

**BSSA**

# A PROFILE OF THE UK STAINLESS STEEL MARKET

Special BSSA Report - October 2004

## INTRODUCTION

Since the early 1980's stainless steel has enjoyed an average annual rate of growth of 5-6%, significantly faster than the rate of growth of the OECD economies and the majority of other metals. While the sector retains close links with the wider steel industry from which it has emerged, it has increasingly developed an identity of its own alongside other 'special' metals, such as titanium, aluminium and the higher nickel alloys.

This Special Report traces the development and current structure of the UK stainless steel market, identifying key trends of the past 25 years. It is intended, firstly, to assist companies in the stainless steel supply chain towards a better understanding of the U.K. market for their products. Secondly, it is designed to inform a wider audience about the distinctive features of the stainless steel sector, which differentiate it from the wider steel industry. Thirdly, in a periodic season of turbulence within raw material markets, stainless steel users will hopefully gain a perspective on immediate trends affecting their business.

The report draws on a wide range of sources, the most important of which are referenced. In particular, thanks are due to the Iron and Steel Statistics Bureau (ISSB), which is the official repository of steel statistics on behalf of the industry; and to Yorkshire Forward, who sponsored Hatch Beedows to carry out a study of the market in 2002 to assess the potential for developing advanced engineering applications in the Yorkshire and Humberside region.

## A GLOBAL PERSPECTIVE

Stainless steel is a relatively 'new' metal. Several countries, including the UK, lay claim to the original discovery, for which commercial production was established during the years immediately following the First World War.

Since the 1980's, stainless steel production has benefited from significant advances in process technology, which have allowed the concentration of melting and hot rolling on single sites, the adoption of integrated processes and increasing economies of scale. This has resulted in a beneficial cycle, in which growth in demand, investment in new capacity, reduction in the unit cost of production and increasing market penetration, have become mutually reinforcing. Consequently global growth in stainless steel, which emerged slowly during the 1960's and '70's, accelerated sharply in the 1980's and '90's, averaging 5-6% p.a. from the 1980's. By 2000 world melted production had reached 18 million tonnes. During 2003 it grew by 9.1% to 22.8 million tonnes<sup>1</sup> worth an estimated £38 billion.

Europe contributed strongly to this trend during the 1990's. During the early 1980's the five largest European markets - Germany, Italy, France, UK and Spain - grew at a similar rate. Germany and Italy began to establish a pattern of higher growth from the mid 1980's compared to France and the UK; in the Italian case accelerating in the mid 1990's to bring Italian consumption in line with that of Germany. Spanish growth

began to accelerate during the second half of the 1990's to overtake the UK as the fourth largest market in Europe.

This rapid expansion was accompanied by structural changes within the industry. European producers were at the forefront of the race to become global market leaders both as exporters and as global producers, through a combination of joint ventures, mergers and acquisitions. The process encouraged a series of multi-national mergers, which has reduced the number of European flat product producers to four: Acerinox (Spanish), Arcelor (French, Belgian), Outokumpu (Finnish, Swedish, British) and ThyssenKrupp (German, Italian). These companies hold a strong position in the world market and with South Africa account for 40% of world stainless crude steel production<sup>2</sup>.

From 1996 China has begun to emerge as the dominant regional engine for growth, initially in the manufacture of consumer goods for re-export, but increasingly to meet the demands of a rapidly expanding domestic market.

## UK MARKET DEMAND

Steel producers traditionally measure market size in terms of volume, rather than value. The standard measure is 'apparent domestic consumption' (ADC)<sup>3</sup>, defined as domestic production of primary steel products - plate, sheet, bar, tube etc. - for sale to the home market, plus imports. ADC therefore measures the demand for stainless steel products for further transformation, rather than demand by final consumers for stainless steel in finished products.

Between 1990 and 2003, the latest year for which figures are available (see Table 1<sup>4</sup>), UK ADC for stainless steel products approximately trebled to 432.2kt. In 2003 the market was split almost exactly 50:50 between cold rolled flat and other products, with cold rolled plate, sheet and strip accounting for 49.7% of the total. Of the other products, long products accounted for 16.4%, hot rolled flat products 15.5%, tubes 11.1%, and forged and cast ingots 7.3%.

The most significant period of growth occurred during the 1980's when it averaged above 9% p.a. During the 1990's growth slowed to an average of 3.6% p.a. The slowdown in growth has accelerated over time. While the rate of growth averaged 5.2% p.a. during the first half of the 1990's, it fell to 1.7% p.a. during the second half. Despite a slight recovery in 2002, the market has reduced in size at an average rate of 1% p.a. since 2000. These figures mask a difference between flat and long products. While growth in flat products almost halved from 4.7% to 2.6% between the first and second half of the 1990's, it was nonetheless positive; long products experienced little or no growth during the same ten-year period.<sup>5</sup>

This UK performance is in marked contrast with other European markets where higher rates of growth continued throughout the 1990's. With an average rate of growth from 1990 to 2003 of only 2.5% p.a. - half the European average-

the UK is currently placed bottom of the European league in terms of both growth and consumption per capita. This can be attributed primarily to the poor performance of British manufacturing during the second half of the 1990's. While the strength of sterling against the euro is often highlighted as the most significant factor, underlying structural differences have had a major impact. According to reports published by the EEF<sup>6</sup>:

- Manufacturing in Germany benefits both from its greater scale and in serving a larger domestic market than the UK. The UK and France are more comparable in terms of the actual size of their domestic markets.
- There are structural differences between the UK manufacturing sector and its larger European rivals. Traditional engineering sectors such as metals and metal products and mechanical engineering are much more strongly represented in Germany and Italy (UK 18.6% c.f. Germany 27.5% and Italy 25%). The UK is more strongly represented in industries in which output has grown very slowly or been declining during the 1990's – food, drink and tobacco.
- UK manufacturers have invested at a significantly lower rate than continental rivals over the past 30 years, reaching a historic low in 2003. The exceptions are pharmaceuticals, aerospace and food processing. This has created a significant gap between UK companies and their European counterparts in terms of capital intensity and labour productivity.
- While manufacturing exports performed relatively strongly during the 1990's compared with the two previous decades, the impact of the strength of sterling and increasing global competition has altered the balance of trade. From 1997 imports, especially of finished manufactured goods, have accelerated, quadrupling between the first and second half of the 1990's.
- During the period 1986 – 2002 manufacturing output in the UK has gradually fallen behind other leading European economies (UK +19%, c.f. Germany and France +30%). This was noticeable during the early 1990's and has been particularly noticeable since 1997.

While manufacturing is not the sole determinant of stainless steel demand, it is clearly a significant contributor. It is therefore no surprise that differences in the relative size, importance and patterns of growth of the various manufacturing sub-sectors – particularly in relation to the different intensity of stainless steel use – provide the most convincing explanation for the relatively poor performance of the UK stainless steel market compared with France, Germany, Italy and Spain.

Supply side factors have also played their part. During the 1990's Germany, Italy and Spain benefited from greater investment in market development through their respective national stainless steel development associations than was the case in the UK. Recognition of the need for more resources to be made available to develop the UK market has resulted in the reorganisation and expansion of market development activities by the British Stainless Steel Association (BBSA) since 2000.

## SECTORS AND APPLICATIONS

Stainless steel is used across a wide range of sectors and applications, primarily:

- Catering and household goods, such as cutlery, holloware, sinks and white goods – products most readily identifiable by the general public as being manufactured in stainless steel
- Food and drinks processing, where the hygienic proper-

ties of stainless are of paramount importance

- Heavy industries, such as chemicals, pulp and paper, oil and gas extraction and power generation, where enhanced corrosion resistance is required
- Transport, including road, rail, air and sea, where stainless provides good durability, strength, fire and impact resistance
- Construction, where stainless is increasingly used for its aesthetic appeal, as well as for its strength and low maintenance requirements
- General engineering applications, where enhanced durability is required

It is difficult to accurately measure the market for stainless steel by industry sector due to this diversity of applications, compounded by the relatively small order quantities supplied to individual customers. Distributors, in particular, who account for approximately 75% of sales, tend to record sale by product type rather than the application for which it is sold. 'End use' data is therefore only available by combining details of direct mill deliveries to the larger end users with estimates derived from interviews with other key players in the supply chain.

In an attempt to quantify the UK data, a market research project was carried out during 2002 by Hatch Beddows on behalf of Yorkshire Forward, which provides the most comprehensive analysis to date<sup>7</sup>. The response accounted for around 60% of the total market for primary stainless steel products and demonstrated the diversity of sectors and applications for which stainless steel is supplied..

- Domestic and household goods accounted for 17% of the total, with food and drink processing and distribution accounting for a further 12%
- Process industries accounted for 23%, of which petrochemicals accounted for 10% and other basic industries 8%.
- Transport, for which automotive exhausts was the most significant sub-sector, accounted for 15%
- Construction and civil engineering applications accounted for 16%, a share of the market which is believed to have increased during the past decade
- General engineering applications accounted for a further 17%

This UK research can be compared with other similar market studies. A recent analysis of the Italian stainless steel market<sup>8</sup> showed similar diversity: household appliances (18%), catering (12%), foodstuffs (20%), chemical and petrochemical industries (20%), pharmaceuticals (4%), energy (5%); transport (8%), building (10%) and others (3%).

## UK PRODUCTION

Following the discovery of stainless steel in Sheffield in 1913, production was established by three major steel companies, Firth Vickers in Sheffield, Richard Thomas and Baldwin at Panteg and Samuel Fox at Stocksbridge. With the formation of British Steel in 1967, these operations were eventually merged within a single division - British Steel Stainless - with its headquarters at the former Firth Vickers site in Sheffield, where a major new melt shop was built during the 1970's.

Consistent with the move towards consolidation of production onto integrated sites, the 1990's saw further consolidation within Europe. In 1992 British Steel merged its stainless division with the Swedish producer Avesta AB to form Avesta Sheffield AB. A key component in this merger was the investment by Avesta in an integrated Steckel hot rolling mill with

sufficient capacity to roll slab melted in Sheffield. A further merger with the Finnish producer, Outokumpu Oy, resulted in the formation of AvestaPolarit in 2001. The merged company was subsequently fully acquired and consolidated within the Outokumpu group, and renamed Outokumpu Stainless in 2004.

Following the closure of the Panteg works in 2004, stainless steel production in the UK is concentrated at the Sheffield works, which includes an annual melting shop capacity of approximately 500,000 tonnes. A recent £18 million investment in a bloom & billet caster allows this capacity to be used for long as well as flat products. Downstream facilities include cold rolling of sheet, coil and precision strip, and the production of wire rod and welded tube.

At the beginning of the 1990's the UK failed to consolidate and modernise its production of intermediate products, including welded tubes, bright bar and fittings, which has resulted in the survival of only a small number of firms manufacturing mainly long products and operating within specific market niches. As a result the UK has the highest import penetration for stainless steel products in Europe with the exception of Austria. This is largely offset by the significant share of UK production, which is sold for export. It is also modified to the extent that Swedish and Finnish products imported by the Outokumpu group are included as components of the domestic producer's market share.

## CURRENT TRENDS AND CHALLENGES

In common with other basic metals, stainless steel entered a period of turbulence in 2004, due to the revival in the world economy following the end of the Iraq war and the rapid expansion of the Chinese economy. In 1995, Chinese demand for stainless steel was less than 1 million tonnes. By 2000 it had doubled to 2 million tonnes and by 2003 it had doubled again to 4 million tonnes. This explosion in demand has been accompanied by a rapid expansion in Chinese stainless steel production. In 2003 alone, Chinese production grew by more than 56% to 1.8 million tonnes.<sup>9</sup> As a result China has acted as a magnet for raw materials, including iron ore, nickel, chromium and molybdenum, the basic alloys in stainless steels. On average, between 55% and 65% of every new tonne of stainless steel is melted from recycled scrap, and this too has been in short supply due to demand exceeding supply. Together with other supply constraints, the consequence has been a combination of rising prices and increased volatility.

However, it is important to set the current situation within a long-term perspective. As a result of process improvements and increasing economies of scale, the long-term trend of stainless steel prices is down not up. Conversion margins (sales price less raw material costs) have reduced at an average rate of 2 to 3% p.a. in real terms for the past 20 years. This compares favourably with competing materials. Raw material prices also tend to behave cyclically, responding to changes in forecast as well as actual demand, as well as to supply constraints. Peaks in the price of raw materials – most notably nickel – are followed by a period of adjustment, in which supply is brought back in line with demand and prices fall back accordingly. A similar pattern is forecast once new mining capacity has been brought on stream, as there is no underlying shortage of the raw materials required.

Nevertheless, the explosion in Chinese production undoubtedly augurs more fundamental changes in the structure of world trade, which will undoubtedly impact on the global stainless steel market, including that of the UK. There are encouraging signs that UK manufacturing is beginning to recover after a period of relative decline. But there are significant structural problems to be overcome if any revival is to be

sustained. The ability of UK manufacturers to achieve this is a necessary condition for growth in the market for stainless steel. The EEF has highlighted the following underlying principles for success as global competition becomes more intense<sup>10</sup>:

- Product and process innovation is critical to maintain competitiveness. This will require a policy of continuous investment in human as well as capital resources.
- Companies will rarely be able to supply all the required resources on their own, so partnerships and networks will be at a premium, integrating new technology within competitive supply chains
- Developing new markets will be vital as a spur to competitiveness and to ensure sufficient critical mass to achieve the economies of scale essential for survival.

These principles will need to be accompanied by well focused and sustained market development, to convince designers and specifiers of the virtues and benefits of stainless steel in its competition with other materials. It is in this role that BSSA can assist, both as a catalyst and co-ordinator for initiatives that companies do not have the resources to accomplish alone.

## REFERENCES

<sup>1 2 9</sup> Statistics published by the International Stainless Steel Forum (ISSF), 2004

<sup>3</sup> 'Consumption' in this context follows the standard economic definition

<sup>4</sup> Statistics provided by the Iron and Steel Statistics Bureau (ISSB)

<sup>5</sup> The figures for bar show a step-change between 1994 and 1995; otherwise the pattern is stable. 1995 corresponds with a change in the tariff codes used to classify Swedish imports, which is believed to be the explanation

<sup>6</sup> *Bridging the continental divide: The EEF comparative study of EU and UK manufacturing productivity*, EEF, April 2003, chapters 1-3 and *Manufacturing and the euro: a guide for members*, EEF, May 2003, chap.3

<sup>7</sup> *Market research on stainless steel for the Advanced Engineering and Metals Cluster Team at Yorkshire Forward*, Hatch Beddows, August 2002

<sup>8</sup> F Capelli, P Viganò, *The Italian stainless steel market*, Stainless Steel Focus, 321/19.05.2003

<sup>10</sup> *Manufacturing in the Marketplace*, EEF, May 2002, chap.3

## NOTES

The statistics on page 4 are provided by the Iron and Steel Statistics Bureau (ISSB) and provide the most comprehensive data on UK apparent domestic consumption, based on returns provided by UK producers and trade statistics provided by HM Customs and Excise.

As far as possible, the table excludes deliveries for conversion into another product included in the table. To avoid duplication wire rod has been excluded from the figures. The figures for welded and seamless tubes include estimates of UK production.

Product definitions follow the standard tariff codes. Specific definitions are as follows:

*Plate* = hot or cold rolled products >3mm thick

*Sheet* = hot or cold rolled products =<3mm thick

*HR Narrow strip* = coils <600mm wide

*CR Narrow strip* = coils <500mm wide

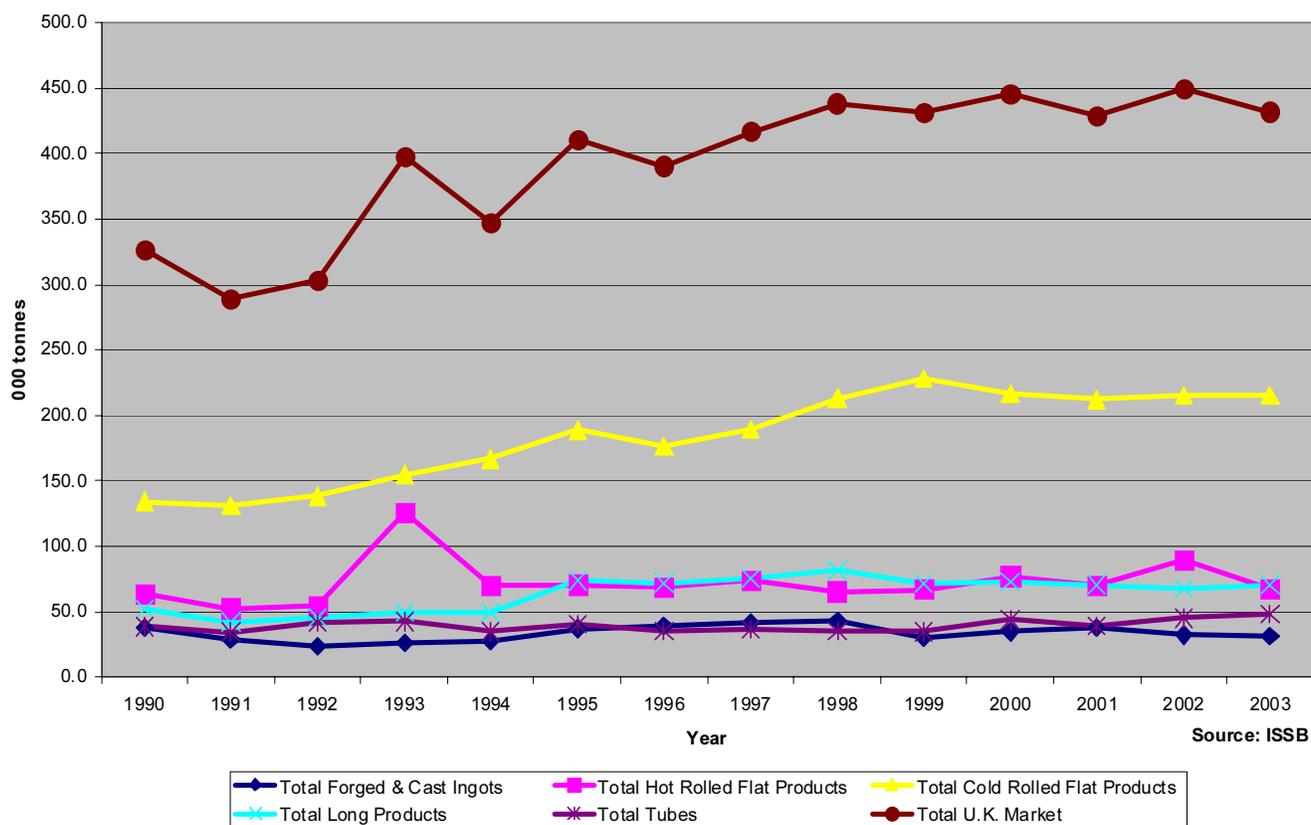
*Merchant bar* = hot rolled bars of all shapes and sizes

*Bright bar* = cold drawn or finished bars of all shapes and sizes

Product/Year	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
Ingots & Semis for Forging	12.5	8.1	5.4	6.1	5.6	6.8	6.0	8.9	10.6	7.7	9.1	10.9	5.4	4.5
Castings	25.4	20.6	17.9	19.5	21.6	30.3	33.2	32.3	32.6	22.0	25.7	26.4	26.8	26.8
<b>Total Forged &amp; Cast Ingots</b>	<b>37.9</b>	<b>28.7</b>	<b>23.3</b>	<b>25.7</b>	<b>27.2</b>	<b>37.1</b>	<b>39.1</b>	<b>41.2</b>	<b>43.2</b>	<b>29.7</b>	<b>34.9</b>	<b>37.3</b>	<b>32.1</b>	<b>31.3</b>
HR Wide Coil	3.6	5.0	10.8	74.6	19.9	29.6	24.7	33.9	29.0	23.6	26.9	38.9	31.7	24.9
HR Narrow Strip	10.0	7.0	5.4	3.2	5.1	3.5	12.2	9.1	5.6	7.9	7.3	1.7	2.9	2.3
HR Plate and Sheet	50.5	40.6	38.1	47.9	44.6	37.8	31.5	30.9	30.8	35.6	42.8	29.0	54.5	39.9
<b>Total Hot Rolled Flat Products</b>	<b>64.1</b>	<b>52.5</b>	<b>54.3</b>	<b>125.7</b>	<b>69.6</b>	<b>70.9</b>	<b>68.4</b>	<b>73.9</b>	<b>65.4</b>	<b>67.1</b>	<b>77.0</b>	<b>69.7</b>	<b>89.1</b>	<b>67.1</b>
CR Sheet	84.6	81.0	84.4	86.7	90.6	115.0	107.7	115.6	131.0	146.5	146.3	145.0	140.5	141.0
CR Plate	8.3	9.3	10.1	13.5	16.9	13.7	11.5	10.6	18.0	17.1	15.1	13.8	13.6	12.3
CR Narrow Strip	41.1	40.8	43.6	54.6	59.4	60.2	57.4	63.2	64.4	64.9	55.5	53.5	61.2	61.6
<b>Total Cold Rolled Flat Products</b>	<b>134.0</b>	<b>131.0</b>	<b>138.1</b>	<b>154.8</b>	<b>166.9</b>	<b>188.9</b>	<b>176.5</b>	<b>189.4</b>	<b>213.4</b>	<b>228.5</b>	<b>216.9</b>	<b>212.3</b>	<b>215.4</b>	<b>214.9</b>
Wire	13.6	12.2	14.0	14.6	14.8	16.8	15.7	17.9	18.2	16.7	20.1	17.7	17.5	16.7
Merchant Bar	15.0	12.7	12.4	13.6	13.4	28.1	26.4	25.5	27.7	22.1	16.4	19.1	18.2	20.4
Bright Bar	22.0	14.9	17.1	19.2	18.1	25.9	27.1	30.1	31.8	29.3	30.4	30.2	27.3	30.3
Rolled Sections	1.4	2.2	2.5	2.0	2.9	3.0	2.7	2.0	3.5	3.7	6.2	3.6	4.6	3.5
<b>Total Long Products</b>	<b>51.9</b>	<b>42.1</b>	<b>46.0</b>	<b>49.3</b>	<b>49.2</b>	<b>73.8</b>	<b>71.9</b>	<b>75.6</b>	<b>81.2</b>	<b>71.7</b>	<b>73.1</b>	<b>70.6</b>	<b>67.6</b>	<b>70.8</b>
Seamless Tubes	18.7	12.9	17.9	23.1	12.5	16.2	12.5	11.6	12.9	11.6	13.0	9.7	10.5	14.0
Welded Tubes	19.8	21.6	23.5	19.3	22.4	24.4	22.4	25.1	22.6	23.2	30.7	29.2	34.4	34.1
<b>Total Tubes</b>	<b>38.5</b>	<b>34.5</b>	<b>41.4</b>	<b>42.5</b>	<b>34.9</b>	<b>40.6</b>	<b>34.9</b>	<b>36.7</b>	<b>35.5</b>	<b>34.8</b>	<b>43.7</b>	<b>39.0</b>	<b>44.9</b>	<b>48.0</b>
<b>Total U.K. Market</b>	<b>326.5</b>	<b>288.8</b>	<b>303.1</b>	<b>398.0</b>	<b>347.8</b>	<b>411.2</b>	<b>390.8</b>	<b>416.9</b>	<b>438.7</b>	<b>431.9</b>	<b>445.6</b>	<b>428.8</b>	<b>449.1</b>	<b>432.2</b>

Table 1: UK apparent domestic consumption 1990-2003 (kt)

Source ISSB



Source: ISSB