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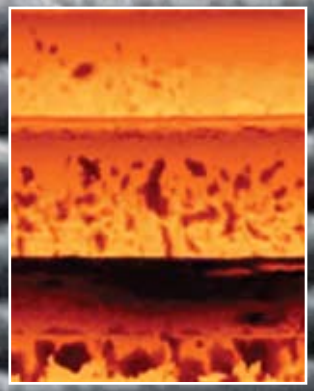


celsa steel UK
CELSA GROUP

Local focus, global commitment

Local focus, global commitment

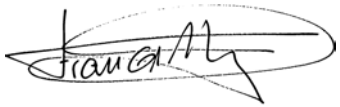
Celsa Group is a global company. This has come to mean many things over the years, but at Celsa we have a very clear understanding of what it means to us. Being global means not only that we are affected by global trends and influences, but also that we play our part in contributing to them.

As a steel producer that manufactures its products by recycling scrap iron and steel, we have a very stable future; in fact we provide an essential role in sustainable living. In order to be a sustainable producer a company must demonstrate commitment to sustainability issues – something that has been the underlying philosophy of Celsa Group since it began. Our focus on ethical suppliers, sustainable and responsible production, the local community and service to our customers will never change.

In 2006, Celsa Group President Francisco Rubiralta and First Minister for Wales Rhodri Morgan opened a new melt shop at Celsa UK, representing an £80 million investment in steelmaking in South Wales. As well as improving our production efficiency, this investment also helped the local community by reducing noise and other pollution.

It has also helped us to recycle more by enabling us to capture process dust more efficiently. This can then be recycled and reused.

Together with these values come other commitments. My experience within Celsa Group has proved to me that our dedication to innovation, quality, health & safety and customer service set Celsa Group companies apart, and I believe this commitment will continue to grow.



Francesc Mesegue
General Manager
Celsa UK

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The underground station at Canada Water is part of the impressive Jubilee Line extension.

Celsa Group

Celsa Group is committed to a common strategy across all of its companies, a high degree of vertical integration, producing a large product portfolio, and being outstandingly competitive.

Celsa, later to become Celsa Group, was created in 1967. It started out as a small reinforcing bar re-rolling mill, yet the company's spirit of growth and commercial expertise have enabled it to become the parent of one of Europe's largest producers of long steel products.

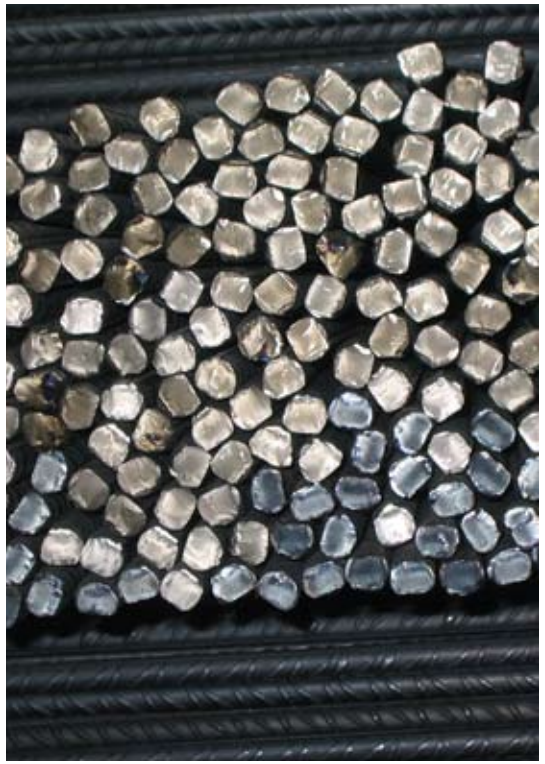
The group has total annual sales of over 4,500 million euro, with an output of around nine million tonnes of steel per year and a workforce of some 6,000 employees. Celsa's commitment as a company relies upon adhering to a common strategic outlook across all its companies. Through a high degree of vertical integration and a wide-ranging product portfolio, Celsa Group seeks to remain outstandingly competitive in all of the markets it serves. The company's success is demonstrated by the consolidated results recorded year after year, and in its growth and expansion policies.

Today, as one of Europe's most diversified steel groups, Celsa's emphasis is still on introducing new technologies, achieving exemplary quality in its products, making improvements to its service to industry and working to be environmentally efficient.

Celsa Group recycles over ten million tonnes of scrap every year through its mills. This is equivalent to melting down a line of cars that would stretch all the way from Cardiff to Sydney and back.

Right from the outset, Celsa Group's company policy has been geared towards pursuing a global commitment with regards to its customers, its suppliers, its workforce and society in general. For Celsa Group, playing our part in preserving the environment in highly important.

The company's requirements exceed the current environmental regulations in the UK, Spain and the European Union. Celsa Group is continually improving its methods and installations, checking emission levels, and investing in treatment for fumes, waste-water and waste in general, all with a view to ensuring that its operations are environmentally efficient and thus helping to preserve the environment.



Celsa History

2007: Founding of Celsa France, Bayonne and Celsa Atlantic, La Coruña took group production to over 9 million tonnes per year

2007: Celsa Nordic established as the leading supplier of reinforcement to Nordic countries

2006: New Melt Shop built in Cardiff

2004: Second EAF built in Barcelona

2003: Acquisition of Celsa Huta Ostroweic in Poland includes rolling and forged products divisions

2003: Celsa UK founded in Cardiff, South Wales, ensuring Celsa is the largest reinforcement producer in the UK

1996: Integration of Nervacero with Laminaciones Arregui, S.L. extends Celsa's product range

1988: Global Steel & Wire (GSW), Santander, acquired as Celsa's wire rod manufacturing arm

1987: Acquisition of Nervacero in Bilbao establishes Celsa as the leading producer of reinforcing bar in Spain

1977: First EAF built in Barcelona, enabling production of hot steel from scrap metal

1967: Celsa founded in Barcelona as a re-rolling mill

Celsa Group locations clearly demonstrate the company's strong European presence.

Celsa Group

Upstream and downstream integration, where necessary, has formed an essential part of the functionality of the Celsa Group.

Each of the eight parent companies in the Group – Celsa, Nervacero, Global Steel and Wire, Celsa UK, Celsa Huta Ostrowiec, Celsa Nordic, Celsa France and Celsa Atlantic – pursues its business in distinct markets, produces a wide range of different products and has its own management team.

In addition to these parent companies, the Celsa Group owns and operates several downstream and upstream operations. These companies again operate with their own management team and form a vital part of the supply and service stream for the group.

By the end of 2007, the Celsa Group was operating 12 scrap companies (8 in Spain and 4 in Poland). This upstream integration enables the group to have certainty of supply and some control of costs for their main raw material.

Also in Spain, Celsa Group owns and operates several steel processing plants. These range from companies such as Tycsa which produces high quality wires and strand, Moreda producing fencing and other wire products to ACSA – one of Spain's largest reinforcing mesh producers.

In Scandinavia Celsa has also obtained a large downstream network. Formerly part of the Fundia group, Celsa Steel Service is a technical and manufacturing organisation supplying construction sites across the region with engineered reinforcement and ancillary products.

Celsa Group products

- Angles
- Armatures
- Channels
- Couplers
- Crankshafts
- Cut and bent products
- Diesel engine components
- Drawn wire
- EE steel fibres
- Electro-welded mesh
- Flat bars
- Hard steel by-products
- High yield coil
- Other wire rod
- Plain round bars
- Prestressing strand
- Reinforcing bar
- Shafting lines
- Special welded products
- Springs
- Square bars
- Steel cables and ropes
- Strip
- Structural sections
- Welded mesh
- Welded tube
- Wind power plant main shafts
- Wire fencing
- Wire rod for mesh

Celsa's subsidiary and scrap companies located throughout Europe.

Celsa UK – introduction

Celsa UK is a large long steel producer focussed on supplying the UK and Irish markets.

Becoming part of Celsa Group in 2003, Celsa UK is the largest producer of steel reinforcement in the United Kingdom and one of the largest producers of other long steel products.

We use the most up-to-date steelmaking and rolling technology for the manufacture of our products. From the scrap steel feedstock to the final product, our knowledge of steel processing, combined with state-of-the-art control, ensures that we produce products of reliable, consistent quality at all times.

Our facilities in Cardiff, acquired and expanded by Celsa Group, comprise a melt shop – built on the site in 2006 – and two production facilities: one for rolling reinforcing products and wire rod, the other for rolling merchant bar and light sections. Our new melt shop has enabled us to increase both environmental efficiency and production capacity.

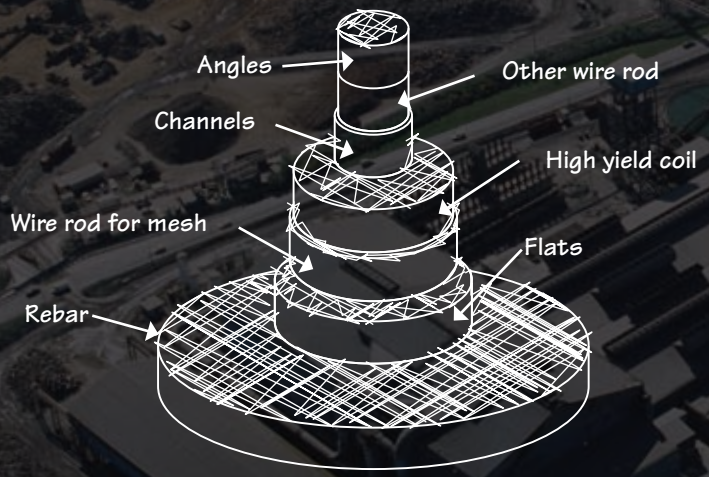
We produce and deliver around 1.2 million tonnes of finished product, mostly to the UK and Irish markets, each year.

We employ over 500 staff as well as several hundred sub-contractors in South Wales. As the closest steel mill to Ireland, we regard this as part of our home market and supply over 30 companies with their steel requirements every month.

Carrington Wire Ltd.

Proportion of products manufactured by Celsa UK

Of the 1.3 million tonnes of finished product manufactured annually by Celsa UK, the proportion of products by type is shown.



The Tremorfa Works at Celsa UK is dominated by the new melt shop facility.

Celsa UK – the environment

Celsa UK is committed as a responsible supplier and operates a zero waste policy in all its activities so that any adverse impacts to the environment are either minimised or eliminated.

Celsa UK is dedicated to being a sustainable producer. All of the steel we produce in our melt shop is produced from scrap metal using the electric arc furnace (EAF) process. This means we buy scrap metal which melts in our furnace to produce steel billet, from which our finished products are manufactured. Steel production using the EAF method consumes only a third of the embodied energy and emits only one sixth of the CO_2 compared with other steelmaking processes. In other words, we are a recycler and produce steel by the most sustainable manner available.

Since the UK is a net exporter of scrap steel, all the scrap metal we buy is sourced from within the UK. In fact, our purchasing strength enables us to source most of our scrap from within a 200 mile radius of our facilities in Cardiff.

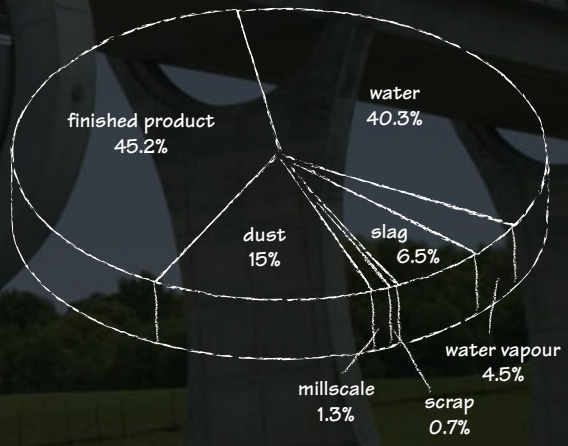
The steel we produce consists of 98% recycled scrap metal and 2% ferro-alloys and minerals that are added to the production process to remove impurities from the steel and to ensure the finished product has the correct properties.

During the production process, impurities are removed through the furnace slag, a steel by-product that is recycled as an aggregate for the construction industry after any treatment, grading and remaining metal has been extracted for reuse. All the other by-products of production are recycled, ranging from mill scale – used as an iron-bearing source in the cement industry – to flue dust, from which zinc and other metals are recovered.

We operate a zero effluent policy and are committed to continual improvements in all of our activities to minimise or eliminate any adverse impacts to the environment. We operate an environmental management system certified to ISO EN 14001:2004.

Percentage of output materials created by Celsa UK

Keeping both waste and pollution to a minimum are key considerations in our production processes. Finished product makes up the largest single output, with water being the next largest product, followed by very small amounts of other recyclable or reusable by-products.



The Falkirk Wheel – a reinforced concrete structure which clearly demonstrates its sustainability credentials within its surroundings.

Celsa UK – our people

Celsa UK works with its staff and the community to develop a safe, healthy, motivated, versatile and productive workforce.

Celsa UK recognises that its people are paramount to the success of the company. We are committed to the promotion of all aspects of the wellbeing, health and safety of our employees, contractors, visitors and neighbouring communities. We actively encourage a positive safety culture among our employees and contractors.

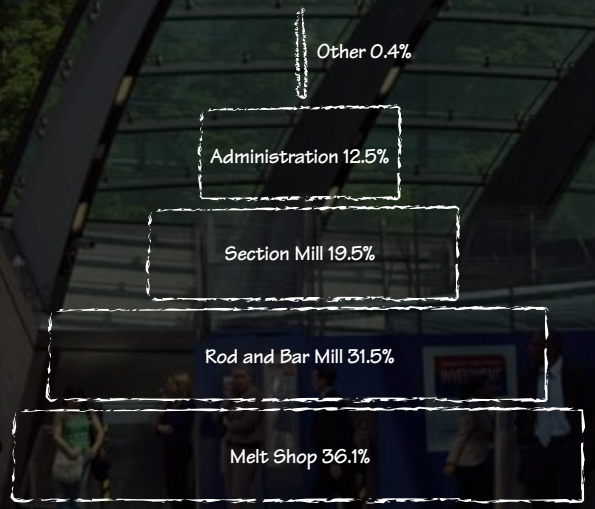
We are committed to developing our people to their full potential. We encourage our staff to participate in regular training to help them develop on a personal and professional level, as individuals, and as part of a team. We also encourage them to accept more and greater responsibilities through promotion.

Celsa operates a number of training programmes. The most successful of these is the NVQ level 2 qualification in Metals Processing and Allied Operations, which provides the foundation for future development for production operators driven by the strategic objectives of the business, and the resultant need to change operational procedures against which the operators are required to perform.

We also offer a three-year Advanced Modern Engineering Apprenticeship Programme to school leavers and other young people. The programme gives young people the chance to obtain new skills and qualifications, helping them to become the engineers, craftspersons and technicians of the future. These new-found skills will enable us to develop a highly motivated, dynamic, versatile and productive workforce.

Staff locations within Celsa UK

Celsa UK employs approximately 500 members of staff, each of whom has a key role in ensuring the company is run as efficiently and responsibly as possible. The breakdown of staff by area is shown below.



The entrance to Canary Wharf underground station, Jubilee Line, London.

Celsa UK – sourcing and supply

By working closely with customers so that production is in line with market demand, Celsa UK has proved that the service it offers is second to none.

In the current climate where local sourcing of materials and the need to reduce CO_2 emissions are becoming increasingly more important, using alternative methods to transport raw materials and finished product is both a sustainable and an economic goal. Most scrap used in our production process is sourced from within a 200 mile radius of our facilities in Cardiff. We bring in approximately 60% of our scrap metal and send out approximately 35% of our finished product by rail. These figures are planned to rise year on year.

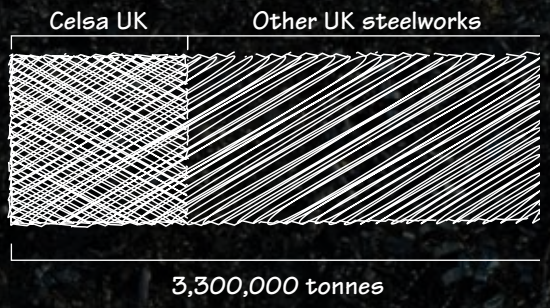
Celsa Group philosophy is to both roll to, and supply from, stock. We endorse this philosophy, and hold in the region of 70,000 tonnes of finished stock at any one time so we can supply our products to anywhere in the UK within 24 hours, and to Ireland within 48 hours. We understand that our customers' needs are the priority when rolling and supplying material. Whether working closely with our customers to ensure rolling programmes are in line with market demand, offering bespoke loading options or through our customer zone, where customers can access stock levels and retrieve test certificates electronically, the service we provide is second to none.

All the reinforcement we produce complies with Eco-Reinforcement, a certification scheme operated by the Building Research Establishment. As an EAF producer certified to ISO EN 14001, we are committed to reducing our carbon emissions in line with UK government regulations to 2050, and to print rebar miles on delivery notes.

Through an auditable process under which the origin of all bought scrap is recorded, we calculate the exact distance the scrap has travelled to reach our plant. Distances to our customers' facilities – and from there to their clients' construction sites – are taken into account when calculating the average number of miles travelled by the steel in that bundle from raw material to end user.

UK scrap recovered and recycled

For every tonne of new steel produced in the UK at least one tonne of steel is recycled as scrap metal. In 2007 approximately 13 million tonnes of steel were recovered and recycled. Of this about half was for export. Celsa UK recycled 1.3 million tonnes of the estimated 3.3 million tonnes of steel scrap used by UK steelworks.



Piles of turnings, bales and old steel – just some examples of the types of scrap metal recycled by Celsa UK.

Celsa UK – customers and industry

Celsa UK works closely with government bodies and industry professionals to be the market leader in education and innovation, as well as product quality and performance.

As the market leader for many of our products and product ranges, we recognise how developing strong relationships with our customers has influenced and consolidated our position. We understand that presentation and service are paramount: it is vital that our products reach our customers' premises on time and in perfect condition. Achieving this requires an efficient production process, good storage facilities, top-rate handling systems and excellent logistics.

We appreciate that product diversification is key to the development of both the steel and the construction industries, and we strive to develop and manufacture products of greater usefulness and ever higher quality for our customers and end users. The completion of our new state-of-the-art melt shop in 2006 enabled us to expand our product range to include new steel grades, while the addition of a spooler mill in 2007 meant that, for the first time, UK customers can use high ductility grade 500C reinforcement throughout their projects. This, coupled with investments to increase the range of sizes in both reinforcing and merchant bar products, is just one of the reasons why we are such a popular and dependable supplier.

We work in conjunction with various professional bodies to encourage improvements in quality and to develop the setting of standards for steel products. Representatives of Celsa UK sit on British and European standards committees, helping to keep the construction industry up to date with developments and innovation in the manufacture and performance of steel products. As a member of the British Association of Reinforcement (BAR) we provide representation on various committees; we also make presentations to engineering consultants and contractors around the country on developments within the steel industry. Finally we work closely with universities, professional and technical associations, public authorities and industry bodies, striving to be market leader not only in terms of product quality and performance but also in education and innovation.

Express Reinforcements Ltd.

Growth of the UK construction industry

The UK construction industry is predicted to achieve sustained growth with a concomitant growth in the need for steel. The graph, in millions of pounds at 2000 prices, shows that the total of all work in construction is predicted to exceed £90 billion by 2011.

The Millau Viaduct is the world's tallest vehicular bridge, spanning the valley of the River Tarn, Southern France.

Celsa UK – our products

Our commitment to our products means that we invest heavily in improving technology and standards to enable us to manufacture better products with greater usefulness and ever higher quality.

The highly competitive environment of the capital intensive steel sector makes constant and continuous investment necessary to secure productivity improvements across all areas of the company. The provision of high quality products has always been our priority, and this is why we devote a sizeable share of our investments to improving internal controls and quality assurance. This is backed up by substantial investments in new technology and facilities, including our new £80 million state-of-the-art melt shop, completed in 2006, which has increased production to 1.2 million tonnes and enabled us to develop new grades. In addition, a £10 million spooler line extension to our rod and bar mill was completed in 2007, making ours the first mill in the UK to produce hot spooled grade 500C high yield coil.

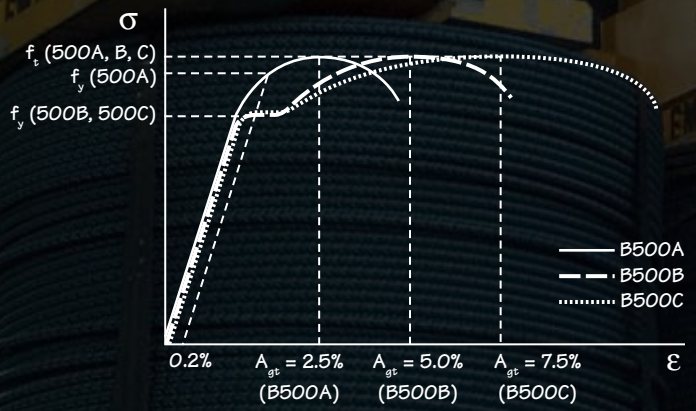
Owing to the nature of the products we manufacture, each of our operations has to monitor its processes using a large number of quality factors. Not only must our products conform to British Standards, UK CARES (the UK Certification Authority for Reinforcing Steel) and EN 10025:2004, they must also comply with individual customer specifications. We have three on-site laboratories equipped with the necessary testing machines and fully qualified staff, as well as operating a quality management system, certified in accordance with the requirements of BS EN ISO 9001:2000.

Celsa Group has always been committed to pioneering research into top quality products. We played a prominent role in the design of a new high ductility rebar, a product that brings the greater structural security necessary for dealing with overloads caused by unexpected events such as flooding or explosion. As a member of Celsa Group, we understand that investment in research and product development is not just an additional expense but an essential prerequisite for future success.

Tables and graphs for 500C compared with 500A/B

Type of steel	fs/fy	Agt	Ductility grade
Grade 500A	≥ 1.05	≥ 2.5%	low
Grade 500B	≥ 1.08	≥ 5.0%	normal
Grade 500C	≥ 1.05 < 1.35	≥ 7.5%	high

Comparison of stress-strain curves for steel grades B500C, B500B and B500A



Freshly spooled high yield coils are transferred for storage by magnetic crane.

Production at Celsa UK

With the construction of Celsa UK's new melt shop, capacity has risen to 1.2 million tonnes per year and there is the potential to improve on this with further investment.

In December 2006 Celsa UK opened its new state-of-the-art melt shop. This facility increased our crude steel capacity from 850,000 tonnes to 1.2 million tonnes per year.

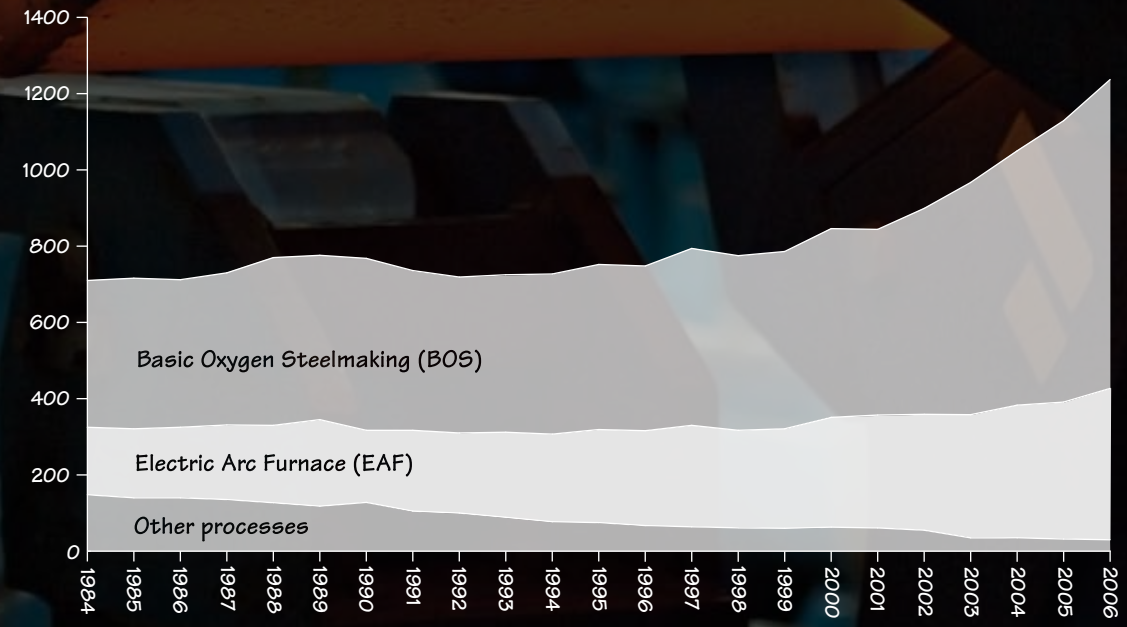
Celsa UK is an electric arc furnace (EAF) steelmaker: we make new steel products from scrap metal. Elsewhere the most common production method for steel is basic oxygen steelmaking (BOS). BOS requires purchasing iron ore and coal, heating them in a blast furnace, then manufacturing the crude steel through a secondary steelmaking process. It is far less efficient, in terms of energy and the environment, than the EAF process we use.

Scrap arrives at our facilities by rail and by road for delivery to the melt shop. There are over 20 different grades of scrap, each representing a different level of quality. Scrap ranges from scrapped cars – which often contain impurities such as copper from copper wiring – to turnings from machining factories where the steel tends to have fewer tramp elements. Each of our products has a different recipe for the scrap employed depending on its final use. Some wire rods can be drawn down to just 0.5mm diameter by our customers, so it is essential that the scrap we use for such products has few impurities.

After leaving the melt shop as billet, or slab, the steel travels by rail to either the rod and bar mill or the section mill. Here the steel ingots are reheated to around 1,100 Celsius and rolled to the required shape and size. They are then bundled, labelled for traceability and put in to stock ready for delivery.

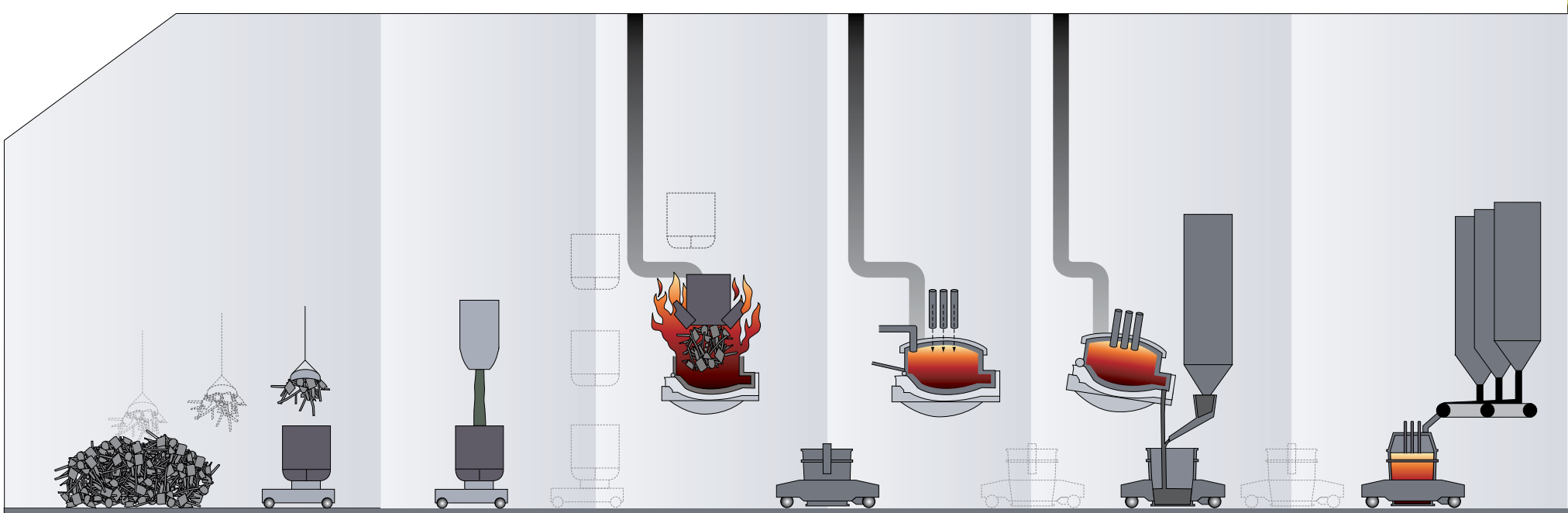
Global production of crude steel by process

In the 20 years between 1986 and 2006 global production of crude steel almost doubled from 710 million tonnes to 1,237 million tonnes. During that time production using BOS and EAF techniques has more than doubled as other processes have been abandoned as being too wasteful.



Glowing billets cool in the melt shop shortly after casting, prior to being transported to the rolling mills.

From scrap to mills



Scrap
Different grades of scrap metal are lifted into the scrap bucket. The proportions of material used depends on the desired final product.

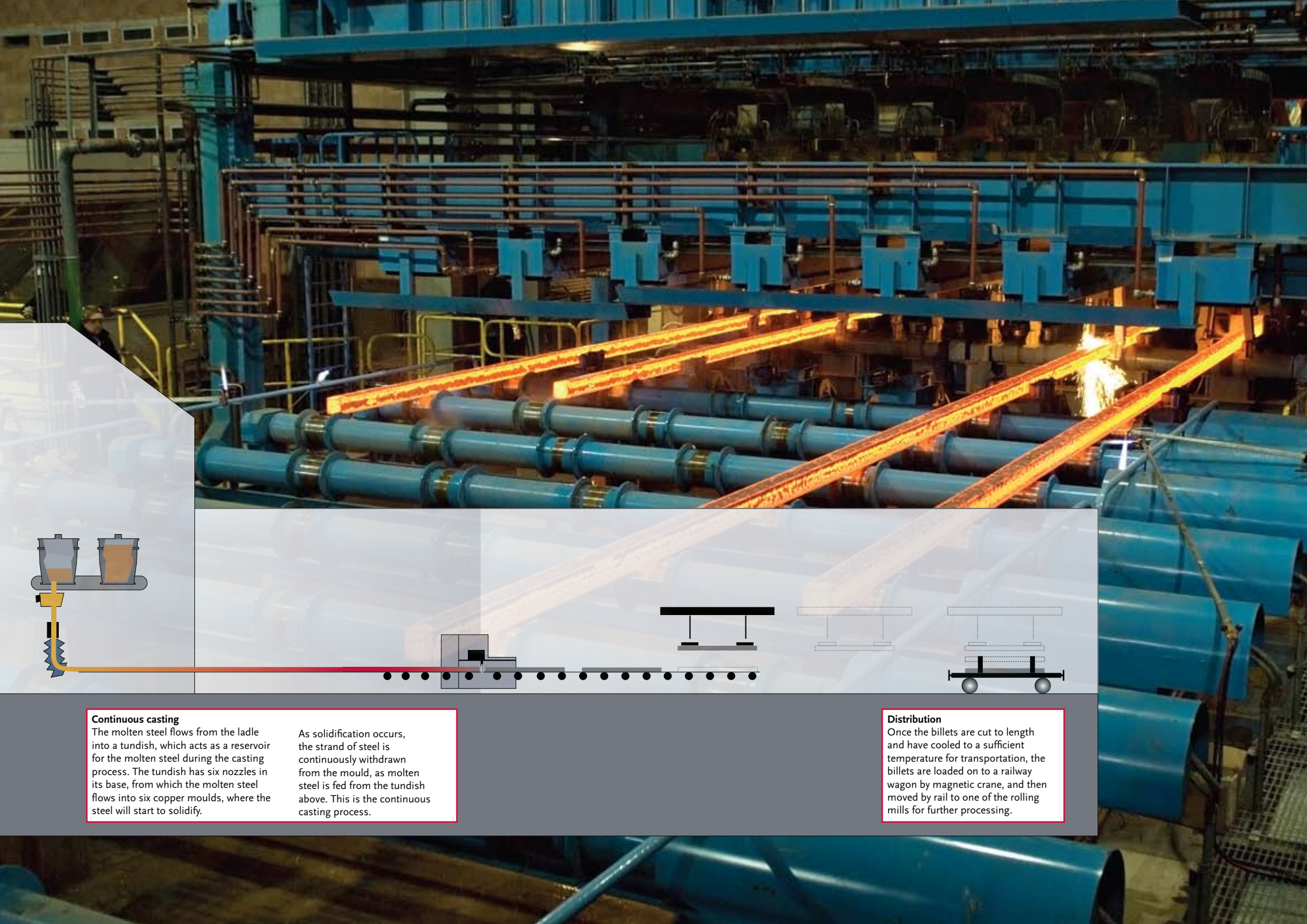
Lime
A small amount of lime is added to form the slag through which impurities are removed during melting.

Electric arc furnace steelmaking
The scrap bucket is lifted over the electric arc furnace, and the scrap is dropped into the furnace through the clam mechanism in the base of the bucket.

Electrodes
Three graphite electrodes are lowered into the electric arc furnace and an electric current is discharged through the electrodes, melting the scrap and turning it into molten steel.

Tapping and secondary steelmaking
As steel is tapped from the furnace into the ladle, alloying elements are added to the molten steel which prevent any impurities from having a harmful effect on the steel's properties.

Temperature control and composition
The ladle of molten steel is then moved to the ladle furnace. Here the temperature and composition of the steel are adjusted to tightly controlled limits, to ensure that the required properties in the finished products are achieved.



Continuous casting
The molten steel flows from the ladle into a tundish, which acts as a reservoir for the molten steel during the casting process. The tundish has six nozzles in its base, from which the molten steel flows into six copper moulds, where the steel will start to solidify.

As solidification occurs, the strand of steel is continuously withdrawn from the mould, as molten steel is fed from the tundish above. This is the continuous casting process.

Distribution
Once the billets are cut to length and have cooled to a sufficient temperature for transportation, the billets are loaded on to a railway wagon by magnetic crane, and then moved by rail to one of the rolling mills for further processing.

The melt shop

The raw material for Celsa UK products is steel scrap. Hence all of our products are made from 100% recycled material.

The melt shop at Celsa UK uses the electric arc furnace (EAF) process. This process is more flexible, produces lower CO_2 emissions and consumes less energy than the traditional basic oxygen steelmaking (BOS) process. Scrap is placed in the furnace and high current electrical arcs are applied through graphite electrodes. Once the scrap has melted, the molten steel is further refined before the furnace is tapped into a refractory-lined ladle for further processing.

Once the molten steel is in the ladle, the main alloying elements – such as manganese and silicon – are added. These elements combine with impurities such as oxygen and sulphur, preventing them from having a harmful effect on the steel properties and helping to strengthen the steel.

Next the temperature and composition of the steel are adjusted to tightly controlled limits to ensure that the steel is of the right analysis to produce the required properties. Alloying elements such as manganese, vanadium or boron may be added to produce the necessary strength, ductility or toughness depending on the intended use of the finished product.

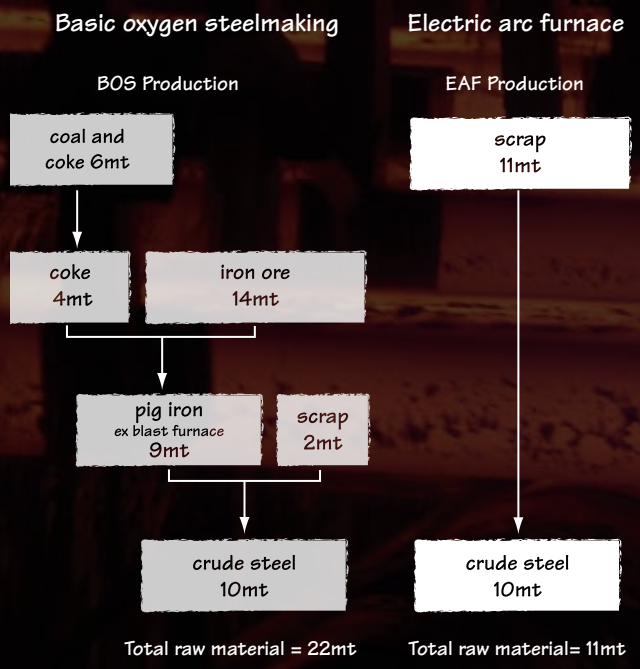
Once the ladle of molten steel has reached the required temperature and chemical composition it is moved to the continuous caster. The molten steel is run through a gate in the base of the ladle into a tundish – a bath-shaped refractory-lined vessel – which acts as a reservoir for the molten steel during casting. In the base of the tundish are six nozzles, from which the molten steel flows into six moulds, where the steel will start to solidify from the outside. As this solidification occurs, the strand of steel is continuously withdrawn from the mould while molten steel is fed from the tundish above. This is the continuous casting process.

During the casting process, an electric current is passed around the mould. This effectively stirs the solidifying steel, ensuring that any impurities are moved to the centre of the billet where they do not affect the quality or the rolling performance of the product.

The solidifying strand in square or rectangular cross section is straightened then cut to the required length by gas torches. This produces billets, up to 15m in length, which are transferred by rail to either the rod and bar mill or the section mill.

BOS v EAF production

Electric arc furnace steel production is much more energy efficient and less wasteful than basic oxygen steelmaking.



Gas torches are used to cut the continuously cast billets to the required lengths.

Rod and bar production

Significant investment has strengthened Celsa UK's position as the leading producer of reinforcing and wire rod products in the UK. We believe such investment is necessary to achieve productivity improvements throughout the company.

Our rod and bar mill is capable of producing 890,000 tonnes each year for a wide range of reinforcing and wire rod products. In 2006 we invested £10 million in a new four-line spooler mill, making ours the first UK mill to produce hot spooled coil, a process vital for achieving grade 500C properties in coil format.

After casting in the melt shop the steel billets are transferred to the mill by rail. Before rolling, billets are reheated to 1,150 Celsius in a gas-fired furnace. Reheating is vital for rolling billet into finished product: it makes the steel softer so the final shape is produced using less energy.

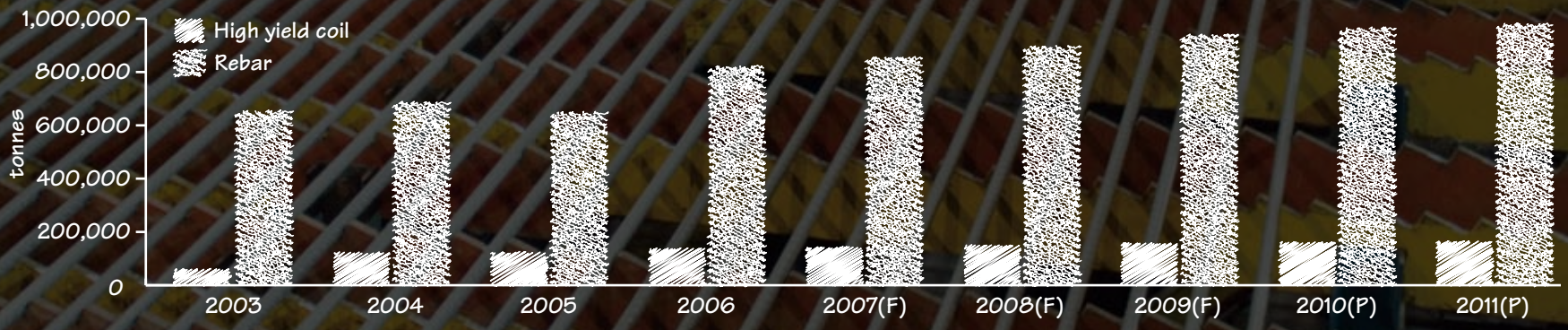
Once up to temperature the billets are pushed into the rolling stands, each of which has a pair of grooved cylindrical steel rolls. As the steel is forced through the grooves, the area of the cross section is reduced. This process is repeated continually over several stands, with the cross section reducing each time until the required dimensions are achieved. In the case of reinforcing steels, notches are cut into the grooves of the final rolling stand and the steel that fills these notches forms the ribs on the bar surface.

In order to achieve the strength and ductility of grade 500C reinforcing steel, the steel is cooled by high pressure water jets. This results in a hard, strong surface with a soft, ductile central core. This process is known as quench and self temper (QST). Once cooled the bars are sheared to a length of around 80 metres and transferred to a cooling bed where they cool further in still air. The bars are then sheared to standard lengths and moved to storage.

For reinforcing coil, bar is diverted to the spooler mill after QST and shearing. Here it is hot spooled by a travelling head on one of our four high-speed spoolers, and forms tightly spooled high yield coils.

Rolling wire rod is similar except that more rolling stands are used. The final length of small coil sizes can be several kilometres. To handle this long length, the rolled stock passes through a helical tube spinning at high speed; this forms the rod into a helical coil.

UK reinforcing market



The total demand for reinforcing bar and high yield coil in the UK is predicted to grow year-on-year to 2011 and beyond. Within the industry this requirement is expected to be split 33% new housing, 14% public non-housing, 14% infrastructure and 39% commercial. This compares to a split of 30%, 20%, 18% and 32% in 2003. (Source: CPA)

Reinforcing bars cool on the 78 metre cooling bed in the Rod and Bar Mill.

Reassure

Reassure distinguishes improved quality and performance in high ductility reinforcing steel with proven significantly improved tensile, fatigue, bond and cyclic behaviour.

Reassure is a trademark for grade 500C reinforcement that has specific added value. The quality and performance of the steel that carries the mark exceed current British and European standards; therefore Reassure products are guaranteed to comply with these standards. Products that are part of the Reassure brand are easily identifiable by the RE✓ mark that is rolled at regular intervals on the surface of the bar or coil.

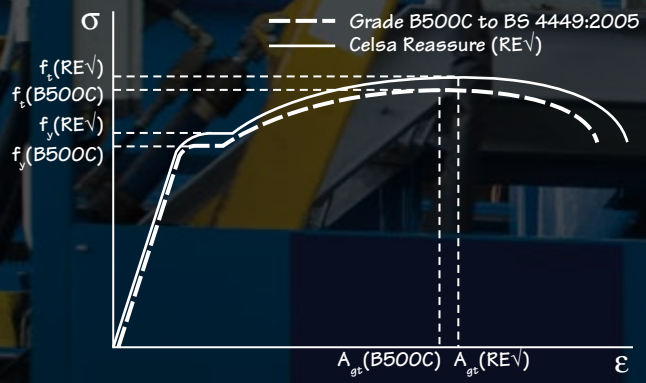
Grade C reinforcement is the highest quality reinforcing product that can be specified in the UK national annex of Eurocode 2. It is over 50% more ductile than standard grade 500B material, despite being otherwise identical in properties other than its rib pattern. It is the highest grade of reinforcement produced in Spain and Portugal and is also produced in many other European countries.

Research has shown that Reassure material offers significantly better tensile, fatigue, bond and cyclic behaviour than the grade 500C material referred to in the standards.

In addition to these performance advantages, continual research and development has led to the inclusion of a new high yield coil rib pattern that enables easier decoiling and improved bending performance.

This improvement will be invaluable to engineers in applications where the inherent robustness of reinforced concrete is an invaluable asset: for example, in overload conditions, when last-minute design changes are made, when additional fatigue requirements are necessary, and where cyclic performance is important.

Comparison of stress-strain curves for steel grade B500C to BS 4449:2005 and Celsa Reassure



Studies on bond, fatigue and cyclic performance are also being carried out and are expected to yield similar results to the tensile properties of Celsa Reassure.

State-of-the-art strapping and mechanical handling equipment completes the process of hot-spooled high yield coil production.

Celsamax

Advanced design, enhanced results. Celsa Group presents Celsamax, a new high performance range of high yield reinforcing coils that offers both improved performance and significant economic savings for fabricators and cutting and bending companies.

Celsa's innovative new reinforcing coil, Celsamax, provides significant performance and productivity benefits in decoiling, bending, and, potentially, even in transport and storage.

Celsamax is a high yield coil with more constant, consistent material characteristics and guaranteed mechanical properties. Its geometric design means that coil ribs experience significantly less damage during rolling and subsequent cold processing, preserving the height of the rib and thus improving the bond performance with concrete. In addition, the wear on straightening machine rolls is considerably reduced when producing cut and bent material, resulting in prolonged roll life.

Due to the hot spooled production process, which allows spooling without any twisting of the material, coils are easier to straighten with no bending out of plane when decoiling. The lack of spring in the material and the fact that there are no welds within the coil means that Celsamax is safer to work with than standard contistretch material.

The fact that there is potential to produce Celsamax in larger coils has numerous productivity and logistical advantages. Coils of greater weight allow for greater decoiling speed during subsequent cold processing, with fewer changeovers and less adjustments needed to straightening machines. Furthermore, larger, heavier coils result in lower rolling, transport and storage costs. Tighter tolerances in the coil geometry result in more compact coils which are easier and safer to transport, stack and store, with less space needed per coil.

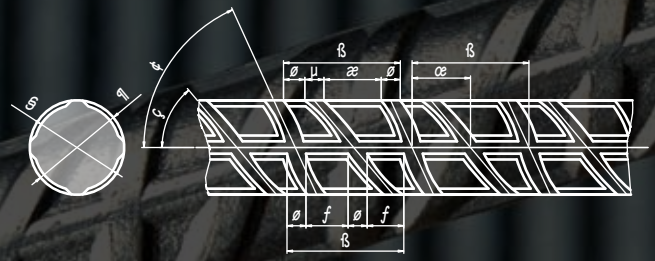
Celsamax is available in coils of 8mm, 10mm, 12mm, 16mm and 20mm diameters, with the potential for availability in larger diameter coils up to 25mm as demand dictates. Compliance with British (high ductility grade B500C reinforcing coil to BS 4449:2005) and European standards is guaranteed, whilst fatigue and cyclic load performance are also guaranteed to exceed current standard requirements. Celsa is confident that Celsamax will satisfy the highest levels of quality demanded by our customers and industry alike.

Celsamax: a high performance range

Mechanical properties	
Yield strength (f_y)	≥ 500 n/mm²
Ultimate tensile strength (f_s)	≥ 575 n/mm²

Ductility parameters	
Elongation to maximim load (a_{gt})	≥ 7.5%
Stress ratio ultimate tensile strength/yield strength	$1.15 \leq f_s/f_y \leq 1.35$

Rib technical detail



The unique rib pattern of Celsamax offers unrivalled advantages for fabricators.

Rolling section shapes

Our section mill has undergone several improvements in both its production and handling operations to ensure we are employing the best possible technology for all of our processes.

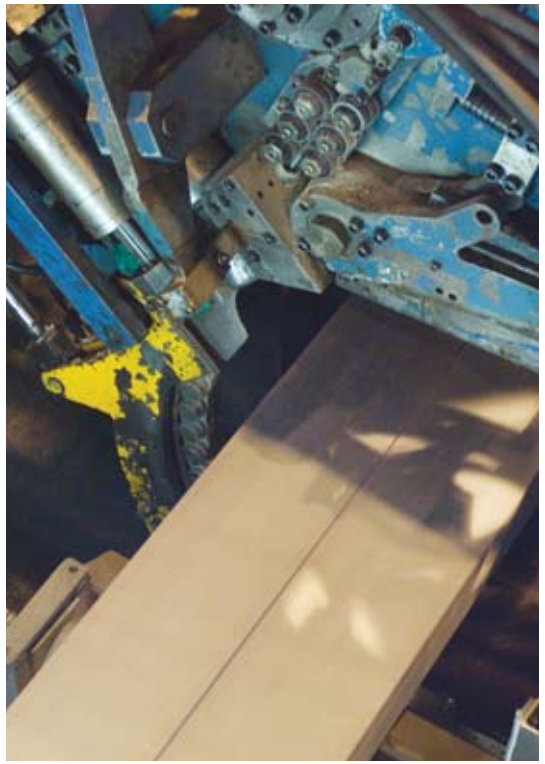
Our section mill is capable of producing 350,000 tonnes of merchant bar and section. It is a 14-stand cross-country mill with a billet reheating furnace that can produce 80 tonnes per hour.

The original mill was commissioned in 1964 and updated in 1985 to produce a range of medium steel section products, including angles, flats and channels in a range of sizes and lengths up to 15.5m long. The next major development came in 1993 and 1994 when the furnace was reconstructed to use either oil or gas, and a seven-stand finishing mill with twin 6m stackers was added

In 2003, after a successful commissioning period, the mill began producing equal and unequal angles from 50mm to 125mm, standard and UPN channels from 76mm to 150mm, and flat bars from 60mm to 300mm. In 2006 a new Russula process control system was installed ensuring tighter tolerances and greater production volume as well as extending the product range by rolling down to 40mm in flats and angles.

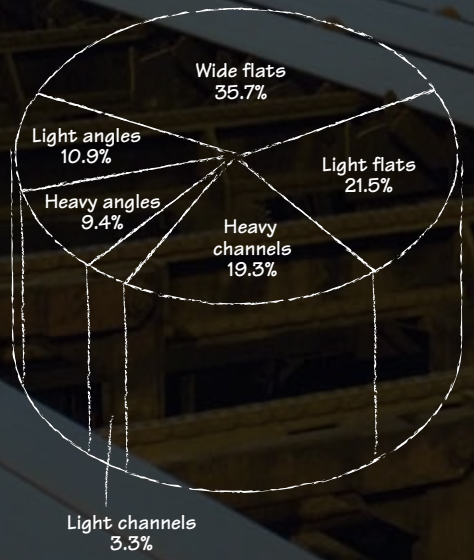
After casting in the melt shop the steel billets are transferred by rail to the section mill. Here sections are rolled in a similar way to bar but on a dedicated section mill. Grooved rolls are again used to shape the stock as it passes through the rolling line.

Once sections have been rolled they are cooled in still air on a cooling bed prior to in-line roller straightening, bundling, labelling and storage ready for despatch.



Merchant bar products produced by Celsa UK

We produce a wide variety of section shapes and sizes, from simple flat bar to channels. Production is geared to match sales, and to maintain sufficient stocks so that orders can be fulfilled immediately.



Wide flats cool in the Section Mill prior to being cut to length.

Reinforcing bar

Celsa produces grade B500C high ductility, hot rolled, ribbed steel bar. Our grade B500C reinforcing bars meet all the requirements of BS 4449:2005 grade B500C, are fully weldable and are available in all BS 4449:2005 preferred sizes, from 8mm to 50mm.

All of our grade B500C reinforcement is CARES approved, carries the Reassure mark and is Eco-Reinforcement compliant.

Product range

Nominal size	Cross sectional area	Mass per metre
mm	mm^2	kg
8	50.3	0.395
10	78.5	0.616
12	113	0.888
16	201	1.58
20	314	2.47
25	491	3.85
32	804	6.31
40	1257	9.86
50	1963	15.4

Mechanical properties

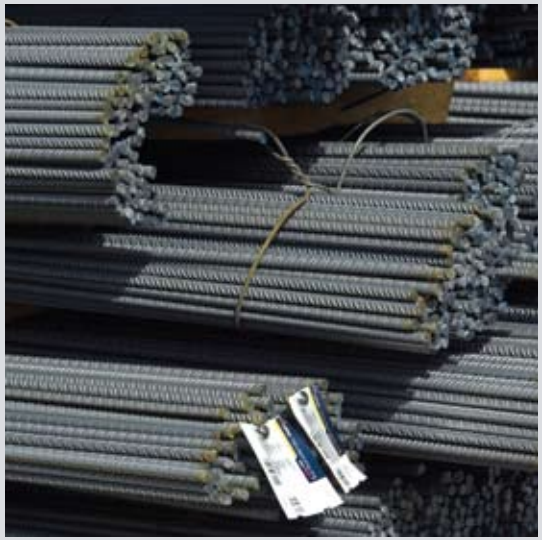
Yield strength R_e (characteristic)	500MPa
Bend requirements	BS 4449:2005
Fatigue requirements	BS 4449:2005
Bond requirements	BS 4449:2005 BS 5400-4:1990 BS EN 1992-1-1:2004 (Eurocode 2, EC2)
Welding requirements	BS 4449:2005 BS EN 10080:2005 BS 7123:1989

Length

Standard lengths	6m, 12m, 14m, 15m
Special length (available by prior order)	from 6m to 18m
Length tolerance	-0 +100mm

Applications

- For general reinforcement of concrete structures
- Moment distribution (up to 30%) in reinforced concrete design
- Additional ductility allows plastic/non-linear design
- Additional ductility and cyclic performance make it suitable for any potential overload situations where inherent robustness is important
- Other design applications are for pile caps, retaining walls, shear walls, and beams and columns



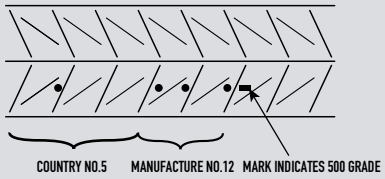
Express Reinforcements Ltd.

Ductility properties

Stress ratio: ultimate tensile strength/yield strength f_s/f_y	1.15 to 1.35
Uniform elongation A_{gt}	≥ 7.5%

Bar geometry and rolling marks

- The rib pattern for Celsa grade 500C bars is the double angle rib pattern which complies with BS 4449:2005.



High yield coil

Our grade B500C reinforcement can also be supplied in spooled coils of 2.2 tonnes, known as high yield coil. Our grade B500C high yield reinforcing coils exceed the requirements of BS 4449:2005 grade B500B, are fully weldable, and are available, ex-stock, in all BS 4449:2005 preferred sizes, from 8mm to 20mm.

All of our grade B500C reinforcement is CARES approved, carries the Reassure mark and is Eco-Reinforcement compliant.

Product range

Nominal size	Cross sectional area	Mass per metre
mm	mm²	kg
8	50.3	0.395
10	78.5	0.616
12	113	0.888
16	201	1.58
20	314	2.47

Mechanical properties

Yield strength R_e (characteristic)	500MPa (N/mm²)
Bend requirements	BS 4449:2005
Fatigue requirements	BS 4449:2005
Bond requirements	BS 4449:2005 BS 5400-4:1990 BS EN 1992-1-1:2004 (Eurocode 2, EC2) BS EN 10080:2005
Welding requirements	BS 4449:2005 BS EN 10080:2005 BS 7123:1989

Applications

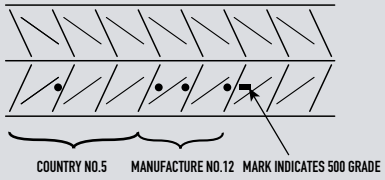
- High yield coil is generally used for the manufacture of links for confinement in reinforced concrete structures
- Ends of coils can be welded together so this process doesn't produce any waste
- Celsa's high yield coil is of Grade C ductility, and can be straightened and used as reinforcing bar
- Once straightened it can be used in the production of grade 500C mesh
- Celsa grade 500C high yield coil is hot spooled directly from the mill, so the tendency for twisting when decoiled is greatly reduced, enabling less power to be used by the bending machines, reduced wear on the rolls and greatly reduced out-of-plane bending

Ductility properties

Stress ratio: ultimate tensile strength/yield strength f_s/f_y	1.15 to 1.35
Uniform elongation A_{gt}	≥ 7.5%

Bar geometry and rolling marks

- The rib pattern for Celsa grade 500C high yield coil is the double angle rib pattern that complies with BS 4449:2005.



Wire rod for mesh

Celsa produces a mild steel coil, also known as wire rod for mesh. This mesh coil is used by some fabricators in the production of reinforcing mesh. The wire rod is produced on our rod line, which can achieve speeds of up to 90 metres per second during production. The material is laid on the cooling beds via a laying head where it cools before being stacked and bound vertically.

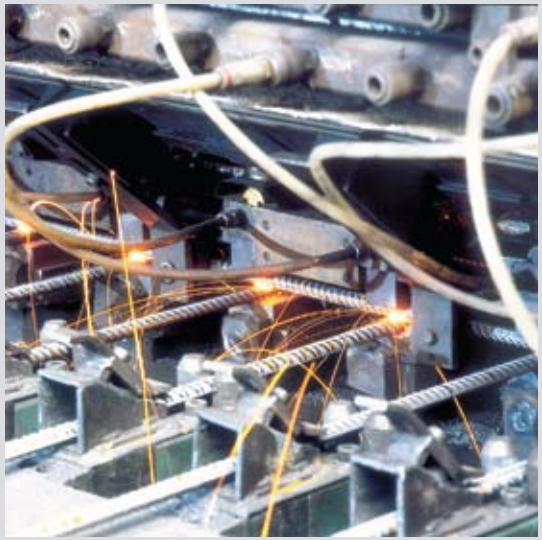
Wire rod for mesh is produced in a wild coil format and has a carbon content of ≤ 0.18% in diameters between 5.5mm and 17mm. Coil weight is 1.85 tonnes.

Product range

Designation	Grade	Size
		mm
NK08L1/NK10L1	Coil to BS 4482:2005 Grade 250	5.5 – 17
NK08L1/NK10L1	Feedstock to BS 4449:2005 Grade 500	5.5 – 17

Applications

- Wire rod for mesh is used as feedstock for the production of Grade 500A high yield coil which is used predominantly in the production of reinforcing mesh for concrete
- Celsa wire rod has a typical yield strength of 300N/mm^2. Once sold to mesh producers, the mild steel coil is fed into a cold rolling line where it is work hardened increasing the yield strength to over 500N/mm^2, and has ribs indented onto the surface of the material
- Reinforcing mesh is produced by welding together a series of lengths of horizontal and vertical reinforcing bars in a grid formation. Mesh reinforcement mats are predominantly used to reduce cracking in concrete slabs.



Other wire rod

Celsa produces a low carbon steel coil, also known as 'other wire rod'. This material can be produced in numerous different grades and qualities depending upon final purpose, such as drawing down to wire. General drawing grades may also be referred to as 'commercial' drawing grades, and are used for relatively simple applications, such as fencing, general wire fabrication, nails and supermarket trolleys. Our other wire rod has a high drawability with both chemical and mechanical descaling.

Our other wire rod is produced in a wild coil format and has a carbon content of ≤ 0.15% in diameters between 5.5mm and 17mm. Coil weight is 1.85 tonnes.

Product range

Designation	%C	%Mn	%Si	%P	%S	Typical UTS	Size
				(max)	(max)	(MPa)	mm
K06	max 0.06	0.30 – 0.55	0.10 – 0.18	0.030	0.030	≤ 440	5.5 – 13
K06-400B	max 0.06	0.30 –0.75	0.16 – 0.28	0.040	0.040	≤ 440	5.5 – 13
K08	max 0.08	0.30 – 0.60	0.10 – 0.30	0.040	0.040	≤ 480	5.5 – 13
K10	0.07 – 0.10	0.30 – 0.60	0.10 – 0.30	0.040	0.040	≤ 520	5.5 – 13
K18C	0.16 – 0.18	0.65 – 0.95	0.15 – 0.30	0.035	0.040	≤ 580	5.5 – 13
These grades are typical, other grades are possible – please contact us for details							

Applications

Celsa's extensive range of low carbon wire rod is suitable for the following applications:

- Thin, annealed, grey and galvanised wires for agricultural and commercial uses
- Bright wire and bars for chrome plating, nickel plating, electrolytic zinc coating, painting, etc
- Normal and special nails for automatic nailing
- Barbed wire, metal mesh, fencing, etc
- Industrial wires, shaped parts for automobiles, etc
- Screws, nuts and bolts
- Shaped wires

Carrington Wire Ltd.

Flat bars

Our flat bars are hot rolled and range from 40mm to 300mm wide and from 5mm to 25mm thick. All flats comply with BS EN 10025:2004 and are CE marked accordingly. We offer the most extensive range on the market, and the quality of our products, indicated by the CE mark, is widely recognised. Length tolerance of 100mm max. is guaranteed.

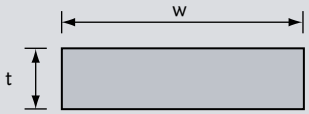
Product range

Mass per metre (kg/m)								
Width (w)	**Thickness (t) mm**							
mm	5	6	8	10	12	15	20	25
40	1.57	1.88	2.51	3.14	3.77			
50	1.96	2.36	3.14	3.93	4.71	5.89	7.85	
60	2.36	2.83	3.77	4.71	5.65	7.07	9.42	
65		3.06	4.08	5.10	6.12	7.65	10.2	
70		3.30	4.40	5.50	6.59	8.24	11.0	13.7
75		3.53	4.71	5.89	7.07	8.83	11.8	14.7
80		3.77	5.02	6.28	7.54	9.42	12.6	15.7
90		4.24	5.65	7.07	8.48	10.6	14.1	17.7
100		4.71	6.28	7.85	9.42	11.8	15.7	19.6
110		5.18	6.91	8.64	10.4	13.0	17.3	21.6
120		5.65	7.54	9.42	11.3	14.1	18.8	23.6
130		6.12	8.16	10.2	12.2	15.3	20.4	25.5
140		6.59	8.79	11.0	13.2	16.5	22.0	27.5
150		7.07	9.42	11.8	14.1	17.7	23.6	29.4
160			10.0	12.6	15.1	18.8	25.1	31.4
180			11.3	14.1	17.0	21.2	28.3	35.3
200			12.6	15.7	18.8	23.6	31.4	39.3
220			13.8	17.3	20.7	25.9	34.5	43.2
250			15.7	19.6	23.6	29.4	39.3	49.1
300			18.8	23.6	28.3	35.3	47.1	58.9

Applications

These solid rectangular sections have an endless number of applications in sectors as varied as the automobile industry, the naval industry, construction, agriculture, mining and metal joinery.

Section geometry



Steel grades

Standard	Grade
BS EN 10025:2004	S-225-JR
BS EN 10025:2004	S-225-JO
BS EN 10025:2004	S-275-JR
BS EN 10025:2004	S-275-JO
BS EN 10025:2004	S-355-JR
BS EN 10025:2004	S-355-JO
BS EN 10025:2004	S-355-J2 (t ≤ 12mm)

Length

Standard length	6m
Special lengths	available on request
Length tolerance	-0 +100mm
Size and tolerance standard	BS EN 10058:2003 (w ≤ 150mm) BS 4360:1990 (w > 150mm)

Channels

Celsa manufactures three types of hot rolled channels: parallel flanged, tapered flanged and UPN for the European market. We manufacture our channels with various qualities, the most usual being S-275-JR. All channels comply with BS EN 10025:2004 and are CE marked accordingly. Tapered flange and UPN channels are sold on actual weights. Parallel flange channels are sold on theoretical weights.

Tapered flange channels

Size	Mass per metre	Depth	Width	Web thick	Flange thick
mm	kg/m	mm	mm	mm	mm
76 x 38	6.7	76.2	38.1	5.1	6.8

Parallel flange channels

Size	Mass per metre	Depth	Width	Web thick	Flange thick
mm	kg/m	(D) mm	(B) mm	(S) mm	(T) mm
100 x 50	10.2	100	50	5	8.5
125 x 65	14.8	125	65	5.5	9.5
150 x 75	17.9	165	75	5.5	10.0

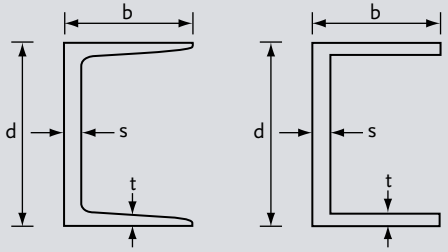
UPN channels

Size	Mass per metre	Depth	Width	Web thick	Flange thick
mm	kg/m	(D) mm	(B) mm	(S) mm	(T) mm
UPN 80	8.6	80	45	6.0	8.0
UPN 100	10.6	100	50	6.0	8.5
UPN 120	13.4	120	55	7.0	9.0
UPN 140	16.0	140	60	7.0	10.0

Applications

Channels are used mainly in steel and composite construction, although they have endless applications including the manufacture of cranes, handrail posts, and traffic signposts.

Section geometry



Steel grades

Standard	Grade
BS EN 10025:2004	S-225-JR
BS EN 10025:2004	S-225-JO
BS EN 10025:2004	S-275-JR
BS EN 10025:2004	S-275-JO
BS EN 10025:2004	S-355-JR
BS EN 10025:2004	S-355-JO
BS EN 10025:2004	S-355-J2 (t ≤ 12mm)

Length

Standard lengths	6.1m and 12.2m
UPN lengths	6m and 12m
Special lengths	available on request
Length tolerance	-0 +100mm
Size and tolerance standards	BS EN 10279:2000

Angles

Celsa manufactures hot rolled equal and unequal angles. The standard manufacturing range of our equal angles extends from 50mm to 120mm, while the range of unequal angles extends from 75mm x 50mm to 125mm x 75mm.

We can manufacture our angles in various qualities, the most usual being S-275-JR or S-355-JO. All channels comply with BS EN 10025:2004 and are CE marked accordingly.

Equal angles

Mass per metre (kg/m)						
Size				**Thickness (mm)**		
mm	**5**	**6**	**7**	**8**	**10**	**12**
50 x 50	3.76	4.46		5.83		
60 x 60		5.42		7.09	8.69	
70 x 70		6.38		8.36	10.3	
80 x 80		7.34		9.63	11.9	
90 x 90		8.27		10.9	13.4	
100 x 100				12.2	15.0	17.8
120 x 120				14.7	18.2	21.6

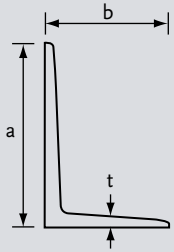
Unequal angles

Mass per metre (kg/m)						
Size				**Thickness (mm)**		
mm	**5**	**6**	**7**	**8**	**10**	**12**
75 x 50		5.65		7.39	9.27	
100 x 65			8.77	9.94	12.3	
100 x 75				10.6	13.0	15.4
125 x 75				12.2	15.0	17.8

Applications

Angles are used mainly in construction, though there are endless applications including the construction of electricity pylons, cranes and roofs, plus all kinds of structural design including steel frames, brackets, bracing and trim, and reinforcements.

Section geometry



Steel grades

Standard	Grade
BS EN 10025:2004	S-225-JR
BS EN 10025:2004	S-225-JO
BS EN 10025:2004	S-275-JR
BS EN 10025:2004	S-275-JO
BS EN 10025:2004	S-355-JR
BS EN 10025:2004	S-355-JO
BS EN 10025:2004	S-355-J2 (t ≤ 12mm)

Length

Standard lengths	6m and 12m
Special lengths	available on request
Length tolerance	-0 +100mm
Size and tolerance standards	BS EN 10056-2:1993

Contacts

We welcome enquiries of all kinds. Whether you want further product details, design and construction advice or other information about steel and steelmaking please do not hesitate to contact us.

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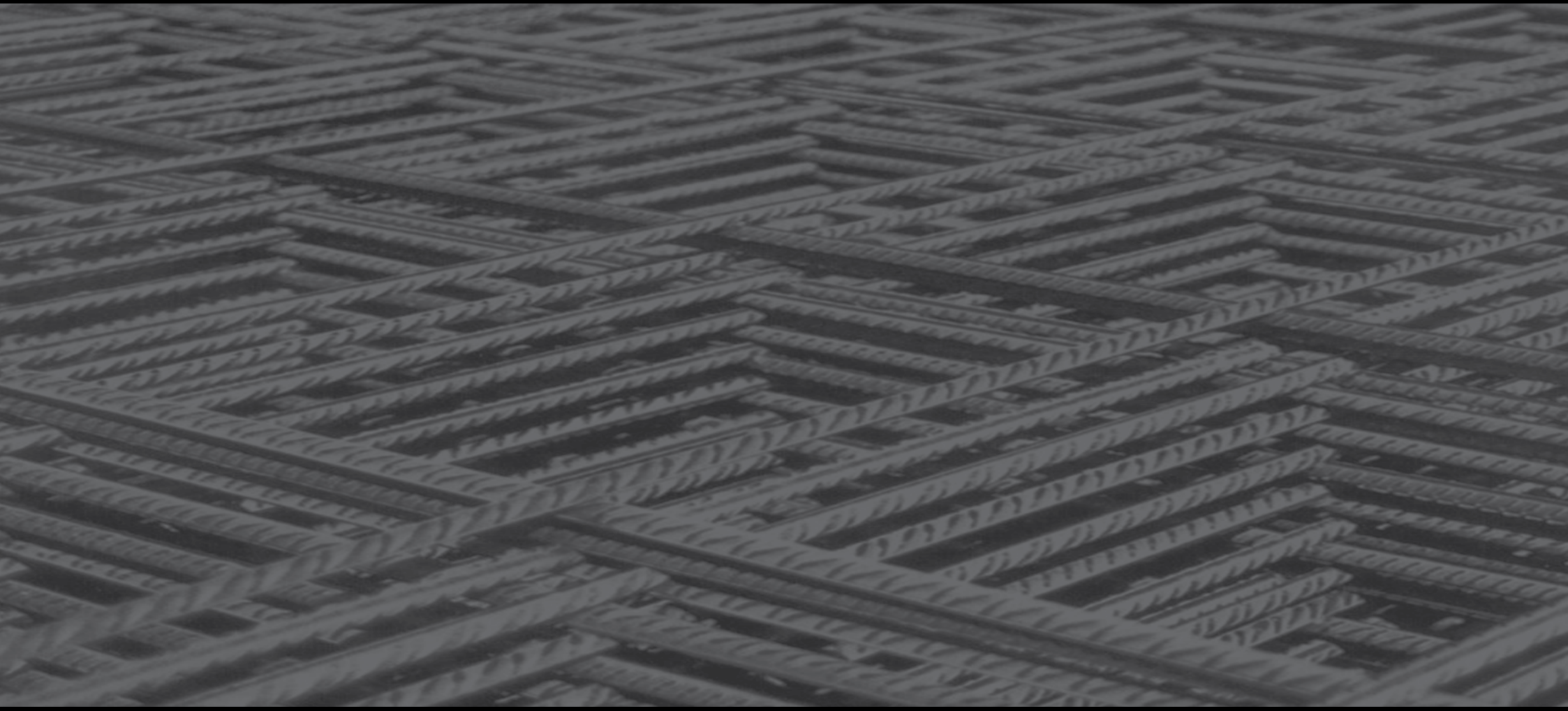

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