

Advanced steel making

In the last few hundred years the UK has been at the forefront of the metals processing industry, and the same is true in the 21st century



Initially the metals industry was focused on the production of iron and steel, but it has diversified to encompass the range of non-ferrous metals including copper, zinc and aluminium. The extensive industrial expertise of UK engineering companies has been applied to metals production technology and the sector is now forming the future of metals production around the globe.

The sector has invested heavily in technology, research and development and as a result the UK has one of the most cost-effective steel industries in the world. According to the UK Steel Association, UK steel industry employees are now four times more productive than 20 years ago. Over the last 10 years the sector has invested over £2 billion on innovation; and over £50 million is spent every year on educating the workforce.

Steel products made in the UK include bright steel bars, plate and strip mill products, hot rolled and long products, special steels, tubes and pipes, wire and wire products.

UK steel companies respond constantly to meet the challenge from competing materials to ensure that steel remains the material of choice for thousands of manufacturing applications. Some 70 per cent of the steels used in automotive production today did not exist 10 years ago. Leading steel companies have developed ultra-light steel solutions for car designs including car bodies and suspension systems. Some 15 per cent of a modern commercial aircraft is made from specially developed steels.

Across the globe research and development has focused on new processes for the production and forming of metals, which required new metallurgical plant that has been developed and produced by companies in the UK.

The UK metallurgical plant construction sector is made up of companies who design and supply capital plant, systems, services and equipment for the world's iron and steel and non-ferrous metals industries. Many are now part of global

companies who can handle major turnkey projects. The sector offers world-class design and engineering capabilities and expertise covers a wide range of technologies from handling of primary raw materials to melting, casting, hot rolling, cold rolling and forming. Process lines for cleaning, coating and cutting the product are also designed to meet maximum output speeds with consistent quality performance.

LARGEST PLATE MILL STAND

The largest ever plate mill stand to be built in the UK has recently been completed by Sheffield Forgemasters. The machining and fabrication was handled by DavyMarkham, also of Sheffield. The five-metre wide, 20MW stand was designed for the Shuangang steel company of China, and at 1,000 tonnes, is the heaviest rolling mill fabricated from separate castings connected by high tension bolts. The project required casting, pouring, transporting, handling and machining processes never before employed by Sheffield Forgemasters and DavyMarkham.

When installed and commissioned, the stand, which has a maximum rolling load of 10,000 tonnes, produces plate between 1500mm and 4,900mm wide, at speeds up to 7.3 metres per second, for applications such as shipbuilding, construction and civil engineering.

The skills and engineering expertise of the constructors of metallurgical plants in the UK are no longer confined to the domestic market but are applied to metal production in every part of the world. "Construction of new facilities in developing regions or modernisation of existing plant to improve output or to enhance the quality of the product, frequently involves engineering companies based in the UK. In this work they are supported by other specialists who are closely associated with this vital technological industry, by providing engineering solutions, ➡



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NATIONAL METALS TECHNOLOGY CENTRE

The National Metals Technology Centre (NAMTEC), a collaboration between the industry, academia and the UK Government, is helping to keep the UK metals industry competitive. It places science, innovation and best practice at the core of its activity and provides a focal point for the UK's vast range of technical expertise in the design, production, fabrication and application of metals.

By providing a single source of expert advice to the vast number of companies that either produce, shape, fabricate or use metal, the centre has helped to improve the

productivity of the sector and the quality and consistency of its products. Overall some 1,900 companies have benefited from technical assistance and consultation carried out by NAMTEC staff.

As a result, sales have increased, jobs have been created and many others safeguarded.

The centre is now expanding its activities to deliver an extensive high-level technical training programme, targeted to meet the needs of the metals and manufacturing industry. It is also extending its scope to include the provision of research and development.



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UK Steel Association

installation services, mechanical parts or technology components on a subcontract basis,” he said.

QUALITY CONTROL

In the UK, quality enhancement involves the use of leading-edge process control systems. The latest technologies from the process automation solutions companies ensure that the UK metals industry remains at the forefront of quality performance. All advanced steel making and metals processing equipment meets current and foreseen environmental requirements, and is designed to the appropriate safety standards.

CASTING

Specialist and precision investment casting companies make components for a wide range of sectors including construction, transport, power generation, valve, switchgear as well as general engineering applications. Investment casting offers significant cost savings by providing close tolerance, near net shape, components which often require no further machining. Companies work with a wide range of materials, including carbon and stainless steels, aluminium and copper based alloys as well as stainless steel.

Many companies offer their customers an in-house casting design facility with 3D modelling. Casting simulation software is used to predict defects at the design stage thus reducing development time and cost.

FINISHES

Components can be supplied with a variety of finishes including particle shot blast, electropolished, mirror and satin finish, as well as painted and powder coated. The sector is also expert in the finish machining of castings, from simple drilling and tapping through to complex CNC forms. Some

companies supply sub assemblies to their customers and offer a full range of heat treatment services, including vacuum heat treatment. Many companies are also experienced in rapid prototyping.

The sector also offers a wide range of forging finishes and services including black as forged, proof machined and fully machined in materials such as carbon, alloy, stainless steel, titanium and aluminium.

GALVANISING

UK has a strong hot dip zinc galvanising service industry to meet the varied requirements of steel component producers. It is able to galvanise anything from the smallest washer to structural steel components up to 29 metres long.

UK galvanisers have many years of experience and can offer protection of up to 20 years in industrial and marine environments. Due to the now highly mechanised and closely controlled factory process, the cost of galvanising is getting steadily cheaper. UK companies offer excellent reliability with the weights of coatings being regular and predictable. Galvanising is one of the few coatings which is completely defined by a British Standard (BS EN ISO 1461).

The UK is also home to specialists in the provision of duplex coatings, when organic coatings such as paint or powder are applied over hot dip galvanised steel. These coatings can be used to add colour for aesthetic, camouflage or safety purposes, further increase the economic life of steel structures and provide additional protection in aggressive environment. ■

i FOR MORE INFORMATION

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