939, v. 54, no. 15, p. 411-14. tables.
- Heat treatment following electric welding of aluminum magnesium alloys, by R. Le Coeuvre. Journal of the R.A.S., London, Apr. 1939, v. 43, no. 340, p. 296. tables.
- La Soudure des alliages d'aluminium, par A. Dumas. Bulletin technique veritas, Paris, Apr. 1939. p. 20-27. diagrs., illus.
- Forging strong aluminum alloys, by George Sachs. Metal industry, London, Mar. 31, 1939, v. 54, no. 13, p. 366-70. illus.  
(Also Heat treating and forging, Pittsburgh, Pa., Mar. 1939, v. 25, no. 3, p. 117-22. illus.)
- Der Derzeitige stand der schmelzschweissung von aluminiumlegierungen, von E. Rajakovics. Autogene metallbearbeitung, Berlin, Mar. 15, 1939, v. 32, no. 6, 7, p. 85-89, 101-06. illus., tables.
- The Extrusion of some aluminum alloys, by C. E. Pearson. Metal industry, London, Mar. 10, 1939, v. 54, p. 295-98. illus., tables.
- Tendances nouvelles dans la soudure par points des alliages légers. La Technique moderne, Paris, Feb. 15, 1939, v. 31, no. 4, p. 166. illus.
- Mechanische eigenschaften und verarbeitung der avionallegierungen, von R. Irmann. Schweizer archiv, Solothurn, Switzerland, Feb. 1939, v. 5, no. 2, p. 48-60. illus., tables.
- Die Punkt- und rollennahtschweissung von leichtmetallen, von F. Rosenberg. Aluminium, Berlin, Feb. 1939, v. 19, no. 2, p. 89-97. diagrs., illus., tables.

## METALS AND LIGHT ALLOYS

- Spot-welding of aircraft materials, by Charles L. Hibert. Aluminum and non-ferrous review, London, Jan.-Feb. 1939, v. 4, no. 2, 3, p. 73-75, 105-07. diags., illus., tables.
- Some aspects of the mechanical properties, uses and manipulations of aluminum, by F. R. C. Smith. Journal of the R.A.S., London, Jan. 1939, v. 43, no. 337, p. 1-18. illus., tables.
- Spot-welding aluminum, by F. C. Payne. Western flying, Los Angeles, Cal., Jan. 1939, v. 19, no. 1, p. 10-13. diags., illus., tables.
- Aluminum die castings, by G. M. Rollason. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939, p. 1302-08. diags., illus., tables)
- Anleitungsblätter für das schweissen und löten der leichtmetalle, by A. Matting. V.D.I. Verlag, Berlin, 1939. 113 p. diags., illus., tables.
- Cold and hot forming aluminum alloys, by C. F. Nagel Jr. and P. U. Faragher. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939, p. 1308-10. diags., illus., tables)
- Arc welding aluminum, siluminum and aluminum bronze, by N. I. Poliakov. Avtogennoye delo, Moscow, Feb.-Mar. 1939, no. 2-3, p. 31-32.
- Machining aluminum and aluminum alloys, by R. L. Templin. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939, p. 1315-20. diags., illus., tables)
- Some studies on wire drawing, by Masaharu Goto and H. Tanaka. Tokyo, Tokyo Imperial university, 1939. 37 p. diags. (Aeronautical research institute report no. 14)
- Welding aluminum and its alloys. Pittsburgh, Pa., Aluminum company of America, 1939. 48 p. diags., illus., tables.
- Welding of metals: aluminum and aluminum alloys, by C. W. Obert. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 239-46. diags.)
- Fortschritte auf dem aluminiumgussgebiet durch giesstechnik und prüfmethoden, von J. Dornauf. Giesserei, Düsseldorf, Dec. 1938, v. 25, no. 26, p. 664-69. illus., tables.
- Das Nieten der leichtmetalle, von E. von Burg. Werkstoff und betrieb, München, Dec. 1938, v. 71, no. 24, p. 309-14. diags., illus., tables.
- Light alloys in production. Aircraft engineering, London, Nov. 1938, v. 10, no. 117, p. 359-61. illus.

## ALUMINUM - FABRICATION

- Das Nieten der aluminiumlegierung, gattung Al-Cu-Mg (Avional D.), von E. von Burg. Schweizer archiv, Solothurn, Switzerland, Nov. 1938, v. 4, no. 11, p. 308-13. illus.
- Research on welded aluminum alloys, by E. Rajakovics. Aluminum and non-ferrous review, London, Nov. 1938, v. 3, no. 12, p. 421-23. illus., tables.
- Welding of thin aluminum sheets. Light metals, London, Nov. 1938, v. 1, no. 10, p. 348-50. diagsr., illus., tables.
- Age-hardening of aluminum alloys, by W. L. Fink and D. W. Smith. American institute of mining and metallurgical engineers, New York, Oct. 1938, v. 128, p. 223-48. illus., tables.
- Roller-die process of metal forming, by Lessiter C. Millbourn. Aero digest, New York, Oct. 1938, v. 33, no. 4, p. 52-53. diagsr., illus.
- Welding aluminum and its alloys. Aero digest, New York, Sep. 1938, v. 33, no. 3, p. 58-62, 92. illus., tables.
- The Casting of aluminum bronze, by H. J. Miller. Metal industry, London, Aug. 12, 19, 26, 1938, v. 53, no. 7-9, p. 147-52; 175-80; 199-202. illus., tables.
- Aus der praxis der leichtmetallgussbearbeitung, von W. Hartl. Werkstattstechnik und werksleiter, Berlin, Aug. 1, 1938, v. 32, no. 15, p. 348-52. illus.
- Leichtmetallguss, von E. Kothny. Werkstattstechnik und werksleiter, Berlin, Aug. 1, 1938, v. 32, no. 15, p. 341-45. illus.
- Progress in metallic arc welding of aluminum and its alloys, by C. Auchter. Aluminum and non-ferrous review, London, Aug. 1938, v. 3, no. 9, p. 316-22. illus., tables.
- Langsam aushärtende leichtmetalle und ihre anwendung als nietwerkstoff, von K. Matthaes. Zeitschrift für metallkunde, Berlin, July 1938, v. 30, no. 7, p. 238-44. diagsr., illus., tables.
- Riveting methods and rivet equipment used in the german light metal aeroplane construction, by Wilhelm Pleines. Journal of the R.A.S., London, July 1938, v. 42, no. 57, p. 761-815. diagsr., illus., tables.
- Tiefziehen von leichtmetallen für den luftfahrzeugbau, von E. J. Ritter. Deutsche luftwacht, ausgabe Luftwissen, Berlin, July 1938, v. 5, no. 7, p. 249-55. illus., tables.
- Extrusion of light alloys. Flight, London, June 30, 1938, v. 33, no. 1540, p. 39-42. illus.



## METALS AND LIGHT ALLOYS

- Sur le durcissement par vieillissement d'un alliage aluminium-cuivre, par J. Calvet, P. Jacquet et A. Guinier. C. R. Acad. sci., Paris, June 27, 1938, v. 206, no. 26, p. 1972-74. illus., tables.
- Extruding and rolling the light alloys. Metal industry, London, June 10, 1938, v. 53, p. 593-99. illus.
- Spot welding of aircraft materials, by C. L. Hibert. Welding journal, New York, June 1938, v. 17, no. 6, p. 22-26. illus., tables.
- X-ray as aid in manufacture of aluminum castings, by G. E. Stoll and A. T. Rupe. American foundrymen's association, Chicago, June 1938, v. 9, no. 3, p. 801-15. illus.
- Roll forming of aircraft sections. Machinery, London, May 5, 1938, v. 52, no. 1334, p. 131-32. illus.
- The Mechanism of age hardening in copper-aluminum alloys. Engineer, London, Apr. 29, 1938, v. 11, p. 120-23. illus.
- Melting and casting of aluminum and its alloys. Metal industry, London, Apr. 29, 1938, v. 52, p. 452-54. illus.
- New producing plant for light alloys. Aeroplane, London, Apr. 6, 1938, v. 54, no. 1402, p. 417-19. illus.
- Drawing of light alloy tubes, by Chrichton Harris. Light metals, London, Mar. 1938, 3 p. illus.
- Gussspannungen der aluminium-gusslegierungen. Aluminium, Berlin, Mar. 1938, v. 20, no. 3, p. 188-91. illus.
- Hochwertige aluminium-gusslegierungen in eloxalqualität, von G. Seumel. Aluminium, Berlin, Mar. 1938, v. 20, no. 3, p. 191-96. illus.
- Die Kaltaushärtung von aluminium-kupfer-legierungen, von W. Hartnagel, Zeitschrift für metallkunde, Berlin, Mar. 1938, v. 30, no. 3, p. 81-86. illus., tables.
- Manufacture of high-strength alloy extrusions and their use in aircraft, by R. Worsdale. Metallurgia, Manchester, England, Feb.-Mar. 1938, v. 17, no. 100, 101, p. 134-36, 193-96. illus.
- Schrumpfung und schwindung einiger aluminium-gusslegierungen, von L. Herrmann. Aluminium, Berlin, Mar. 1938, v. 20, no. 3, p. 182-87. illus., tables.
- Soudure et chaudronnerie d'aluminium, par R. Kauffmann. Revue de l'aluminium, Paris, Mar. 1938, v. 15, no. 99, p. 1128-29. diagrs., illus.

## ALUMINUM - FABRICATION

- Machining aluminum and its alloys. Aero digest, New York, Feb. 1938, v. 32, no. 2, p. 28-30. diags., illus.
- La Soudure électrique par points et à la molette de l'aluminium et de ses alliages. Revue de l'aluminium, Paris, Feb. 1938, v. 15, no. 98, p. 1055-70. diags., illus., tables.
- Aluminum alloy castings, by K. R. Van Horn and J. J. Heath. Automobile engineer, London, Jan. 1938, v. 28, no. 67, p. 23-25. illus.
- Aluminum and aluminum alloys - welding, by G. O. Hoglund. (In Welding handbook, New York, American welding society, 1938. p. 598-612. diags., illus., tables)
- Essais de soudures électriques par points d'alliages légers avant et après corrosion, par L. Doussin. (In 18 me Congrès de chimie industrielle, Nancy, Sep. 22, Oct. 2, 1938. Paris, Chimie et industrie, 1938. p. 145c-53c. diags., illus., tables)
- Langsam aushärtende Leichtmetalle und ihre Anwendung als Nietwerkstoff, von K. Matthaes. (In Jahrbuch der Z.F.M., München, 1938, p. 504-10. diags., illus., tables)
- Plattierung mit reinstaluminium (4199-99), von P. Brenner. (In Jahrbuch der Z.F.M., München, 1938, p. 515-16. diags., illus.)
- Spot welding aluminum and its alloys, by L. A. Ferney. Metal industry, London, Dec. 24, 1937, v. 5, p. 617-22. illus., tables.
- Die Beurteilung von Leichtmetallschweißungen auf Grund des Zugversuches, von W. Feldmann. Metallwirtschaft, Berlin, Dec. 1937, v. 16, no. 50, p. 1299-1306. illus., tables.
- Kraftwirkungsfiguren an Al-Cu-Mg-Legierungen, von Eva Ruppel. Metallwirtschaft, Berlin, Dec. 1937, v. 16, no. 50, p. 1307-08. illus., tables.
- Resistance welding of aluminum alloys. Flight, London, Nov. 11, 1937, v. 32, no. 1507, p. 468. illus.
- Gasschmelzschweißen von Leichtmetallen, von A. V. Zeerleder. Werkstatt und Betrieb, München, Nov. 1937, v. 70, no. 21-22, p. 287-89. diags., illus.
- Einige Beispiele über Einfluss der Erstarrungsverhältnisse in Aluminiumgussteilen, von R. Irmann. Aluminium, Berlin, Oct. 1937, no. 10, p. 635-39. illus.

## METALS AND LIGHT ALLOYS

- Die Fortschritte der metalllichtbogenschweissung des aluminiums und seiner legierungen, von C. Aucher. Zeitschrift für Metallkunde, Berlin, Sep. 1937, v. 29, no. 9, p. 310-15. diagsr.
- Untersuchung über geschweisste aluminiumlegierungen, von E. Rajakovics. Zeitschrift für metallkunde, Berlin, Sep. 1937, v. 29, no. 9, p. 315-18. diagsr., illus.
- Modern aluminum welding practice. Sheet metal industries, New York, July 1937, v. 11, no. 123, p. 658-60. illus.
- Spot welding aluminum and its alloys, by L. A. Ferney. Metal industry, London, July 1937, v. 51, no. 26, p. 617-22. illus.
- Spot and seam welding resistance of Al alloy sheet, by D. I. Bohn. Metal progress, Cleveland, Ohio, July 1937, v. 32, p. 53-56. illus., tables.
- Welding aluminum and its alloys. Journal of the American welding society, New York, July 1937, p. 39-40. tables.
- Weldability of aluminum bronzes, by H. Szepanik. Metal industry, London, June 11, 1937, v. 50, no. 25, p. 652.
- Spot-welding and seam-welding the aluminum alloys, by G. O. Hoglund. Industry and welding, Cleveland, Ohio, June 1937, v. 10, no. 6, p. 42-43. diagsr., illus. (Also S.A.E. journal, New York, Feb. 1937, v. 40, no. 2, p. 57-64; Iron age, New York, Jan. 21, 1937, v. 139, p. 63-64 and American machinist, New York, Jan. 13, 1937, v. 81, p. 17-21)
- Age hardening and improved light alloys. Metal industry, London, Apr. 30, 1937, v. 50, no. 18, p. 506-09. illus.
- The Welding of aluminum, by N. F. Daniel. Flight, London, Apr. 29, 1937, v. 30, p. 21-24. illus.
- Oberflächenvergütung von leichtmetallen durch diffusion, von W. Bungardt. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, p. 225-28. diagsr., illus.
- Über die elektrische punktschweissung an leichtmetallen, von Eugen Osswald. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, p. 215-23. diagsr., illus., tables.
- A New aluminum solder. Flight, London, Mar. 4, 1937, v. 31, no. 1471, p. 210d. illus.
- Aircraft spot welding, by B. Burns. S.A.E. journal, New York, Mar. 1937, v. 40, p. 99-107. illus., tables.
- Fabrication of aluminum, by L. Herrmann and E. Zurbruegg. Metals and alloys. New York, Mar. 1937, v. 8, no. 3, p. MA182-83.

## ALUMINUM - FABRICATION

- Schweissen von aluminium, von K. Bungardt. Zeitschrift des V.D.I., Berlin, Jan. 9, 1937, v. 81, p. 51-52. illus.
- Zur frage der aushärtung von aluminium-siliziumlegierungen, von W. Helling. Zeitschrift für metallkunde, Berlin, Jan. 1937, v. 29, no. 1, p. 25-28. diagrs., illus., tables.
- Experiments of welding stamped tanks made of aluminum-maganese alloy, by I. I. Kaganov. Aviapromishlennost, Moscow, 1937, no. 5, p. 46-48.
- Der Leichtmetallschweisser, von H. Holler. Halle, Carl Marhold, 1937. 102 p. diagrs., illus., table.
- Schmieden von leichtmetallen, von B. Preuss. Technisches zentralblatt für praktische metallbearbeitung, 1937, p. 676-80.
- Das Schweissen von aluminium und seine legierungen, von A. V. Zeerleder und M. Bosshard. Schweizer archiv, Solothurn, Switzerland, 1937, no. 12, p. 315-24. diagrs., illus.
- The Welding and riveting of aluminum. London, Northern aluminum company, 1937. 61 p. diagrs., illus.
- The Forgeability of light alloys, by Albert Portevin and Paul G. Bastian. Metal industry, London, Sep. 18, 1936, v. 49, no. 12, p. 296-300. illus.
- Beizen von aluminium. Werkstatt und bertieb, München, Sep. 1936, v. 69, no. 17-18, p. 235. diagrs.
- Fehlerquellen beim giessen und schmieden von blöcken aus aluminium und aluminiumlegierungen, von W. Schnorrenberg. Aluminium, Berlin, Sep. 1936, no. 9, p. 422-27. diagrs., illus., tables.
- Spot-welding aluminum alloys in production, by C. Weston Steward. Aviation, New York, Aug., Sep. 1936, v. 8, 9, p. 29-31; 25-27. illus.
- Use of forgings in modern aircraft, by P. N. Jansen. Aero digest, New York, Sep. 1936, v. 29, no. 3, p. 44. diagrs.
- Welding of aircraft structures, by J. B. Johnson. Journal of the American welding society, New York, Sep. 1936, v. 15, p. 2-11. illus., tables.
- Methods of welding aluminum and its alloys, by J. Douchement. Engineer, London, Aug. 28, 1936, v. 162, p. 155-56. diagrs.
- Application of X-rays to the study of the annealing of aluminum, by J. J. Trillat. Metal industry, London, July 10, 1936, v. 49, p. 27-32. illus., tables.

## METALS AND LIGHT ALLOYS

- Machining aluminum aircraft engine sections, by A. G. Arend.  
Aluminum and non-ferrous review, London, July 1936, v. 1, no. 10, p. 455-56. illus.
- The Deep drawing capacity of aluminum. Engineer, London, June 26, 1936, v. 10, p. 139-41.
- Age hardening of aluminum alloys by A. M. Talbot and J. T. Norton.  
Aluminum and non-ferrous review, June 1936, v. 1, p. 412-16. diags., illus.
- Untersuchung über punktschweissung von aluminumlegierungen, von K. Schraivogel. Aluminium, Berlin, May 1936, v. 18, no. 5, p. 177-83. illus., tables.
- Advance made in welding of aluminum, by G. O. Hoglund. Iron age, New York, Mar. 19, 1936, v. 137, p. 46-47. illus.
- A Deep-drawing test for aluminum, by A. G. C. Gwyer. Journal of the Institute of metals, London, Mar. 1936, v. 58, no. 1, p. 83-90. diags., tables.
- La Soudure de l'aluminium et de ses alliages, par J. Douchement.  
Revue de metallurgie, Paris, Mar. 1936, v. 28, p. 68-69. diags.
- Progress in casting of aluminum, by H. J. Rowe. Foundry, Cleveland, Ohio, Feb. 1936, v. 64, p. 22-24, 63-64, 66. diags.
- Gas welding aluminum and its alloys, by G. O. Hoglund. Metal industry London, Jan. 3, 1936, v. 48, no. 1, p. 5-7. illus.
- Die Bearbeitung des aluminiums, von E. Herrmann und E. Zurbrüegg.  
Leipzig, Akademische verlagsgesellschaft, 1936. 117 p. diags., illus., tables.
- Heat treatment of wrought aluminum alloys, by C. F. Nagel, Jr., and P. V. Faragher. (In Metals handbook, Cleveland, Ohio, American society for metals, 1936. p. 1003-06)
- Use of forgings in modern aircraft, by P. N. Jansen. Aero digest, New York, 1936, v. 28, no. 3, p. 44.
- The Working of aluminum, by Edgar T. Painton. New York, Longmans Green and company, 1936. 233 p. diags., illus., tables.
- Über den kraftbedarf beim schmieden von aluminiumlegierungen, von A. Zeerleder. Werkstatt und betrieb, München, Dec. 1935, v. 68, no. 23-24, p. 315. diags., illus.
- Manufacture of tubular aluminum articles by extrusion, by O. Kuehner. Metal industry, London, Nov. 29, 1935, v. 47, no. 22, p. 535-36, 539. illus.

## ALUMINUM - FABRICATION

- Das Nieten von vergütbaren aluminium-legierungen, von H. Bohner. Maschinenbau, Berlin, Oct. 1935, v. 14, no. 19-20, p. 545-48. diags., illus.
- Aluminiumguss und seine verwendung im modernen kraftfahrzeugbau, von Oskar Summa. Automobiltechnische zeitschrift, Berlin, June 25, 1935, v. 38, no. 12, p. 297-301. diags., illus., tables.
- Fabricating and welding aluminum. Sheet metal worker, New York, May 1935, v. 26, p. 203-06. illus.
- Sur le recuit de l'aluminium pur, par Jean J. Trillat. C. R, Acad. sci., Paris, Mar. 18, 1935, v. 200, no. 12, p. 1037-1039. diags., illus.
- Gasschmelzschweissung und löten von Al legierungen, von A. V. Zeerleder. Technisches zentralblatt für praktische metallbearbeitung, Berlin, Jan., Feb. 1935, v. 45, no. 1-2, p. 29-34.
- Löten und schweissen von aluminium und seinen legierungen, von E. Lüder. Zeitschrift des V.D.I., Berlin, Jan. 1935, v. 79, no. 4, p. 102. diags.
- Werkstatt-Technik bei kalt hämmerbaren aluminiumlegierungen, unter besonderer zerücksichtigung der spanlosen verformung, von G. Okert. Aluminium, Berlin, Jan. 1935, v. 17, 2 p.
- Aluminiumschweissung. Reparatur-Kolben, Berlin, 1935, no. 4, p. 108-09. diags., illus.
- Leichtmetall stanzteile für flugzeuge, von G. Hertel. (In Jahrbuch der D.V.L., Berlin, 1935, p. 67-96. diags., illus.)
- Schleifen und polieren von aluminium und seinen legierungen, von A. V. Zeerleder. Aluminium, Berlin, 1935, v. 17, no. 5, p. 245-51. diags., illus.
- Soldering of aluminum, by H. Silman. Metal industry, London, 1935, v. 46, p. 218. diagr.
- Technologie des aluminiums und seiner leichtlegierungen, von A. V. Zeerleder. Leipzig, Akademische verlagsgesellschaft, 1935. 300 p. diags., illus., tables.
- Spot welding light alloys. Flight, London, Dec. 20, 1934, v. 26, no. 1356, p. 1365-66. illus., tables.
- Die Blasenbildung vergütbarer aluminiumlegierungen, von W. Gatzek. Luftfahrtforschung, München, Aug. 13, 1934, v. 11, no. 3, p. 65-73. diags., illus.

## METALS AND LIGHT ALLOYS

- Aluminum castings for aircraft, by N. F. Budgen. Aircraft engineering, London, Aug. 1934, v. 6, no. 66, p. 207-08, 214. illus.
- Spot-welding aluminum alloys, by D. I. Bohn. Aviation, New York, Aug. 1934, v. 33, no. 8, p. 256-58. illus.
- Sur le recuit de l'aluminium pur et son utilisation possible comme critérium de pureté de ce métal, par J. Calvet. C. R. Acad. sci., Paris, Jan. 2, 1934, v. 200, no. 1, p. 66-68.
- Materials; their effect on design, by J. B. Johnson. Aviation, New York, Jan. 1934, v. 33, no. 1, p. 16-18. illus.
- La Fonderia d'alluminio, di Carlo Panseri. Milano, Ulrico Hoepli, 1934. 582 p. diagrs., illus., tables.
- Sur le vieillissement après trempe des alliages aluminium-glucinium, par C. Matignon et J. Calvet. C. R. Acad. sci., Paris, May 1, 1933, v. 196, no. 18, p. 1256-60. tables. (Abstract Le Génie civil, Paris, May 13, 1933, v. 102, no. 19, p. 454)
- Le Forgeage et matriçage des alliages légers et ultra-légers, par E. Decherf. Aciers spéciaux métaux et alliages, Paris, Sep. 1932, Apr. 1933, v. 7, 8, no. 85, 92, p. 329-44; 102-08. illus., tables.
- Heat treatment and annealing of aluminum and its alloys, by N. F. Budgen. Cleveland, Ohio, Sherwood press, 1933. 341 p. diagrs., illus., tables.
- Zur Geschichte der entwicklung und theorie aushärtbarer aluminium-walzlegierungen, von G. Sachs. Zeitschrift des V.D.I., Berlin, Aug. 20, 1932, v. 76, no. 34, p. 829-30. (Abstract R.A.S. journal, London, May 1933, v. 37, no. 269, p. 460)
- Aluminum alloy airplane parts heat treated by immersion process, by J. B. Nealey. Iron age, New York, Mar. 10, 1932, v. 129, no. 10, p. 606-07, 628. diagrs.
- Heat treatment and use of aluminum alloys for aircraft structures, by R. J. Anderson. Fuels and furnaces, Pittsburgh, Pa., Nov., Dec. 1931, Jan., Feb., Mar., 1932, v. 9, 10, no. 11, 12, 1, 2, 3, p. 1243-50; 1375-80; 53-56; 133-36; 217-20. illus., tables.
- The Heat treatment and annealing of aluminum and its alloys, by N. F. Budgen. London, Chapman and Hall, 1932. 341 p. diagrs., illus., tables.
- Forming of aluminum alloy sheet for aircraft, by F. V. Hartman and G. O. Hoglund. Aviation engineering, New York, Nov. 1931, p. 36-50. illus., tables.

## ALUMINUM - FABRICATION

- La Saldatura dell'alluminio e delle sue leghe. L'Aerotecnica, Roma, Nov. 1931, v. 11, no. 11, p. 1475-81. illus.
- Le Forgeage et le matricage des alliages légers et ultra-légers, par E. Decherf. Aciers spéciaux métaux et alliages, Paris, Feb., Sep. 1931, v. 6, no. 66, 73, p. 60-68, 441-52. illus.
- Light weight alloys in aircraft engines, by E. F. Lake. Metal industry, London, Jan. 23, 1931, v. 38, no. 4, p. 113-15. illus. (Also Metal industry, New York, Nov. 1930, v. 28, no. 11, p. 508-11)
- Machining aluminum and its alloys. S.A.E. journal, New York, Jan. 1931, v. 28, no. 1, p. 49.
- Advantages of oxide films as basis for aluminum pigmented surface coatings for aluminum alloys, by R. W. Buzzard and W. H. Mutchler. Washington, 1931. (N.A.C.A. Technical notes no. 400)
- The Age hardening of some aluminum alloys of high purity, by M. L. V. Gaylor and G. D. Preston. London, H. M. Stat. off., 1931. (A.R.C. R. & M. no. 1431)
- Der Einfluss der kaltbearbeitung auf die physikalischen eigenschaften des aluminiums, unter besonderer berücksichtigung seines spezifischen elektrischen widerstandes, von G. Greenwood. Zeitschrift für kristallographie, 1931, v. 80, p. 4891-94.
- New developments in machining aluminum and its alloys, by R. L. Templin. S.A.E. journal, New York, Nov. 1930, v. 27, no. 5, p. 548-52. diags., illus.
- Advances and trends in heat treating aluminum alloys, by R. J. Anderson. Iron age, New York, Sep. 11, 1930, v. 126, p. 696-98. illus.
- Comments on the achievements in light rolling alloys, by U. G. Muzalevski. Teknika vozdušnovo flota, Moscow, Sep. 1930, no. 9, p. 609-23. diags., tables.
- Aluminum forgings and castings applied to aircraft, by D. B. Hobbs. Aviation, New York, Aug. 1930, v. 29, p. 98-99. diags.
- Applications of stampings, forgings and castings in aircraft construction, by H. G. Runde. (In Symposium on aircraft materials, American society for testing materials, Philadelphia, Pa., June 1930, v. 30, pt. II, p. 56-66. diags.)
- Heat treatment of aircraft parts, by Horace C. Knerr. (In Symposium on aircraft materials, American society for testing materials, Philadelphia, Pa., June 1930, v. 30, pt. II, p. 133-49, 191-92) (Also Iron age, New York, Aug. 29, 1929, v. 124, no. 9, p. 519)



## METALS AND LIGHT ALLOYS

- Metal joints in aircraft construction; aluminum welding and soldering, by T. Watson Downes. (In Symposium on aircraft materials, American society for testing materials, Philadelphia, Pa., June 1930, v. 30, pt. II, p. 106-18, 185-91. diags.)
- Aluminum welding in aircraft design, by W. M. Dunlap. Aviation, New York, May 24, 1930, v. 28, p. 1028-31. illus.
- Machining aluminum and its alloys, by R. L. Templin. Mechanical engineer, New York, May 1930, v. 52, p. 542-43. (Also Metal industry, New York, Feb. 1930, v. 28, p. 67-69. illus.)
- Aluminum casting alloys in aircraft, by L. S. Reid. Aviation engineering, New York, Feb., Mar., 1930, v. 3, no. 2, 3, p. 11-13; 9-12. illus.
- Die Verwendung von aluminiumgusslegierung im flugzeugbau, von E. Löhrike. Flugwesen, Prag, 1930, v. 10, no. 11, p. 120-24. illus.
- Service characteristics of light alloys, by E. H. Dix, Jr. S.A.E. journal, New York, Nov. 1929, v. 25, no. 5, p. 463-68. illus., tables. (Also American machinist, New York, Sep. 12, 1929, v. 71, no. 11, p. 441-44)
- The Stability of aluminum and magnesium casting alloys, by A. J. Lyon. Machinery, London, June 20, 1929, v. 34, no. 871, p. 368. diags.
- Aluminum for the automotive industry, by Z. Jefferies. S.A.E. journal, New York, June 1929, v. 24, p. 617-20. illus.
- Welding, by A. Eyles. Metal industry, New York, Mar.-May, June 1929, v. 27, p. 116-18, 218-19, 280-81. diags., illus.
- Welding experience gained by one aircraft builder, by H. A. Backus. Airway age, New York, June 1929, v. 10, p. 801-05. illus.
- Aluminum alloy rivets in aircraft construction, by W. Nelson. Airway age, New York, Dec. 1928, v. 9, p. 44-47. diags. (Abstract American machinist, New York, Jan. 10, 1929, v. 7, no. 2, p. 60)
- Riveting aluminum and its alloys. Machinery, London, Nov. 22, 1928, v. 33, no. 841, p. 230-31. illus.
- Neue selbstveredelnde aluminiumgusslegierungen mit hoher elastizitätsgrenze, von M. Schwarz. Z.F.M., München, Aug. 28, 1928, v. 19, no. 16, p. 361-64. illus.
- Spot welding of aluminum and its alloys, by W. M. Dunlap. Aviation, New York, Aug. 25, 1928, v. 25, p. 590-91. diags. (Also Automotive industries, Philadelphia, May 5, 1928, v. 58, p. 694-95)

## ALUMINUM - FABRICATION

- Age hardening of aluminum alloys, by L. Marx. Engineer, London, June 28, 1928, v. 147, p. 93-94. illus.
- Welding. Sheet metal worker, New York, June 1, 1928, v. 19, p. 353-54. illus.
- Les Alliages légers, par C. Haus. Bulletin du service technique de l'aéronautique, Bruxelles, June 1928, 17 p. diags., tables. (Bulletin no. 8)
- The Forging of aluminum alloys, by A. Riebatz. Teknika vozdukhovogo flota, Moscow, June 1928, no. 6, p. 381-89. diags., illus.
- Sheet aluminum welding, by A. Eyles. Sheet metal worker, New York, May 18, 1928, v. 19, p. 317-18. illus.
- Methods of machining aluminum cylinder blocks, by J. A. Lucas. American machinist, New York, Feb. 2, 9, 1928, v. 68, p. 219-23, 247-52. illus.
- Age hardened light metal casting, by P. Schwerber. Giesserei, Düsseldorf, 1928, v. 25, p. 430-33. diags., illus.
- Observation in casting aluminum alloys, by W. J. Clark. Foundry, Cleveland, Ohio, Nov. 1-15, 1927, v. 55, p. 847-49, 891-93. illus.
- Aluminum alloys and their castings, by W. Bannard. Metal industry, New York, Sep.-Oct. 1927, v. 25, no. 9, 10, p. 366-68; 417-19. diags., illus., tables.
- Report on the "burning" of aluminum, by J. D. Grogan. London, H. M. Stat. off., 1926. 12 p. (A.R.C. R. & M. no. 1035)
- Welding aluminum in automotive parts manufacture, by H. C. Knerr. Automotive industries, Philadelphia, Mar. 29, 1923, v. 48, p. 726-31. diags.
- Tests on work-hardened aluminum sheet, by H. C. H. Carpenter and C. C. Smith. Engineering, London, Mar. 1923, v. 115, p. 310, 316-18. diags.
- Solders for aluminum. Bureau of standards, Washington, U. S. Govt. print. off., 1923. 14 p. illus. (Circular no. 78)
- Tests of aluminum solders. Automotive industries, Philadelphia, July 27, 1922, v. 47, p. 168. diags.
- Le Traitement thermique de certains alliages complexes d'aluminium, par L. Guillet. La Génie civil, Paris, Dec. 10, 1921, v. 79, p. 520-21. illus.

## METALS AND LIGHT ALLOYS

- A Real aluminum solder at last. *Aeroplane*, London, Sep. 28, 1921, v. 21, no. 13, p. 282.
- Die Autogene schweissung des aluminiums. *Illustrierte flugwoche*, Leipzig, July 20, 1921, v. 3, no. 15, p. 316-17. illus.
- Etude de la trempe de certains alliages d'aluminium. *L'Aéronautique*, Paris, Nov. 1919, v. 1, no. 6, p. 240-41.
- Aluminum castings. *Aeronautics*, London, Oct. 30, 1919, v. 17, no. 315, p. 416. diags.
- Zum löten von aluminium. *Autogene metallbearbeitung*, Halle, Apr. 1919, v. 12, no. 4, p. 57-62. illus., tables.
- Some tests of light aluminum casting alloys; effect of heat treatment, by P. D. Merica and C. P. Karr. Bureau of standards, Washington, U. S. Govt. print. off., 1919. 29 p. (Technical papers no. 139)
- Aluminum solder. *Metal industry*, New York, June 1, 1917, v. 87, p. 707. illus.
- An Aluminum soldering process. *Aviation engineering*, New York, Nov. 15, 1916, v. 1, no. 8, p. 264.
- Analyses of aluminum castings for zeppelins. *Foundry*, Cleveland, Ohio, Nov. 1916, v. 44, p. 481.
- Aluminum castings and forgings, by P. E. McKinney. *Journal of the A.S.M.E.*, New York, Oct. 1916, v. 38, p. 832. (Also *Iron age*, New York, Sep. 21, 1916, v. 98, p. 679-80)
- Aluminum welding, by H. B. Hoover. *Machinery*, New York, Aug. 1916, v. 22, p. 1032-35. diags.
- Aluminum welding extraordinary. *Aeronautics*, London, June 7, 1916, v. 10, n.s., no. 138, p. 369. illus.
- Soldering of aluminum as a substitute for welding. *Scientific american*, New York, May 13, 1916, v. 114, p. 508-09. illus.
- Soldering of aluminum. *Metal industry*, New York, Apr. 7, 1916, v. 85, p. 476-77. diags.
- Aluminum alloy pistons, by M. R. Machol. *Horseless age*, New York, Nov. 1, 1915 v. 36, p. 413-16. illus.
- Aluminum aeroplane motor casting. *Automobile*, New York, Aug. 26, 1915, v. 33, p. 371.
- Autogeneous soldering of aluminum. *Machinery*, New York, Jan. 1915, v. 21, p. 369-71. tables.

## ALUMINUM - PROPERTIES AND USE

- Einfluss der dauererwärmung auf die mechanisch-technologischen eigenschaften von reinstaluminium in abhängigkeit von der kaltverformung, von H. Wolf und H. Tuxhorn. Aluminium, Berlin, Jan. 1940, v. 22, no. 1, p. 14-20. diags., illus., tables.
- Prüfung der scherfestigkeit von nietdraht und nieten aus leichtmetall, von G. Kraetsch. Aluminium, Berlin, Jan. 1940, v. 22, no. 1, p. 12-13. tables.
- Über das verhalten der in reinaluminium ausgeschiedenen gefügebestandteile bei der spanlosen verformung, von H. Röhrig und J. Roche. Aluminium, Berlin, Jan. 1940, v. 22, no. 1, p. 21-24. diags., illus., tables.
- Light alloys and production; plant and technique. Aeroplane, London, Dec. 8, 1939, v. 57, no. 1489, p. 704-07. diags., illus.
- Begriffsbestimmung des kriechwiderstandes von aluminiumlegierungen von F. von Göler und W. Jung-König. Zeitschrift für metallkunde, Berlin, Oct. 1939, v. 31, p. 313-17. illus.
- Massnahmen zur verbesserung der ermüdungsfestigkeit genieteteter knotenpunktverbindungen aus al legierungen für den flugzeugkarosserie-und kranenbau, von W. Müller. Schweizer archiv, Solothurn, Switzerland, Oct. 1939, v. 5, no. 10, p. 294-307. diags., illus., tables.
- Fatigue of light metal alloys, by R. L. Templin. Metals and alloys, New York, Aug. 1939, v. 10, no. 8, p. 243-45. diags., illus.
- Aluminum alloys 14 S-T and 24 S-T. Results of some mechanical tests, by W. B. Mechling and S. S. Jack. Metal industry, London, July 28, 1939, v. 55, no. 4, p. 83-86. illus., tables.
- Propriétés mécaniques après durcissement structural des alliages aluminium-magnésium-zinc à faible teneur en magnésium et en zinc, par Jean Hérenguel et Georges Chaudron. C. R. Acad. sci., Paris, July 10, 1939, v. 209, no. 2, p. 109-11. diags.
- Versuche mit leichtmetallagern in prüfmaschinen und flugmotoren, von A. Buske. Automobiltechnische zeitschrift, Berlin, July 10, 1939, v. 42, no. 13, p. 355-63. diags., illus., tables.
- Les Métaux et alliages modernes en construction aéronautique, par R. Cazaud. La Technique moderne, Paris, May 1, 1939, v. 51, no. 9, p. 333-36. diags., illus.

## METALS AND LIGHT ALLOYS

- The Use of light alloys in aircraft construction, by R. LeCoeuvre. Journal of the R.A.S., London, Apr. 1939, v. 43, no. 340, p. 289-309. illus. (Also Metal industry, London, Nov. 4, 11, 1938, v. 53, no. 19, 20, p. 437-42, 465-66 and Metallurgia, Manchester, Nov. 1938, v. 19, no. 109, p. 11-14)
- Light alloys for aircraft, by H. Sutton. Iron age, New York, Mar. 30, 1939, v. 143, no. 13, p. 28-31, 92.
- Metals for aeroplane construction, by J. B. Johnson. Journal of the Aeronautical sciences, New York, Mar. 1939, v. 6, no. 5, p. 185-202. diags., illus.
- Modern aluminum alloys, by J. R. Hanforth. Aircraft engineering, London, Mar. 1939, v. 11, no. 121, p. 101-06. illus., tables.
- Strain marking in aluminum alloys. Engineer, London, Feb. 24, 1939, v. 12, no. 1, p. 2-3. illus., tables.
- Über die rekristallisationstemperatur von aluminium-kupfer-legierungen, von W. Bungardt und E. Osswald. Zeitschrift für metallkunde, Berlin, Feb. 1939, v. 31, no. 2, p. 45-54. diags., illus., tables.
- Abscheidung, eigenschaften und anwendungsgebiete des elektrolitsch vergüteten aluminiums, von H. Roehrig. Zeitschrift des V.D.I., Berlin, Jan. 7, 1939, p. 33-39. illus., tables.
- Some aspects of the mechanical properties, uses and manipulations of aluminum, by F. R. C. Smith. Journal of the R.A.S., London, Jan. 1939, v. 43, no. 337, p. 1-18. illus., tables.
- Les Barres de connexion en aluminium. Paris, Société l'aluminium français, 1939. 23 p. diags., illus.
- Effect of service stress on impact resistance, X-ray diffraction patterns, and microstructure of 25 S aluminum alloy, by J. A. Kies and G. W. Quick. Washington, U. S. Govt. print. off., 1939. 22 p. (N.A.C.A. Report no. 659)
- The "Pack" method for compressive tests of thin specimens of materials used in thin wall structures, by C. S. Aitchison and L. B. Tuckerman. Washington, U. S. Govt. print. off., 1939. (N.A.C.A. Report no. 649)
- Physical constants of aluminum, by Junius D. Edwards. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1240-45. diags., illus., tables.
- Properties of aluminum copper alloys, by E. H. Dix, Jr. and J. J. Bowman. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1248-49. diags.

## ALUMINUM - PROPERTIES AND USE

- Properties of aluminum copper (8 0/0) casting alloys, by H. J. Rowe. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1265. tables)
- Properties of aluminum-copper-nickel-magnesium alloy cast in permanent molds, by O. H. Heil. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1274-75. diags., illus., tables)
- Properties of aluminum-magnesium alloys, by L. W. Kempf and J. F. Keller. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1254-57. diags.)
- Properties of aluminum-magnesium (4 0/0) casting alloy, by L. W. Kempf and H. J. Rowe. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1259. tables)
- Properties of aluminum-silicon alloys, by L. W. Kempf. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1261-64. diags., illus., tables)
- Properties of aluminum-silicon (5 0/0) and 13 0/0) casting alloys, by H. J. Rowe. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1265-66. tables)
- Properties of aluminum-silicon nickel-copper-magnesium alloy, by L. W. Kempf and O. H. Heil. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1282-83. diags.)
- Properties of aluminum-zinc alloys, by L. W. Kempf. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1286-87. diags.)
- Properties of cast copper-aluminum alloys, by Jerome Strauss and Lewis H. Fawcett. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1425-27. diags.)
- Properties of commercially pure wrought aluminum, by P. V. Faragher. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1246-47. tables)
- Properties of heat-treated aluminum copper (4 0/0) casting alloys, by H. J. Rowe. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1262-63. tables)
- Properties of heat-treated aluminum-magnesium (10 0/0) casting alloys. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1258. tables)
- Properties of heat treated aluminum-silicon-copper magnesium casting alloys, by L. W. Kempf and H. J. Rowe. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1278-79. tables)

## METALS AND LIGHT ALLOYS

- Properties of heat treated aluminum-silicon-magnesium casting alloy, by L. W. Kempf and H. J. Rowe. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1280-81. diags., tables.)
- Properties of wrought aluminum-manganese alloys, by P. V. Faragher. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 126. table)
- Properties of wrought aluminum-magnesium-silicon alloys, by J. F. Keller and T. W. Bossert. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1276. diags., tables.)
- Properties of wrought aluminum-manganese-magnesium alloys, by T. W. Bossert and S. A. Nock, Jr. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1277. table)
- Properties of wrought aluminum-silicon-magnesium alloy, by L. W. Kempf and S. H. Alden. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1284-85. diags., illus., tables)
- Properties of wrought copper aluminum alloys. Aluminum bronze, by Jerome Strauss and Lewis H. Fawcett. (In Metals handbook, Cleveland, Ohio, American society for metals, 1939. p. 1408-10. diags., illus., tables)
- Torsional stability of aluminum alloy seamless tubing, by Robert L. Moore and Donald A. Paul. Washington, 1939. 13 p. diags., illus., tables. (N.A.C.A. Technical notes no. 696)
- Light alloys for aircraft; problems of their fabrication and application, by H. Sutton. Metal industry, London, Dec. 16, 23, 30, 1938, v. 53, no. 25, 26, 27, p. 581-84, 609-12, 637-40. illus., tables.
- Les Alliages légers (ultra-légers) et leur classification, par L. Guillet. Le Génie civil, Paris, Dec. 24, 1938, v. 113, no. 26, 27, p. 537-42, 566-67. illus., tables.
- Über die rekristallisation und entfestigung der magnesium-knetlegierung, von W. Bungardt, K. Bungardt und E. Schiedt. Metallwirtschaft, Berlin, Dec. 2, 1938, v. 17, no. 48, p. 1267-72. illus., tables.
- Magnesium-aluminum alloys in aircraft construction, by R. Le Coeuvre. Metal progress, Cleveland, Ohio, Dec. 1938, v. 34, p. 670, 706, 722.

## ALUMINUM - PROPERTIES AND USE

- The Use of light alloys in aircraft, by R. Le Coeuvre. Aluminum and non-ferrous review, London, Nov., Dec. 1938, v. 3, 4, no. 12; 1, p. 407-11; 23-24. illus., tables.
- Light metals in aircraft construction, by R. Le Coeuvre. Metal industry, London, Nov. 4, 11, 1938, v. 53, p. 437-43, 465-66. (Also Engineering, London, Nov. 4, 1938, v. 146, no. 3799, p. 538)
- Light alloys in aircraft construction. Aeroplane, London, Nov. 9, 1938, v. 55, no. 1433, p. 571-74. illus., tables.
- Light alloys in production. Aircraft engineering, London, Nov. 1938, v. 10, no. 117, p. 359-61. illus.
- The Mechanical properties of aluminum-magnesium alloys, by W. Broniewski, P. Bernaciak and S. Blazewski. Aluminum and non-ferrous review, London, Oct.-Nov. 1938, v. 3, no. 11, 12, p. 365-68, 400-01. diags.
- Versuch über den fliessvorgang und die bruchgefahr von aluminium-legierungen der gattung Al-Cu-Mg-und Al-Mg-Si, von J. Valyi. Schweizer archiv, Solothurn, Switzerland, Nov. 1938, v. 4, no. 11, p. 313-18. illus.
- Einfluss von gussfehlern auf die festigkeit bei leichtmetall-gusstücken, von F. Bollenrath und E. Schiedt. Luftfahrt-forschung, München, Oct. 10, 1938, v. 15, no. 10-11, p. 511-16. illus.
- Mechanical properties of the deformable Al-Mg-Mn alloys, by A. Bundin. Teknika vozdušnovo flota, Moscow, Oct. 1938, no. 10, p. 37-50. illus., tables.
- Some applications of high-strength aluminum casting alloys. Metallurgia, Manchester, England, Oct. 1938, v. 18, no. 108, p. 191-93. illus.
- Über den einfluss der schmelzbedingungen auf die struktur und die mechanischen eigenschaften von umschmelz-aluminium-legierungen, von P. Röntgen und H. Winterhager. Metall-wirtschaft, Berlin, Oct. 1938, v. 17, no. 40, p. 1045-51. illus., tables.
- Aluminum alloys in aircraft. Metal industry, London, Aug. 12, 1938, v. 53, p. 156.
- Besondere eigenschaften der kupfer-aluminium-legierungen, die aus reinstaluminium hergestellt sind. Metallwirtschaft, Berlin, Aug. 1938, v. 17, no. 33, p. 882-84. diags., illus., tables.



## METALS AND LIGHT ALLOYS

- Kritische zusammenstellung der neuesten und wichtigsten dauerfestigkeitsuntersuchungen von aluminiumknetlegierungen, von H. Westhoff. Zeitschrift für metallkunde, Berlin, Aug. 1938, v. 30, no. 8, p. 258-65. illus., tables.
- The Properties of high purity aluminum, by C. S. Taylor, A. L. Willey, D. W. Smith and J. D. Edwards. Metals and alloys, New York, Aug. 1938, v. 9, no. 8, p. 189-92. illus., tables.
- Kraftwirkungsfiguren bei aluminumlegierungen, von M. Bosshard und H. Hug. Metallwirtschaft, Berlin, June 1938, v. 17, no. 26, p. 708-10. illus., tables.
- Neuere untersuchungen an der aluminium-silizium-legierung silumin-gamma im hinblick auf die forderungen des flugmotorenbaues, von P. Kötzsche. Deutsche luftwacht, ausgabe Luftwissen, Berlin, June 1938, v. 5, no. 6, p. 205-11. illus., tables.
- Sur les variations de propriétés mécaniques observées sur un alliage aluminium-magnésium en fonction de l'affinage, par F. Fournier. C. R. Acad. sci., Paris, Apr. 15, 1938, v. 200, no. 16, p. 1398-1400. illus.
- Beryllium-aluminum alloys for aircraft pistons, by J. B. Johnson. Metals and alloys, New York, Apr. 1938, v. 9, no. 4, p. 94. illus., tables.
- Metals used in aircraft industry, by J. Richard Goldstein. Metal progress, Cleveland, O., Apr. 1938, v. 33, no. 4, p. 357-61. illus. (Also Canadian metals and metallurgical industries, Toronto, Apr. 1938, v. 1, no. 4, p. 110-12, 119)
- Gussgefüge und dauerbiegefestigkeiten aluminium-legierungen, von E. Boehm. Aluminium, Berlin, Mar. 1938, v. 20, no. 3, p. 168-74. illus., tables.
- Manufacture of high-strength light alloy extrusions and their use in aircraft, by R. Worsdale. Metallurgia, Manchester, England, Feb.-Mar. 1938, v. 17, no. 100, 101, p. 134-36, 193-96. diags., illus.
- Market forms of aluminum and its alloys, by W. Ashcroft. Metallurgia, Manchester, England, Mar. 1938, v. 17, no. 101, p. 175-76. diags.
- Caractéristiques de l'aluminium et de ses alliages et leur métallurgie, par R. Kauffmann. Société des ingénieurs soudeurs, Paris, Jan.-Feb. 1938, v. 9, no. 49, p. 2979-88. illus., tables.
- Mechanical properties of light alloys for use in aircraft construction at atmospheric temperature, by E. R. Gadd. Metal industry, London, Jan. 7, 1938, v. 52, no. 1, p. 5-10. illus., tables.

## ALUMINUM - PROPERTIES AND USE

- Ausschuss für werkstofffragen, von W. Müller. (In Jahrbuch der deutsche luftfahrtforschung, München, 1938, p. 18-19. diags.)
- Dynamische festigkeitseigenschaften von leichtmetall-legierungen bei tiefen temperaturen, von K. Bungardt. (In Jahrbuch der deutschen luftfahrtforschung, München, 1938, p. 529-31. diags., illus., tables)
- Leichtmetall-lager, von R. Hinzmann. Zeitschrift für metallkunde, Berlin, 1938, v. 29, no. 5, p. 158-62. diags., illus.
- Über den einfluss des kupfer-magnesium-und siliziumgehaltes auf die eigenschaften der Al-Cu-Mg-legierungen, von M. Hansen. (In Jahrbuch der deutschen luftfahrtforschung, München, 1938, p. 501-03. diags.)
- Die Wirkung der kerben auf die zugfestigkeit von aluminium-magnesium-legierungen mit verschiedenen gefügen, von H. Vosskühler. Metallwirtschaft, Berlin, 1938, v. 17, p. 31-34.
- Die Mechanischen eigenschaften von warmausgehärteten Al-Cu-Mg-legierungen, von P. Brenner und H. Kostron. Luftfahrtforschung, München, Dec. 20, 1937, v. 14, no. 12, p. 647-52. illus., tables.
- The Bearing strength of steel and aluminum alloy sheet in riveted or bolted joints, by R. A. Miller. Journal of the Aeronautical sciences, New York, Nov. 1937, v. 5, no. 1, p. 22-25. illus.
- Elastic properties of some aluminum alloys, by R. H. Greaves. Engineer, London, Oct. 29, 1937, v. 164, p. 72-74. illus.
- Elastic properties of aluminum, by M. Sugihara. Metal industry, London, Oct. 8, 1937, v. 51, no. 4, p. 360.
- Structure and characteristics of aluminum alloys, by H. C. Hall. Metal industry, London, June 25, July 2, 1937, v. 50, 51, no. 26; 1, p. 705-09; 9-12, 12-16. illus., tables.
- Heimwerkstoffe im flugzeug-und flugmotorenbau, von K. Schraivogel. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, 5, p. 224-27. diags., illus., tables.
- Aircraft-engine materials, by J. B. Johnson. S.A.E. journal, New York, Apr. 1937, v. 40, no. 4, p. 153-64. illus., tables. (Also Heat treating and forging, Pittsburgh, Pa., Feb. 1937, v. 23, no. 2, p. 75-79)
- Investigation of the aluminum-copper-magnesium system, by H. Nishimura. (In Memoirs of the College of engineering, Tokyo imperial university, Tokyo, Apr. 1937, v. 10, no. 1, p. 18-33. illus.)

## METALS AND LIGHT ALLOYS

- Aluminum alloys vs. stainless steel for aircraft, by W. L. Sutton and E. E. Thum. Metal progress, Cleveland, O., Jan. 1937, v. 31, no. 1, p. 46-52. illus., tables.
- Development of (245) alloy extensively used in aircraft, by T. W. Bossert. Metal progress, Cleveland, O., Jan. 1937, v. 31, no. 1, p. 42-45. illus., tables.
- Increasing the strength of aluminum alloy columns by prestressing, by E. C. Hartmann and M. Holt. Washington, 1937. 12 p. illus., table. (N.A.C.A. Technical notes no. 618)
- Mechanical properties of aluminum alloy rivets, by William C. Brueggeman. Washington, 1937. 14 p. (N.A.C.A. Technical notes no. 585)
- On aging processes of aluminum-magnesium-silicon alloys which have an excess of Si. (Type arial and 51S), by S. M. Voronov and J. A. Deutsch. Aviapromyschlennost, Moscow, 1937, v. 6, no. 5, 6, p. 22-30, 29-37. illus.
- On the recovery of a strong aluminum alloy, by R. H. Hobrock. Daniel Guggenheim airship institute, Akron, Ohio, 1937. p. 80-89. illus., tables.
- Hochfrequenztechnik und aluminium, von A. Habermann. Aluminium, Berlin, Dec. 1936 v. 18, no. 12, p. 612. illus.
- Sur les potentiels de dissolution de l'aluminium et des alliages légers, par P. Lacombe et G. Chaudron. Revue de métallurgie, Paris, Dec. 1936, v. 33, no. 12, p. 697-704. illus., tables.
- Light alloys in british aircraft and automobile construction, by C. H. S. Tupholme. Canadian chemistry and metallurgy, Toronto, Nov. 1936, v. 20, no. 11, p. 352, 354. tables.
- Laufeigenschaften von aluminium-lagermetall (Quarzal), von M. Schwarz. Zeitschrift für metallkunde, Berlin, Sep. 1936, v. 28, no. 9, p. 272-75. illus., tables.
- Neuere plattierte aluminium-kupfer-magnesium-werkstoffe und ihre eigenschaften, von P. Brenner. Zeitschrift für metallkunde, Berlin, Sep. 1936, v. 28, no. 9, p. 276-80. diags., illus., tables.
- Einfluss der verformungsart und der thermischen vergütung auf die ermüdungsfestigkeit von vergüteten aluminiumlegierungen, von H. Bohner. Metallwirtschaft, Berlin, Aug. 28, 1936, v. 15, no. 35, p. 813-14. diags.
- Alloys for aircraft die castings and their applications, by Herbert Chase. Aero digest, New York, July 1936, v. 29, no. 1, p. 54-56, 58. illus., tables.

## ALUMINUM - PROPERTIES AND USE

- Comparison of a corrosion resistant steel and aluminum alloy, by J. E. Sullivan. Automotive industries, Philadelphia, May 16, 1936, v. 74, p. 709. diags.
- Tiefziehfähigkeit des aluminiums, von W. Helling. Metallwirtschaft, Berlin, Apr. 24, May 1, 1936, v. 15, no. 17, 18, p. 388-94, 409-12. diags., illus., tables.
- Alloys of aluminum and their uses, by P. V. Faragher. Product engineering, New York, Apr. 1936, v. 7, no. 2, p. 137-40. illus.
- Building it with aluminum, by R. S. Merritt. Engineering and mining journal, New York, Apr. 1936, v. 137, no. 4, p. 195-98. diags.
- Limite d'endurance des alliages d'aluminium, par R. Irman. Revue de métallurgie, Paris, Apr. 1936, v. 33, no. 4, p. 231-36. diags., illus.
- Herstellung, eigenschaften und verwendung von raffiniertem aluminium, von R. Gardeau. Chemische fabrik, Berlin, Mar. 18, 1936, v. 9, p. 142.
- Selection of light alloys for aero engines, by J. R. Hanforth. Metal treatment, London, Jan.-Mar., 1936, v. 2, no. 5, p. 3-13. illus., tables.
- Aluminum cylinder heads. Automotive industries, Philadelphia, Feb. 29, 1936, v. 74, p. 349-50. illus.
- Development of aluminum for aircraft, by C. F. Nagel, Jr. Aero digest, New York, Feb. 1936, v. 28, no. 2, p. 27-29, 84-86. diags., illus.
- Uses of aluminum in the power plant, by T. W. Bossert. Power plant engineering, Chicago, Feb. 1936, v. 40, p. 93-94.
- Properties of Al-Si (13 0/0) casting alloys, by H. J. Rowe. (In Metals handbook. Cleveland, O., American society for metals, 1936, p. 953-54)
- Messungen der wärmeleitfähigkeit von aluminiumlegierungen, von H. Hanemann und G. Euringer. Metallwirtschaft, Berlin, Dec. 1935, v. 14, no. 20, p. 389-90. diags., illus., tables.
- Etude sur la fabrication, les propriétés et les emplois de l'aluminium raffiné, par R. Gadeau. Chimie et industrie, Paris, Nov. 1935, v. 34, p. 1021-26. diags., illus.
- Light metals and their alloys, by William M. Corse. Journal of the American society of naval engineers, Washington, Nov. 1935, v. 47, no. 4, p. 632-39. illus., tables.

## METALS AND LIGHT ALLOYS

- Non-ferrous metals used in aircraft, by J. B. Johnson. Metal progress, Cleveland, O., Oct. 1935, v. 28, no. 4, p. 123-28, 130. diags., tables.
- Properties of wrought aluminum alloys at elevated temperatures, by F. M. Howell and D. A. Paul. Metals and alloys, New York, Oct. 1935, v. 6, no. 10, p. 284-88. illus., tables.
- Kraftverbrauch beim schmieden und pressen von aluminiumlegierungen, von A. V. Zeerleder und R. Irmann. Zeitschrift für metallkunde, Berlin, July 1935, v. 27, no. 7, p. 145-48. diags., illus., tables.
- Air cooled engine with hard aluminum cylinder. Automotive industries, Philadelphia, June 1, 1935, v. 72, no. 22, p. 731. diags.
- The Effects of thermic treatment upon the physical properties of aluminum alloys, by J. Towns Robinson. Metallurgia, Manchester, England, June 1935, v. 12, no. 68, p. 51-66. diags., illus., tables.
- Contribution à l'étude des alliages formés par la solution solide aluminium-magnésium, par G. Chaudron et R. Dandres. C. R. Acad. sci., Paris, Apr. 8, 1935, v. 200, no. 15, p. 1324-26. illus.
- Wrought copper-nickel-aluminum alloys, by D. K. Crapton and H. P. Croft. Metals and alloys, New York, Apr. 1935, v. 6, no. 4, p. 79-84. diags., illus., tables.
- Effect of elevated temperatures on strength and dimensional stability of certain aluminum alloys used in aircraft, by R. R. Kennedy. Metal industry, London, Feb. 8, Mar. 8, 1935, v. 46, no. 6, 10, p. 169-70, 281-82. illus. (Also American society for testing materials, Philadelphia, 1935, v. 35, p. 218-32. diags., illus.)
- Les pistons et les culasses en alliages d'aluminium, par H. Petit. Technique automobile et aérienne, Paris, Jan.-Mar. 1935, v. 26, no. 168, p. 1-10. diags., illus.
- Stress distribution in aluminum connecting rods, by R. L. Templin. Railway mechanical engineer, New York, Mar. 1935, v. 109, p. 93-96. diags., illus.
- Bestimmung der dauerstandfestigkeit von aldreyl und reinaluminium, von R. Irmann und W. Müller. Aluminium, Berlin, Jan. 1935, v. 17, no. 1, p. 7-10. diags., illus., tables.
- The Column properties of corrugated aluminum alloy sheet, by C. G. Brown. Washington, U. S. Govt. print. off., 1935. 19 p. diags., illus., tables. (Air corps information circular no. 699)

## ALUMINUM - PROPERTIES AND USE

- Über aluminiumlegierungen hoher reinheit. Metallwirtschaft, Berlin, Dec. 14, 1934, v. 13, no. 50, p. 893. diagsr.
- Ein Beitrag zur bestimmung der giessbarkeit an aluminiumlegierungen, von A. V. Zeerleder und R. Irmann. Zeitschrift für metallkunde, Berlin, Dec. 1934, v. 26, no. 12, p. 271-74. diagsr., illus.
- Aluminum alloys for engines, by G. D. Welty and F. C. Pyne. Aviation, New York, Sep. 1934, v. 33, no. 9, p. 286-88. illus.
- Le Leghe leggere nelle costruzioni aeronautiche, di Attilio Izzo. L'Ala d'Italia, Milano, Sep. 1934, v. 12, p. 36-40. diagsr., illus., tables.
- The Properties of aluminum and two of its alloys at elevated temperatures, by F. M. Howell and D. A. Paul. Metals and alloys, New York, Aug. 1934, v. 5, no. 8, p. 176-79. diagsr., illus., tables.
- Aluminum alloys up to date, by C. F. Nagel, Jr. and F. C. Pyne. Aviation, New York, July 1934, v. 33, no. 7, p. 212-14. illus.
- Leichtmetalle im luftfahrzeugbau, von H. Mann. Werkstattstechnik, Berlin, Jan. 15, 1934, v. 28, no. 3, p. 21-24. diagsr.
- Aluminum; its manufacture, properties and uses, by Sainte-Claire Deville and Henri Etienne. London, Chapman and Hall, 1934. 204 p. diagsr., illus., tables.
- Transverse tests on sand cast aluminum alloy bars, by C. E. Phillips and J. D. Grogan. London, H. M. Stat. off., 1934. 1 p. (A.R.C. R. & M. no. 1620)
- Aluminum for struts and wire, by F. Giolitti. Metal progress, Cleveland, O., Nov. 1933, v. 24, p. 48.
- La Sollecitazione a compressione nelle leghe leggere laminate, di G. Guidi. Alluminio, Milano, Sep. 1933, v. 2, no. 5, p. 285-86. illus.
- Strength of aluminum corrugated sheets. Engineering news-record, New York, June 1, 1933, v. 110, p. 705.
- Aluminum cylinder heads, by F. F. Kishline. Automobile engineer, London, June 1933, v. 23, p. 209-10. illus. (Also S.A.E. journal, New York, Apr. 1933, v. 32, p. 121-23)
- Developments in aluminum alloys in relation to economics in aircraft construction, by C. F. Nagel, Jr. and G. O. Hoglund. Transactions of the A.S.M.E., New York, June 1933, v. 5, no. 2, p. 75-78. illus.

## METALS AND LIGHT ALLOYS

- Making of aluminum titanian alloys, by S. G. Glazunov. *Teknika vozdušnovo flota*, Moscow, June 1933, no. 5, p. 49-58. diagsr.
- Fatigue resisting properties of light aluminum alloys, by J. W. Cuthbertson. *Engineering*, London, Mar. 24, 1933, v. 135, p. 342-43. illus. (Also *Engineer*, London, Mar. 17, 1933, v. 155, p. 267)
- Manufacture and use of light alloys, by W. C. Devereux. *Journal of the R.A.S.*, London, Feb. 1933, v. 37, no. 266, p. 145-67. diagsr., illus. (Also *Aircraft engineering*, London, Jan. 1933, v. 5, no. 47, p. 6-12)
- How to use aluminum in aircraft, by C. F. Nagel, Jr. *Western flying*, Los Angeles, Cal., Jan. 1933, v. 13, no. 1, p. 10-12. illus.
- Uses of aluminum for cylinder heads eliminates excessive dead weight. *Automotive industries*, Philadelphia, Dec. 16, 1932, v. 67, p. 749.
- Non-ferrous metals in the aircraft industry, by Francis A. Westbrook. *Metal industry*, New York, Dec. 1932, v. 30, no. 12, p. 463-65. tables.
- Dynamische festigkeitseigenschaften einiger leichtmetalle, von K. Matthaes. *Zeitschrift für metallkunde*, Berlin, Aug. 1932, v. 24, no. 8, p. 176-80. diagsr., illus., tables. (Abstract Journal of the R.A.S., London, Sep. 1933, v. 37, no. 273, p. 809)
- Über die rekristallisation und kristallerholung von reinaluminium und einigen aushärtbaren aluminiumlegierungen auf Al-Cu-basis nach kaltverformung, von H. Bohner und R. Vogel. *Zeitschrift für metallkunde*, Berlin, Aug. 1932, v. 24, no. 8, p. 169-75. diagsr., illus., tables. (Abstract Journal of the R.A.S., London, Sep. 1933, v. 37, no. 273, p. 808)
- Strukturumwandlungen und andre eigenschaften von legierungen, von F. von Göler. *Zeitschrift des V.D.I.*, Berlin, July 23, 1932, v. 76, no. 30, p. 724. (Abstract Journal of the R.A.S., London, May 1933, v. 37, no. 269, p. 459)
- Untersuchungen über spannungskorrosionsrisse an leichtmetallen, von P. Brenner. *Zeitschrift für metallkunde*, Berlin, July 1932, v. 24, no. 7, p. 145-51. diagsr., illus., tables. (Abstract Journal of the R.A.S., London, May 1933, v. 37, no. 269, p. 460)
- Untersuchungen über die warmfestigkeit von leichtmetallen bei statischer und bei wechselnder beanspruchung, von W. Schwinning und E. Strobel. *Zeitschrift für metallkunde*, Berlin, June, July 1932, v. 24, no. 6, 7, p. 132-37, 151-53. diagsr., illus.

## ALUMINUM - PROPERTIES AND USE

- Aluminum and its alloys in aircraft, by T. W. Bossert. Aero digest, New York, Jan. 1932, v. 24, no. 1, p. 54-55. illus. (Also Metals and alloys, New York, Jan. 1930, v. 1, no. 7, p. 325-26 and Heat treating and forging, Pittsburgh, Pa., Oct. 1929, v. 15, no. 10, p. 1315-16)
- Alcoa aluminum and its alloys. Pittsburgh, Pa., Aluminum company of America, 1932. 73 p. diags., illus., tables.
- Dimensional stability of heat-treated aluminum alloys, by J. D. Grogan and D. Clayton. London, H. M. Stat. off., 1932. 14 p. (A.R.C. R. & M. no. 1435)
- The Influence of titanium tetrachloride on the gas content and grain size of aluminum and some alloys, by W. Rosenhain, J. D. Grogan and T. H. Schofield. London, H. M. Stat. off., 1932. 10 p. illus., tables. (A.R.C. R. & M. no. 1386)
- Stressless corrosion followed by fatigue test to destruction on aluminum crystal, by H. J. Gough and G. Forrest. London, H. M. Stat. off., 1932. 11 p. (A.R.C. R. & M. no. 1476)
- L'Aluminium et ses alliages légers, par E. Marcotte. Revue des combustibles liquides, Paris, Dec. 1931, v. 9, no. 90, p. 420-27. illus., tables.
- Leghe alluminio-cromo, di G. Gallo e G. Fragapane. L'Aerotecnica, Roma, Dec. 1931, v. 11, no. 12, p. 1539-54. diags., illus., tables.
- I Metalli leggeri all'esposizione e congresso internazionale di fonderia, di Armando Silvestri. Rivista aeronautica, Roma, Dec. 1931, v. 7, no. 12, p. 499-513. illus., tables.
- Light alloys in engine construction, by E. F. Lake. Aviation engineering, New York, July 1931, v. 5, no. 1, p. 15-17. illus., tables.
- Les Alliages légers au XIII<sup>e</sup> salon de l'aéronautique. Revue de métallurgie, Paris, Apr. 1931, v. 28, no. 4, p. 185-93. illus.
- Deformation of aluminum under prolonged loading, by D. Hanson and A. Wheeler. Metallurgia, Manchester, England, Mar. 1931, v. 3, p. 169.
- L'Impiego delle leghe di alluminio nelle costruzioni degli aeroplani. L'Ala d'Italia, Milano, Mar. 1931, v. 10, no. 3, p. 224. illus.
- Light weight alloys in aircraft engines, by E. F. Lake. Metal industry, London, Jan. 23, 1931, v. 38, no. 4, p. 113-15. illus. (Also Metal industry, New York, Nov. 1930, v. 28, no. 11, p. 508-11)



## METALS AND LIGHT ALLOYS

- The Mechanical properties of aluminum and magnesium alloys, by R. L. Templin and D. A. Paul. (In Symposium on effect of temperature on metals. Philadelphia, American society for testing materials, 1931, p. 290)
- On the manufacture and the mechanical properties of the Al-Cu-Si light alloys, by M. Goto, S. Fukuta, S. Horiguchi and T. Nagai. Tokyo, Tokyo imperial university, 1931. 76 p. diagr., tables. (Aeronautical research institute report no. 73)
- Non-ferrous metals for aircraft, by D. Hanson. Aircraft engineering, London, Dec. 1930, v. 2, no. 22, p. 308-10. diagrs., tables.
- Strength of aluminum alloy sheets; experiments performed at Massachusetts institute of technology and at Stanford university, by J. S. Newell. Airway age, New York, Nov.-Dec. 1930, v. 11, p. 1420-24, 1548-51. diagrs.
- I Recenti progressi nelle leghe leggere dell'alluminio. L'Ala d'Italia, Milano, Aug., Nov. 1930, v. 9, no. 8, 11, p. 656-66, 917-19. illus., tables.
- Typical mechanical properties of wrought aluminum and aluminum alloys. Metal progress, Cleveland, O., Nov. 1930, v. 18, p. 81.
- Lo-Ex alloy for aluminum pistons. Aero digest, New York, Oct. 1930, v. 22, no. 10, p. 96.
- Fatigue resistance of some aluminum alloys, by J. B. Johnson and T. T. Oberg. Engineer, London, Sep. 26, 1930, v. 156, p. 137-39. illus. (Also American society for testing materials, Philadelphia, 1929, v. 2, p. 339-43)
- Use of non-ferrous metals in the aeronautical industry, by D. Hanson. Engineer, London, Sep. 12, 1930, v. 150, p. 291-93. tables. (Also Engineering, London, Sep. 12, 1930, v. 130, p. 333-34)
- Y alloy used in aircraft structures and engines. Canadian mining journal Toronto, Aug. 22, 1930, v. 51, p. 821.
- New low expansion aluminum piston alloy. U. S. Air services, Washington, Aug. 1930, v. 15, no. 8, p. 50. diagrs.
- Über die kerbzähigkeit einiger aluminiumlegierungen insbesondere bei tiefen temperaturen, von W. A. Gueldner. Zeitschrift für metallkunde, Berlin, Aug. 1930, v. 22, no. 8, p. 257-60, 412-16. diagrs., illus.
- Aluminum competes with copper, steel and other products, by R. J. Anderson. Iron age, New York, July 31, 1930, v. 126, p. 284-88. illus.

## ALUMINUM - PROPERTIES AND USE

- Aluminum alloys for pistons and cylinder heads, by A. J. Lyon. American machinist, New York, June 19, 1930, v. 72, p. 996. illus.
- Failures of aircraft engine parts and causes thereof, by Thomas T. Neill. (In Symposium on aircraft materials. Philadelphia, American society for testing materials, June 1930, v. 30, pt. 2, p. 78-87, 173-79)
- Materials of construction in aircraft engines, by R. L. Moore. (In Symposium on aircraft materials. Philadelphia, American society for testing materials, June 1930, v. 30, pt. 2, p. 67-77)
- Mechanical testing of aircraft materials, by J. B. Johnson. (In Symposium on aircraft materials. Philadelphia, American society for testing materials, June 1930, v. 30, pt. 2, p. 98-105, 179-85)
- Specifications and materials control, by H. A. Backus. (In Symposium on aircraft materials. Philadelphia, American society for testing materials, June 1930, v. 30, pt. 2, p. 88-97, 179-88)
- Structural and engineering light alloys for aircraft, by R. L. Templin, F. V. Hartman and E. C. Hartmann. (In Symposium on aircraft materials. Philadelphia, American society for testing materials, June 1930, v. 30, pt. 2, p. 13-19, 150-60)
- X-ray testing of aircraft materials, by Ancel St. John. (In Symposium on aircraft materials. Philadelphia, American society for testing materials, June 1930, v. 30, pt. 2, p. 126-29)
- L'Alluminio e le sue leghe, di T. Zinelli. Aeronautica, Roma, Mar.-Apr. 1930, v. 8, no. 3, 4, p. 193-95, 277-88. diags., illus.
- Alloy metals in aircraft construction, by Gardner Turman. Colorado engineer, Boulder, Colo., Jan. 1930, v. 26, no. 2, p. 51, 68, 70. illus.
- Gas removal and grain refinement in aluminum alloys, by W. Rosenhain, J. D. Crogan and T. H. Schofield. London, H. M. Stat. off., 1930. 8 p. diags., illus. (A.R.C. R. & M. no. 1387)
- Metals used in aircraft construction, by Bradley Stoughton. Society of chemical industry, London, Dec. 13, 1929, v. 48, no. 50, p. 1189-98. illus., tables.
- Service characteristics of light alloys as used in aircraft, by E. H. Dix, Jr. Aeronautical world, Los Angeles, Cal., Dec. 1929, v. 2, no. 12, p. 31-33, 36, 60. illus., tables.

## METALS AND LIGHT ALLOYS

- Modern light alloys and their application to aircraft-engine design, by G. D. Welty. S.A.E. journal, New York, Nov. 1929, v. 25, no. 5, p. 469-73. illus., tables. (Also Aviation, New York, Sep. 7, 1929, v. 27, p. 512-13)
- Service characteristics of light alloys, by E. H. Dix, Jr. S.A.E. journal, New York, Nov. 1929, v. 25, no. 5, p. 463-68. illus., tables. (Also American machinist, New York, Sep. 12, 1929, v. 71, no. 11, p. 441-44)
- The Use of light alloys in the manufacture of aircraft. Aviation, New York, Oct. 12, 1929, v. 27, no. 15, p. 740-43. illus.
- Light alloys in aircraft, by Edward P. Warner. Aviation, New York, Sep. 7, 1929, v. 27, no. 10, p. 511-13. illus.
- Wrought alloys of aluminum in aircraft, by G. Mortimer. Aircraft engineering, London, Sep. 1929, v. 1, no. 7, p. 223-27. illus., tables.
- Aluminum alloys in metal airplanes, by F. H. Colvin. American machinist, New York, Jan. 3, 1929, v. 70, no. 1, p. 15-18. illus.
- Aluminum rivets in aircraft, by W. Nelson. Airway age, New York, Dec. 1928, v. 9, no. 12, p. 44-47. illus.
- Aircraft casting alloys must possess stability and permanence, by A. J. Lyon. Foundry, Cleveland, O., Nov. 1, 1928, v. 56, no. 21, p. 875-79. illus., tables.
- Hat das aluminium ein umwandlungspunkt? von A. Schutze. Zeitschrift für physik, Braunschweig, July 1928, v. 49, no. 1, p. 146-54. illus.
- Les Alliages légers, par C. Haus. Bulletin du service technique de l'aéronautique, Bruxelles, June 1928, 17 p. diagrs., tables. (Bulletin no. 8)
- American light alloys of high durability, by V. A. Lukoshin. Teknika vozdušnovo flota, Moscow, Apr. 1928, no. 4, p. 278. tables.
- Versuche über die dauer-und beulungsfestigkeit von leichtmetallröhren. Luftfahrtforschung, München, Mar. 30, 1928, v. 7, p. 102-08. diagrs., illus.
- Die Leichtmetalle im flugzeugbau, von Paul Brenner. Z.F.M., München, Mar. 28, 1928, v. 19, no. 6, p. 121-24. diagrs., illus., tables.
- Caratteristiche di leghe leggere, di Leonardo Lo Curto. Congresso internazionale di navigazione aerea, Roma, 1928, v. 3, p. 362-79. illus.

## ALUMINUM - PROPERTIES AND USE

- Alferium, aluminum type metal for aeroplane construction, by E. Kalster. *Lotnik*, Poznań, May 14, 1927, v. 1, no. 5, p. 9-10. illus.
- Possibilité des applications de l'aluminium et de ses alliages dans la marine. *L'Aéronautique*, Paris, Mar. 1927, v. 5, no. 51, p. 82-84. diags.
- Wechselfeitige druckversuche an aluminium, von G. Sachs und E. Schiebold. *Zeitschrift des V.D.I.*, Berlin, Dec. 12, 19, 1925, v. 69, no. 50, 51, p. 1557-61, 1601-04. illus., tables.
- Characteristics, tests and methods of inspection of aluminum alloy used in air service, by Samuel Daniels. Foundry, Cleveland, O., Dec. 15, 1925, v. 53, no. 24, p. 1003-06, 1015-16. diagr., illus., tables.
- Propriétés élastiques des alliages, par P. Chevenard et A. Portevin. *C. R. Acad. sci.*, Paris, Nov. 23, 1925, v. 181, no. 21, p. 780-82. illus.
- Aluminum-chromium, by F. T. Sisco and M. R. Whitmore. *Industrial and engineering chemistry*, Washington, Sep. 1925, v. 17, no. 9, p. 956-58. illus.
- Aluminum alloys for aeroplane engines, by F. C. Lea. *Journal of the R.A.S.*, London, Aug. 1925, v. 29, p. 338-98. diags., illus., tables.
- Alloys of aluminum with small amount of silicon, by S. Daniels. *Industrial and engineering chemistry*, Washington, May 1925, v. 17, no. 5, p. 485.
- Alloys of tungsten with aluminum containing 10% of copper, by M. R. Whitmore and F. T. Sisco. *Industrial and engineering chemistry*, Washington, Jan. 1925, v. 17, no. 1, p. 15-20. diags., illus.
- A Method of improving the properties of aluminum alloy castings, by S. L. Archbutt. London, H. M. Stat. off., 1925. 10 p. diags., illus., tables. (A.R.C. R. & M. no. 959)
- Thermal expansion of aluminum and various important aluminum alloys, by P. Hidnert. Bureau of standards, Washington, U. S. Govt. print. off., 1925. 29 p. (Scientific papers no. 497)
- Cast alloys of aluminum and small amounts of magnesium, by S. Daniels. *Industrial and engineering chemistry*, Washington, Dec. 1924, v. 16, p. 1243-49. diags.
- Light alloys of aluminum, by W. Rosenhain and S. L. Archbutt. *Engineering*, London, June 6, 13, 1924, v. 117, p. 742, 750-52, 780-82. illus.

## METALS AND LIGHT ALLOYS

- Die Verwendungsgebiete des aluminiums. Electrotechnische zeitschrift, Berlin, May 1, 1924, v. 45, p. 440-41. illus.
- Data on aluminum alloys for airplane structural work, by F. H. Colvin. American machinist, New York, Feb. 14, 1924, v. 60, p. 235-38. diagrs., illus.
- Contraction of light aluminum alloys, by R. J. Anderson. Foundry, Cleveland, O., Oct. 15, 1923, Jan. 15, 1924, v. 51, 52, p. 832, 872, 912; 24, 58. illus., tables.
- L'Emploi des alliages légers dans la construction moderne, par M. Chauvière. La Technique automobile et aérienne, Paris, Sep. 1923, v. 14, no. 122, p. 74-83. diagrs., illus., tables.
- Tests on work-hardened aluminum sheet, by H. C. H. Carpenter and C. C. Smith. Journal of the Institute of metals, London, July 1923, v. 29, no. 1, p. 29-70. diagrs., illus., tables.
- Extra-light alloys and their utilization in aeronautics, by A. M. Portevin and R. De Fleury. Engineering, London, June 29, 1923, v. 115, p. 796.
- Distortion of an aluminum crystal during a tensile test, by G. I. Taylor. Engineering, London, Mar. 30, 1923, v. 115, p. 403. illus.
- L'Emploi des alliages légers en aéronautique. Le Génie civil, Paris, May 6, 1922, v. 80, p. 404-07. illus., tables.
- Brittleness developed in aluminum and duralumin by stress and corrosion, by S. Rawdon, A. I. Krynitsky and J. F. T. Berliner. Chemical and metal engineer, New York, Jan. 25, 1922, v. 26, p. 154-58. diagrs., tables.
- Report of the effects of overheating and repeated melting of aluminum, by W. Rosenhain and J. D. Grogan. London, H. M. Stat. off., 1922. 11 p. illus. (A.R.C. R. & M. no. 783)
- Thermal expansion of nickel, monel metal, stellite, stainless steel and aluminum, by Wilmer H. Sonder and Peter Hidnert. Bureau of standards, Washington, U. S. Govt. print. off., 1922. 22 p. (Scientific papers no. 426)
- Applications industrielles de l'aluminium et du magnésium. Le Génie civil, Paris, July 9, 1921, v. 79, no. 2, p. 36-39. diagrs., illus..
- The Composition of aluminum alloys. Aerial age, New York, May 2, 1921, v. 12, no. 8, p. 185.
- Properties of aluminum and its alloys, by W. Rosenhain. Metal industry, London, Feb. 4, 1921, v. 18, no. 5, p. 85-83. illus.

## ALUMINUM - PROPERTIES AND USE

- Aluminum and its alloys applied to aircraft construction. Aeronautics, London, June 17, 1920, v. 18, no. 368, p. 470.
- Aluminum in airship construction, by E. V. Pannell. Metal industry, New York, June 1920, v. 18, p. 262. illus.
- Aluminum-copper-magnesium alloy, by P. D. Merica, R. G. Walterberg and J. R. Freeman. Bulletin of the American institute of mining and metallurgical engineers, New York, July 1919, no. 151, p. 1031-49. illus.
- Festigkeit des aluminums und aluminiumlegierungen, von H. Rieger. Giesserei, Düsseldorf, May 15, 1919, v. 16, no. 10, p. 151-53. illus.
- Untersuchungen über aluminium, von W. Jaeger, K. Scheel und L. Holborn. Electrotechnische zeitschrift, Berlin, Apr. 3, 1919, v. 40, no. 14, p. 150-52. illus.
- Some tests of light aluminum casting alloys; effect of heat treatment, by P. D. Merica and C. P. Karr. Bureau of standards, Washington, U. S. Govt. print. off., 1919. 29 p. (Technical papers no. 139)
- Aluminum and its alloys, by W. Rosenhain. Aeronautics, London, Oct. 2, 1918, v. 15, no. 259, p. 321-22. illus.
- Aluminum in airship construction. Metal industries, New York, June 1918, v. 16, p. 22. illus.
- Aluminum alloy from a german zeppelin. Engineering and mining journal, New York, Mar. 1918, v. 105, p. 425. illus. (Also Iron age, New York, Feb. 1918, v. 101, p. 373)
- Aluminum and its use in modern aeroplane motor and motor car construction, by J. E. Diamond. Automobile, New York, Oct. 19, 1916, v. 35, p. 643, 680.
- Alloys used in zeppelin construction. Metal industry, New York, Sep. 1916, v. 14, p. 385.
- Adoption of aluminum pistons, by W. M. Levett. Automobile, New York, Sep. 2, 1915, v. 33, p. 421.
- Aluminum - a feather weight, by J. G. Schipper. Automobile, New York, Mar. 26, 1914, v. 30, p. 673-77. illus., tables.
- Why pistons of aluminum are wanted. Automobile, New York, Mar. 2, 1914, v. 30, p. 602-04. illus.
- Light alloys for aeronautical purposes, by W. Rosenhain. Mechanical engineer, Manchester, England, Sep. 16, 1910, v. 26, no. 66, p. 360-62. tables.

## METALS AND LIGHT ALLOYS

Brass vs. aluminum, by F. Allender Roberts. *Flight*, London, Jan. 1, 1910, v. 2, no. 1, p. 15.

## ALUMINUM - GENERAL

Vorkommen, verbreitung und gewinnung der wichtigsten leichtmetalle, von H. Schneiderhöhn. *Aluminium*, Berlin, Jan. 1940, v. 22, no. 1, p. 5-9. diags., tables.

Aluminum and magnesium alloys. *Metal industry*, London, Apr. 14, 1939, v. 54, no. 14, p. 424-25. illus.

Advent of aluminum-magnesium light alloys, by R. Le Coeuvre. *Journal of the R.A.S.*, London, Apr. 1939, v. 43, no. 340, p. 292. illus.

Research work on aluminum and magnesium. *Aluminum and non-ferrous review*, London, Mar. 1939, v. 4, no. 4, p. 121-22. illus., table.

Light alloys for aircraft, by H. Sutton. *Aircraft production*, London, Feb. 1939, v. 1, no. 4, p. 125.

Technologie des aluminiums und seiner leichtlegierungen, von A. V. Zeerleder. Leipzig, Akademische verlagsgesellschaft, 1939. 449 p. diags., illus., tables.

Aluminum and its alloys, by J. D. Edwards. *Metal progress*, Cleveland, O., Oct. 1938, v. 34, p. 511-12. illus.

Aluminum and its alloys, by F. A. Fox. *Machinery*, London, Aug. 4, Sep. 1, 1938, v. 52, no. 1347, 1351, p. 549-53, 673-76. illus., tables.

Growth of aluminum alloy U, by W. Tschitschagov and E. Demitscheva. *Awiapromyschlennost*, Moscow, Sep. 1938, no. 9, p. 33-37. illus., tables.

Aluminum alloys in aircraft. *Metal industry*, London, Aug. 12, 1938, v. 53, no. 6, p. 156.

Metals in aircraft industry, by J. R. Goldstein. *Aero digest*, New York, July 1938, v. 33, no. 1, p. 46-47, 50. diags., illus., tables.

Research on aluminum alloys. *Metal industry*, London, Apr. 8, 1938, v. 52, no. 13, p. 388.

Alloys of the light metals, by C. H. Desch. *Journal of the Society of chemical industries*, London, Mar. 1938, v. 57, p. 69-75. illus., tables.

## ALUMINUM - GENERAL

- Leichtmetall-entwicklungsarbeiten der forschungsanstalt der  
Dürener metallwerke, von M. Hanse, W. Stenzel und K. L.  
Dreyer. Metallwirtschaft, Berlin, Feb. 18, 1938, v. 17, no.  
7, p. 184-90. illus.
- Stufen zum reinen aluminium, von H. Röhrig. Aluminium, Berlin,  
Feb. 1938, v. 20, no. 2, p. 69-71. illus.
- Neuere analysenmethoden zur bestimmung von legierungsbestandteilen  
in aluminium, von K. Steinhauser. Angewandte chemie, Berlin,  
Jan. 15, 1938, v. 51, no. 2, p. 35-38. illus., tables.
- Über die rekristallisation technischer aluminium-magnesium-legier-  
ungen, von F. Bollenrath und W. Bungardt. Zeitschrift für  
metallkunde, Berlin, Jan. 1938, v. 30, no. 1, p. 28-29.  
illus., tables.
- Alloys of aluminum and magnesium, by E. H. Dix, Sr. (In Symposium  
of high-strength constructional metals. Philadelphia, Ameri-  
can society for testing materials, 1938. 150 p. diags.,  
illus.)
- Chemische analysenmethoden für aluminium und seine legierungen,  
von K. Steinhauser und P. Urech. Berlin, Aluminium  
zentrale, 1938. 275 p. diags., illus., tables.
- Die Elektrolytische oxydation des aluminiums und seine legierungen,  
von A. Jenny. Dresden, Theodor Steinkopff, 1938. 224 p.  
diags., illus., tables.
- Weiterentwicklung der aluminium-magnesiumlegierungen, von G.  
Siebel. (In Jahrbuch der Deutschen luftfahrtforschung,  
München, 1938, p. 511-14. diags., illus., tables)
- Progress in light alloys; aluminum and magnesium, by A. J.  
Dornblatt. Metal progress, Cleveland, O., Oct. 1937, v. 32,  
no. 4, p. 575, 577-78, 580-81. illus.
- Aluminum base alloys. Engineer, London, May 14, 1937, v. 164,  
p. 584. diags.
- Letkie stopy, pisarz W. Loskiewicz. Przegląd mechaniczny, Warsaw,  
May 10, 1937, v. 3, no. 9, p. 525-34. illus., tables.
- Aircraft structures and materials. Metallurgia, Manchester,  
England, May 1937, v. 16, no. 91, p. 37.
- Die Entwicklung der aluminiumwirtschaft in der welt seit der  
jahrhundertwende, von Alfred Dederer. Aluminium, Berlin,  
Mar. 1937, v. 19, no. 3, p. 210-14. diags., tables.
- Developments in aircraft metallurgy. Metal progress, Cleveland,  
O., Jan. 1937, v. 31, no. 1, p. 33-36. illus.



## METALS AND LIGHT ALLOYS

- Aluminium-magnesium-legierungen, von A. Hermann. Berlin, Aluminium zentrale, 1937. 24 p. illus., tables.
- Das Aluminium in der deutschen metallwirtschaft, von H. Pricks. Aluminium, Berlin, Dec. 1936, no. 12, p. 649-52. illus.
- Recent advances in the aluminum industry, by F. C. Frary. Metal industry, London, Oct. 23, 1936, v. 49, no. 19, p. 412-13. diags.
- Activity in copper and light metals. Metal progress, Cleveland, O., Oct. 1936, v. 30, no. 4, p. 229-34. illus., tables.
- Il Metallo nazionale-l'alluminio. L'Ala d'Italia, Milano, Aug. 1936, v. 14, p. 51-54. illus.
- Aluminum facts and figures issued by British aluminum company. Engineering, London, Jan. 3, 1936, v. 141, p. 12.
- Les Alliages aluminium, par M. P. Vachet. Revue de l'aluminium et de ses applications, Paris, Dec. 1935, 12 p. diags., illus., tables.
- Aluminum-copper alloys. Metal industry, London, Oct. 11, 18, 1935, v. 47, no. 18, p. 368, 391.
- Einfache mittel zur unterscheidung der verschiedenen aluminium-legierungen, von E. Zurbrügg. Aluminium, Berlin, Oct. 1935, v. 17, no. 10, p. 531-33. diags., illus., tables.
- Non-ferrous metals used in aircraft, by J. B. Johnson. Metal progress, Cleveland, O., Oct. 1935, v. 28, p. 123-27, 130. diags., illus.
- Story of aluminum in aircraft, by F. C. Pyne. Aero digest, New York, July 1935, v. 27, p. 30-31. illus.
- Leichtmetalle. Aluminium, Berlin, May 1935, v. 17, no. 5, p. 261-66. diags., illus.
- Aluminum alloys up to date, by C. F. Nagel, Jr. and F. C. Pyne. Aviation, New York, July 1934, v. 33, no. 7, p. 212-14. illus.
- Les Alliages aluminium-silicium. La Technique automobile et aérienne, Paris, 1934, 6 p. diags.
- Metallographie des aluminiums und seiner legierungen, von V. Fuss. Berlin, J. Springer, 1934. 219 p. diags., illus., tables.
- Aluminum bronzes, by E. C. J. Marsh and E. Mills. Aircraft engineering, London, Nov.-Dec. 1933, v. 5, p. 251-55, 286-87. diags., illus.

## ALUMINUM - GENERAL

- Aluminum and its alloys, by N. F. Budgen. London; New York, Isaac Pitman and son, 1933. 278 p. diagsr., illus., tables.
- Étude de certains alliages légers d'aluminium, par C. Matignon. Chimie et industrie, Paris, June 1932, v. 27, no. 6, p. 1259-73. illus., tables.
- Materials in 1930; steel and aluminum alloys, by J. B. Pearson. Airway age, New York, Jan. 1931, v. 12, no. 1, p. 40-43. illus.
- Secondary aluminum, by Robert J. Anderson. Cleveland, O., Sherwood press, 1931. 563 p. diagsr., illus., tables.
- I Recenti progressi nelle leghe leggere dell'alluminio. L'Ala d'Italia, Milano, Aug. 1930, v. 8, no. 8, p. 665-66. diagsr., illus.
- Aluminum for aviation, by U. G. Muzalevski. Teknika vozdušnovo flota, Moscow, Jan.-Feb. 1930, no. 1, 2, p. 47-50; 104-11. diagsr., tables.
- Aluminum and aluminum alloys, by S. Tour. Mining and metallurgy, New York, Jan. 1930, v. 11, p. 7-8. illus.
- L'Alluminio-i metalli leggeri e le loro leghe, di E. Koelliker e U. Magnani. Milano, Ulrico Hoepli, 1930. 468 p. diagsr., illus., tables.
- Aluminum in aircraft. Pittsburgh, Pa., Aluminum company of America, 1930. 159 p. diagsr., illus., tables.
- The Aluminum industry, by J. D. Edwards, F. C. Frary and Zay Jefferies. New York, McGraw-Hill book company, 1930. v. 1, 2; 1228 p. diagsr., illus., tables.
- Rohstoffprobleme der deutschen aluminiumindustrie im rahmen ihrer wirtschaftlichen entwicklung, von A. Czimatis. Dresden, Paul Wentzel, 1930. 126 p. diagsr., illus., tables.
- Aluminum alloys. Engineer, London, Dec. 27, 1929, v. 148, p. 178-79. illus.
- Metals used in aircraft construction, by B. Stoughton. Journal of the Society of chemical industry, London, Dec. 13, 1929, v. 48, no. 40, p. 1189-98. illus., tables.
- Aeronautical progress in Great Britain, by H. E. Wimperis. Journal of the R.A.S., London, Oct. 1929, v. 133, no. 226, p. 935-46. illus.
- Novità in rapporto alle leghe di alluminio usate in aviazione, di E. Garuffa. L'Ala d'Italia, Milano, Oct. 1929, v. 8, no. 10, p. 961-62. illus.

## METALS AND LIGHT ALLOYS

- Aluminum and its alloys, by A. G. C. Gwyer. Engineer, London, Sep. 20, 1929, v. 148, p. 281-83, 294-95. illus. (Also Engineering, London, Sep. 13, 1929, v. 128, p. 353-54)
- Aluminium. Die leichtmetalle und ihre legierungen, von P. Melchior. Berlin, V.D.I. Verlag, 1929. 280 p. diagrs., illus., tables.
- Aluminum industry, by C. S. Taylor. Minnesota techn-log, Minneapolis, Mar. 1928, v. 8, no. 6, p. 172-73. illus. (University of Minnesota)
- Werkstoffe der flugtechnik auf der werkstofftagung, von J. Hausen. Zeitschrift für flugtechnik, München, Jan. 14, 1928, v. 19, no. 1, p. 9-12. illus.
- Industrial methods of preparing light aluminum alloys of high strength, by U. G. Muzalevski. Teknika vozdušnovo flota, Moscow, Aug.-Dec. 1927, no. 2-6, p. 122-29, 189-93, 235-42, 291-94, 344-54. illus., tables.
- Zusammenarbeit von konstruktion, betrieb und werkstoffprüfung im leichtbau, von H. Steudel. Zeitschrift des V.D.I., Berlin, Oct. 22, 1927, v. 71, no. 43, p. 1517-20. illus.
- Metallurgy of aluminum and aluminum alloys, by R. J. Anderson. New York, H. C. Baird and company, 1925. 913 p. diagrs., illus., tables.
- Metals used in world cruiser airplanes, by J. B. Johnson. Iron age, New York, Oct. 16, 1924, v. 114, no. 16, p. 994-95. illus.
- Aluminium und aluminium legierungen, von M. Berg. Frankfurt, A/M, H. Berchold, 1924. 150 p. diagrs., illus., tables.
- Developments in the german aluminum industry. Engineering and mining journal, New York, Sep. 8, 1923, v. 116, no. 10, p. 448.
- L'Aluminium dans l'industrie, par J. Escard. Paris, Dunod, 1921. 424 p. diagrs., illus., tables.
- Aluminum and its alloys, by A. M. Grand. London, Constable and company, 1921. 184 p. illus.
- Le Leghe leggere in aeronautica, di G. Gallo. L'Aerotecnica, Roma, 1921, v. 1, p. 170-79. diagrs., illus.
- Aluminum alloys. Aviation, New York, Aug. 15, 1920, v. 9, no. 2, p. 58.
- Aluminum and its alloys, by P. D. Merica. Washington, U. S. Govt. print. off., 1919. 8 p. illus. (N.A.C.A. Report no. 34) (Also Chemical and metal engineering, New York, Nov. 15, 1918, v. 19, no. 10, p. 729-32)

## ALUMINUM-- GENERAL

Aluminum sheet and sections in automobile and aircraft construction. London, British aluminum company, 1919. diags., illus., tables.

Aluminum copper alloys. Aeronautics, London, Aug. 23, 1916, n.s., v. 11, no. 140, p. 124.

## BERYLLIUM

Beryllium - a versatile element, by Louis L. Stott. Iron age, New York, Sep. 21, 1939, v. 144, no. 12, p. 42-45. diags., illus.

The Development of age hardening alloys. Light metals, London, Dec. 1938, v. 1, no. 11, p. 395-400. diags., tables.

Beryllium und seine legierungen, von M. Hessenbruch. Giesserei, Düsseldorf, Sep. 1938, v. 25, no. 19, p. 491.

Beryllium and its alloys. Engineer, London, Aug. 26, 1938, v. 11, p. 148-51. illus.

Beryllium-aluminium legierungen. Aluminium, Berlin, May 1938, v. 20, no. 6, p. 360. tables.

Newer developments in beryllium, by C. B. Sawyer and B. R. K. Jellgren. Industrial and engineering chemistry, Washington, May 1938, v. 30, no. 5, p. 501-05. illus.

A Note on beryllium-aluminum alloys for aircraft pistons, by J. B. Johnson. Metals and alloys, New York, Apr. 1938, v. 9, no. 4, p. 94.

Leghe di berillio, di A. Labó. Alluminio, Milano, Feb. 1938, v. 7, no. 1, p. 13-16. diags., tables.

Beryllium, by Eric N. Simons. Canadian mining journal, Toronto, Jan. 1938, v. 59, no. 1, p. 15-17. diags.

The Present position of beryllium, by F. Horn. Light metals, London, Jan. 1938, v. 1, no. 1, p. 23-24. illus.

The Design of flexure pivots, by Fred S. Eastman. Journal of the Aeronautical sciences, New York, Nov. 1937, v. 5, no. 1, p. 16-21.

Is beryllium ductile? by W. Kroll. Metals and alloys, New York, Aug. 1937, v. 8, no. 12, p. 349-53. tables.

Influence of beryllium on crystallization and structure of Mg-Al alloys, by K. Peredel'ski. Metallurgia, Manchester, England, May 1937, v. 12, no. 5, p. 114-18. illus.

## METALS AND LIGHT ALLOYS

- New alloys for aircraft construction - beryllium expectations not realized. *Chemical age*, London, Jan. 23, 1937, v. 36, no. 917, p. 74-75. illus.
- The Magic metal. *Aeroplane*, London, Jan. 20, 1937, v. 52, no. 1339, p. 69-71. diagsr.
- Recent studies on beryllium alloys, by I. Taka, Ichiro and Tomosada Yamabe. *Kinzoka*, Osaka, Japan, Jan. 1937, v. 7, no. 1, p. 21-23.
- Beryllium and its alloys, by Jack Delmonte. *Metals and alloys*, New York, July-Aug. 1936, v. 7, no. 7, 8, p. 175-80, 211-15. diagsr., illus., tables.
- Les Métaux légers. Le glucinium, par Victor Charrin. *Chimie et industrie*, Paris, July 1936, v. 36, no. 1, p. 221-25. diagsr., illus.
- El Berilio como material en la construcción aeronáutica, de V. Garriga. *Revista de aeronáutica*, Madrid, July 1934, v. 3, no. 28, p. 370-71. diagsr.
- L'Avenir du glucinium dans la construction automobile et aéronautique, par Maurice Déribéré. *Technique automobile et aérienne*, Paris, Apr. 1934, v. 25, no. 165, p. 58-61. illus.
- Quelques propriétés d'un cupro-nickel au glucinium, par Marcel Ballay. *C. R. Acad. sci.*, Paris, Feb. 5, 1934, v. 198, p. 578-80. tables. (Abstract *Le Génie civil*, Paris, Feb. 17, 1934, v. 104, no. 7, p. 159)
- What can be expected from beryllium, by Josef Verö. *Bányászati kohászati lapok*, Budapest, 1934, v. 67, p. 33-38, 58-63. illus.
- Influence of beryllium on steel, by W. Kroll. *Engineering*, London, Dec. 8, 1933, v. 136, p. 634.
- Characteristics and uses of beryllium. *Canadian machinery and manufacturing news*, Toronto, Nov. 1933, v. 44, no. 11, p. 16, 28.
- Special properties and applications of beryllium-copper alloys, by Edwin F. Cone. *Iron age*, New York, Sep. 7, 1933, v. 132, no. 10, p. 18-19, 66.
- Corrosion research on light metals, by F. Horn. *Chemical age*, London, Feb. 4, 1933, v. 28, no. 710, p. 9-11.
- Le Glucinium, par A. F. Pellat. *La Nature*, Paris, Jan. 1, 1932, v. 60, no. 2872, p. 36.

## BERYLLIUM

- Le Béryllium et la construction aéronautique, par L. Guillet et M. Ballay. *Revue de métallurgie*, Paris, Oct. 1931, v. 28, p. 525.
- Alluminio, magnesio, berillio e loro leghe, di A. W. Bonaretti. *Metalli leggeri e loro applicazioni*, Milano, Jan. 1931, no. 4, p. 191-98. illus.
- Some characteristics of light alloys for aircraft, by H. W. Gillett. *Transactions of the A.S.M.E.*, New York, July-Sep. 1930, v. 2, no. 1, p. 115-20. illus.
- Beitrag zum härtungsproblem von beryllium-aluminium-und magnesium-aluminium legierungen, von M. Haas. *Zeitschrift für metallkunde*, Berlin, Aug. 1930, v. 22, no. 8, p. 277-79. illus.
- Le Glucinium et ses alliages, by J. B. Jungen. *La Conquête de l'air*, Bruxelles, May 1, 1930, v. 26, no. 5, p. 397-98.
- Beryllium as a possible structural metal, by C. B. Sawyer. *S.A.E. Journal*, New York, Jan. 1930, v. 26, no. 1, p. 98.
- Beryllium - its extraction and its alloys. Heat treating and forging, Pittsburgh, Pa., Nov. 1929, v. 15, no. 3, p. 1460-61. diags.
- Some thermal and electrical properties of beryllium, by E. Lewis. *Physical revue*, New York, Oct. 15, 1929, v. 34, p. 1575.
- The Use of light alloys in the manufacture of aircraft. *Aviation*, New York, Oct. 12, 1929, v. 27, no. 15, p. 740-43. illus., tables.
- Beryllium - researches, by T. H. Turner. *Metal industry*, London, Sep. 6, 27, 1929, v. 35, no. 9, 13, p. 230-32, 299-301. illus.
- Electrochemistry in aeronautics. *Iron age*, New York, Sep. 26, 1929, v. 124, no. 13, p. 832-33.
- Light alloys in aircraft, by Edward P. Warner. *Aviation*, New York, Sep. 7, 1929, v. 27, no. 10, p. 511-13. illus.
- Die Legierungen des berylliums mit eisen, von W. Kroll. *Metallwirtschaft*, Berlin, Sep. 6, 1929, v. 8, p. 881-83.
- Work on beryllium and its alloys, by H. W. Gillett. *Metals and alloys*, New York, Aug. 1929, v. 1, no. 2, p. 71-72. illus.
- Über eisen-beryllium und eisen-bor-legierungen und über die struktur des eisenborids, von F. Wever. *Zeitschrift für technische physik*, Leipzig, Apr. 8, 1929, v. 10, no. 4, p. 137-38. diags., illus.

## METALS AND LIGHT ALLOYS

- Beryllium-kupfer-aluminium-legierungen, von I. Meissner. Zeitschrift für metallkunde, Berlin, Jan. 1929, v. 21, no. 1, p. 33-34. tables.
- Possible use of beryllium in aircraft construction, by H. W. Gillett. Transactions of the American electrochemical society, New York, 1929, v. 56, p. 71-76. diags.
- Über die zweistoffsysteme eisen-bor und eisen-beryllium, mit einem beitrage zur kenntnis des zweistoffsystems eisen-aluminium, von F. Wever und A. Müller. Mitteilungen aus dem Kaiser-Wilhelm institute für eisenforschung, Düsseldorf, 1929, v. 11, p. 218. diags.
- Beryllium alloys, by W. Werner. Metal industry, London, Nov. 16, 1928, v. 33, no. 20, p. 462. tables.
- Le Glucinium et ses alliages, par A. Valiane. Aciers spéciaux métaux et alliages, Paris, Nov. 1928, v. 3, no. 34, p. 240-48. diags.
- Alloys of beryllium, by G. Masing and O. Dahl. Engineer, London, Apr. 27, 1928, v. 4, p. 53-55. illus.
- Technically useful properties of the light metal beryllium, by P. Schwerber. Metallbörse, Berlin, Mar. 24, 1928, v. 18, no. 24, p. 649-50, illus.
- Legierungen des berylliums mit kupfer, nickel, kobalt, silber und eisen, von G. Masing. Zeitschrift für metallkunde, Berlin, Jan. 1928, v. 20, no. 1, p. 19.
- Propriétés rëductrices du glucinium, isolement du baryum, du magnésium, du potassium et de l'aluminium. C. R. Acad. sci., Paris, Mar. 21, 1927, v. 184, p. 715-17f.
- Light metals and alloys; silicon, beryllium and their alloys. Bureau of standards, Washington, U. S. Govt. print. off., 1927. 7 p. (Circular no. 346)
- Vergütbare aluminium-legierungen, von W. Kroll. Metal und erz, Berlin, Nov. 1926, v. 23, no. 22, p. 613-16. illus.
- Beryllium; its sources, production and properties, by L. P. Sidney. Chemical age, London, Apr. 3, 1926, v. 14, p. 25-27. diags., illus.

## DURALUMIN

- Research into corrosion and the protection of light alloys, by A. V. Zeerleder. Interavia, Geneva, Dec. 29, 1939, no. 690, p. 1-4. illus.

## DURALUMIN

- Spray quenching of light metal parts--its use in the aircraft industry, by K. Scherzer. Metal industry, London, Dec. 22, 1939, v. 55, no. 25, p. 523-25. illus.
- Light alloys and production. Aeroplane, London, Dec. 8, 1939, v. 57, no. 1489, p. 704-07. illus.
- Das Löten von leichtmetallen, von R. Schulze. Aluminium, Berlin, Oct. 1939, v. 21, no. 10, p. 710-12. illus.
- Fatigue of light metal alloys, by R. L. Templin. Metals and alloys, New York, Aug. 1939, v. 10, p. 243-45. illus.
- Les Métaux et alliages modernes en construction aéronautique. La Technique moderne, Paris, May 1, 1939, v. 31, no. 9, p. 333-36. diagrs., illus.
- Light metals in american aircraft design, by H. W. Perry. Light metals, London, May 1939, v. 2, no. 3, p. 171-74. illus.
- Über die rückbildung der kaltaushärtung von duralumin, von K. L. Dreyer. Zeitschrift für metallkunde, Berlin, May 1939, v. 31, no. 5, p. 147-52. illus.
- Aluminum and magnesium alloys. Metal industry, London, Apr. 14, 1939, v. 54, no. 14, p. 424-25.
- The Use of light alloys in aircraft construction, by R. Le Coeuvre. Journal of the R.A.S., London, Apr. 1939, v. 43, no. 340, p. 289-309. illus., tables.
- Light alloys for aircraft, by H. Sutton, Iron age, New York, Mar. 30, 1939, v. 143, p. 28-31, 32. (Also Aircraft production, London, Feb. 1939, v. 1, no. 4, p. 125)
- Combating corrosion in design and construction, by R. S. Barnaby. Journal of the Aeronautical sciences, New York, Mar. 1939, v. 6, no. 5, p. 211-15. illus.
- Metals for aeroplane construction, by J. B. Johnson. Journal of the Aeronautical sciences, New York, Mar. 1939, v. 6, no. 5, p. 185-202. diagrs., illus.
- Spot welding of aircraft materials, by C. L. Hibert. Aluminum and non-ferrous review, London, Feb. 1939, v. 4, no. 3, p. 105-07. illus.
- Sur la corrosion des assemblages soudés d'alliages légers, par J. Cournot et M. Baudrand. C. R. Acad. sci., Paris, Jan. 23, 1939, v. 208, no. 4, p. 280-82. tables.
- Strength of spot welding of duralumin, by J. Brailovski. Teknika vozdušnovo flota, Moscow, Jan. 1939, v. 13, no. 2, p. 61-67. illus., tables.



## METALS AND LIGHT ALLOYS

- Properties of aluminum-copper-magnesium-manganese alloy, by P. V. Faragher. (*In Metals handbook*. Cleveland, O., American society for metals, 1939, p. 1270-71. tables)
- Age hardening of duralumin, by M. Cohen. *Metal industry*, London, Dec. 30, 1938, v. 53, no. 26, p. 629-33. illus.
- Light alloys for aircraft, by H. Sutton. *Metal industry*, London, Dec. 16, 23, 30, 1938, v. 53, no. 24, 25, 26, p. 581-84, 609-12, 637-40. illus., tables.
- Les Alliages légers (ultra-légers) et leur classification, par L. Guillet. *Le Génie civil*, Paris, Dec. 1938, v. 113, no. 26, 27, p. 537-42, 566-67. illus., tables.
- The Development of age hardening alloys. *Light metals*, London, Dec. 1938, v. 1, no. 11, p. 395-400. diagrs., tables.
- Das Nieten der leichtmetalle, von E. von Burg. *Werkstatt und betrieb*, München, Dec. 1938, v. 71, no. 23, p. 309-14. illus.
- Light alloys in aircraft construction. *Aeroplane*, London, Nov. 9, 1938, v. 55, no. 1433, p. 571-74. illus., tables.
- Light alloys in aircraft construction, by R. Le Coeuvre. *Metal industry*, London, Nov. 4, 11, 1938, v. 53, no. 18, 19, p. 437-42, 456-66. diagrs., illus. (*Also Engineering*, London, Nov. 4, 1938, v. 146, no. 3799, p. 538)
- Light alloys in production. *Aircraft engineering*, London, Nov. 1938, v. 10, no. 117, p. 359-61. illus.
- Einfluss von gussfehlern auf die festigkeit bei leichtmetallgussstücken, von F. Bollenrath und E. Schiedt. *Luftfahrtforschung*, Berlin, Oct. 10, 1938, v. 15, no. 10, 11, p. 511-16. illus.
- Mechanical properties of the deformable Al-Mg-Mn-alloys, by A. Bundin. *Teknika vozdušnovo flota*, Moscow, Oct. 1938, no. 10, p. 37-50. illus., tables.
- Untersuchungen über die korrosionsermüdung von aluminium und magnesiumknetlegierungen, von F. Bollenrath und E. Schiedt. *Zeitschrift für metallkunde*, Berlin, Oct. 1938, v. 30, no. 10, p. 357. tables.
- Riveting methods and rivet equipments used in the german light metal aeroplane construction, by Wilhelm Pleines. *Journal of the R.A.S.*, London, Sep. 1938, v. 42, no. 333, p. 761-96, 798-815. illus., tables.
- Die Elektrische punktschweissung von duraluminbauteilen im flugzeugbau, von F. H. Hentzen. *Deutsche luftwacht*, ausgabe *Luftwissen*, Berlin, Aug. 1938, v. 5, p. 279-83. diagrs., illus.

## DURALUMIN

- Notes sur les limites de résistance du duralumin, par Maxine Robin. Revue technique de l'association des ingénieurs de l'aéronautique, Paris, July-Aug. 1938, no. 10, p. 239-41. illus., table.
- Tiefziehen von leichtmetallen für den luftfahrzeugbau, von E. J. Ritter. Deutsche luftwacht, ausgabe Luftwissen, Berlin, July 1938, v. 5, p. 249-55. illus., tables.
- Langsam aushärtende leichtmetalle und ihre anwendung als nietwerkstoff, von K. Matthaes. Zeitschrift für metallkunde, Berlin, July 1938, v. 30, no. 7, p. 238-44. illus., tables.
- Extrusion of light alloys. Flight, London, June 30, 1938, v. 33, no. 1540, p. 39-42. illus.
- Extruding and rolling the light alloys. Metal industry, London, June 10, 1938, v. 52, no. 23, p. 593-99. illus.
- Il Duralluminio e le leghe leggere L2 e L1, di L. Stiavelli. L'Aerotecnica, Roma, June 1938, v. 18, no. 6, p. 710.
- Duralumin. Metal industry, New York, May 6, 1938, v. 52, p. 479. illus.
- On age-hardening of Al-Cu-Mg alloys, by H. Nishimura. Memoires of the College of engineers, Tokyo, Japan, Apr. 1938, v. 10, no. 4, p. 117-30. diagrs., tables.
- Alloys of the light metals, by C. H. Desch. Journal of the Society of chemical industry, London, Mar. 1938, v. 57, p. 69-75. illus.
- Drawing of light alloy tubes, by Chrichton Harris. Light metals, London, Mar. 1938, v. 1, no. 3, p. 221-24. illus.
- Manufacture of high-strength light alloy extrusions and their use in aircraft, by R. Worsdale. Metallurgia, Manchester, England, Feb.-Mar. 1938, v. 17, no. 100, 101, p. 134-36, 193-96. diagrs., illus.
- Photomicrography of light alloys, by W. Mutchler and H. O. Willier. American society for metals, Philadelphia, Mar. 1938, v. 24, no. 1, p. 279-85. illus.
- Leichtmetall-entwicklungsarbeiten der forschungsanstalt der Dürener metallwerke, von M. Hansen, W. Stenzel und K. L. Dreyer. Metallwirtschaft, Berlin, Feb. 18, 1938, v. 17, no. 7, p. 184-90. illus.
- Beitrag zur kenntnis der spannungskorrosion bei knetlegierungen, von Friedrich C. Althof. Luftfahrtforschung, München, Jan. 20, 1938, v. 15, p. 60-82. diagrs., illus., tables.

## METALS AND LIGHT ALLOYS

- Latest progress in the development of light alloys, their hardening by aging. Light metals, London, Jan. 1938, v. 1, p. 395-400. diags., illus., tables.
- Column strength of tubes elastically restrained against rotation at the ends, by W. R. Osgood. Washington, U. S. Govt. print. off., 1938. 38 p. illus. (N.A.C.A. Report no. 615)
- Corrosion-fatigue properties of duralumin with and without protective coatings, by I. J. Gerard and H. Sutton. London, H. M. Stat. off., 1938. 2 p. illus., tables. (A.R.C. R. & M. no. 1828)
- Essais de soudures électriques par points d'alliages légers avant et après corrosion, par L. Doussin. (In 18<sup>me</sup> Congrès de chimie industrielle, Nancy, Sep. 22, Oct. 2, 1938, communications. Paris, Chimie et industrie, 1938, p. 145c-153c. diags., tables)
- Langsam aushärtende leichtmetalle und ihre anwendung als nietwerkstoff, von Kurt Matthaes. (In Jahrbuch der deutsche luftfahrtforschung, Berlin, 1938, p. 504-10. diags., illus., tables)
- Les Métaux légers dans la construction des avions et des moteurs d'avions, par R. Hinzmann. L'Aérophile, Paris, 1938, 5 p. diags., illus.
- The Problem of age hardening of duralumin, by D. A. Petrov. Journal of the Institute of metals, London, 1938, v. 62, no. 1, p. 81-100. illus., tables.
- Die Beurteilung von leichtmetallschweissungen auf grund des zugversuches, von W. Feldmann. Metallwirtschaft, Berlin, Dec. 1937, v. 16, no. 50, p. 1299-1306. illus., tables.
- Recovery of duraluminium from tensile overstrain, by R. H. Greaves. Engineer, London, Dec. 1937, v. 164, no. 4277, p. 83-84. illus., tables.
- Über die normung der korrosionsprüfverfahren für leichtmetalle, von P. Brenner. Chemische fabrik, Berlin, Nov. 24, 1937, no. 47, p. 486-91. illus.
- Variation of the modulus of elasticity of duralumin, by W. L. Howland. Journal of the Aeronautical sciences, New York, Oct. 1937, v. 4, no. 11, p. 507-09. illus., table. (Abstract Journal of the R.A.S., London, Nov. 1937, v. 41, no. 49, p. 115)
- Les Avions légers du concours du duralumin, par Daniel, de la Simone. Revue de l'Aluminium et de ses applications, Paris, July-Aug. 1937, v. 93, p. 815-20. diags., illus.

## DURALUMIN

- Duralumin and its heat treatment, by P. L. Teed. Metals and alloys, New York, June 1937, v. 8, p. MA 384-85. illus.  
(Also Metal industry, London, Apr. 30, 1937, v. 50, p. 517)
- The Problem of the age hardening of duralumin, by D. A. Petrov. Journal of the Institute of metals, London, June 1937, v. 52, no. 1, p. 81-97. diags., illus.
- Letkie stopy, by W. Loskiewicz. Przegląd mechaniczny, Warsaw, May 10, 1937, v. 3, no. 9, p. 525-34. illus., tables.
- Zur Oberflächenverbesserung von leichtmetallen durch diffusion, von W. Bungardt. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, 5, p. 204-08. illus.
- Über die elektrische punktschweissung an leichtmetallen, von Eugen Osswald. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, p. 215-23. diags., illus., tables.
- Der Einfluss des hydrostatischen druckes auf aushärtung von duralumin, von G. Tamman und H. Hartman. Zeitschrift für metallkunde, Berlin, Mar. 1937, v. 29, no. 3, p. 88-89. illus.
- The Theory of age-hardening, by M. L. V. Gaylor. Journal of the Institute of metals, London, Mar. 1937, v. 60, no. 1, p. 249-65. diags., tables.
- Duralogy. Aeroplane, London, Feb. 17, 1937, v. 52, no. 1343, p. 210.
- Duralumin and its heat treatment, by P. T. Litherland. London, Charles Griffin, 1937. 115 p. diags., illus., tables.
- Schmieden von leichtmetall, von B. Preuss. Technisches zentralblatt für praktische metallbearbeitung, 1937, v. 47, no. 17, 18, p. 676, 678, 680. diags., illus.
- Zur corrossiongeschwindigkeit des duraluminiums, von G. Tammann und W. Boehme. Zeitschrift für anorganische und allgemeine chemie, Leipzig, Dec. 31, 1936, v. 226, no. 1, p. 82-91. diags., illus.
- Les Métaux et alliages modernes en construction aéronautique, par Paul Bastien. La Technique moderne, Paris, Nov. 15, 1936, v. 28, no. 22, p. 794-96. diags.
- Materiale aeronautico per eccellenza è il duralluminio, di G. Gabrielli. L'Ala d'Italia, Milano, Oct.-Nov. 1936, v. 14, p. 168-69. illus.
- The Forgeability of light alloys, by Albert Portevin and Paul G. Bastien. Metal industry, London, Sep. 18, 1936, v. 49, no. 12, p. 296-300. diags., illus.

## METALS AND LIGHT ALLOYS

- Note on influence of salt-bath, heat-treatment on corrosion resistance of duralumin, by A. J. Sidery and B. Evans. *Journal of the Institute of metals*, London, Sep. 14, 1936, no. 737, p. 259-65. illus. (Also *Sheet metal industry*, London, Oct. 1936, v. 10, no. 114, p. 763-64, 796)
- Wechselbiegefestigkeitsversuche mit duralumin, von G. Euringer. *Metallwirtschaft*, Berlin, June 12, 1936, v. 15, no. 24, p. 540-41.
- Duralumin im flugzeugbau, von J. Bally. *Giesserei*, Düsseldorf, June 1936, v. 23, no. 13, p. 328. (Also *Revue de l'aluminium*, Paris, Mar. 1936, p. 105-08)
- On the phenomenon of incubation of alloys, by K. Honda and K. Tamaru. *Bulletin of the Institute of physical and chemical research*, Tokyo, June 1936, v. 15, p. 315-19. illus.
- Improved coatings for duralumin, by H. Chase. *Aero digest*, New York, May 1936, v. 28, no. 5, p. 40.
- Einfluss der warmbedhandlung auf die korrosionsbeständigkeit von plattiertem duralumin, von P. Brenner, *Werkstatt und betrieb*, Leipzig, Apr. 1936, v. 69, no. 7, 8, p. 95-99. (Also *Zeitschrift für metallkunde*, Aug. 1935, v. 27, no. 8, p. 169-73)
- Note on pickling or etching baths for duralumin, by H. Sutton and T. J. Peake. *Journal of the Institute of metals*, London, Feb. 1936, v. 59, no. 2, p. 59-65. diags., illus.
- Heat treating and anodic oxidation equipment, by B. V. Korvin-Kroukovsky. *Aero digest*, New York, Jan. 1936, v. 28, no. 1, p. 24-25. diags.
- Etching duralumin-type alloys. *Mining and metallurgy*, New York, Dec. 1935, v. 16, p. 513.
- Versuche zur ermittlung der günstigsten aushärtungstemperatur bei durallegierungen, von U. V. Scheidt. *Zeitschrift für metallkunde*, Berlin, Dec. 1935, v. 27, no. 12, p. 275-77. diags.
- Investigation of duralumin channel section struts under compression, by W. S. Parr and W. M. Beakley. *Journal of the Aeronautical sciences*, New York, Sep. 1935, v. 3, no. 1, p. 21-25. illus.
- Duralumin and related alloys - properties and heat treatment procedure, by Harold Silman. *Metal industry*, London, Aug. 30, 1935, v. 47, p. 199.
- Corrosion-fatigue properties of duralumin with and without protective coatings, by I. J. Gerard and H. Sutton. *Journal of the Institute of metals*, London, July 1935, v. 56, no. 1, p. 29. (Also *Engineering*, London, Mar. 15, 1935, v. 139, p. 289)

## DURALUMIN

- Heat treatment of metals used in aircraft; steel and duralumin, by Horace C. Knerr. Aero digest, New York, July 1935, v. 27, no. 7, p. 22-24. illus., tables.
- Caratteristiche delle odierne leghe leggere per getti meccanici, di V. Prever. L'Aerotecnica, Roma, June 1935, v. 15, no. 6, p. 676-77. illus.
- Duralumin in aircraft construction, by F. P. Laudan. Metal progress, Cleveland, O., Apr. 1935, v. 27, no. 4, p. 39-42. illus.
- The Influence of pickling on the fatigue strength of duralumin, by H. Sutton and W. J. Taylor. London, H. M. Stat. off., 1935. 4 p. diagrs., illus. (A.R.C. R. & M. no. 1647)
- Strength tests of thin walled duralumin cylinders of elliptic section, by E. E. Lundquist and W. F. Burke. Washington, 1935. 7 p. (N.A.C.A. Technical notes no. 527)
- The Torsional stiffness of thin duralumin shells subjected to large torques, by Paul Kuhn. Washington, 1935. 11 p. (N.A.C.A. Technical notes no. 500)
- Metallurgical survey of engineering materials, by J. W. Jones. Metal industry, London, Dec. 7, 1934, v. 45, no. 23, p. 537-41.
- Étude de la lumière diffusée sur des plaquettes d'aluminium. Revue de métallurgie, Paris, Dec. 1934, v. 31, no. 12, p. 566-67. illus.
- Metal construction, by M. Langley. Flight, London, Nov. 29, 1934, v. 26, no. 1553, p. 81-96. diagrs., illus.
- Influence de la corrosion sur la résistance à la fatigue du duralumin, par R. Cazaud. Revue de métallurgie, Paris, Oct. 1934, v. 31, no. 10, p. 440.
- Influence of pickling on the fatigue-strength of duralumin, by H. Sutton and W. J. Taylor. Metal industry, London, Oct. 1934, v. 32, p. 349. illus. (Also Engineering, London, Sep. 21, 1934, v. 138, p. 295; Engineer, London, Sep. 21, 1934, v. 158, p. 288 and Iron age, New York, Sep. 6, 1934, v. 134, p. 76)
- Effect of high hydrostatic pressure on aging, by L. R. Van Wert. Transactions of the American society for metals, Cleveland, O., Sep. 1934, v. 23, no. 3, p. 633-44. illus.
- Le Leghe leggere nelle costruzioni aeronautiche, di Attilio Izzo. L'Ala d'Italia, Milano, Sep. 1934, v. 12, p. 36-40. diagrs., illus., tables.

## METALS AND LIGHT ALLOYS

- Duralumin aging, by J. L. Burns. American society for metals, Cleveland, O., Aug. 1934, v. 22, no. 8, p. 728-36. diagsr., illus.
- Über das verhalten von leichtmetallblechstreifen mit kreisrunden randgebördelten löchern bei schubbeanspruchung, von Karl Schüssler. Luftfahrtforschung, München, Aug. 1934, v. 11, no. 3, p. 74-85. diagsr., illus., tables.
- Salt baths for dural; heat treating duralumin at the naval aircraft factory, by F. H. Trembly. American machinist, New York, July 18, 1934, v. 78, p. 497. illus.
- Étude sur la vitesse de chauffage du duralumin, par L.E.O. Charlton. Arts et métiers, Paris, May 1934, v. 164, p. 112-15. diagsr.
- Rate of age hardening of duralumin, by J. O. Lyst. Metals and alloys, New York, Mar. 1934, v. 5, no. 3, p. 57-58. illus., table.
- Leichtmetalle im luftfahrzeugbau, von H. Mann. Werkstattstechnik, Berlin, Jan. 15, Feb. 1, 1934, v. 28, no. 2, 3, p. 21-24, 49-52. diagsr., illus.
- Materials; their effect on design, by J. B. Johnson. Aviation, New York, Jan. 1934, v. 33, no. 1, p. 16-18. illus.
- Strength tests of thin walled duralumin cylinders in compression, by Eugene E. Lundquist. Washington, U. S. Govt. print. off., 1934. 8 p. (N.A.C.A. Report no. 473)
- Hardness behavior of duralumin, by H. O'Neill, Jackson and Farnham. Philosophical magazine, London, Nov. 1933, v. 16, no. 108, p. 913-29. illus., tables.
- Improved salt baths for duralumin. Aircraft engineering, London, Oct. 1933, v. 5, p. 232. illus.
- Versuche über die Dauerhärtung von duralumin nieten und den einfluss der Härtetemperatur, von Martin Abraham. Zeitschrift für metallkunde, Berlin, Sep. 1933, v. 25, no. 9, p. 203-05. diagsr.
- Duralumin applied to aircraft construction, by W. H. Lewis. Journal of the R.A.S., London, Aug. 1933, v. 37, no. 272, p. 680-93. illus., tables.
- Über die sogenannte inkubationszeit bei der duraluminaushärtung, von W. Fraenkel und R. Hahn. Zeitschrift für metallkunde, Berlin, Aug. 1933, v. 25, no. 8, p. 185-89. diagsr., tables.
- La Corrosione dei metalli, cause ed effetti, di G. Guzzoni. L'Aeroteca, Roma, June 1933, v. 13, no. 6, p. 714-44. diagsr., illus., tables.

## DURALUMIN

- Some factors influencing the conditions of thermal treatment of duralumin, by P. A. Vargunin. *Teknika vozdušnovo flota*, Moscow, June 1933, v. 5, p. 58-78. illus., tables.
- Le Forgeage et matriçage des alliages légers et ultra-légers, par E. Decherf. *Aciers spéciaux métaux et alliages*, Paris, Sep. 1932, Apr. 1933, v. 7, 8, no. 85, 92, p. 329-44; 102-08. illus.
- Manufacture and use of light alloys, by W. C. Devereux. *Journal of the R.A.S.*, London, Feb. 1933, v. 37, no. 266, p. 145-67. diags., illus. (Also *Aircraft engineering*, London, Jan. 1933, v. 5, no. 47, p. 6-12)
- Assemblage par rivets en duralumin, par A. Grzędzielski. *Bulletin de l'Institut des recherches de l'aéronautique*, Varsovie, 1933, no. 12, 21 p. diags., illus.
- Intercrystalline corrosion of duralumin, by A. J. Sidery, K. G. Lewis and H. Sutton. London, H. M. Stat. off., 1933. 3 p. (A.R.C. R. & M. no. 1523)
- Testing, by I. G. Shulgin. Moscow, Scientific technical department of the Supreme council of national economy, 1933. 38 p. illus. (C.A.H.I. Transactions no. 143)
- Esperimenti flesso-torsionali su tubi di duralluminio, di G. Gabrielli. *L'Aerotecnica*, Roma, Dec. 1932, v. 12, no. 12, p. 1594-1605. diags., illus. (Abstract Journal of the R.A.S., London, Sep. 1933, v. 37, no. 273)
- Research on the influence of air tempering upon the mechanical properties of duralumin, by I. G. Shulgin. *Teknika vozdušnovo flota*, Moscow, Oct. 1932, no. 10, p. 933-49. diags.
- Duralumin and steel construction, by G. H. Handasyde. *Aircraft engineering*, London, Sep. 1932, v. 4, no. 38, p. 88-90. illus.
- Le Forgeage et le matriçage des alliages légers et ultra-légers, par E. Decherf. *Aciers spéciaux métaux et alliages*, Paris, Feb., Sep. 1931, v. 6, no. 66, 73, p. 60-68, 441-52. diags., illus.
- How to take care of dural, by C. F. Nagel, Jr. and G. O. Hoglund. *Western flying*, Los Angeles, Cal., June-July 1932, v. 11, 12, no. 6; 1, p. 18-19, 18-20. illus.
- Untersuchung von duralplattechen, von K. Schraivogel und E. K. O. Schmidt. *Z.F.M.*, München, June 14, 1932, v. 24, no. 3, p. 57-62. illus.
- Étude de certains alliages légers d'aluminium, par C. Matignon. *Chimie et industrie*, Paris, June 1932, v. 27, no. 6, p. 1259-73. illus., tables.



## METALS AND LIGHT ALLOYS

- Einfluss der kalten verdichtung auf die aushärtung von duralumin, von K. L. Meissner. Zeitschrift für metallkunde, Berlin, Apr. 1932, v. 24, no. 4, p. 88-89.
- Protezione dell'alluminio e duralluminio con rivestimenti elettrolitici di zinco e di cadmio, di Mario Cambioli. L'Aerotecnica, Roma, Mar. 1932, v. 12, no. 3, p. 314-20. tables.
- Cold prevention of dural age-hardening. Aviation engineering, New York, Jan. 1932, v. 6, no. 1, p. 38. diagrs.
- Metals. Aviation engineering, New York, Jan. 1932, v. 6, p. 38. (Also American machinist, New York, Sep. 7, 1931, v. 75, p. 439-41)
- Compressive strength of duralumin columns of equal angle section, by Eugene E. Lundquist. Washington, 1932. 12 p. diagrs., tables. (N.A.C.A. Technical notes no. 413) (Abstract Journal of the R.A.S., London, Oct. 1932, v. 36, no. 262, p. 913)
- Investigations on the elastic and plastic deformation of the bending of duraluminium sheets, by I. G. Shulgin. Moscow, Scientific technical department of the Supreme council of national economy, 1932. 36 p. illus. (C.A.H.I. Transactions no. 114)
- Tempering of duraluminium, by S. M. Voronov and P. A. Vargunin. Teknika vozdušnovo flota, Moscow, Dec. 1931, no. 12, p. 833-45. diagrs., illus., tables.
- La Protection des alliages légers contre la corrosion, par M. Pubellier. Aciers spéciaux métaux et alliages, Paris, Nov. 1931, v. 6, no. 75, p. 575-85. illus.
- Dural or stainless steel? by Alexander Klemin. Scientific american, New York, Oct. 1931, v. 145, p. 263-64. illus.
- Cold treating of dural with solid carbon-dioxide. American machinist, New York, Sep. 17, 1931, v. 75, p. 439-41. diagrs., tables.
- Cold treating duralumin rivets, by Robert Johnson. Metal industry, New York, Sep. 1931, v. 29, no. 3, p. 383.
- Duralumin. Refrigeration engineer, New York, Sep. 1931, v. 22, p. 182.
- Korrosionsversuche mit duralplat-nietverbindungen, von Paul Brenner. Z.F.M., München, June 15, 1931, v. 22, no. 11, p. 344-46. illus., tables.
- Corrosion of duralumin rivets, by James E. Sullivan. Aviation, New York, June 1931, v. 30, no. 6, p. 347-49. illus.

## DURALUMIN

- Les Alliages légers au XII<sup>e</sup> salon de l'aéronautique. Revue de métallurgie, Paris, Apr. 1931, v. 28, no. 4, p. 185-93. illus., tables.
- La Corrosione dei materiali impiegati nelle costruzioni aeronautiche, di G. Guidi. Ingegnere, Roma, Mar. 1931, v. 5, no. 3, p. 153-63. illus.
- The Phase-theory basis of aging of duralumin. Metallurgia, Manchester, England, Mar. 1931, v. 3, p. 177-82. diagrs.
- The Resistance of treated super-duralumin, by K. L. Meissner. Metallurgia, Manchester, England, Mar. 1931, v. 3, p. 176. illus.
- Duralumin requires special treatment, by B. K. Price. Steel, Cleveland, O., Feb. 12, 1931, v. 88, p. 31-33. illus.
- Duralumin. Engineer, London, Jan. 30, 1931, v. 151, p. 12-13. illus.
- Corrosion of light and extra light metals and alloys. Mechanical engineering, New York, Jan. 1931, v. 53, no. 1, p. 55-56. tables.
- La Corrosione dei metalli e leghe usati in aeronautica, di G. Guzzoni ed E. Nardi. L'Aerotecnica, Roma, Jan. 1931, v. 11, no. 1, p. 50-77. diagrs., illus., tables.
- Quelques nouveautés dans l'étude de la corrosion et dans les protections de surface des produits métallurgiques contre la corrosion, par Jean Cournot. La Technique aéronautique, Paris, Nov.-Dec. 1930, v. 21, no. 109, 110, p. 269-73, 282-92. illus., tables.
- Artificial aging of duralumin and superduralumin, by K. L. Meissner. Engineering, London, Oct. 10, 1930, v. 130, p. 473-75. illus. (Also Engineer, London, Sep. 19, 1930, v. 150, p. 319)
- Duralumin shapes for aircraft. Automotive industries, Philadelphia, Sep. 13, 1930, v. 63, p. 369.
- Use of non-ferrous metals in the aeronautical industry, by D. Hanson. Engineer, London, Sep. 12, 1930, v. 150, p. 291-93. tables. (Also Engineering, London, Sep. 12, 1930, v. 130, p. 333-34)
- Comments on the achievements in light rolling alloys, by U. G. Muzalevski. Teknika vozdušnovo flota, Moscow, Sep. 1930, no. 9, p. 609-23. diagrs., illus., tables.
- Corrosion of duralumin, by W. Kroenig. Engineer, London, July 25, 1930, v. 150, p. 107-09. illus.

## METALS AND LIGHT ALLOYS

- Stato attuale delle cognizioni sul fenomeno dell'invecchiamento e della corrosione delle leghe tipo duralluminio, di Carlo Focaccetti. *L'Aerotecnica*, Roma, June 1930, v. 10, no. 6, p. 470-80. illus., tables.
- Duralumin construction of aircraft components. *Machinery*, London, May 8, 1930, v. 36, no. 917, p. 161-64. illus.
- Combating corrosion of aircraft metal parts, by J. E. Sullivan. *Aviation*, New York, Feb. 1, 1930, v. 28, no. 5, p. 201-04. illus.
- Alloy metals in aircraft construction, by Gardner Turman. Colorado engineer, Boulder, Colo., Jan. 1930, v. 26, no. 2, p. 51, 68, 70. illus.
- Neue untersuchungen über den einfluss von Fe, Si und Mn auf die duraluminveredelung, von Karl L. Meissner. (*In Jahrbuch der D.V.L.*, München, 1930, p. 341-46. diags., tables)
- Wie das duralumin entstand. *Das Luftschiff*, Berlin, 1930, v. 2, no. 10, 11, p. 82.
- How to weld duralumin. *Aero digest*, New York, Dec. 1929, v. 15, no. 6, p. 164.
- La Protection des alliages légers à haute résistance contre la corrosion. Paris, *Bulletin de la Chambre syndicale des industries aéronautiques*, Nov.-Dec. 1929. 11 p. diags., illus.
- Corrosion and fatigue of metals, by Tord K. Angstrom. *Journal of the R.A.S.*, London, Oct. 1929, v. 33, no. 226, p. 900-08. diags., illus.
- Tempering of sheet duralumin depending upon the heating time, by N. V. Geveling. *Teknika vozdušnovo flota*, Moscow, Oct. 1929, no. 10, p. 640-50. diags., illus., table.
- Process of strengthening duralumin by means of thermal treatment, by S. M. Voronov. *Teknika vozdušnovo flota*, Moscow, Aug.-Sep. 1929, no. 8, 9, p. 500-13, 568-76. diags., tables.
- Provvidenze per impedire la corrosione del duralluminio, di E. Garuffa. *L'Ala d'Italia*, Milano, Aug. 1929, no. 8, p. 757-68. illus., tables.
- Effect of corrosion accompanied by stress on tensile properties of sheet duralumin, by H. S. Rawdon. *Metal industry*, New York, July 1929, v. 27, p. 322-23. illus.
- Intercrystalline corrosion of duralumin, by Frank M. Bondor. *Aviation*, New York, June 15, 1929, v. 26, no. 24, p. 99-100. illus.

## DURALUMIN

- Duralumin airship construction, by O. H. Barnhill. Metal industry, New York, May 1929, v. 27, p. 207-09. diags., illus.
- Extruded duralumin in aircraft, by J. F. Hardecker. Airway age, New York, Mar. 1929, v. 10, no. 3, p. 270-74. tables.
- Duraluminum dess egenskaper och laniplighet for flygmaskinskonstruktioner, utaf G. Stahle. Tekniska foreningens i Finland forhandlingar, Helsinki, Jan. 1929, v. 49, no. 1, p. 1-9. illus.
- Prevention of corrosion in duralumin airplane structures, by L. B. Richardson. S.A.E. journal, New York, Jan. 1929, v. 24, p. 24-29. tables.
- The Use of light alloys in aircraft from the point of view of corrosion, by H. Sutton. Journal of the R.A.S., London, Jan. 1929, v. 33, no. 217, p. 38-54. illus., tables.
- Corrosion embrittlement of duralumin. V. Results of weather-exposure tests; VI. The effect of corrosion, accompanied by stress on the tensile properties of sheet duralumin, by Henry S. Rawdon. Washington, 1929. 26 p; 26 p. illus., tables. (N.A.C.A. Technical notes nos. 304, 305)
- Curves showing column strength of steel and duralumin tubing, by O. E. Ross. Washington, 1929. 12 p. illus. (N.A.C.A. Technical notes no. 306)
- La Construction des avions, par L. Merlin. Métallurgie et la construction mécanique, Paris, Nov. 1, 1928, no. 44, p. 5, 7. tables.
- Einfluss von verschiedenen warmbehandlungen auf die eigenschaften des duralumins. Stahl und eisen, Düsseldorf, Oct. 18, 1928, v. 48, no. 42, p. 1472-73.
- Aluminum-coated duralumin proves durable aircraft material, by T. W. Downes. Automotive industries, Philadelphia, Aug. 18, 1928, v. 59, no. 7, p. 238-41. diags., illus.
- Protecting and finishing aircraft structures, by Thomas B. Colby. Aviation, New York, July 2, 1928, v. 25, no. 1, p. 26, 61-62. illus.
- Duralumin for airplane use, by Henry S. Rawdon. Mining and metallurgy, New York, May 1928, v. 9, p.234.
- Protection of duralumin against embrittlement. Mining and metallurgy, New York, May 1928, v. 9, p. 234-35. illus. (Also Brass world, New York, May 1938, v. 24, p. 147 and Journal of the Franklin institute, Philadelphia, Mar. 1928, v. 205, p. 417-20. illus.)

## METALS AND LIGHT ALLOYS

- American light alloys of high durability, by V. A. Lukoshin. Teknika vozdušnovo flota, Moscow, Apr. 1928, no. 4, p. 278-82. tables.
- Die Leichtmetalle im flugzeugbau, von Paul Brenner. Z.F.M., München, Mar. 28, 1928, v. 19, no. 6, p. 121-24. diagrs., illus., tables.
- Werkstoffe der flugtechnik auf der werkstofftagung, von J. Hausen. Zeitschrift für flugtechnik, München, Jan. 14, 1928, v. 19, no. 1, p. 9-12. illus.
- Giant airships use aluminum alloy for construction. Metal industry, New York, Jan. 1928, v. 26, no. 1, p. 18. illus.
- Les Alliages légers, par C. Haus. Bruxelles, Bulletin du service technique de l'aéronautique, 1928. 17 p. diagrs., tables. (Bulletin no. 8)
- Caratteristiche di leghe leggere, di Leonardo Lo Curto. (In IV Congresso internazionale di navigazione aerea, Oct. 24-30, 1927, Roma, 1928, v. 3, p. 362-79. illus.)
- Corrosion embrittlement of duralumin. I. Practical aspects of the problem. II. Accelerated corrosion tests and the behavior of high-strength aluminum alloys to different compositions. III. Effect of the previous treatment of sheet material on the susceptibility of this type of corrosion. IV. The use of protective coating, by Henry S. Rawdon. Washington, 1928. 11, 38, 24, 31 p. diagrs., illus., table. (N.A.C.A. Technical notes nos. 282, 283, 284, 285)
- On manufacturing and on the mechanical characteristics of duralumin. Tokyo, Tokyo imperial university, 1928. 132 p. illus., tables. (Aeronautical research institute report no. 39)
- Zusammenarbeit von konstruktion, betrieb und werkstoffprüfung im leichtbau, von H. Steudel. Zeitschrift des V.D.I., Berlin, Oct. 22, 1927, v. 71, no. 43, p. 1517-20. illus.
- Korrosionserscheinungen und korrosionsversuche an leichtmetallen für den flugbetrieb, von E. Rackwitz. Korrosion und metallschutz, Leipzig, Aug. 1927, v. 3, no. 8, p. 171-77. illus.
- Corrosion fatigue of non-ferrous metals, by D. J. McAdam, Jr. Engineering news-record, New York, July 21, 1927, v. 99, no. 3, p. 95-96. tables.
- Le Procédé Bengough pour la protection des surfaces en duralumin. L'Aéronautique, Paris, Mar. 1927, v. 9, no. 94, p. 81. diagr.
- La Résistance du duralumin à la corrosion. L'Aéronautique, Paris, Mar. 1927, v. 9, no. 94, p. 80-81. illus.

## DURALUMIN

- Duralumin and its corrosion, by William Nelson. Washington, 1927. 14 p. illus. (N.A.C.A. Technical memorandums no. 408) (From Aviation, New York, Nov. 1, 1926, v. 21, no. 18, p. 738-41)
- Duralumin - defects and failures, by William Nelson. Washington, 1927. 13 p. illus. (N.A.C.A. Technical memorandums no. 443) (From Aviation, New York, Aug. 29, 1927, v. 23, no. 9, p. 476-78)
- Duralumin welding, by William Nelson. Washington, 1927. 8 p. illus. (N.A.C.A. Technical memorandums no. 399) (From Aviation, New York, Jan. 17, 1927, v. 22, no. 3, p. 130-32)
- The Heat treatment of duralumin, by William Nelson. Washington, 1927. 18 p. diags. (N.A.C.A. Technical memorandums no. 401) (From Aviation, New York, Feb. 21, 1927, v. 22, no. 8, p. 362-65)
- The Protection of duralumin from corrosion, by William Nelson. Washington, 1927. 24 p. illus. (N.A.C.A. Technical memorandums no. 404) (From Aviation, New York, Nov. 8, 1926, v. 21, no. 19, p. 795-99)
- An Atomic picture of duralumin and its crystal structure, by R. J. Anderson. Journal of the Franklin institute, Philadelphia, June 1926, v. 201, no. 1204, p. 465-84. diags., tables.
- Duralumin construction on original lines. Flight, London, Mar. 11, 1926, v. 18, no. 10, p. 139-41. illus.
- Duralumin as a material for aircraft construction, by Oswald Short. Flight, London, Jan. 28, 1926, v. 18, no. 4, p. 48h-48k. illus.
- Study of dural and steel for airplane structures, by J. A. Roche. Washington, U. S. Govt. print. off., 1926. 7 p. diags. (Air corps information circular no. 568)
- Deterioration of duralumin in the Shenandoah. Results of Bureau of standard tests. Engineering news-record, New York, Dec. 17, 1925, v. 95, p. 1000-01.
- The Question of duralumin welding. Aviation, New York, Apr. 20, 1925, v. 18, no. 16, p. 439.
- Influence de l'eau salés sur le duralumin. L'Aéronautique, Paris, Feb. 1925, v. 7, no. 69, p. 77. illus.
- Alloys similar to duralumin made in other countries than Germany, by K. L. Meissner. Washington, 1925. 7 p. illus. (N.A.C.A. Technical memorandums no. 314) (From Zeitschrift für metallkunde, Berlin, Feb. 1925, v. 17, no. 2, p. 64-65)

## METALS AND LIGHT ALLOYS

- Some materials used in aeronautical construction, by J. D. North and L. Aitchison. Journal of the R.A.S., London, Apr. 1924, v. 28, no. 160, p. 226-59. diagsr., illus. (Abstract L'Aerotechnica, Roma, Jan.-Feb. 1925, v. 5, no. 1, p. 119-21)
- Duralumin, its properties and uses, by R. Beck. Washington, 1924. 8 p. illus. (N.A.C.A. Technical memorandums no. 284) (From Zeitschrift für metallkunde, Berlin, Apr. 1924, v. 16, no. 4, p. 122-27)
- Torsional strength of tubing-dural and nickel, by N. S. Otey. Washington, 1924. 29 p. diagsr., illus., tables. (N.A.C.A. Technical notes no. 189)
- Manufacture and uses of duralumin, by R. W. Daniels. S.A.E. journal, New York, Nov. 1923, v. 13, p. 427-29. illus.
- L'Emploi des alliages légers dans la construction moderne, par Marc Chauvière. La Technique automobile et aérienne, Paris, July-Sep. 1923, v. 14, no. 122, p. 74-83. diagsr., illus.
- Endurance of duralumin, electron metal and manganese bronze, by R. L. Moore. Chemical and metallurgical engineering, New York, July 9, 1923, v. 29, p. 58. (Also Engineering news-record, New York, July 5, 1923, v. 91, p. 26-27)
- Investigation of duralumin, by S. Konno. Mechanical engineering, New York, Mar. 1923, v. 45, p. 185.
- Practical heat treatment of duralumin, by J. A. Binnie. American machinist, New York, Feb. 8, 1923, v. 58, p. 221-24. tables. (Abstract Scientific american, New York, Oct. 1923, v. 129, p. 280)
- Holz-oder metallflugzeug, von H. Seehase. Zeitschrift für flugtechnik, München, Jan. 26, 1923, v. 14, no. 1, 2, p. 2-6, illus.
- Tests on riveted joints in sheet duralumin, by H. F. Rettew and G. Thumin. Washington, 1923. 11 p. (N.A.C.A. Technical notes no. 165)
- The Use of duralumin in Goodyear ship. Aerial age, New York, Sep. 1922, v. 15, p. 460.
- Properties and methods of using duralumin. Automotive industries, Philadelphia, Aug. 24, 1922, v. 47, p. 370-76. diagr., tables.
- L'Emploi des alliages légers en aéronautique. Le Génie civil, Paris, May 6, 1922, v. 80, p. 404-07. illus.
- Welding duralumin, by H. C. Knerr. Automotive industries, Philadelphia, May 4, 1922, v. 46, p. 964-68. illus.

## DURALUMIN

- Inter-crystalline brittling of dural. Automotive industries, Philadelphia, Jan. 25, 1922, v. 46, p. 154.
- Gegevens ontrent duraluminium, door H. J. Takens. Vliegvelde, Amsterdam, Jan. 15, 1922, v. 5, no. 2, p. 21-24. illus.
- Duralumin sheet-tests of flaws. Automotive industries, Philadelphia, Dec. 22, 1921, v. 45, p. 1216.
- Duralumin, its characteristics and use, by William B. Stout. Aviation, New York, Oct. 17, 1921, v. 11, no. 16, p. 455-56. illus.
- Alliages légers d'aluminium, par J. Dyrion. Houille blanche, Grenoble, May-June 1921, v. 20, no. 53, 54, p. 109-13. table.
- Le Leghe leggere in aeronautica, di G. Gallo. L'Aerotecnica, Roma, Mar. 1921, v. 1, no. 3, p. 170-79. diagrs., illus.
- Composition and properties of duralumin. Automotive manufacturer, New York, Dec. 1920, v. 62, no. 9, p. 18-19. illus. (Also S.A.E. journal, New York, Oct. 1920, v. 7, no. 4, p. 359-62)
- Duralumin, by E. Unger and E. Schmidt. Washington, 1920. 10 p. diagrs., (N.A.C.A. Technical notes no. 8) (Also Aerial age, New York, Aug. 16, 1920, v. 11, no. 23, p. 772-74 and Aeronautics, London, Aug. 12, 1920, v. 19, no. 356, p. 135-38)
- Quenching of certain alloys of aluminum, by L. Guillet, J. Durand and J. Galibourg. C. R. Acad. sci., Paris, Sep. 15, 1919, v. 169, p. 508-11. illus.
- Le Duralumin en aviation. L'Aérophile, Paris, May 15, 1919, v. 27, no. 9, 10, p. 129-30. illus.
- Duralumin, by L. M. Cohn. Metallurgical and chemical engineering, New York, June 1911, v. 9, no. 6, p. 295.
- A New metal for aeroplane construction. Scientific american, New York, Jan. 28, 1911, v. 104, no. 4, p. 101.
- A New alloy, by N. C. Daniels. Industrial and engineering chemistry, New York, Nov. 1910, v. 2, p. 494. diagrs.

## ELEKTRON

- Elektron diffraction and surface structure. Light metals, London, Nov. 1939, v. 2, no. 11, p. 371-74. illus.
- The Autogenous welding of elektron metal. Aluminium and non-ferrous review, London, June-July 1939, v. 4, no. 7, 8, p. 225-28, 255-59. diagrs., illus., tables.



## METALS AND LIGHT ALLOYS

- Spot welding light metals in a german aircraft works; spot welding elektron, by K. Reickel. Welding journal, New York, May 1939, v. 18, no. 5, p. 182-84. illus. (Also Engineering foundation, New York, May 1939, v. 4, no. 5, p. 184)
- Die Oberflächenbehandlung von elektron und magnesium-metallen, von H. Krause. Technisches zentralblatt für praktische metallbearbeitung, Berlin, Feb. 1939, v. 49, no. 3, 4, p. 180-84. illus.
- Einfluss von gussfehlern auf die festigkeit bei leichtmetallgussstücken, von F. Bollenrath und E. Scheidt. Luftfahrtforschung, München, Oct. 10, 1938, v. 15, no. 10, p. 511-16.
- Die Warmfestigkeitseigenschaften der elektronlegierungen bei statischer zugbeanspruchung, von H. Vosskühler. Metallwirtschaft, Berlin, Sep. 2, 1938, v. 17, no. 35, p. 935-41. illus., tables.
- Hydronalium und elektron metall, von E. Baroni. Österreichische chemiker-zeitung, Wien, Aug. 5, 1938, v. 41, no. 15, p. 283-87. tables.
- Die Herstellung von gesenken aus elektronmetall zur verwendung im flugzeugbau, von O. Oeckl. Deutsche luftwacht, ausgabe Luftwissen, Berlin, Aug. 1938, v. 5, p. 285-88. illus., tables.
- Elektron magnesium alloys. Metal industry, London, June 17, 1938, v. 52, no. 24, p. 621-22. illus.
- Hints on how to weld elektron - one of the newest and lightest alloys, by N. F. Daniel. Sheet metal industries, London, June 1938, v. 12, no. 124, p. 702-03. illus.
- Welding of elektron. Welding industry, London, May 1938, v. 6, no. 4, p. 127-28. tables.
- Applications of wrought elektron in the aircraft industry, by D. B. Winter. Aeroplane, London, Apr. 20, 1938, v. 54, no. 1404, p. 476-78. illus.
- Important points in the welding of elektron, by C. W. Brett. Light metals, London, Apr. 1938, v. 1, no. 3, p. 107. illus.
- Die Elastizität der metallischen werkstoffe, von M. Vater. Bauingenieur, Berlin, Feb. 4, 1938, v. 19, no. 5, 6, p. 67-69. diags.
- Recent progress in application of magnesium alloys, by D. B. Winter. Metallurgia, Manchester, England, Feb. 1938, v. 17, no. 100, p. 119-21. tables.

## ELEKTRON

- Über den zusammenhang zwischen biegezugfestigkeit und biegewechs-  
elfestigkeit, von Erich Mohr. Zeitschrift für metallkunde,  
Berlin, Feb. 1938, v. 30, no. 2, p. 71-73. diagrs., illus.
- Oberflächenschutz von elektron, von H. Giehmann. Korrosion und  
metallschutz, Berlin, Jan. 1938, v. 14, no. 1, p. 9-13.
- Dauerfestigkeitseigenschaften von elektronlegierungen, insbeson-  
dere kerbempfindlichkeit der knetlegierungen, von Walter  
Buchmann. (In Jahrbuch der deutschen luftfahrtforschung,  
Berlin, 1938, p. 524-28. illus.)
- Elektron magnesium alloys. London, F. A. Hughes and company, 1938.  
128 p. illus.
- Das Gasschmelzschweissen von elektron und hydronalium, von F.  
Grahl. Werkstatt und betrieb, München, Nov. 1937, v. 70,  
no. 21, 22, p. 289-92. tables.
- Leichtmetall-lager, von Reinhold Hinzmann. Zeitschrift für metall-  
kunde, Berlin, May 1937, v. 29, no. 5, p. 158-62. diagrs.,  
illus., tables.
- Bearbeitung von elektron-blechen, von Kurt Winkler. Werkstatt  
und betrieb, München, Apr. 1937, v. 70, no. 7, 8, p. 89-92.  
illus.
- Corrosion of elektron alloys, by Hachie Sawamoto. Smyokwai-shi,  
Tokyo, 1937, v. 9, no. 3, p. 179-88. diagrs., illus.
- Fortschritte und jetziger stand der verwendung des elektronmetalls,  
von Walther Schmidt und Paul Spitaler. Zeitschrift für  
metallkunde, Berlin, Aug. 1936, v. 28, no. 8, p. 220-22.  
diagrs., illus., tables.
- On the heat conductivity of super conductive alloys, by H. Bremmer  
and W. J. de Hass. Physica, The Hague, July 1936, v. 3, no.  
7, p. 692-704. illus., tables.
- Beitrag zur kenntnis der magnesium-gusslegierungen, von H. Busch.  
Giesserei, Düsseldorf, June 5, 1936, v. 23, no. 13, p. 290-  
95. diagrs., illus., tables.
- Über elektron-und hydronaliumguss, von P. Spitaler. Giesserei,  
Düsseldorf, Apr. 10, 1936, v. 23, no. 8, p. 177-81. diagrs.,  
illus., tables.
- Elektron magnesium alloys. Automobile engineer, London, Mar.  
1936, v. 26, p. 84.
- Investigation of the weldability of elektron. The influence of  
sea water on the corrosion of elektron, by A. S. Orlov and  
W. M. Fakejev. Moscow, Military aeronautical institute,  
1936. 64 p. diagrs., illus., tables.

## METALS AND LIGHT ALLOYS

- Magnesium alloy castings (fully heat treated). London, H. M. Stat. off., 1936. 3 p. (A. M. Spec. no. D.T.D. 285)
- Magnesium alloy castings (heat treated). London, H. M. Stat. off., 1936. 3 p. (A. M. Spec. no. D.T.D. 281)
- Magnesium alloy castings (heat treated). London, H. M. Stat. off., 1936. 3 p. (A. M. Spec. no. D.T.D. 289)
- The Corrosion of elektron alloy AM 503 by leaded fuels. Mechanism of attack, by G. D. Bengough and L. Whitby. Journal of the R.A.S., London, Dec. 1935, v. 39, no. 300, p. 1144-53. diags., tables.
- Magnesium alloys in aeroplanes, by E. R. Gadd. Aircraft engineering, London, Dec. 1935, v. 7, no. 82, p. 299-302. illus., tables.
- L'Impiego dell'electron nella costruzione degli aeroplani. Rivista aeronautica, Roma, Sep. 1935, v. 11, no. 9, p. 552. diags., illus.
- Elektron in aircraft construction. Flight, London, Aug. 25, 1935, v. 28, no. 1392, p. 10-11. (Also Aeroplane, London, July 17, 1935, v. 49, no. 1260, p. 87, 90-91. illus.)
- Dauerstandversuche an übersättigten magnesium-mischkristallen, von W. Schmidt und H. Vosskühler. Zeitschrift für metallkunde, Berlin, Aug. 1935, v. 27, no. 8, p. 179-82. tables.
- Use of magnesium alloys in aircraft construction, by E. Player. Metallurgia, Manchester, England, June 1935, v. 12, no. 68, p. 61-65. diags., tables.
- Elektron und hydronalium im kraftwagenbau. Zeitschrift des V.D.I., Berlin, Oct. 20, 1934, v. 78, p. 1229-30. diags.
- Die Leichtmetalltagung an der montanistischen hochschule in Loeben, 7, bis 9, Juni 1934, von P. Spitaler. (In Berg- und hüttenmännisches jahrbuch, Sep. 28, 1934, v. 82, no. 3, p. 83-165. illus.)
- Leichtmetalle im luftfahrzeugbau, von H. Mann. Werkstattstechnik, Berlin, Jan. 15, Feb. 1, 1934, v. 28, no. 2, 3, p. 21-24, 49-52. illus.
- Elektron and hydronalium, by W. Schmidt. Chemical age, London, Jan. 6, 1934, v. 30, p. 4.
- Über die hexagonale struktur des magnesiums und ihre bedeutung für die mechanische technologie und konstruktive verwendung des elektronmetalls, von G. Boehme. Hannover, Technischehochschule, 1934. 29 p. diags., illus., tables.

## ELEKTRON

- Light alloys for aeronautical purposes with special reference to magnesium, by L. Aitchison. *Aeroplane*, London, Dec. 26, 1933, v. 45, no. 25, p. 1063-64. diags., illus., tables. (Also *Metallurgia*, Manchester, England, Dec. 1933, v. 9, no. 50, p. 49-52 and *Journal of the R.A.S.*, London, May 1931, v. 38, no. 281, p. 382-412)
- Die Entwicklung der leichtmetalle elektron und hydronalium, von W. Schmidt. *Angewandte chemie*, Berlin, Sep. 30, 1933, v. 46, p. 626. illus.
- Dynamische festigkeitseigenschaften einiger leichtmetalle, von K. Matthaes. *Zeitschrift für metallkunde*, Berlin, Aug. 1932, v. 24, p. 176-80. diags., tables.
- Machining elektron. *Aviation engineering*, New York, June 1932, v. 6, no. 6, p. 34-36. diags.
- Machining the magnesium alloy elektron. *Machinery*, New York, Mar. 1932, v. 38, p. 532-33. diags. (Abstract *Aviation engineering*, New York, June 1932, v. 6, p. 34-35)
- I Metalli leggeri all'esposizione e congresso internazionale di fonderia, di Armando Silvestri. *Rivista aeronautica*, Roma, Dec. 1931, v. 7, no. 12, p. 499-513. illus., tables.
- Magnesium alloy finds varied uses in Germany. *Iron age*, New York, Nov. 13, 1931, v. 128, p. 1240.
- Röntgenographische untersuchungen von gitterstörungen in leichtmetallen, von J. Hengstenber und H. Mark. *Zeitschrift für elektrochemie*, Berlin, Aug.-Sep. 1931, v. 37, p. 524-28. tables.
- Über die relaxationszeiten einiger werkstoffe bei dynamischer beanspruchung, von A. Esau. *Zeitschrift für technische physik*, Leipzig, Sep. 1931, v. 12, p. 492-95. illus.
- Das Oberflächendrücken zur erhöhung der drehschwingfestigkeit, von Paul Behrens. *Metallwirtschaft*, Berlin, May 29, 1931, v. 10, p. 431-35. illus.
- The Lightest alloy. *Aeroplane*, London, Apr. 1, 1931, v. 40, no. 13, p. 575-76. illus.
- Die Bedeutung des kristallaufbaues für die beurteilung der elastizitätsgrenze und dauerfestigkeit von elektronmetall, von W. Schmidt. *Zeitschrift für metallkunde*, Berlin, Feb. 1931, v. 23, p. 54-57. tables.
- Use of elektron metal in airplane construction, by E. I. Deridder. Washington, 1931. 22 p. diags., illus. (N.A.C.A. Technical memorandums no. 608)

## METALS AND LIGHT ALLOYS

- Use of non-ferrous metals in the aeronautical industry, by D. Hanson. Engineer, London, Sep. 12, 1930, v. 150, p. 291-93. tables. (Also Engineering, London, Sep. 12, 1930, v. 130, p. 333-34)
- Über elektronmetal im flugzeugbau und europarundflug 1930, von J. Ruhrmann. Zeitschrift für metallkunde, Berlin, Sep. 1930, v. 22, p. 317-18. illus.
- Brinellhärte, eindringtiefe und pendelhärte bei verschiedenen leichtmetall-legierungen, von Franz Bollenrath. Metallwirtschaft, Berlin, July 25, 1930, v. 9, p. 625-29. diags., illus.
- Korrosionsschutz bei electronmetal, von Karl Diege. Metallwirtschaft, Berlin, Apr. 25, 1930, v. 19, p. 361-62. illus.
- Über elektronbleche. Zeitschrift für die gesamte giessereipraxis, Berlin, Sep. 22, 1929, v. 50, no. 38, p. 151-52.
- Beitrag zur erkenntniss der elastischen eigenschaften der leichtmetalle, von H. Siegler Schmidt. Metallwirtschaft, Berlin, Aug. 30, 1929, v. 8, p. 843-46. tables.
- Elektron, by Z. Pulawski. Lot Polski, Warsaw, June 1929, v. 7, no. 6, p. 23-25. illus.
- Oberflächenschutz von leichtmetallen im flugzeugbau, von K. Schmidinger. Deutsche motor-zeitschrift, Dresden, Apr. 1929, v. 6, no. 4, p. 192, 194. diags.
- Leichtlegierungen im flugzeugbau. Giesserei, Düsseldorf, Jan. 25, 1929, v. 16, no. 4, p. 34-35. illus.
- Magnesium alloy castings. Automobile engineering, London, Jan. 1929, v. 19, p. 29-31. diags.
- Korrosion, von P. Melchior. (In his Aluminium. Berlin, V.D.I. Verlag, 1929, p. 74. tables)
- Vergütbare magnesiumlegierungen, von P. Melchior. (In his Aluminium. Berlin, V.D.I. Verlag, 1929, p. 55-57. diags.)
- Die Bearbeitung des elektrons unter berücksichtigung der schweissung von elektronblechen. Motorwagen, Berlin, Oct. 20, 1928, v. 31, no. 29, p. 685-89. tables.
- Veredelungsversuche an elektronlegierungen, von K. L. Meissner. Zeitschrift des V.D.I., Berlin, Sep. 1, 1928, v. 72, p. 1234. illus.
- Elektronmetal. Zeitschrift für die giessereipraxis, Berlin, May 13, 1928, v. 49, no. 20, p. 79.

## ELEKTRON

- Mechanical properties of elektron alloy, by H. J. Tapsell, S. L. Archbutt and J. W. Jenkin. London, H. M. Stat. off., 1928. 9 p. diags., illus., tables. (A.R.C. R. & M. no. 1285)
- Age-hardening tests with elektron alloys, by K. L. Meissner. Journal of the Institute of metals, London, 1927, v. 38, no. 2, p. 195-216. illus., tables. (Also Engineering, London, Nov. 4, 1927, v. 124, no. 3225, p. 597-98. illus.)
- Endurance of duralumin, electron metal and manganese bronze, by R. L. Moore. Chemical and metallurgical engineering, New York, July 9, 1923, v. 29, p. 58. (Also Engineering, London, July 5, 1923, v. 26, p. 7)
- Elektron metal; a new magnesium alloy, by A. Bregman. Metal industry, New York, Jan. 1922, v. 20, p. 1-5. diags., illus.
- Le Métal électron, alliage de magnésium. Le Génie civil, Paris, Dec. 31, 1921, v. 79, p. 593-94. illus.

## HIDUMINIUM, HYDRONALIUM

- Über die festigkeitseigenschaften von arcatomschweissungen von hydronalium von H. Mäder. Elektroschweissung, Braunschweig, Feb. 1940, v. 11, no. 2, p. 29-32. diags., illus., tables.
- Eigenschaften und verwendung der hiduminium R-R-legierungen, von B. Trautmann. Metallwirtschaft, Berlin, Feb. 17, 1939, v. 18, no. 7, p. 154-57. illus., tables.
- Hydronalium und elektron metall, von E. Baroni. Österreichische chemiker zeitung, Wien, Aug. 5, 1938, v. 41, no. 15, p. 283-87. tables.
- Tensile tests of light alloys (Hiduminium), by H. Quinney. Engineering, London, May 13, 1938, v. 145, no. 3774, p. 530-31.
- Hiduminium R-R-77. Aircraft engineering, London, Jan 1938, v. 10, no. 107, p. 10. tables.
- A New aluminum alloys (Hiduminium R-R-77). Flight, London, Nov. 18, 1937, v. 32, no. 1508, p. 498e. tables.
- Das Gasschmelzschweissen von elektron und hydronalium, von F. Grahl. Werkstatt und betrieb, München, Nov. 1937, v. 70, no. 21, 22, p. 289-92. tables.
- Hiduminium R-R-77. Metallurgia, Manchester, England, Nov. 1937, v. 17, p. 22.
- Manufacture and characteristics of hiduminium R-R alloys, by J. Towns Robinson. Metallurgia, Manchester, Aug. 1937, v. 17, no. 94, p. 131-34.

## METALS AND LIGHT ALLOYS

- Über die elektrische punktschweissung an leichtmetallen (Hydronalium), von Eugen Osswald. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, p. 215-23. diags., illus., tables.
- A New aluminum for highly stressed structural parts (Hiduminium). Machinery, London, 1937, v. 51, no. 1310, p. 204. tables.
- Über elektron-und hydronaliumguss, von P. Spitaler. Giesserei, Düsseldorf, Apr. 10, 1936, v. 23, no. 8, p. 177-81. diags., illus., tables.
- Corrosion resistance of cast hydronalium, by G. Siebel. Aluminum and non-ferrous review, London, 1936, v. 18, p. 511-18. illus., tables. (Also Aluminium, Berlin, Nov. 1935, v. 17, no. 11, p. 562-67)
- Elektron und hydronalium im kraftwagenbau. Zeitschrift des V.D.I., Berlin, Oct. 20, 1934, v. 78, p. 1229-30. diags.
- Eigenschaften und verwendung von hydronalium, von P. Spitaler. (In Berg-und hüttenmännisches Jahrbuch, Wien, Sep. 28, 1934, v. 82, no. 3, p. 83-165. diags., illus., tables)
- Korrosionsversuche mit hydronalium, von P. Brenner. Zeitschrift für metallkunde, Berlin, Oct. 1933, v. 25, no. 10, p. 252-58. diags., illus.
- Die Entwicklung der leichtmetalle elektron und hydronalium, von W. Schmidt. Angewandte chemie, Berlin, Sep. 30, 1933, v. 46, p. 685
- Hydronalium eine neue leichtmetall-legierung. Automobiltechnische zeitschrift, Berlin, May 1933, v. 36, no. 10, p. 269. illus. (Abstract Journal of the R.A.S., Mar. 1934, v. 38, no. 279, p. 247)
- Fortschritte auf dem gebiete der leichtmetall-legierungen (Hydronalium), von O. Keinert. Werkstattstechnik und werksleiter, Berlin, Mar. 1, 1933, v. 27, no. 5, p. 100-03. illus.
- Manufacture and use of light alloys, by W. C. Devereux. Journal of the R.A.S., London, Feb. 1933, v. 37, no. 266, p. 145-67. diags., illus. (Also Aircraft engineering, London, Jan. 1933, v. 5, no. 47, p. 6-12)
- Hiduminium, by W. C. Deveraux. Mechanical engineering, New York, July 1930, v. 52, p. 712. illus. (Also Automotive industries, Philadelphia, May 3, 1930, v. 62, no. 18, p. 697-98)
- Hiduminium R-R-50. Chemical age, London, Feb. 1, 1930, v. 22, p. 10.
- Light alloys and their production commercially (Hiduminium). Flight, London, June 21, 1928, v. 20, no. 25, p. 470-71. illus.

## HIDUMINIUM, HYDRONALIUM

Light alloys for aircraft work (Hiduminium). *Aeroplane*, London, Apr. 18, 1928, v. 34, no. 16, p. 568.

## MAGNESIUM

- Magnesium for aircraft construction, by Emerson W. Conlon. *Journal of the Aeronautical sciences*, New York, Apr. 1940, v. 7, no. 6, p. 252-55. diags., illus.
- Welding magnesium alloy sheets. *Iron age*, New York, Jan. 18, 1940, v. 144, p. 48-49. illus.
- Vorkommen, verbreitung und gewinnung der wichtigsten leichtmetalle, von H. Schneiderhöhn. *Aluminium*, Berlin, Jan. 1940, v. 22, no. 1, p. 5-9. diags., tables.
- Spray quenching of light metal parts; its use in the aircraft industry, by K. Scherzer. *Metal industry*, London, Dec. 22, 1939, v. 55, p. 523-25. illus.
- Light alloys and production. *Aeroplane*, London, Dec. 8, 1939, v. 57, no. 1489, p. 704-07. illus.
- Magnesium castings for airframe production. *Aeroplane*, London, Dec. 8, 1939, v. 57, no. 1489, p. 721-23. tables.
- Forging magnesium alloys. *Light metals*, London, Dec. 1939, v. 2, p. 400-02. illus.
- Magnesium alloys in aircraft, by A. W. Winston. *Metal industry*, London, Nov. 10, 1939, v. 55, p. 409-12. tables.
- Magnesium sheet for aircraft, by L. B. Grant. *Aviation*, New York, Nov. 1939, v. 38, no. 12, p. 36-37, 82. tables.
- Die Oberflächenbehandlung von magnesium und seinen legierungen. *Werkstatt und betrieb*, Berlin, Nov. 1939, v. 72, no. 21, 22, p. 276-78. illus.
- Study of the properties of forged magnesium alloys, by J. L. Haughton and E. L. Tate. *Heat treating and forging*, Pittsburgh, Pa., Nov. 1939, v. 25, no. 11, p. 552-58. illus.
- Technique and equipment for die casting magnesium alloys, by H. Chase. *Light metals*, London, Nov. 1939, v. 2, p. 375-77. illus.
- Welding magnesium alloy sheet. *Sheet metal industries*, London, Nov. 1939, v. 13, p. 1375-79. tables.
- Protective coatings for magnesium, by T. P. Hoar. *Engineer*, London, Oct. 27, 1939, v. 168, p. 67-70. tables.



## METALS AND LIGHT ALLOYS

- Das Löten von Leichtmetallen, von R. Schulze. Aluminium, Berlin, Oct. 1939, v. 21, no. 10, p. 710-12. illus.
- Modern methods of die-casting, by H. L. Harvill. Western flying, Los Angeles, Cal., Oct. 1939, v. 19, no. 10, p. 16-18. illus.
- Oberflächenschutz von Magnesiumlegierungen. Maschinenbau, Berlin, Oct. 1939, v. 18, no. 19, 20, p. 36. illus.
- Age-hardening magnesium alloys, by W. F. Chubb. Light metals, London, Sep. 1939, v. 2, p. 329-32. illus., tables.
- American practice in die-casting magnesium, by H. Chase. Light metals, London, Sep. 1939, v. 2, p. 320-21. illus., tables.
- Corrosion and protection of magnesium alloys. Light metals, London, Sep. 1939, v. 2, p. 313-16. illus.
- Use of magnesium-alloys in the European automotive industry, by H. Altwicker. S.A.E. journal, New York, Sep. 1939, v. 45, no. 3, p. 12-13, 17-19. illus.
- Fatigue of light metal alloys, by R. L. Templin. Metals and alloys, New York, Aug. 1939, v. 10, no. 8, p. 243-45. illus.
- Magnesium and its alloys - recent developments in Great Britain, by J. L. Haughton. Industrial and engineering chemistry, Washington, Aug. 1939, v. 31, no. 8, p. 969-71. illus., tables.
- Magnesium alloys - their importance as engineering materials, by M. Philipp. Metal industry, London, June 26, 1939, v. 54, p. 561-65. tables.
- Age-hardening magnesium alloys, by W. F. Chubb. Light metals, London, June 1939, v. 2, p. 221-23. illus.
- La Protection du magnésium par voie galvanique, par J. Frasch. Métaux et corrosion, Paris, June 1939, v. 14, no. 166, p. 83-96. illus., tables.
- Les Métaux et alliages modernes en construction aéronautique. La Technique moderne, Paris, May 1, 1939, v. 31, no. 9, 4 p. diags., illus.
- Light metals in American aircraft design, by H. W. Perry. Light metals, London, May 1939, v. 2, p. 171-74. illus.
- The Rolling of light alloys, by H. Sedlachek, H. Zapp and B. Stockbauer. Metal industry, London, Apr. 28, 1939, v. 54, no. 17, p. 459-62. illus.
- Protecting magnesium alloys, by E. G. Savage. Metal industry, London, Apr. 21, 1939, v. 54, no. 16, p. 447-49. illus.

## MAGNESIUM

- Aluminum and magnesium alloys. Metal industry, London, Apr. 14, 1939, v. 54, no. 15, p. 424-25. tables.
- Magnesium alloys for the industry, by A. Kufferath. Aircraft engineering, London, Apr. 1939, v. 11, no. 122, p. 149-50. illus., table.
- The Use of light alloys in aircraft construction, by R. LeCoeuvre. Journal of the R.A.S., London, Apr. 1939, v. 43, no. 340, p. 289-309. illus., tables.
- Light alloys for aircraft, by H. Sutton. Iron age, New York, Mar. 30, 1939, v. 143, p. 28-31, 92.
- A New light magnesium alloy. Metal industry, London, Mar. 3, 1939, v. 54, p. 271.
- Metals for aeroplane construction, by J. B. Johnson. Journal of the Aeronautical sciences, New York, Mar. 1939, v. 6, no. 5, p. 185-202. diagrs., illus.
- Research work on aluminum and magnesium. Aluminum and non-ferrous review, London, Mar. 1939, v. 4, no. 4, p. 121-22. illus.
- Magnesium-spritzguss, von A. Bauer. Metallwirtschaft, Berlin, Feb. 23, 1939, v. 18, no. 8, p. 167-73. illus.
- Plating of magnesium alloys. Flight, London, Feb. 16, 1939, v. 31, p. 172-73. tables.
- Korrosionsschutz bei magnesiumlegierungen, von E. Nachtigall. Korrosion und metallschutz, Berlin, Jan.-Feb. 1939, v. 15, no. 1, 2, p. 43. illus., tables.
- Light alloys for aircraft, by H. Sutton. Aircraft production, London, Feb. 1939, v. 1, no. 4, p. 125.
- Die Oberflächenbehandlung von elektron-und magnesium-metallen, von H. Krause. Technisches zentralblatt für praktische metallbearbeitung, Berlin, Feb. 1939, v. 49, no. 3, 4, p. 180-84. illus.
- Spot welding of aircraft materials, by C. L. Hibert. Aluminum and non-ferrous review, London, Feb. 1939, v. 4, no. 3, p. 105-07. illus.
- Sur la corrosion des assemblages soudés d'alliages légers, par J. Cournot et M. Baudrand. C. R. Acad. sci., Paris, Jan. 23, 1939, v. 208, no. 4, p. 280-82. tables.
- Aluminium-magnesium-legierungen mit niedrigem magnesiumgehalt, von G. Chaudron. Korrosion und metallschutz, Berlin, 1939, v. 14, no. 164, p. 66.

## METALS AND LIGHT ALLOYS

- Hot and cold working of magnesium and its alloys, by H. Menking. (In Metals handbook. Cleveland, O., American society for metals, 1939, p. 1596-1600. illus.)
- Machining of magnesium and its alloys, by H. Menking. (In Metals handbook. Cleveland, O., American society for metals, 1939, p. 1601-08. diags.)
- Magnesium alloy die castings, by W. H. Gross. (In Metals handbook. Cleveland, O., American society for metals, 1939, p. 1594-96)
- Magnesium and its alloys, by J. L. Haughton and W. E. Prytherch. New York, American chemical publishing company, 1939. 100 p. diags., illus., tables.
- Magnesium as an engineering material. Metal treatment, London, 1938-1939, v. 4, no. 16, p. 175-76; 181. tables.
- Magnesium und seine legierungen, von R. Beck. Berlin, J. Springer, 1939. 520 p. diags., illus., tables.
- Physical constant of magnesium, by C. S. Taylor and J. D. Edwards. (In Metals handbook. Cleveland, O., American society for metals, 1939, p. 1576-80. tables)
- Properties of magnesium-aluminum alloys, by R. T. Wood. (In Metals handbook. Cleveland, O., American society for metals, 1939, p. 1581-85. diags.)
- Protection of magnesium against corrosion, by J. A. Gann. (In Metals handbook. Cleveland, O., American society for metals, 1939, p. 1611-16. illus.)
- Riveting of magnesium and its alloys, by H. Menking. (In Metals handbook. Cleveland, O., American society for metals, 1939, p. 1609-10)
- Light alloys for aircraft. Problems of their fabrication and application, by H. Sutton. Metal industry, London, Dec. 16, 23, 30, 1938, v. 53, no. 24, 25, 26, p. 581-84; 609-12; 637-40. illus., tables.
- Schweissen von magnesiumlegierungen, von P. Bräuer und O. Lehmann. Autogene metallbearbeitung, Berlin, Dec. 15, 1938, v. 31, no. 24, p. 398-401. illus.
- Korrosionsschutz von aluminium-magnesium-legierungen durch plattieren, von P. Brenner. Metallwirtschaft, Berlin, Dec. 2, 1938, v. 17, no. 48, p. 1272-76. illus.
- Les Alliages légers (ultra-légers) et leur classification, par L. Guillet. Le Génie civil, Paris, Dec. 1938, v. 113, no. 26, 27, p. 537-42; 566-67. illus., tables.

## MAGNESIUM

- The Development of age hardening alloys. Light metals, London, Dec. 1938, v. 1, no. 11, p. 395-400. diagrs., tables.
- Magnesium-aluminum alloys in aircraft construction, by R. Le Coeuvre. Metal progress, Cleveland, O., Dec. 1938, v. 34, p. 670, 706, 722. tables.
- Das Nieten der leichtmetalle, von E. Burg. Werkstoff und betrieb, Berlin, Dec. 1938, v. 71, no. 23, 24, p. 309-14. illus., tables.
- Construction of certain magnesium-rich alloys, by W. H. Rothery and G. V. Raymor. Engineering, London, Nov. 11, 1938 v. 132, p. 566-68. illus. (Also Metal industry, London, Oct. 28, 1938, v. 53, p. 416-19)
- Use of light alloys in aircraft construction, by R. Le Coeuvre. Metal industry, London, Nov. 4, 11, 1938, v. 53, no. 19, 20, p. 437-42, 465-66. illus. (Also Engineering, London, Nov. 4, 1938, v. 146, no. 3799, p. 538; Metallurgia, Manchester, England, Nov. 1938, v. 19, no. 109, p. 11-14 and Aluminum non-ferrous review, London, Nov. 1938, v. 3, no. 12, p. 407-11)
- Light alloys in aircraft construction. Aeroplane, London, Nov. 9, 1938, v. 55, no. 1433, p. 571-74. illus., tables.
- Magnesium alloys. Aeroplane, London, Nov. 9, 1938, v. 55, no. 1433, p. 575-76. illus. (Also Automotive industries, Philadelphia, May 15, 1938, v. 79, p. 662)
- Light alloys in production. Aircraft engineering, London, Nov. 1938, v. 10, no. 117, p. 359-61. illus.
- Spangebende formung von magnesiumlegierungen; drehen-hobeln-bohren, von E. Rauscher. Maschinenbau, Berlin, Nov. 1938, v. 17, no. 21, 22, p. 561-63. illus.
- Use of light-alloys in aircraft construction. Metallurgia, Manchester, England, Nov. 1938, v. 19, no. 109, p. 11-14. illus.
- Einfluss von gussfehlern auf die festigkeit bei leichtmetallgussstücken, von F. Bollenrath und E. Schiedt. Luftfahrtforschung, Berlin, Oct. 10, 1938, v. 15, no. 10, 11, p. 511-16. illus.
- Untersuchungen über die korrosionsermüdung von aluminium-und magnesiumlegierungen, von H. H. Böhm. Metallwirtschaft, Berlin, Sep. 2, 1938, v. 17, no. 35, p. 925-32. illus., tables.
- Der Verordnung über sicherheitsvorschriften für magnesiumlegierungen, von H. H. Böhm. Metallwirtschaft, Berlin, Sep. 2, 1938, v. 17, no. 35, p. 925-32. illus., tables.

## METALS AND LIGHT ALLOYS

- The Heat treatment of magnesium alloys, by L. G. Day and H. G. Warrington. *Light metals*, London, Sep. 1938, v. 1, no. 8, p. 269-71. diags., illus.
- New non-corrodible magnesium light alloy, by J. Jitaka, R. Shiota and T. Yamanobe. *Journal of the Society of chemical industry*, Tokyo, Sep. 1938, v. 57, no. 9, p. 1055. diags.
- Magnesium alloys and their use in the production of aircraft and engine parts, by A. W. Winston. *Aero digest*, New York, Aug. 1938, v. 33, no. 2, p. 50-52. illus., tables.
- Corrosion-resisting materials, by Francis A. Fox. *Flight*, London, July 28, 1938, v. 34, no. 1544, p. 82.
- The Constitution of magnesium alloys. *Metal industry*, London, June 24, July 1, 1938, v. 52, 53, p. 651; 4. illus.
- The Corrosion of magnesium alloys, by S. Morioka. *Aluminum and non-ferrous review*, London, July 1938, v. 3, no. 8, p. 275-82. diags., illus.
- Langsam aushärtende leichtmetalle und ihre anwendung als nietwerkstoff, von K. Matthaes. *Zeitschrift für metallkunde*, Berlin, July 1938, v. 30, no. 7, p. 238-44. illus., tables.
- Das Tiefziehen von leichtmetallen im luftfahrzeugbau, von E. J. Ritter. *Deutsche luftwacht, ausgabe luftwissen*, Berlin, July 1938, v. 5, p. 249-55. illus., tables.
- Extrusion of light alloys. *Flight*, London, June 30, 1938, v. 33, no. 1540, p. 39-42. illus.
- Surface protection of magnesium alloys, by E. J. Pike. *Flight*, London, June 30, 1938, v. 33, no. 1540, p. 43-44. illus.
- Extruding and rolling the light alloys. *Metal industry*, London, June 10, 1938, v. 52, p. 593-99. illus.
- Tensile tests of light alloys, by H. Quinney. *Engineering*, London, May 13, 1938, v. 145, no. 3774, p. 530-31. illus., tables.
- Magnesium alloys slash dead weight, by A. W. Winston. *Machine design*, Cleveland, O., May 1938, v. 10, no. 5, p. 39-41. tables.
- The Surface treatment of magnesium alloys, by C. H. S. Tupholme. *Light metals*, London, May 1938, v. 1, p. 129-30. illus.
- Metals used in aircraft industry, by J. Richard Goldstein. *Metal progress*, Cleveland, O., Apr. 1938, v. 33, no. 4, p. 357-61. illus. (Abstract *Aero digest*, New York, July 1938, v. 33, no. 1, p. 46-47, 50)

## MAGNESIUM

- Korrosionsprüfung von leichtmetallen auf seeklima-und seewasserbeständigkeit DIN 4853. Metallwirtschaft, Berlin, Mar. 25, 1938, v. 17, no. 12, p. 323-26. illus., tables.
- Alloys of the light metals, by C. H. Desch. Journal of the Society of chemical industry, London, Mar. 1938, v. 57, p. 69-75. diags., tables.
- Drawing of light alloy tubes, by Chrichton Harris. Light metals, London, Mar. 1938, v. 1, 3 p. illus.
- Manufacture of high-strength light alloy extrusions and their use in aircraft, by R. Worsdale. Metallurgia, Manchester, England, Feb.-Mar. 1938, v. 17, no. 100, 101, p. 134-36, 193-96. diags., illus.
- Leichtmetall-entwicklungsarbeiten der forschungsanstalt der Dürener metallwerke, von M. Hansen, W. Stenzel und K. L. Dreyer. Metallwirtschaft, Berlin, Feb. 18, 1938, v. 17, no. 7, p. 184-90. illus.
- Recent progress in the application of magnesium alloys, by D. B. Winter. Metallurgia, Manchester, England, Feb. 1938, v. 17, no. 100, p. 119-20. diags.
- The Use of light alloys in modern design, by W. C. Devereux. Journal of the Institute of automobile engineers, London, Feb. 1938, v. 6, no. 5, p. 428.
- Beitrag zur kenntnis der spannungskorrosion bei knetlegierungen, von Friedrich Carl Althof. Luftfahrtforschung, München, Jan. 20, 1938, v. 15, p. 60-82. diags., illus., tables.
- Mechanical properties of light alloys for use in aircraft construction at atmospheric temperature, by E. R. Gadd. Metal industry, London, Jan. 7, 1938, v. 52, no. 1, p. 5-10. illus., tables.
- Latest progress in the development of light alloys, their hardening by aging. Light metals, London, Jan. 1938, v. 1, p. 395-400. diags., illus.
- Manufacture, characteristics and uses of magnesium castings, by W. G. Harvey. S.A.E. journal, New York, Jan. 1938, v. 44, no. 1, p. 43-48. illus.
- Das Abkanten magnesiumlegierter bleche, von R. Hummel. Maschinenbau, Berlin, 1938, v. 17, no. 13, 14, p. 359-60. illus.
- Allgemeine konstruktionsgrundlagen für die verwendung von magnesiumlegierungen, von E. Ridder. (In Werkstoff-magnesium. Berlin, V. D. I. Verlag, 1938, p. 48-66. illus.)

## METALS AND LIGHT ALLOYS

- Alloys of aluminum and magnesium, by E. H. Dix, Jr. (In Symposium on high-strength constructional metals. Philadelphia, American society for testing materials, 1938. 150 p. illus., tables)
- Der Aufbau der magnesiumreichen legierungen der systeme magnesium-aluminium, magnesium-gallium, magnesium-indium und magnesium-thallium. Metallwirtschaft, Berlin, 1938, v. 17, no. 26, p. 711-12. illus.
- Der Einsatz der magnesiumlegierungen in der wirtschaft, von P. Spitaler. (In Werkstoff-magnesium. Berlin, V.D.I. Verlag, 1938, p. 29-47. illus.)
- Magnesium ein deutsches metall, von F. Löb. (In Werkstoff-magnesium. Berlin, V.D.I. Verlag, 1938, p. 1-4)
- Physikalische und mechanische eigenschaften der magnesiumlegierungen, von F. Bollenrath. (In Werkstoff-magnesium. Berlin, V.D.I. Verlag, 1938, p. 5-28. diagrs., tables)
- The Protection of magnesium alloys against corrosion, by H. Sutton and L. F. Le Brocq. London, H. M. Stat. off., 1938. 4 p. illus. (A.R.C. R. & M. no. 1828) (Also Journal of the Institute of metals, London, 1935, v. 57, no. 2, p. 199-220)
- Sand-und kokillenguss von magnesiumlegierungen, von H. Luyken. (In Werkstoff-magnesium. Berlin, V.D.I. Verlag, 1938, p. 84-93. illus., tables)
- Spanlose formung von magnesiumlegierungen, von H. Alawicker. (In Werkstoff-magnesium. Berlin, V.D.I. Verlag, 1938, p. 106-11. diagrs., illus., tables)
- Spritzguss von magnesiumlegierungen, von W. Müller. (In Werkstoff-magnesium. Berlin, V.D.I. Verlag, 1938, p. 94-105. diagrs., illus., tables)
- Verordnung über magnesiumlegierungen vom 8. märz 1938. Reichsgesetzblatt, May 1938, no. 22, p. 239. diagrs.
- Die Beurteilung von leichtmetallschweissungen auf grund des zugversuches, von W. Feldmann. Metallwirtschaft, Berlin, Dec. 1937, v. 16, no. 50, p. 1299-1306. illus., tables.
- Hardening a magnesium-aluminum alloy, by J. G. McGivern and C. A. Wilkinson. Metal industry, London, Nov. 26, 1937, v. 51, p. 521-25. illus.
- Über die normung der korrosionsprüfverfahren für leichtmetalle, von P. Brenner. Chemische fabrik, Berlin, Nov. 24, 1937, v. 10, no. 47, 48, p. 486-91. illus.

## MAGNESIUM

- Magnesium und seine legierungen, von K. Bungardt. Zeitschrift des V.D.I., Berlin, Nov. 6, 1937, v. 81, no. 45, p. 1289-93. illus., tables.
- Magnesium alloys. The manufacture, machining and characteristics of castings, by W. G. Harvey. Automobile engineer, London, Nov. 1937, v. 27, no. 365, p. 449-50. illus.
- Neuere fortschritte und erfahrungen im ausland über die eigenschaften von magnesiumlegierungen, von K. Bungardt. Luftfahrtforschung, München, Oct. 20, 1937, v. 14, no. 10, p. 527-36. illus., tables. (Also Zeitschrift für metallkunde, Berlin, Oct. 1937, v. 29, no. 10, p. 325-33)
- Finishing small magnesium-base alloy components. Machinery, London, Oct. 10, 1937, v. 51, no. 1306, p. 77-79. illus., tables.
- Progress in light alloys, aluminum and magnesium, by A. J. Dornblatt. Metal progress, Cleveland, O., Oct. 1937, v. 32, no. 4, p. 575, 577-78, 580-81. diagrs., illus.
- La Protection du magnesium par la peinture. Les Ailes, Paris, Sep. 30, 1937, v. 17, p. 6-8. illus.
- Deutsches magnesium und seine legierungen. Deutsche technik, Leipzig und Berlin, Sep. 1937, v. 5, p. 435-39. illus., tables.
- Essais de corrosion sur magnésium et alliages ultra-légers protégés par des dépôts de surface, par J. Cournot et L. Halm. C. R. Acad. sci., Paris, May 3, June 28, 1937, v. 204, no. 18, 26, p. 1333-34, 1941-43. illus.
- Recent developments in magnesium alloys, by J. L. Haughton. Engineer, London, May 28, 1937, v. 164, p. 631-32. tables.
- Letkie stopy, W. Loskiewicz. Przegląd mechaniczny, Warsaw, May 10, 1937, v. 3, no. 9, p. 525-34. diagrs., tables.
- Magnesium alloys, by C. H. Desch. Journal of the R.A.S., London, May 1937, v. 41, no. 317, p. 369-81. illus., tables. (Also Metal progress, Cleveland, O., Mar. 1937, v. 31, no. 3, p. 300-02, 304; Metal industry, London, Jan. 29, 1937, v. 50, no. 5, p. 161-67 and Metallurgia, Manchester, England, Jan. 1937, v. 15, no. 8, p. 89-92)
- Age-hardening and improved light alloys. Metal industry, London, Apr. 30, 1937, v. 50, no. 18, p. 506-09. illus.
- Recent developments in magnesium alloys, by J. L. Haughton. Engineer, London, Apr. 23, 30, 1937, v. 164, p. 483-86, 519-20. illus., tables. (Also Metal industry, London, Apr. 23, 1937, v. 50, p. 487-93. tables)



## METALS AND LIGHT ALLOYS

- Heimwerkstoffe im flugzeug-und flugmotorenbau, von K. Schraivogel. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, p. 224-27. diags., illus., tables.
- Oberflächenvergütung von leichtmetallen durch diffusion, von W. Bungardt. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, 5, p. 204-08. diags., illus.
- Über die elektrische punktschweissung an leichtmetallen, von Eugen Osswald. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, p. 215-23. diags., illus., tables.
- Aircraft-engine materials, by J. B. Johnson. S.A.E. journal, New York, Apr. 1937, v. 40, no. 4, p. 153-62. illus., tables. (Also Heat treating and forging, Pittsburgh, Pa., Feb. 1937, v. 23, no. 2, p. 75-79)
- Protection of light alloys, by E. C. J. Marsh and E. Mills. Aircraft engineering, London, Apr. 1937, v. 9, no. 98, p. 97-102. illus., tables.
- Sur la recristallisation d'alliage aluminium-magnesium, par R. Michaud et E. Segol. C. R. Acad. sci., Paris, Mar. 22, 1937, v. 204, no. 12, p. 980-83. illus.
- Magnesium; right corner of magnesium-aluminum-zinc system, by L. Sergeev. Metallurgia, Manchester, England, Mar. 1937, v. 12, p. 79-94. illus., tables.
- Welding of magnesium alloys, by A. J. T. Eyles. Industrial gases, London, Mar. 1937, v. 18, no. 1, p. 43-45.
- Protective anodized coating on magnesium alloys, by R. W. Buzzard and J. H. Wilson. Journal of research, Bureau of standards, Washington, Jan. 1937, v. 18, no. 3, p. 83-87. illus., tables. (Also Journal of the R.A.S., London, Apr. 1937, v. 41, no. 42, p. 408)
- Developments in aircraft metallurgy. Metal progress, Cleveland, O., Jan. 1937, v. 31, no. 1, p. 33-36. diags., illus., tables.
- The Corrosion of magnesium alloys, by S. Morioka and H. Endo. Tohoku imperial university, Sendai, 1937, v. 26, p. 167-80. illus. (Scientific report no. 2)
- La Corrosione dei metalli, di G. Guidi e G. Guzzoni. Milano, Ulrico Hoepli, 1937. 373 p. diags., illus., tables.
- Le Développement actuel des études sur la corrosion et leur avenir, par R. Le Coeuvre. La Technique aéronautique, Paris, 1937, v. 28, no. 146, p. 255-66.

## MAGNESIUM

- Magnesium alloys; mechanical properties and corrosion resistance of magnesium-manganese and magnesium-manganese-zinc alloys, by H. Imai, H. Tanimura and H. Mikashima. *Tetsu-to-hagane*, Tokyo, 1937, v. 23, p. 452-65. illus., tables.
- Magnesium and its alloys, by J. L. Haughton and W. E. Prytherch. Department of scientific and industrial research, London, H. M. Stat. off., 1937. 100 p. illus.
- Magnesiumlegierungen, von C. Götz, G. Apel and A. Grützner. Berlin, Chemie verlag, 1937. 192 p. diagrs., illus., tables.
- Pseudo-binary magnesium alloys, by K. W. Peredel'ski. *Legkije metally*, Moscow, 1937, v. 6, no. 3, p. 27-29.
- Schmieden von leichtmetall, von B. Preuss. *Technisches zentralblatt für praktische metallbearbeitung*, Berlin, 1937, v. 47, no. 17, 18, p. 678, 680. diagrs.
- Some characteristics of magnesium sheetings and alloys, by M. Goto, M. Nito and H. Asada. Tokyo, Tokyo imperial university, 1937. 155 p. diagrs., illus., tables. (Aeronautical research institute report no. 148)
- Heat treatment and properties of magnesium alloys, by I. G. Shulgin. *Legkije metally*, Moscow, Dec. 1936, v. 5, p. 35-39. illus.
- Les Métaux et alliages modernes en construction aéronautique, par Paul Bastien. *La Technique moderne*, Paris, Nov. 15, 1936, v. 28, no. 22, p. 794-96. tables.
- Light alloys in british aircraft and automobile construction, by C. H. S. Tupholme. *Canadian chemistry and metallurgy*, Toronto, Nov. 1936, v. 20, no. 11, p. 352-54. tables.
- The Forgeability of light alloys, by Albert Portevin and Paul G. Bastien. *Metal industry*, London, Sep. 18, 1936, v. 49, no. 12, p. 296-300. illus.
- Un Metallo dell'avvenire: il magnesio, di P. Pietravalle. *L'Ala d'Italia*, Milano, Sep. 1936, v. 14, p. 38-42. diagrs.
- Alloys for aircraft die castings and their applications, by Herbert Chase. *Aero digest*, New York, July 1936, v. 29, no. 1, p. 54-56, 58. illus., tables.
- Magnesium alloys, by E. Strasser. *Engineer*, London, June 5, 1936, v. 163, p. 612.
- Tubing in aircraft. The Manufacture and uses of steel, aluminum and magnesium alloy tubes, by A. E. Reynolds. *Flight*, London, Mar. 26, v. 29, no. 1422, p. 328d-328f.

## METALS AND LIGHT ALLOYS

- Alloys of magnesium and aluminum, by J. J. Bowman and E. H. Dix, Jr. Iron age, New York, Mar. 12, 1936, v. 137, p. 55. diagsr., illus.
- Electrical resistance of alloys of manganese-aluminum, by J. L. Thomas. Journal of research, Bureau of standards, Washington, Feb. 1936, v. 16, p. 149-59. illus.
- Alloys of magnesium, by H. G. Warrington. Metal industry, London, Jan. 24, 1936, v. 48, no. 4, p. 136-40. illus. (Abstract L'Aerotechnica, Roma, Jan. 1937, v. 17, no. 1, p. 55)
- The Casting and treatment of magnesium alloys, by A. J. Murphy. Metal industry, London, Jan. 17, 1936, v. 48, p. 108. diagsr., illus.
- Constitution of magnesium-aluminum alloys, by H. E. Bakken and R. T. Wood. (In Metals handbook. Cleveland, O., American society for metals, 1936, p. 1197-98)
- Observations sur le laminage des alliages magnesium-aluminium, par L. Doussin et F. Fournier. Paris, E. Blondel La Rougery, 1936. 22 p. diagsr., illus., tables. (Pub. scient. tech. Min. de l'air no. 85)
- Fusione ed estrusione di leghe di magnesio, di G. Guzzoni. L'Aerotechnica, Roma, Nov.-Dec. 1935, v. 15, no. 11, 12, p. 1080-84. diagsr.
- Magnesium alloys in aeroplanes, by E. R. Gadd. Aircraft engineering, London, Dec. 1935, v. 7, no. 82, p. 299-302. diagsr., illus.
- Light metals and their alloys, by William M. Corse. Journal of the American society of naval engineers, Washington, Nov. 1935, v. 47, no. 4, p. 632-39. illus. (Also Industrial and engineering chemistry, Washington, July 1935, v. 27, no. 7, p. 745-51)
- Surface preparation and painting of magnesium alloys, by A. W. Winston, J. B. Reid and W. H. Gross. Industrial and engineering chemistry, Washington, Nov. 1935, v. 27, no. 11, p. 1333-37. illus., tables.
- Non-ferrous metals used in aircraft, by J. B. Johnson. Metal progress, Cleveland, O., Oct. 1935, v. 28, no. 4, p. 123-28, 130. diagsr., tables.
- Magnesium alloys in aircraft construction. Flight, London, Aug. 29, 1935, v. 28, no. 1392, p. 224d-224e. table.
- Aluminum magnesium alloys. Metal industry, London, July 19, 1935, v. 47, no. 3, p. 66. diagsr.

## MAGNESIUM

- Use of magnesium alloys in aircraft construction, by E. Player. Metallurgia, Manchester, England, June 1935, v. 12, no. 68, p. 61-65. illus.
- Betrachtungen über die möglichkeiten des korrosionsschutzes von metallen, von M. Straumanis. Korrosion und metallschutz, Berlin, Mar. 1935, v. 11, no. 3, p. 49-52. illus., tables.
- Alloys of magnesium; mechanical properties of some wrought magnesium alloys, by W. E. Prytherch. Journal of the Institute of metals, London, Jan. 1935, v. 56, no. 1, p. 133-50. tables.
- Elektrolytisch erzeugte fluoridüberzüge auf magnesium und seinen legierungen, von H. Fischer und W. Schwan. Wissenschaftliche veröffentlichungen aus den Siemens-werken, Berlin, 1935, v. 14, no. 2, p. 54-62. tables.
- Le Magnésium dans les constructions aéronautiques, par R. de Fleury. Paris, E. Blondel La Rougery, 1935. 112 p. diagrs., illus., tables. (Pub. scient. tech. Min. de l'air no. 75) (Abstract L'Usine, Paris, Feb.-Mar. 1936, v. 45, no. 9, 29, p. 29, 34-35)
- Metallurgical survey of engineering materials, by J. W. Jones. Metal industry, London, Dec. 7, 1934, v. 45, no. 23, p. 537-41. tables.
- Mécanisme d'oxydation des alliages de magnésium et de ceux du calcium à température élevée, par M. R. Delavault. C. R. Acad. sci., Paris, Sep. 10, 1934, v. 199, no. 11, p. 580-82. illus., tables.
- Le Leghe leggere nelle costruzioni aeronautiche, di Attilio Izzo. L'Ala d'Italia, Milano, Sep. 1934, v. 12, p. 36-40. diagrs., illus., tables.
- Corrosion and protection of magnesium and its alloys, by G. D. Bengough and L. Whitby. Journal of the R.A.S., London, May 1934, v. 38, no. 281, p. 413-31. diagrs., illus. (Also Metal industry, London, Jan. 5, 1934, v. 44, no. 1, p. 3-5 and Aircraft engineering, London, Jan. 1934, v. 6, no. 59, p. 7-12) (Abstract L'Aerotecnica, Roma, May 1935, v. 15, no. 5, p. 532)
- Light alloys for aeronautical purposes with special reference to magnesium, by L. Aitchison. Journal of the R.A.S., London, May 1934, v. 38, p. 382-412. illus. (Also Mechanical world, London, Feb. 9, 16, Mar. 2, 1934, v. 95, no. 2458, 2459, 2461, p. 117-18, 148-49, 202; Aeroplane, London, Dec. 20, 1933, v. 45, no. 25, p. 1063-64 and Metallurgia, Manchester, England, Dec. 1933, v. 9, no. 50, p. 49-52)

## METALS AND LIGHT ALLOYS

- Leichtmetalle im luftfahrzeugbau, von H. Mann. Werkstattstechnik und werksleiter, Berlin, Jan. 15, Feb. 1, 1934, v. 28, no. 2, 3, p. 21-24, 49-52. diags., illus.
- Il Magnesio e le sue leghe, di G. Guzzoni. Rivista aeronautica, Roma, Feb. 1934, v. 10, no. 2, p. 357. (Also L'Aerotecnica, Roma, Feb. 1932, v. 12, no. 2, p. 261)
- Constitution of magnesium-rich alloys of magnesium and nickel, by J. L. Haughton and R. J. M. Payne. London, H. M. Stat. off., 1934. 1 p. (A.R.C. R. & M. no. 1608)
- Effect of heat treatment on the corrosion of magnesium-zinc alloys and of magnesium-aluminum alloys, by T. Murakami and S. Morioka. Tohoku imperial university, Sendai, 1934, v. 23, p. 612-36. (Science report no. 4)
- Remarques sur l'étude de la corrosion des métaux et la corrosion des divers alliages de magnésium, par Albert M. Portevin, Paul G. Bastien et M. Bonnot. C. R. Acad. sci., Paris, June 26, 1933, v. 196, no. 26, p. 1999-2002. diags., illus., tables. (Abstract Le Génie civil, Paris, July 8, 1933, v. 103, no. 2, p. 46)
- Le Forgeage et matriçage des alliages légers et ultra-légers, par E. Decherf. Aciers spéciaux métaux et alliages, Paris, Nov. 1931, Sep. 1932, Apr. 1933, v. 6, 7, 8, no. 75, 85, 92, p. 575-85, 329-44; 102-08. diags., illus., tables.
- Contribution à l'étude des propriétés physiques et mécaniques des alliages magnésium-aluminium-cuivre, riches en magnésium, par A. Portevin et P. Bastien. C. R. Acad. sci., Paris, Mar. 6, 1933, v. 196, no. 10, p. 693-96. diags., illus. (Abstract Le Génie civil, Paris, Mar. 18, 1933, v. 102, no. 11, p. 263)
- Manufacture and use of light alloys, by W. C. Devereux. Journal of the R.A.S., London, Feb. 1933, v. 37, no. 266, p. 145-67. diags., illus. (Also Aircraft engineering, London, Jan. 1933, v. 5, no. 47, p. 6-12)
- Étude des alliages magnésium-aluminium-cuivre, riches en magnésium. Contribution à l'étude des propriétés de fonderie des métaux et alliages, par Paul Bastien. Paris, E. Blondel La Rougery, 1933. 143 p. diags., illus., tables. (Pub. scient. tech. Min. de l'air no. 20)
- Étude des flux d'épuration et de protection de magnésium et de ses alliages pendant leur fusion dans les creusets et leur coulée dans les moules, par Maurice Hardoulin. Paris, E. Blondel La Rougery, 1933. 46 p. diags., illus., tables. (Pub. scient. tech. Min. de l'air no. 28)

## MAGNESIUM

- Fonderie du magnésium; coulée en sable à vert, par A. Caillon et R. de Fleury. C. R. Acad. sci., Paris, Sep. 26, 1932, v. 195, no. 13, p. 549-51. tables. (Abstract Le Génie civil, Paris, Oct. 8, 1932, v. 101, no. 15, p. 363)
- Les Applications du magnésium à l'aéronautique, par R. de Fleury. Revue de métallurgie, Paris, July 1932, v. 29, no. 7, p. 341-47. illus. (Abstract Le Génie civil, Paris, Dec. 17, 1932, v. 101, no. 25, p. 616)
- Étude de certains alliages légers d'aluminium, par C. Matignon. Chimie et industrie, Paris, June 1932, v. 27, no. 6, p. 1259-73. diags., illus.
- Sur la détermination de la perte de poids dans les essais de corrosion, par J. M. Chaussain. C. R. Acad. sci., Paris, May 23, 1932, v. 194, no. 21, p. 1823-24. illus.
- Magnesium alloys in aircraft engine, by G. D. Welty. S.A.E. journal, New York, Mar. 1932, v. 30, no. 3, p. 112-15. illus., tables. (Also Aviation, New York, Dec. 1931, v. 30, p. 698d)
- Protection of metal parts of aircraft against corrosion, by H. Sutton. Journal of the R.A.S., London, Jan. 1932, v. 36, no. 253, p. 1-23. diags., illus.
- Corrosion of magnesium alloys, by G. Kostylev and W. Kroenig. Moscow, Scientific technical department of the Supreme council of national economy, 1932. 40 p. illus. (C.A.H.I. Transactions no. 128)
- A New light alloy. Flight, London, Dec. 25, 1931, v. 23, no. 52, p. 1264e-1264f. illus.
- La Protection des alliages légers contre la corrosion, par M. Pubellier. Aciers spéciaux métaux et alliages, Paris, Nov. 1931, v. 6, no. 75, p. 575-85. illus., tables.
- Light alloys in engine construction, by E. F. Lake. Aviation engineering, New York, July 1931, v. 6, no. 1, p. 15-17. table. (Also Metal industry, London, Jan. 23, 1931, v. 38, no. 4, p. 113-15 and Metal industry, New York, Nov. 1930, v. 28, no. 11, p. 508-11)
- Magnesium, by J. A. Gann. S.A.E. journal, New York, June 1931, v. 29, p. 653-68. diags., illus.
- La Corrosione dei materiali impiegati nelle costruzioni aeronautiche, di G. Guidi. Ingegnere, Roma, Mar. 1931, v. 5, no. 3, p. 153-63. illus., tables.
- La Corrosione dei metalli e leghe usati in aeronautica, di G. Guzzoni ed E. Nardi. L'Aerotecnica, Roma, Jan. 1931, v. 11, no. 1, p. 50-77. diags., illus., tables.

## METALS AND LIGHT ALLOYS

- Alluminio, magnesio, berillio e loro leghe, di A. W. Bonaretti. *Metalli leggeri e loro applicazioni*, Milano, 1931, no. 4, p. 191-98. illus.
- Beiträge zur physik und metallographie des magnesiums, von E. Schmidt und E. Goens. *Zeitschrift für elektrochemie und angewandte physikalische chemie*, Berlin, 1931, v. 37, p. 447-59. diagrs., illus., tables.
- The Mechanical properties of aluminum and magnesium alloys, by R. L. Templin and D. A. Paul. (*In* Symposium on effect of temperature on metals. Philadelphia, American society for testing materials, 1931, p. 290)
- Electrical conductivity and tensile properties of magnesium-aluminum alloys, by E. Wilson. *Institute of Electrical Engineers journal*, London, Dec. 1930, v. 69, p. 89-94.
- Magnesium alloy castings, by E. Player. *Metallurgia*, Manchester, England, Dec. 1930, v. 3, no. 14, p. 46, 52. illus.
- Magnesium. *Engineer*, London, Sep. 26, 1930, v. 150, p. 130. diagrs.
- Use of non-ferrous metals in the aeronautical industry, by D. Hanson. *Engineer*, London, Sep. 12, 1930, v. 150, p. 291-93. tables. (*Also* *Engineering*, London, Sep. 12, 1930, v. 130, p. 333-34)
- Comments on the achievements in light rolling alloys, by U. G. Muzalevski. *Teknika vozdušnovo flota*, Moscow, Sep. 1930, no. 9, p. 609-23. diagrs., tables.
- Some characteristics of light alloys for aircraft, by H. W. Gillett. *Transactions of the A.S.M.E.*, New York, July-Sep. 1930, v. 2, no. 1, p. 115-20. illus.
- The Corrosion of metals, by H. Sutton. *Aircraft engineering*, London, Aug. 1930, v. 2, no. 18, p. 209-10. diagrs., illus., table.
- Magnesium-manganese alloys, by G. W. Pearson. *Industrial and engineering chemistry*, Washington, Apr. 1930, v. 22, no. 4, p. 367-70. diagrs.
- Magnesium and its alloys in aircraft, by W. G. Harvey. *Metals and alloys*, New York, Feb. 1930, v. 1, no. 8, p. 365-67. illus. (*Also* *Metal industry*, London, Dec. 27, 1929, v. 35, no. 26, p. 615-17; *American machinist*, New York, Oct. 10, 1929, v. 71, no. 15, p. 624; *Heat treating and forging*, Pittsburgh, Pa., Oct. 1929, v. 15, no. 10, p. 1317-19 and *Electro-chemical society*, New York, Sep. 19, 21, 1929, v. 56, no. 34, p. 57-70)

## MAGNESIUM

- The Protection of magnesium alloys against corrosion, by H. Sutton and L. F. LeBrocq. London, H. M. Stat. off., 1930. 22 p. diags., illus., tables. (A.R.C. R. & M. no. 1390)
- Metals used in aircraft construction, by Bradley Stoughton. Journal of the Society of chemical industry, London, Dec. 13, 1929, v. 48, no. 50, p. 1189-98. tables.
- Magnesium alloys in aeronautics. Airway age, New York, Dec. 1929, v. 10, no. 12, p. 1937-39. illus.
- La Protection des alliages légers à haute résistance contre la corrosion. Paris, Bulletin de la Chambre syndicale des industries aéronautiques, Nov.-Dec. 1929. 11 p. diags., illus.
- Service characteristics of light alloys as used in aircraft, by E. H. Dix, Jr. Aeronautical world, Los Angeles, Cal., Dec. 1929, v. 2, no. 12, p. 31-33, 36, 60. illus., tables.
- Modern light alloys and their application to aircraft-engine design, by G. D. Welty. S.A.E. journal, New York, Nov. 1929, v. 25, no. 5, p. 469-73. illus., tables.
- The Use of light alloys in the manufacture of aircraft. Aviation, New York, Oct. 12, 1929, v. 27, no. 15, p. 740-43. illus., tables.
- The Use of light alloys in aircraft from the point of view of corrosion, by H. Sutton. Journal of the R.A.S., London, Jan. 1929, v. 33, no. 217, p. 38-54. illus. (Also Notiziario tecnico di aeronautica, Roma, June 1929, v. 7, no. 6, p. 62-83)
- Mechanical properties of pure magnesium and certain magnesium alloys in the wrought condition, by S. L. Archbutt and J. W. Jenkin. London, H. M. Stat. off., 1929. 15 p. illus., tables. (A.R.C. R. & M. no. 1287)
- Treatment and structure of magnesium alloys, by John A. Gann. Transactions of the A.I.M.E., New York, 1929, p. 309-32. illus., tables.
- Aircraft casting alloys must possess stability and permanence, by A. J. Lyon. Foundry, Cleveland, O., Nov. 1, 1928, v. 56, no. 21, p. 875-79. illus., tables.
- Use of magnesium gradually increasing in automotive field, by P. M. Heldt. Automotive industries, Philadelphia, Oct. 27, 1928, v. 59, p. 586-89. diags.
- Les Alliages légers, par C. Haus. Bulletin du service technique de l'aéronautique, Bruxelles, June 1928, p. 13-30. diags., tables. (Bulletin no. 8)



## METALS AND LIGHT ALLOYS

- American light alloys of high durability, by V. A. Lukoshin. Teknika vozdushnovo flota, Moscow, Apr. 1928, no. 4, p. 278-82. tables.
- Die Leichtmetalle im flugzeugbau, von Paul Brenner. Z.F.M., München, Mar. 28, 1928, v. 19, no. 6, p. 121-24. diagrs., illus., tables.
- Werkstoffe der flugtechnik auf der werkstofftagung, von J. Hausen. Z.F.M., München, Jan. 14, 1928, v. 19, no. 1, p. 9-12. illus., table.
- Caratteristiche di leghe leggere, di Leonardo Lo Curto. IV Congresso internazionale di navigazione aerea, Oct. 24, 30, 1927, Roma, 1928, v. 3, p. 362-79. illus.
- Mechanical properties of pure magnesium and certain magnesium alloys in the wrought condition. Mechanical properties of elektron alloy, by H. J. Tapsell, S. L. Archbutt and J. W. Jenkin. London, H. M. Stat. off., 1928. 9 p. diagrs., illus., tables. (A.R.C. R. & M. no. 1285)
- Beitrag zur kenntniss derhochprocentigen magnesiumlegierungen, von W. Schmidt. Zeitschrift für metallkunde, Berlin, Nov. 1927, v. 19, no. 11, p. 452-55. illus.
- Zusammenarbeit von konstruktion, betrieb und werkstoffprüfung im leichtbau, von H. Steudel. Zeitschrift des V.D.I., Berlin, Oct. 22, 1927, v. 71, no. 43, p. 1517-20. diagrs., illus., table.
- Corrosion fatigue of non-ferrous metals, by D. J. McAdam, Jr. Engineering news-record, New York, July 21, 1927, v. 99, no. 3, p. 95-96. tables.
- Étude de la vitesse de dissolution des alliages de magnésium ultra-légers, par A. Portevin et E. Preter. C. R. Acad. sci., Paris, July 11, 1927, v. 185, no. 2, p. 125-27. illus.
- Le Magnesium, par R. de Fleury. Revue de métallurgie, Paris, Nov. 1926, v. 6, no. 11, p. 649-57. diagrs., tables.
- Mechanical properties of pure magnesium and certain magnesium alloys in the wrought condition, by S. L. Archbutt and J. W. Jenkin. London, H. M. Stat. off., 1926. 13 p. diagrs., tables. (A.R.C. R. & M. no. 1037)
- Un Nuovo metallo per l'aeronautica, il magnesio. L'Ala d'Italia, Milano, Apr. 1924, v. 3, no. 4, p. 94. illus.
- L'Emploi des alliages légers dans la construction moderne, par Marc Chauvière. La Technique automobile et aérienne, Paris, Oct. 1923, v. 14, no. 22, p. 74-83. diagrs., illus., tables.

## MAGNESIUM

- Magnesium. Handbook of information relating to the use of magnesium and magnesium alloys as they are made by the American magnesium corp. New York, American magnesium corporation, 1923. 170 p. diags., illus.
- L'Emploi des alliages légers en aéronautique. Le Génie civil, Paris, May 6, 1922, v. 80, p. 404-07. illus.
- Le Leghe leggere in aeronautica, di G. Gallo. L'Aerotecnica, Roma, 1921, v. 1, p. 170-79. diags., illus.

## STEEL - CHROMIUM-NICKEL

- Nickel and its alloys. Aeroplane, London, Dec. 8, 1939, v. 57, p. 707-08. tables.
- Creep of some chromium-molybdenum steels, by H. D. Newell. Metals and alloys, New York, Nov. 1939, v. 9, p. 342-45.
- The Working of S.A.E. nickel alloys steels. American machinist, New York, Oct. 18, 1939, p. 865-76. illus., tables.
- Study of the corrosion resisting properties of Cr-Mn steels, by A. I. De Sy. American society for metals, Cleveland, O., Sep. 1939, v. 36, p. 389-400. diags., illus.
- The Effect of nitrogen additions and heat-treatment on the properties of high chromium steels, by E. W. Colbeck and R. P. Garner. Engineering, London, June 16, 1939, v. 147, p. 726-29.
- Schweissen von chromstählen, von H. Cornelius. Zeitschrift des V.D.I., Berlin, June 1939, v. 83, no. 23, p. 707-12. tables.
- Über die warmformgebung hochlegierter korrosionsbeständiger chrom- und chrom-aluminium-silizium-stähle, von J. Schiffler und W. Hirsh. Technische zeitschrift, Berlin, May 1939, v. 49, no. 9-10, p. 373-76. diags., tables.
- Anodic corrosion resistance of nickel alloys and nickel sheets, by J. L. Bray and F. R. Morral. Transactions of the Electrochemical society, New York, Apr. 1939, v. 75, p. 40.
- Properties of nickel-alloy steels at low temperature, by Nasaru Yamaguchi. Tokyo, Japan nickel information bureau, 1939. 75 p. diags., illus., tables.
- Zeit- und dauerfestigkeit ungeschweisster und stumpfgeschweisster chrom-molybdän-stahlrohren bei verschiedenen zugmittelspannungen, von F. Bollenrath und H. Cornelius. Zeitschrift des V.D.I., Berlin, Dec. 3, 1938, v. 82, no. 49, p. 1412-13. (Also Stahl und eisen, Düsseldorf, Mar. 3, 1938, v. 58, no. 9, p. 241-45 and Jahrbuch der deutschen luftfahrtforschung, München, 1938, p. 1549-53)

## METALS AND LIGHT ALLOYS

- The Development of age hardening alloys. Light metals, London, Dec. 1938, v. 1, no. 11, p. 395-400. diagsr., illus., tables.
- Les Aciers spéciaux dans la construction aéronautique, par Pierre Egge. Revue du nickel, Paris, Nov. 1938, v. 9, no. 6, p. 164-69. illus.
- New development in seamless steel tubing, by W. M. Murray. Journal of the Aeronautical Sciences, New York, Nov. 1938, v. 6, no. 1, p. 20-23.
- Properties of principal fe/cr alloys and fe/cr/ni alloys. Metal progress, Cleveland, O., Oct. 1938, v. 34, no. 4, p. 344-45. illus.
- Untersuchung über die eignung warmfester werkstoffe für verbrennungsmotoren, von F. Bollenrath, H. Cornelius und W. Bungardt. Luftfahrtforschung, München, Sep.-Oct. 1938, v. 15, p. 468-80, 505-10. illus., tables. (Also Jahrbuch der D.V.I., München, 1938, p. 326-44. diagsr., illus., tables)
- Use of high strength Cr-Mn-Si steel in airplane construction, by N. Slessarew. Aviapromyschennost, Moscow, Sep. 1938, no. 9, p. 16-20. illus.
- Corrosion-resisting materials, by Francis A. Fox. Flight, London, July 28, 1938, v. 34, no. 1544, p. 82.
- Welding chromium steels (up to 10% cr) a review of the literature to July 1, 1937, by W. Spraragen and G. E. Claussen. Journal of the American welding society, New York, May, July 1938, v. 17, no. 5, 7, p. 1-7, 1-39. diagsr., illus., tables.
- Verleichende drehversuche an chrom-nickel und chrom-molybdän-baustählen, von W. Blüthgen. Stahl und eisen, Düsseldorf, June 16, 1938, v. 58, p. 646-50. illus., tables.
- La Soudabilité au chalumeau oxy-acétylénique de l'acier au chrome-molybdène employé en construction aéronautique, par W. Bonhomme. Revue universelle des mines, de la métallurgie des travaux publics, Liège, June 1938, v. 14, no. 6, p. 457-61. tables.
- Untersuchung an 18/9 chrom-manganstählen. Metallwirtschaft, Berlin, May 13, 1938, v. 17, p. 509-13. illus.
- Electric heat treating of seamless chromium-molybdenum tubes, by F. Vdovin. Stal, Moscow, May 1938, v. 8, p. 48-54. illus., tables.
- Austenitic chromium-manganese steels. Engineer, London, Apr. 29, 1938, v. 165, p. 123-25. illus., tables.

## STEEL - CHROMIUM-NICKEL

- Heat resisting steels, by W. H. Hatfield. Engineering, London, Apr. 1, 22, 1938, v. 145, p. 372-74, 455-57. illus., tables. (Also Institute of fuels, London, Apr. 1938, v. 11, no. 58, p. 245-304)
- Metals used in aircraft industry, by J. Richard Goldstein. Metal progress, Cleveland, O., Apr. 1938, v. 33, no. 4, p. 357-61. illus. (Also Canadian metals and metallurgical industries, Toronto, Apr. 1938, v. 1, no. 4, p. 110-12, 119) (Abstract Aero digest, New York, July 1938, v. 33, no. 1, p. 46-47, 50)
- Influence of heat treatment on creep of carbon-molybdenum and chromium-molybdenum-silicon steel, by R. A. Miller, R. F. Campbell, R. H. Aborn and E. C. Wright. American society for metals, Cleveland, O., Mar. 1938, v. 26, no. 1, p. 81-105. illus., tables.
- Influenza del vanadio negli acciai al nichel-cromo molibdeno, di H. H. Abram. L'Aerotecnica, Roma, Mar. 1938, v. 18, no. 3, p. 326. (Also Engineering, London, Jan. 8, 1937, v. 143, no. 3704, p. 53)
- Versuche über die metall-lichtbogenschweissung dünner bleche aus chrom-molybdänstahl, von H. Cornelius. Luftfahrtforschung, München, Mar. 1938, v. 15, no. 3, p. 133-40. diagrs., illus., tables.
- Developments in heat-resisting steels, by C. T. Eakin. Iron age, New York, Jan. 6, 1938, v. 141, p. 149-52, 154-57. diagrs., illus., tables.
- Alloys of iron and nickel, by J. S. Marsh. New York, McGraw-Hill book company, 1938. 593 p. diagrs., illus., tables.
- Chromium-manganese steels as heat resisting steels, by J. H. C. Monypenny. Metallurgia, Manchester, England, 1938, v. 17, no. 99, p. 93-96. diagrs., tables.
- Column strength of tubes elastically restrained against rotation at the ends, by W. R. Osgood. Washington, U. S. Govt. print. off., 1938. 38 p. diagrs., illus., tables. (N.A.C.A. Report no. 615)
- Vergleichende untersuchung von nickelhaltigen und nickelfreien stählen auf ihre mechanischen eigenschaften, insbesondere auf ihr verhalten bei der schwingungsprüfung, von A. Pomp und M. Hempel. Mitteilungen aus dem Kaiser-Wilhelm-institute für eisenforschung, Düsseldorf, 1937, 1938, v. 19, no. 16, p. 221-36. diagrs., illus., tables.
- Vergleichende untersuchungen über die durchhärtung von chrom-molybdän-vergütungsstählen, von A. Pomp und A. Krisch. Mitteilungen aus dem Kaiser-Wilhelm-institute für eisenforschung, Düsseldorf, 1938, v. 20, p. 102-23. diagrs.

## METALS AND LIGHT ALLOYS

- A Correlated abstract on corrosion and corrosion resistant metals and alloys, by V. V. Kendall. Metals and alloys, New York, Nov.-Dec. 1937, v. 8, no. 11, 12, p. 313-19, 355-60. illus.
- Further experiments on the nitrogen-hardening of high-chromium and austenitic steels, by B. Jones. Engineering, London, Nov. 19, 1937, v. 144, no. 3749, p. 581-83. illus., tables.
- Einsatzhärtung von stählen mit 14% Cr., von E. Widawski. Archiv für das eisenhüttenwesen, Düsseldorf, Oct. 1937, v. 11, p. 195-98. diagrs.
- On the constitutional diagrams of alloys with nickel as the chief constituent, by Hideo Nishimura. Japan nickel review, Tokyo, Oct. 1937, v. 5, no. 4, p. 440-62. diagrs., illus.
- Vergleichende untersuchungen von nickelhaltigen und nickelfreien stählen auf ihre mechanischen eigenschaften, insbesondere auf ihr verhalten bei der schwingungsprüfung, von A. Pomp und M. Hempel. Luftfahrtforschung, München, Oct. 1937, v. 14, no. 10, p. 511-26. diagrs., illus., tables.
- Exhaust valve steel-materials and design of exhaust poppet valves of internal combustion engines, by C. H. S. Tupholme. Canadian chemistry and metallurgy, Toronto, Sep. 1937, v. 21, p. 313-14. diagrs.
- Metallurgy and the aero engine, by D. R. Pye. Journal of the Institute of metals, London, Sep. 1937, v. 4, p. 9.
- Notes on the grain size of cast ni-cr heat-resisting alloys, by F. K. Ziegler and L. B. Haughwout. Metals and alloys, New York, Aug. 1937, v. 8, p. 225-29. illus.
- Influence of alloying elements on steel, by G. F. Comstock and C. L. Clark. Metallurgia, Manchester, England, May 1937, v. 16, no. 91, p. 5-6. diagrs.
- Einfluss langzeitigen glühens auf kaltverformte, nichtrostende Cr-Ni-stähle, sowie kaltverformung auf ihr kriechverhalten, von H. Cornelius. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, 5, p. 209-14. diagrs., illus.
- Über die weiterentwicklung warmfester werkstoffe für flugzeugtriebwerke, von F. Bollenrath. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, 5, p. 196-203. diagrs., illus., tables.
- Influence du vanadium dans les aciers au nickel-chrome-molybdène, par H. H. Abram. Revue du nickel, Paris, Mar. 1937, v. 8, no. 2, p. 57-58. diagrs., illus.
- Exhaust steels for internal combustion engines. Nickel bulletin, London, Feb. 1937, v. 10, no. 2, p. 27-31. illus., tables.

## STEEL - CHROMIUM-NICKEL

- Molybdenum steels used in building aircraft engines. Machinery, New York, Nov. 1936, v. 43, no. 3, p. 207. illus.
- Metallurgical problems of aero engine manufacture, by E. R. Gadd. Journal of the R.A.S., London, Aug. 1936, v. 40, no. 308, p. 622-33. illus., tables.
- Chrome-molybdenum steel for aircraft, by A. J. Herzig. Aero digest, New York, July 1936, v. 29, no. 1, p. 32-33. diagrs., illus.
- Nickel steels and alloys in aircraft engines. Aero digest, New York, July 1936, v. 29, no. 1, p. 38-39. illus., tables.
- High-strength chromium-nickel steels. American machinist, New York, Feb. 12, 1936, v. 80, p. 165. tables.
- Aircraft requires welding in many parts, by C. de Ganahl. Metal progress, Cleveland, O., Feb. 1936, v. 29, no. 2, p. 61-63. illus.
- Chromium-molybdenum steel used in fabricating the China Clipper. Machinery, New York, Feb. 1936, v. 42, no. 6, p. 405. illus.
- Rapid determination of nickel in "18-and-8" and other high chromium steels and alloys, by F. P. Peters. Metals and alloys, New York, Oct. 1935, v. 6, no. 10, p. 278.
- Impact resistance of certain nickel steels at low atmospheric temperatures, by D. A. Campbell. American society for metals, Cleveland, O., Sep. 1935, v. 23, no. 3, p. 761-81. diagrs., illus.
- The Ductility of chromium austenitic steels at elevated temperatures, by H. D. Newell. American society for metals, Cleveland, O., Mar. 1935, v. 23, no. 1, p. 225-48. diagrs., illus., tables.
- Ricerche sugli acciai per valvole dei motori a scoppio e sulle loro caratteristiche alle temperature elevate, di I. Musatti ed A. Reggiori. Aerotecnica, Roma, Mar. 1935, v. 15, no. 3, p. 299-306. diagrs., illus., tables. (Also Metallurgia italiana, Milano, July-Oct. 1934, v. 26, no. 7, 8, 9, 10, p. 475-98; 569-99; 675-89; 765-93)
- Nickel alloys in aircraft engineering, by Y. Taji. Japan nickel review, Tokyo, Jan. 1935, v. 3, p. 20-29. illus., tables.
- The Use of ferrous metals for aeronautical purposes, by J. R. Hanforth. Metal treatment, London, Jan. 1935, v. 1, no. 1, p. 33-37. illus., tables.
- Nickel alloy steels in the aeronautical industry, by J. A. Rabbitt. Far east review, Shanghai, June 1934, v. 30, p. 274-76. illus.

## METALS AND LIGHT ALLOYS

- Heat-resisting steel 18/8 containing si and al, by M. M. Romanov and O. I. Ver. Metallurgia, Manchester, England, Apr. 1934, v. 9, no. 4, p. 43-52. illus., tables.
- Steel specifications for engines, by B. G. Davis. Popular aviation, Chicago, Apr. 1934, v. 14, no. 4, p. 242.
- Study of the strength of stainless and heat resisting steels at high temperatures, by M. S. Hunter and A. K. Robertson. Pittsburgh, Pa., Carnegie institute of technology, 1934. 64 p. diags., illus., tables.
- Research on valve steels, by G. V. Akimov and A. M. Borzdyka. Teknika vozdušnovo flota, Moscow, Nov.-Dec. 1932, no. 11, 12, p. 1043-62. diags., illus., tables.
- Wärmebeständige chrom-aluminium-stähle, von E. Scheil und E. H. Schulz. Archiv für das eisenhüttenwesen, Düsseldorf, Oct. 1932, v. 6, no. 10, p. 155-68. illus., tables.
- Creep in chromium vanadium steels at high temperatures, by W. Kahlbaum and L. Jordan. Journal of research, Bureau of standards, Washington, Sep. 1932, v. 9, no. 3, p. 441.
- Propriétés et applications du nickel et de ses alliages, par Léon Guillet. Le Génie civil, Paris, June 18, 25, 1932, v. 11, no. 25, 26, p. 613-17; 633-39. diags., illus., tables.
- Heat-resistant nickel-chromium alloys, by W. Hermann. Engineer, London, May 27, 1932, v. 159, p. 76-78. illus.
- Impact properties of austenitic chromium-nickel-steels, by Roy W. Tindula. Pittsburgh, Pa., Carnegie institute of technology, 1932. 58 p. diags., illus., tables.
- Rapid chemical test for identification of chromium-molybdenum steel aircraft tubing, by J. C. Redmond. Washington, 1932. 3 p. (N.A.C.A. Technical notes no. 411)
- Les Aciers au nickel. Position actuelle, par M. Léon Guillet. Revue du nickel, Paris, Oct. 1931, v. 2, 15 p. diags., illus.
- Nickel alloy steel forgings, by Charles McKnight. Western flying, Los Angeles, Cal., Mar. 1931, v. 9, no. 3, p. 77.
- Chromium-molybdenum steel tubes in aeroplane making, by G. V. Akimov. Teknika vozdušnovo flota, Moscow, Feb. 1931, no. 2, p. 90-105. diags., illus., tables.
- Estudio del temple de un acero especial al cromo-vanadio, de J. Navarro Alcacer y G. Gayoso. Revista de ingeniería industrial, Madrid, Jan.-Feb. 1931, v. 2, p. 7-10. illus., tables.

## STEEL - CHROMIUM-NICKEL

- Chromium cast steels resist heat and corrosion, by H. D. Philips. Foundry, New York, Jan. 1, 1931, v. 59, no. 1, p. 65-69.
- Steels for aircraft engines. Metal progress, Cleveland, O., Jan. 1931, v. 19, p. 70-76. diags., illus.
- Endurance and other properties at low temperatures of some alloys for aircraft use, by H. W. Russel and W. A. Welcker, Jr. Washington, 1931. 26 p. illus., tables. (N.A.C.A. Technical notes no. 381)
- Metallurgy of nickel, by V. Y. Mostowitch. New York, Bookniga corporation, 1931. 105 p. diags., illus., tables.
- Le Nickel dans l'aviation, par I. J. Gerard. Aciers spéciaux métaux et alliages, Paris, Dec. 1930, v. 5, no. 64, p. 566-73. illus.
- Vanadium additions improve properties of steel, by N. Petinot. Steel, Cleveland, O., Aug. 21, 28, Sep. 4, 1930, v. 87, no. 8, 9, 10, p. 43-49, 56-57, 60. illus.
- Nature of the nickel-chromium rustless steels, by R. H. Aborn and E. C. Bain. Transactions of the American society for steel treating, Cleveland, O., Sep. 1930, v. 18, p. 857-93. tables.
- The Use of nickel alloys in aircraft engine design. Nickel bulletin, London, June 1930, v. 3, p. 179-86. illus., tables.
- Gas welding chrome-nickel steel, by H. S. Lancing. Welding journal, London, May 1930, v. 27, p. 147. illus.
- Propriétés mécaniques des aciers au nickel et au nickel-chrome, par J. S. Negru. Aciers spéciaux, métaux et alliages, Paris, May 1930, v. 5, no. 57, p. 201-16. illus., tables.
- Nickel-chromium alloys, by J. H. Russell. Metal industry, London, Apr. 4, 18, 1930, v. 36, no. 14, 16, p. 377-380; 429-31.
- Molybdenum steels gaining favor; chromium-molybdenum steels for automobiles and aircraft, by E. E. Thom. Iron age, New York, Jan. 9, 1930, v. 125, no. 2, p. 141-44, 201-02. illus.
- Alloy metals in aircraft construction, by Gardner Turman, Colorado engineer, Boulder, Colo, Jan. 1930, v. 26, no. 2, p. 51, 68, 70. illus.
- Nickel-chromium heat-resisting alloys. Nickel bulletin, London, Jan. 1930, v. 3, no. 1, p. 5.
- Methods for the identification of aircraft tubing of plain carbon steel and chromium-molybdenum steel, by W. H. Mutchler and R. W. Buzzard. Washington, 1930. 27 p. illus. (N.A.C.A. Technical notes no. 350)



## METALS AND LIGHT ALLOYS

- Steel, chromium-molybdenum medium carbon; bars and billets (aircraft use). U. S. Navy department, Washington, U. S. Govt. print off., 1930. p. 1-4. tables. (Specifications no. 46S.23)
- Equilibrium diagram of the nickel-chromium system, by Seiji Nishigori and Matsujiro Hamasumi. Tohoku imperial university, Sendai, Dec. 1929, v. 18, p. 491-502. illus., tables. (Science report no. 7)
- Chromium-molybdenum-steel tubing fuselage construction, by J. H. Kindelberger. S.A.E. journal, New York, Nov. 1929, v. 25, no. 5, p. 474-77. diags., illus.
- An Investigation of the physical properties of certain chromium-aluminum steels, by F. B. Lounsberry and W. R. Breeler. Transactions of the American society for steel treating, Cleveland, O., May 1929, v. 15, no. 5, p. 733-66. diags., illus., tables.
- The Creep of 80:20 nickel-chromium alloy at high temperatures, by A. G. Lobley and G. L. Betts. Journal of the Institute of metals, London, 1929, v. 42, p. 157.
- Chrom-molybdänstahl für den flugzeugbau, von H. Illies. Z.F.M., München, Nov. 14, 1928, v. 19, no. 21, p. 496-97. illus.
- Nickel steel used extensively in airplane engine parts. Iron trade review, Cleveland, O., Nov. 8, 1928, v. 83, no. 19, p. 1186-87, 1190. tables.
- Chrome-molybdenum steel in airplane construction, by J. B. Johnson. Iron age, New York, Apr. 19, 1928, v. 121, no. 16, p. 1076-78. illus.
- Some tests of a chrome-nickel steel at high temperatures, by R. S. MacPherran. Proceedings of the American society for testing materials, Philadelphia, 1927, v. 27, pt. 2, p. 73-77.
- Nickel-chrome alloys, by J. Kent Smith. Metal industry, London, Feb. 9, 1924, v. 22, no. 6, p. 121-22.
- Resistance to corrosion of various types of chromium steels, by Henry S. Rawdon and Alexander I. Krynitsky. Chemical and metallurgical engineering, New York, July 26, 1922, v. 27, p. 171-73.
- Temper brittleness of nickel-chromium steels, by R. H. Greaves and J. J. Jones. Journal of the Iron and steel institute, London, Sep. 1920, v. 102, p. 171-218. illus., tables.
- Étude de l'élasticité de torsion des aciers au nickel à haute teneur en chrome, par P. Chevenard. C. R. Acad. sci., Paris, July 12, 1920, v. 171, p. 93-96. diags.

## STEEL - CHROMIUM-NICKEL

- The Structure of some chromium steels, by J. H. G. Monypenny.  
Journal of the Iron and steel institute, London, May 1920,  
v. 101, no. 1, p. 493-518. diags., illus., tables.
- Nickel-chrome forgings, by J. H. Andrews, J. N. Greenwood and G. W. Green.  
Journal of the Iron and steel institute, London, Sep. 1919, v. 100, no. 11, p. 231-323.
- High-chromium steels for exhaust valves. S.A.E. journal, New York, 1919, v. 5, p. 262-63. illus.

## STEEL - FABRICATION

- The Welding of stainless steel and its alloys, by G. H. Tweney.  
Aero digest, New York, Dec. 1939, v. 35, no. 6, p. 45, 54.  
illus., table.
- The Causes of cracks in welded aircraft steels, by O. Werner.  
Welding journal, London, Nov. 1939, p. 425-28. tables.
- Formation of cracks after welding, by B. Bochenek. Aircraft engineering, London, Nov. 1939, v. 9, p. 428-30. illus.
- Polishing technique for stainless steels, by W. M. Mitchell. Iron age, New York, Oct. 19, 26, 1939, v. 144, p. 56-59, 92-94; 32-35, 92. illus.
- The Effect of alloying on metallic arc welding, by R. W. Emerson.  
Welding journal, London, Oct. 1939, v. 36, p. 381-92. illus.
- Further studies of the spot welding of low carbon and stainless steels, by Wendel F. Hess and Robert A. Wyant. Welding journal, New York, Oct. 1939, v. 18, no. 10, p. 348-54. illus., tables.
- Steel castings in aircraft, by Alexander Finlayson. Iron and steel, New York, Oct. 1939, v. 13, p. 11-13, 16.
- Drop forging of steel and light alloys, by K. Daeves and A. Riston.  
Metal treatment, July-Sep. 1939, v. 5, no. 18, p. 82-86. tables.
- La Soudure des aciers inoxydables. La Pratique des industries mécaniques, Paris, Aug. 1939, v. 22, no. 5, p. 199-201. table.
- Lichtbogenschweissung von chrom and- silizium-und chrom-molybdänstählen, von G. Knjasen. Flugzeugindustrie, Berlin, June 1939, v. 7, no. 6, p. 77-79. diags.
- Schweissen von chromstählen, von H. Cornelius. Zeitschrift des V.D.I., Berlin, June 1939, v. 83, no. 23, p. 707-12. tables.

## METALS AND LIGHT ALLOYS

- Cold forming operations of stainless steels, by W. M. Mitchell. American machinist, New York, May 3, 1939, p. 290-92. diags., illus.
- Über die warmformgebung hochlegierter, korrosionsbeständiger chrom- und chrom-aluminium-silizium-stähle, von J. Schiffler und W. Hirsch. Technische zeitschrift, Berlin, May 1939, v. 49, no. 9, 10, p. 373-76. diags., tables.
- The Fabrication and welding of stainless alloys, by A. J. Moses. Welding journal, London, Apr. 1939, p. 238-40.
- Die Härtung borhaltiger austenitischer chrom-nickel-stähle beim anlassen, von H. Cornelius. Archiv für das eisenhüttenwesen, Düsseldorf, Apr. 1939, v. 12, no. 10, p. 499-505. illus.
- Projet de spécifications relatives aux essais de soudabilité des aciers pour les constructions aéronautiques. Soudure au chalumeau et soudure par points. Revue de la soudure auto-gène, Paris, Apr. 1939, v. 31, no. 301, p. 654-60. diags.
- Werkstoff, gestaltung und behandlungsfragen bei stählen im flugmotorenbau, von H. Wiegand. Deutsche luftwacht, Berlin, Apr. 1939, v. 6, no. 4, p. 47-53. diags., illus., tables.
- Sonderaufgaben der lichtbogenschweisstechnik mit besonderer berücksichtigung der schweissung hochlegirter stähle und nichteisenmetalle, von F. von Womaczka. Elektrotechnik und maschinenbau, Wien, Mar. 31, 1939, v. 57, no. 13, p. 178-89. diags., illus.
- The Manufacture of composite metals by carbon arc welding, by R. E. Kinkead. Mechanical world and engineering record, Manchester, England, Mar. 10, 1939, p. 246-47. diags., illus. (Also Metropolitan-vickers news bulletin, London, Mar. 17, 1939, no. 652, p. 5)
- The Manufacture of tubes for aircraft, by W. Hackett, Jr. Aircraft engineering, London, Mar. 1939, v. 11, no. 121, p. 137. illus.
- Über die ursachen der schweissrissigkeit bei flugzeugstählen, von O. Werner. Archiv für das eisenhüttenwesen, Düsseldorf, Mar. 1939, v. 12, no. 9, p. 449-55. illus., tables.
- Shearing, blanking, drawing, spinning, forming and riveting of stainless steel. Iron age, New York, Feb. 2, 1939, v. 143, p. 37-41. illus.
- Welding coated steel, by W. Spraragen and G. E. Claussen. Welding journal, New York, Feb. 1939, v. 18, no. 2, p. 33-43. diags., illus. (Abstract Metropolitan-vickers news bulletin, London, Mar. 3, 1939, no. 650, p. 4)

## STEEL - FABRICATION

- Festigkeitseigenschaften und schweisbarkeit dünner bleche aus hochfesten baustählen, von H. Cornelius und F. Bollenrath. Archiv für das eisenhüttenwesen, Düsseldorf, Jan. 1939, v. 12, no. 7, p. 335-39. illus. (Abstract Welding journal, New York, Apr. 1939, v. 18, p. 150-52)
- Notes on welding practice, by J. G. Waterhouse and A. R. Mowbray. Aircraft engineering, London, Jan. 1939, v. 11, no. 119, p. 27.
- Schweisstrukturen, von R. Hünchen. Berlin, J. Springer, 1939. 123 p. diagrs., illus., tables.
- Steel and its heat treatment, by Denison Kingsley Bullens. London, John Wiley and sons, 1938-1939. v. 1, 2; 936 p. diagrs., illus., tables.
- Das Verhalten von stählen und leichtmetallen beim gesenkschmieden, von K. Daeves und A. Ristow. Stahl und eisen, Düsseldorf, Dec. 22, 1938, v. 58, p. 1451-57. diagrs., illus.
- Flame hardening and molybdenum steels. Alloy metals revue, Lancashire, England, Dec. 1938, v. 2, no. 12, p. 42-44.
- Herstellung und eigenschaften dünnwandiger nahtgeschweißter rohre aus stählen höherer festigkeit, von H. Cornelius. Autogene metallbearbeitung, Halle, Nov. 15, 1938, v. 31, no. 22, p. 361-64. illus., table.
- New development in seamless steel tubing, by W. M. Murray. Journal of the Aeronautical sciences, New York, Nov. 1938, v. 6, no. 1, p. 20-23.
- Stainless steel welding, by V. W. Whitmer. Sheet metal industry, London, Nov. 1938, p. 1299-1302. (Abstract Metropolitan-vickers technical news bulletin, London, Nov. 11, 1938, no. 634, p. 5)
- Der Einfluss von kohlenstoff und mangan auf die schweisbarkeit von stahl, von H. Cornelius. Zeitschrift des V.D.I., Berlin, Oct. 1938, v. 82, no. 41, p. 1200-03. tables.
- Characteristics and fabrication of stainless steels containing more than 14% chromium, by V. N. Krivobok. Metal progress, Cleveland, O., July-Sep. 1938, v. 34, p. 47-52, 135-39, 223-29.
- Forgings for aircraft, manufacture and inspection, by W. Naujoks. Metal progress, Cleveland, O., Sep. 1938, v. 34, p. 247-52. (Also Canadian metals and metallurgical industries, Toronto, July 1938, v. 1, p. 190-95)
- Welding of silicon steels, by W. Spraragen and G. E. Claussen. Welding journal, London, Sep. 1938, p. 1-7. (Abstract Metropolitan-vickers technical news bulletin, London, Sep. 30, 1938, no. 628, p. 7)

## METALS AND LIGHT ALLOYS

Production of forgings for aircraft, by W. Naujoks. Industrial heating, Pittsburgh, Pa., July, Aug. 1938, v. 5, p. 594-98, 700-02.

Submersion hardening of steels after saturation of the surface with glucinum, by J. Kontorovitsch and M. Lvovski. Teknika vozdušnovo flota, Moscow, July 1938, no. 7, p. 29-38. illus., tables.

Manipulation of stainless steel for aircraft, by Carl de Gareabel and W. L. Sutton. Aero digest, New York, July 1938, v. 33, no. 1, p. 44-45. illus.

The Nitriding process of metal hardening, by B. Clements. Aero digest, New York, July 1938, v. 33, no. 1, p. 74. diagr., illus.

An Installation for the heat treatment of aircraft parts, by H. Mansfield. Industrial heating, Pittsburgh, Pa., June 1938, v. 5, p. 491-94, 548.

Metallurgy and aircraft construction. Metallurgia, Manchester, England, June 1938, v. 18, no. 104, p. 49.

Thermal expansion and effects of heat treatments on the growth, density and structure of some heat resisting alloys, by P. Hidnert. Journal of research, Bureau of standards, Washington, June 1938, v. 20, no. 6, p. 809-24. illus., tables.

Welding stainless steel, by T. R. Lichtenwalter. Steel, Cleveland, O., May 16, 1938, v. 102, p. 64-65.

The Working of stainless steel. Machinist, London, May 11, 1938, v. 52, no. 1335, p. 869-80.

Roll forming of aircraft sections. Machinery, London, May 5, 1938, v. 52, no. 1334, p. 131-32.

Stainless steel soldered, brazed and welded, by C. A. Crowley. Popular mechanics, Chicago, May 1938, v. 69, p. 788-93. illus.

Welding stainless steel, by W. D. Wilkinson, Jr. Western flying, Los Angeles, Cal., May 1938, v. 18, no. 5, p. 12-14. illus., tables.

Detection of electric welding faults by x-rays, by J. E. de Graaf. Welding journal, London, Apr. 1938, v. 17, p. 93-96. (Also Metropolitan-vickers technical news bulletin, London, Apr. 22, 1938, no. 607, p. 13)

The Effect of nitrogen on the welding of steel, by W. Sprzragen and G. E. Claussen. Welding journal, London, Apr. 1938, p. 9-29. illus., tables.

## STEEL - FABRICATION

- Shrinkage distortion and shrinkage stresses in welding, by G. E. Claussen. *Welding journal*, New York, Mar. 1938, v. 17, no. 3, p. 17-21.
- Sull'invecchiamento del ferro ed acciaio trafilato, di R. Ariano. *L'Aerotecnica*, Roma, Mar. 1938, v. 18, no. 3, p. 326.
- Versuche über die metall-lichtbogenschweissung dünner bleche aus chrom-molybdänstählen, von H. Cornelius. *Luftfahrtforschung*, München, Mar. 1938, v. 15, no. 3, p. 133-40. illus., tables.
- Effect of hot-working processes on the primary grain size of carbon steel, by I. Feszczenko-Czopowski and A. Szczepanski. *Lotnik*, Katowice, Poland, Feb. 1938, v. 10, p. 66-81. diagsr., illus.
- Fatigue resistance of welded joints; a summary of published German investigations, by L. F. Denaro. *Transactions of the Institute of welding*, London, Jan. 1938, v. 1, p. 52-58.
- Report of subcommittee on welding of low alloy steels, by J. H. Critchett. *Welding journal*, New York, Jan. 1938, v. 17, p. 8-14. illus.
- Crack formation factors in welded steel parts of airplanes and how to eliminate them, by I. Brailovski. *Aviapromyslennost*, Moscow, 1938, no. 7, p. 12-23. illus., tables.
- Notes on the case-hardening of iron and steel with special reference to flame hardening, by R. H. Harriss. *Journal of South African institution of engineers*, Johannesburg, 1938, v. 36, p. 178-97. illus.
- Versuche und erfahrungen mit elektrischer punktschweissung bei den Aradoflugzeugwerken, von K. Reichel. (*In Jahrbuch 1938 der deutschen luftfahrtforschung*, Berlin, p. 538-48. illus., tables.)
- Working and heat treating of steel, by Robert Henry Harcourt. Stanford, Cal., Stanford university book store, 1938. 261 p. diagsr., illus.
- Welding stainless and alloy steels, by T. R. Lichtenwalter. *Iron age*, New York, Dec. 9, 1937, v. 140, no. 24, p. 106-08. illus.
- Bright annealing of seamless steel aircraft tubing, by H. R. Lewis. *Metals and alloys*, New York, Dec. 1937, v. 8, no. 12, p. 331-34. illus.
- Pre-forming metal sheets in U.S.A., by Alexander Klemin. *Aircraft engineering*, London, Dec. 1937, v. 9, no. 106, p. 325-27. diagsr., illus.

## METALS AND LIGHT ALLOYS

- New high-speed steel treatment, Automotive industries, Philadelphia, Nov. 20, 1937, v. 77, no. 21, p. 759. illus.
- Further experiments on the nitrogen hardening of high chromium and austenitic steels, by B. Jones. Engineering, London, Nov. 19, 1937, v. 144, no. 3749, p. 581-83. illus., tables.
- Einsatzhärtung von stählen mit 14% Cr., von E. Widawski. Archiv für das eisenhüttenwesen, Düsseldorf, Oct. 1937, v. 11, p. 195-98. illus.
- Heat treat; metal processing is the secret of strength in the modern airplane structure, by E. R. Smith. Western flying, Los Angeles, Cal., Oct. 1937, v. 12, no. 10, p. 15-17, 24. illus.
- Das Schweißen von nichtrostenden nickelfreien chromstählen, von W. Tofaute. Zeitschrift des V.D.I., Berlin, Sep. 13, 1937, v. 81, no. 38, p. 1117-22. illus., tables.
- Welding of stainless steel, by V. W. Whitmer. Welding journal, New York, Sep. 1937, v. 16, no. 9, p. 8-19. diagrs., illus., table.
- Embrittling effects of tempering steel, by M. Ballay. Engineer, London, Aug. 27, 1937, v. 164, no. 4259, p. 53-54. table.
- Influence of cold work on austenitic grain size, by Albert M. Portevin. Metal progress, Cleveland, O., Aug. 1937, v. 32, p. 166-67.
- Oxy-acetylene welding of stainless steel. Industry and welding, Cleveland, O., Aug. 1937, v. 10, p. 47-49.
- The Tocco process of hardening, by W. E. Benninghoff. S.A.E. journal, New York, Aug. 1937, v. 41, no. 2, p. 370-71. illus.
- Alloy steels; their characteristics, fabrication and heat treatment, by H. C. Knerr. Aero digest, New York, July 1937, v. 31, no. 1, p. 28-29. illus., tables.
- Metallurgical quality in forgings, by E. O. Dixon. Aero digest, New York, July 1937, v. 31, no. 1, p. 38, 40, 50. illus., table.
- Über den praktischen wert einiger tiefziehprüfkennzahlen, von Otto Andrieu. Drahtwelt, Leipzig, July 1937, v. 30, no. 7, p. 45-48.
- Über weichglühen nahtloser rohre nach erfolgter kaltverformung, von Alfred Krüger. Drahtwelt, Leipzig, June 26, 1937, v. 30, no. 6, p. 37-42. diagrs.

## STEEL - FABRICATION

- Zur frage der schweissempfindlichkeit von flugzeugbaustählen, von F. Bollenrath und H. Cornelius. Archiv für das eisenhüttenwesen, Düsseldorf, June 1937, v. 10, no. 12, p. 563-76. illus., tables.
- Studio sul controllo delle saldature ossiacetileniche in aeronautica, di E. Zavattiero. L'Aerotecnica, Roma, May 1937, v. 17, no. 4, p. 415-42. diags., illus. (Also Metallurgia italiana, Roma, July 1937, v. 29, p. 337-49)
- Einfluss langzeitigen glühens auf kaltverformte, nichtrostende Cr-Ni-stähle, sowie kaltverformung auf ihr kriechverhalten, von H. Cornelius. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, 5, p. 209-14. diags., illus.
- Case hardening and chromium plating data requested, by H. K. Cummings. S.A.E. journal, New York, Apr. 1937, v. 40, no. 4, p. 164. illus., tables.
- Sheet metal working processes. Aircraft engineering, London, Apr. 1937, v. 9, no. 98, p. 104-05. illus.
- Steel hard-facing procedure, by E. E. LeVan. Welding journal, London, Apr. 1937, v. 16, no. 4, p. 32-36. illus.
- La Soudure des aciers inoxydables, par M. Boutte. Revue du nickel, Paris, Mar. 1937, v. 8, no. 2, p. 35-38. illus. (Abstract L'Aerotecnica, Roma, Mar. 1938, v. 18, no. 3, p. 327)
- Will x-ray widen use of steel castings? by W. G. Wood. S.A.E. journal, New York, Mar. 1937, v. 40, no. 3, p. 122-29. illus.
- Heat treated alloy steel, the lightest material of construction, by Horace C. Knerr. Metal progress, Cleveland, O., Jan. 1937, v. 31, no. 1, p. 37-41. illus. (Abstract Aero digest, New York, July 1937, v. 31, no. 1, p. 28-29)
- Heat treating equipment at Consolidated aircraft corporation. Iron and steel industry, London, Jan. 1937, v. 31, p. 53-55. diags.
- Electric welding of molybdenum steel, by M. N. Merksin and E. A. Aleksejev. Sovietskoje kotloturbostroenie, Moscow, 1937, no. 9, 10, p. 467-70. illus., tables.
- Heat treating large aircraft parts, by J. K. Ball. Heat treating and forging, Pittsburgh, Pa., Dec. 1936, v. 22, no. 12, p. 629-32. illus. (Abstract S.A.E. journal, New York, Feb. 1937, v. 40, no. 2, p. 67.
- General principles of heat treatment with special reference to steel, by F. C. Thompson. Iron and steel industry, London, Sep.-Nov. 1936, v. 9, 10, p. 517-20; 125-28; 177-79. illus.



## METALS AND LIGHT ALLOYS

- The Quench-aging of commercial mild steel, by J. A. Jones. Engineer, London, Oct. 30, 1936, v. 10, p. 171-73. tables.
- Heat treatment by Boeing, by H. Mansfield. American machinist, New York, Oct. 7, 1936, v. 80, no. 21, p. 861-63.
- Boeing aircraft company modernizes heat treating department. Western machinery and steel world, San Francisco, Cal., Sep. 1936, v. 27, no. 9, p. 321-22. illus. (Also Heat treating and forging, Pittsburgh, Pa., July 1936, v. 22, no. 7, p. 351-52)
- Production of cold-rolled strip. Sheet metal industries, London, Sep. 1936, v. 10, no. 113, p. 669-71.
- Welding of aircraft structures, by J. B. Johnson. Welding journal, New York, Sep. 1936, v. 15, no. 9, p. 2-11. diagsr.
- Surface hardening of steel, by C. T. Eakin. Iron age, New York, July 23, 1936, v. 138, no. 4, p. 25-29. illus., tables.
- Über die weichlötung von stahlblechen und ihre verwendung im flugzeugbau, von A. Sambras. Luftfahrtforschung, München, June 20, 1936, v. 13, no. 6, p. 190-98. diagsr.
- Modern heat treating plant for aircraft steel is all-electric, Boeing aircraft company. Steel, Cleveland, O., June 1936, v. 98, no. 23, p. 49-50. illus.
- Stainless steels in aircraft construction, by W. L. Sutton. Metal progress, Cleveland, O., June 1936, v. 29, no. 6, p. 40-44.
- Nitralloy cylinder barrels for airplane engines. Metals and alloys, New York, May 1936, v. 7, p. 119-21.
- Beitrag zur frage der schweissempfindlichkeit dünnwandiger teile aus stählen höherer festigkeit, von F. Bollenrath und H. Cornelius. Luftfahrtforschung, München, Apr. 20, 1936, v. 13, no. 4, p. 18-24. diagsr.
- Tubing in aircraft. The manufacture and uses of steel, aluminum and magnesium alloy tubes, by A. E. Reynolds. Flight, London, Mar. 26, 1936, v. 29, no. 1422, p. 328d-f.
- Case hardening of iron and iron alloys by beryllium, by J. Laissus. Mechanical engineering, New York, Mar. 1936, v. 58, no. 3, p. 184-85.
- Use of forgings in modern aircraft, by P. N. Jansen. Aero digest, New York, Mar. 1936, v. 28, no. 3, p. 44. illus.
- Weldability of high-tensile steels, by J. Mueller. Mechanical engineer, New York, Mar. 1936, v. 58, no. 3, p. 188.

## STEEL - FABRICATION

- Aircraft requires welding in many parts, by C. De Ganahl. Metal progress, Cleveland, O., Feb. 1936, v. 29, no. 2, p. 61-63.
- Nitriding of austenitic steels, by W. R. Jones. Metal progress, New York, Feb. 1936, v. 29, no. 2, p. 39.
- Welding properties of corrosion-resisting alloy steels improved with columbium, by W. J. Priestley. National petroleum news, Cleveland, O., Jan. 29, 1936, v. 28, p. 29-30, 72.
- Some factors affecting the machinability of steel and other elements. Metal progress, Cleveland, O., Jan. 1936, v. 29, no. 1, p. 31.
- Aluminum as an alloying element in nitriding steels, by Robert Sergeson and R. L. Rolf. (In their Metals handbook. Cleveland, O., American society for metals, 1936, p. 363-64. table)
- Hardening iron and steel with the oxy-acetylene flame, by R. L. Rolf and Robert Sergeson. (In their Metals handbook. Cleveland, O., American society for metals, 1936, p. 685-87. tables)
- Improved fabrication of 18-8 chromium steels, by Donald R. Pratt. Welding journal, New York, Dec. 1935, v. 14, no. 12, p. 16-19. illus.
- Die Warmbehandlung von konstruktionsstählen, von H. Kallen und Hans Schrader. Zeitschrift des V.D.I., Berlin, Nov. 30, 1935, v. 79, no. 48, p. 1439-42. diags., illus., tables.
- Cold pressing and drawing; the metallurgical aspect, by C. H. Desch. Journal of the R.A.S., London, Nov. 1935, v. 39, no. 299, p. 1077-80.
- Heat treatment of steel, by R. L. Rolf. Heat treating and forging, Pittsburgh, Pa., Oct. 1935, v. 21, no. 10, p. 477.
- Notes on welding important groups of stainless steel, by Ernest Thum. Metal progress, Cleveland, O., Oct. 1935, v. 28, no. 4, p. 111-16. diags., illus., tables.
- Cold drawing alloy steel, by R. Saxton. Heat treating and forging, Pittsburgh, Pa., Sep. 1935, v. 21, no. 9, p. 430-32. diags.
- Selecting the proper hardening treatment, by H. W. McQuaid. Metal progress, Cleveland, O., Sep. 1935, v. 27, no. 3, p. 25.
- Stahlrohre für den flugzeugbau und ihre schweissverbindungen, von W. Hoffmann. Zeitschrift des V.D.I., Berlin, Sep. 1935, v. 79, no. 38, p. 1145-48. diagr., illus., tables.

## METALS AND LIGHT ALLOYS

- A Note on some results concerning the variation of chemical composition in the gas-welding of ordinary steels, by Albert M. Portevin and A. Leroy. *Welding journal*, New York, Aug. 1935, v. 14, no. 8, p. 9-11. diags.
- Heat treatment of metals used in aircraft; steel and duralumin, by Horace C. Knerr. *Aero digest*, New York, July 1935, v. 27, no. 7, p. 22-24. illus., tables.
- Örtliche oberflächenhärtung von kurbelwellen, von H. Voss. *Zeitschrift des V.D.I.*, Berlin, June 15, 1935, v. 79, no. 24, p. 743-49. diags., illus.
- Einfluss der legierungselemente auf das verhalten von stählen bei der einsatzhärtung, von Edward Houdremont und Hans Schrader. *Archiv für das eisenhüttenwesen*, Düsseldorf, Apr. 1935, v. 8, no. 10, p. 445-59. diags., illus., tables. (*Abstract Engineer*, London, Oct. 25, 1935, v. 160, no. 4163, p. 67-68)
- Das Schweißen der warmfesten und hitzebeständigen stahllegierungen, von H. Schottky. *Zeitschrift des V.D.I.*, Berlin, Jan. 12, 1935, v. 79, no. 2, p. 41-46. diags., illus.
- Einfluss des alterns der stähle auf deren dauerfestigkeit, von F. Körber und M. Hempel. *Mitteilungen aus dem Kaiser Wilhelm institute für eisenforschung*, Düsseldorf, 1935, v. 17, no. 292, p. 247-57. diags., tables.
- Heat treatment and metallography of steel, by H. C. Knerr. Philadelphia, H. C. Knerr, Temple university, 1935. 161 p. diags., illus., tables.
- Weldability of high-tensile steels from experience in airplane construction, with special reference to welding crack susceptibility, by J. Müller. Washington, 1935. 25 p. diags., illus. (N.A.C.A. Technical memorandums no. 779) (*From Luftfahrtforschung*, Berlin, Oct. 1, 1934, v. 11, no. 4, p. 93-103)
- The Working, heat treating and welding of steel, by H. L. Campbell. New York, John Wiley and sons, 1935. 185 p. diags., illus., tables.
- Beitrag zur frage der anlass-sprödigkeit, von W. Bischof. *Archiv für das eisenhüttenwesen*, Düsseldorf, Dec. 1934, v. 8, no. 7, p. 293-301. diags., illus., tables.
- Einfluss der wärmebehandlung auf die rissbildung bei stählen, von E. Scheil, *Archiv für das eisenhüttenwesen*, Düsseldorf, Dec. 1934, v. 8, no. 7, p. 309-14. diags., illus., tables.
- Oxy-acetylene welding and cutting in metal working, by W. S. Walker. Iron and steel engineer, Pittsburgh, Pa., Dec. 1934, v. 11, p. 479-84. illus.

## STEEL - FABRICATION

- Drawing and polishing stainless steel, by R. F. Johnston. Machinery, New York, June 1934, v. 40, no. 10, p. 589-90.
- Stainless steel in aircraft construction, by F. Flader. Transactions of the A.S.M.E., New York, May 1934, v. 56, no. 5, p. 295-300.
- Les Récents progrès de la cémentation des aciers par le carbone, par Léon Guillet. Le Génie civil, Paris, Jan. 6, 13, 20, 27, 1934, v. 104, no. 1, 2, 3, 4, p. 7-12, 29-36, 58-62, 82-85.
- Utmattingshaall fasthet nos kallvalsat staal foer flyplan, utaf Otto Fredrik Forsman. Ingenioers vetenskaps akademien, Handlinger, Stockholm, 1934, no. 127, 16 p. (Also Statens prooningsanstalt - report, 1934, no. 60, 16 p.)
- Die Auswirkung neuerer erkenntnisse der werkstoffforschung auf den luftfahrzeugbau, von P. Brenner. Z.F.M., München, Sep. 28, 1933, v. 24, no. 18, p. 497-505. illus.
- Research in the speed of steel heating, by V. F. Kopitov and P. V. Sorokin. Aviapromyschlenost, Moscow, July-Aug. 1933, no. 6, p. 15-21. diagrs., tables.
- Krupp-nitrierhärtung. Z.F.M., München, July 28, 1933, v. 24, no. 14, p. 405.
- Sur la corrosion des soudures d'aciers doux, par Francis Meunier. C. R. Acad. sci., Paris, Jan. 23, 1933, v. 196, no. 4, p. 271-73. diagrs., tables. (Abstract Le Génie civil, Paris, Feb. 4, 1933, v. 102, no. 5, p. 118)
- Scaling of steel at heat-treating temperature, by C. Upthegrove. Ann Arbor, Mich., University of Michigan, 1933. 36 p. diagr., illus. (Engineering research bulletin no. 25)
- Neue wege der stahlhärtung, von Otto Gassner. Automobiltechnische zeitschrift, Berlin, Nov. 25, 1932, v. 35, no. 22, p. 552-53. (Abstract Journal of the R.A.S., London, Sep. 1933, v. 37, p. 810)
- Oil quenching of steel. An analysis of the properties of various oils showing their relative suitability, by E. C. J. Marsh and E. Mills. Aircraft engineering, London, Oct. 1932, v. 4, no. 44, p. 255-58. diagrs., tables.
- Heat treatment, by J. Geschelin. Automotive industry, Philadelphia, Sep. 3, 1932, v. 67, no. 10, p. 291-92, 316. (Abstract Journal of the R.A.S., London, May 1933, p. 459)
- Grundlagen für die konstruktive anwendung und ausführung von stahlrohrschweissung im flugzeugbau, von A. Rechtlich. Autogene metallbearbeitung, Halle, Sep. 1, 1932, v. 25, no. 17, p. 258-66.

## METALS AND LIGHT ALLOYS

- Developments in aircraft welding, by J. B. Johnson. Welding, Pittsburgh, Pa., Sep. 1932, v. 3, no. 9, p. 519-22. illus.
- Le Durcissement superficiel des aciers; cémentation, nitruration, etc., par M. Galibourg. Journal de la Société des ingénieurs de l'automobile, Paris, July-Sep. 1932, 20 p. diagrs., illus.
- Shot welding stainless steel in aircraft construction, by E. J. W. Ragsdale. Welding, Pittsburgh, Pa., Aug. 1932, v. 3, no. 8, p. 471-73. (Also Aviation, New York, Apr. 1932, v. 31, no. 4, p. 177-79)
- Les Aciers austénitiques inoxydables. Leur durcissement, essais de corrosion activés, soudure autogène, décapage, traitement thermique, laminage, chaudronnage et moulage, emboutissage, usinage. Revue du nickel, Paris, July 1932, v. 3, 52 p. diagrs., illus.
- Note sur la nitruration des aciers (Société Hispano-Suiza). La Technique aéronautique, Paris, Apr.-June 1932, v. 23, no. 124, p. 99-105. tables.
- Drop forgings and stampings, by W. A. Thain. Aircraft engineering, London, Apr.-May 1932, v. 4, no. 38, 39, p. 96-97, 120-22. illus.
- Houghton on quenching; a treatise on the quenching of steel, by E. F. Houghton. Philadelphia, E. F. Houghton and company, 1932. 69 p. diagrs., illus., tables.
- Investigation in the nitrogen-hardening of steels. Pt. 1 - The nitriding properties of nitralloy steels with special reference to the effect of the constituent elements, by B. Jones and H. E. Morgan. Iron and steel institute, London, 1932, v. 21, p. 39. diagrs.
- Heat treatment for aircraft engine crankshafts, by E. F. Lake. Heat treating and forging, Pittsburgh, Pa., Aug. 1931, v. 17, no. 8, p. 763-67. illus.
- Spot welding of stainless steel, by J. F. Hardecker. Airway age, New York, July 4, 1931, v. 13, no. 1, p. 37-39. illus.
- The Machining of stainless steel, by R. Wasdell and F. Worton. Aeroplane, London, Apr. 29, 1931, v. 40, no. 17, p. 784-90. illus. (Also Mechanical world and engineering record, Manchester, England, Jan. 16, 23, 1931, v. 89, no. 2298, 2299, p. 58-59, 80-82 and Machinery, London, Jan. 8, 1931, v. 37, no. 952, p. 491-93)
- The Effect of various annealing temperatures on cold worked low carbon steel, by H. E. Publow, C. M. Heath and R. A. Gezelius. East Lansing, Mich., Engineering experiment station, Mar. 1931. 17 p. diagrs., illus.

## STEEL - FABRICATION

- Heat treatment of aircraft engine parts, by R. L. Moore. Fuels and furnaces, Pittsburgh, Pa., Mar. 1931, v. 9, no. 3, p. 279-89. illus.
- Importance of correct heat treatment of aircraft parts, by F. T. Sisco. Black and white (Metal edition) Philadelphia, Mar. 1931, v. 3, no. 5, p. 4-8. illus.
- Les Aciers nitrurés; leurs applications. La Nature, Paris, Dec. 1, 1930, v. 58, pt. 2, p. 525-26.
- The Case-hardened steels in aircraft, by L. S. Reid. Aviation engineering, London, Nov. 1930, v. 3, no. 11, p. 9-11. illus.
- La Tecnica delle saldature ossiacetileniche degli acciai nella costruzione dei velivoli, di F. Bonifacio. Ala d'Italia, Roma, Oct. 1930, v. 9, no. 10, p. 833-36. illus.
- What heat treatment has done for aircraft engine parts, by R. L. Moore. Iron age, New York, Sep. 11, 1930, v. 126, no. 9, p. 677-79, 757.
- Notably light airplane wings of alloy steel heat treated. Iron age, New York, Aug. 21, 1930, v. 126, no. 8, p. 485. illus.
- Metallurgy for Wasps and Hornets, by John Haydock. American machinist, New York, July 31, 1930, v. 73, p. 189-92.
- Arc welding of stainless and corrosion resistant steels, by R. D. Thomas. Welding journal, New York, July 1930, v. 9, p. 90-98. diags., illus. (Also Iron and coal trades review, London, June 19, 1930, v. 86, p. 59-62)
- Heat treatment of aircraft parts, by Horace C. Knerr. Proceedings of the American society for testing materials, Philadelphia, June 23, 27, 1930, v. 30, p. 154-70, 212-14. illus. (Also Iron age, New York, Aug. 29, 1929, v. 124, no. 9, p. 519-24)
- Heat treating aircraft materials, by J. W. Urquhart. Heat treating and forging, Pittsburgh, Pa., June 1930, v. 16, p. 743-46. diags.
- Gas welding chrome-nickel steel, by H. S. Lancing. Welding journal, London, May 1930, v. 27, p. 147. illus.
- Two fundamentals in aircraft welding, by K. Perkins. Western machinery and steel world, San Francisco, Cal., Apr. 1930, v. 21, no. 4, p. 141-43. illus. (Also Iron trade review, Cleveland, O., Feb. 6, 1930, v. 86, no. 6, p. 77-78, 80 and Western flying, Los Angeles, Cal., Jan. 1930, v. 7, no. 1, p. 78)
- Gas welding in the aircraft industry, by C. E. Kirkbrude. Modern machine shop, Cincinnati, O., Mar. 1930, v. 2, p. 54-61.

## METALS AND LIGHT ALLOYS

- Research on cold rolled steel used in aeroplane making, by G. V. Akimov. *Teknika vozdušnovo flota*, Moscow, Mar. 1930, no. 3, p. 182-95. diags., illus., tables.
- Specialized manufacture of parts aid small airplane builder. *Iron trade review*, Cleveland, O., Feb. 13, 1930, v. 86, no. 7, p. 45-48. illus.
- Airplane welding, by J. B. Johnson. Chicago, Goodheart Wilcox company, 1930. 295 p. diags., illus., tables.
- Applications of stampings, forgings and castings in aircraft construction, by H. G. Runde. (*In* Symposium on aircraft materials. Philadelphia, American society for testing materials, 1930, p. 56-66. illus.)
- Lectures on steel and its treatment, by John F. Keller. Cleveland, O., American society for metals, 1930. 329 p. diags., illus., tables.
- Heat-treating aircraft engine bearing. *American machinist*, New York, Dec. 26, 1929, v. 71, p. 1041-42.
- Welding of steel and light alloys, by V. N. Burtzev. *Teknika vozdušnovo flota*, Moscow, Nov. 1929, no. 11, p. 712-23. illus.
- Heat treated stainless steel tubes, by A. I. Findley. *Iron age*, New York, Oct. 31, 1929, v. 124, no. 18, p. 1157-60. diags., illus.
- Heat treatment of alloy steels in airplane work, by C. E. Phillips. *Aviation*, New York, Oct. 19, 1929, v. 27, no. 16, p. 781-83. illus. (*Also* *Machinery*, New York, Aug. 1929, v. 35, no. 12, p. 343-45 and *Iron trade review*, Cleveland, O., Aug. 1929, v. 85, p. 325-29)
- Welding of rust-resisting steels. *Engineer*, London, Oct. 1929, v. 135, p. 147-49.
- Heat-treatment of airplane parts, by R. F. Johnston. *American machinist*, New York, Sep. 5, 1929, v. 71, no. 10, p. 389-90. illus.
- The Welding of stamped and formed aircraft parts, by S. C. Clark and W. I. Gaston. *Metal stampings*, Pittsburgh, Pa., Sep. 1929, v. 2, no. 9, p. 709-12. illus.
- Welding experience gained by one aircraft builder, by Harold A. Backus. *Airway age*, New York, June 1929, v. 10, no. 6, p. 801-05. illus.
- Welded airplane joints. *American machinist*, New York, May 30, 1929, v. 70, no. 22, p. 859-62. illus.

## STEEL - FABRICATION

- Aircraft metallurgy, by Horace C. Knerr. Aviation engineering, New York, Mar.-Apr. 1929, v. 2, no. 3, 4, p. 7-12, 20-24. illus. (Also American society for steel treating, Cleveland, O., May 1928, v. 13, no. 5, p. 723-53)
- Heat treatment, uses and properties of steel, by H. B. Knowlton. Cleveland, O., American society for metals, 1929. 437 p. diags., illus., tables.
- Welding of stainless materials, by H. Hull and L. Johnson. Washington, 1929. 43 p. diags. (N.A.C.A. Technical memorandums no. 532)
- Welding rustproof steels, by W. Hoffman. Washington, 1929. 9 p. diags., illus., tables. (N.A.C.A. Technical memorandums no. 531) (From Autogene metallbearbeitung, Halle, Dec. 15, 1927, v. 20, no. 24, p. 337-45)
- Address before American association for steel treating, by E. P. Warner. American society for steel treating, Cleveland, O., Nov. 1928, v. 14, no. 11, p. 682-87.
- La Standardisation des traitements thermiques des aciers de l'aéronautique, par L. Gazzaniga. La Technique moderne, Paris, Mar. 1, 1928, v. 20, no. 5, p. 191-94. diags.
- The Correct hardening of tool steel. Flight, London, Jan. 26, 1928, v. 20, no. 4, p. 541.
- The Change in tensile strength due to aging of cold drawn iron and steel, by L. B. Pfeil. Journal of the Iron and steel institute, London, 1928, v. 118, no. 2, p. 167.
- Trempe, recuit, revenu. I. Théorie; II. Pratique; III. Résultats, par Léon Quillet. Paris, Dunod, 1927-1928. v. 1-2; 308, 296, 490 p. diags., illus.
- Welding of high chromium steels, by W. B. Miller. Washington, 1928. 13 p. illus. (N.A.C.A. Technical notes no. 290)
- Steel thermal treatment, by John W. Urquhart. London, Technical press, 1927. 350 p. diags., illus., tables.
- The Fusion-joining of metallic materials in aircraft construction, by S. Daniels. Mechanical engineering, New York, Nov. 1926, v. 48, no. 11a, p. 1240-46. illus.
- Trempe, recuit et cémentation des aciers, par L. Grenet. Paris, Librairie polytechnique, 1926. 658 p. diags., illus., tables.
- Welding of carbon and alloy steel tubing for aircraft, by J. B. Johnson. Slipstream, New York, Nov. 1925, v. 6, no. 12, p. 9-12. illus.



## METALS AND LIGHT ALLOYS

- Steel structural parts for aircraft, by Horace C. Knerr. Iron age, Philadelphia, Sep. 27, 1923, v. 112, no. 13, p. 816-20. illus.
- Heat treatment of alloy steels, by R. L. Moore and E. V. Schaal. Forging and heat treating, Pittsburgh, Pa., Feb. 1923, v. 9, no. 2, p. 113-21. illus.
- The Heat treatment of steels. Aeroplane, London, Nov. 15, 1922, v. 23, no. 20, p. 382-84. diags. (Also Aeronautics, London, Oct. 23, 1919, v. 17, no. 314, p. 381)
- Effect of heating in hardening steels. S.A.E. journal, New York, Sep. 1922, v. 11, no. 3, p. 357.
- La Struttura ed i trattamenti termici degli acciai impiegati in aeronautica, di Gino Gallo. Atti. Assoc. ital. aerotecn., Roma, 1922, v. 2, no. 3, 4, p. 65-85. illus., tables.
- The Engineering value of the heat treatment of steels, by D. Aitchison. Aircraft engineering, London, Jan.-Oct. 1920, Jan.-Mar. 1921, v. 1, 2, no. 1-10; 1, 3, p. 16-19, 53-55, 74-78, 104-08, 132-35, 162-64, 193-95, 214-17, 233-35, 252-55; 7-11, 38-42. diags., illus.
- Heat treatment of soft and medium steels, by F. Giolitti, E. E. Thum and D. G. Vernaci. New York, McGraw-Hill book company, 1921. 374 p. diags., illus., tables.
- Le Traitement thermique préliminaire des aciers doux et demi-durs pour la construction mécanique, par F. Giolitti. Paris, Dunod, 1921. 524 p. diags., illus., tables.
- Working of steel; annealing, heat treatment and hardening of carbon and alloy steel, by F. H. Colvin and K. A. Juthe. New York, McGraw-Hill book company, 1921. 245 p. diags., illus., tables.
- The Heat-treatment of a high chromium steel, by H. J. French and N. Yamaguchi. S.A.E. journal, New York, 1920, v. 7, p. 103-09. diags.
- Some remarks concerning the heat treatment of steel and their application to the treatment of steels used for airplane motors, by Albert Sauveur. Journal of the Franklin institute, Philadelphia, Aug. 1919, v. 188, no. 2, p. 189-97. diags.
- Shop practice in respect of aircraft steel, by H. P. Philpot. Aeronautical journal, London, Mar. 1919, v. 23, no. 99, p. 101-29. illus.
- Hardening, tempering, annealing and forging of steel, by J. V. Woodworth. New York, Norman W. Henley publishing company, 1919. 321 p. diags., illus., tables.

## STEEL - FABRICATION

- Commercial steels and their heat treatment, by J. B. Hoblyn. Aeronautics, London, June 5, 1918, v. 14, no. 242, p. 489-98. illus.
- The Heat treatment of steel, by J. M. Rogers. Aeroplane, London, Feb. 21, 1917, v. 12, no. 8, p. 498-500. illus. (Also Aviation and aeronautical engineering, New York, Jan. 15, 1917, v. 1, no. 12, p. 385-86. illus.)
- L'Acier en aviation; contrôle-traitement; étude des caractéristiques pour avions et moteurs, par C. A. M. Grard. Paris; Nancy, Berger-Levrault, 1915. 192 p. diagrs., illus.

## STEEL - PROPERTIES AND USE

- Structural and other uses of stainless steel in airplanes. Aero digest, New York, Dec. 1939, v. 35, no. 6, p. 50-52, 54. illus., tables.
- The Effect of nitrogen additions and heat-treatment on the properties of high chromium steels, by E. W. Colbeck and R. P. Garner. Engineering, London, June 16, 1939, v. 147, p. 726-29. illus.
- What about grain size? by C. L. Shapiro. Iron age, New York, Mar. 30, Apr. 6, 1939, v. 143, p. 23-26, 33-37. illus.
- Projet de spécifications relatives aux essais de sondabilité des aciers pour les constructions aéronautiques - soudure au chalumeau et soudure par points. Revue de la soudure automatique, Paris, Apr. 1939, v. 31, no. 301, p. 654-60. illus.
- Werkstoff, gestaltung und behandlungsfragen bei stählen im flugmotorenbau, von H. Wiegand. Deutsche luftwacht, ausgabe Luftwissen, Berlin, Apr. 1939, v. 6, no. 4, p. 47-53. diagrs., illus., tables.
- Materials of aircraft construction, by J. B. Johnson. Journal of the Aeronautical sciences, New York, Mar. 1939, v. 6, no. 5, p. 185-202. diagrs., illus., tables.
- Recent developments in piston ring materials, by B. A. Yates. S.A.E. journal, New York, Feb. 1939, v. 44, no. 2, p. 49-58. tables.
- Effect of aluminum on inclusions in steel and cast iron, by A. Portevin. Metal progress, Cleveland, O., Jan. 1939, v. 35, p. 68-70. diagrs.
- Festigkeitseigenschaften und schweissbarkeit dünner bleche aus hochfestenbaustählen, von H. Cornelius und F. Bollenrath. Archiv für das eisenhüttenwesen, Düsseldorf, Jan. 1939, v. 12, no. 7, p. 335-39. illus.

## METALS AND LIGHT ALLOYS

- Kerbschlagzähigkeit legierter stähle bei temperaturen von 20° bis - 253° (Siedetemperatur des wasserstoffs.) II. Harteprüfungen und zerreißversuche an legierten stählen bei tiefen temperaturen, von A. Pomp, A. Kirsch und G. Haupt. Mitteilungen aus dem Kaiser-Wilhelm institute für eisenforschung, Düsseldorf, 1939, v. 21, no. 15, p. 219-30, 231-41. illus., tables.
- Tensile elastic properties of 18:8 chromium-nickel-steel as affected by plastic deformation, by D. J. Adam and R. W. Mebs. Washington, U. S. Govt. print. off., 1939. 42 p. illus., tables. (N.A.C.A. Report no. 670)
- Stainless steel has merit as conductor; high tension ignition cables for automobiles and airplanes, by M. Peters. Electrical world, New York, Dec. 3, 1938, v. 110, p. 1618.
- The Effect of the speed of stretching and the rate of loading in the yielding of mild steel, by E. A. Davis. Transactions of the A.S.M.E., New York, Dec. 1938, v. 5, no. 4, p. 137-40. illus., tables.
- Fliegwerkstoff-kennzeichen; stähle. Heinkel werkzeitung, Berlin, Dec. 1938, no. 9, p. 321-25. illus.
- Herstellung und eigenschaften dünnwandiger nahtgeschweisster rohre aus stählen höherer festigkeit, von H. Cornelius. Autogene metallbearbeitung, Halle, Nov. 15, 1938, v. 31, no. 22, p. 361-64. illus., tables.
- Steels for aircraft, by W. H. Hatfield. Aeroplane, London, Nov. 9, 1938, v. 55, no. 1433, p. 559-60. illus., tables.
- Effect of primary austenite grain size on the properties of steel, by Ivan Feszczenko-Czopivski and Boleslav Stegenta. Lotnik, Katowice, Nov. 1938, v. 10, no. 11, p. 559-73.
- Fatigue and corrosion fatigue of steels, by B. B. Westcott. Mechanical engineering, New York, Nov. 1938, v. 7, p. 313-22. diags., illus., tables.
- Materials of aircraft construction, by H. J. Gough. Journal of the R.A.S., London, Nov. 1938, v. 42, p. 922-1031. diags., illus.
- Properties of principal fe/cr alloys and fe/cr/ni alloys. Metal progress, Cleveland, O., Oct. 1938, v. 34, no. 4, p. 344-45. illus.
- Untersuchung über die eignung warmfester werkstoffe für verbrennungskraftmaschinen, von F. Bollenrath, H. Cornelius und W. Bungardt. Luftfahrtforschung, München, Sep.-Oct. 1938, v. 15, p. 468-80, 505-10. illus., tables. (Also Jahrbuch der D.V.L., München, 1938, p. 326-38, 339-44)

## STEEL - PROPERTIES AND USE

- Strong trend toward use of steel in airplane construction. Steel, Cleveland, O., Sep. 5, 1938, v. 103, no. 10, p. 15-17, 90. diags.
- Use of high strength Cr-Mn-Si steel in airplane construction, by N. Slessarew. Aviapromyschlennost, Moscow, Sep. 1938, no. 9, p. 16-20. illus.
- Defects in steel, by J. A. Duma. Heat treating and forging, Pittsburgh, Pa., July 1938, v. 24, p. 333-38, 350. illus., tables.
- Baustähle für besondere verwendung, von W. Büttner. Automobil-technische zeitschrift, Berlin, June 1938, v. 41, no. 12, p. 307-15. illus., tables.
- Materials of aircraft construction. Metallurgia, Manchester, England, June 1938, v. 18, no. 104, p. 54-59. tables.
- Embrittlement of steels at high temperatures. Metal progress, Cleveland, O., May 1938, v. 33, p. 508.
- Der Werkstoff stahlguss im flugzeugbau, von H. Eckartsberg, H. Juretzek und W. Mantel. Deutsche luftwacht, ausgabe luftwissen, Berlin, May 1938, v. 5, no. 5, p. 167-71. illus., tables.
- Einfluss der querschnittsform auf die dauerfestigkeit von weichem flusstahl, von W. Siebenburg, F. Bollenrath und H. Cornelius. Luftfahrtforschung, München, Apr. 6, 1938, v. 15, no. 4, p. 214-17. illus., tables.
- Effect of low temperatures on hardened steels EI-173 and EI-184, by N. Minkevitsch, O. Ivanov and J. Dvlgalevski. Stal, Moscow, Apr. 1938, v. 8, no. 4, p. 63-65. illus., tables.
- Laboratory investigation of low temperatures impact properties of some S.A.E. steels, by R. M. Parke and A. J. Herzig. Metals and alloys, New York, Apr. 1938, v. 9, no. 4, p. 90-93. illus., tables.
- Metals used in aircraft industry, by J. R. Goldstein. Metal progress, Cleveland, O., Apr. 1938, v. 33, no. 4, p. 357-61. illus. (Also Canadian metals and metallurgical industry, Toronto, Apr. 1938, v. 1, no. 4, p. 110-12, 119)
- Nuovi orientamenti nella scelta degli acciai saldabili per costruzioni aeronautiche, di G. Calbiani. Metallurgia italiana, Milano, Apr. 1938, v. 30, no. 4, p. 171-80. diags., tables.
- The Fatigue resistance of steel as affected by some cleaning methods, by J. H. Frye and G. L. Kehl. Transactions of the American society for metals, Cleveland, O., Mar. 1938, v. 26, no. 1, p. 192-218. illus., tables.

## METALS AND LIGHT ALLOYS

- Effect of oxygen on the corrosion of steels, by F. G. Frese. Industrial and engineering chemistry, Washington, Jan. 1938, v. 30, p. 83-85. illus.
- Steels for the user, by R. L. Rolf. Journal of the R.A.S., London, Jan. 1938, v. 42, p. 106-08. illus., tables.
- Actual grain size related to creep strength of steels at elevated temperatures, by S. H. Weaver. Proceedings of the American society for testing materials, Philadelphia, 1938, v. 38, p. 176-96. illus., tables.
- Einfluss des werkstoffes der kolbenringe auf ihre laufzeit, von M. Kuhn. (In Jahrbuch der deutschen luftfahrtforschung, München, 1938, p. 87-96. diagrs., illus., tables)
- Härten und vergüten des stahles, von Hugo Herders. Berlin, J. Springer, 1938. 68 p. diagrs., illus., tables.
- Untersuchung über die eignung warmfester werkstoffe für verbrennungsmotoren, von F. Bollenrath, H. Cornelius und W. Bungardt. (In Jahrbuch der deutschen luftfahrtforschung, München, 1938, p. 326-38, 339-44. diagrs., illus., tables)
- Steel alloy for pistons, by R. H. McCarroll. Automotive industries, Philadelphia, Dec. 18, 1937, v. 77, no. 25, p. 875, 884-86. illus.
- Advantages of stainless steel for aircraft, by E. J. W. Ragsdale. S.A.E. journal, New York, Dec. 1937, v. 41, no. 6, p. 596.
- Rostfritt staal som konstruktionsmaterial for flyplan, utaf Einar Ameen. Teknick ukeblad, Oslo, Nov. 20, 1937, v. 67, p. 97-101. illus.
- Gli Acciai inossidabili ed i fenomeni della corrosione, di V. S. Prever. Industria meccanica, Milano, Aug., Sep., Nov. 1937, no. 8, 9, 11, p. 581-86, 673-76, 780-87. illus.
- Das Verhalten von stählen bei erhöhten temperaturen, von O. Leihener und P. Grün. Korrosion und metallschutz, Berlin, Oct.-Nov. 1937, v. 13, p. 354-64. diagrs., illus.
- Hardness of steel at high temperatures. Engineer, London, Oct. 29, 1937, v. 164, no. 4268, p. 67-69. illus., tables.
- Short time creep characteristics of stainless steels, by S. I. Wolfson and A. M. Borzdyka. Metals and alloys, New York, Oct. 1937, v. 8, no. 10, p. 294-96. illus., tables.
- Exhaust valve steels-materials and design of exhaust poppet valves of internal combustion engines, by C. H. S. Tupholme. Canadian chemistry and metallurgy, Toronto, Sep. 1937, v. 21, p. 313-14. illus.

## STEEL - PROPERTIES AND USE

- Metallurgy and the aero-engine, by D. R. Pye. Journal of the Institute of metals, London, Sep. 1937, v. 61, no. 2, p. 19-34. diags., illus.
- Neuere entwicklung der baustähle für flugmotoren, von P. Kotzochke. Deutsche luftwacht, ausgabe luftwissen, Berlin, Sep. 1937, v. 4, no. 9, p. 268-72. diags., tables.
- Notes on the grain size of cast ni/cr heat-resisting alloys, by F. K. Ziegler and L. B. Haughwout. Metals and alloys, New York, Aug. 1937, v. 8, p. 225-29. illus.
- Alloy steels - their characteristics, fabrication and heat treatment, by H. C. Knerr. Aero digest, New York, July 1937, v. 32, no. 28-29. illus., tables.
- Hardness of metals, by F. C. Lea. Metals and alloys, New York, June 1937, v. 8, no. 6, p. 884-85. illus.
- The Effect of protective coatings on the corrosion fatigue resistance of steel, by D. G. Sopwith and H. J. Gough. Engineer, London, May 14, 21, 1937, v. 164, no. 4244, 4245, p. 558-60, 589-91. diags., tables. (Also Engineering, London, May 14, 1937, v. 144, no. 3722, p. 559-60 and Journal of the iron and steel institute, London, Jan. 1937, v. 135, p. 315-38)
- Influence of alloying elements on steel, by G. F. Comstock and C. L. Clark. Metallurgia, Manchester, England, May 1937, v. 16, no. 91, p. 5-6. diags.
- Effect of temperature on the properties of steel, by C. E. MacQuigg. Engineer, London, Apr. 23, 30, 1937, v. 164, no. 4241, 4242, p. 483-86, 519-20. illus., tables.
- Heimwerkstoffe im flugzeug, von K. Schraivogel. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, 5, p. 224-27. illus., tables.
- Über die weiterentwicklung warmfester werkstoffe für flugzeugtriebwerke, von F. Bollenrath. Luftfahrtforschung, München, Apr. 20, 1937, v. 14, no. 4, 5, p. 196-203. diags., illus.
- Aircraft engine materials, by J. B. Johnson. S.A.E. journal, New York, Apr. 1937, v. 40, no. 4, p. 153-64. illus. (Also Heat treating and forging, Pittsburgh, Pa., Feb. 1937, v. 23, p. 75-79)
- Ermittlung von streckgrenze und festigkeit von stählen mit hilfe des kegeldruckversuchs, von H. Krainer. Messtechnik, Halle, Apr. 1937, v. 13, no. 4, p. 64-68. illus., tables.
- Mechanical analysis of impact brittleness, by N. Davidekov and F. Wittmann. Technical physics, Leningrad, Apr. 1937, v. 4, no. 4, p. 308-24. illus., tables.

## METALS AND LIGHT ALLOYS

- Influence of aluminum on the normality of steel, by G. R. Brophy and E. R. Parker. Transactions of the American society for metals, Cleveland, O., Mar. 1937, v. 25, no. 1, p. 315-20. illus.
- Exhaust steels for internal combustion engines. Nickel bulletin, London, Feb. 1937, v. 10, no. 2, p. 27-31. illus., tables.
- Phosphorus as an alloying element in steels for use at elevated temperatures, by H. C. Cross and D. E. Krause. Metals and alloys, New York, Feb. 1937, v. 8, no. 2, p. 53-58. diags., tables.
- Les Aciers résistant à chaud, par J. Biren. Société royale belge des ingénieurs et des industriels, Bruxelles, 1937, no. 6, p. 515-59. diags., illus.
- Fatigue properties of metals used in aircraft construction at 3450 and 10600 cycles, by T. T. Oberg and J. B. Johnson. Proceedings of the American society for testing materials, Philadelphia, 1937, v. 37, p. 195-205. illus.
- Test to increase the quality of steel parts of airplanes, by J. M. Griasnov. Aviapromyschlenost, Moscow, 1937, v. 6, no. 1, p. 68-69.
- Controlled grain size in steel, by T. Swinden and G. R. Bolsover. Heat treating and forging, Pittsburgh, Pa., Nov.-Dec. 1936, v. 22, no. 11, 12, p. 554-59, 614-19, 625-26. illus. (Also Engineering, London, Oct. 16, 30, 1936, v. 142, no. 3692, 3694, p. 432-34, 488-89)
- The Creep curve and stability of steels at constant stress and temperature, by S. H. Weaver. Transactions of the A.S.M.E., New York, Nov. 1936, v. 58, no. 8, p. 745-51. illus., tables.
- Molybdenum steel used in building aircraft engines. Machinery, New York, Nov. 1936, v. 43, no. 3, p. 207. illus.
- Les Aciers et alliages spéciaux pour garnitures des soupapes de moteurs d'aviation. Le Génie civil, Paris, Oct. 31, 1936, v. 109, no. 18, p. 388-89. diags.
- Austenitic stainless steels of the chromium-nickel variety, by V. N. Krivobok and R. A. Lincoln. Iron age, New York, Oct. 29, 1936, v. 138, no. 17, p. 26-34, 40. illus., tables.
- Die Bedeutung der Korngrösse beim stahl, von O. Leihener. Stahl und eisen, Düsseldorf, Oct. 22, 1936, v. 56, no. 43, p. 1273-78. diags., illus.
- Springs of stainless steel, by S. Tour. Iron age, New York, Oct. 15, 1936, v. 138, no. 16, p. 101-04, 106, 108, 110, 112. illus., tables.

## STEEL - PROPERTIES AND USE

- Dauerstandfestigkeit von stahl, von F. Bollenrath, H. Cornelius und W. Bungardt. Technisches zentralblatt für praktische metallbearbeitung, Berlin, May-Aug. 1936, v. 46, no. 9-16, p. 366-68, 429-30, 432, 496-98, 577-78. diags., illus., tables.
- Metallurgical problems of aero engine manufacture, by E. R. Gadd. Journal of the R.A.S., London, Aug. 1936, v. 40, no. 308, p. 622-33. diags.
- Festigkeitseigenschaften der stähle bei hohen temperaturen, von M. Ross und A. Eichinger. Zeitschrift des V.D.I., Berlin, July 25, 1936, v. 80, no. 30, p. 922-23.
- Effect of surface conditions on the fatigue resistance of steels, by G. A. Hankins, M. L. Becker and H. R. Mills. Heat treating and forging, Pittsburgh, Pa., July 1936, v. 22, no. 7, 8, p. 340-45, 394-99. illus.
- The Embrittlement of high-tensile alloy steels at elevated temperatures, by W. E. Goodrich. Engineering, London, June 12, 1936, v. 141, no. 3674, p. 651-53. illus., tables.
- Nitralloy cylinder barrels for airplane engines. Metals and alloys, New York, May 1936, v. 7, no. 5, p. 119-21. illus.
- Small plastic deformations in strip steel, by N. P. Goss. Metals and alloys, New York, May 1936, v. 7, no. 5, p. 132-34. illus., tables.
- Dämpfungsfähigkeit von kurbelwellenstählen, von A. Appenrodt. Zeitschrift des V.D.I., Berlin, Apr. 25, 1936, v. 80, no. 17, p. 517-18. diags., illus.
- Mitwirkung des luftstickstoffs beim fressen aufeinander gleitender stahlteile und beim dauerbruch, von H. Schottky und H. Hiltenkamp. Stahl und eisen, Düsseldorf, Apr. 9, 1936, v. 56, no. 15, p. 444-46. diags., illus., tables.
- Tubing in aircraft. The Manufacture and uses of steel, aluminum and magnesium alloy tubes, by A. E. Reynolds. Flight, London, Mar. 26, 1936, v. 29, no. 1422, p. 20-22. diags.
- Embrittlement of steel on prolonged heating, by H. A. Dickie. Engineering, London, Mar. 13, 1936, v. 141, no. 3661, p. 301-02.
- Metallurgy in aircraft engine construction, by C. R. Moore. Canadian chemistry and metallurgy, Toronto, Mar. 1936, v. 20, p. 81-82.
- The Properties of metals at elevated temperatures, by C. L. Clark and A. E. White. Ann Arbor, University of Michigan 1936. 102 p. illus. (Engineering research bulletin no. 27)



## METALS AND LIGHT ALLOYS

- Long-time creep tests of 18cr. 8 ni. steel and 0.35 per cent carbon steel, by H. C. Cross and F. B. Dahle. Transactions of the A.S.M.E., New York, Feb. 1936, v. 58, no. 2, p. 91-97. tables.
- Les Tôles composées et leurs applications à la construction aéronautique, par R. V. Le Ricolais. L'Aéronautique, Paris, Feb. 1936, v. 18, no. 201, p. 25-28. diagrs., tables.
- A Comparison of corrosion resistant steel (18 per cent chromium - 8 per cent nickel) and aluminum alloy (24ST), by J. E. Sullivan. Washington, 1936. 12 p. illus. (N.A.C.A. Technical notes no. 560)
- Dauerfestigkeitsschaubilder von stählen bei verschiedenen zugmittellspannungen, von A. Pomp und M. Hempel. Mitteilungen aus dem Kaiser-Wilhelm institute für eisenforschung, Düsseldorf, 1936, v. 18, no. 294, p. 1-14. diagrs., illus.
- Notes on the research being carried out by the British electrical and allied industries research association on the creep and corrosion of steels for use at high temperatures, by D. V. Onslow. Proceedings of the Institution of mechanical engineers, London, 1936, v. 133, p. 533-38. tables.
- Resistance of nitrided austenitic manganese steel against sea-water corrosion, by S. Satoh. Institute of physical and chemical research, Tokyo, 1936, v. 28, p. 221-30. illus., tables. (Scientific papers no. 615)
- Die Schwingungsfestigkeit und dämpfungsfähigkeit von handelsüblichen stählen und kupfer und ihre beeinflussung durch kalt-nietung, von H. Sonnemann. Braunschweig, Mitteilungen aus dem Wöhler institut, 1936. 87 p. diagrs., illus., tables.
- Steel physical properties atlas, by Charles Newman Dawes. Cleveland, O., American society for metals, 1936. 87 p. diagrs.
- Wechselbeanspruchung von stahl bei höheren temperaturen, von M. Hempel und H. E. Tillmanns. Mitteilungen aus dem Kaiser-Wilhelm institut für eisenforschung, 1936, v. 18, p. 163-82. diagrs., illus.
- Causes and effects of brittleness in steel, by C. L. Shapiro. Heat treating and forging, Pittsburgh, Pa., Oct.-Dec. 1935, v. 21, no. 10, 11, 12, p. 467-72, 517-21, 569-76. diagrs.
- Importance of aluminum additions in modern commercial steels, by H. W. McQuaid. American society for metals, Cleveland, O., Dec. 1935, v. 23, p. 797-838. illus. (Also Metal progress, Cleveland, O., Nov. 1935, v. 28, p. 33-37; Steel, Cleveland, O., Oct. 14, 1935, v. 97, p. 45-46 and Iron age, New York, Oct. 10, 1935, v. 136, p. 20-27)

## STEEL - PROPERTIES AND USE

- B. S. 3 S. 11 steel in aircraft structures, by P. L. Teed. Metal treatment, London, Sep.-Nov. 1935, v. 1, p. 135-40. illus.
- High temperature properties of steels are discussed before metal congress. Oil and gas journal, Tulsa, Okla., Oct. 3, 1935, v. 33, no. 20, p. 16.
- Les Aciers utilisés en U.R.S.S., par Michel Précoul. L'Aérophile, Paris, Sep. 1935, v. 43, no. 9, p. 273-75. tables.
- The Influence of oxide films on the wear of steels, by S. J. Rosenberg and L. Jordan. American society for metals, Cleveland, O., Sep. 1935, v. 23, no. 3, p. 577-92. diagrs., illus.
- Ferrous metallurgy in relation to aircraft, by W. H. Hatfield. Journal of the R.A.S., London, July 1935, v. 39, no. 295, p. 552-618. diagrs., illus., tables. (Also Aircraft engineering, London, May-June 1935, v. 7, no. 75, 76, p. 113-25, 143-52)
- Alloy steels for aircraft construction, by W. H. Hatfield. Metallurgia, Manchester, England, June 1935, v. 12, no. 68, p. 45-48. diagrs., tables.
- Steel developed to match expansion of aluminum, by A. J. Grant. Automotive industries, Philadelphia, Mar. 23, 1935, v. 72, no. 12, p. 413.
- Vergrößerung der widerstandsfähigkeit von stahl der gleichzeitig durch drillbeanspruchung und corrosion angegriffen ist durch zusatz eines schutzmittels zur angreifenden flüssigkeit, von H. Ochs. Zeitschrift des V.D.I., Berlin, Mar. 16, 1935, v. 79, no. 11, p. 358. diagrs., tables.
- The Ductility of chromium austenitic steels at elevated temperatures, by H. D. Newell. American society for metals, Cleveland, O., Mar. 1935, v. 23, no. 1, p. 225-48. diagrs., illus., tables.
- Ricerche sugli acciai per valvole dei motori a scoppio e sulle loro caratteristiche alle temperature elevate, di I. Musatti ed A. Reggiori. Aerotecnica, Roma, Mar. 1935, v. 15, no. 3, p. 299-306. diagrs., illus., table. (Also Metallurgia italiana, Milano, July-Oct. 1934, v. 26, no. 7, 8, 9, 10, p. 475-98, 569-99, 675-89, 765-93)
- Einfluss von recken und altern auf das verhalten von stahl bei der schwingungsbeanspruchung, von F. Koerber und M. Hempel. Mitteilungen aus dem Kaiser-Wilhelm-institut für eisenforschung, Düsseldorf, 1935, v. 17, p. 247-57. diagrs., illus., tables.
- Influence of time on creep of steels, by A. E. White, C. L. Clark and R. L. Wilson. Proceedings of the American society for testing materials, Philadelphia, 1935, v. 35, p. 167-92. diagrs., illus., tables.

## METALS AND LIGHT ALLOYS

- Kerbempfindlichkeit bei wechselbeanspruchung von legierten und unlegierten stählen, von R. Mailänder. Stahl und eisen, Düsseldorf, 1935, v. 55, no. 2, p. 39-42. diags., illus., table.
- Quelques nouvelles recherches sur la fatigue des métaux en construction aéronautique, par R. Cazaud. Bulletin de l'Association technique maritime et aéronautique, Paris, 1935, v. 39, p. 513-25. illus., tables.
- Recherches sur la résistance à la fatigue des aciers au carbone, par M. Ogee. Paris, Blondel la Rougery, 1935. 69 p. diagr., illus. (Pub. scient. tech. Min. de l'air no. 58)
- Schwingungsfestigkeit und dämpfungsfähigkeit von unlegierten stählen in abhängigkeit von der chemischen zusammensetzung und der wärmebehandlung, von Max Hempel und Carl Hans Plock. Mitteilungen aus dem Kaiser-Wilhelm-institut für eisenforschung, Düsseldorf, 1935, v. 17, p. 19-31. diags., illus., tables.
- Tubing, steel, corrosion resisting (18 per cent chromium and 8 per cent nickel) seamless drawn, streamline-cross section (aircraft use). Washington, U. S. Govt. print. off., 1935. 7 p. (U. S. Navy department specifications no. 44T29)
- The Use of ferrous metals for aeronautical purposes, by J. R. Hanforth. Metal treatment, London, Mar.-June 1935, v. 1, no. 1, p. 33-37. illus.
- Wechselfestigkeit und kerbempfindlichkeit der stähle bei hohen temperaturen, von W. Schwinning, M. Knockaund K. Uhlemann. Zeitschrift des V.D.I., Berlin, Dec. 22, 1934, v. 78, no. 51, p. 1469-76. diags.
- Einfluss der gefügeausbildung auf die dauerstandfestigkeit des stahles, von Walter Enders. Stahl und eisen, Düsseldorf, Nov. 29, 1934, v. 54, no. 48, p. 1232-33.
- Compression tests of structural steel at elevated temperatures, by P. D. Sale. Journal of research, Bureau of standards, Washington, Nov. 1934, v. 13, no. 5, p. 713-43. diags., illus., tables.
- Steels for aircraft requirements. Aircraft engineering, London, Sep. 1934, v. 6, no. 67, p. 244-45. (Also Automobile engineer, London, Aug. 1934, v. 24, no. 322, p. 291-92)
- Heat resisting steel 18/8 containing silicon and aluminum, by M. M. Romanov and O. I. Ver. Metallurgia, Manchester, England, Apr. 1934, v. 9, no. 4, p. 43-52. illus., tables.
- Steel specifications for engines, by B. G. Davis. Popular aviation, New York, Apr. 1934, v. 14, no. 4, p. 242.

## STEEL - PROPERTIES AND USE

- Factors determining the impact resistance of hardened carbon steels, by H. Scott. Transactions of the American society for metals, Cleveland, O., 1934, v. 22, p. 1142. diagsr., illus.
- Fatigue strength of airplane and engine materials, by Kurt Matthaes. Washington, 1934. 31 p. diagsr., illus. (N.A.C.A. Technical memorandums no. 743) (From Z.F.M., München, Nov. 4, 28, 1933, v. 24, no. 21, 22, p. 593-98, 620-26)
- Die Korrosiondauerfestigkeit von V2A-stahl, von H. Ochs. Technische hochschule, Darmstadt, 1934, no. 3, p. 32-39. illus. (Schrifttum der Hessischen hochschulen)
- Recherches sur la fatigue des aciers, par Roger Cazaud. Paris, E. Blondel la Rougery, 1934. 158 p. diagsr., illus., tables. (Pub. scient. tech. Min. de l'air no. 39)
- Study of the strength of stainless and heat resisting steels at high temperatures, by M. S. Hunter and A. K. Robertson. Pittsburgh, Pa., Carnegie institute of technology, 1934. 64 p. diagsr.
- Utmattningshall fasthet hos kallvalsat staal för flygplan, utaf Otto Fredrik Forsman. Stockholm, Ingeniörs vetenskaps akademien, 1934, no. 127, 16 p. diagsr., illus.
- The Metallography of automotive and aircraft valves, by E. D. Viers. Fuels and furnaces, Pittsburgh, Pa., Sep.-Dec. 1932, July-Oct. 1933, v. 10, 11, p. 513-20, 591-94; 139-42, 171-74. diagsr., illus., tables.
- Mechanical properties at minus 40 degrees of metals used in aircraft construction, by J. B. Johnson and T. Oberg. Metals and alloys, New York, Mar. 1933, v. 4, no. 3, p. 25-30. diagsr., illus.
- Notes on the use of stainless steel in aircraft structures, by H. J. Pollard. Flight, London, Dec. 1, 1932, v. 24, no. 1249, p. 1152e-1152g. illus.
- On the creep of steel at elevated temperatures, by Atsumaro Shimidzu. Journal of the Society of mechanical engineers, Tokyo, Dec. 1932, v. 35, no. 188, p. 1174-79. diagsr., illus., tables.
- Research on valve steels, by G. V. Akimov and A. M. Borzdyka. Teknika vozdušnovo flota, Moscow, Nov.-Dec. 1932, no. 11, 12, p. 1043-62. diagsr., illus., tables.
- Steel versus aluminum, by S. H. Phillips. U. S. Air services, Washington, Nov. 1932, v. 17, no. 11, p. 21-23. illus.

## METALS AND LIGHT ALLOYS

- Tensile properties of some ferrous alloys at high temperatures, by W. Kahlbaum and L. Jordan. Journal of research, Bureau of standards, Washington, Sep. 1932, v. 9, no. 3, p. 327-32. illus., tables. (Abstract Journal of the R.A.S., London, May 1933, v. 37, p. 457)
- Beitrag zur frage der flockenbildung in baustählen, von W. Eilender und H. Kiessler. Zeitschrift des V.D.I., Berlin, July 23, 1932, v. 76, no. 30, p. 729-35. diags., illus. (Abstract Journal of the R.A.S., London, May 1933, v. 37, p. 458)
- Un Particolare modo di attacco per i cavetti d'acciaio nelle costruzioni aeronautiche, di Silvio Bassi. L'Aerotecnica, Roma, Mar. 1932, v. 12, no. 3, p. 351-53. illus.
- Acciai per magneti, di A. Labo. L'Aerotecnica, Roma, Feb. 1932, v. 12, no. 2, p. 16. diags., tables.
- Effect of heat treatment on the physical properties of stainless steel, by G. A. Holderness and W. C. France. Pittsburgh, Pa., Carnegie institute of technology, 1932. 16 p. diags.
- Factors affecting the inherent hardenability of steel, by E. C. Bain. Transactions of the American society for steel treatment, Cleveland, O., 1932, v. 20, p. 385. diags.
- Les Aciers au chrome-molybdène et leur emploi dans l'aviation, par M. Baer. Revue de métallurgie, Paris, Oct. 1931, v. 28, no. 10, p. 570-74. diags., illus.
- Dural or stainless steel? by Orson D. Munn. Scientific american, New York, Oct. 1931, v. 145, no. 4, p. 263-64. illus.
- Some aspects of metallurgy in aircraft construction, by J. B. Johnson. Aviation engineering, London, Sep. 1931, v. 5, no. 3, p. 7-12, 41. illus.
- Steel plays important role in airship industry. Steel, Cleveland, O., Aug. 20, 1931, v. 89, no. 8, p. 19. illus.
- Aceros para automovilismo y aviación, de A. Lafont Ruiz. Ingeniería y construcción, Madrid, Aug. 1931, v. 9, no. 104, p. 470-79. illus. (Also Ibérica, Barcelona, June 13, 1931, v. 18, no. 382, p. 376-80)
- Heat treatment for aircraft engine crankshafts, by E. F. Lake. Heat treating and forging, Pittsburgh, Pa., Aug. 1931, v. 17, p. 763-67.
- Investigation of steels for aircraft engine valve springs, by A. Swan, H. Sutton and W. D. Douglas. Engineering, London, Feb. 27, Mar. 13, 1931, v. 131, p. 307-08, 314-16, 374-76. illus. (Also Proceedings of the Institution of mechanical engineers, London, 1931, v. 120, p. 291-99)

## STEEL - PROPERTIES AND USE

- The Tensile properties of alloy steels at elevated temperatures as determined by the short time method, by William Kahlbaum, R. L. Dowell and W. A. Tucker. Journal of research, Bureau of standards, Washington, Feb. 1931, v. 6, no. 2, p. 199-218. diags., illus., tables.
- Some experiments on the impact hardness of high-speed steel at elevated temperatures, by A. R. Page. Metallurgia, Manchester, England, Jan. 1931, v. 3, p. 85-86. illus.
- Steels for aircraft engines. Metal progress, Cleveland, O., Jan. 1931, v. 19, p. 70-76. diags., illus.
- Comparison of weights of 17 ST and steel tubular structural members used in aircraft construction, by E. C. Hartmann. Washington, 1931. 17 p. illus. (N.A.C.A. Technical notes no. 378)
- Effect of gases and stress on 18 per cent chromium, 8 per cent nickel steels at elevated temperatures, by Allesandro Reggiori. Pittsburgh, Pa., Carnegie institute of technology, 1931. 12 p. illus.
- Endurance and other properties at low temperatures of some alloys for aircraft use, by H. W. Russel and W. A. Welcker, Jr. Washington, 1931. 26 p. illus., tables. (N.A.C.A. Technical notes no. 381)
- On the yield point of mild steel, by Fujio Nakanishi. Tokyo, Tokyo imperial university, 1931. 57 p. diags., illus. (Aeronautical research institute report no. 72)
- Principaux produits métallurgiques utilisés dans la construction aéronautique, par G. R. Hamel. Aciers spéciaux métaux et alliages, Paris, Dec. 1930, v. 5, no. 64, p. 550-58. illus., table.
- Steels for valves. Aeroplane, London, Nov. 26, 1930, v. 39, no. 23, p. 1246-47. tables.
- Some characteristics of light alloys for aircraft, by H. W. Gillett. Transactions of the A.S.M.E., New York, July-Sep. 1930, v. 2, no. 1, p. 115-20.
- The Highly-alloyed steels in aircraft construction, by J. Strauss. Proceedings of the American society for testing materials, Philadelphia, June 23, 27, 1930, v. 30, pt. 2, p. 41-47, 171-214. diags., illus.
- Propriétés mécaniques des aciers au nickel et au nickel-chrome, par J. S. Negru. Aciers spéciaux métaux et alliages, Paris, May 1930, v. 5, no. 57, p. 201-16. diags., tables.

## METALS AND LIGHT ALLOYS

- Alloy steels important in valve manufacture, by A. H. Allen. Iron trade review, Cleveland, O., Feb. 20, 1930, v. 86, no. 8, p. 39-42, 47. illus.
- Alloy steel sheets for aircraft, by J. B. Johnson. Iron age, New York, Feb. 13, 1930, v. 125, no. 7, p. 502-05. diagsr., illus.
- Modern aircraft engine steels, by N. L. Deuble. Airway age, New York, Feb. 1930, v. 11, no. 2, p. 192-96. illus.
- Metals used in aircraft construction, by Bradley Stoughton. Metals and alloys, New York, Jan. 1930, v. 1, no. 7, p. 317-24. illus. (Also Journal of the Society of chemical industry, London, Dec. 13, 1929, v. 48, no. 50, p. 1189-98)
- Ferrous metals used in airplane construction, by J. B. Johnson. (In Symposium on aircraft materials. Philadelphia, American society for testing materials, 1930, p. 7-12. diagsr., illus.)
- Impurities in metals; their influence on structure and properties, by Colvin J. Smithells. New York, John Wiley and son, 1930. 190 p. diagsr., illus., tables.
- An Investigation of some of the physical properties of the iron-nickel-aluminum system, by W. A. Dean. Troy, N. Y., Rensselaer polytechnic institute, 1930. 31 p. illus., tables. (Engineering and science series no. 26)
- Materials of construction in aircraft engines, by R. L. Moore. (In Symposium on aircraft materials. Philadelphia, American society for testing materials, 1930. p. 67-77., illus., tables.
- Present-day experimental knowledge and theories of fatigue phenomena in metals. Proceedings of the American society for testing materials, Philadelphia, 1930, v. 30, pt. 1, p. 260. diagsr.)
- Steels for automobiles and aeroplanes, by W. H. Hatfield. Proceedings of the Institute of automobile engineers, London, 1929-1930, v. 24, p. 81-160. diagsr., illus., tables. (Abstract Metallurgia, Manchester, England, Dec. 1929, v. 1, no. 2, p. 51-52)
- Steels used in aero work, by W. H. Hatfield. (In Air annual of the British empire, London, 1930, p. 261-67. illus., tables.)
- High quality steel utilized in airplane engines; Pratt and Whitney aircraft company, Hartford, Conn., by H. R. Simonds. Iron trade review, Cleveland, O., Dec. 5, 1929, v. 85, no. 23, p. 1437-41. illus.

## STEEL - PROPERTIES AND USE

- Steel requirements in aircraft industry, by H. J. French. Blast furnace and steel plant, Pittsburgh, Pa., Nov.-Dec. 1929, v. 16, no. 11, 12, p. 1436-38, 1579-83. (Also Engineer, London, Feb. 22, 1929, v. 147, no. 3815, p. 19-21; Iron age, New York, Nov. 8, 1928, v. 122, no. 19, p. 1161-63 and Iron trade review, Cleveland, O., Nov. 1, 1928, v. 83, no. 18, p. 1105-08)
- Metals in aircraft structures, by J. D. North. Metal industry, London, Oct. 11, 13, 1929, v. 35, no. 15, 16, p. 339-40, 350; 369-70. diags., illus.
- Metals in aircraft construction, by J. F. Hardecker. American machinist, New York, Oct. 10, 1929, v. 71, no. 15, p. 629-32. illus.
- Materials in aircraft structures, by W. A. Mankey. Aviation engineering, New York, Oct. 1929, v. 10, no. 2, p. 22-24. illus., table.
- Metals used in airplane making, by G. S. Herrick. Iron age, New York, July 25, 1929, v. 124, no. 4, p. 211-14. illus.
- Die Metalle im aufbau des flugzeuges, von H. Steudel and G. Bock. Zeitschrift für metallkunde, Berlin, July 1929, v. 21, p. 213-23. illus.
- Technical characteristics of steel in some aviation motors, by N. A. Minkevich. Teknika vozdušnovo flota, Moscow, June-July 1929, no. 6, 7, p. 358-77, 435-43. tables.
- Addition of nitrogen to steel and the use of this steel in motor making, by N. A. Minkevich and E. E. Kontorovitsch. Teknika vozdušnovo flota, Moscow, Apr.-May 1929, no. 4, 5, p. 236-43, 311-15. diags., tables.
- An Investigation of the physical properties of certain chromium-aluminum steels, by F. B. Lounsberry and W. R. Breeler. Transactions of the American society for steel treating, Cleveland, O., May 1929, v. 15, no. 5, p. 733-66.
- Steel failures in aircraft, by F. T. Sisco. Transactions of the American society for steel treating, Cleveland, O., Apr. 1929, v. 15, no. 4, p. 589-629. diags., illus. (Abstract Aviation engineering, New York, May-June 1929, v. 2, no. 5, 6, p. 11-13, 21-24)
- Steel for aviation motor valves, by S. S. Feldman. Teknika vozdušnovo flota, Moscow, Apr. 1929, no. 4, p. 221-36. diags., tables.
- Uses of aircraft steels. Aircraft engineering, London, Apr. 1929, v. 1, no. 2, p. 51-53. illus.



## METALS AND LIGHT ALLOYS

- Aviation skyscrapers; radio reveals new vistas for use of steel, by W. H. Lloyd. Iron trade review, Cleveland, O., Jan. 3, 1929, v. 84, no. 1, p. 6-9, 121. illus..
- The Creep of 80:20 nickel-chromium alloy at high temperatures, by A. G. Lobley and G. L. Betts. Institute of metals journal, London, 1929, v. 42, p. 157. diagsr.
- The Creep of steel at high temperatures, by Frederick Hardwood Norton. New York, McGraw-Hill book company, 1929. 90 p. diagsr., illus., tables.
- Curves showing column strength of steel and duralumin tubing, by O. E. Ross. Washington, 1929. 12 p. diagsr. (N.A.C.A. Technical notes no. 306)
- Die Dauerprüfung der werkstoffe, von O. Foepl, E. Becker und G. von Heydekampf. Berlin, Julius Springer, 1929. 124 p. diagsr., illus., tables.
- Effect of alloying elements upon the stability of steel at elevated temperatures, by A. E. White and C. L. Clark. Transactions of the A.S.M.E., New York, 1929, v. 51, p. 213-34. diagsr., illus.
- Heat treatment, uses and properties of steel, by H. B. Knowlton. Cleveland, O., American society for metals, 1929. 437 p. diagsr., illus., tables.
- Researches on springs. Static and endurance tests of laminated springs made of carbon and alloy steels, by R. G. Batson and J. Bradley. London, H. M. Stat. off., 1929. 33 p. diagsr., illus. (Department of scientific and industrial research, Special report no. 13)
- Strength of tubing under combined axial and transverse loading, by L. B. Tuckerman, S. N. Petrenko and C. D. Johnson. Washington, 1929. 17 p. illus. (N.A.C.A. Technical notes no. 307)
- Alloy steels assume important role in manufacture of airplanes, by E. Joyce. Iron trade review, Cleveland, O., Dec. 13, 1928, v. 83, no. 24, p. 1491-93, 95. illus.
- La Construction des avions, par L. Merlin. Métallurgie et la construction mécanique, Paris, Nov. 1, 1928, no. 44, p. 5, 7, diagsr.
- Die Herstellung und kontrolle der flugzeugstähle bei den deutschen edelstahlwerken. Flugwoche, Berlin, Sep. 1928, v. 10, no. 9, p. 276-78. illus.
- Aircraft metallurgy, by H. C. Knerr. Transactions of the American society for steel treating, Cleveland, O., May 1928, v. 13, no. 5, p. 723-58. diagsr., illus.

## STEEL - PROPERTIES AND USE

- Materials for aircraft construction, by A. Klemin and G. F. Titterton. Heat treating and forging, Pittsburgh, Pa., May 1928, v. 14, p. 518-21. diagsr.
- Heat resisting alloys, by B. Evans. Transactions of the American society for steel treating, Cleveland, O., Mar. 1928, v. 13, no. 3, p. 493-94. diagsr.
- Use of steel in aircraft construction, by E. A. Richardson. Heat treating and forging, Pittsburgh, Pa., Mar. 1928, v. 14, no. 3, p. 284-91.
- Heat-resisting alloys, by T. H. Turner. Metal industry, London, Feb. 10, 17, 1928, v. 32, p. 153-79. diagsr.
- Heat resisting and non-corrodible steel, by S. A. Main. Fuel, London, Jan. 1928, v. 7, no. 1, p. 4-20. illus. (Also Journal of the Institution of aeronautical engineers, London, Aug. 1927, v. 1, no. 8, p. 5-44)
- Mechanical properties of some materials used in airplane construction, by E. B. Wolff and L. J. G. Van Ewijk. Washington, 1928. 17 p. diagsr., illus., tables. (N.A.C.A. Technical memorandums no. 448)
- Steel for aircraft construction, by Edward Adams Richardson. New York, American institute of mining and metallurgical engineers, 1928. 19 p. diagsr., illus.
- Steel requirements of the aircraft industry, by H. J. French. (In Yearbook. New York, American iron and steel institute, 1928. p. 350-98. diagsr., illus.)
- Le Nickel dans les industries de l'automobile et de l'aviation, par Léon Guillet. Revue de métallurgie, Paris, Dec. 1927, v. 24, no. 12, p. 722-29. tables.
- A Study of some of the causes of failure in heat-resisting alloys, by H. Sutton. Transactions of the American society of steel treating, Cleveland, O., Aug. 1927, v. 12, p. 221-34.
- Aero engine valve steels, by P. B. Henshaw. Journal of the R.A.S., London, Mar. 1927, v. 31, no. 195, p. 187-217. diagsr., illus., tables. (Abstract Engineering, London, Dec. 3, 1926, v. 122, p. 698-99)
- Properties and testing of magnetic materials, by T. Spooner. New York, McGraw-Hill book company, 1927. 385 p. diagsr., illus., tables.
- Influence d'un séjour prolongé au rouge sur la résilience de quelques métaux pour soupapes d'échappement, par J. F. Saffy. C. R. Acad. sci., Paris, Nov. 15, 1926, v. 183, no. 20, p. 861-63. table.

## METALS AND LIGHT ALLOYS

- Steels for aeroplane engine exhaust valves. Engineer, London, Sep. 24, 1926, v. 142, p. 133-35. diags.
- French experimental work on valve steels, by C. Grard. Automotive industries, Philadelphia, July 1, 1926, v. 55, no. 1, p. 6. diags.
- Influence de la zone thermique de travail sur la sélection des métaux pour moteurs d'aviation. Application aux soupapes d'échappement, par C. Grard. Revue de métallurgie, Paris, June 1926, v. 23, no. 6, p. 317-30. illus. (Also C. R. Acad. sci., Paris, Dec. 28, 1925, v. 181, no. 26, p. 1143-45)
- Study of dural and steel for airplane structures, by J. A. Roche. Washington, U. S. Govt. print. off., 1926. 7 p. diags. (Air Corps information circular no. 568)
- Steels used in aero work, by W. H. Hatfield. Journal of the R.A.S., London, Oct. 1925, v. 29, no. 178, p. 469-534. illus.
- Steel versus lighter alloys, by N. T. Belaliew. Proceedings of the Institute of aeronautical engineers, London, Nov. 7, 1924, no. 13, p. 15-34. illus.
- Nouvelles recherches sur les aciers et leur utilisation en aviation, par E. Pitois. La Technique aéronautique, Paris, Aug. 15, 1924, n.s., v. 15, no. 34, p. 261-77. illus.
- Brinell's researches on the resistance of iron, steel and some other materials to wear, by Herman A. Holz. Testing, New York, Feb. 1924, v. 1, no. 2, p. 104-46. illus., tables.
- Characteristics of material for valves operating at high temperatures, by J. B. Johnson and S. A. Christiansen. Proceedings of the American society for testing materials, Philadelphia, 1924, v. 24, pt. 2, p. 383-400. diags., illus.
- Elastizität und festigkeit, von C. Bach und R. Baumann. Berlin, Julius Springer, 1924. 687 p. diags., illus., tables.
- A New process of steel cylinder construction, by Glenn D. Angle. Aviation, New York, Dec. 31, 1923, v. 15, no. 27, p. 794-95.
- Welded steel cylinder water jackets, by Glenn D. Angle. Aviation, New York, Aug. 6, 1923, v. 15, no. 6, p. 148-52. illus.
- Some mechanical properties of a series of chromium steels, by Charles R. Austin. Iron and coal trades review, London, May 11, 1923, v. 106, no. 2880, p. 697-98. diags.
- Material selection should be based on strength weight factor, by Horace C. Knerr. Automotive industries, Philadelphia, Apr. 19, 1923, v. 48, no. 16, p. 868-72. diags.

## STEEL - PROPERTIES AND USE

- Fatigue in metals, by C. F. Jenkin. Journal of the R.A.S., London, Mar. 1923, v. 27, no. 146, p. 89-104. illus., tables.
- Holz-oder metallflugzeug, von H. Seehase. Zeitschrift für flug-technik, München, Jan. 26, 1923, v. 14, no. 1, 2, p. 2-6. illus.
- Influence of temperature upon the mechanical properties of steel, by B. Lapshin. Vestnik vozdušnovo flota, Moscow, Jan. 1923, no. 1, p. 51-54. illus., tables.
- The Effect of scratches and of various workshop finishes upon the fatigue strength of steel, by W. Norman Thomas. London, H. M. Stat. off., 1923. 28 p. diags., illus. (A.R.C. R. & M. no. 860)
- Properties of a series of chromium steels, by Charles R. Austin. Journal of the Iron and steel institute, London, 1923, v. 106, 107, p. 697-98, 419-38. diags., tables.
- Récents progrès dans la fabrication et l'utilisation des alliages, par Léon Guillet. Journal de physique et le radium, Paris, 1923, v. 4, ser. 6, p. 89-114. diags., illus.
- Les Aciers spéciaux et la construction des aéroplanes. Usine, Paris, Dec. 9, 1922, v. 31, no. 49, p. 21-29.
- Properties of metal at low temperature-190° C. Aviation, New York, May 1, 1922, v. 12, no. 18, p. 511. tables.
- Development of stainless steel; its properties and uses, by Thomas Firth. Sheffield, England, Thomas Firth and sons, 1922. 82 p. diags., illus., tables.
- Effect of temperatures, deformation and rate of loading on the tensile properties of low carbon steel in the thermal critical range, by H. J. French. Journal of research, Bureau of standards, Washington, 1922, v. 16, p. 679.
- Thermal expansion of nickel, monel, metal stellite, stainless steel and aluminum, by Wilmer H. Sonder and Peter Hidnert. Bureau of standards, Washington, U. S. Govt. print. off., 1922. 22 p. (Scientific papers no. 426)
- The Case-hardening of steel, by Harry Brearley. London, Longmans, Green and company, 1921. 218 p. diags., illus., tables.
- Les Matériaux des constructions mécaniques et aéronautiques, par E. Marcotte e E. Berehare. Paris, Dunod, 1921. 414 p. diags., illus., tables.
- Stainless steel; its properties and uses. Sheffield, England, Brown Bayley's steel works, 1921. 5 p. diags.

## METALS AND LIGHT ALLOYS

- Steel for the structural parts of aircraft, by John L. Harkness. Journal of the American society for steel treating, Cleveland, O., June 1920, v. 2, no. 9, p. 466-69. diags., illus.
- Hochwertige werkstoffe, von F. Kretzschmar. Schiffbau, Berlin, Mar. 17, 24, 31, Apr. 7, 1920, v. 21, no. 17-18, p. 519-23, 556-61. illus.
- British standard schedule of cold-worked steels for aircraft. London, C. Lockwood and son, 1920. 16 p. diags., illus.
- British standard schedule of sheet steels for aircraft. London, British engineering standards association, 1920. no. 113; 12 p. diags., illus.
- British standard schedule of wrought steels for aircraft. London, C. Lockwood and son, 1920. 27 p. diags., illus.
- Valve failures and valve steels in internal combustion engines, by Leslie Aitchison. Proceedings of the Institution of automobile engineers, London, 1919-1920, v. 14, p. 31-114. diagr., illus., tables. (Also Engineering, London, Dec. 12, 19, 1919, v. 108, no. 2815, 2816, p. 799-802, 834-36)
- Some remarks concerning the heat treatment of steel and their application to the treatment of steels used for airplane motors, by Albert Sauveur. Journal of the Franklin institute, Philadelphia, Aug. 1919, v. 188, no. 2, p. 189-97. illus., tables.
- Notch toughness of steel, by Samuel L. Hoyt. Journal of the American society for steel treating, Cleveland, O., May 1919, v. 1, no. 8, p. 247-55. illus.
- The Properties of steels in relation to variations in temperature. Aeroplane, London, Dec. 11, 1918, v. 15, no. 24, p. 2215.
- Steel for allied aircraft; joint Anglo-american specifications are being perfected. Iron trade review, Cleveland, O., Sep. 19, 1918, v. 63, p. 663-64. illus.
- Specifications for aircraft steels. Iron age, New York, July 11, 1918, v. 102, no. 2, p. 70-71.
- Metals used in the construction of aircraft, by Charles Vickers. Foundry, Cleveland, O., Feb. 1918, v. 46, no. 2, p. 66-68. tables.
- Steels used in airplane work, by W. H. Hatfield. Automotive industries, Philadelphia, July 19, 26, Aug. 2, Sep. 20, 1917, v. 37, no. 3, 4, 5, 6, 12, p. 102-04; 154-56; 188-91; 234-35; 507-09. illus. (Also Aerial age, New York, July 2, 23, Aug. 6, 1917, v. 5, no. 16, 19, 21, p. 528-29; 640-41; 726-27)

## STEEL - PROPERTIES AND USE

- The Use and abuse of steel, by R. K. Bagnall-Wild and E. W. Birch. Iron age, New York, Aug. 9, 1917, v. 100, p. 312-15. illus. (Also Engineer, London, Apr. 20, 27, May 11, 1917, v. 123, p. 352, 384-86, 430-33 and Flight, London, Apr. 12, May 3, 1917, v. 9, no. 15-18, p. 355, 378-79, 401-02)
- The Manufacture of steel. An elementary study of the processes employed in the production of steel and the characteristics and uses of the resulting materials. Aeronautics, London, July 4, 1917, v. 13, no. 194, p. 12-16. illus.
- Steels used in aero work. Flight, London, Apr. 26, 1917, v. 9, no. 17, p. 390.
- Steels suited to aeronautical purposes, by E. A. Richardson. Mechanical engineering, New York, Apr. 20, 1917, v. 39, no. 1004, p. 300-01. (Also Iron age, New York, Mar. 29, 1917, v. 99, p. 778-80)
- How steel is used in aeroplanes, by W. S. Doxsly. Iron trade review, Cleveland, O., Jan. 4, 1917, v. 60, no. 1, p. 97-100. illus.
- L'Acier en aviation; controle-traitement étude des caractéristiques-pour avions et moteurs, par Charles Albert Marie Grard. Paris, Berger-Levrault, 1915. 192 p. diagrs., illus.

## STEEL - STAINLESS

- Oberflächenangriff, interkristalliner Kornzerfall und elektrotechnisches Verhalten der nichtrostenden Stähle, von H. Wiester. Stahl und Eisen, Düsseldorf, Feb. 1940, v. 60, no. 6, p. 119-21. diagrs., table.
- Electrolytic polishing of stainless steel, by G. Kiefer. Iron age, New York, Dec. 21, 1939, v. 144, p. 30-32, 66. illus.
- Structural and other uses of stainless steel in airplanes. Aero digest, New York, Dec. 1939, v. 35, no. 6, p. 50-52, 54. illus., tables.
- The Welding of stainless steel and its alloys, by G. H. Tweney. Aero digest, New York, Dec. 1939, v. 35, no. 6, p. 45, 54. illus., tables.
- Polishing technique for stainless steels, by W. M. Mitchell. Iron age, New York, Oct. 19, 26, 1939, v. 144, no. 16, 17, p. 56-59, 92-94, 32-35, 92. illus.
- Further studies of the spot welding of low carbon and stainless steels, by Wendel F. Hess and Robert A. Wyant. Journal of the American welding society, New York, Oct. 1939, v. 18, no. 10, p. 348-54. illus., tables.

## METALS AND LIGHT ALLOYS

- Stainless clad steel by a new process. *Metals and alloys*, New York, Sep. 1939, v. 9, no. 9, p. 287-89. illus.
- La Soudure des aciers inoxydables. *La Pratique des industries mécaniques*, Paris, Aug. 1939, v. 22, no. 5, p. 199-201. table.
- Cold forming operations of stainless steels, by W. M. Mitchell. *American machinist*, New York, May 3, 1939, v. 82, p. 290-92.
- Über die warmformgebung hochlegierter korrosionbeständiger chrom- und chrom-aluminium-silizium-stähle, von J. Schriffler und W. Hirsch. *Technische zeitschrift*, Berlin, May 1939, v. 49, no. 9, 10, p. 373-76. diagsr., illus., tables.
- Die Härtung borhaltiger austenitischer chrom-nickel-stähle beim anlassen, von H. Cornelius. *Archiv für das eisenhüttenwesen*, Düsseldorf, Apr. 1939, v. 12, no. 10, p. 499-505. illus.
- Shearing, blanking, drawing, spinning, forming and riveting of stainless steel. *Iron age*, New York, Feb. 2, 1939, v. 143, p. 37-41. illus.
- Tensile elastic properties of 18:8 chromium-nickel-steel as affected by plastic deformations, by D. J. Adam and R. W. Mebs. Washington, U. S. Govt. print. off., 1939. 42 p. illus., tables. (N.A.C.A. Report no. 670)
- Stainless steel has merit as conductor; high tension ignition cables for automobiles and airplanes, by M. Peters. *Electrical world*, New York, Dec. 3, 1938, v. 110, p. 1618.
- Study of the influence of carbon on the corrosion of steel, by W. S. Patterson. *Chemical industries*, New York, Dec. 1938, v. 57, p. 442-44. illus.
- Stainless steel for aircraft, by V. W. Whitmer. *Automotive industries*, Philadelphia, Nov. 12, 1938, v. 79, p. 648. diagsr.
- Low-carbon stainless steels, data sheets, makers, composition, physical properties, etc. *Chemical and metallurgical engineering*, New York, Nov. 1938, v. 45, p. 641-42. illus.
- Stainless steel welding, by V. W. Whitmer. *Sheet metal industries*, London, Nov. 1938, v. 12, p. 1299-1302. illus. (Also *Welding journal*, New York, Sep. 1937, v. 16, no. 9, p. 8-19) (Abstract *Metropolitan-vickers technical news bulletin*, London, Nov. 11, 1938, v. 634, p. 5)
- Characteristics and fabrication of stainless steels containing more than 14% chromium, by V. N. Krivobok. *Metal progress*, Cleveland, O., July-Sep. 1938, v. 34, p. 47-52, 135-39, 223-29. diagsr., illus.

## METALS AND LIGHT ALLOYS

- Corrosion in stainless steels, by V. N. Krivobok. American machinist, New York, Oct. 6, 1937, v. 81, no. 20, p. 910. illus.
- Short time creep characteristics of stainless steels, by S. I. Wolfson and A. M. Borzdyka. Metals and alloys, New York, Oct. 1937, v. 8, no. 10, p. 294-96. illus., tables.
- Das Schweissen von nichtrostenden nickelfreien chromstählen, von W. Tofaute. Zeitschrift des V.D.I., Berlin, Sep. 18, 1937, v. 81, no. 38, p. 1117-22. illus., tables.
- Stainless steels, by H. E. Blank, Jr. Automotive industries, Philadelphia, Sep. 18, 1937, v. 77, no. 11, p. 382-90, 400, 401. illus.
- Oxy-acetylene welding of stainless steel. Industry and welding, Cleveland, O., Aug. 1937, v. 10, p. 47-49. illus.
- Metal for the light plane, by James P. Eames. Western flying, Los Angeles, Cal., July 1937, v. 17, no. 7, p. 22-23.
- A Digest of stainless steels, by V. N. Krivobok. Iron age, New York, June 3, 1937, v. 139, no. 22, p. 39-43, 43a-43b. illus., tables.
- Laboratory corrosion tests of welded low-carbon stainless steel, by G. A. Ellinger and L. C. Bibber. Welding journal, London, Apr. 1937, v. 16, no. 4, p. 18-19. illus.
- Is aviation ready for stainless? by E. J. W. Ragsdale. Metal progress, Cleveland, O., Mar. 1937, v. 31, no. 3, p. 275-77. illus.
- La Soudure des aciers inoxydables, par M. Boutte. Revue du nickel, Paris, Mar. 1937, v. 8, no. 2, p. 35-38. illus. (Abstract L'Aerotecnica, Roma, Mar. 1938, v. 18, no. 3, p. 327)
- Corrosion resistance of metals and alloys, by Robert J. McKay and Robert Worthington. New York, Reinhold publishing corporation, 1937. 492 p. diagrs., illus., tables.
- Austenitic stainless steels of the chromium-nickel variety, by V. N. Krivobok and R. A. Lincoln. Iron age, New York, Oct. 29, 1936, v. 138, no. 17, p. 26-34a, 40. illus., tables.
- Springs of stainless steel, by S. Tour. Iron age, New York, Oct. 15, 1936, v. 138, no. 16, p. 101-04, 106, 108, 110, 112. illus., tables.
- Stainless steels in aircraft construction, by W. L. Sutton. Metal progress, Cleveland, O., June 1936, v. 29, no. 6, p. 40-44. illus.



## STEEL - STAINLESS

- Stainless coatings by an improved chromizing process. Iron age, New York, Mar. 12, 1936, v. 137, no. 11, p. 35.
- Compression tests of stainless steel sections, by E. W. Walker. Aero digest, New York, Mar. 1936, v. 28, no. 3, p. 32.
- Long-time creep tests of 18 cr. 8 ni. steel and 0.35 per cent carbon steel, by H. C. Cross and F. B. Dahle. Transactions of the A.S.M.E., New York, Feb. 1936, v. 58, no. 2, p. 91-97. illus.
- Stainless steels, by H. Bull. Aircraft engineering, London, Feb. 1936, v. 8, no. 184, p. 51-54. tables. (Also Engineer, London, Jan. 10, 1936, v. 161, no. 4174, p. 58)
- Welding properties of corrosion-resisting alloy steels improved with columbium, by W. J. Priestley. National petroleum news, Cleveland, O., Jan. 29, 1936, v. 28, p. 29-30, 72. illus.
- Steel made stainless by chromium-alloy plating. Automotive industries, Philadelphia, Jan. 25, 1936, v. 74, no. 4, p. 113.
- Comparison of corrosion resistant steel (18 per cent chromium - 8 per cent nickel) and aluminum alloy (24ST), by J. E. Sullivan. Washington, 1936. 12 p. illus. (N.A.C.A. Technical notes no. 560)
- Improved fabrication of 18-8 chromium steels, by Donald R. Pratt. Welding journal, New York, Dec. 1935, v. 14, no. 12, p. 16-19. illus.
- Notes on welding important groups of stainless steel, by Ernest E. Thum. Metal progress, Cleveland, O., Oct. 1935, v. 28, no. 4, p. 111-16. diags., illus., tables.
- Friction tests on stainless shaft. Engineering, London, July 19, 1935, v. 140, no. 3627, p. 72. diags.
- Stainless in aircraft, by W. L. Sutton. Aviation, New York, June, July 1935, v. 34, no. 6, 7, p. 30-32, 29-31. diags., tables. (Also Aero digest, New York, July 1935, v. 27, no. 1, p. 40, 42)
- Emploi des aciers inoxydables dans la construction des hydravions. Revue du nickel, Paris, Apr. 1935, v. 6, no. 2, p. 109-12. diags.
- The Book of stainless steels, by M. S. Hunter. Cleveland, American society for metals, 1935. 502 p. illus., tables.
- Stainless steel, by E. E. Thum. Cleveland, American society for metals, 1935. 787 p. diags., illus., tables.

## METALS AND LIGHT ALLOYS

- Tubing, steel, corrosion resisting (18 per cent chromium and 8 per cent nickel) seamless drawn, streamline cross section (aircraft use). Washington, U. S. Govt. print. off., 1935. 7 p. diags. (Navy department, specification no. 44T29)
- Stainless steels in aircraft construction, by W. H. Hatfield. Iron and coal trades review, London, Dec. 28, 1934, v. 129, no. 3487, p. 1018-19. illus. (Also Aeroplane, London, Dec. 19, 1934, v. 47, no. 1230, p. 743-44)
- Le Problème de la corrosion; la solution par les aciers inoxydables, par H. Leroux. Métaux et machines, Paris, Dec. 1934, v. 18, no. 251, p. 341-44.
- Drawing and polishing stainless steel, by R. F. Johnston. Machinery, New York, June 1934, v. 40, no. 10, p. 589-90. illus.
- Stainless steel in aircraft construction, by Frederic Flader. Transactions of the A.S.M.E., New York, May 1934, v. 56, no. 5, p. 295-300. tables. (Abstract Automotive industries, Philadelphia, July 1933, v. 69, no. 1, p. 15)
- Heat resisting steel 18/8 containing silicon and aluminum, by M. M. Romanov and O. I. Ver. Metallurgia, Manchester, England, Apr. 1934, v. 9, no. 4, p. 43-52. diags., illus.
- Study of the strength of stainless and heat resisting steels at high temperatures, by M. S. Hunter and A. K. Robertson. Pittsburgh, Pa., Carnegie institute of technology, 1934. 64 p. diags., illus., tables.
- Rostfreier stahl für flugzeuge, von P. Brenner. Zeitschrift des V.D.I., Berlin, Oct. 21, 1933, v. 77, no. 42, p. 1135. diags., illus.
- Stainless steel in aircraft construction, by E. J. W. Ragsdale. Transactions of the A.S.M.E., New York, Apr.-June 1933, v. 55, p. 89-95. illus. (Also Aviation engineering, New York, Aug. 1932, v. 7, no. 2, p. 5-7, 31; Welding, Pittsburgh, Pa., Aug. 1932, v. 3, no. 8, p. 471-73 and American machinist, New York, June 16, 1932, v. 76, p. 776) (Abstract Journal of the R.A.S., London, Mar. 1934, v. 38, no. 279, p. 247)
- Un Nouveau matériau de construction aéronautique; l'acier inoxydable soudé, par J. Desgranges. La Nature, Paris, May 1, 1933, v. 61, no. 1, p. 414-16. illus.
- The Corrosive resistance of stainless aircraft steels, by E. L. Jacob. Aviation engineering, New York, May 1933, v. 8, no. 5, p. 8-10, 22. illus.
- La Fabbricazione dell' acciaio inossidabile. Rivista aeronautica, Roma, May 1933, v. 9, no. 5, p. 356. diags.

## STEEL - STAINLESS

- Making stainless steels, by C. G. Grey. *Aeroplane*, London, Apr. 19, 1933, v. 44, no. 16, p. 696-700. illus.
- La Mesure du degré de poli en vue de la détermination de la tenue à la corrosion des aciers inoxydables, par Jean Cournot et Louise Halm. *C. R. Acad. sci.*, Paris, Apr. 1933, v. 196, no. 14, p. 1017-19. tables. (Abstract *Le Génie civil*, Paris, Apr. 15, 1933, v. 102, no. 15, p. 358)
- L'Acciaio inossidabile nelle costruzioni aeronautiche. *L'Aerotecnica*, Roma, Mar. 1933, v. 13, no. 3, p. 194-205. diags., illus., tables.
- Notes on the use of stainless steel in aircraft structures, by H. J. Pollard. *Flight*, London, Dec. 1, 1932, v. 24, no. 1249, p. 1152e-1152g. illus.
- Two-ply stainless steel, by S. L. Ingersoll. *Automotive industries*, Philadelphia, Sep. 24, 1932, v. 67, no. 13, p. 392-93. illus. (Abstract *Journal of the R.A.S.*, London, May 1933, v. 37, no. 269, p. 457)
- Les Aciers austénitiques inoxydables. Leur durcissement, essais de corrosion activés, soudure autogène, décapage, traitement thermique, laminage, chaudronnage et moulage, emboutissage, usinage. *Revue du nickel*, Paris, July 1932, v. 3, 52 p. diags., illus.
- Stainless steel and shot-welding, by E. J. W. Ragsdale. *Aviation*, New York, Apr. 1932, v. 31, no. 4, p. 177-79. diags., illus.
- Protection of metal parts of aircraft against corrosion, by H. Sutton. *Journal of the R.A.S.*, London, Jan. 1932, v. 36, no. 253, p. 1-23. diags., illus. (Abstract *Canadian air review*, Toronto, Oct. 1931, v. 4, no. 8, p. 25)
- A Corrosion test of heat resisting steel, 18-8 type, with various additions, by Vasili Kuznetzoff and Ivan Liferenko. Pittsburgh, Pa., Carnegie institute of technology, 1932. 24 p. diags., illus., tables.
- Effect of heat treatment on the physical properties of stainless steel, by G. A. Hoderness and W. C. France. Pittsburgh, Pa., Carnegie institute of technology, 1932. 16 p. diags., illus.
- Influence de l'état de surface sur la corrosion des aciers inoxydables, par Jean Cournot. *C. R. Acad. sci.*, Paris, Dec. 21, 1931, v. 193, no. 25, p. 1335-37. table.
- Dural or stainless steel? by Orson D. Munn. *Scientific american*, New York, Oct. 1931, v. 145, no. 4, p. 263-64. illus.

## METALS AND LIGHT ALLOYS

- Spot welding of stainless steel, by J. F. Hardecker. Airway age, New York, July 4, 1931, v. 13, no. 1, p. 37-39. illus.
- Use of stainless steel in aircraft construction, by N. O. Robinson. Aviation engineering, New York, July 1931, v. 6, no. 1, p. 11-14, 19. illus.
- The Machining of stainless steel, by R. Waddell and F. Worton. Aeroplane, London, Apr. 29, 1931, v. 40, no. 17, p. 784, 786, 788, 790. illus. (Also Mechanical world and engineering record, Manchester, England, Jan. 16, 23, 1931, v. 89, no. 2298, 2299, p. 58-59, 80-82 and Machinery, London, Jan. 8, 1931, v. 37, no. 952, p. 491-93)
- Rustless steels as applied to automobiles and aircraft, by W. H. Hatfield. Flight, London, Mar. 10, 1931, v. 23, no. 10, p. 214-15. diags., tables. (Also Proceedings of the Institution of automobile engineers, London, 1930-1931, v. 25, p. 285-304. illus.)
- Stainless steel in aircraft. Aero digest, New York, Jan. 3, 1931, v. 18, no. 1, p. 13.
- Corrosion prevention methods used in aircraft, by H. S. Rawdon. Aeronautical world, Los Angeles, Cal., Jan. 1931, v. 4, no. 1, p. 18-19. illus.
- Effect of gases and stress on 18 per cent chromium, 8 per cent nickel steel at elevated temperature, by Allesandro Reggiori. Pittsburgh, Pa., Carnegie institute of technology, 1931. 12 p. diags., illus.
- Stainless iron and steel, by J. H. C. Monypenny. New York, John Wiley and sons, 1931. 575 p. diags., tables.
- The Corrosion of metals, by H. Sutton. Aircraft engineering, London, Aug. 1930, v. 2, no. 18, p. 209-10. illus.
- Results of research in stainless steel, by E. J. W. Ragsdale. Aviation, New York, Aug. 1930, v. 29, no. 2, p. 97-98. illus.
- Arc welding of stainless and corrosion resistant steels, by R. D. Thomas. Journal of the American welding society, New York, July 1930, v. 9, p. 90-98. illus., tables. (Also Iron and coal trades review, London, June 19, 1930, v. 86, p. 59-62)
- Corrosion of metals. Aircraft servicing, New York, May 1930, v. 1, no. 1, p. 23-24.
- Heat and corrosion resisting materials, by H. D. Phillips. Heat treating and forging, Pittsburgh, Pa., Apr. 1930, v. 16, no. 4, p. 466-70. tables.

## STEEL - STAINLESS

- Highly-alloyed steels in aircraft construction. Proceedings of the American society for testing materials, Philadelphia, 1930, v. 30, p. 41-47, 171-214. illus., tables. (Abstract Steel, Cleveland, O., July 17, 1930, v. 87, no. 3, p. 52)
- Heat treats stainless steel tubes, by A. I. Findley. Iron age, New York, Oct. 31, 1929, v. 124, no. 18, p. 1157-60. diagsr., illus.
- Corrosion and fatigue of metals. Aeronautical research in Sweden, by Tord K. Angstrom. Journal of the R.A.S., London, Oct. 1929, v. 33, no. 226, p. 900-08. diagsr., illus. (Abstract L'Aerotecnica, Roma, Jan.-Feb. 1930, v. 10, no. 1, 2, p. 65)
- Welding of rust-resisting steels. Engineer, London, Oct. 1929, v. 48, p. 147-49. illus.
- Rust proofing steel and aluminum aircraft parts. Iron age, New York, Aug. 15, 1929, v. 124, no. 6, p. 409.
- Stainless steel members in R. 101, by John F. Hardecker. Iron age, New York, June 27, 1929, v. 123, no. 26, p. 753-58. illus.
- Stainless steel and iron, by W. W. Hackett, Jr. Journal of the R.A.S., London, Mar. 1929, v. 33, no. 219, p. 235-38. illus.
- Welding of stainless materials, by H. Bull and L. Johnson. Washington, 1929. 43 p. diagsr., illus. (N.A.C.A. Technical memorandums no. 532)
- Welding rustproof steels, by W. Hoffmann. Washington, 1929. 9 p. diagsr., illus., tables. (N.A.C.A. Technical memorandums no. 531) (From Autogene metallbearbeitung, Halle, Dec. 15, 1927, v. 20, no. 24, p. 337-45)
- Stainless steel for aircraft, by F. Sigrist. Flight, London, Sep. 27, 1928, v. 20, no. 39, p. 834b-834d. illus.
- Protecting and finishing aircraft structures, by Thomas B. Colby. Aviation, New York, July 2, 1928, v. 25, no. 1, p. 26, 61-62. illus.
- Alloy and stainless steels, by J. Hopcraft. Journal of the R.A.S., London, Jan. 1928, v. 32, no. 205, p. 69-76. diagsr., illus., tables.
- Heat resisting and non-corrodible steel, by S. A. Main. Fuel, London, Jan. 1928, v. 7, no. 1, p. 4-20. illus., tables. (Also Journal of the Institution of aeronautical engineers, Melbourne, Aug. 1927, v. 1, no. 8, p. 5-44)
- Welding of high chromium steels, by W. B. Miller. Washington, 1928. 13 p. illus. (N.A.C.A. Technical notes no. 290)

## METALS AND LIGHT ALLOYS

- The Tensile properties of stainless iron and other alloys at elevated temperatures, by P. G. McVetty and N. Mochel. Transactions of the American society for steel treating, Cleveland, O., Jan. 1927, v. 11, no. 1, p. 74-100, 169. diags., illus.
- Anodic treatment of alloy steels in aircraft construction, by G. D. Bengough and H. Sutton. Metal industry, London, Aug. 13, 1926, v. 29, no. 3163, p. 153, 175. (Abstract Engineering, London, 1926, v. 122, p. 274)
- Stainless steel in engineering, by James Edgar. Iron and steel of Canada, Gardenvale, May 1922, v. 5, p. 61-62.
- Development of stainless steel; its properties and uses, by Thomas Firth. Sheffield, England, Thomas Firth and sons, 1922. 82 p. diags., illus., tables.
- Thermal expansion of nickel, monel metal, stellite, stainless steel and aluminum, by Wilmer H. Sonder and Peter Hidnert. Washington, U. S. Govt. print. off., Bureau of standards, 1922. 22 p. illus. (Scientific papers no. 426)
- Stainless steel; its properties and uses. Sheffield, England, Brown Bayley's steel works, 1921. 5 p. diags.
- Stainless steel; its treatment, properties and application, by W. H. Marble. Transactions of the American society for steel treating, Cleveland, O., Dec. 1920, v. 1, p. 170-77. illus., tables.
- The Heat-treatment of a high chromium steel, by H. J. French and Y. Yamaguchi. S.A.E. journal, New York, July 1920, v. 7, no. 1, p. 103-09. illus.
- Rust-proof steel for aircraft. Flight, London, Mar. 28, 1917, v. 6, no. 13, p. 341. diags.

## STEEL - GENERAL

- Research on alloy steels. Engineering, London, May 26, June 2, 1939, v. 147, p. 612-14, 663-64. tables. (Also Engineer, London, June 2, 1939, v. 167, p. 683-84)
- Metals for aeroplane construction, by J. B. Johnson. Journal of the Aeronautical sciences, New York, Mar. 1939, v. 6, no. 5, p. 185-202. diags., illus.
- Metals used in aircraft industry, by J. Richard Goldstein. Metal progress, Cleveland, O., Apr. 1938, v. 33, no. 4, p. 357-61. illus. (Also Canadian metals and metallurgical industries, Toronto, Apr. 1938, v. 1, no. 4, p. 110-12, 119) (Abstract Aero digest, New York, July 1938, v. 33, no. 1, p. 46-47, 50)

## STEEL - GENERAL

- Research on alloy steels. Engineering, London, Oct. 16, 1936, v. 142, no. 3692, p. 428.
- Modern steel and weight reduction, by J. C. Whetzel. Heat treating and forging, Pittsburgh, Pa., July-Aug. 1935, v. 21, no. 7, 8, p. 329-33, 373-75. diagrs., tables. (Also Iron age, New York, May 30, 1935, v. 135, no. 22, p. 32-43 and Steel, Cleveland, O., May 27, 1935, v. 96, no. 21, p. 40-44, 60)
- Methods of testing steel, by E. Skerry. Aircraft engineering, London, Aug. 1933, v. 5, no. 54, p. 43-45. illus.
- Les Métaux dans la construction des avions, par G. W. Ivanov. Conquête de l'air, Bruxelles, May 1933, v. 29, no. 5, p. 213-14. illus.
- A Year's progress in steels. Aircraft engineering, London, Mar. 1933, v. 5, no. 49, p. 12.
- Les Aciers spéciaux au XIII<sup>e</sup> salon de l'aéronautique, par J. Galibourg. Technique aéronautique, Paris, Oct.-Dec. 1932, v. 23, no. 126, p. 340-49. illus.
- Duralumin and steel construction, by G. H. Handasyde. Aircraft engineering, London, Sep. 1932, v. 4, no. 38, p. 88-90. illus.
- Vergütungsstähle, von Erich Eichwald. Automobiltechnische zeitschrift, Berlin, Aug. 10, 1932, v. 15, p. 363-69. tables. (Abstract Journal of the R.A.S., London, May 1933, v. 42, p. 457)
- Recent developments in steels. Some of the advances made in the last eighteen months reviewed and described. Aircraft engineering, London, Apr. 1932, v. 4, no. 38, p. 101.
- Les Aciers spéciaux, par G. Mars. Paris, Dunod, 1932. 548 p. diagrs., illus., tables.
- Alloy steels in the aircraft industry, by Roy U. Wright. Airway age, New York, Oct. 3, 1931, v. 13, no. 14, p. 289.
- Materials in 1930--Steel and aluminum alloys, by J. B. Pearson. Airway age, New York, Jan. 1931, v. 12, no. 1, p. 40-43.
- Progress in aircraft material development, by J. B. Johnson. Aviation, New York, Jan. 1931, v. 30, no. 1, p. 40-42. illus.
- Steels for aircraft engines, 1918 vs. 1930. Metal progress, Cleveland, O., Jan. 1931, v. 19, no. 1, p. 70-76. illus.
- More metal being used in planes. Metals and alloys, New York, Nov. 1930, v. 1, p. 849.

## METALS AND LIGHT ALLOYS

- The Development of materials for aircraft purposes, by W. Rosenhain. Journal of the R.A.S., London, Aug. 1930, v. 34, no. 236, p. 631-48. illus. (Also Aeroplane, London, Dec. 25, 1929, v. 37, no. 26, p. 1434, 1436 and Metallurgia, Manchester, England, Dec. 1929, v. 1, no. 2, p. 47)
- Dependence of aviation on metallurgy, by J. B. Johnson. Metals and alloys, New York, Apr. 1930, v. 1, p. 450-54. illus., table.
- Steels and alloys. (In Air annual of the British empire, London, 1930, p. 572-605. illus.)
- Steel, unfinished steel and cast iron in aeroplane construction, by N. A. Minkevitch. Moscow and Leningrad, V.V.D., 1930. 829 p. diags., illus., tables.
- Progrès de la métallurgie et leur influence sur l'aéronautique, par D. R. Pye. Mémoires et compte rendu des travaux de la Société des ingénieurs civils de France, Paris, Jan. 1928, v. 81, no. 1, p. 113-70. diags., illus.
- Commercial aeronautics and steel, by W. P. MacCracken, Jr. Iron age, New York, Apr. 7, 1927, v. 119, no. 14, p. 987-89. illus., tables.
- Steel, light alloys and wood in aeroplane construction, by V. A. Liekoshin. Leningrad, V.V.D., 1927. 375 p. diags., illus., tables.
- Aircraft steels and material, by Bagnall Wild, Ralph Kirby, Leslie Aitchison, A. A. Remington, A. J. Rowledge and W. A. Thain. London, Constable and company, 1923. 209 p. diags., illus., tables.
- Tendances actuelles de la construction des avions, par P. Grimault. Aéronautique, Paris, Dec. 1922, v. 4, no. 43, p. 387-94. illus.
- Aircraft steels and material, by W. Ripper. London, Constable and company, 1922. 209 p. illus.
- La Struttura ed i trattamenti termici degli acciai impiegati in aeronautica, di G. Gallo. Atti Assoc. ital. aerotecn., Roma, 1922, v. 2, no. 3, 4, p. 65-85. illus., tables.
- Three types of alloy sheet steel, by Horace C. Knerr. Iron age, New York, Sep. 8, 15, 22, 1921, v. 108, no. 10, 11, 12, p. 594-96, 655-58, 725-28. illus.
- L'Acier, aviation, automobilisme, constructions mécaniques, sanctions de la guerre, par C. A. M. Grard. Paris, Berger-Levrault, 1921. 364 p. illus., tables.



## STEEL - GENERAL

- The Structure of steel, by N. T. Belaiev. Aeronautics, London, Nov. 4, 11, 18, 1920, v. 19, no. 368-70, p. 329-30, 347-49, 358. illus., tables.
- Report on materials of construction used in aircraft and aircraft engines, by Charles Frewen Jenkins. London, H. M. Stat. off., 1920. 162 p. illus., tables.
- Aircraft steels, by Albert Sauveur. American institute of mining and metallurgical engineers, New York, Dec. 1919, v. 153, p. 2323-38. illus., tables.
- Steels. Sheffield, Burys and company, 1918. 29 p. diagsr., illus.
- The Structure of ball-bearing steel. Aerial age, New York, Nov. 12, 1917, v. 6, no. 9, p. 381, 391. illus.
- The Manufacture of steel for aircraft. Aerial age, New York, Sep. 10, 1917, v. 5, no. 26, p. 974-75. illus.
- Problem of getting suitable steel for aeronautical motors and magnetos solved. Aerial age, New York, Nov. 29, 1915, v. 2, no. 11, p. 245.

## GENERAL

- Fatigue of eight metal alloys, by R. L. Templin. Metals and alloys, New York, Aug. 1939, v. 10, no. 8, p. 243-45. illus.
- Light metals in american airplane manufacture, by H. W. Perry. Light metals, London, Aug. 1939, v. 2, no. 16, p. 171-74. illus.
- Fatigue problems in the aircraft industry, by K. Arnstein and E. L. Shaw. Metals and alloys, New York, July 1939, v. 10, no. 7, p. 203-09. illus.
- Les Métaux et alliages modernes en construction aéronautique, par R. Cazaud. La Technique moderne, Paris, May 1, 1939, v. 51, no. 9, p. 333-36. diagsr., illus.
- Materials for airplane construction, by J. B. Johnson. Journal of the Aeronautical sciences, New York, Mar. 1939, v. 6, no. 5, p. 185-202. illus., tables.
- Some corrosion problems relating to modern aircraft, by A. J. Sidery and J. W. Willstrop. Metal industry, London, Feb. 10, 17, 1939, v. 54, p. 179-81, 208-12. illus.
- The Protection of metal surfaces, by T. P. Hoar. Metal industry, London, Jan. 13, 1939, v. 54, p. 83-90. illus.

## METALS AND LIGHT ALLOYS

- Materials of aircraft construction, by H. J. Gough. Journal of the R.A.S., London, Nov. 1938, v. 42, no. 335, p. 921-1032. illus., tables.
- Aircraft use many alloys. Steel, Cleveland, O., Aug. 15, 1938, v. 103, no. 6, p. 64.
- Corrosion-resisting materials. Flight, London, July 28, 1938, v. 34, p. 82e-82h. diags.
- Manufacturers of aircraft materials and fabricated parts. Aero digest, New York, July 1938, v. 33, p. 94-113. illus., tables.
- Metals in the aircraft industry, by J. R. Goldstein. Aero digest, New York, July 1938, v. 33, p. 46-47, 50. illus. (Also Metal progress, Cleveland, O., Apr. 1938, v. 33, no. 4, p. 357-61)
- Materials of aircraft construction. Metallurgia, Manchester, England, June 1938, v. 18, no. 104, p. 54-59. tables.
- Recent developments in magnetic materials, by C. W. Webb. Journal of the Institution of electrical engineers, London, Mar. 1938, v. 82, no. 495, p. 303-24. (Abstract Journal of the R.A.S., London, Apr. 1938, v. 42, no. 54, p. 481)
- Applicazione dell'analisi spettrografica nello studio delle leghe, di H. Triché. L'Aerotecnica, Roma, Feb. 1938, v. 18, no. 2, p. 209.
- Metallurgy and the aero-engine, by D. R. Pye. Journal of the Institute of metals, London, Sep. 6, 1937, v. 61, no. 2, p. 19-34. diags., illus.
- Metal for the light airplane, by J. P. Eames. Western flying, Los Angeles, Cal., May 1937, v. 17, no. 5, p. 27-28, 30. illus.
- Matériaux pour l'aviation dans l'U.S.S.R. L'Aérophile, Paris, Dec. 1936, Feb. 1937, v. 44, 45, no. 12; 2, p. 278-80; 38. diags., illus. (Abstract Journal of the R.A.S., London, Apr. 1937, v. 41, no. 42, p. 408)
- Metallurgical problems of aero engine manufacture, by E. R. Gadd. Journal of the R.A.S., London, Aug. 1936, v. 40, p. 622-33. illus.
- Die Sowjetrussischen forschungsarbeiten auf dem gebiete der korrosion und korrosionsverhütung, von M. Pohl. Korrosion und metallschutz, Berlin, Apr. 1936, v. 12, no. 4, p. 89-94. illus.
- Metals and alloys used in airplane construction, from data supplied by airplane manufacturers. Engineering and mining journal, New York, Nov. 1935, v. 136, p. 557. illus.

## GENERAL

- I Metalli nell'aviazione, di G. Guidi. L'Ala d'Italia, Milano, Mar. 1932, v. 10, p. 21-26. illus.
- Protection of metal parts of aircraft against corrosion, by H. Sutton. Journal of the R.A.S., London, Jan. 1932, v. 36, p. 1-14. illus., tables. (Also Engineer, London, Nov. 27, 1931, v. 152, p. 172-74)
- Light alloys in aircraft, by H. W. Gillett. Cleveland, O., Case school of applied science, 1932. 6 p. illus. (Abstract Mechanical engineering, New York, Jan. 1932, v. 54, no. 1, p. 50-51)
- Electrical method for research in material for auto and avio motor construction, by V. A. Pivovarov. Teknika vozdušnovo flota, Moscow, Apr. 1931, no. 4, p. 272-76. diagsr.
- La Corrosione dei materiali impiegati nelle costruzioni aeronautiche, di G. Guidi. Ingegnere, Roma, Mar. 1931, v. 5, no. 3, p. 153-63. illus., tables.
- I Metalli nelle costruzioni aeronautiche. L'Ala d'Italia, Milano, Feb. 1931, v. 10, no. 2, p. 149-60. illus., tables.
- El Metal en las construcciones aeronáuticas. Boletín del Aero club argentino, Buenos Aires, Dec. 1930, v. 1, no. 2, p. 53.
- Metallurgical problems involved in structural metals used in aircraft. (In Symposium on aircraft materials. American society for testing materials, Philadelphia, 1930, v. 30, p. 26)
- Metals used in aircraft construction, by B. Stoughton. Journal of the Society of chemical industry, London, Dec. 13, 1929, v. 48, no. 50, p. 1189-98. diagsr., tables.
- Aircraft metallurgy, by H. C. Knerr. Transactions of the American society for steel treating, Cleveland, O., May 1928, v. 13, no. 5, p. 723.
- Materials in aircraft construction, by L. Aitchison. Journal of the R.A.S., London, Apr. 1924, v. 28, p. 234-59. illus. (Also Flight, London, Jan. 24, 1924, v. 16, no. 4, p. 48-52 and Engineering, London, Jan. 18, 1924, v. 117, p. 89-91)
- Some materials in aircraft construction, by John D. North. Journal of the R.A.S., London, Apr. 1924, v. 28, no. 160, p. 226-33. tables.

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