



# Leading Industrial Components

Together  
ahead. **RUAG**

## **One target, one round, one choice. RUAG Ammotec.**

RUAG Ammotec stands for a most sophisticated ammunition technology. The company develops and manufactures high-performance standard and special ammunition for Hunting & Sports and Defence & Law Enforcement, as well pyrotechnic elements and components for industry in general. Across the globe, the company has been supplying customers of many different nations with high-precision ammunition products of the military and civil markets for years.

# About RUAG Ammotec

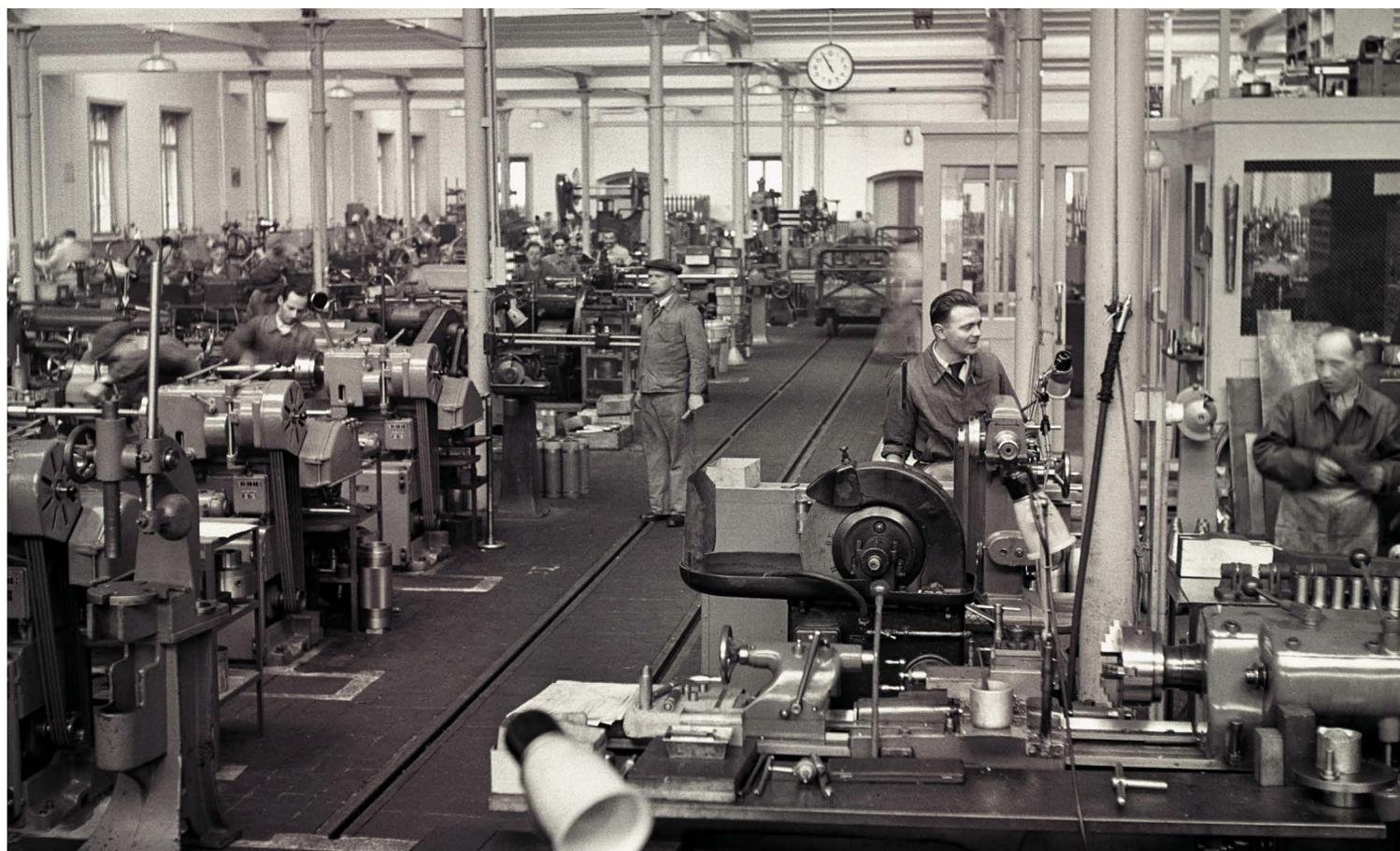
Based upon a 150 year heritage of quality and innovation, RUAG Ammotec has become a trusted technology leader and strategic partner in the global ammunition industry.

The company was formed by the merger of the small arms activities of the Swiss RUAG, the German Dynamit Nobel, the Hungarian MFS 2000 and the Swedish Norma Precision AB. Distribution companies in France, Great Britain, Austria and the USA support sales to armed forces, law enforcement, private customers and the industry.

The history of RUAG Ammotec is characterized by a pioneering spirit and innovation. The result is one of the world's leading producers of ammunition. The experiences gained from generations of expertise and attention to detail have become a part of the RUAG culture and have seamlessly been integrated into today's modern manufacturing processes. This knowledge, coupled with the selection of the purest materials, form the foundation of developing a high quality cartridge.

Our logo with the slogan «Together ahead. RUAG» communicates our daily promise to our customers, partners and employees in an active, clear manner. It means working together to ensure mutual success!

The products are renowned for their ultimate dependability, precision and optimally engineered effect. Environmentally safe disposal of pyrotechnic products also forms part of the service portfolio. Building on its ammunition expertise, RUAG Ammotec is the leader in heavy-metal-free primer technology, e.g. for actuator cartridges for the construction industry and special applications in automotive safety systems. With the continuous further development of its products the company satisfies the highest demands of its customers and is a dependable partner to them at all times.



# Components for Small Arms Ammunition

Ammunition consists of four components: cartridge case, primer cap, propellant powder and projectile. RUAG Ammotec as one of the most important ammunition manufacturers produces all the components for its ammunition products, except for propellant powder. The high quality standards of components make RUAG the preferred partner of other ammunition manufacturers who gladly utilise RUAG's production know-how.





## Cups

Cups are the component necessary for the production of cartridge cases. Cups are pressed from brass strips for cases and projectiles and undergo further finishing processes so that they can be best utilised in the manufacture of cases. The first manufacturing process determines the quality of the cases made from these cups. RUAG Ammotec delivers cups to customer specifications to optimise the further production by the customer.

## Primer Caps For Small Arms Ammunition

The quality of the primer caps determines the quality of the ammunition. The compatibility of the primer caps with other ammunition components especially the cartridge case and propellant results in the difference between a mass produced product and one which is specifically matched to a particular system. Only the best ammunition can provide the desired precision from the intended weapon. RUAG Ammotec uses its expertise and know-how to adjust each primer cap to suit specific customer requirements. RUAG Ammotec manufactures Berdan and Boxer primer caps for all current small calibres.

## Cartridge Cases

RUAG Ammotec produces not only cartridge cases of the most commonly used calibres for Armed Forces and law enforcement (5.56mm, 7.62mm, 9mm and 12.7mm) but also a large variety of other cases.

## Projectiles

Besides projectiles of the most commonly used calibres for Armed Forces and law enforcement (5.56mm, 7.62mm, 9mm and 12.7mm) RUAG Ammotec also manufactures a large variety of other special projectiles.

# Ignition Elements

Primer caps are applied not only to ignite ammunition but also in other applications, which require fast reaction. In addition to Berdan primer caps and primer caps with an anvil (Boxer) RUAG Ammotec manufactures stab primers, friction primers, electric primers, ignition chains and propellant charge primers. Actuators complete the range of products.



## Primer Caps

RUAG Ammotec's primer caps trigger the special ammunition used for explosive disposal waterjet disruptors and initiate the release of oxygen masks in passenger aircraft. Signal ammunition for sea rescue services functions predominantly with friction primer caps from RUAG Ammotec.

## Primers for Medium and Large Calibre Ammunition

Electric primer caps from RUAG Ammotec for medium calibre ammunition guarantee a high rate of fire, accuracy and reliability for cannons. By means of applying the so-called metal layer elements RUAG Ammotec has developed a sophisticated technology, which is clearly superior to the conventional systems (gap primers and primers with bridge wire ignition) and thus has set a new standard for new generation ammunition. Primers and propellant charge primers (with both mechanical and electric triggers) are available in different designs. In addition to ignition chains for 30mm ammunition, which is standard ammunition for light armoured vehicles and is used in particular for UN missions, propellant charge primers for artillery ammunition e.g. 155mm play a dominant role in the product portfolio of RUAG Ammotec.

## Actuators

Pin pulling or pushing actuators used as pyrotechnical switches complete the product range of RUAG Ammotec. Actuators activate the stabilising fins of a missile and help to minimise the risk of whiplash injuries in road traffic accidents using crash-active headrests.



# Industrial Cartridges

Propellant cartridges are used in dynamic devices in which something is moved by means of gas pressure. These are mainly blank cartridges whereby the case of the propellant tank, the powder charge and the primer charge or primer cap is the igniter. The propellant charge is converted into gas in order to move a pin within a pressured chamber. The pin in turn moves or activates another part.

In addition to the described cartridges for direct fastening or animal stunning there are also special cartridges for activating ejection seats or defusing explosives. In all applications RUAG Ammotec works closely with system manufacturers and with its pyrotechnical knowhow is able to meet varied requirements.





## Direct Fastening

The idea of using the speed and power of ammunition technologies for fast and repetitive fastening processes was first implemented during the Second World War. With the help of powder actuated tools a lot of damaged ships could be repaired much more efficiently than by welding or drilling. A market success of modern pyrotechnical fastening was achieved by the brothers Martin and Eugen Hilti from the Principality of Liechtenstein. In 1953 they launched the first fastening tool shortly after the invention of a pneumatic nail gun in the USA. RUAG Ammotec produces propellants for modern powder actuated tools. These are mainly blank cartridges, which generate a gas pressure in the main device and are used as the actuator. In the fastening tool the blank cartridges activate the thrust of the piston, which drives the respective fastening element, normally a nail, into the specified position with an exact amount of energy. These cartridges from RUAG Ammotec enable direct fastening in just one step. Previously this process required three individual operations of boring a hole, inserting a dowel and tapping a screw.

## Animal Stunning Cartridges

At the beginning of the last century the stunning of cattle using a bolt stunner has enabled the humane slaughtering of livestock and still remains the most humane method of stunning today. The increased number of abattoirs has introduced more efficient, if questionable, stunning methods. Therefore, today, cartridge operated bolt stunning tools are predominantly used in small and medium sized slaughter houses. RUAG Ammotec works closely with bolt stunner manufacturers to ensure the cartridges are best suited to the tools.

# Explosive Mixtures

The manufacturing of non-toxic primary explosives is a core expertise of RUAG Ammotec. In the 1920s the world's first corrosion-free primer composition was developed with the brand name SINOXID®. In the 1980s the first heavy metal free primer composition followed with the brand name SINTOX®, which even today is still without competition.

Today RUAG Ammotec continues to manufacture most of its products where possible with non-toxic (lead and other heavy metal free) primer compositions. Primer Compositions and pyrotechnical primer mixtures from RUAG Ammotec are primarily applied by customers in automotive safety systems (e.g. airbags and seat belt tighteners). Furthermore, there are many other fields of application including the aviation and space industries.



## Primary Explosive

- Primary Explosive is the core of an igniter:  
its task is to dissipate energy into a flame effective due to quick and uniform ignition (time-to-light  $\ll$  1 msec).
- RUAG Ammotec production program:  
Lead styphnate, Benzanate, CaStyp, Diazol, Pikrazol

## Booster Charges And Special Mixtures

- RUAG Ammotec Booster Mixtures:  
B/KNO<sub>3</sub>, TIPP
- Auto Ignition Mixtures are used to meet the requirements of official standards regarding transport safety (bonfire test) as specified by e.g. BAM, DOT, etc.
- High Temperature stable Pyrotechnic Mixtures (HTPM) are a newly developed group of pyrotechnical mixtures designed for use in engine compartments or more generally in environments where high thermal stability is required.
- Specific mixtures and developments available upon request.



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