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# EXPLANATORY NOTES: IRON AND STEEL



1981

**STATISTICAL OFFICE OF THE EUROPEAN COMMUNITIES**

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# Foreword

In its programme of publications on the iron and steel industry the Statistical Office of the European Communities presents all the essential data which are regularly forwarded to it, providing this does not infringe statistical confidentiality.

Following the major changes in the programme of publications which have occurred since 1 January 1978 (see Eurostat News, 3/4-1977) the SOEC hopes that the present documentation, which is a follow-up to a similar publication in 1970, will meet a real need for detailed information among the users of iron and steel industry statistics. It is possible, however, that certain definitions have altered slightly owing to technical and commercial developments in the sector.

The explanatory notes refer to the whole programme of statistics on the iron and steel industry (special explanatory notes for the monthly bulletin are appended to Bulletin No 1 every year). As far as possible the subject-matter to which they refer is given in the same order as that of the publications themselves.

# Contents

*Chapter I*

# INTRODUCTION

## A — Definition of the iron and steel industry in the ECSC Treaty

*10.* The undertakings referred to in the Treaty establishing the *European Coal and Steel Community (ECSC)* are all those engaged in the production activities in the coal and steel sectors within the territory of the Community. The Treaty is also applicable to coal and steel merchants by virtue of its provisions on competition.

The following are considered as *ECSC iron and steel products*: crude iron, high-carbon ferro-manganese, crude steel, semi-finished products, hot-rolled finished products, products of continuous casting, cold-rolled sheets and coated sheets. For more details, the reader should refer to Annex I of the Treaty or to Chapters 26, 27 and 73 of the 'Nomenclature of Goods for the External Trade Statistics of the Community and Statistics of Trade between Member States' (Nimexe) which refer to coal and steel.

*11.* The Treaty does not cover the activities referred to as 'those for *primary transformation of iron and steel*', namely manufacture of steel tubes, wire and wire products and cold-rolled strip, forging and cold forming, pressing and stamping of steel and foundries for ferrous metals. However, according to Annex I of the Treaty, its provisions extend to *steel foundries* integrated in the steel industry proper, while *castings* from independent steel foundries are subject to statistical coverage only.

These activities are often, at works level, integrated in the steel industry as defined by the Treaty, and this may make it difficult to compare statistics compiled in accordance with the Treaty definitions with statistics for which the enterprise is considered as the basic statistical unit. This is the case with the results of the annual inquiry into industrial activity and the annual inquiry on investments, some of which are given in the Yearbook (Tables 1.4 and 7.1 respectively).

The SOEC is particularly interested in this group of sectors because of their significance as consumers of steel products. In point of fact, the Commission is obliged, under Article 46 of the Treaty, to conduct a continuous study of market trends.

## B — Manufacture of steel products

*12.* Most *crude iron* (pig iron) is produced in blast furnaces. Direct reduction and chemical processes such as electrolysis are less common in the Community. In the blast furnace process, coke is used primarily as a reducing agent for iron ore (and sometimes other material containing iron such as scrap). Crude iron is obtained in liquid form, and usually converted directly into steel in steel works.

*13.* The raw materials for the production of *crude steel* in steel works are crude iron (hot metal) and scrap. The steels obtained are mostly ductile, malleable and elastic, whereas crude iron, because of its high carbon content, is used only for casting; part of the iron production is re-melted in iron foundries. There are two main groups of processes for producing crude steel: those in which crude iron is refined in a converter, by blowing (e.g. in oxygen or air converters and basic Bessemer works) and the hearth processes (electric arc and open hearth furnaces). After these operations, the molten steel is usually cast into ingots in ingot moulds or poured directly into casting moulds (in steel foundries).

An increasing proportion of crude steel is cast directly into semi-finished form in *continuous casting* installations. Continuous casting is used mainly for casting semi-finished products, and also rounds and squares for seamless steel tubes, blanks for wide flanged beams, etc. and cuts out the stage of manufacture of semis from ingots in blooming or slabbing mills, where the rolling losses are considerable. Since an increasing proportion of steel is no longer being cast in ingots, the use of the continuous casting process may create evaluation problems for certain statistics currently expressed in ingot equivalents (see paragraphs 60 to 64).

*14.* After solidification, the ingots are rolled to form *semi-finished products* (blooms, billets, slabs and sheet bars) or made into forged semis.

*15.* The semi-finished products are then made into *finished Treaty products* in rolling mills or *non-Treaty products* in other installations such as forging shops, drop forging and drawing works, etc. The process of rolling converts the products, depending on their shape and the positioning of the rolls, into flat products such as plate and sheet, or bars of round or polygonal cross-section, angles and sections of various cross-sections, tubes, pipes, etc. Hot rolling refers to rolling carried out in a temperature range between the rapid recrystallization temperature and that at which melting commences. This range depends on various factors and primarily on the composition of the steel. As a rule, the

final temperature of the work piece during hot rolling is in the region of 900 °C. Cold rolling is carried out at temperatures below the recrystallization temperature, right down to ordinary room temperature. Rolled finished products which are further treated (e.g. by cladding or coating) are usually designated as *end products.*

### C — Data sources

*16.* As a general rule, statistical data are collected by a central organization such as the national trade association for the iron and steel industry or other national bodies and then forwarded to the SOEC, which is empowered by Article 47 of the Treaty to collect the information necessary for carrying out the tasks which the Treaty confers on the Commission of the EC. In exceptional cases, the SOEC approaches national governments for information under Article 86, where the undertakings from which information is required do not come under the Treaty (e.g. merchants).

The foreign trade statistics are drawn up in conjunction with the government offices in the Member States as they form part of Nimexe (see paragraphs 50 to 52).

Statistics on primary transformation industries and statistics on non-member countries are obtained from the appropriate external sources. These statistics are not of course always compiled with definitions comparable with those used for the ECSC statistics proper.

## *Chapter II*

## PRODUCTION BASES

*The 'production bases' section contains information on production facilities and production factors affecting the manufacture of iron and steel, namely manpower, raw materials and energy.*

*Taken together these three elements account for more than three-quarters of the production costs in the iron and steel industry. The remaining production costs arise mainly from maintenance, repairs to plant, and transport.*

### A — Statistics on the workforce and number of hours worked

*These data illustrate both the importance of the iron and steel industry for employment in industry and the high share of the 'labour' factor in production costs in that branch.*

*20. Total employment* is taken to include all employees (manual and non-manual grades and apprentices) on books (employment registers) as full-time or part-time workers.

These employment figures include employees in production sectors coming under the ECSC Treaty and those in ancillary, subsidiary and administrative sections. However, for companies whose activities are only partially covered by the ECSC Treaty, the employees in certain 'shared' departments should be divided between ECSC iron and steel production activities and non-ECSC iron and steel production activities as defined in the Treaty. These 'shared' departments may include maintenance and ancillary activities, transport, energy production, sales and dispatching, administration and book-keeping.

*21. Manual workers* are employees who have a contract of employment and whose wages are normally calculated on piece rates or hourly or daily rates. Employees who are paid on a monthly basis should also be included under manual workers if the work they do is of an essentially manual nature.

*Non-manual workers* are employees who are not in the main engaged in manual work, who have a contract of employment, and who are paid a monthly salary. This category also includes employees who are paid an hourly or daily rate or who are paid on a piece-work basis, but whose main duties are not of a manual nature.

*Apprentices and trainees* are persons who are employed under a specific training programme (usually for a set period) and who are paid at a special rate for trainees. It includes not only trainees on the production side and in craft trades, but also graduate trainees and trainees on the technical and administrative side.

Persons who have been absorbed into the work process as a result of national job-creation schemes are only included in this category if their work can be classified predominantly as occupational training.

Persons who have not reported for work for more than six months as a result of protracted illness, military service or other reasons are not included. It is essential that these persons be excluded so that a genuine comparison can be made of the real operational workforce in the iron and steel industry. For instance, if these people were to be included in the workforce statistics for those Member States with compulsory military service, and in which a conscript's job is guaranteed by law during his period of military service, the statistics would not be directly comparable with those of a Member State where conscription does not exist.

*22.* The *number of hours worked* includes:

(a) the number of hours actually worked during normal working time;

(b) the number of hours worked in addition to (a), which are normally paid at above the normal hourly rate (e.g. overtime, Sundays and public holidays and night shifts). These hours should be entered regardless of the rate paid, i.e. only 1 hour being entered for an hour's work paid at double-time;

(c) the time spent at the place of work during which no productive work is done, e.g. as a result of occasional non-availability of work, mechanical breakdowns or accidents, or the time spent at the place of work during which no work is done, but for which payment is guaranteed on the basis of a binding contract of employment;

(d) time spent at the place of work and devoted to duties such as preparation of the place of work, repairs and maintenance, preparation and cleaning of tools, etc.;

(e) the time representing short breaks at the place of work.

The following are not to be included as hours actually worked:

(a) hours paid but not actually worked, such as paid leave, paid Sundays and public holidays, continued payment in case of illness;

(b) meal breaks;

(c) time spent travelling from home to the place of work and vice versa.

## B — Raw materials and energy

*These statistics refer to supplies and consumption of the main raw materials used by the iron and steel industry: iron ore and manganese ore (primarily for the production of crude iron and ferro-alloys), scrap and crude iron* [1] *(used principally for the production of steel), and energy raw materials.*

### *Iron ore and manganese ore*

*23. Iron ore* refers to ores containing iron, the manganese content of which is less than 20% (dry content). *Manganese ores* are ores with a manganese content of 20% or more (dry content). The 'iron content' of the various components of the charge, and of production, is calculated according to the results of chemical analysis made from time to time on the materials used.

*Sinter and briquettes* are produced by the sintering or agglomeration of several components of the blast furnace burden. The sintering process entails heating a combination of materials in granular or powder form, essentially a mixture of ore fines, fuel (coke) and lime, which is roasted in ladles or on a sintering strand. In this operation the ore fines are agglomerated into larger particles.

### *Scrap*

*24.* Definition of *categories of scrap*

The following categories of scrap are distinguished:

(a) non-alloy iron scrap: old iron castings, such as ingot moulds, mechanical and commercial castings, building materials, drainpipes, etc. but not including burnt calcined castings or castings attacked by acids;

(b) alloy scrap (of iron and steel): scrap containing at least one of the following alloy elements (the minimum content is shown in brackets): chromium (1.0%), cobalt (0.5%), manganese (7.0%), molybdenum (0.15%), nickel (1.0%), tungsten (0.5%), vanadium (0.2%) and silicon (2% in steel scrap and 7% in iron scrap);

(c) non-alloy steel scrap: this includes ordinary steel scrap and all other scrap not mentioned above, including castings and grates burnt or attacked by acids.

*N.B.*: In the external trade statistics, however, scrap is divided into the following categories: [2]
- — scrap not sorted or graded,
- — scrap (sorted or graded) of iron,
- — scrap (sorted or graded) of tinned iron,
- — other scrap.

*25. Sources of scrap*

(a) *Internal scrap*

1. *Casting pit scrap* obtained either in the melting shop or in integrated steel casting shops as a result of the casting process.

2. *Steel scrap from the production of Treaty products*

   Process scrap is scrap produced during the manufacture of semis, rolled finished and final products, ingot scrap and defective steel castings [3] and ingots [3] from integrated steel foundries. 'Mill scrap' does not, however, include material which is intended for re-rolling (e.g. some heavy scrap arising from the manufacture of certain products to particular specifications can be rolled to produce other products).

3. *Internal capital scrap*

   Recovered scrap is that arising from the dismantling, demolition and scrapping of old plant: machinery, buildings, tools, old ingot moulds and all steel objects or iron objects recovered within the works.

(b) *Process scrap from the steel-using industries*

Process scrap from the steel-processing industries arises from the activity of these industries and the tonnages may be estimated by applying a 'scrap yield ratio' to the industry's apparent consumption of steel. These ratios vary from country to country and reflect the structural differences between the steel-processing industries of the various countries.

This category also includes iron and steel scrap and waste from day-to-day production in departments integrated in ECSC works which process or use iron or steel, i.e. waste such as turnings, forging waste and scrap from integrated iron foundries.

(c) An additional source of scrap is bought-in capital scrap (from *demolition* etc.) collected by scrap dealers.

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[1] For iron, please refer to Chapter III on 'Production statistics' (paragraph 31).

[2] See, for details, Nimexe subdivisions 73.03-10 to 73.03-59.

[3] If the amounts in question have not been included in production of crude steel they should be considered as 'casting pit scrap'.

The various sources described above, considered together with foreign trade in scrap and variations in stocks, provide a framework for a general study of the scrap market and scrap supply conditions (see Tables 2-19 and 2-22 in the Yearbook).

*Energy*

*26.* The statistics on consumption of energy raw materials allow one to study the consumption (both overall and specific) of the various products in question. The iron and steel industry is the largest industrial consumer of energy, and above all coke, in the Community. These statistics are also used as a basis for more detailed calculation of specific energy consumption in blast furnaces, melting shops and rolling mills, for which the various consumption levels (and the production levels, e.g. of blast furnace gas and electricity generated at own works) are converted into a common unit (e.g. Joules and tonnes of coal or oil equivalent) using the coefficients published in the SOEC's publications on energy.

In these statistics, the *coke* consumed in blast furnaces should be considered both as an energy raw material and as a reducing agent for iron ore.

## C — Structure and utilization of production capacity

*27. Some figures indicate the general trend of technological development in the iron and steel industry and do, to a certain extent, reflect improvements in productivity and competitiveness. The main indicators are the size of blast furnaces, the production processes used and the individual capacity of melting shops.*

*28. Utilization of capacity is an economic indicator, inasmuch as the existence of surplus capacity indicates a poor balance between supply and demand. Also, the differences between capacity utilization for different production processes may reflect the relative productivity of various types of installation (e.g. high prices for electricity and scrap should lead to a reduction in the utilization of electric steel-melting capacity).*

Utilization of installations for the production of crude iron and crude steel is calculated by reference to the *maximum possible annual production* of the installations. These figures are provided in the results of the annual inquiry on investments conducted by the Commission in the iron and steel industry as defined by the Treaty; the inquiry includes returns not only on investments during the year in question and planned for subsequent years, but also on the production capacity available as a result of investments. Maximum production of molten steel in independent steel foundries is estimated for each country.

*29. Definition of maximum possible annual production*

The rated production capacity available at a works indicates the maximum production which could be achieved in practice by all installations, taking account of the bottlenecks which the rated capacity of one particular part of the installations may impose on the others. Maximum possible production is defined as follows:

Maximum possible production is the maximum production that can be attained during the year in question in ordinary working conditions, having regard to repairs, maintenance and normal holidays, with the equipment available at the beginning of the year, taking account also of the supplementary production of equipment that will come into operation, and of existing plant that should definitely be closed down during the year.

Any evaluation of production must be based on the probable proportions of the composition of the charge for each of the installations under consideration and on the assumption that raw materials will be available. So far as converter steels are concerned, the production capacity should be established by taking into account not each individual melting shop but the overall combination of blast-furnaces and melting shops.

*Chapter III*

# PRODUCTION

*The production statistics refer not only to the main products of the iron and steel industry as defined by the Treaty (finished rolled products and end products), but also to intermediate products such as crude iron, ferro-alloys (most of which are intended for the production of crude steel) and crude steel obtained primarily in the form of ingots or products of continuous casting.*

*See paragraphs 12 to 15 for a brief description of the manufacturing processes for these products.*

## A — Crude iron

*30. The bulk of crude iron produced is intended for decarburization in melting shops and some is used for the production of cast iron in iron foundries. Ferro-alloys are used primarily as additives in steel manufacture.*

The statistics on crude iron production in the Community refer to *net production,* i.e. they exclude recycled crude iron made previously in the works or bought in. Iron produced in hot-blast cupolas and not intended for sale is also excluded from the statistics.

## 31. *Definitions*

The definitions of the products are as follows:

(a) *Crude iron (pig-iron)*

Ferrous products containing 1.9% or more of carbon and possibly containing, either separately or together:
less than 15% phosphorus,
8% and below of silicon,
6% and below of manganese,
30% and below of chromium,
40% and below of tungsten,
10% and below, in total, of other alloy elements (nickel, copper, aluminium, titanium, vanadium, molybdenum, etc.).

(b) *Spiegeleisen*

A product containing more than 6% and up to and including 30% of manganese, and conforming to the other characteristics set out under the definition of iron (see (a)).

(c) *Ordinary non-alloy irons*

Ordinary non-alloy irons may contain phosphorus, silicon and manganese up to the maximum levels shown in paragraph 31 (a). In addition, they may contain, either separately or together, not more than:
0.3% of nickel,
0.2% of chromium,
0.3% of copper,
0.1% of each of the other alloy elements (aluminium, titanium, vanadium, tungsten, etc.).

Iron is described as phosphoric if it contains more than 0.5% but less than 15% of phosphorus.

The distinction between foundry and steelmaking iron is made on the basis of the silicon and manganese content as follows:[1]

1. Ordinary non-alloy steelmaking iron:
   (i) Phosphoric ($P > 0.5\%$, $Si \leqslant 1\%$),
   (ii) Non-phosphoric ($P \leqslant 0.5\%$, $Si \leqslant 1\%$, $Mn > 0.4\%$).
2. Ordinary non-alloy foundry iron:
   (i) Phosphoric ($P > 0.5\%$, $Si > 1\%$),
   (ii) Non-phosphoric ($P \leqslant 0.5\%$).
      1. $Si > 1\%$ $Mn > 0.4\%$
      2. $0.1\% \leqslant Mn \leqslant 0.4\%$
      3. $Mn < 0.1\%$ (iron for making spheroidal graphite castings)

(d) *Alloy iron*

Iron containing alloy elements in excess of the levels set out in (c).

(e) *Ferro-alloys*

Crude ferrous foundry products which are for all practical purposes unusable for rolling or forging, which conform to the compositions used in the iron and steel industries and which contain, separately or together:
more than 8% silicon,
more than 30% manganese,
more than 30% chromium,
more than 40% tungsten,
more than 10%, in total, of other alloying elements.

(f) *'Special iron'*

Alloy iron, iron produced by special processes (e.g. refined iron) and all other unalloyed grades not included in the above categories.

## B — Crude steel

*32. Crude steel is the product obtained directly at the steelworks, usually to be converted at a later stage into semi-finished or finished products by successive rolling operations.[2] A small amount is used in steel foundries for the production of steel castings. Production of crude steel, excluding that used for steel castings, is measured at the first stage of solidification; crude steel for castings is measured at the liquid stage (see paragraph 33 (b) below).*

These statistics also refer to *total net production,* i.e. including the steel directly converted into iron by recarburization (production of special iron), but including production of liquid steel for casting. To avoid double counting, Duplex steel is recorded as being made in the furnace in which it is finally processed. For example, basic Bessemer steel delivered directly as hot metal to open hearth furnaces is not entered as basic Bessemer steel.

### 33. *Definitions*

(a) *Crude steel* refers to those ferrous products containing up to 1.9%[3] of carbon (except for certain non-deforming steels with a high chromium content, which may have a higher carbon content). The percentage of Fe must be higher than that of each alloying element.

(b) Crude steel production includes production of ingots, continuously cast products and liquid steel for castings.

1. *Ingots* are steel products intended for rolling, forging or the manufacture of seamless tubes and are obtained by casting molten steel in ingot moulds. The production statistics exclude faulty products recognized as such on leaving the ingot moulds and intended for immediate remelting.
2. Production of *continuously cast products* refers to the total output of steel continuous casting installations.
3. Production of *liquid steel for castings* refers to the tonnages of steel delivered to the foundry. Finished steel castings are those which are ready for sale in the form they leave the foundry after trimming, and before any machining.

[1] Ordinary non-alloy irons are classified on the basis of their chemical analysis and such classification only gives an approximate indication of the ultimate use of the iron.
[2] The continuous casting process differs from the ingot casting process in that crude steel is obtained directly in the form of semi-finished products.
[3] 2% as from 1980.

## A — Definition [a] of the two classes: 'Non-alloy steels' and 'Alloy steels'

*(content in %)*

| Non-alloy steels | | | | Alloy steels | | | |
|---|---|---|---|---|---|---|---|
| — Al | : < 0.10 | — Nb [2] | : < 0.05 | — Al | : ⩾ 0.10 | — Nb [2] | : ⩾ 0.05 |
| — Bi | : < 0.10 | — Pb | : < 0.40 | — Bi | : ⩾ 0.10 | — Pb | : ⩾ 0.40 |
| — B | : < 0.0008 | — Se | : < 0.10 | — B | : ⩾ 0.0008 | — Se | : ⩾ 0.10 |
| — Cr [1] | : < 0.30 | — Si | | — Cr [1] | : ⩾ 0.30 | — Si | : ⩾ 0.50 |
| — Co | : < 0.10 | — Te | : < 0.10 | — Co | : ⩾ 0.10 | — Te | : ⩾ 0.10 |
| — Cu [1] | : < 0.40 | — Ti [2] | : < 0.05 | — Cu [1] | : ⩾ 0.40 | — Ti [2] | : ⩾ 0.05 |
| — Lanthanides | : < 0.05 | — V [2] | : < 0.10 | — Lanthanides | : ⩾ 0.05 | — V [2] | : ⩾ 0.10 |
| — Mn | : < 1.60 | — W | : < 0.10 | — Mn | : ⩾ 1.60 | — W | : ⩾ 0.10 |
| — Mo [1] | : < 0.08 | — Zr [2] | : < 0.05 | — Mo [1] | : ⩾ 0.08 | — Zr [2] | : ⩾ 0.05 |
| — Ni [1] | : < 0.30 | — others (except C, P, S, $N^2$ and $O^2$) | : < 0.05 | — Ni [1] | : ⩾ 0.30 | — others (except C, P, S, $N^2$ and $O^2$) | : ⩾ 0.05 |

[a] According to the lower limit values of the composition range stipulated on cast analysis. [(If these elements are defined by a minimum value, this minimum value shall be used — if, exceptionally, these elements are defined by a maximum value, take into consideration only 70% of this value, except for manganese, for which one should check whether the maximum content indicated is 1.80% or above (in which case the steel is alloy steel) or lower than 1.80% (in which case it is non-alloy steel)].

[1] Where these elements are found specified in combinations of 2, 3, or 4 in the steel grade specified, the limiting content of the combination of these elements is reduced to 70% of the sum of their individual limits, as shown above, for each of the two, three or four elements present; the individual limits for each of the elements are as shown above.

[2] The preceding rule applies similarly to these elements.

(c) Pure *oxygen steel* is steel obtained by pure oxygen blowing processes such as the LD, LD-AC, OLP, Kaldo, Rotor, OBM, LWS processes and similar. However, steel obtained by blowing processes using an oxygen-enriched blow must still be classified according to the type of plant used.

(d) *Electric steel* is steel produced in electric arc or induction furnaces.

## C — Special steels

*34. Special steels are steels which are processed to obtain special characteristics appropriate to a special use, such as elasticity and hardness (mechanical properties), corrosion resistance, or electrical and magnetic properties. These steels are usually sold as steel castings, semi-finished products or finished rolled products (or even end products) and their value is usually greater than that of the same products in basis and quality steels (ordinary steels).*

Special steels are in general intended for heat treatment, as they exhibit a consistent response to such treatment. Moreover, owing to the particular conditions of manufacture, these steels generally have a greater degree of cleanness, particularly with regard to inclusions, than that of quality and basis steels, as defined in EURONORM 20-74 ('Definition and classification of grades of steel'). Their characteristics are such that they can only be achieved by special care in hot processing and working and by constant checking during production, which cannot be consistently guaranteed by the general methods of production used for basis and quality steels.

### *35. Definitions*

(a) According to EURONORM 20-74, steels are classified according to their composition in two classes:

— non-alloy steels,

— alloy steels.

The above table shows the limit values for alloying elements (and the contents to be taken into consideration) for the classification of alloy and non-alloy steel.

(b) Both alloy and non-alloy steels are then subdivided according to the utilization criteria, and one should refer to EURONORM 20-74 for the subdivision of steels into basis steels, quality steels and special steels. *As a general rule, however, all alloy steels are special steels,* except those not intended for heat treatment, such as silico-manganese steels for springs or abrasion-resistant parts with P and S > 0.035%, and alloy steels for rails.

(c) *Alloy steels* are also subdivided into the following categories:

1. Bearing steels: Cr steels for the manufacture of the bearing elements of ball bearings, needle bearings, etc. and all devices which are used for a similar purpose.
2. Stainless and heat resisting steels: alloy steel containing by weight 12% and over of chromium, with or without other alloy elements, and with less than 1% carbon.

[1] See EURONORM 52-67 ('Vocabulary of heat treatment') for a definition of these treatments, which are divided into four main categories: hardening, tempering, thermochemical diffusion treatments and various treatments such as normalization and ageing. Annealing (e.g. stress relieving and full or normalizing annealing) should not be considered as heat treatment.

3. Steels with special physical properties: these are steels with certain electrical or magnetic properties or certain properties with regard to expansion or yield strength.
4. High speed steels: alloy containing, with or without other alloying elements, at least two of the following three elements: tungsten, molybdenum or vanadium, with a total weight equal to or over 7% of these elements and over 0.6% carbon.
5. Tool steels.
6. Engineering steels (except bearing steels) including steels for specific uses.

Some of these categories of steels are covered by specific EURONORMS, e.g.
EU 94-73 (bearing steels),
EU 96-79 (tool steels).

The full list of EURONORMS is obtainable from the Office for Official Publications of the European Communities, or from the national standards institute.

## D — Finished products and end products

*36.* These statistics refer to all rolled products as defined in the ECSC Treaty (see Annex I of the Treaty) and cover all production whether or not it is for the works' own account: hire-rolling (jobbing) operations are included in the production figures for the works where they are carried out, and not in those for the works which has ordered the work. Production also includes second-class products, plate and sheet cuttings and crop ends not for remelting.

The statistics refer to *net production* which must be measured in such a way that all duplication is eliminated from the production statistics for finished products (e.g cold-rolled sheet in coils which is cut up into sheets by another works is not included twice).

*N.B.: The production statistics for finished products include finished products which are subsequently converted into end products.*

### *37. Definitions* [1]

(a) *Railway track material*

Hot-rolled products used for the construction of railways: rails, sleepers, fishplates and soleplates.

(b) *Heavy sections*

This group of products includes the following:
1. sheet piling
2. wide-flanged beams
3. other beams, U sections ⩾ 80 mm and zores beams.

(c) *Wide flats (Universals)*

Products of rectangular section, hot-rolled lengthwise in a closed box or universal mill, with a thickness of not less than 4 mm and with a width exceeding 150 mm but not more than 1 250 mm. They are always delivered flat.

(d) *Hot-rolled narrow strip*

Rolled products with or without sheared edges of a width less than 600 mm, and a thickness not exceeding 1/10 of the width, delivered in straight strips, in coils or folded bundles.

(e) *Plate and sheet*

Rolled products (with the exception of hot-rolled wide strip (coils) as defined below) with maximum thickness of 125 mm (thicker plate is included in this heading provided that it does not conform to the definition of semi-finished products); and, if these products are square or rectangular, with width greater than either 500 mm, if they are cold-rolled,[2] or 600 mm, if they are hot-rolled.

(f) *Hot-rolled wide strip (coils)*

Flat hot-rolled products, the width of which is greater than or equal to 600 mm, which immediately after the final rolling pass are spirally coiled in regularly superimposed coils in order to form a coil with almost smooth lateral surfaces. These products are considered as finished products if they are not intended for re-rolling or further processing into finished steel products in Community works (direct utilization) or if they are exported out of the Community.

*N.B.*: Cold-rolled plate and sheet, in coils or otherwise, is included with plate and sheet.

(g) *Wire rod*

A finished rolled product coiled while still hot into irregularly wound coils. The section of the wire rod may be circular, oval, square, rectangular, octagonal, semicircular or other. Its surface is normally smooth. Wire rod dressed and cut into length is classed with merchant bars of all forms and dimensions, subject to current size tolerances, whereas all products supplied in coils are counted as wire rod even if they are intended for concrete reinforcement work.

(h) *Concrete reinforcing bars*

Rounds and squares of not less than 5 mm, with a smooth, crenellated or ribbed surface. These products are mainly intended for the reinforcement of concrete, and may have been subjected to regular cold deformation such as torsion around the longitudinal axis.

(i) *Other merchant bars*

Finished hot-rolled products which do not come under any of the categories above or below.

(j) *Rounds and squares for seamless tubes*

Rounds and squares obtained by continuous casting or rolling, must be considered as semi-finished products but are included in finished products production statistics for the sake of consistency with past statistics.

(k) *End products*

In the statistics a distinction is made between the following groups of products:
1. *Tinplate and other tinned sheets, tinplate strip covered by the Treaty:* sheet, plate and strip of all thicknesses, hot or cold-rolled, covered with a metallic layer with a tin content of 97% or more by weight, whether or not these products are coated with varnish.
2. *Blackplate:* In EURONORM 79-69, blackplate is defined as a flat product of non-alloy mild steel, less than 0.50 mm thick, delivered in sheet form, whose surface has been degreased and which is suitable for tinning, painting or printing. In the SOEC statistics the definitions used in each country are being followed for the time being.
3. *Galvanized sheets, terneplate and other coated sheets:* Galvanized sheets are all hot or cold-rolled sheets and plates, in coils or cut lengths, flat or corrugated, zinc coated by hot dipping or electrolytically.

[1] These definitions may be amended slightly after the revision of EURONORM 79 ('Definition and classification of steel products by shape and definitions').
[2] Also included is cold-rolled plate (thickness of 3 mm and over) which does not strictly speaking come under the ECSC Treaty.

4. *Electrical sheets:* Sheet and plate with a loss in Watts per kilogramme, evaluated according to the Epstein method, for a current of 50 cycles and induction of 10 000 Gauss:
   - — less than or equal to 2.1 W if the thickness does not exceed 0.2 mm;
   - — less than or equal to 3.5 W if the thickness is between 0.2 and 0.6 mm;
   - — less than or equal to 6 W if the thickness is between 0.6 mm and 1.5 mm inclusive.

*N.B.: Semi-finished products are:*

- — all products obtained directly by continuously casting steel;
- — products obtained by simply rolling ingots, such as blooms, billets, slabs, sheet bars, rounds and squares for seamless tubes (including analogous products of polygonal cross-section), and blanks for sections;
- — all tube rounds and squares are to be entered as semi-finished products even if their surface finish exceeds that of the semi-finished products given above;
- — hot-rolled wide strip (coils) which is to be re-rolled or converted into other finished products (e.g. by cutting to length) in ECSC iron and steel works.

## *Chapter IV*

## ORDERS, DELIVERIES AND RECEIPTS

***Works' deliveries of steel are dependent on consumption and stock movements in the steel-consuming industries, the accumulation of or withdrawals from stock by merchants and export demand. They often give a better reflection of the economic situation than steel production does. In turn, new orders indicate the possible level and destination of future deliveries and are thus useful for short-term forecasting.***

### A — **Deliveries, new orders and order-books**

*40.* There is a basic uniformity of definitions and inclusion criteria for these three sets of statistics.

*Deliveries* in a given month are those made either directly to a customer by the works making the return or through a national stockyard or store belonging to the works. Hence transfers between works and their national stockyard or stores are not to be declared.

Declarations of delivery (and consequently those relating to new orders and order-books) are based on the *commercial principle*, i.e. the works which receives the order and invoices the delivery of products to non-ECSC consumers (steel processing units, stockholders, customers in third countries) declares this transaction, even if the products are dispatched on its behalf by another works or jobber (subcontractor) located in a different country. Deliveries declared on the basis of this principle do not therefore always correspond to the actual physical movement of the goods in question.

*New orders* recorded are shown after deduction of cancelled orders.

*The order-book* indicates the situation in respect of rolling orders recorded by the works and still to be delivered, after deduction of cancelled orders.

Rolling orders are orders with definitive specifications. For the *definitions of the products*, the reader should refer to the definitions used for the production statistics (Chapter III). Second class products, plate and sheet cuttings and crop ends not for remelting are all included.

Below are some details on recording deliveries and orders of certain groups of products.

*41. Deliveries and orders of ordinary steel*

Returns on finished and end products do not include deliveries from one steelworks to another ECSC steelworks. For ingots, semi-finished products and hot-rolled wide strip, the returns do not include deliveries from a steelworks coming under the Treaty to another of the same company's steelworks in the same country (i.e. internal company transactions are excluded).

However, the returns do include own consumption by integrated works and shops which do not come under the ECSC Treaty.

*N.B.: Jobbing and subcontracting*

Finished (and end) products dispatched for jobbing must not be declared. However, semi-finished products supplied by the principal to a jobber or subcontractor must be declared as deliveries. Finished or end products deriving from jobbing must be declared as deliveries by the principal since the principal issues the invoice, even if the product is dispatched directly to the final customer by the jobber or subcontractor. If the principal does not belong to the steel industry within the meaning of the ECSC Treaty, the steelworks carrying out the jobbing must declare both the order for and the delivery of the finished product, regardless of the country in which the principal is located.

*42.* The same criteria apply in the case of statistics on *deliveries of special steels.* However, all deliveries of ingots and semi-finished products for re-rolling in the Community are excluded.

*43. For deliveries (sales), and orders of iron,* the returns include all new orders and deliveries of products which count as a sale, even between companies in the same country. However, they exclude deliveries and orders between various works in the same company and the same country, which are not tantamount to sales.

## B — Statistics on works' receipts of products for re-rolling

*44.* These statistics refer to works' direct receipts of ingots, semis and hot-rolled wide strip for re-rolling, delivered either by other companies within the same country (including merchants) or from outside the country. The aim is to complete the figures on works' deliveries.

The figures cover all receipts: for jobbing (hire-processing), resale without further processing, and conversion to other ECSC products or non-ECSC products.

## C — Statistics on works' home market deliveries, by consuming industry

*45. Although these statistics only refer to deliveries by works (and hence exclude deliveries by merchants and imports by consumers) they do reflect the sectoral structure of sales on the home market.*

Customers are classified in the various sectors by reference to the *final use of the product*, and care should be taken never to infer a product's destination simply from the nature of the product.

To avoid duplication, these returns do not include deliveries to another steelworks as defined in the ECSC Treaty if this works is to process the products into other ECSC Treaty products. The figures do, however, include works' own consumption and deliveries to integrated non-ECSC divisions of the steelworks.

The various sectors of industry are divided into the following distinct groups:

(a) Extractive industries (coalmining and other mining) and steelworks' own consumption.

(b) Industries for primary transformation of steel, comprising steel foundries, forging and pressing, steel tube industry, wire drawing, bright drawing, cold rolling and manufacture of cold formed shapes, pressing and stamping.

(c) Manufacture and construction of other metal industries, comprising the following: metal furniture, screws, nuts and bolts and turned and pattern cut products, hardware, cutlery, tools and locks, cans and metal boxes, metal drums, boilers and other vessels, precision engineering, optics and toys.

(d) Machinery (non-electric).

(e) Shipbuilding.

(f) Locomotives, wagons, automobiles, cycles and other vehicles.

(g) Building and public works, including structural steelwork (bridges, scaffolding, permanent railway material, mine supports).

(h) Merchants.

(i) Other consumers, including electrical machinery and the construction and maintenance of rail and tram tracks and ancillary structures (railway bridges, etc.) where this work is carried out directly by the railway companies.

*Chapter V*

# FOREIGN TRADE

*These statistics are compiled from official data on foreign trade (special trade) and include improvement trade. Certain data have been converted into crude steel equivalent (ingots) in order to calculate apparent or final consumption of steel.*

## A — Methodology and definitions

*50.* The external trade statistics for the countries of the Community are compiled on the basis of the *Nomenclature of Goods for the External Trade Statistics of the Community and Statistics of Trade Between Member States (Nimexe),*[1] which covers all products. Nimexe may undergo amendments to maintain or improve concordance between it and other product nomenclatures, or to take account of commercial changes in the sector concerned. Furthermore, Member States are free to insert additional statistical subdivisions to meet national requirements. Nimexe is a nomenclature designed for statistical purposes, providing a further breakdown of the Community's customs tariff nomenclature. This is in turn a breakdown of the Customs Cooperation Council Nomenclature,[2] on which several non-member countries have based their own customs or statistical nomenclature.

The partner countries in foreign trade are shown in accordance with the nomenclature of countries for external trade of the Community and trade between Member States (*Geonomenclature*). There is a rule that the nomenclatures of countries (Geonomenclature) and goods (Nimexe) on which the external trade statistics are based must not be changed in the course of the year.

For the publication[3] of foreign trade data on iron and steel products, the basic data are arranged in accordance with a suitable nomenclature, which is virtually identical to that for production (and deliveries) of iron and steel products. The following table shows the headings used in the publications and the corresponding Nimexe headings (1981 edition).

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[1] The harmonized statistical nomenclature for coal and steel which was adopted by the Member States on 1 January 1964 was incorporated in Nimexe on 1 January 1966.

[2] Formerly: Brussels Nomenclature.

[3] More detailed statistics on foreign trade in iron and steel products are available on microfiches or in the Analytical tables of external trade according to Nimexe (Volume H, Chapter 73).

## Products referred to in foreign trade statistics and corresponding Nimexe headings

| Groups of products [1] | Nimexe headings (1981) |
|---|---|
| *Pig-iron and ferro-alloys* | |
| Pig-iron for steelmaking | 7301 BI a - 7301 CI |
| Foundry pig-iron (and special pig-iron) | 7301 BI b - 7301 BII - 7301 BIII - 7301 CII - 7301 D |
| Spiegeleisen | 7301 A |
| High-carbon ferro-manganese | 7302 AI |
| *Ingots and semis* | |
| Ingots and blocks | 7306 - 7315 AI b1 - 7315 BI b1 bb |
| Blooms and billets (a) | 7307 AI - 7315 AI b2 - 7315 BI b2 |
| Slabs and sheet bars (b) | 7307 BI |
| *Finished and end products* | |
| Coils | 7308 - 7315 AIII - 7315 BIII |
| New rails | 7316 AII a |
| Sleepers, fishplates and soleplates | 7316 B - 7316 C - 7316 DI |
| Wire rod | 7310 AI - 7315 AV b1 - 7315 BV b1 |
| Bars | 7310 AII - 7310 AIII - 7310 DI a - 7315 AV b2 - 7315 AV d1 aa - 7315 BV b2 - 7315 BV d1 aa |
| Sheet piling | 7311 B |
| Sections of a height of 80 mm and more (b) | 7311 AI a2 |
| Other sections | 7311 AI a1 - 7311 AI b - 7311 AIV a1 |
| Hot-rolled strip | 7312 A - 7312 BI - 7312 CV a1 - 7315 AVI a - 7315 AVI c1 aa - 7315 BVI a - 7315 B VI c1 aa - |
| Universals | 7309 - 7315 AIV - 7315 BIV |
| Electrical sheet and plate | 7313 A - 7315 BVII a |
| Uncoated plate (3 mm and over) | 7313 BI a1 - 7313 BI a2 - 7315 AVII a1 - 7315 AVII a2 - 7315 BVII b1 aa - 7315 BVII b1 bb |
| Uncoated plate (less than 3 mm) | 7313 BI a3 - 7313 BI b - 7313 BII b - 7313 BII c - 7313 BIII - 7313 BV a2 - 7315 AVII a3 - 7315 AVII b2 - 7315 AVII d1 7315 BVII b1 cc - 7315 BVII b2 bb - 7315 BVII b4 aa |
| Tinplate and tinned sheet | 7312 CIII a - 7313 BIV b - 7313 BIV d1 |
| Other coated or clad plate and sheet | 7313 BIV c - 7313 BIV d2 - 7313 BIV d3 - 7315 AVII c - 7315 BVII b3 |
| *Steel products of the primary processing industries* | |
| Cold-rolled strip and cold-formed sections bright steel bars, cold-rolled plates (3 mm and over) (non-ECSC) | 7310 C - 7310 DI b - 7310 DII - 7311 AIII - 7311 AIV a2 - 7311 AIV b - 7312 BII - 7312 CI - 7312 CII - 7312 CIII b - 7312 CIV - 7312 CV a2 - 7312 CV b - 7312 D - 7313 BII a - 7313 BIV - 7313 BV a1 - 7313 BV b - 7315 AV c - 7315 AV d1 bb - 7315 AV d2 - 7315 AVI b - 7315 AVI c1 bb - 7315 AVI c2 - 7315 AVI d - 7315 AVII b1 - 7315 AVII d2 - 7315 BV c - 7315 BV d1 bb - 7315 BV d2 - 7315 BVI b - 7315 BVI c1 bb - 7315 BVI c2 - 7315 BVI d - 7315 BVII b2 aa - 7315 BVII b4 bb |
| Forged and other products (non-ECSC) | 7304 - 7305 A - 7307 AII - 7307 BII - 7307 C - 7310 B - 7311 AII - 7315 AI a - 7315 AII - 7315 AV a - 7315 BI a - 7315 BII - 7315 BV a - 7316 AI - 7316 DII - 7316 E |
| Drawn wire (non-ECSC) | 7314 - 7315 AVIII - 7315 BVIII |
| Steel tubes, pipes and tube and pipe fittings (non-ECSC) | 7318 - 7319 - 7320 (part) |
| *Other products* | |
| Used rails | 7316 AII b |
| Iron tubes, pipes and tube and pipe fittings (non-ECSC) | 7317 - 7320 (part) |
| Ferro-alloys (non-ECSC) | 7302 (excluding 7302 AI) |
| Sponge iron and steel | 7305 B |
| *Ore and scrap* | |
| Roasted iron pyrites (non-ECSC) | 2601 AI |
| Other slag (non-ECSC) | 2602 B |
| Iron ore | 2601 AII |
| Manganese ore | 2601 B |
| Blast furnace flue dust | 2602 A |
| Unsorted scrap | 7303 A |
| Iron scrap | 7303 BI |
| Tinned scrap | 7303 BII |
| Other scrap | 7303 BIII - 7315 BI b1 aa |

(a) Including slabs and sheet bars of special steels.
(b) Only ordinary steel.
[1] See Annex I for the definitions used in foreign trade statistics, where these differ from the definitions given in paragraphs 31, 33, 35 and 37.

*51.* For all the Member States, the data given in the foreign trade statistics refer to *special trade.*[1]

*Imports* include:

(a) Goods declared for trade and consumption on direct importation or on leaving bonded warehouses;

(b) Goods imported for processing or working, to be re-exported subsequently;

(c) Goods re-imported after working or processing outside the Community;

(d) Returned goods.[2]

*Exports* include:

(a) Goods produced in the Community (and goods nationalized by the completion of customs formalities on entry), which are effectively leaving the statistical territory.

(b) Goods exported for processing or working outside the Community, to be re-imported subsequently.

(c) Goods re-exported after the processing or working for which they were originally imported.

(d) Returned goods.[2]

Trade with the German Democratic Republic and East Berlin is not included in the foreign trade statistics of the Federal Republic of Germany.

The goods described do not include those covered by transit statistics and warehouse statistics.

*52.* From 1977 onwards, the external trade statistics show the partner countries according to the following rules:

— On importation, one determines to show the *country of origin* as defined in Council Regulation (EEC) No 802/68 of 27 June 1968 for goods originating in non-member countries which are not in free circulation in the Community.

— For other goods, one shows the *Member State of consignment*, on importation.

— The *country of destination* refers to the last known country, at the time of exportation, to which the goods are to be dispatched.

*General remarks*

(a) *The disparities often found between imports and corresponding exports from the country of origin* (e.g. in intra-Community trade) may be influenced by the following factors:

— transit delays (e.g. between Belgium and Italy);

— hold-ups in customs (warehouses) and other unexpected delays such as delayed unloading of ships, etc.

As a rule these factors have less effect on the figures for overall trade in iron and steel products than they do on a given subheading where only minor or very minor trade flows are recorded.

However, in many cases the disparities even out in the long term.

(b) *Some major disparities are found between the statistics for direct deliveries to works and the official statistics on exports* for products of comparable shapes, dimensions and grades.

In principle, the following factors should be borne in mind in any attempt at comparison between the two sets of statistics:

— the foreign trade statistics record tonnages crossing frontiers, including exports by dealers, whereas the statistics on deliveries refer only to direct deliveries by works recorded according to the commercial principle (see paragraph 40). Products exported by dealers may also include products of foreign origin.

— Differences of product nomenclature and definition between statistics provided by the works and those for foreign trade (see Annex I).

  Examples:

  — in foreign trade, wire rod is limited to a maximum of 13 mm side or diameter

  — the definitions of 'high carbon steel' and 'alloy steel' in foreign trade are not completely identical to the definitions of 'special steels' in the statistics on deliveries.

— There may be differences in the dates and places for making returns (on leaving the works or warehouse in the case of statistics on deliveries — on crossing the frontier in the case of foreign trade).

— Activities of import-export companies, which are unknown.

— Differences in the statistics on improvement trade.

## B — Direct and indirect trade in crude steel equivalent

*53. The statistics on direct trade expressed in crude steel equivalent can be used for comparisons with the steel production statistics; they are essen-*

[1] From 1 January 1978 onwards. Until 31 December 1977, Ireland and Denmark (and, until 31 December 1976, the United Kingdom) submitted foreign trade data for general trade including movement of goods into and out of warehouses.

[2] Pending the adoption of provisions on the standardization of data regarding among others, return of goods, bunker provisions, catering supplies, vessels and aircraft in pursuance of Council Regulation (EEC) No 1736/75 of 24 June 1975 on the external trade statistics of the Community and statistics of trade between Member States, the current provisions remain applicable.

*tial for calculating apparent consumption of steel (see paragraphs 60 and 61).*

Direct trade in crude steel equivalent is obtained by converting trade in ECSC products into ingot equivalents, using the conversion coefficients given in the publications (see reference (1) at the bottom of Table 6.1 in the Yearbook and the Quarterly Bulletin).

Trade in non-Treaty steel products is included in statistics on indirect trade.

*54. Indirect foreign trade in steel, which is also expressed in crude steel equivalent, is of use in converting apparent consumption of steel into 'final consumption of steel' (see paragraph 64).*

Indirect foreign trade entails imports and exports of products containing steel by the processing industries. From the point of view of the iron and steel industry, one is thus dealing with the quantity of steel indirectly exported or imported.

The Community's indirect foreign trade in steel is calculated as follows:

(a) Choice of products and groups of products:

The calculation is carried out for all products containing steel, as listed in Nimexe. These are primarily end products which do not come under the ECSC Treaty, listed in Nimexe Chapters 84, 85, 86, 87, 88, 89, 90, 93, 94 and 98, which are made completely or partly of iron or steel.

(b) Calculation of specific steel consumption.

The specific steel consumption has been determined for each group of products, distinguishing between:

— the weight of steel included per unit of weight of the product in question;

— the corresponding weight of finished steel employed (taking account of processing losses in transforming and fabricating industries);

— the weight of crude steel employed corresponding to this weight of finished products.

The weight of steel included in the different products (the 'weight of steel incorporated') is used as the basis for theoretical calculations of indirect external trade in steel. With the help of technical coefficients drawn up with assistance from technical experts, the weight of steel incorporated can be used to calculate the weight of finished steel employed for the manufacture of the products in question and the corresponding weight of crude steel.

The weight of the product is used as the base (=100) for conversion.

The different coefficients correspond to the following equations:

(a) Coefficients for the weight of steel incorporated:

$$K_0 = \frac{\text{weight of steel incorporated in the product}}{\text{weight of product}} \times 100$$

They are derived from technical inquiries in the processing industries.

(b) Coefficients for calculating the weight of (finished) steel employed (actual tonnage consumed):

$$K_1 = \frac{\text{weight employed}}{\text{weight of product}} \times 100$$

They are derived from the above ($K_0$), taking account of processing losses of material in the course of fabrication and transformation in the consuming industries.

(c) Coefficients for conversion of the weight employed into crude steel equivalent:

$$K_2 = \frac{\text{crude steel equivalent}}{\text{weight employed}} \times 100$$

They are derived from the coefficients of weight employed ($K_1$) taking account of the nature of the iron and steel products employed and the conversion coefficients for converting these products into ingot equivalent, taking account of the average processing losses occurring in the iron and steel industry between the ingot stage and the finished product stage.

(d) Coefficient for direct conversion of the weight of the product into the crude steel equivalent:

$$K_3 = \frac{\text{crude steel equivalent}}{\text{weight of the product}} \times 100 = \left( \frac{K1 \times K2}{100} \right)$$

The determination of $K_1$ presupposes an exact knowledge of the relative size of the various quantities of steel used for the manufacture of the products in question. In turn, $K_2$ and $K_3$ call for:

— detailed information on the categories of products relating to these volumes of steel (e.g. plate, sheet, sections, merchant bars, etc.);

— a precise indication of the quantity of waste arising in the manufacturing or fabrication process (process scrap) from the ingot stage onwards.

*Chapter VI*

## STEEL CONSUMPTION AND CRUDE STEEL BALANCE SHEET

*Steel consumption is calculated at two consumption levels:*

— *apparent consumption: consumption of steel in the country steel-consuming industries; a variant of apparent consumption includes non-ECSC steel products;*

— *final consumption: consumption of steel, in the sense of the quantity of steel (expressed as crude steel) that finds an end use in the country in the form of consumer and capital goods, manufactured by national or foreign steel-consuming industries.*

### A — Apparent consumption of steel

*60. Apparent consumption of ECSC steel* or 'supplies to the market of crude steel' is expressed in terms of ingots and calculated as follows:

Apparent consumption of steel in ingot equivalent weight = production of crude steel + scrap consumption in rolling mills + net direct imports ± variations in stocks held by works and merchants.

Production of crude steel in ingots is obtained by converting production of continuously cast semis, which is included in crude steel production, into normally cast ingots by multiplication with a coefficient of 1.175. This coefficient is based on the processing losses in Community rolling mills between the normally-cast ingot stage and the semi-finished stage, and indicates the theoretical ingot weight required to produce the given weight of continuously cast semis.

Variations in stocks, and net imports, are converted with the special coefficients for the crude steel equivalent for each rolled ECSC product (see paragraph 53). Higher coefficients are used for products in special steels, for which the rolling losses are greater. The conversion coefficients depend on the trends observed in processing losses in rolling mills and fabrication plant, and may be revised periodically.

*61. Apparent consumption of total steel (ECSC and non-ECSC steel)* is obtained in the same way. However, the variations in stocks held by works and merchants are confined to variations in stocks of ECSC Treaty products.

Thus by looking at foreign trade in certain non-Treaty steel products (drawn wire, steel tubes and pipes, cold reduced strip, drawn products, forgings, etc.) one can obtain an impression of the situation which is more in line with international definitions of steel products.

*N.B.:* Apparent consumption can only be considered as a general indication of actual consumption of steel production by steel-using industries, for the following reasons:

— Apparent consumption calculated in this way does not take account of variations in stocks held by steel-using industries, nor of stocks of non-Treaty steel products held by steelworks and merchants.

— It is necessary to take into consideration all the definitions and methods used for the external trade stastistics, particularly as regards improvement trade (e.g. ECSC products may be imported for processing into non-ECSC products and then re-exported).

*Apparent steel consumption by product category*

*62.* Apparent steel consumption by product category is calculated by the following formula (without conversion into crude steel).

Consumption = production + net imports ± variations in stocks held by works and merchants, as appropriate.

However for ingots, semi-finished products and hot-rolled wide strip, this formula is replaced by the following one, in view of the lack of precise data on production:

Consumption = works deliveries on the home market + total imports − works' receipts for re-rolling ± variations in stocks held by merchants.

Other factors to be taken into account when using these figures as indicators of actual consumption (see paragraph 61) are the differences between the definitions used for the production (deliveries) statistics and those used for the foreign trade statistics as regards the shapes, dimensions and grades of products.

*Steel consumption by sectors (for the record)* [1]

*63.* A study of steel consumption by sector is useful from several points of view. Among other things, it improves the quality of short and long-term forecasts of steel consumption; it can also be of use in establishing the coefficients for calculating indirect trade, or assessing the conditions for supplies of scrap to the market by processing industries.

Studies are currently being carried out in the Member States with a view to drawing up a table showing steel consumption by sector and by product.

## B — (Apparent) final consumption of steel

*64.* The disadvantage of apparent consumption of ECSC steel is that it tends to overestimate the net indirect exporting countries' level of consumption by including in internal requirements the tonnages of steel which are consumed by processing industries and subsequently exported (and conversely, to underestimate the requirements of net indirect importing countries). Introducing indirect trade into the calculation provides a way of overcoming this problem and arriving at a more precise notion of steel consumption.

Final consumption of steel is obtained by including in the calculation of apparent steel consumption not only non-ECSC steel products but also all other products which contain steel and which are included in indirect trade in steel (see paragraph 54). It goes without saying that the points made in connection with apparent steel consumption are also valid for final consumption. Furthermore, these statistics do not take account of variations in stocks of products containing steel (i.e. those included in indirect trade) in industry and the distribution trades.

[1] Branches, as in the national accounts—see the European System of Integrated Economic Accounts (ESA).

*Chapter VII*

## INVESTMENTS

*Pursuant to the provisions of Article 47 of the ECSC Treaty (see also paragraph 16), the Commission conducts an annual inquiry on investments in industry in the ECSC,[1] This inquiry provides information on actual and planned investment (capital expenditure) and helps to guide the policy of coordinated development of investments in the Community. Under Article 54 of the Treaty, the Community may facilitate the carrying-out of investment programmes by granting loans to undertakings or by guaranteeing other loans which they may contract.*

*70.* For the purposes of the inquiry on investments in the ECSC iron and steel industry, 'investments' refers to those outlays which are or will be counted in the balance sheet as capital or fixed assets, excluding accommodation intended for personnel. There are three *categories of investment:*

Category A

Investments for which a certain sum (or the entire sum) has already been booked (spent) before 1 January in the year under review.

Category B

Investments for projects approved but not yet started on 1 January of the year under review, which have already been defined technically and the implementation of which has already been decided by company boards.

Category C

Investments, the start of work on which is planned during the following three years (including the year under review). These investments are not included in the statistics on investments planned.

*71.* The results of the ECSC inquiry on investments may differ from those obtained in the annual Eurostat inquiry, as in the latter the classification of undertakings is based on the principal activity of the undertaking.

[1] This inquiry includes returns on existing and planned production capacity and the results are presented in an annual report published by the Commission.

*Chapter VIII*

## PRICES, UNIT VALUES AND LABOUR COSTS

### A — ECSC basis prices

*The system of basis prices has arisen from the implementation of Article 60 of the ECSC Treaty, which allows for the publication of price lists and conditions of sale applied within the common market in coal and steel, together with a series of rules governing price formation, with a view to improving market transparency.*

*80. Iron and steel*

The prices shown for (pig) iron and steel products are the basis prices according to the price lists and conditions of sale which ECSC manufacturers are obliged to submit to the Commission of the European Communities.

The prices in question are producers' prices at the basing point stated, excluding VAT and any other taxes or dues. They are the prices applied by the manufacturers taken to be the most representative of their countries.[1] They are always expressed in the currency of the country of manufacture.

The periods shown in the tables do not coincide, or coincide only on rare occasions, with the dates on which the new price lists actually come into force, as these lists can be changed by the producers at any time.

The frequency of the reference date is determined by the state of the market. The prices given do not necessarily correspond to the prices actually charged by the manufacturers. Discrepancies between the actual prices and the listed prices may result from the *right of firms to align their prices with the price lists of competing undertakings from within the Community*[2] *and from certain EFTA countries,*[3] *or with the prices quoted in tenders submitted from non-member countries.*[2] Manufacturers may also apply special prices to certain consumer groups,[4] for transactions regarded as 'indirect' export, for second-class and off-grade products, etc.

[1] The basis prices for all ECSC products and manufacturers are published monthly in the catalogue 'Pig-Iron and Steel—Basis Prices'.
[2] In accordance with Article 60 of the ECSC Treaty.
[3] Under the terms of the agreements between the Community and seven EFTA countries, five of these countries—Austria, Finland, Norway, Portugal and Sweden—have adopted the ECSC pricing system (Article 60) for sales on their national markets and sales to the Community countries and vice versa. Switzerland and Iceland have a free market system.
[4] Commission Decision of 22 December 1972 amending Decisions 30/53 and 31/53 (OJ Special Edition, 1972, 30-31 December, p. 1923).

*81. Scrap*

The scrap prices are those for category 03 (graded old wrought scrap free from abnormal oxidation, excluding motorcar scrap and items of alloy steel) of the new Community classification of scrap for steelmaking jointly drawn up by the scrap trade and the steel undertaking of the Community. (N.B.: From April 1974, the prices for Germany relate to Category 0 of the new German classification.)

The scrap prices stated are prices per metric tonne, tax excluded, at the stockyard.

The American composite price relates to the long ton (1 016 kg).

## B — Foreign trade average values for scrap, iron ore and iron and steel products

*Although these figures are not actual prices and sometimes refer to mixed groups of products, they still reflect trends in import prices and receipts on the common market (in the case of trade between Member States) and the markets of non-member countries.*

*82.* Data from the foreign trade statistics on quantities and values of products are used to calculate the unit values for various groups of iron and steel products, scrap and iron ore. The figures are based on the official statistics for imports (values cif frontier [1]) and exports (values fob frontier), disregarding import duties and any compensatory amounts (as in the case of scrap). The figures are then converted into ECU. [2]

The data published refer only to Treaty iron and steel products which are not declared at customs as high carbon steel or alloy steel. The grade of steel considered thus appears to correspond roughly to the grade generally defined as *'ordinary steel'*. (The differences in definitions are irrelevant in this particular case.) It should be borne in mind that these values may sometimes vary in time due to changes in grades (manufacturing processes, ratio between first and second-class products, etc.) and dimensions, and also to alterations in the origin and destination of the products (which in turn determine the proportion of transport costs incorporated in the value of the products when they cross the frontiers).

## C — Statistics on hourly wages and labour costs in the iron and steel industry

*Harmonized statistics on wages and labour costs provide a means of comparison, on a common basis, of wage costs in the iron and steel industry throughout the Community.*

*83.* The field of this survey is the same as that for statistics on registered employees and hours of work: hours of paid work and total remuneration are divided between workers in ECSC and non-ECSC fields (if necessary by means of a special key for ancillary and associated departments).

*84.* The *direct wage* refers to the earnings directly related to the work actually done by the worker. It includes the employee's social security contributions and taxes and dues payable by the employee and deducted by the employer. It is made up of the following:

hourly wage, wage with bonus, piecework wage, cost-of-living allowance, overtime pay, allowances for night work and work at weekends and public holidays, job and responsibility bonuses, bonuses for arduous, dirty or dangerous work, loyalty bonuses, bonuses for length of service, productivity bonuses (where these are linked with the hourly wage and paid on a regular basis), wages paid in the event of absence due to trade union duties, payment for days off work brought about by reductions in working hours.

It does not include family allowances nor payments made for working days not worked (paid weekends, public holidays and leave, paid short-time days, etc.).

*85.* For the purposes of the survey, *labour costs* include the following expenditure by employers: direct wages, allowances and bonuses, payment for days not worked, employers' social security contributions (statutory and otherwise), benefits in kind and various other expenditure of social nature associated with the employment of staff (vocational training, transport, etc.).

*Chapter IX*

## ECSC LEVY

*90. Under Article 49 of the ECSC Treaty, the Commission is empowered to procure the funds it requires to carry out its tasks by imposing levies on the production of coal and steel. Article 50 of the Treaty lays down the uses of the levies: administrative expenditure, aid towards readaptation of workers, investment aid and technical and economic research.*

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[1] The statistical declarations should in principle show the values free at national frontier. However, for the purposes of the Common Customs Tariff, the customs value of imported goods is assessed at the point where the goods enter the customs territory of the Community.

[2] However, data prior to 1977 are shown in EMA units of account (=$) or in EUR, the unit of account which is still used by the Member States for transactions relating to the European Monetary Cooperation Fund (FECOM).

The levies are assessed annually on the various products according to their average value. Before each financial year, which always runs from 1 January to 31 December, the Commission fixes the rate of the levy applicable to production in the following financial year. The average values are calculated per tonne of each of the products subject to the levy, and are expressed in ECU. They take account of the value of the average quantities of products on which the levy has already been paid that are needed to produce one tonne of the product in question.

ANNEX I

## Excerpts from the Notes on Chapter 73 of the CCCN and supplementary notes on the customs tariff of the European Community

*Preliminary note*

The notes on Chapter 73 of the *Customs Cooperation Council Nomenclature* (CCCN) are given below, with some supplementary notes on the *Community customs tariff* (these are preceded by the letters (ECSC)), where these definitions differ markedly from those used for the statistics on production and deliveries.

However, since the Customs Cooperation Council is planning an imminent revision of CCCN Chapter 73 (Iron and Steel), the SOEC has decided not to reproduce the explanatory notes to the CCCN and the nomenclature of the Common Customs Tariff; the aim of the revisions made to Chapter 73 will be to bring the CCCN definitions closer to those used in industry and trade.

*Definitions* [1]

(a) Pig-iron for steelmaking, foundry pig-iron (and special pig-iron), Spiegeleisen, high-carbon ferro-manganese and other ferro-alloys.

The definitions are the same as those given in paragraph 31.

(b) Alloy steel

Steel containing, by weight, one or more elements in the following proportions:

more than 2% of manganese and silicon, taken together, or
2% or more of manganese, or
2% or more of silicon, or
0.50% or more of nickel, or
0.50% or more of chromium, or
0.10% or more of molybdenum, or
0.30% or more of vanadium, or
0.30% or more of tungsten, or
0.30% or more of cobalt, or
0.30% or more of aluminium, or
0.40% or more of copper, or
0.10% or more of lead, or
0.12% or more of phosphorus, or
0.10% or more of sulphur, or
0.20% or more of phosphorus and sulphur taken together, or
0.10% or more of other elements taken separately.

(c) High carbon steel

Steel containing by weight, not less than 0.60% of carbon and having a content, by weight, of less than 0.04% of phosphorus and sulphur taken separately and less than 0.07% of these elements taken together.

(d) Puddled bars and pilings

Products for rolling, forging or re-melting, obtained:

— by shingling balls of puddled iron to remove the slag arising during puddling, or
— by roughly welding together by means of hot-rolling, packets of scrap iron or steel or puddled iron.

(e) Ingots

Products for rolling or forging obtained by casting into moulds (ECSC). Liquid steel shall be treated as steel of the corresponding kind in ingots.

(f) Blooms and billets

Semi-finished products of rectangular section, of a cross-sectional area exceeding 1 225 $mm^2$ and of such dimensions that the thickness exceeds one quarter of the width.

(g) Slabs and sheet bars

Semi-finished products of rectangular section, of a thickness not less than 6 mm, of a width not less than 150 mm and of such dimensions that the thickness does not exceed one quarter of the width.

(h) Coils for re-rolling

Coiled semi-finished hot-rolled products, of rectangular section, not less than 1.5 mm thick, of a width exceeding 500 mm and of a weight of not less than 500 kg per piece.

(i) Universal plates

Products of rectangular section, hot-rolled lengthwise in a closed box or universal mill, of a thickness exceeding 5 mm but not exceeding 100 mm, and of a width exceeding 150 mm but not exceeding 1 200 mm.

(j) Hoop and strip

Rolled products with sheared or unsheared edges, of rectangular section, of a thickness not exceeding 6 mm, of a width not exceeding 100 mm and of such dimensions that the thickness does not exceed one tenth of the width, in straight strips, coils or flattened coils.

(k) Sheets and plates

Rolled products (other than coils for re-rolling as defined in note (h) above) of any thickness and, if in rectangles, of a width not exceeding 500 mm.

[1] For the statistics on foreign trade in ECSC iron and steel products, data are only collected on rolled products corresponding to the definitions given, to the exclusion of forged, drawn and other products which correspond to the definitions.

(l) Bars and rods

Products of solid section which do not conform to the entirety of any of the definitions (f), (g), (h), (i), (j), and (k) above, and which have cross-sections in the shape of circles, segments of circles, ovals, isosceles triangles, rectangles, hexagons, octagons or quadrilaterals with only two sides parallel and the other two sides equal.

The expression also includes concrete reinforcing bars, which apart from minor indentations, flanges, grooves or other deformations produced during the rolling process correspond to the above definition.

(ECSC) Wire rod is a product of solid section obtained exclusively by hot-rolling, and which is hot coiled.

The term covers only such products:

1. of round or square section of which the diameter or side does not exceed 13 mm;
2. of any other section, which do not conform to the definition of hoops and strip in Note (j) above, weighing not more than 1.33 kg per linear metre.

(m) Angles, shapes and sections

Products other than railway and tramway track construction material which does not conform to the entirety of any of the definitions (f), (g), (h), (i), (j) and (k) above, and which do not have cross-sections in any of the forms indicated in Note (l).

ANNEX II

**Paragraphs of the Explanatory Notes and corresponding tables in the publications on iron and steel**

| Paragraph | Table Nos | | |
|---|---|---|---|
| | Monthly Bulletin | Quarterly Bulletin | Yearbook |
| 10–16 | for the record | for the record | for the record |
| 20–22 | – | 2.1–2.3 | 2.1, 2.2 |
| 23 | – | 2.4, 2.5 | 2.9–2.15 |
| 24, 25 | 21, 22 | 2.7, 5.6 | 2.18–2.21 |
| 26 | – | – | 2.22–2.25 |
| 27 | – | – | 2.7, 2.8 |
| 28, 29 | – | – | 3.4, 3.13 |
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| 43 | – | 4.1, 4.2, 4.3 | 4.1, 4.2 |
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| 53, 54 | – | – | 1.3, 5.1, 5.4, 5.8, 5.12 |
| 60, 61 | 1 | 6.1 | 6.1, 6.2 |
| 62 | – | – | 6.4 |
| 63 | – | – | 6.5 (for the record) |
| 64 | – | – | 6.3 |
| 70, 71 | – | – | 7.1–7.4 |
| 80, 81 | – | – | 8.2–8.14 |
| 82 | – | – | 8.15–8.17 |
| 83–85 | – | – | 8.18, 8.19 |
| 90 | – | – | 9.1, 9.2 |

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De europæiske Fællesskabers statistiske Kontors program vedrørende de publikationer, der udgives i løbet af året, offentliggøres, inddelt efter emner, i årets første nummer af brochuren »Eurostat News« (»Informations de l'Eurostat«), der udkommer hvert kvartal.

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