

A GLOBAL LEADER IN METAL FLOW ENGINEERING

Capital Markets Day Delivering on our Commitments

Düsseldorf, Germany | 18 – 19 June 2015

VESUVIUS PLC

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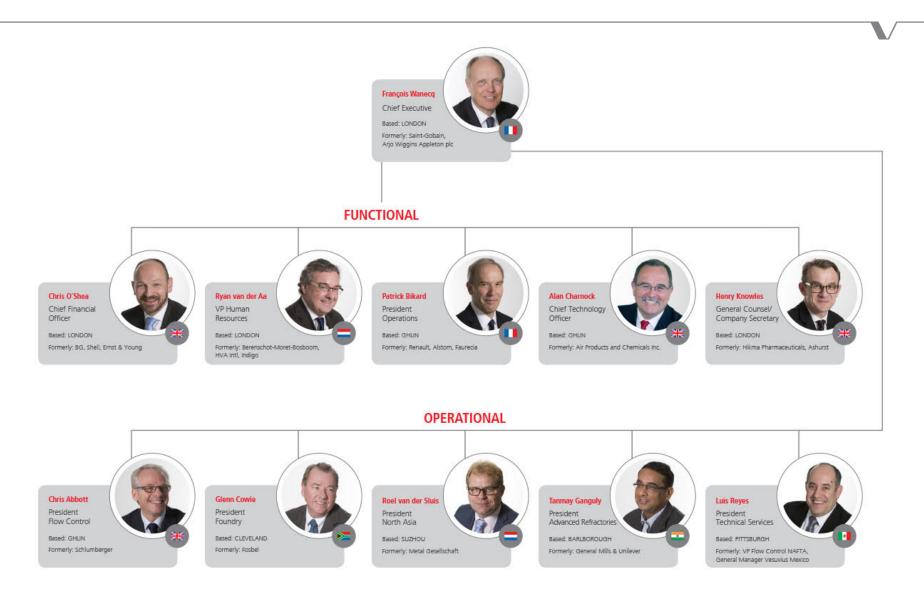
A GLOBAL LEADER IN METAL FLOW ENGINEERING

Markets perspectives and strategy

François Wanecq Chief Executive



An experienced international management team...



... supported by a strong Board



John McDonough **CBF** Chairman

John joined Vesuvius as Chairman in 2012. CEO of Carillion plc for 11 years until his retirement in 2011, John has been the Chairman of The Vitec Group plc since June 2012. John was formerly a Non Executive Director of Exel plc, and Chair of the Remuneration Committee of Tomkins plc from 2007 to 2010.



Douglas Hurt Senior Independent Director and Audit Committee Chair

Douglas joined Vesuvius in 2015 as a Non Executive Director. A Chartered Accountant,, Douglas also has significant financial experience as Finance Director of IMI plc and has held numerous senior finance positions at GlaxoSmithKline plc. He chairs the Audit Committee and is a Non Executive Director at Tate & Lyle plc.



Jane Hinkley Non Executive Director and Remuneration Committee Chair

Jane joined Vesuvius in 2012 as a Non Executive Director. Jane has significant international experience as Managing Director of Navion Shipping AS and CFO then CEO of Gotaas-Larsen Shipping Corp. Jane chairs the remuneration committee at Premier Oil plc and is a Non-Executive Director of Teekay GP LLC.



Christer Gardell Non Executive Director

Christer joined the Cookson Group plc Board in 2012. He is Managing Partner of Cevian Capital, which holds over 20% of Cookson Group plc's issued share capital, and a Non Executive Director of Metso Corporation. Previously a Non Executive Director of AB Lindex and Tieto Corporation.



Nelda Connors Non Executive Director

Nelda joined Vesuvius in 2013 as a Non-Executive Director. Nelda was President and CEO of Tyco International, Electrical & Metals Products, Nelda is a Non-Executive Director of Blount International. Inc. and Boston Scientific Corporation and sits on the Board of the Federal Reserve Bank of Chicago and is Chairwoman and Founder of Pine Grove Holdings, LLC.



Hock Goh Non Executive Director

Hock joined Vesuvius in 2015 as a Non Executive Director. Hock has more than 30 years' experience in the oil and gas industry. Hock is Chairman of MEC Resources Ltd and Advent Energy Ltd. and is a Non Executive Director of AB SKF, BPH Energy Ltd, Santos Ltd, Stora Enso Oyi, and KS Distribution Pte Ltd.



François Wanecq Chief Executive

François joined Cookson Group plc in 2005 as CEO of the Engineered Ceramics division, and joined the Board in 2010. Previously chief executive of ArjoWiggins, and head of technical ceramics division at Saint-Gobain from 1985 to 1995. He graduated at Ecole Polytechnique and Ecole des Mines in Paris.



Chris O'Shea Chief Financial Officer

Chris joined Vesuvius in 2012 as CFO. He was previously with BG Group where he was CFO Africa, Middle East & Asia, and prior to that spent 8 years with Shell in the UK, the US and Africa. A Chartered Accountant, Chris has an MBA from Duke University and has worked with Ernst & Young.



Agenda

Thursday, 18 June

Friday 19, June

Introduction

1700 - 1705

- Overview
 1705 1745
- Advanced Refractories
 1745 1815
- Steel Flow Control
- Foundry
- Wrap up
 1915 1920
- Drinks
 1930 2000
- Dinner 2000 2200

Virginia Skroski

Investor Relations Manager

François Wanecq

Chief Executive

Tanmay Ganguly

President, Advanced Refractories

Chris Abbott

President, Steel Flow Control

Glenn Cowie

President, Foundry

Virginia Skroski

Investor Relations Manager

Sokrates Foyer

Sokrates Dining Room

Breakfast 0730 - 0815

- Overview of day
 0825 0830
- China 0830 0900
- Research & Development
 0900 0930
- Technical Services
 0930 1015
- Financial Strategy
- Questions
 1030 1100
- Depart for GIFA / METEC

Main restaurant

Virginia Skroski

Investor Relations Manager

Roel van der Sluis

President, China and North Asia

Alan Charnock

Chief Technology Officer

Luis Reyes

President, Technical Services

Chris O'Shea

Chief Financial Officer

François Wanecq

Chief Executive



Organised into 4 business segments

	Steel			Foundry
	Steel Flow Control	Advanced Refractories	Technical Services	Foundry & Fused Silica
Revenue ¹ (% of group)	£536m (36%)	£436m (29%)	£47m (3%)	£463m (31%)
Overview	Provides products, systems and services to regulate and protect the flow of steel in the continuous casting process	Provides installation expertise and materials that withstand extreme temperatures and offer corrosion resistance at our customers' facilities	Provides equipment and services that capture data in the metal production process and supports decision making in process management	Improves casting quality and foundry process efficiency through the supply of products and application engineering to the global foundry industry
Products	Nozzles Tube Changers	Lining Precast	Lasers Probes & Measurement	Filters Feeding Crucibles Systems
End Markets ²	Steel (100%)	Iron & Steel (75%) Cement, Aluminium (25%)	Steel (100%)	Vehicles (40%), Power Generation (7%), Mining (7%), Aluminium (10%) Glass (5%) Other (31%)
Employees ²	4,820	2,840	710	3,410

Notes

FY 2014 Proforma Revenue including additional £37m of revenue relating to: Sidermes 2014 Revenue (£18m); and pre-acquisition revenue of £19m from Ecil MET Tec and Process Metrix

Proforma as at 30 April 2015, including approximately 200 employees for Sidermes

Since demerger

- Improved trading performance
 - Headline trading profit⁽¹⁾, up 25% on an underlying⁽²⁾ basis vs 2012
 - Headline return on sales⁽¹⁾ improved by 179 basis point on an underlying⁽²⁾ basis vs 2012
- Restructured the portfolio
 - Sold Precious Metals Division
 - Divested lower margin non-core businesses (VGT Dyko, Andreco Hurll, Canada construction)
- Developed a new strategy targeting Technical Services
 - Acquired three companies to populate the Technical Services business
 - Combined with existing Accumetrix and Avemis products
- Delivered shareholder value
 - Cash conversion ratio of 93% from 2012 to 2014
 - £141m⁽³⁾ returned to shareholders

⁽³⁾ Dividends paid £110.7m (2013 £39.4m; 2014 £41.2m; 2015 YTD £30.1m) plus 2013 share repurchase of £30m



⁽¹⁾ For definitions of non-GAAP measures, refer to note 4 of the 2014 financial statements; Headline results refer to continuing operations and exclude separately reported items

⁽³⁾ Underlying basis is at constant currency and excludes separately reported items and the impact of acquisitions and disposals

Investment Case

- Global market leader
 - strong brands
 - long history of innovation
- Attractive position in the value chain
 - consumable products provided to loyal customers who understand Vesuvius' technical differentiation
 - our products are a small element of our customers' costs but critical to their end product
- Good medium term growth in addressable market of c.5% CAGR over next 10 years
 - Indian steel market growth
 - transition from long to flat steel especially in China
 - increasing penetration of foundry products

- Differentiated customer proposition underpins value pricing
 - customer intimacy and high service levels given "factory floor presence" at customer sites
 - high engineering content with bespoke products
 - reputation for quality and reliability essential for safety critical products
 - global manufacturing footprint to support global customers
- Margin improvement over the medium term
 - operational excellence / cost leadership
 - enhancing product mix
 - operational gearing
- Medium term opportunity in Technical Services

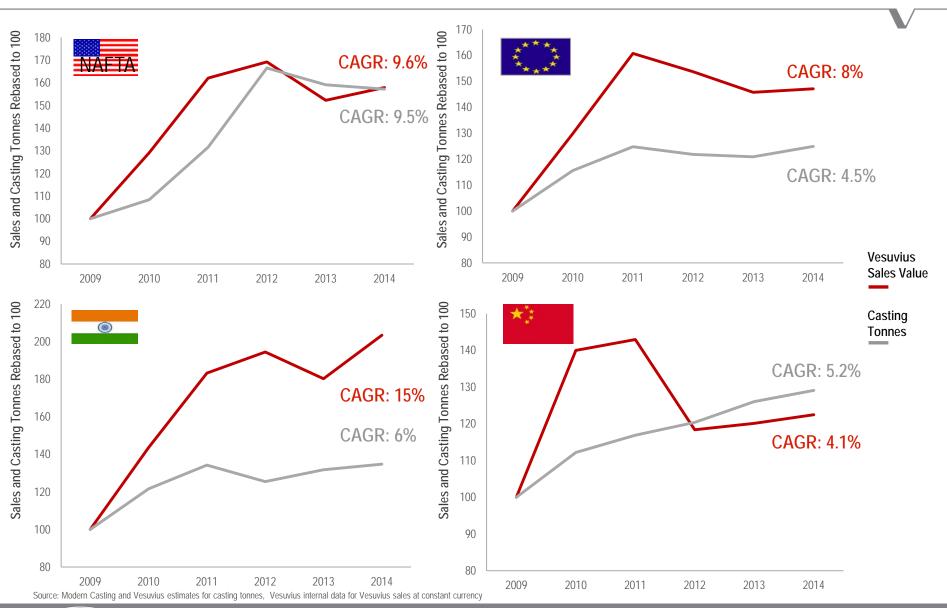


Underlying markets will grow about 5% (CAGR) in the mid term

- Key growth support factors
 - India steel production growth episode anticipated soon
 - China transformation to flat steel is underway
 - Competition between steel and aluminium will serve our markets
 - Foundry should replicate steel growth
 - Chinese foundry growth not completed yet
 - India growth potential
 - Conversion to quality castings in these markets, yet to happen
 - Antipollution regulations and energy saving pressure will demand continued improved casting technologies (ductile iron growth)
- We will keep outperforming our underlying markets

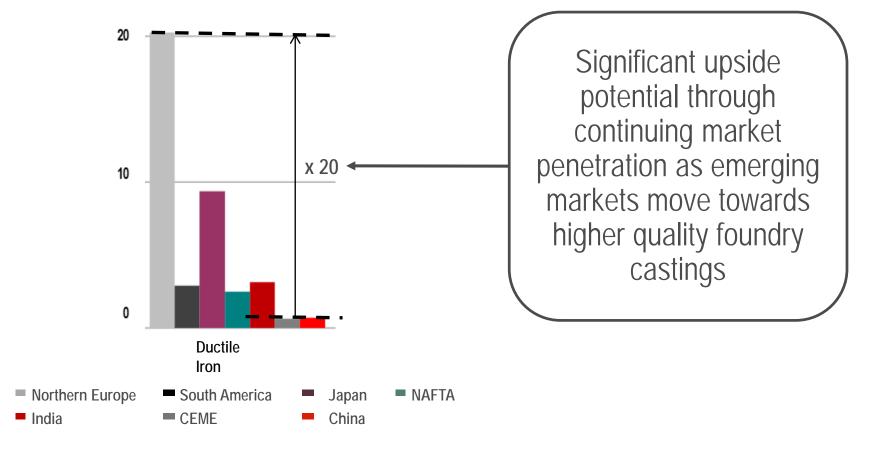


In Foundry we overperformed the market in most areas



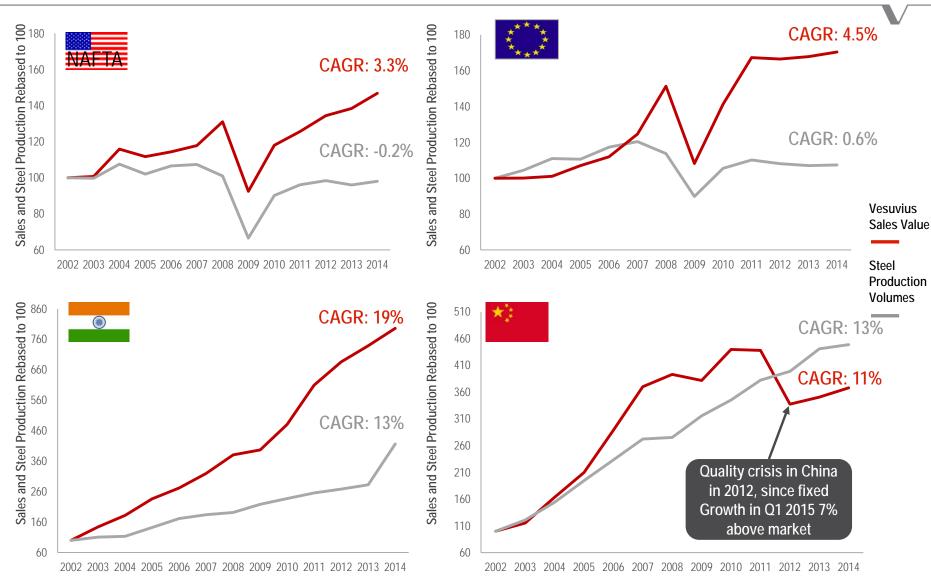
Long term growth in Foundry will come from innovation and marketing







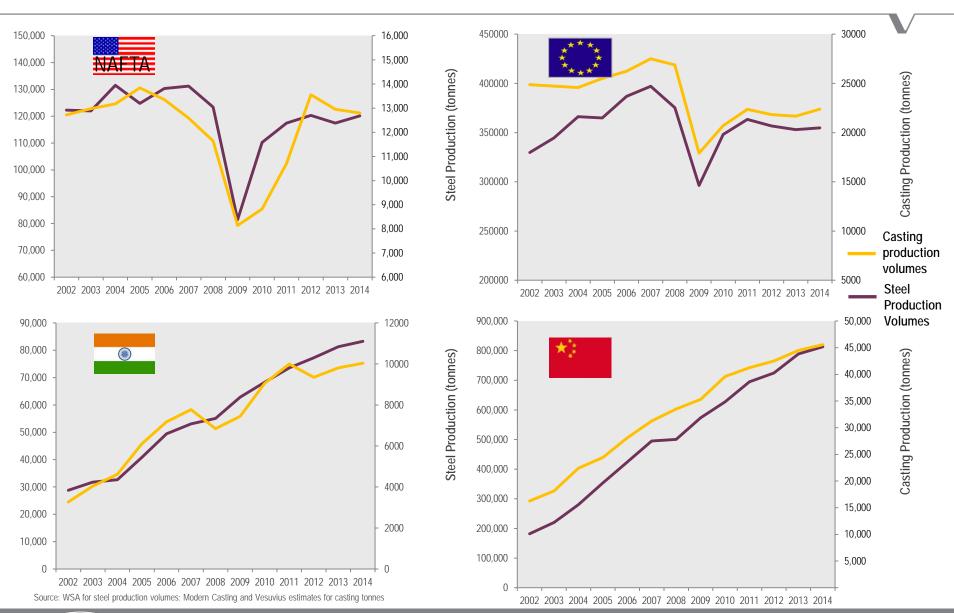
Evidenced as well in steel where we overperformed the market



Source: WSA for steel production volumes, Vesuvius internal data for Vesuvius sales at constant currency. Note 2002 figures are rebased to 100



Steel and Foundry industries trends to remain similar

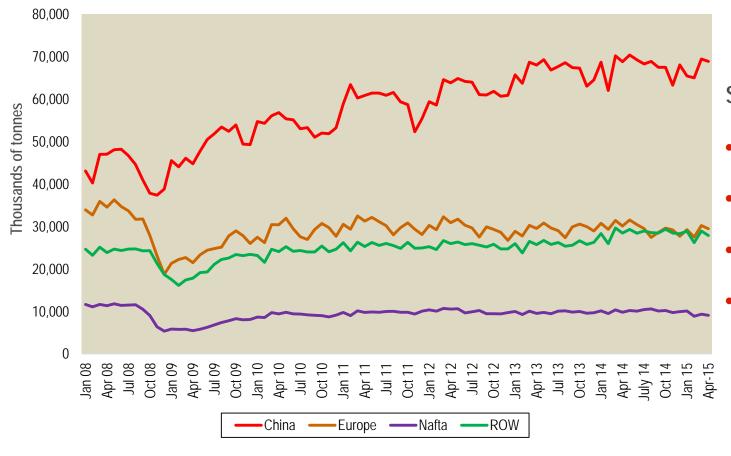


Growth in steel markets

- The steel market should grow from 1.5 to 2 billion tonnes in the next decade based on growth in Indian steel production
 - India should offer the potential for £200m additional Vesuvius sales over 10 years
- Transformation of the Chinese industry from long to flat steel delivers a potential doubling of the accessible market for Vesuvius



Steel Production Volume Trend



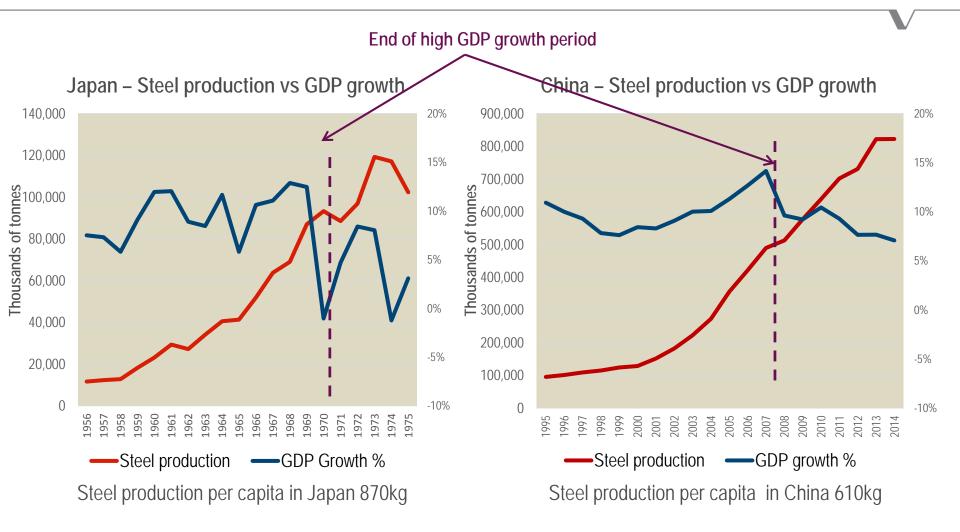
Since 2008

- China has grown 60%
- Europe has shrunk 15%
- NAFTA has shrunk 20%
- Rest of World grew 15%



Source: WSA

China Steel Production: Has the limit been reached? Parallel with Japan



Source: WSA

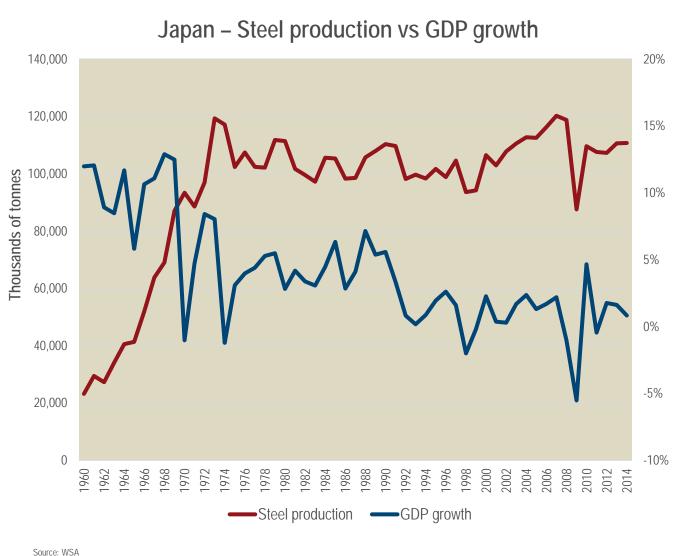
From 1956 to 1973 (18 years) steel production

multiplied by a factor of 10

From 1996 to 2013 (18 years) steel production

multiplied by a factor of 9

What is the steel profile of a maturing economy: the case of Japan

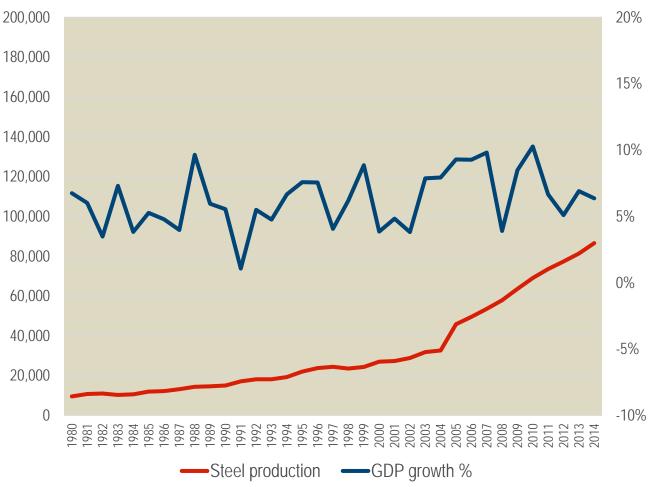


- Steel production per capita in Japan 870kg
- After the peak in 1973
 steel production
 declined a little and
 recovered to about 90%
 of peak over 40 years



The Indian steel production high growth sequence should start soon



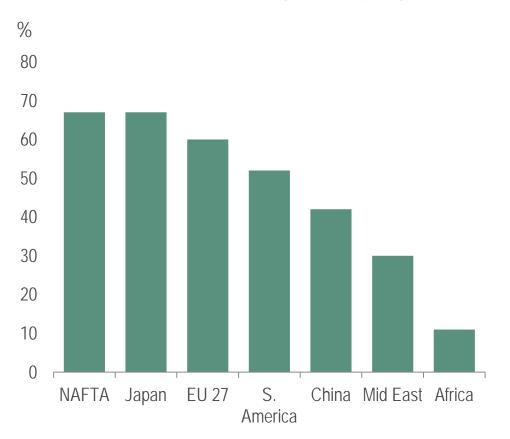


- Steel production per capita in India 70kg (vs 610kg in China)
- The long term steel growth episode should start in the coming three years and take longer than in Japan and China
- Official objective is 300 million tonnes in 2025



Mid term conversion of China to a consumer driven economy opens a considerable growth potential (up to £400m+ revenue)

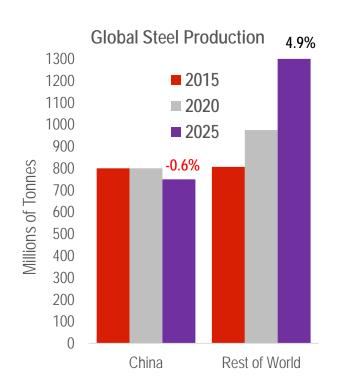
Proportion of flat vs long steel by region (2014)

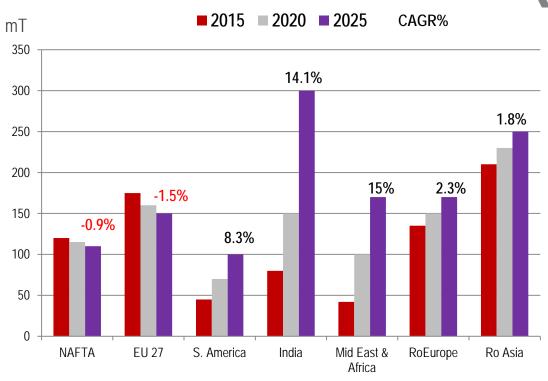


- Chinese economy moves from investment driven towards consumption driven
- Investment consumes predominantly long products while consumption is more on flat steel (cars, domestic appliances)
- Over the years, its ratio of flat to long products will move from 40/60% as now towards 65/35% as in NAFTA
- Today Vesuvius Flow Control sells £50m to China and £500m to the rest of the world



Steel market growth scenario





Global forecast production

2016 – 1.6 billion tonnes

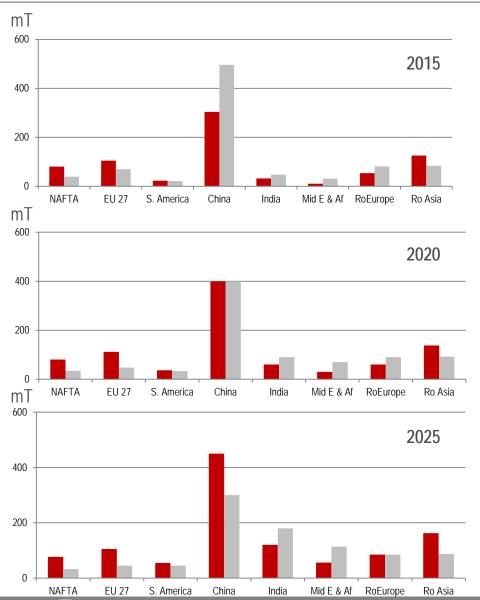
2020 – 1.8 billion tonnes

2025 – 2.0 billion tonnes

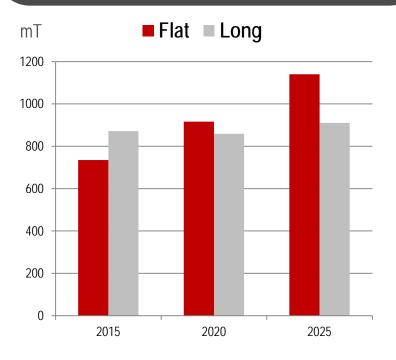
- NAFTA and Europe should decrease slowly as their economic growth model requires less steel
- China stabilises and starts declining at the end of the period
- India enters in a major steel growth episode
- South America, Middle East and at the end of the period, Africa, enjoy sustained growth



Conversion to flat steel is a growth opportunity



- Progression of flat steel vs long steel could generate growth in our accessible market of 30% in 2020 and 55% in 2025
- In the same period global steel production is expected to grow by only 10% and 28% respectively





Conclusions

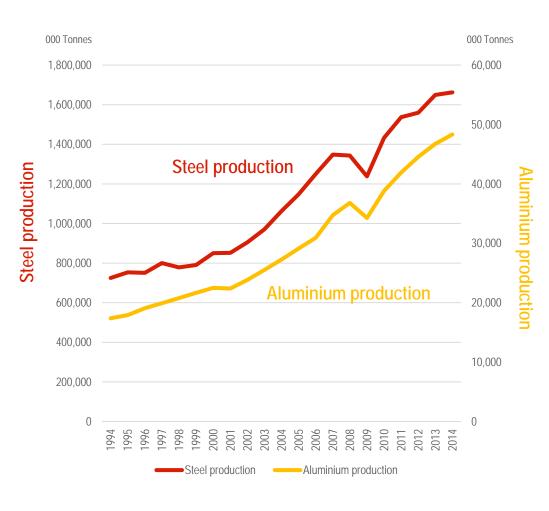
- The steel market should re-start a growth episode during the next decade based on an Indian steel growth period, and reach 2 billion tonnes annually
- Transformation of the Chinese industry from long to flat steel delivers a potential doubling of the accessible market for Vesuvius
- India should offer the potential for £200m additional sales over 10 years

Consequences for Vesuvius

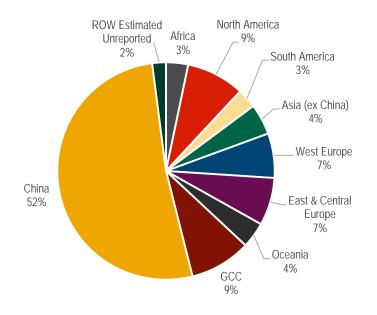
- Flow Control should enjoy an underlying revenue growth of 5% CAGR
- Advanced Refractories revenue growth will be closer to 2% CAGR as we focus for the high margin business rather than volume



Steel vs Aluminum: Parallel growth



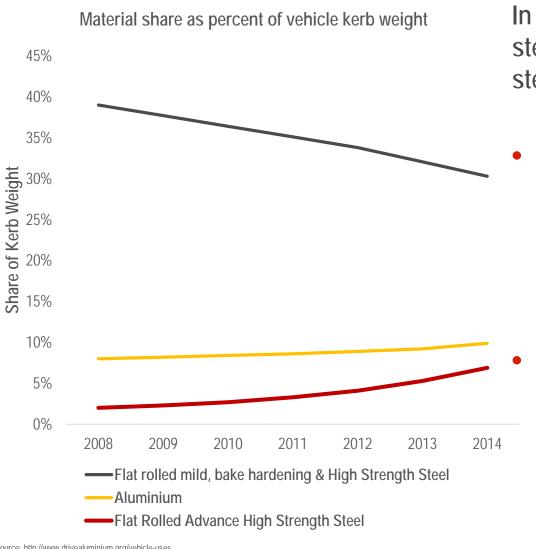
Aluminium production by region – 2014



Source: WSA and World Aluminium Organisation



Steel vs Aluminium: Growth of high-strength steel is an opportunity



In vehicle production, conventional steel is replaced by high-resistance steels as well as by Aluminium

High resistance steels require more sophisticated technologies to be produced (high Ni or Mn content) and tighter control on the process

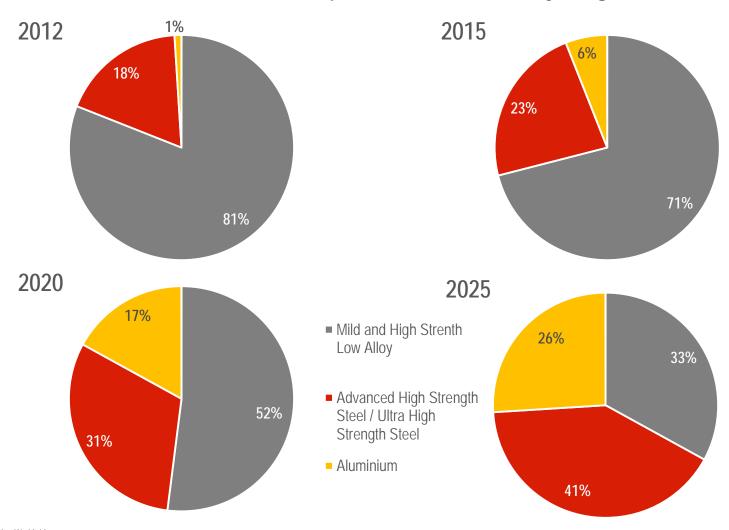
Today the most advanced steel makers suffer very low productivity on such qualities

Source: http://www.drivealuminium.org/vehicle-uses



Steel vs Aluminum: Long term forecasts give the major share to high strength steels for light vehicles

Material share as percent of vehicle body weight





Conclusion

 The shift to high strength steel should compensate Vesuvius for the penetration of Aluminum in the car industry. Vesuvius can expect a higher spending on refractory engineered solutions for these new demanding qualities



Delivering on the strategy

Maintain technology leadership

Increase penetration of value creating solutions

• Capture growth in developing markets

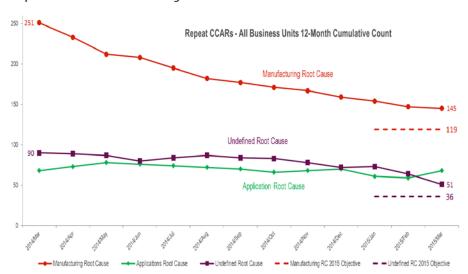
Improve cost leadership

• Build technical services offering

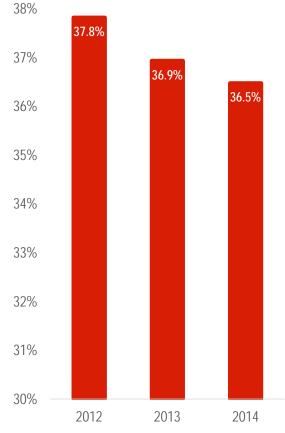


Manufacturing Excellence

- Since demerger we have reduced transformation costs despite the continued increase in the complexity of pieces inherent in our business
- Safety breakthrough, Quality breakthrough and Lean manufacturing plans are well embedded
- Now launched a global Excellence programme aimed at reducing waste, improving efficiency and optimising operational delivery across all activities







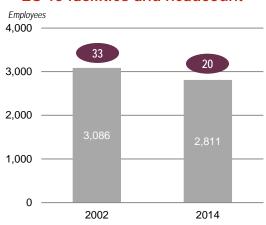


A continued shift of operations to align with customers drives us to lower cost countries

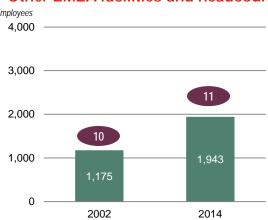
NAFTA facilities and headcount



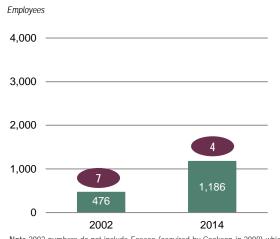
EU 15 facilities and headcount



Other EMEA facilities and headcount



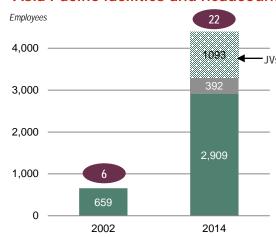
South America facilities and headcount





Note 2002 numbers do not include Foseco (acquired by Cookson in 2008) which had 27 sites and 3400 employees at acquisition

Asia Pacific facilities and headcount



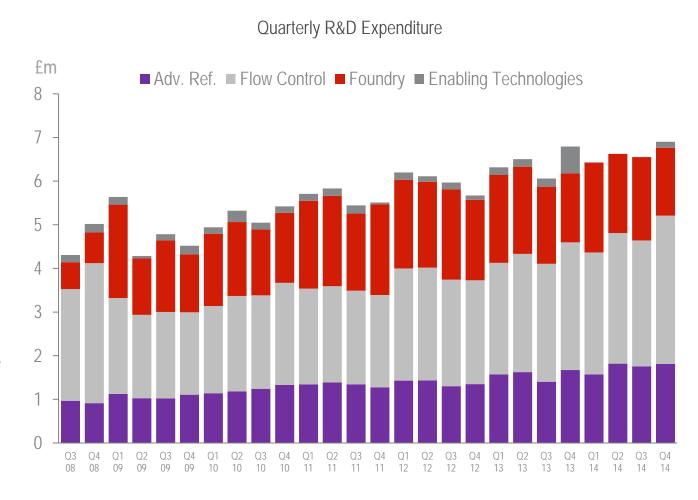


We increase our R&D effort to maintain technology leadership

R&D expenditure has progressed steadily since 2008

- Decision to build in Pittsburgh (USA), Enschede (NL), Vizag (India)
- Necessity to improve our ideas generation and time to market

Sustainable growth will come first from technology





R&D management

- A groupwide New Product Introduction procedure is being deployed to promote:
 - More discipline in the selection of programmes
 - A permanent review of the programme value
 - A rigorous allocation of forces to a limited number of most rewarding programmes
- Objective is to speed up the market launch of new products
- Target of 20% of total sales from new products



Technical Services: Deliveries and potential

- Acquisitions bring us greater technological inroads and market intimacy in data capture
 - Temperature and gas content with ECIL Met Tec and Sidermes
 - Laser technology with Process Metrix
 - Integration is underway (new logo)
- New business model is under development for new products
 - Accuoptix
 - X Mat
- Further acquisitions are under review



Going forward

- Since 2012 we have delivered on our commitments
 - streamlining the business
 - improving our margins
 - delivering shareholder value
 - positioning the company for growth
- We see significant growth potential for our markets in the mid term
 - India steel high growth sequence
 - China's transformation to consumer driven economy
 - Foundry to follow the same pattern
- We are taking the appropriate steps to capture this growth
 - Increased efforts in technology
 - Driving excellence in manufacturing
 - Developing technical services





A GLOBAL LEADER IN METAL FLOW ENGINEERING

Steel Division: Advanced Refractories

Tanmay Ganguly
President, Advanced Refractories

VESUVIUS PLC

Steel Advanced Refractories

- Main products and applications
- Facilities and headcount
- Key financials
- Strategy implementation
- Growth opportunities in Advanced Refractories

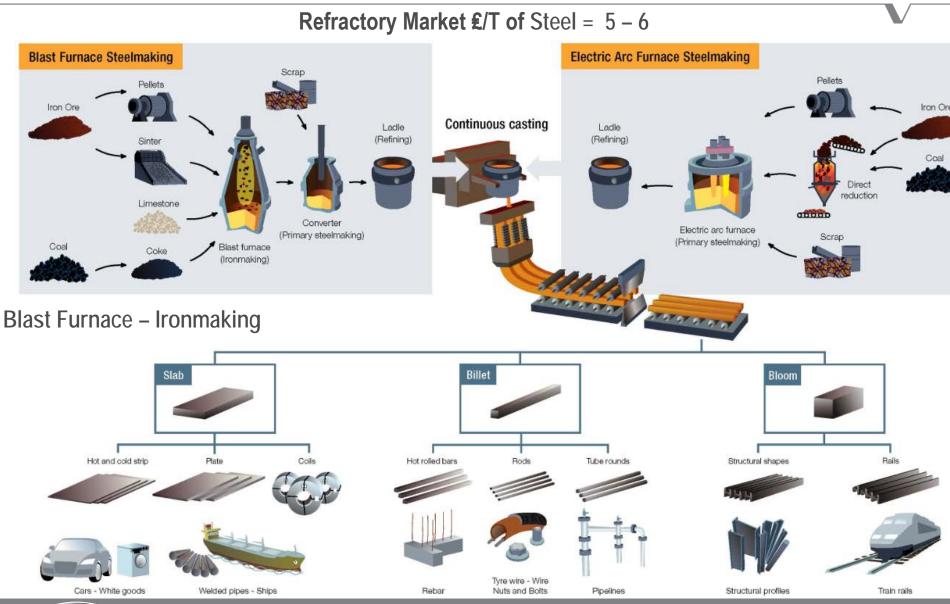


Steel Advanced Refractories

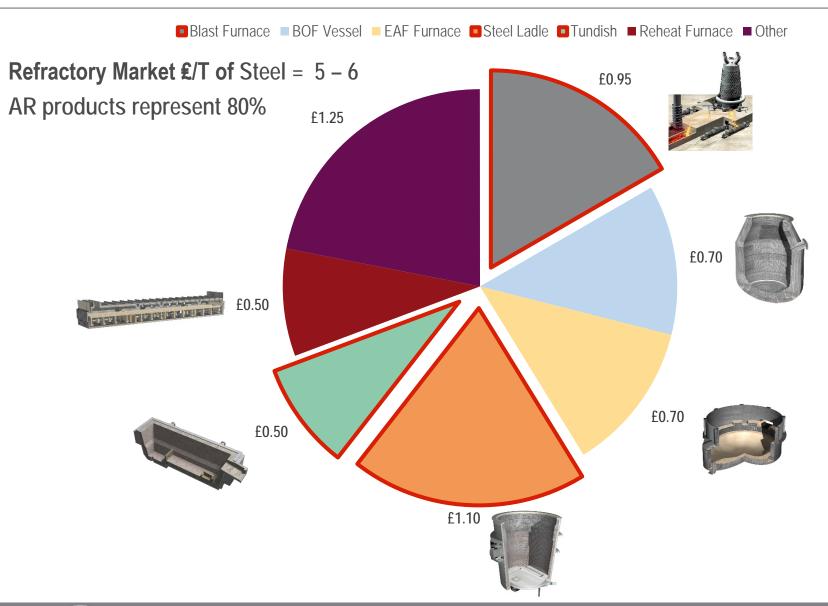
- Key Points
 - Market for our products and technologies
 - How we add value to our customers
 - How do we drive profitable growth?



Advanced Refractories – Products and Applications



Advanced Refractory – Steel Refractory Consumption (£/t)





Advanced Refractories – Products and applications

Blast Furnace

Turn-key Projects

- Complete Furnace Relines
- Stack Repair
- Taphole Clays

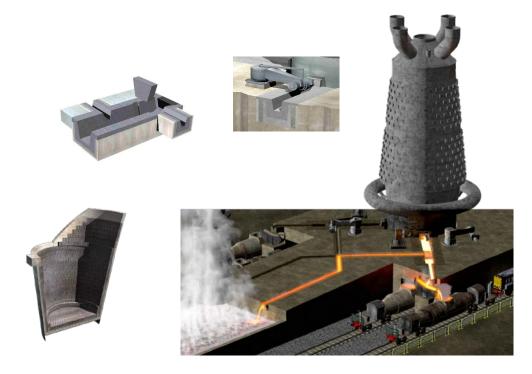
Casthouse

- Trough
- Iron & Slag Runners

Tilters

- Torpedo Ladle
- Iron Transfer Ladle

Refractory Market £/t of Hot Metal = 0.95







Advanced Refractories – Products and applications

Steel Ladle

Refractory Market £/t of Hot Metal = 1.10

Safety Linings

Fired Magnesia Bricks

Fired Alumina Bricks

Alumina Monolithics

Working Linings

Slag Line

Normally Magnesia Carbon Bricks

Dolomite

Barrel

Magnesia Carbon Bricks

Dolomite Bricks

Alumina Magnesia Carbon Bricks

Magnesia Alumina Carbon Bricks

Alumina Spinel Monolithics

Ladle Bottom

Magnesia Carbon Bricks

Alumina Magnesia Carbon Bricks

Cast-in-situ Monolithics

ELBY™ Precast

Maintenance Program

Gunning Materials

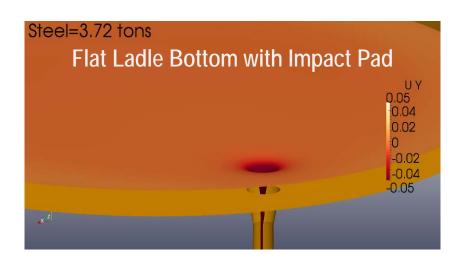
Equipment

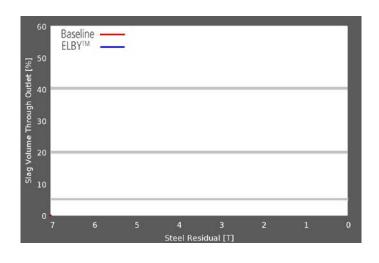


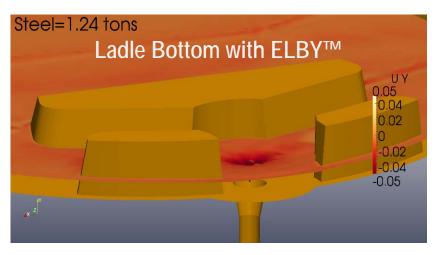


ELBY™ Technology – Ladle simulation

ELBY™ ladle bottom significantly improves yield while decreasing ladle slag carry-over











Advanced Refractories – Products and applications

Tundish

Refractory Market £/T of Hot Metal = 0.5

Insulating Tundish Cover

Working Lining

MgO based wet spray

MgO based Dry Vibratable

Permanent Lining

Bauxite or Mullite based Low Cement Castables

Cast-in-Situ

Insulating Layer

Insulating Bricks/Tiles

Ceramic Fibre

Micropore Tiles

Tundish Furniture - Baffles, Dams & Skimmer

Bauxite or Mullite based Low Cement Castables

Precast

Turbostop

Bauxite or Magnesia based Low Cement Castables

Precast

Nozzle Wellblock

Bauxite or Mullite based Low Cement Castables

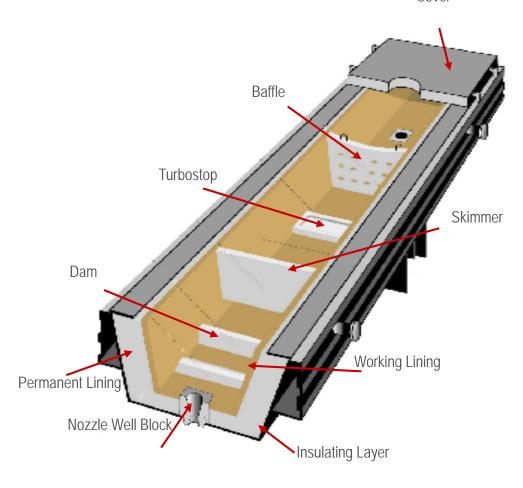
Precast

Insulating Tundish Cover

Combination of Lightweight Castables & Bauxite or

Chamotte based Low Cement Castables

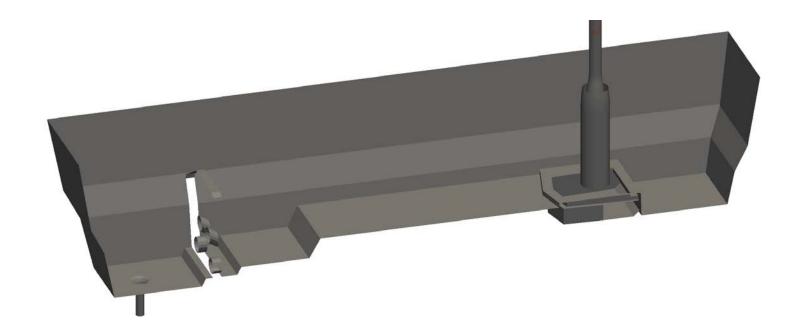
Precast or Cast-in-Situ





STEP Technology – Tundish simulation

STEP Technology improves flow through to casting nozzle, whilst reducing steel left in tundish after cast



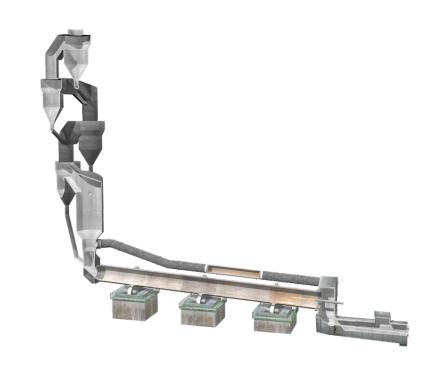
Steel in Tundish: 0.0 ton

Advanced Refractories – Non-Steel products and applications

Industries Served

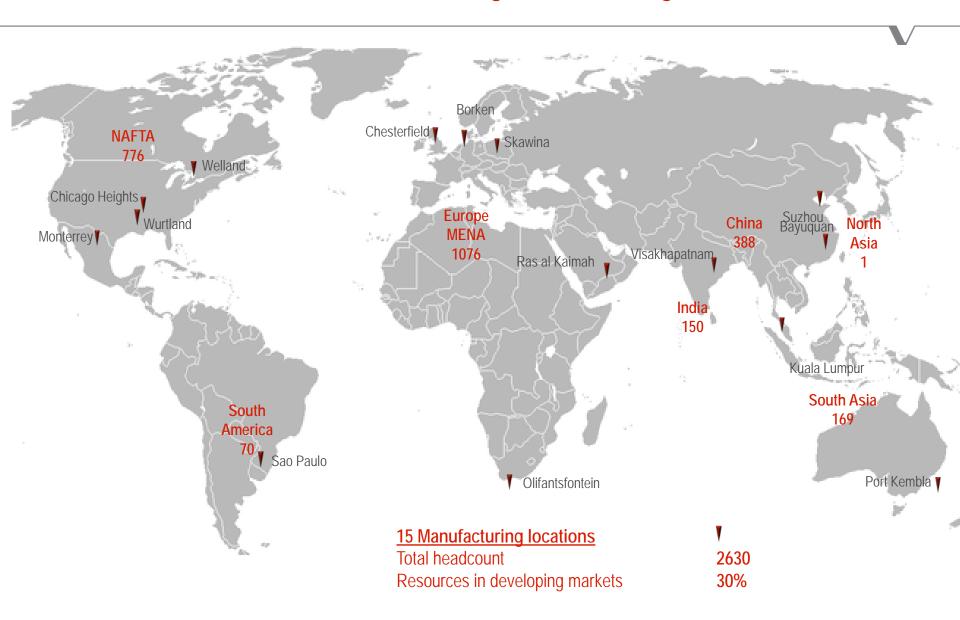
- Metals Producers
 - Aluminium
 - Non-Ferrous
 - Ferro-Alloys
- Foundry
- Minerals Processing Industries
 - Cement
 - Lime
- Power Generation
- Incineration
- Hydrocarbon Processing Industries







Advanced Refractories: Manufacturing locations/ regional headcount

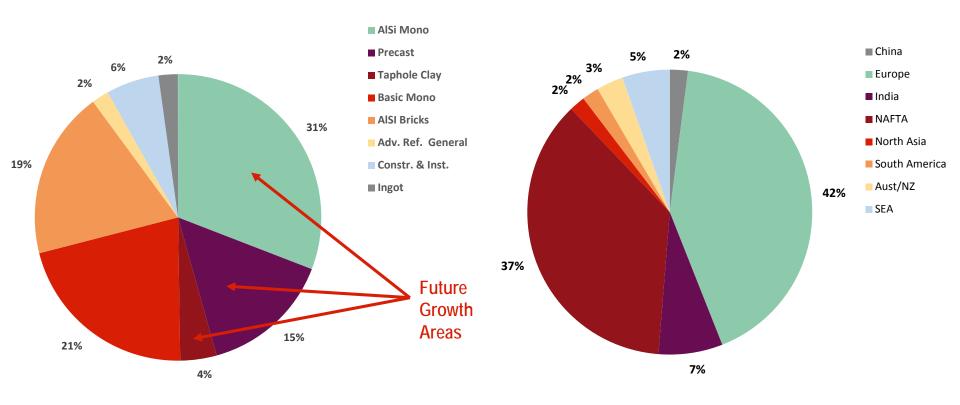




Advanced Refractories – Revenue by product line and geography

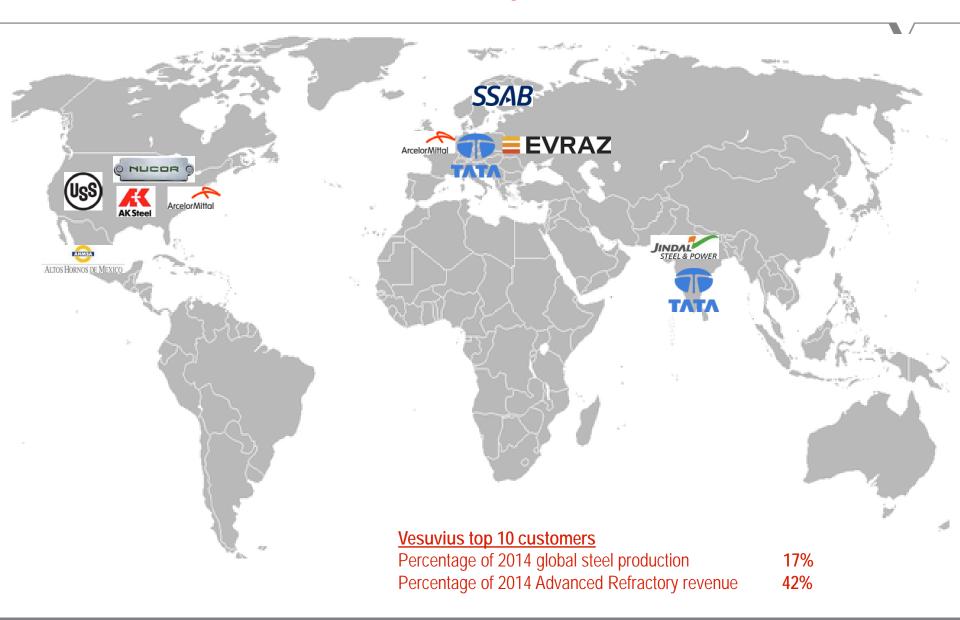


Distribution of Revenue by market in 2014





Sales with top 10 customers have grown 51% since 2008





Advanced Refractories – Delivering on the strategy

Maintain technology leadership

New stage gate system to improve innovation process Centre of Excellence in Vizag, India R&D restructured under one global director

• Increase penetration of value creating solutions

Lavagard BF trough systems for Europe and Nafta ELBY in Nafta and Europe Alugard in Secondary Alluminium, Nafta Smart robotics for tundish in Nafta

Capture growth in developing markets

Secured first BF trough contract in China Market leader in BF trough market share in India Tap Hole clay repeat orders in India Secondary Aluminium success in Brazil

Improve cost leadership

Lean manufacturing programme Logistics Programme

Build technical services offering

First fully automated high speed ladle laser refractory monitoring system in a complete TRM contract Flow Modelling in Tundish / Ladle



Maintain technology leadership

Progress in 2014

- Launched rigorous Stage-Gate® process for managing New Product Innovation
- Restructured R&D under one global director to enhance collaboration across our business
- Completed design plans, for new R&D Centre of Excellence in Vizag, India to be built in 2015 (schematic bottom right)



Increase penetration of value creating solutions

Developing markets

Development of the Blast Furnace Trough business in India – New entrant to Market Leader in 5 years. Product, Design, Installation & Monitoring to drive value for customer.





Value creation in a mature market

Continued penetration of ELBYTM ladle bottom in NAFTA and Europe based upon prime steel yield improvement.

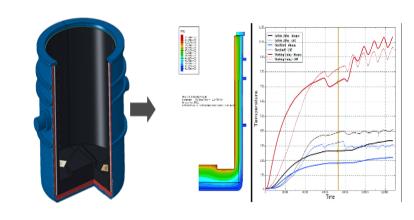


Build Technical Services offering

 Installation of the first fully automated high speed ladle laser refractory monitoring system in a complete Total Refractory Management Solution contract

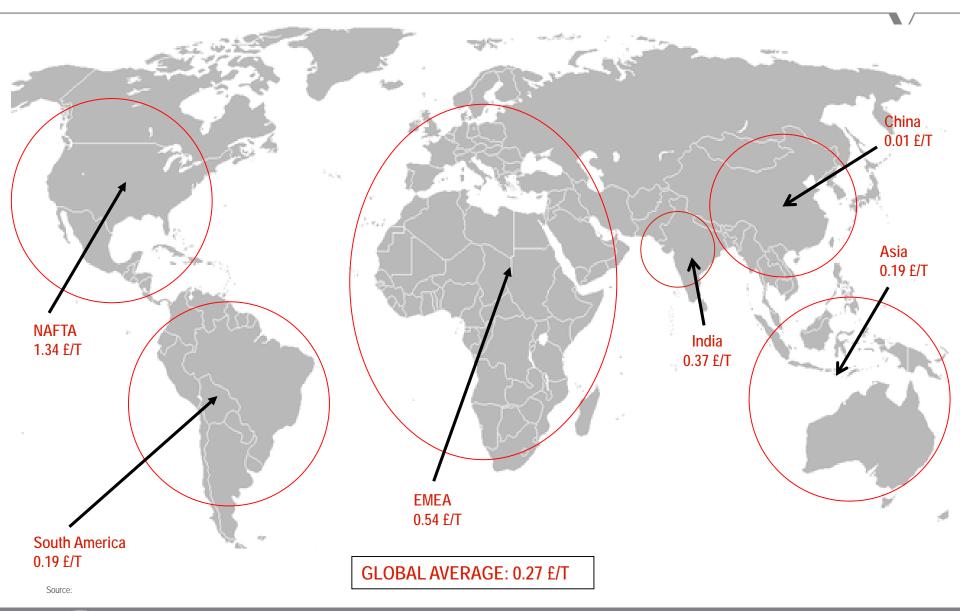


 ACCESS Model (Advanced Control for Cost and Energy Savings by Simulation) developed tool to monitor the thermal profile of the ladle providing improved steel quality, improved energy use and optimised ladle lining design





Steel Production and Advanced Refractories Sales (2014)





Steel Advanced Refractories

- Drive growth in select markets and product categories
 - Markets: India / China / MENA / South America
 - Products: Tundish / ladle / iron making / aluminium
 - Services: Technical Services / Modelling
 - NPI to be more robust and targeted
 - Segment and differentiate





A GLOBAL LEADER IN METAL FLOW ENGINEERING

Steel Division: Flow Control

Chris Abbott
President, Flow Control

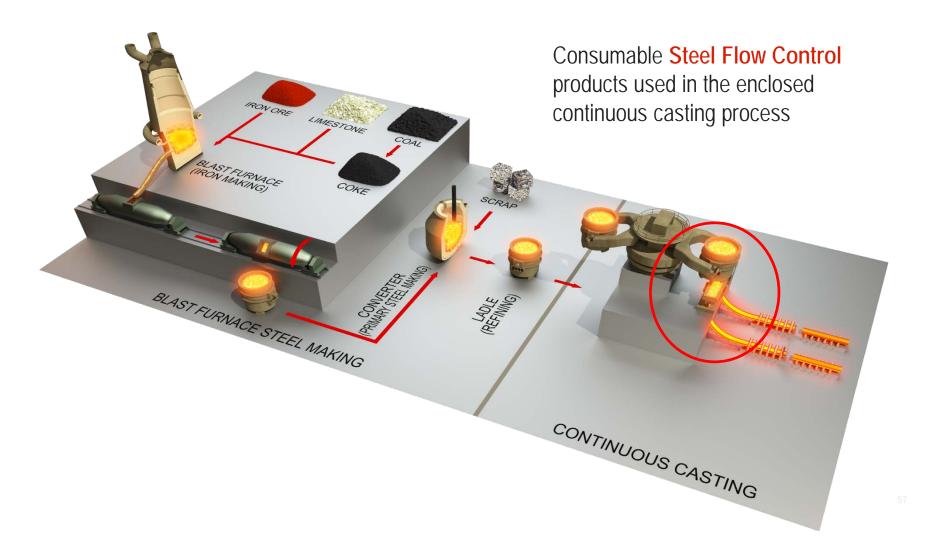
VESUVIUS PLC

Steel Flow Control

- Main products and markets
- Strategy and growth opportunities in Flow Control
- The Flow Control business model
- Technical Services within Flow Control



Steel Flow Control: Main products and markets





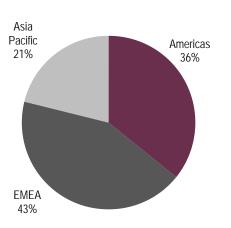
Steel Flow Control: Main products and markets

 A world leader in the supply of consumable Steel Flow Control products used in the enclosed continuous casting process



- Consumables average life 6 8 hours
- Vesuvius differentiation brings reliability & functionality to increase our customers' profits

Flow Control division revenue by operating location



Source Vesuvius breakdown of 2014 Reported Revenues

Well balanced presence in all major geographical areas

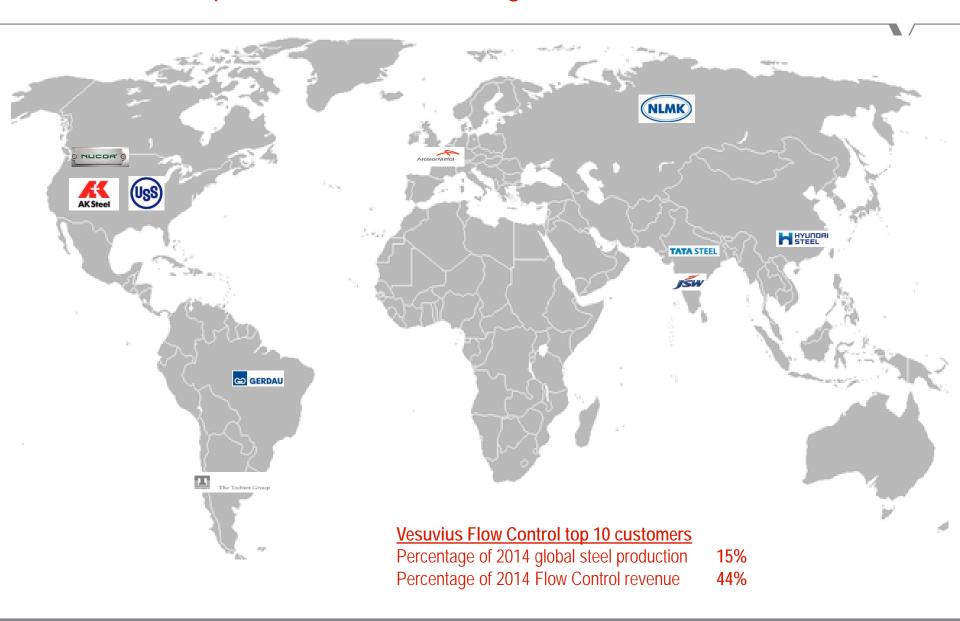
- Vesuvius is the only truly global player in Flow Control
- Asia Pacific major volume growth potential
- Europe, NAFTA & Korea as laboratories for innovation



A global leader for steel flow control consumable ceramics



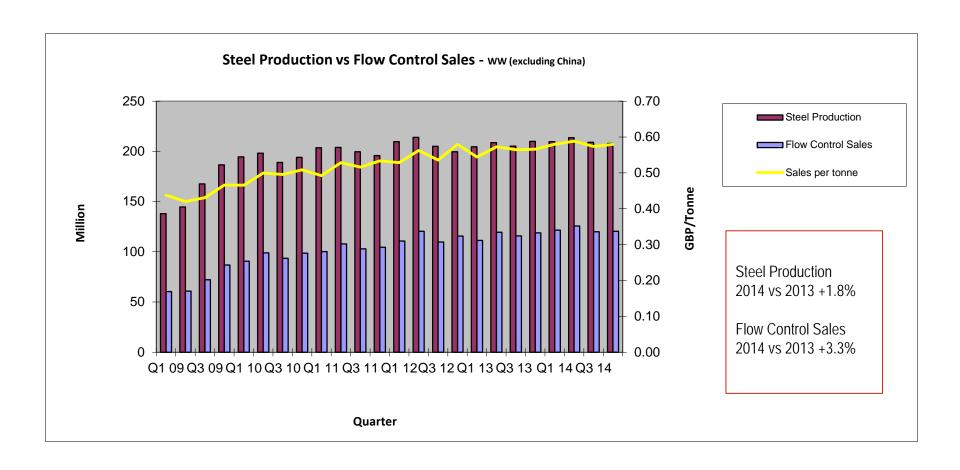
Sales with top 10 customers have grown 25% since 2008





Steel Flow Control: Sales/tonne have grown 32% since 2009

Flow Control sales continue to outperform the underlying Market



Steel Flow Control: Delivering on the strategy

Maintain technology leadership

New location selected in Pittsburgh for R&D Centre New Product Introduction process improved Enhanced Mechatronic capability in Ghlin

Increase penetration of value creating solutions

Success of robotics handling operations
Patented new generation tube changer
Integration of recently acquired Companies
technologies in RCT Offering
Continue to add complimentary product lines &
services where we are strong

Capture growth in developing markets

Invest in countries where steel production is growing Capacity increases to capture growth in China & India Viso mix plant commissioned in Brazil Upgraded facility in Istanbul

• Improve cost leadership

Lean manufacturing programme Logistics Programme

Build technical services offering

Creation of Solutions Group Introduction of PDM300 Flux Feeder Introduction of XMAT Mould Tool Audit Introduction of SMART Refractories



Steel Flow Control: Growth opportunities

New steel capacity

- Greenfield plants in S America, India, SE Asia, Mexico, USA, Vietnam
- Increases in Korea & Brazil
- Revamping projects in China

Challenging market demands

- Overall emphasis on 'clean' steel
- Increase production of higher quality steel grades
- Technology developments in Automotive market sector will continue to drive technology developments in steel and the need for innovative refractory solutions

Technology developments

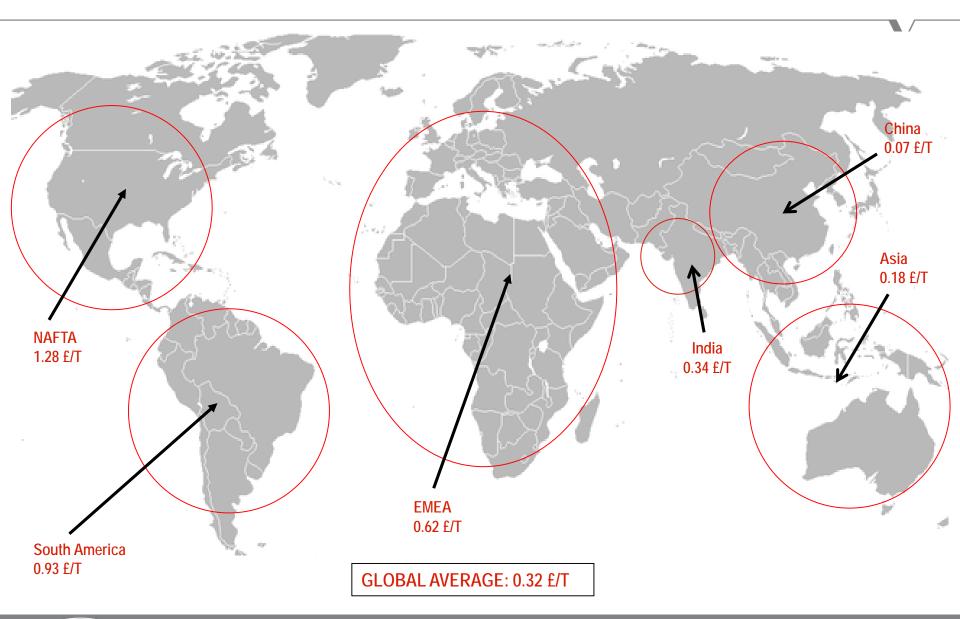
 Safety, Quality and Cost requirements will increasingly influence automation & robotics and the need for improved data capture

Technology advice

- Technical & advisory services to steelmaking industry through Solutions Group
- Leading edge modelling and flow simulation
- Process data analysis

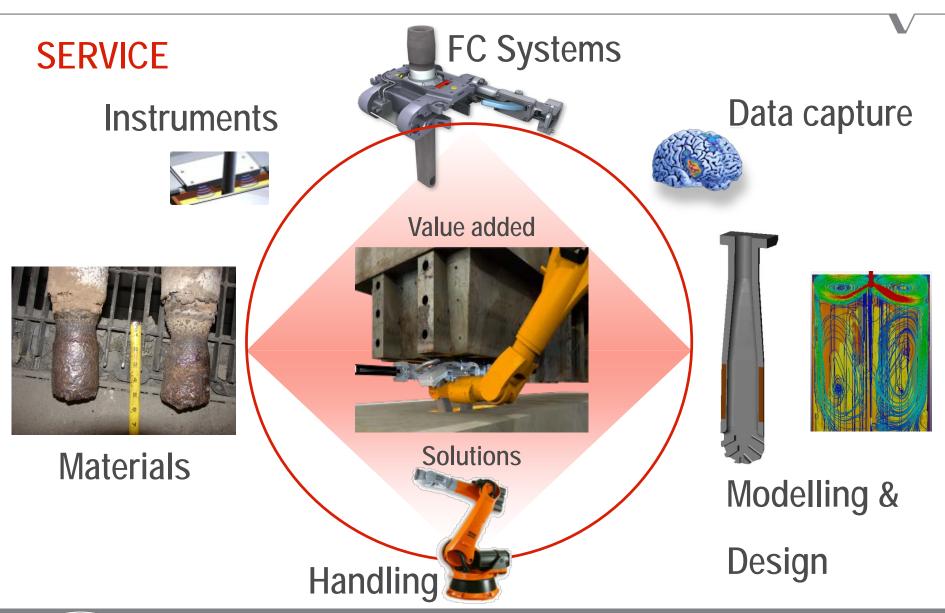


Substantial opportunity for penetration exits





VESUVIUS "Solutions through Technology" approach





Steel Flow Control: Robotic Casting Technology











Steel Flow Control: Robotic Casting Technology











A GLOBAL LEADER IN METAL FLOW ENGINEERING

Technical Services in Flow Control

Chris Abbott
President

VESUVIUS PLC

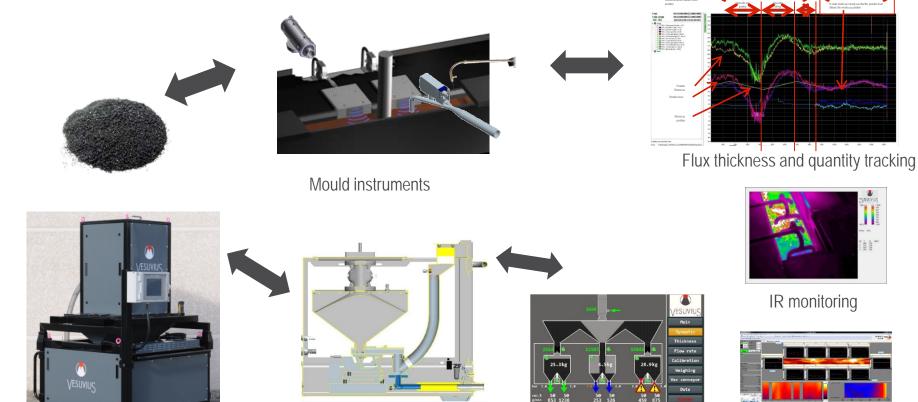
Technical Services in Flow Control helps improve our Customer Business

- Combining consumables and equipment enables real time capture of process data allowing our customers to make informed decisions to:
 - Adjust process parameters
 - Improve consistency
 - Improve quality
 - Improve yield
 - Save energy
 - Reduce cost
- Flow Control has the technology and commercial capability to leverage its market position to support the development of Technical Services



Steel Flow Control: Smart Mould Flux Feeder

Innovative equipment allows us to sell not only consumable material but replaces dangerous manual flux addition and provides a reliable real time process monitoring and facilitates a new pricing model



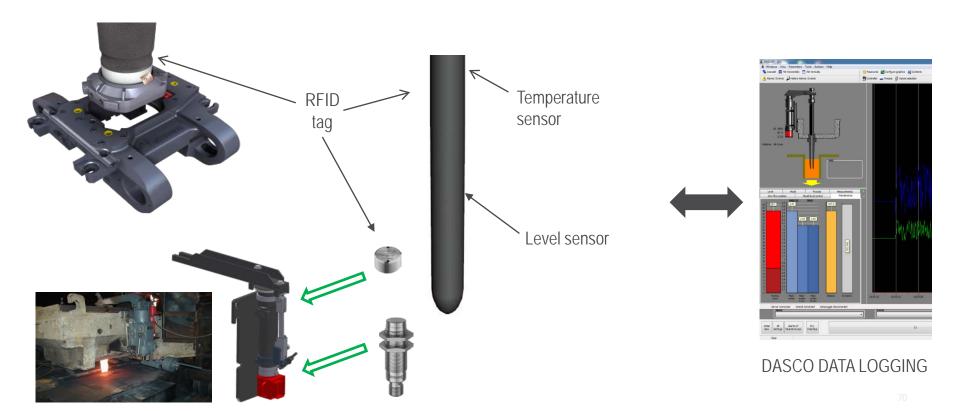
Feeder instruments

Flux quantity tracking

Break out prevention

Steel Flow Control: Smart Refractory

Smart Refractory allows us to combine refractory, instruments and equipment to provide a complete monitoring solution





Steel Flow Control in Summary

- Flow Control still has significant opportunities to grow
- The Flow Control business model of 'Solutions through Technology' will enable us to take advantage of these opportunities, allowing us to continue to grow ahead of the underlying market
- Combining consumables and equipment enables real time capture of process data allowing our customers to make more informed decisions to improve consistency, quality and cost.
- Flow Control has the technology and commercial capability to leverage its market position to support the development of Technical Services





A GLOBAL LEADER IN METAL FLOW ENGINEERING

Foundry Division

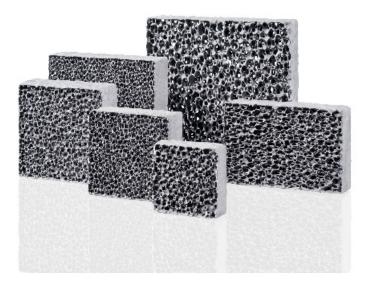
Glenn Cowie President, Foundry

VESUVIUS PLC

Foundry

- What is a Foundry?
- Who are our customers?
- What they produce
- Markets we serve
- Who are we?
- Case Studies
- Competitive advantage
- Growth Potential







Customer base









CATERPILLAR®













































Video





What do our customers do?

- Iron
 - Grey or Ductile
- Steel
- Non ferrous
 - Aluminium
 - Copper Based
 - Zinc

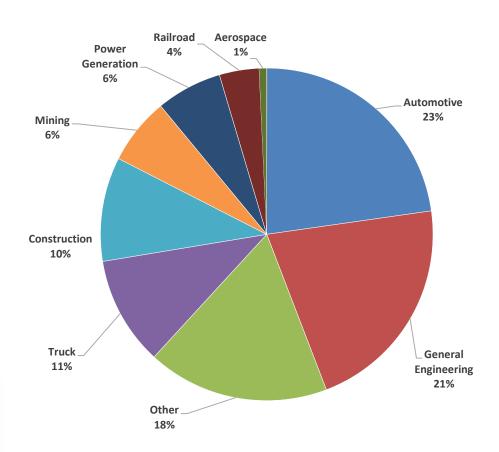


Global casting end-user









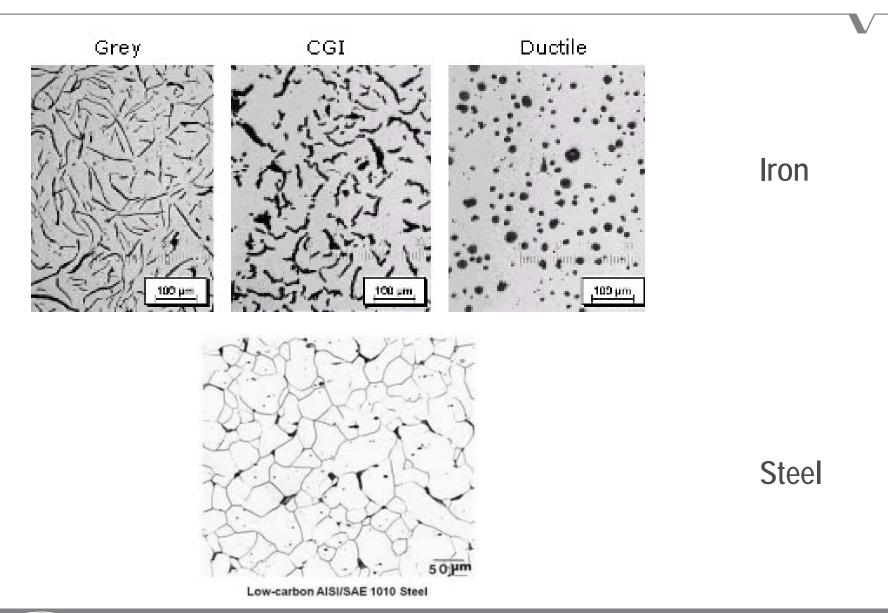






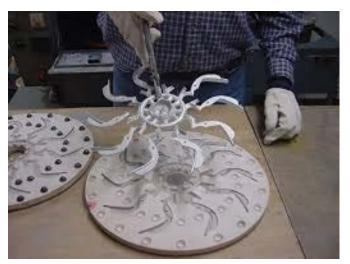


What they do – Grey Iron, Ductile Iron, Steel





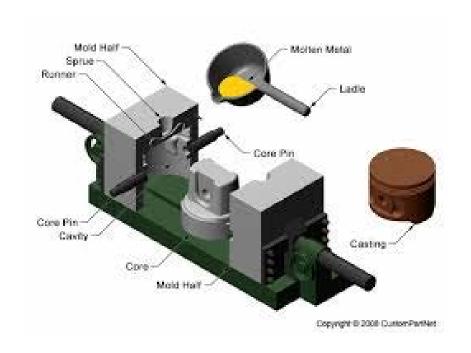
What they do – Very small components, all alloys







What they do – Non Ferrous



Gravity Die casting



Low Pressure automotive rim



What they do – Iron



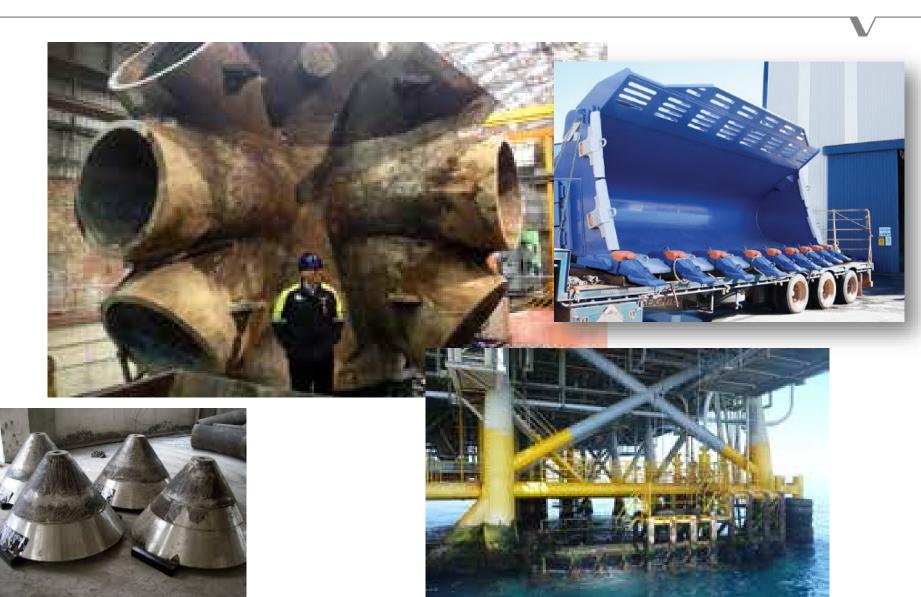






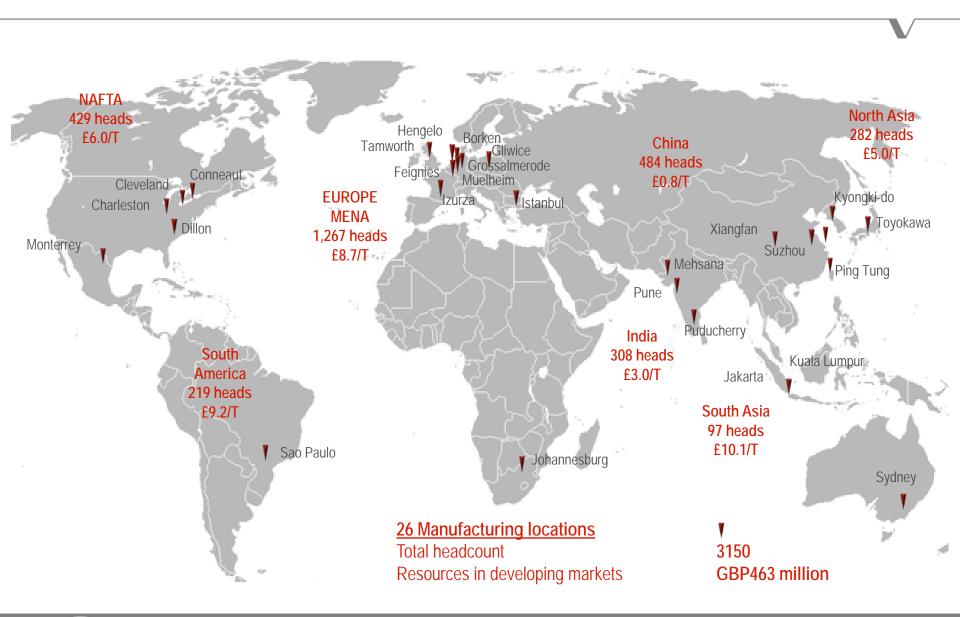


What they do – Steel





Foundry: Manufacturing locations, regional headcount and turnover

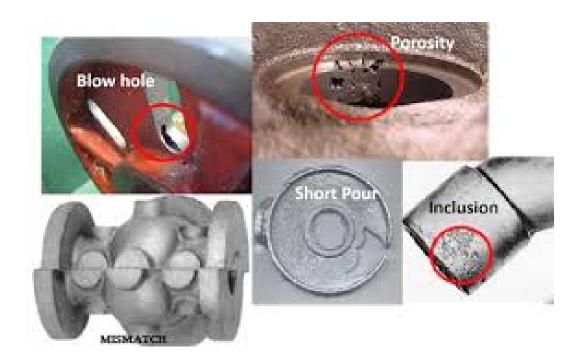




What we do – Make our customers' business more profitable

- Segmentation
- Market Creation
- Technical Services
- Simulation
- Reduce Customers' Costs
 - Machining
 - Scrap
 - Moulding efficiency
 - Energy consumption
 - Safety
 - Yield

Typical defects we can help eliminate for our customers:





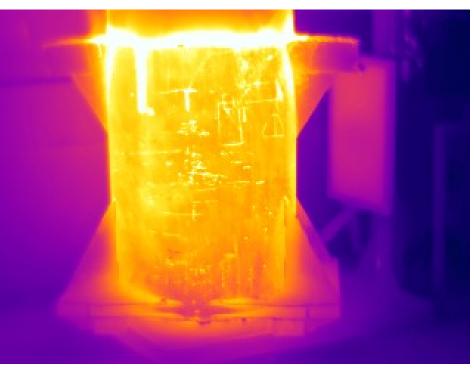
Aluminium transfer ladle



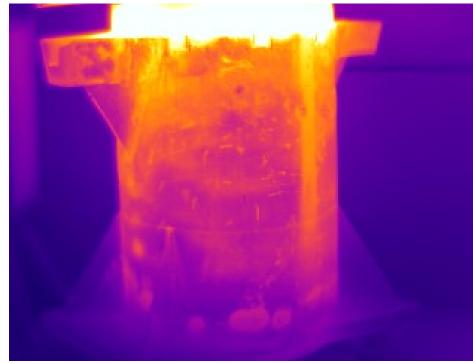
Refractory ladle: After Insural ATL 600

INSURAL ATL vs Castable Lining: Heat loss

Thermal Imaging

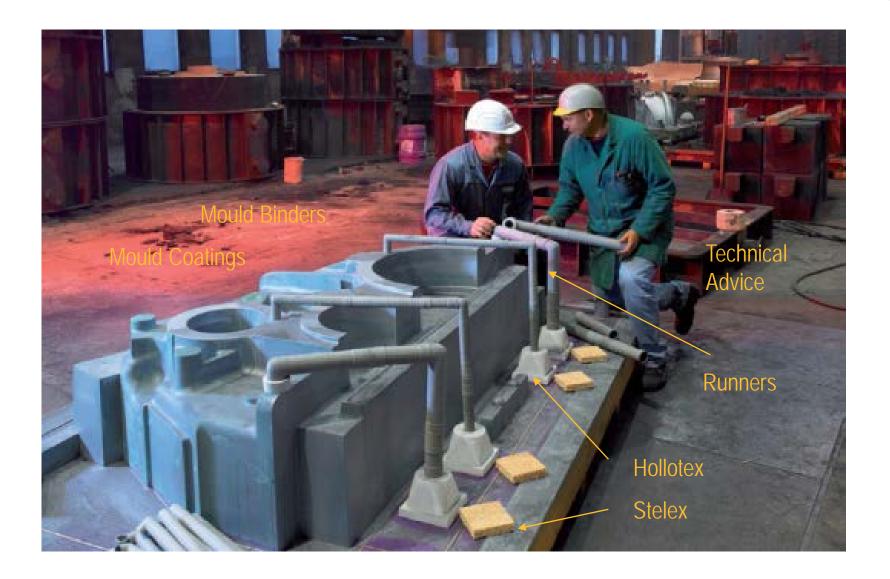


Non-Insural [refractory] ladle



Insural ATL 600 ladle

Running and Filtering large Iron casting – Cleanliness and yield



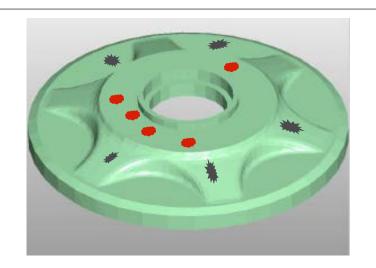


Finished casting

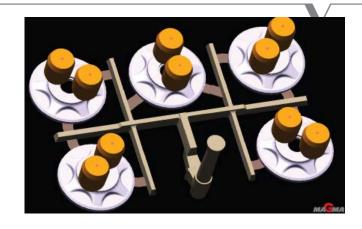


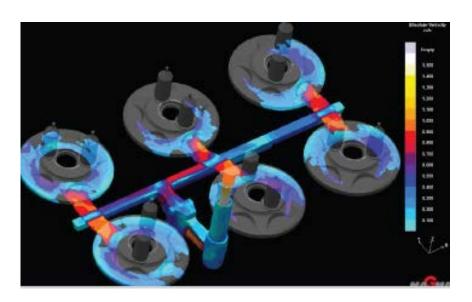
- Energy saving 72.3 kWh per casting
- Weight reduction 38.4 kg per casting

Front Hub Disc Casting – NISSAN Foundry Spain

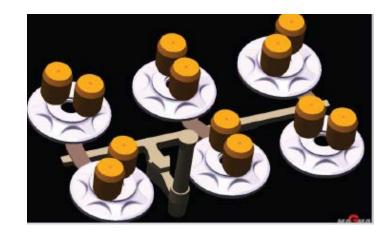














Growth potential and what are we going to do differently

- Geography
 - China: global support, considerable growth through market creation
 - India: aggressive share gain, market creation
 - Western world: hold position share gain and market creation, reduce costs
- Products
 - Vigorous new product R&D and investment
 - Filtration: differentiation and share gain
 - Feeding Systems: market creation and share gain
 - Binders and Coatings: share gain





A GLOBAL LEADER IN METAL FLOW ENGINEERING

China

Roel van der Sluis President, Vesuvius North Asia

VESUVIUS PLC

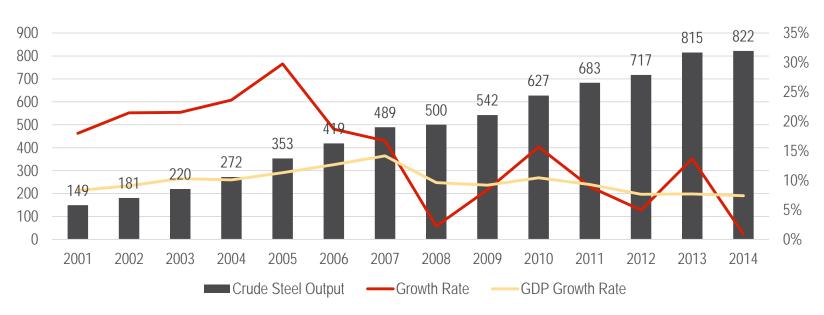
China

- Market development steel and foundry
- Vesuvius in China
- Market penetration and potential

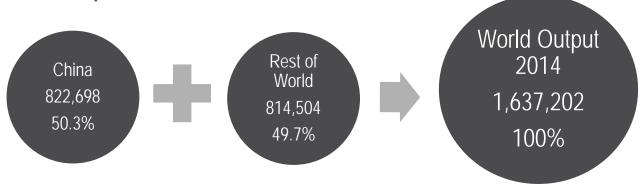


Chinese crude steel output and growth rate 2001 – 2014





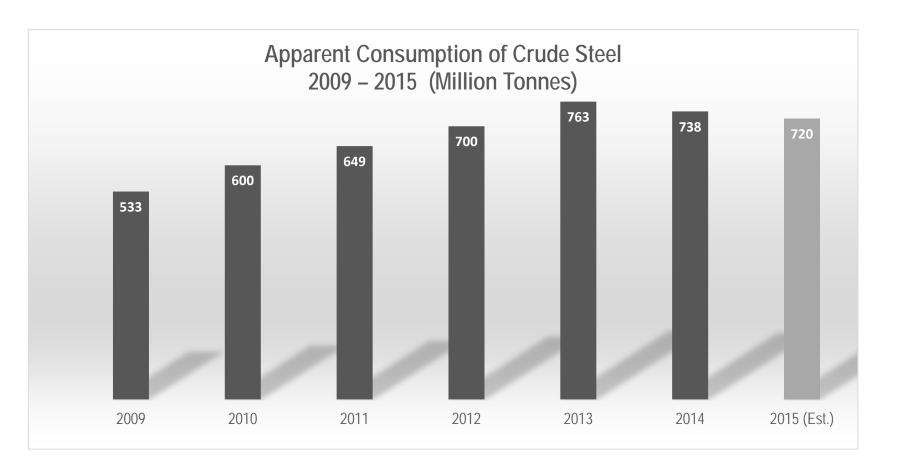




Source: China Iron and Steel Association (CISA) and WSA

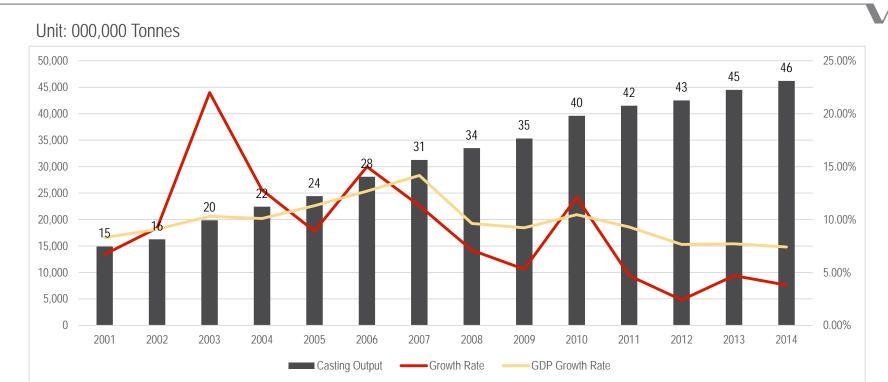


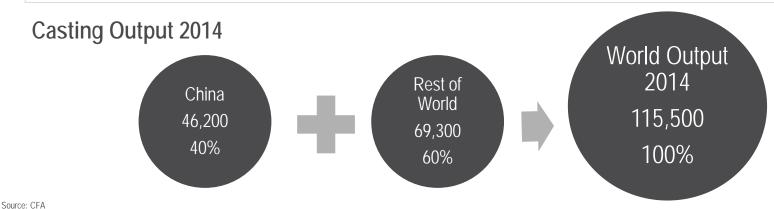
Apparent consumption of crude steel 2009 – 2015





China casting output and growth rate 2000 – 2014







9!

Measures to combat overcapacity

- The expansion of steel production capacities went out of control during the past decade
- More than 700 million tonnes of steel capacities built after 2005, only less than 100 million tonnes of which were approved by the government
- The Ministry of Information and Industry Technology (MIIT) re-examined steel production capacities during 2012 – 2014
- 305 steelmakers and 1122 foundries are identified as qualified under the rules and standards set by MIIT for the steel and foundry industries
- Reduce foundry number from 30,000 to 10,000 in 2020
- Output double from 1,320 tonnes to 2,500 tonnes for each foundry



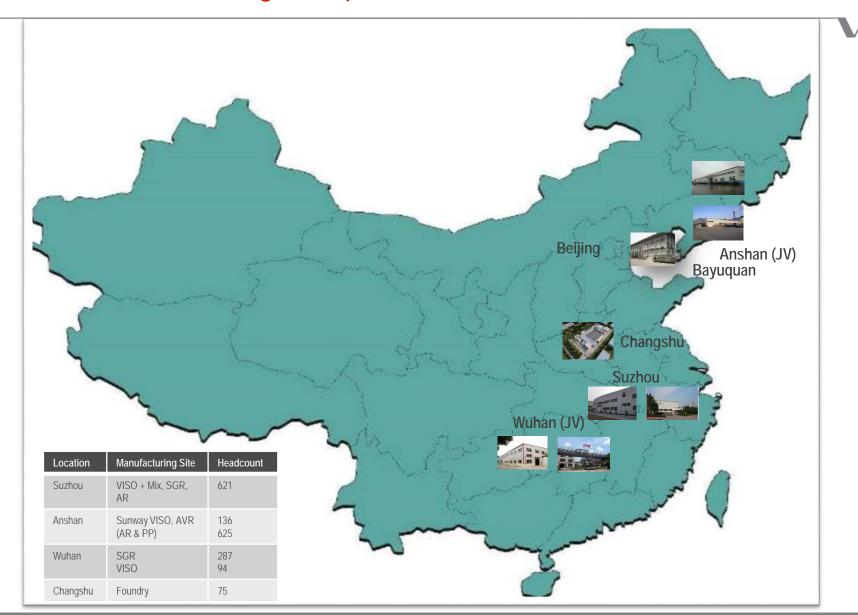


A GLOBAL LEADER IN METAL FLOW ENGINEERING

Vesuvius in China



China Manufacturing Footprint



Full product offering to drive penetration in China

Steel Division

- Slide Gate Raw & Assembled Plate
- Slide gate mechanism
- VISO Mix and VISO
- Bricks MgO C, Alumina – C
- Precast
- Monolithic

Foundry Division

- Filter SEDEX
- FMT
- Crucible
- Fused Silica Roller
- FD Feeding Sleeve
- Coating (Solvent and water based)
- Resin binder





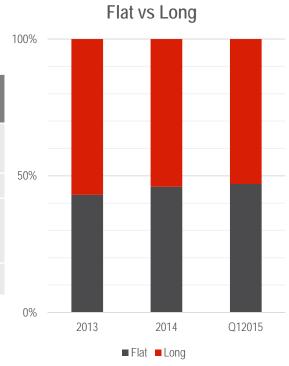
A GLOBAL LEADER IN METAL FLOW ENGINEERING

Our growth plan in China

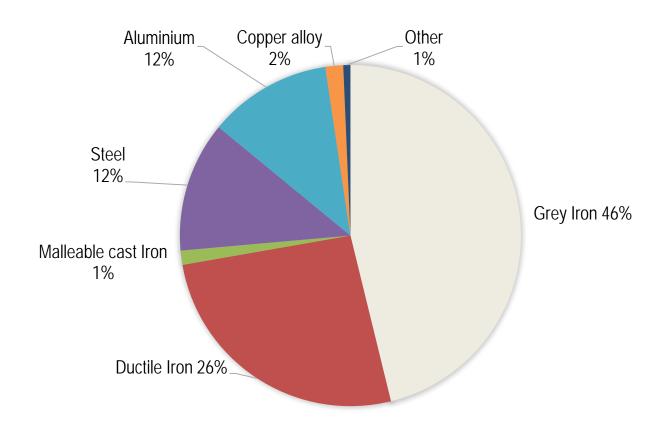


Q1 output of steel and ratio development between flat and long steel

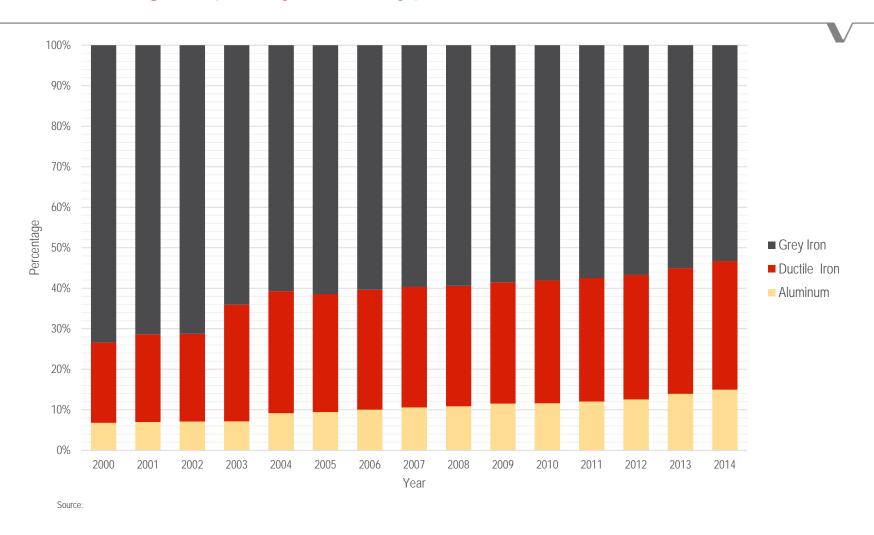
Type of products	Jan – Mar 2015	Jan – Mar 2014	Growth rate %	2014	2013	Growth Rate %
Total finished steels	195,000	190,125	2.5	1036	1035	0.1%
Flat products	89,661	84,437	6.2	477	450	6.0%
Long products	102,617	103,325	0.70%	559	585	-4.4%
Long / Flat	53/47%	55/45%		54/46%	57/43%	



China casting output by metal type



China casting output by metal type



Historically output (2000 – 2014) shows a trend of an increase in ductile iron and aluminium and a proportion
of ductile iron castings should exceed 30% and non-ferrous castings should be around 20% in future



Quality is the first requirement

- At the center of our action plan to grow the business
- An essential part of our brand equity
- Will support our price premium
- Allows us to resist competition successfully under pricing and grow our market share
- Recent progress in quality has restored our value perceived by customers



Sales penetration offers a huge potential

Steel Foundry

China

- Output 822M Tonnes
- Sales penetration f0.084/T

China

- Output 47.2 M Tonnes
- Sales penetration f0.72/T

NAFTA

- Output 120M Tonnes
- Sales penetration f2.75/T

NAFTA

- Output 14.6M Tonnes
- Sales penetration f5.71/T

EMEA

- Output 248M Tonnes
- Sales penetration f1.71/T

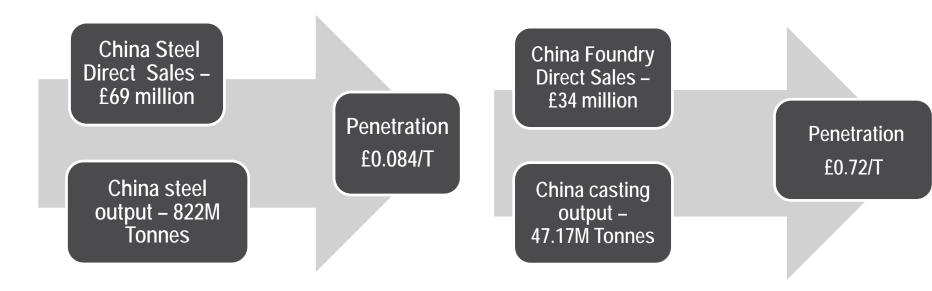
EMEA

- Output 21.7M Tonnes
- Sales penetration £8.48/T



Sales penetration offers a huge potential

In 2014



Region	Penetration (£/MT)
NAFTA	2.45
EMEA	1.70

Region	Penetration (£/MT)
NAFTA	5.71
EMEA	8.48





A GLOBAL LEADER IN METAL FLOW ENGINEERING

Research & Development

Alan Charnock
President, R&D and Chief Technology
Officer

VESUVIUS PLC

Research & Development

- Major changes in our customers' processes have been the main driver for the development of our products
- Leading provider of "Solutions through Technology" for the markets we serve
- Robust R&D processes in place to ensure that we maintain this leadership position
- Focused Research and Development targeting new product development
- Lead the innovation drive to establish the Technical Services portfolio



Vesuvius – Born as a refractory company

What is a refractory?

• ASTM C71 defines *refractories* as "non-metallic materials having those chemical and physical properties that make them applicable for structures, or as components of systems, that are exposed to environments above 538 °C "







• Refractories are heat-resistant materials that constitute the linings for high-temperature furnaces and reactors and other processing units. In addition to being resistant to thermal stress and other physical phenomena induced by heat, refractories must also withstand physical wear and corrosion by chemical agents.

Why do we produce refractory?

Our products are used in contact with liquid metal/slag and melted or softening glass

Application Melting Temperature

Steel $1430 - 1540^{\circ}$ C Cast Iron $1150 - 1400^{\circ}$ C

Aluminium 660° C Copper 1084° C Silicon 1411° C

Glass $1100 - 1500^{\circ}$ C

Refractory Material Melting Points

Alumina 2050°C
Magnesia 2840°C
Fused Silica 1725°C
Zirconia 2680°C
Graphite 3600°C











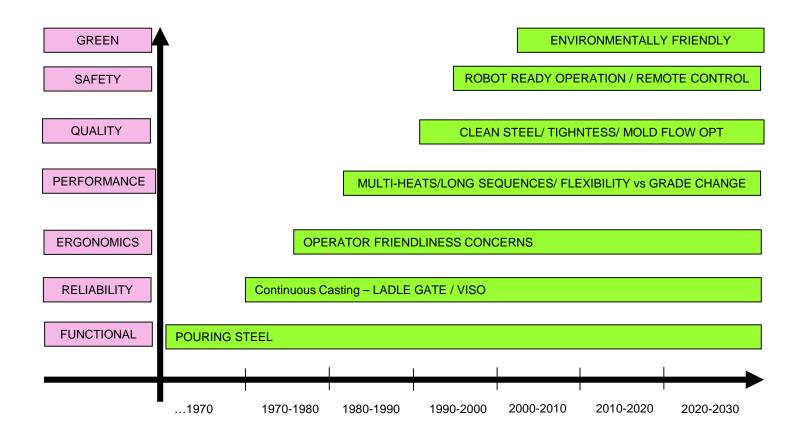


Development drive from the market





Development drive from the market – Casting technology roadmap



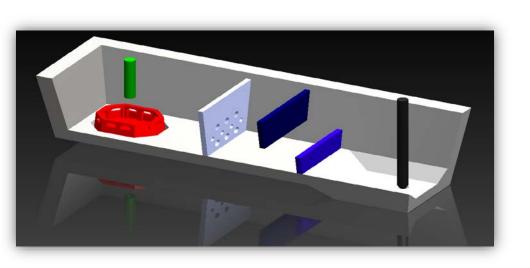


Vesuvius – Evolving to be a metal flow engineering company





Vesuvius – Evolving to be a metal flow engineering company







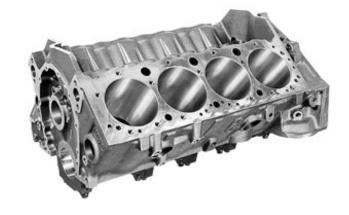
What our products help to make

Ferrrous and Nonferrous castings











What our products help to make

Pipes, sheet, sections – to create cans, cars, trains, buildings and bridges













Our mission and objectives

Technology and innovation leadership

Market penetration

Capture growth in developing markets

Improve cost leadership and margins

Build Technical Services offering R&D Mission: To be an engine for growth and renewal by developing innovative new products and technologies.

Responsive and Proactive

5 Yr Goals and Objectives

Increase sales from new products to > 20% of total sales

Maintain a robust pipeline R&D/Sales > 2%

Create a balanced portfolio of sustaining and breakthrough innovation

Increase R&D productivity

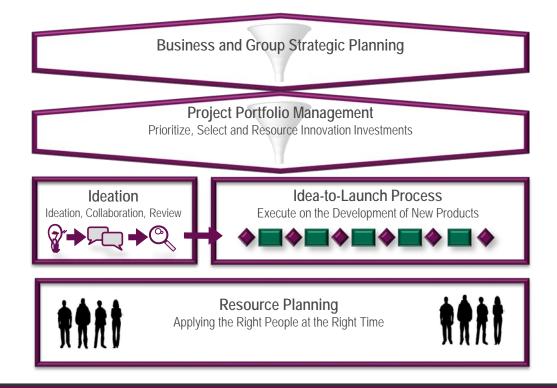
Develop people, culture, and systems for repeatable innovation performance

Verification of new raw materials

Develop leading products and technology for process monitoring and control



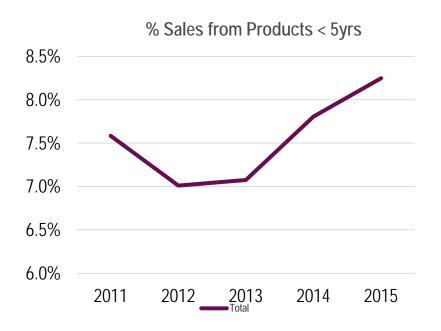
Robust business processes for innovation

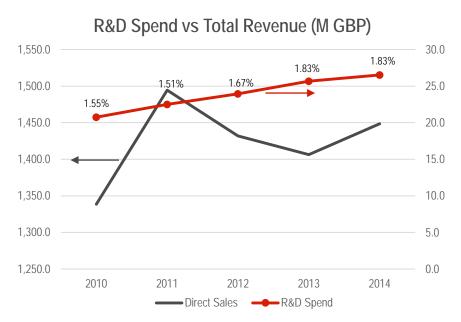


The Prize: 25% – 50% Improvement in "Time to Market" and "Likelihood of Success"



R&D KPI's





Our Patent Portfolio consists of 1805 active patents granted in 162 Families



Global R&D and local development labs

Global Research & Development

"Investment in future growth"

- Step changes
- Breakthrough
- Fundamental understanding
- Technology Platform → Product development

Local Development labs

"Run & maintain current business"

- Product development & modifications
- Incremental (customer specific) changes
- Localization
- RM alternatives and "Cost out" projects



Vesuvius R&D and Simulation Centers



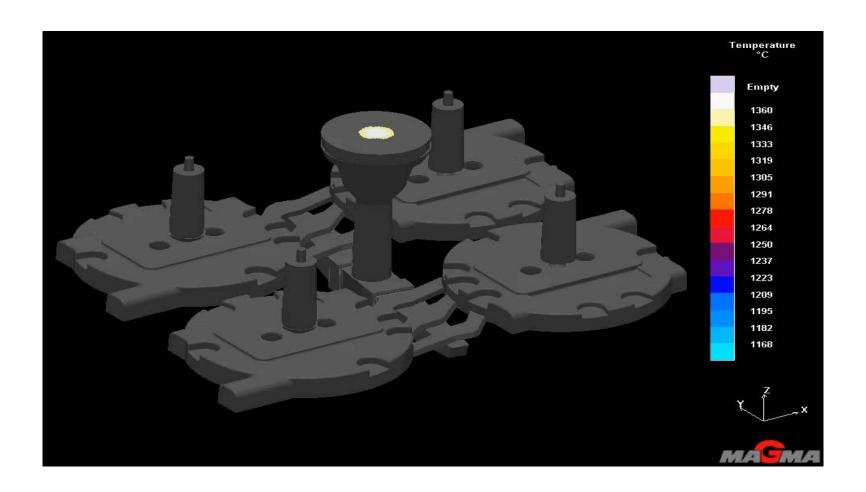
Europe		
NAFTA	COE: Dev Center: Sim Site:	BB/EN/FE/GH BK/TM/SR/LY/ST/HO BK
	COE: Dev Center: Sim Site:	PI/BV CP/CD/PL PW/CD
South America		
India	Dev Center: Sim Site:	SP/PD RJ
IIIuia	Dev Center: Sim Site:	PU/VS CL
N. Asia	Dev Center: Sim Site:	SZ/TP SZ

>300 R&D staff

Acronyms of locations for where centers and sites located

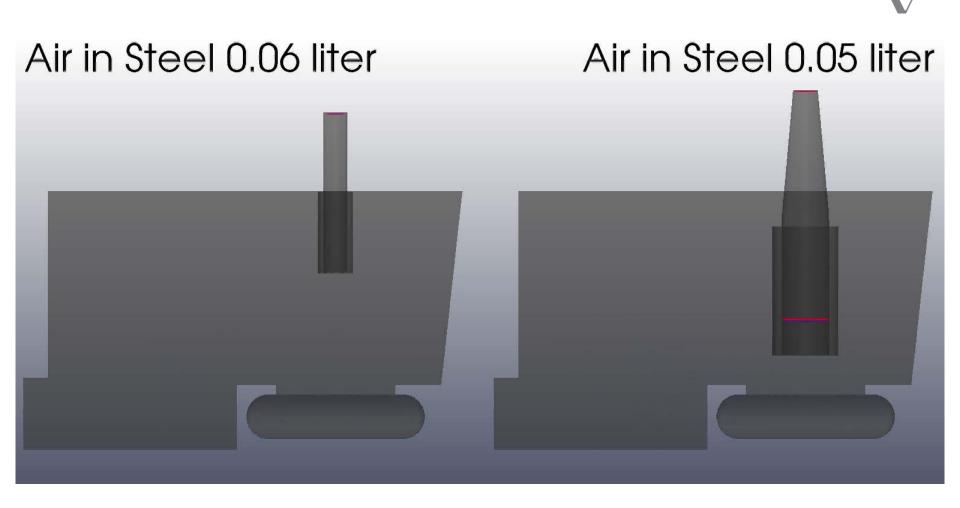


Method simulations: Magma





Method simulations: CFD and Physical Modelling





Enabling Technologies – support to innovation



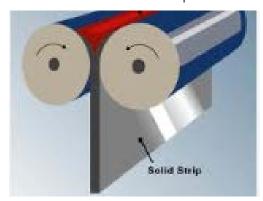
- ~ 10% of the R&D spend
- US & EU based
- University and other external Partnerships
- Emerging Technologies / Technology Watch
 - Clogging phenomena
 - Carbon pickup
 - Filtration efficiency
 - Composite materials
 - Nano technology
 - 3D Printing



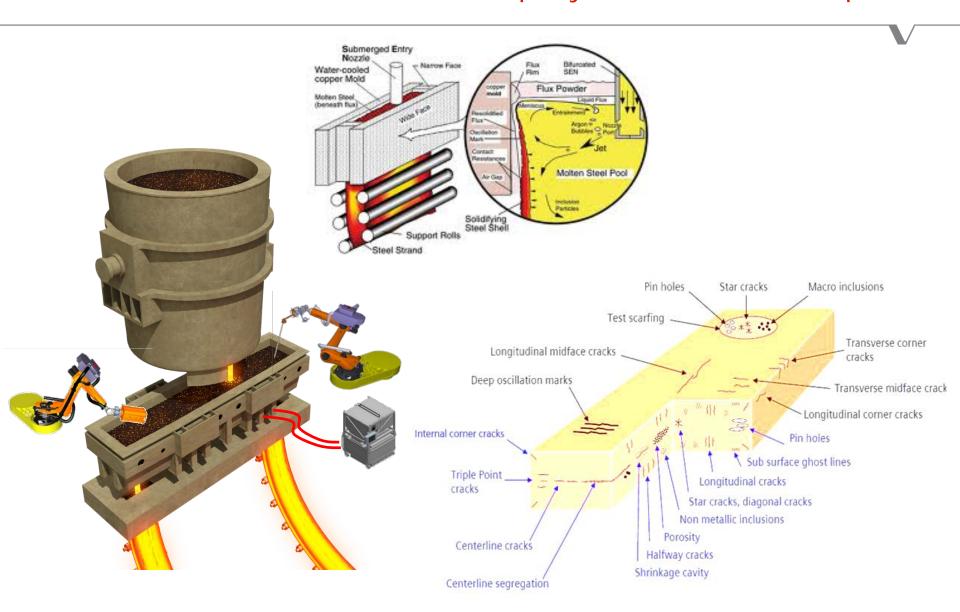




Side dams for twin roll strip caster



And now a Technical Services company – real time data capture





R&D Conclusions

- Targeted ideation
- Robust new product pipeline
- Strategic acquisitions
- Complete symphony of products and technology
- Solutions through technology
- Monitor R&D KPI's





A GLOBAL LEADER IN METAL FLOW ENGINEERING

Technical Services

Luis Reyes President, Technical Services

VESUVIUS PLC

Technical Services

- Vesuvius has accumulated substantial know how and built a strong reputation for quality and expertise
- R&D has always been an important part of the DNA of the Company allowing it not only to participate in new markets but in many cases create new ones
- The proximity with its customers has allowed Vesuvius to understand process information in different parts of the production stages. This information can be used to develop process expert technology to allow customers better decision making



Technical Services: Business description

- Technical Services is a new business segment for the group to complement existing product lines and develop new products and markets
- Focus on data capture of key process parameters complementing this
 with Vesuvius' strong presence and expertise in metal casting to create
 new products, technologies and integrate into process expert systems
- Progressively enter a new market segment which is complementary to existing Vesuvius markets in metal casting

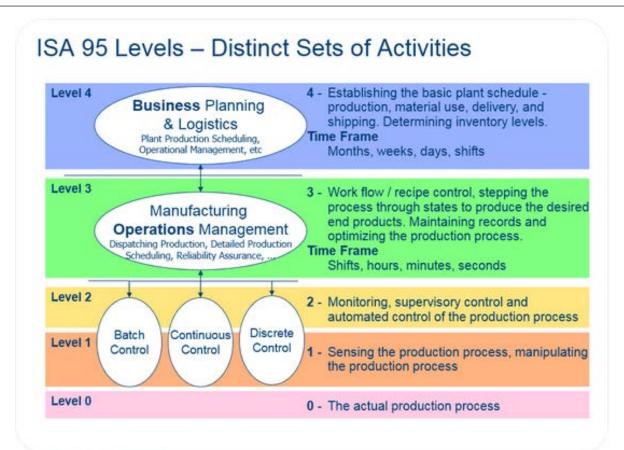


Technical Services: Main business drivers

- Safety: Operational standards and regulations have become tighter and pose a bigger challenge to metal producers
- Quality: Market forces are placing bigger constraints on metal producing processes requiring deeper and tighter process control
- Cost: To increase productivity without jeopardizing safety and quality the production process requires more integration upstream and downstream to allow operators to make quicker decisions



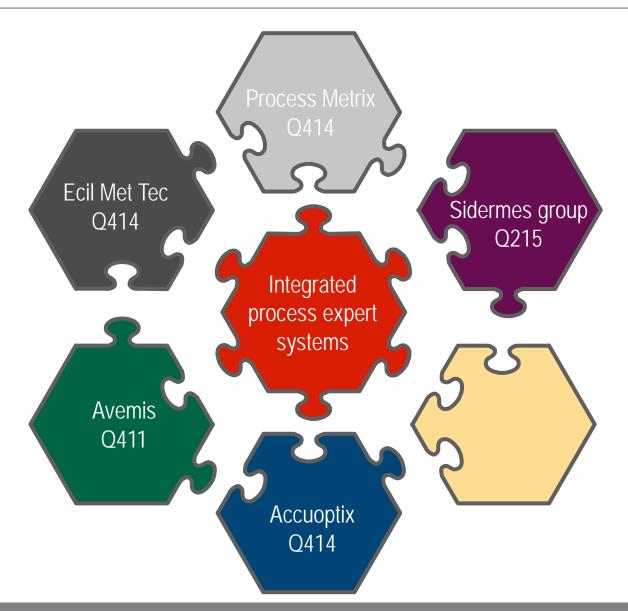
Framework



ANSI/ISA-95, or **ISA-95** is an international standard from the International Society of Automation for developing an automated interface between enterprise and control systems. This standard has been developed for global manufacturers. It was developed to be applied in all industries, and in all sorts of processes, like batch processes, continuous and repetitive processes.



Technical Services: Development and growth





Technical Services: Existing market segments and portfolio

- The initial applications are segmented in three main areas looking for immediate synergies with other business units:
 - Furnace data acquisition: Chemistry sensors and laser scanner services
 - Ladle data acquisition: Laser scanner services and slag prevention technology
 - Caster data acquisition (Tundish + Mould): Continuous temperature sensors and mould information technologies.







Furnace data acquisition

Temperature and Chemistry Sensors



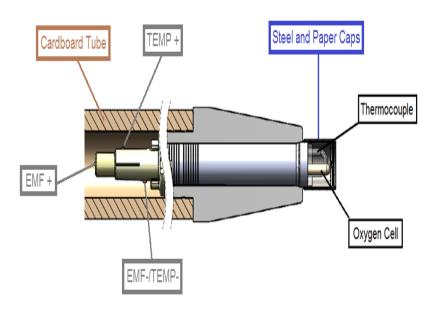
Technical Services: Ecil Met Tec + Sidermes sensor technology

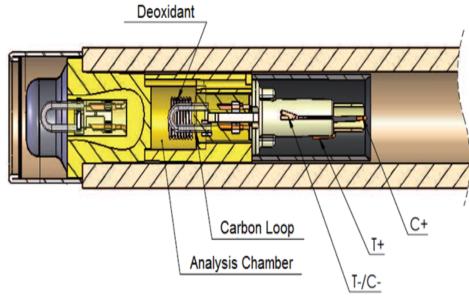




Technical Services: Ecil Met Tec + Sidermes sensor technology

Typical Disposable probe designs

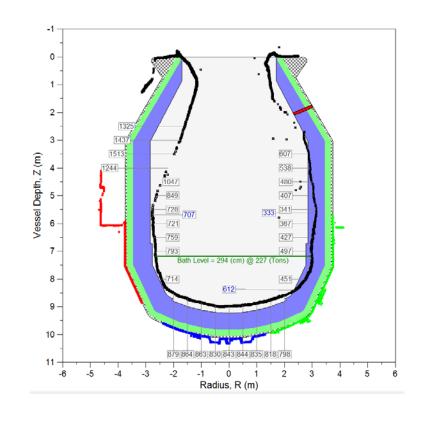






Technical Services: Process Metrix – vessel laser scanning

- Purpose-built hardware and software for the steel mill environment
- Patented Laser Tracking System Autolocation
- Wireless transmission of vessel tilt
- Single mouse-click measurement control
- Fast data analysis (1 3s)
- Fast scan time, complete furnace measurement in 3 minutes
- 100% control of supply, service and support



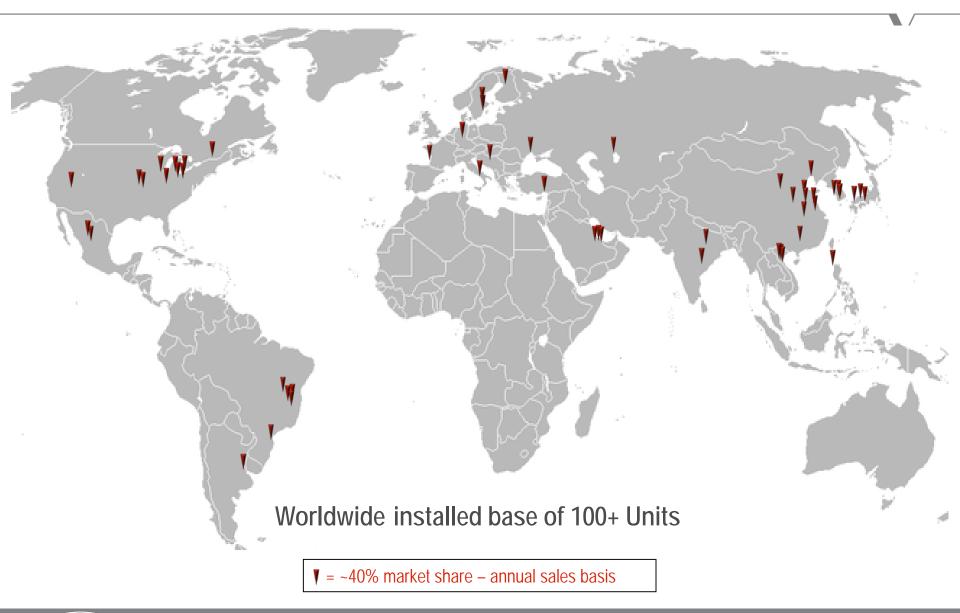


Furnace and ladle data acquisition

Laser scanner



Technical Services: Process Metrix laser scanning





Technical Services: Process Metrix laser scanning

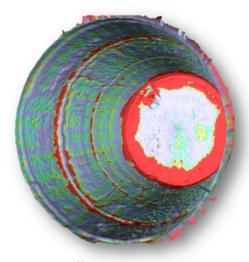
- Safety Targeted analysis of areas of concern
- Cost Provides detailed analysis of lining residual thickness to allow accurate wear out analysis in order to extend refractory lining life safely
- Cost Increase shop productivity by better Schedule vessel wear and down time
- Quality Accurate and repeatable measurement improve material selection



Laser Scanner in standby



Laser Scanner in operation



Ladle 3D scan

Tundish data acquisition

Continuous temperature and slag prevention systems



Technical Services: Avemis Accuoptix Continuous Temperature Measurement (CTM)

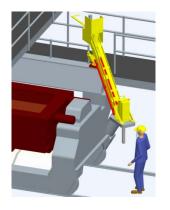
CMD Advantages

- Safety Removes need for operator taking temperature samples at casting platform
- Quality Makes casting near optimum temperature more achievable
- Cost Reduces energy waste by overheating upstream and reduces downstream process defects associated with over/under heating



Manual version

Mounting in tundish prep area



Manipulator version

Assisted handling of the device at cast platform

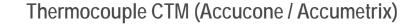


Robotic version

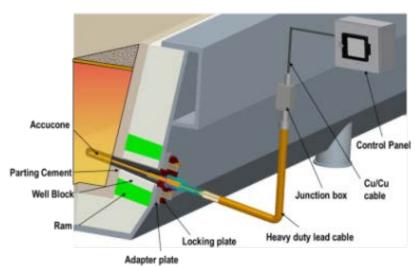
Fully automated unit set up and removal without operator intervention



Technical Services: Avemis



- Legacy & Mature Technology in NAFTA
- Expand to other geographies



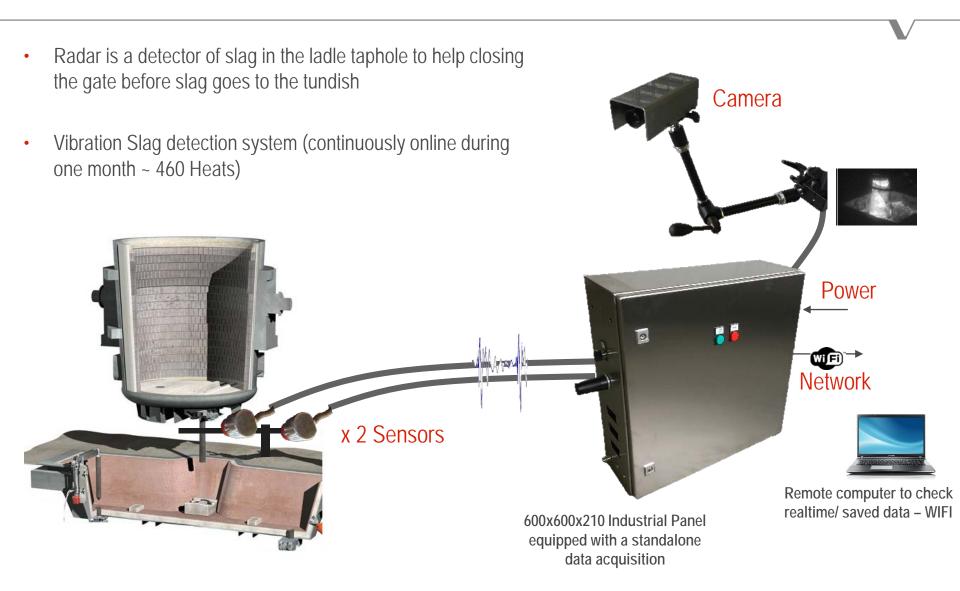
Optical CTM (Accuoptix) – Beta Phase

- Alpha Trial in 2014, BES converted
- 5 10 projects expected for 2015





Technical Services: Avemis RADAR T2



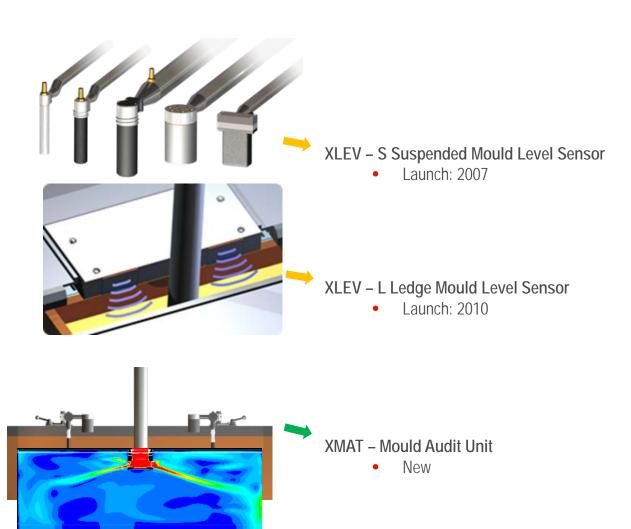


Mould data acquisition

Mould level sensor and mould audit unit



Technical Services: Avemis mould technology











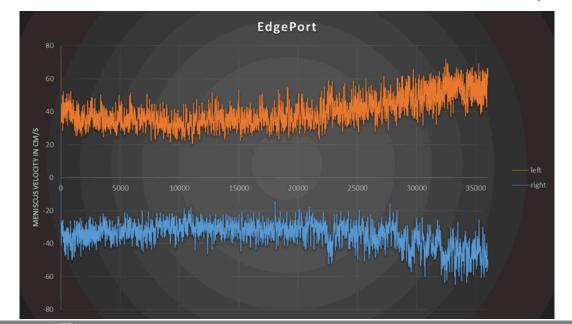
Technical Services: Avemis mould audit technology

Benefits

- Mould «black box» understanding
- SEN/ SES design performance evaluation
- Flow simulation model validation.
- Surface quality improvement



Alpha Trial at an European customer Dec 2014



First Results

Good matching simulation vs actual velocity measurement

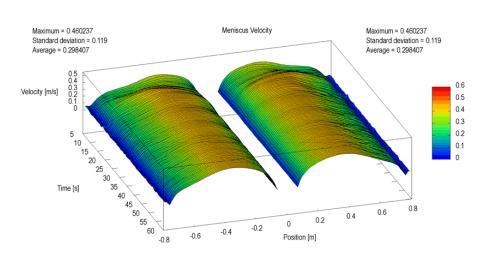


Technical Services: Avemis mould audit technology

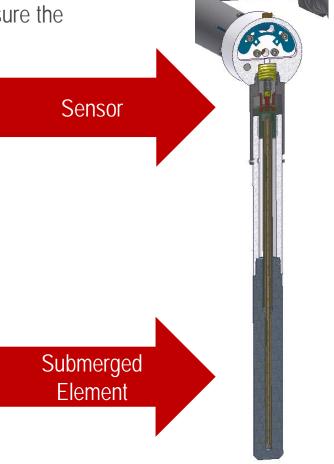
X-Mat is a combination of data collections that allows manufacturers to follow the flow of metal in the mould to ensure the best quality of the metal solidification surface

Benefits

- Mould «black box» understanding
- SEN design performance evaluation (metal delivery)
- Flow simulation model validation
- Surface Quality improvement (laminar flow vs turbulent flow)



3D Scan of actual cast at alpha site



Schematic of sensor design



Technical Services: Conclusions

- Vesuvius has recognised that valuable process information exists at the metal / machine interface
- Through the acquisition and development of a suite of sensor technologies, Vesuvius is now well positioned to be able to extract this process data at critical areas of the production process
- Vesuvius will work with metals producers to transform this information into useable process recommendations for real time optimization of the metal producers processes



A GLOBAL LEADER IN METAL FLOW ENGINEERING

Financial Strategy

Chris O'Shea Chief Financial Officer

VESUVIUS PLC

Financial strategy remains consistent...

• Financial flexibility essential

Committed unutilised facilities of £344.0m

• Conservative balance sheet stewardship

Gearing of 1.48

• Focus on cash generation

2012 - 2014 cash conversion of 93.0%

Cost control

ROS improved by 179 basis points from 2012

Efficient working capital management

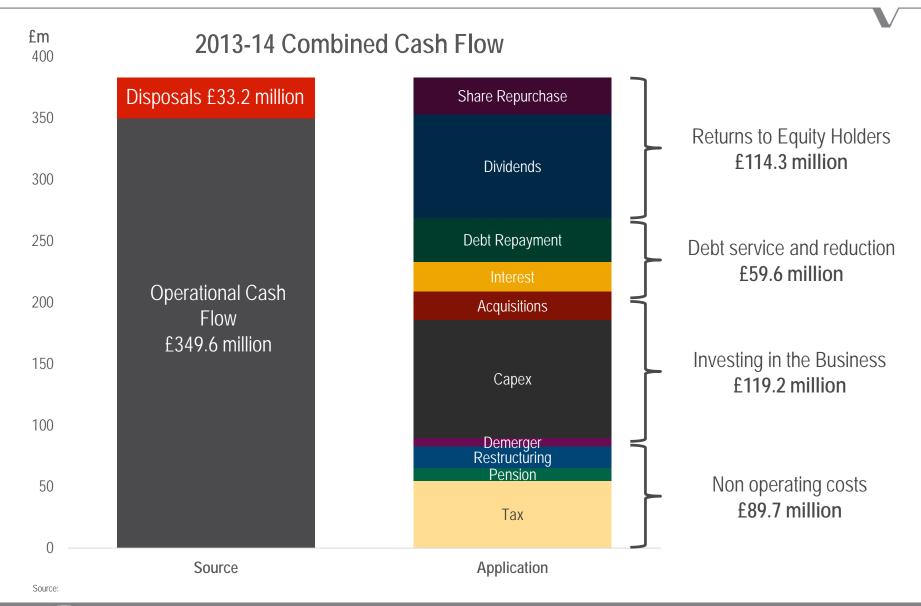
WC to sales ratio 27.3% in 2012 down to 24.8% in 2014

Improve returns

RONA up from 18.7% in 2012 to 25.5% in 2014



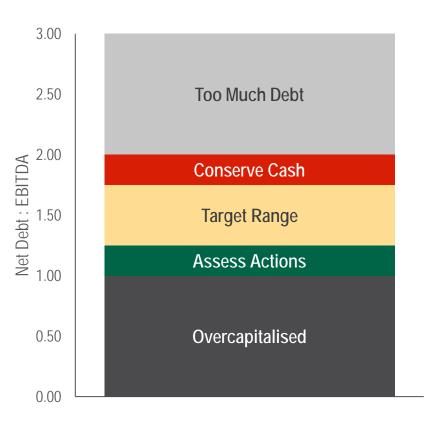
...as evidenced over past 2 years





Strong balance sheet management will continue...

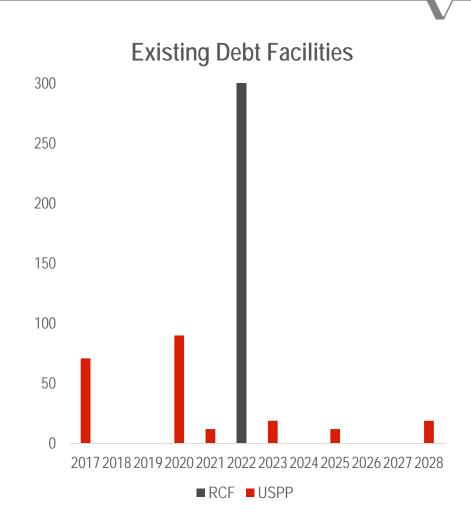
Target Capital Structure



- Governed by 3 times ND:EBITDA ratio
- Internally imposed maximum is 2
 - Retain one turn to guard against short downturns
- Below 1 would trigger consideration of return of capital
- Comfort zone is 1.25 1.75

...supported by newly placed bank facility

- £300 million multi currency facility
 - Replaces £425 million facility expiring 2016
- 5 + 1 + 1 term
 - 2 x 1 year options at lender's discretion
- £200 million accordion
 - Can be exercised before end of 2016
- Margin cut almost in half
- ND:EBITDA covenant of 3.25



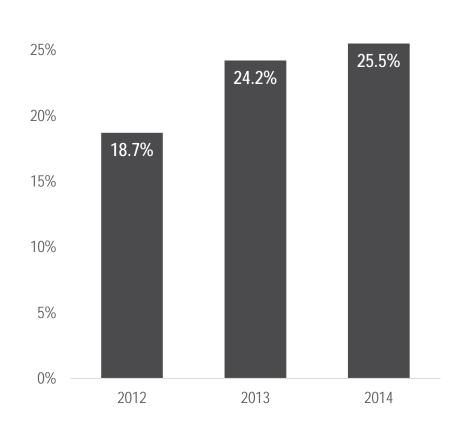


The organic capital requirements are relatively low...

30%

- Low capital intensity
 - Annual Revenue = c6 x Property,
 Plant and Equipment
- More working capital reductions to come
 - Inventory reduction programme continues
 - Receivables moving in right direction
 - Supplier financing solutions with new facility







...and the M&A strategy is focussed & aligned with strategy

Core Competence & Strategy

- Clear core competence
 - We are a global leader in heat containment technology
- Clear business focus
 - We apply our core competence in a focussed way to supplying consumable ceramic products to the steel and foundry industries
- Clear strategic Focus
 - Within the steel and foundry industries we are building a business supplying technical services

M&A Priorities

- Technical Services
 - SERT / Avemis (2012)
 - ECIL Met Tec (2014)
 - Process Metrix (2014)
 - Sidermes (2015)
- Steel & Foundry Consumable Ceramic Products
 - Metallurgica (2012)
- Heat Containment Technology
 - Opportunistically based on value



We anticipate generating substantial free cash flow

Support Organic Capex requirements

Integrated investment framework

New facilities in growth markets (Russia, China, India)

Improved R&D facilities to drive innovation (Pittsburgh, Vizag)



Support M&A Strategy

Bolt-on technical services
e.g. Process Metrix,
ECIL Met Tec, Sidermes

Bolt-on product offerings e.g. Metallurgica

Material adjacencies when valuations support

Deliver
Superior Returns
to Shareholders

Dividend growth in line with underlying earnings e.g. CAGR of 6.4% from 2012 – 2014

Return excess capital to shareholders share buyback post PMP disposal

Increasing productivity and supporting further market penetration though organic capital investment and selective acquisitions at the right price will generate the growth required to increase profits and deliver shareholder value



Going forward

- Since 2012 we have delivered on our commitments,
 - streamlining the business
 - improving our margins
 - delivering shareholder value and
 - positioning the company for growth
- We see a significant growth potential for our markets in the mid term
- We are taking the appropriate steps to capture this growth
 - Increased efforts in technology
 - Driving excellence in manufacturing and
 - Developing technical services





A GLOBAL LEADER IN METAL FLOW ENGINEERING

Q&A

VESUVIUS PLC