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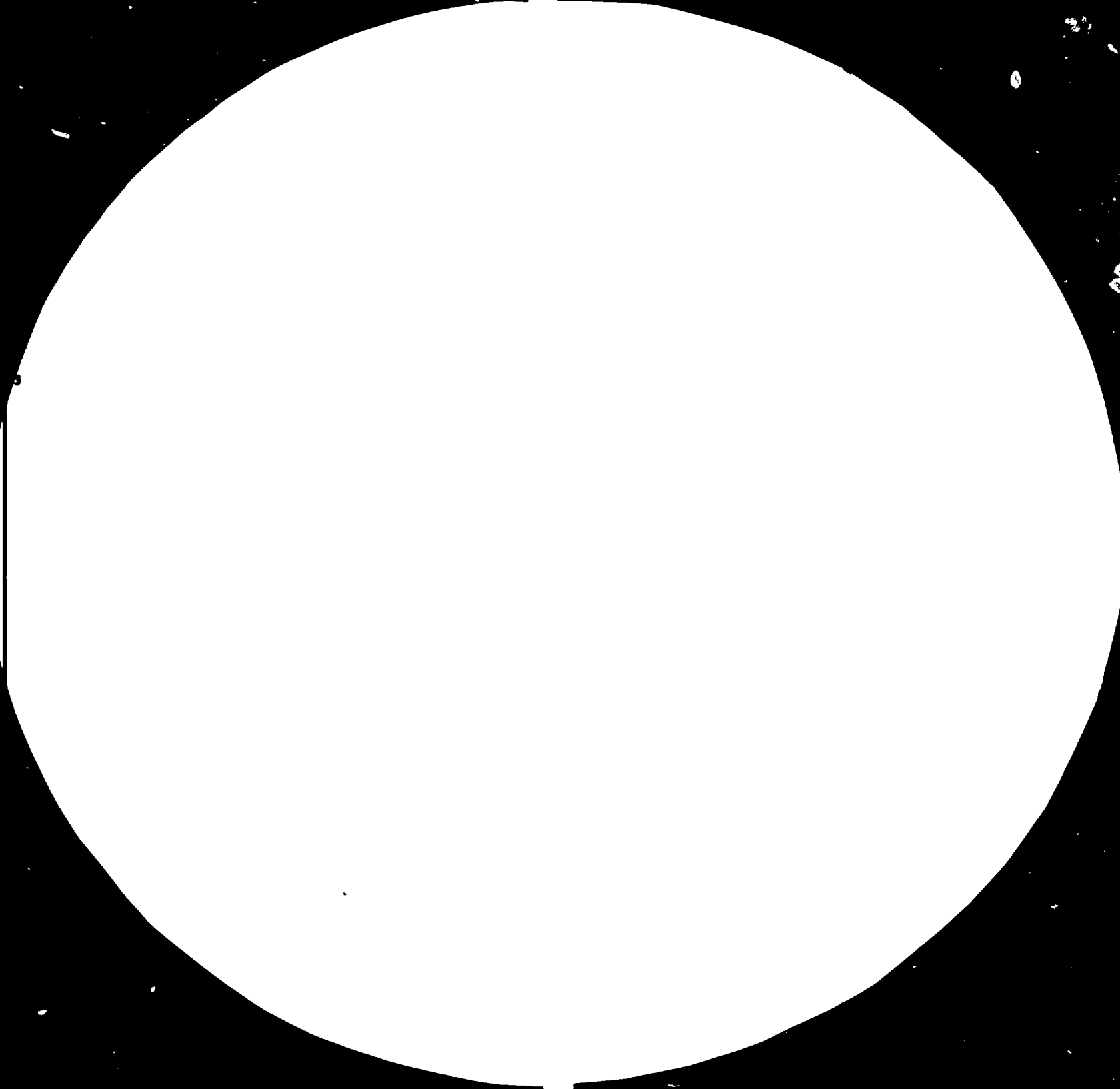
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March 1984.

Brazil and Venezuela.

SPECIFIC CONSUMPTION OF STEEL .

Questionnaires on Brazil and Venezuela prepared by
Mr. Anibal GOMEZ, consultant to UNIDO, as a contribution
of the Sectoral Studies Branch. Division for Industrial
Studies, to publication ECE/STEEL/45 of the Economic
Commission for Europe.

restricted

3423

STUDY ON THE EVOLUTION OF THE

SPECIFIC CONSUMPTION OF STEEL

QUESTIONNAIRE

Please return this questionnaire to the Sectoral Studies Branch, IS, of UNIDO by 10 January 1984.

Country	BRAZIL	Name and function of official responsible for reply	ANIBAL GOMEZ GARCIA - Secretary General - Instituto Latinoamericano del Fierro y el Acero (ILAFA)
Date sent	March, 16, 1984	Official address (in full)	Darío Urzúa 1994, Santiago 9, P.O. Box 16065, Santiago - Chile
Signature	_(signature)_		

Before starting to answer the questions, please read the entire questionnaire and the explanatory notes.

Introduction

In view of the difficulty of providing the extremely detailed data for this type of study, the ad hoc meeting on the evolution of the specific consumption of steel on 19 and 20 October 1981 decided that "the questionnaire should cover one sector common to all countries and another sector selected by each country for its particular importance in that country's national economy".

Countries are therefore asked to select another steel-consuming sector and make an analysis similar to that which is requested for the non-electrical machinery industry (Part D of this questionnaire), using all the types of information which are available but which cannot be collected in a systematic way by means of a general questionnaire.

Further, countries are asked for a qualitative assessment and explanations of the trends observed in steel consumption.

A. General

1. How do you measure the steel consumption of a steel-consuming sector in your country and how is it defined (see footnote 5)? Please provide the relevant data for each individual steel-consuming sector according to the ISIC (International Standard Industrial Classification), Statistical Papers, M. No.4, Rev.2, Add.1, UN, 1971 (see footnote 3 (b)).

2. How is the production of a steel-consuming sector measured in your country and how is it defined (see footnote 3 (a) and (b))? Please provide the relevant data for each individual steel-consuming sector, and formulate your answer as for question 1.

3. Which combination of the measures and the definitions of the steel consumption (question 1) and of the production of a steel-consuming sector (question 2) is, in your opinion, the most accurate approach to analysing the evolution of the specific consumption of steel?

4. Are there any studies available in your country on specific consumption of steel, measured in terms of steel intensities or in any other way? (Compare the measure of specific steel consumption given in question 43).

B. Steel production

Item	Unit	Actual data in unit indicated 1/																							
		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	E 1983
5. The share of alloy steel in total steel production 2/	1.000 t									250	240	257	284	330	669	873	778	880	959	904	1.083	1.443	1.242	1.159	n.a.
	%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	5.6	4.9	4.8	4.7	5.0	9.4	11.6	9.4	9.6	8.6	7.5	7.8	9.4	9.4	8.9	n.a.
6. The share of secondary refined steels in ladles in total steel production, and an indication of which steels are secondary refined 2/	%	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	3.9	n.a.	4.4	5.6	7.3	6.1	6.3	n.a.	n.a.	n.a.	8.3	n.a.	8.0	n.a.

n.a. = not available

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year.

2/ Kindly define the coverage of "total steel production" and give the definition of crude steel which is in use in your country.

C. Global steel consumption

Item	Unit	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Production of the steel-consuming sectors which are defined in terms of ISIC: 3/	(million dollars)																								
7. 381 – Manufacture of fabricated metal products, except machinery and equipment	value										3039	3406	3825	4185	4403	4809	5457	5975	6351	7018	7867	6647	6594	6330
8. 382 – Manufacture of machinery except electrical	"										1656	2184	2599	3249	3509	4039	4633	4373	4579	4909	5660	4742	4022	3358
9. 383 – Manufacture of electrical machinery, apparatus, appliances and supplies	"										1268	1341	1663	2211	2543	2556	3026	3074	3360	3622	3810	3173	3068	2832
10. 384 – Manufacture of transport equipment	"										1988	2472	3028	3863	4589	4612	4944	4776	5440	5728	5843	4253	4539	4430
11. 500 – Construction	"		3905								5036						8989			11333	11764	12686	12115	12067	
Steel consumption of the steel-consuming sectors which are defined in terms of ISIC: 4/																									
12. 381 – Manufacture of fabricated metal products, except machinery and equipment	1 000 t										1174			1792			2734					4048		2998	
13. 382 – Manufacture of machinery except electrical	1 000 t										286			480			804					1144		791	
14. 383 – Manufacture of electrical machinery, apparatus, appliances and supplies	1 000 t										160			231			334					455		357	
15. 384 – Manufacture of transport equipment	1 000 t										864			1277			2002					2706		2429	
16. 500 – Construction	1 000 t										1064			1530			2363					3475		2556	

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year. Metric tons should be given throughout.

3/ (a) The preferred measure of production of a steel-consuming sector is the product value at constant producers' prices (use 1975 as the year of reference); if you can provide data in the total product weight of the end product, please give both. If you cannot provide the data in the form of the above given measures, please give any other available data, such as:
  - the number of units of the end product, their breakdown and their average weight;
  - some production indices based on value added;
  - any other measure (please specify it).

(b) It is desirable to define the steel-consuming sectors according to the ISIC (International Standard Industrial Classification), Statistical Papers, M. No.4, Rev.2, Add.1, UN, 1971, but since the nomenclature of the sectors is often different in different countries, it will be sufficient to give the existing national data obtained from the steel-consuming organizations. In this case, please indicate the coverage of each sector and its corresponding production by weight or volume, specifying the unit of measurement used.

4/ Data on steel consumption of the sectors are requested for any single year to serve as weights for calculating an index of the evolution of the sectors. The year chosen should be one of the years given in the other tables. Please supply the tonnages of actual direct or final steel consumed, as explained in footnote 5, even if they are approximate. Kindly specify to which series of steel consumption the supplied data refers.

D. Steel consumption by sector

Item	Unit	Actual data in unit indicated 1/												E 1972
		1969	1970	1972	1973	1975	1980						
Steel and iron consumption of the steel-consuming sector: 6/ ISIC – 382 Non-electrical machinery													
22. Total	1 000 t	286		480		804	1144						791
– of which flat products	1 000 t	175		309		506	754						485
– of which long products	1 000 t	59		95		171	217						176
– of which tubes (only seamless tubes)	1 000 t	52		76		127	173						136
– of which steel castings	1 000 t	n.a.		n.a.		n.a.	n.a.						n.a.
– of which forgings	1 000 t	n.a.		n.a.		n.a.	n.a.						n.a.
– of which cast-iron products	1 000 t	n.a.		n.a.		n.a.	n.a.						n.a.
23. Steel losses as a percentage of steel consumption	%												
Steel and iron consumption of the steel-consuming sub-sector: 6/ ISIC-3821 Engines and turbines													
24. Total	1 000 t												
– of which flat products	1 000 t												
– of which long products	1 000 t												
– of which tubes	1 000 t												
– of which steel castings	1 000 t												
– of which forgings	1 000 t												
– of which cast-iron products	1 000 t												
25. Steel losses as a percentage of steel consumption	%												

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year. Metric tons should be given throughout.

6/ The preferred measure of steel consumption of a steel-consuming sector is steel delivered to the sector by weight, which is defined as direct purchases of finished steel.
Direct purchases of finished steel by a steel-using industry must comprise direct deliveries by the domestic steel industry + direct deliveries by the sector of first transformation, if not included in the domestic steel industry + deliveries by steel traders + direct imports by the steel-using industry + deliveries by assembly plants, foreign subsidiaries, or other steel-using industries.

If you cannot provide the data on direct purchases of finished steel defined as above, please give any other available data about the measure of input of steel, such as: steel used in production of the end product of sector; steel contained in the end product; any other measure.

If you use any other unit of measurement than tonnage, please specify it. Kindly define the product coverage of "total steel and iron consumption".

Item	Unit	Actual data in unit indicated 1/																							
		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	19?1	19?2	19?3
Steel and iron consumption of the steel-consuming sub-sector: 6/ ISIC-3822 Agricultural machinery and equipment																									
26. Total	1 000 t										64			107			182					272			
- of which flat products	1 000 t										46			69			118					178			
- of which long products	1 000 t										17			37			63					92			
- of which tubes (only seamless tubes)	1 000 t										1			1			1					2			
- of which steel castings	1 000 t										n.a.			n.a.			n.a.		...			n.a.			
- of which forgings	1 000 t										n.a.			n.a.			n.a.					n.a.			
- of which cast-iron products	1 000 t										n.a.			n.a.			n.a.					n.a.			
27. Steel losses as a percentage of steel consumption	%																								
Steel and iron consumption of the steel-consuming sub-sector: 6/ ISIC-3823 Metal and wood working machinery																									
28. Total	1 000 t																								
- of which flat products	1 000 t																								
- of which long products	1 000 t																								
- of which tubes	1 000 t																								
- of which steel castings	1 000 t																								
- of which forgings	1 000 t																								
- of which cast-iron products	1 000 t																								
29. Steel losses as a percentage of steel consumption	%																								

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year. Metric tons should be given throughout.

6/ The preferred measure of steel consumption of a steel-consuming sector is steel delivered to the sector by weight, which is defined as direct purchases of finished steel.
Direct purchases of finished steel by a steel-using industry must comprise direct deliveries by the domestic steel industry + direct deliveries by the sector of first transformation, if not included in the domestic steel industry + deliveries by steel traders + direct imports by the steel-using industry + deliveries by assembly plants, foreign subsidiaries, or other steel-using industries.
If you cannot provide the data on direct purchases of finished steel defined as above, please give any other available data about the measure of input of steel, such as: steel used in production of the end product of sector; steel contained in the end product; any other measure.

If you use any other unit of measurement than tonnage, please specify it. Kindly define the product coverage of "total steel and iron consumption".

Item	Unit	Actual data in unit indicated 1/																						
		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1991	1992	199?
Steel and iron consumption of the steel-consuming sub-sector: 6/ ISIC-3824 Special industrial machinery and equipment (except 3823)																									
30. Total	1 000 t																								
- of which flat products	1 000 t																								
- of which long products	1 000 t																								
- of which tubes	1 000 t																								
- of which steel castings	1 000 t																								
- of which forgings	1 000 t																								
- of which cast-iron products	1 000 t																								
31. Steel losses as a percentage of steel consumption	%																								
Steel and iron consumption of the steel-consuming sub-sector: 6/ ISIC-3825 Office computers and accounting machinery																									
32. Total	1 000 t																								
- of which flat products	1 000 t																								
- of which long products	1 000 t																								
- of which tubes	1 000 t																								
- of which steel castings	1 000 t																								
- of which forgings	1 000 t																								
- of which cast-iron products	1 000 t																								
33. Steel losses as a percentage of steel consumption	%																								

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year. Metric tons should be given throughout.

6/ The preferred measure of steel consumption of a steel-consuming sector is steel delivered to the sector by weight, which is defined as direct purchases of finished steel.
Direct purchases of finished steel by a steel-using industry must comprise direct deliveries by the domestic steel industry + direct deliveries by the sector of first transformation, if not included in the domestic steel industry + deliveries by steel traders + direct imports by the steel-using industry + deliveries by assembly plants, foreign subsidiaries, or other steel-using industries.
If you cannot provide the data on direct purchases of finished steel defined as above, please give any other available data about the measure of input of steel, such as: steel used in production of the end product of sector; steel contained in the end product; any other measure.
If you use any other unit of measurement than tonnage, please specify it. Kindly define the product coverage of "total steel and iron consumption".

		Unit	Actual data in unit indicated 1/																									
	Item		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	E 1983
	Steel and iron consumption of the steel-consuming sub-sector: 6/ ISIC-3829 Machinery, non-electrical, not elsewhere classified																									
34.	Total	1 000 t																								
	- of which flat products	1 000 t																								
	- of which long products	1 000 t																								
	- of which tubes	1 000 t																								
	- of which steel castings	1 000 t																								
	- of which forgings	1 000 t																								
	- of which cast-iron products	1 000 t																								
35.	Steel losses as a percentage of steel consumption	%																								

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year. Metric tons should be given throughout.

6/ The preferred measure of steel consumption of a steel-consuming sector is steel delivered to the sector by weight, which is defined as direct purchases of finished steel.

Direct purchases of finished steel by a steel-using industry must comprise direct deliveries by the domestic steel industry + direct deliveries by the sector of first transformation, if not included in the domestic steel industry + deliveries by steel traders + direct imports by the steel-using industry + deliveries by assembly plants, foreign subsidiaries, or other steel-using industries.

If you cannot provide the data on direct purchases of finished steel defined as above, please give any other available data about the measure of input of steel, such as: steel used in production of the end product of sector; steel contained in the end product; any other measure.

If you use any other unit of measurement than tonnage, please specify it. Kindly define the product coverage of "total steel and iron consumption".

Item	Unit	Actual data in unit indicated 1/																							
		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	E 1983
Production or some other measure of activity of the steel-consuming sector: 3/ ISIC-382 Non-electrical machinery																									
36. 3321 - Engines and turbines	value or 1 000 t																								
37. 3822 - Agricultural machinery and equipment	"																								
38. 3823 - Metal and wood-working machinery	"																								
39. 3824 - Special industrial machinery and equipment (except 3823)	"																								
40. 3825 - Office computers and accounting machinery	"																								
41. 3829 - Machinery, non-electrical, not elsewhere classified	"																								
42. 382 - Total	"																								
43. Evolution of steel weight in certain types of machinery containing steel 7/	% or kg/kg																								

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year. Metric tons should be given throughout.

3/ (a) The preferred measure of production of a steel-consuming sector is the product value at constant producers' prices (use 1975 as the year of reference); if you can provide data in the total product weight of the end product, please give both. If you cannot provide the data in the form of the above given measures, please give any other available data, such as:
- the number of units of the end product, their breakdown and their average weight;
- some production indices based on value added;
- any other measure (please specify it).

(b) It is desirable to define the steel-consuming sectors according to the ISIC (International Standard Industrial Classification), Statistical Papers, M. No.4, Rev.2, Add.1, UN, 1971, but since the nomenclature of the sectors is often different in different countries, it will be sufficient to give the existing national data obtained from the steel-consuming organizations. In this case, please indicate the coverage of each sector and its corresponding production by weight or volume, specifying the unit of measurement used.

7/ It is desirable to give any available data about the evolution of conversion coefficients for converting actual weight of steel contained goods of the ISIC-382 group of products into finished steel equivalents.

If you cannot provide these data, please give evolution of steel weight in kg per kg of total weight of any other types of goods, such as automobiles, tractors, etc.

Please use additional space for a qualitative assessment and explanations of the trends observed in your country's steel consumption.

NOTES TO THE QUESTIONAIRE

B. Steel production

Item 5. "Total steel production" covers total crude steel manufacture, including high, medium and low carbon steels and alloy steels, be these or not submitted to in-ladle secondary refining or to other kinds of further metallurgical processes.

"Crude steel" refers _o steel expressed in ingots produced, to continuously cast products and to "steel for castings". In this latter case, the volume considered is the content of the ladle. The data are provided in thousands of tons and in percentages (%).

Item 6. Under steels submitted to in-ladle secondary refining are those submitted to processes outside the steelmaking furnace, such as vacuum degassing, refining in ladle or in special vessels and some special technologies for ingot production. Secondarily refined steels in Brazil are: tool and die steel, stainless steel, some types of steel for mechanical construction (ball bearing steels, free cutting steels, heat treatment steels, case-hardening and spring steels) and steels with special mechanical properties (silicon steels, steels with low contraction, etc.). The data are provided in percentages (%). There is no information available for the first years of the 1960's, when production was not very significant.

C. Total steel consumption

Item 7 to 11. The measure used for production of the Brazilian steel consuming sectors is the value addes of production, in million of US dollars of 1980. It was not possible to obtain physical production data by sectors.

The data were partly provided by the Instituto Brasileiro de Geografia y Estadísticas - IBGE - (Brazilian Institute of Geography and Statistics), of the Ministry of Industry and Trade and partly by the Getulio Vargas Foundation. The data for 1983 were estimated according to the industrial production indexes of the October 1982-September 1983 period provided by the IBGE.

Item 1? to 16. The information about steel consumption by sectors corresponds to the following sources: for 1969, a special study prepared in 1970 by Tecnometal Estudos e Projetos Industriais S.A. about the Brazilian steel market, requested by the Instituto Brasileiro de Siderurgia - IBS - (Bra-. zilian Iron and Steel Institute) corresponding to a survey that included a direct questionaire to final steel consumers and distributors. The figures reflect direct actual steel consumption by sectors. For 1972, 1975, 1980 and 1982, CONSIDER (Conselho da Siderurgia e Não Ferrosos)'s series of direct actual steel consumption, distributed by sectors, according to statistical information from the IBS's yearbooks. Since the classifications of the above organizations do not correspond exactly to the sectors required in UNIDO's questionaire, it was necessary to group the figures of the different sub-sectors to form each final consuming sector according to a selective criterium. For example, the sector "manufacture of transport equipment" (384) includes the steel consumed by the sub-sectors: car, railway, shipbuilding and planebuilding industries and manufacture of parts and spare parts for automotives and tractors. The sector of non-electrical machinery includes agricultural and road machinery and industrial machinery and equipment. The metallic product manufacturing sector (381) includes wire drawing facilities (wires, nails, etc.), welded tube, manufacturing facilities, tinplate-containers (cylinders and drums) and plate re-rollers.

Item 17. The 1969 data were taken from the Tecnometal study. The 1972 to 1982 data are from CONSIDER. These data on actual consumption of finished steel products were obtained by the algebraic sum of sales for domestic market by steelworks (including imports), direct imports and variations in stored supplies (of consumers or dealers). It was not possible to make a breakdown in alloy steels, non-alloy steels and heat treated steels. The item "Cold rolled flat products" includes coated plates. "Heavy long products" includes medium and heavy shapes and rails. "Light long products" includes reinforcing bars, wire rod and bars for other uses.

The figures given in item 17 correspond .to actual consumption of final steel products in Brazil, determined by CONSIDER. They do not include data on semi-finished steel products neither of cast steel or cast iron products. There are not data available on actual steel consumption before 1969 because no in-depth studies had been made of sectorial demand.

Item 18. Final actual steel utilization is equal to the direct actual steel
consumption minus the balance of indirect trade of steel manufactured products.
These latter include imports and exports of tools, machines and mechanical
and electrical devices (motors, assemblies, etc.), transport material and
other products that contain steel.

Item 19. The final actual steel consumption was calculated by the algebraic
subtraction of the balance of indirect trade of steel in all goods from the
figures for direct actual consumption. The import and export items as regards
the steel products contained in them were calculated to determine indirect
steel trade.

Item 22. Corresponding to the actual consumption data of end steel products
of the non-electrical machinery sector, in thousands of tons. The figures
for "long products" include bars, wire rod and light, medium and heavy sec-
tions but do not include seamless tubes.

Item 26. Corresponding to available data on actual steel consumption of the
agricultural machinery and equipment sub-sector, including also the steel
consumed in tractors and agricultural implements other than machinery.

Items 23 to 25 and 27 to 43. There are no specific data about steel losses
as percentage of steel consumption. There are only global indicators of
steel losses in the transformation process from ingots to end products, which
are estimated in 25 to 30% for "long products", 35 to 40% for "flat products"
and 43% for "tin plates".

The available information does not allow a breakdown of steel consumption for
sub-sectors like ISIC 3823, 3824, 3825 and 3829 since it is differently grouped.
For instance, mechanical machinery includes the consumption of steel products
in machinery for the following industrial sectors: mining, metallurgy, wood,
paper, chemical, electric power, cement, textiles, sugar, etc. The same
happens with the information available for other sub-sectors.

Neither is it possible to have activity data on the sub-sectors of the non-
electrical machinery sector (items 36 to 42) since these were not calculated
in the 1960's and it is assumed that the information of the last decade is
being investigated by the official economic organizations (Ministry of Industry
and Trade).

General

Answers to the questions.

1. Actual steel consumption is equal to the algebraic sum of the companies' sales to the domestic market (including these latter imports), plus direct imports, plus (or minus) the variations in stocks (consumers' and distributors'). The consumption of a steel consuming sector is measured in Brazil by the sum of the consumptions of the different sub-sectors (see note in items 12 to 16).

2. The production of a steel consumer sector is measured by the value added of this latter's total production, in terms of constant dollar (constant US dollars).

3. I believe that the most accurate approximation to analize the evolution of specific annual steel consumption is the quotient between final actual steel consumption (item 19) and the total production of the steel consumer sectors (expressed in constant values). Both should be measured in indexes.

Final comment
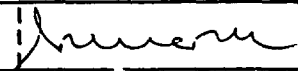
The little statistical information available about production of the steel user sectors during the 1960's, which is always globalized under the title "production of the manufacturing industry" and the complete absence of actual steel consumption data for those years hinders an analysis of the evolution of the variables described. For the rest, the information appears rather dispersed by sectors, although it has been possible to compile it and tabulate it for some years. If you want a more profound review for the sub-sectors, it should be made with the help of the country's official organizations (mainly CONSIDER, IBS and the Ministry of Industry and Trade).

***

STUDY ON THE EVOLUTION OF THE

SPECIFIC CONSUMPTION OF STEEL

QUESTIONNAIRE

Please return this questionnaire to the Sectoral Studies Branch, IS, of UNIDO by 10 January 1984.

Country	Venezuela	Name and function of official responsible for reply	Aníbal Gómez García, Secretary General Instituto Latinoamericano del Fierro y el Acero (ILAFA)
Date sent	March 16, 1984	Official address (in full)	Darío Urzúa 1994, Santiago 9, P.O. Box 16065, Santiago – CHILE
Signature			

Before starting to answer the questions, please read the entire questionnaire and the explanatory notes.

Introduction

In view of the difficulty of providing the extremely detailed data for this type of study, the ad hoc meeting on the evolution of the specific consumption of steel on 19 and 20 October 1981 decided that "the questionnaire should cover one sector common to all countries and another sector selected by each country for its particular importance in that country's national economy".

Countries are therefore asked to select another steel-consuming sector and make an analysis similar to that which is requested for the non-electrical machinery industry (Part D of this questionnaire), using all the types of information which are available but which cannot be collected in a systematic way by means of a general questionnaire.

Further, countries are asked for a qualitative assessment and explanations of the trends observed in steel consumption.

A. General

1. How do you measure the steel consumption of a steel-consuming sector in your country and how is it defined (see footnote 6)? Please provide the relevant data for each individual steel-consuming sector according to the ISIC (International Standard Industrial Classification), Statistical Papers, M. No.4, Rev.2, Add.1, UN, 1971 (see footnote 3 (b)).

2. How is the production of a steel-consuming sector measured in your country and how is it defined (see footnote 3 (a) and (b))? Please provide the relevant data for each individual steel-consuming sector, and formulate your answer as for question 1.

3. Which combination of the measures and the definitions of the steel consumption (question 1) and of the production of a steel-consuming sector (question 2) is, in your opinion, the most accurate approach to analysing the evolution of the specific consumption of steel?

4. Are there any studies available in your country on specific consumption of steel, measured in terms of steel intensities or in any other way? (Compare the measure of specific steel consumption given in question 43).

lg/ind/82/17 (a)
GE.82-24174

Steel production

Item	Unit	Actual data in unit indicated 1/																							
		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
5. The share of alloy steel in total steel production 2/	1.000 t	–	n.a.	n.a.	n.a.	n.a.	20		33	55	50	67	34	28	–	–	–	12	–	–	–	–	–	–	
	%	–					3.2		4.8	6.3	5.9	7.2	3.7	2.5	–	–	–	1.3	–	–	–	–	–	–	
6. The share of secondary refined steels in ladles in total steel production, and an indication of which steels are secondary refined 2/	%	–					–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	

n.a. = not available

It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year.

Kindly define the coverage of "total steel production" and give the definition of crude steel which is in use in your country.

Item	Unit	Actual data in unit indicated 1/																					1981	(**) 1982	1983
		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980			
Production of the steel-consuming sectors which are defined in terms of ISIC: 3/	Million of Bolivares																								
7. 381 – Manufacture of fabricated metal products, except machinery and equipment	value at 1x000.$	363	393	544	619	751	830	803	904	828	877	1109	1115	1116	1157	1665	1615	1901	2573	2178	3068	2896	3018	2765	n.a.
8. 382 – Manufacture of machinery except electrical	"	15	16	23	26	34	47	52	59	153	169	180	195	202	208	243	295	322	322	215	226	248	309	337	n.a.
9. 383 – Manufacture of electrical machinery, apparatus, appliances and supplies	"	*	*	*	*	*	*	*	*	550	565	561	685	820	819	1013	1226	1518	1530	728	835	966	976	1008	n.a.
10. 384 – Manufacture of transport equipment	"	138	152	151	230	379	504	521	490	1336	1514	1544	1735	1878	2064	2468	3409	4158	3992	1413	1247	1302	1628	1694	n.a.
11. 500 – Construction	"	3283	2470	2566	2887	3393	3807	4248	4573	4817	4834	4630	5744	7527	9069	10567	14767	19646	27280	33996	35035	34382	36990	38383	n.a.
Steel consumption of the steel-consuming sectors which are defined in terms of ISIC: 4/(***)																									
12. 381 – Manufacture of fabricated metal products, except machinery and equipment	1 000 t										140						512					905		825	
13. 382 – Manufacture of machinery except electrical	1 000 t										14						11					24		7	
14. 383 – Manufacture of electrical machinery, apparatus, appliances and supplies	1 000 t										3						8					10		13	
15. 384 – Manufacture of transport equipment	1 000 t										30						80					102		62	
16. 500 – Construction	1 000 t										566						829					805		733	

(*) Included in 382. (**) Preliminary figures. (***) There are other steel-consuming sectors, as Mining, Petroleum industries, etc.

n.a. = not available.

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year. Metric tons should be given throughout.

3/ (a) The preferred measure of production of a steel-consuming sector is the product value at constant producers' prices (use 1975 as the year of reference); if you can provide data in the total product weight of the end product, please give both. If you cannot provide the data in the form of the above given measures, please give any other available data, such as:
   – the number of units of the end product, their breakdown and their average weight;
   – some production indices based on value added;
   – any other measure (please specify it).
(b) It is desirable to define the steel-consuming sectors according to the ISIC (International Standard Industrial Classification), Statistical Papers, M. No.4, Rev.2, Add.1, UN, 1971, but since the nomenclature of the sectors is often different in different countries, it will be sufficient to give the existing national data obtained from the steel-consuming organizations. In this case, please indicate the coverage of each sector and its corresponding production by weight or volume, specifying the unit of measurement used.

4/ Data on steel consumption of the sectors are requested for any single year to serve as weights for calculating an index of the evolution of the sectors. The year chosen should be one of the years given in the other tables. Please supply the tonnages of actual direct or final steel consumed, as explained in footnote 5, even if they are approximate. Kindly specify to which series of steel consumption the supplied data refers.

Item	Unit	Actual data in unit indicated 1/																						
		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Total actual consumption of finished steel products in the whole country 5/																									
17. Direct actual steel consumption, total	1 000 t										943						1815					2281		2271	
– of which alloy steels	1 000 t																								
– of which non-alloy steels	1 000 t																								
– of which seamless tubes	1 000 t										180						160					214		465	
– of which hot-rolled flat products	1 000 t										25						430					553		393	
– of which cold-rolled flat products	1 000 t										333						462					526		507	
– of which heavy long products (medium and heavy shapes)	1 000 t										76						93					273		157	
– of which light long products	1 000 t										329						670					715		744	
18. Final actual steel utilization	1 000 t										1297						2582					3165			
19. Final actual steel consumption	1 000 t										1184						2332					2884			
20. Indirect imports, total 5/	1 000 t									363	356						782					912			
– of which final steel products	1 000 t									243	242						527					622			
– of which products of first transformation and other intermediate goods	1 000 t																								
21. Indirect exports, total 5/	1 000 t									2	2						15					28			
– of which final steel products	1 000 t									1	1						10					20			
– of which products of first transformation and other intermediate goods	1 000 t																								

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year. Metric tons should be given throughout.

5/ The data on actual consumption covers the total consumption of finished steel products on the consumer side. It must not be confused with the direct apparent steel consumption which is calculated by adding imports to and subtracting exports from the domestic production of finished steel products. The actual consumption of finished steel is defined as follows:
- Direct actual steel consumption is calculated by subtracting the increase in merchants' and users' stocks of finished products and semis from apparent steel consumption;
- Final actual steel utilization is equal to the direct steel consumption minus the balance of indirect trade of products of first transformation and the other intermediate goods (such as forgings, engines, ball-bearings, etc.). This final use of steel includes consumption of transformed finished steel products, those sub-contracted and components from other industries, as explained in footnote 6. If it is possible to obtain a series relating to the final use of steel, these data are preferable to the series of direct actual consumption only.
- Final actual steel consumption is calculated by algebraic subtraction of the balance of indirect trade of steel in final goods from the figures for final actual utilization or by algebraic subtraction of the balance of indirect trade of steel in all goods from the figures for direct actual consumption.
Please differentiate between steel industry products and products of first transformation in accordance with the ISIC definition (International Standard Industrial Classification, Statistical Papers, M. No.4, Rev.2, Add.1, UN, 1971).

5. Steel consumption by sector

Item	Unit	Actual data in unit indicated 1/																							
		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Steel and iron consumption of the steel-consuming sector: 6/ ISIC - 382 Non-electrical machinery																									
22. Total	1 000 t										14						11					24		7	
- of which flat products	1 000 t										13						8					17		4	
- of which long products	1 000 t										1						3					7		3	
- of which tubes (only seamless tubes)	1 000 t										-						-					-		-	
- of which steel castings	1 000 t										n.a.						n.a.					n.a.		n.a.	
- of which forgings	1 000 t										n.a.						n.a.					n.a.		n.a.	
- of which cast-iron products	1 000 t										n.a.						n.a.					n.a.		n.a.	
23. Steel losses as a percentage of steel consumption	%																								
Steel and iron consumption of the steel-consuming sub-sector: 6/ ISIC-3821 Engines and turbines																									
24. Total	1 000 t																								
- of which flat products	1 000 t																								
- of which long products	1 000 t																								
- of which tubes	1 000 t																								
- of which steel castings	1 000 t																								
- of which forgings	1 000 t																								
- of which cast-iron products	1 000 t																								
25. Steel losses as a percentage of steel consumption	%																								

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year. Metric tons should be given throughout.

6/ The preferred measure of steel consumption of a steel-consuming sector is steel delivered to the sector by weight, which is defined as direct purchases of finished steel.
Direct purchases of finished steel by a steel-using industry must comprise direct deliveries by the domestic steel industry + direct deliveries by the sector of first transformation, if not included in the domestic steel industry + deliveries by steel traders + direct imports by the steel-using industry + deliveries by assembly plants, foreign subsidiaries, or other steel-using industries.

If you cannot provide the data on direct purchases of finished steel defined as above, please give any other available data about the measure of input of steel, such as: steel used in production of the end product of sector; steel contained in the end product; any other measure.

If you use any other unit of measurement than tonnage, please specify it. Kindly define the product coverage of "total steel and iron consumption".

Item	Unit	Actual data in unit indicated 1/																							
		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Steel and iron consumption of the steel-consuming sub-sector: 6/ ISIC-3822 Agricultural machinery and equipment																									
26. Total	1 000 t																								
– of which flat products	1 000 t																								
– of which long products	1 000 t																								
– of which tubes	1 000 t																								
– of which steel castings	1 000 t																								
– of which forgings	1 000 t																								
– of which cast-iron products	1 000 t																								
27. Steel losses as a percentage of steel consumption	%																								
Steel and iron consumption of the steel-consuming sub-sector: 6/ ISIC-3823 Metal and wood working machinery																									
28. Total	1 000 t																								
– of which flat products	1 000 t																								
– of which long products	1 000 t																								
– of which tubes	1 000 t																								
– of which steel castings	1 000 t																								
– of which forgings	1 000 t																								
– of which cast-iron products	1 000 t																								
29. Steel losses as a percentage of steel consumption	%																								

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year. Metric tons should be given throughout.

6/ The preferred measure of steel consumption of a steel-consuming sector is steel delivered to the sector by weight, which is defined as direct purchases of finished steel.
Direct purchases of finished steel by a steel-using industry must comprise direct deliveries by the domestic steel industry + direct deliveries by the sector of first transformation, if not included in the domestic steel industry + deliveries by steel traders + direct imports by the steel-using industry + deliveries by assembly plants, foreign subsidiaries, or other steel-using industries.
If you cannot provide the data on direct purchases of finished steel defined as above, please give any other available data about the measure of input of steel, such as: steel used in production of the end product of sector; steel contained in the end product; any other measure.

If you use any other unit of measurement than tonnage, please specify it. Kindly define the product coverage of "total steel and iron consumption".

	Item	Unit	Actual data in unit indicated 1/																					
			1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
	Steel and iron consumption of the steel-consuming sub-sector: 6/ ISIC-3824 Special industrial machinery and equipment (except 3823)																										
30.	Total	1 000 t																								
	- of which flat products	1 000 t																								
	- of which long products	1 000 t																								
	- of which tubes	1 000 t																								
	- of which steel castings	1 000 t																								
	- of which forgings	1 000 t																								
	- of which cast-iron products	1 000 t																								
31.	Steel losses as a percentage of steel consumption	%																								
	Steel and iron consumption of the steel-consuming sub-sector: 6/ ISIC-3825 Office computers and accounting machinery																										
32.	Total	1 000 t																								
	- of which flat products	1 000 t																								
	- of which long products	1 000 t																								
	- of which tubes	1 000 t																								
	- of which steel castings	1 000 t																								
	- of which forgings	1 000 t																								
	- of which cast-iron products	1 000 t																								
33.	Steel losses as a percentage of steel consumption	%																								

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year. Metric tons should be given throughout.

6/ The preferred measure of steel consumption of a steel-consuming sector is steel delivered to the sector by weight, which is defined as direct purchases of finished steel.
Direct purchases of finished steel by a steel-using industry must comprise direct deliveries by the domestic steel industry + direct deliveries by the sector of first transformation, if not included in the domestic steel industry + deliveries by steel traders + direct imports by the steel-using industry + deliveries by assembly plants, foreign subsidiaries, or other steel-using industries.
If you cannot provide the data on direct purchases of finished steel defined as above, please give any other available data about the measure of input of steel, such as: steel used in production of the end product of sector; steel contained in the end product; any other measure.
If you use any other unit of measurement than tonnage, please specify. Kindly define the product coverage of "total steel and iron consumption".

Item	Unit		Actual data in unit indicated 1/																							
		1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
Steel and iron consumption of the steel-consuming sub-sector: 6/ ISIC-3829 Machinery, non-electrical, not elsewhere classified																									
34. Total	1 000 t																								
– of which flat products	1 000 t																								
– of which long products	1 000 t																								
– of which tubes	1 000 t																								
– of which steel castings	1 000 t																								
– of which forgings	1 000 t																								
– of which cast-iron products	1 000 t																								
35. Steel losses as a percentage of steel consumption	%																								

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year. Metric tons should be given throughout.

6/ The preferred measure of steel consumption of a steel-consuming sector is steel delivered to the sector by weight, which is defined as direct purchases of finished steel.

Direct purchases of finished steel by a steel-using industry must comprise direct deliveries by the domestic steel industry + direct deliveries by the sector of first transformation, if not included in the domestic steel industry + deliveries by steel traders + direct imports by the steel-using industry + deliveries by assembly plants, foreign subsidiaries, or other steel-using industries.

If you cannot provide the data on direct purchases of finished steel defined as above, please give any other available data about the measure of input of steel, such as: steel used in production of the end product of sector; steel contained in the end product; any other measure.

If you use any other unit of measurement than tonnage, please specify it. Kindly define the product coverage of "total steel and iron consumption".

	Item	Unit	Actual data in unit indicated 1/																							
			1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983
	Production or some other measure of activity of the steel-consuming sector: 3/ ISIC-382 Non-electrical machinery																									
36.	3821 - Engines and turbines	value or 1 000 t																								
37.	3822 - Agricultural machinery and equipment	"																								
38.	3823 - Metal and wood-working machinery	"																								
39.	3824 - Special industrial machinery and equipment (except 3823)	"																								
40.	3825 - Office computers and accounting machinery	"																								
41.	3829 - Machinery, non-electrical, not elsewhere classified	"																								
42.	382 - Total	"																								
43.	Evolution of steel weight in certain types of machinery containing steel 7/	% or kg/kg																								

1/ It would be preferred if investigation were undertaken of long time series from 1960 to 1980 in absolute figures and covering every year. However, if this is not possible, countries are requested to provide data for every fifth year. Metric tons should be given throughout.

3/ (a) The preferred measure of production of a steel-consuming sector is the product value at constant producers' prices (use 1975 as the year of reference); if you can provide data in the total product weight of the end product, please give both. If you cannot provide the data in the form of the above given measures, please give any other available data, such as:
   - the number of units of the end product, their breakdown and their average weight;
   - some production indices based on value added;
   - any other measure (please specify it).

(b) It is desirable to define the steel-consuming sectors according to the ISIC (International Standard Industrial Classification), Statistical Papers, M. No.4, Rev.2, Add.1, UN, 1971, but since the nomenclature of the sectors is often different in different countries, it will be sufficient to give the existing national data obtained from the steel-consuming organizations. In this case, please indicate the coverage of each sector and its corresponding production by weight or volume, specifying the unit of measurement used.

7/ It is desirable to give any available data about the evolution of conversion coefficients for converting actual weight of steel contained goods of the ISIC-382 group of products into finished steel equivalents.

If you cannot provide these data, please give evolution of steel weight in kg per kg of total weight of any other types of goods, such as automobiles, tractors, etc.

Please use additional space for a qualitative assessment and explanations of the trends observed in your country's steel consumption.

NOTES TO THE QUESTIONAIRE   - VENEZUELA

B. Steel production

Item 5. "Total steel production" covers total crude steel manufacture, including
high, medium and low carbon steels and alloy steels, be these or not submitted to
in-ladle secondary refining or to other kinds of further metallurgical processes.

"Crude steel" refers to steel expressed in ingots produced, to continuously cast
products and to "steel for castings". In this latter case, the volume considered
is the content of the ladle. The data are provided in thousands of tons and in
percentages (%).

Item 6. Under steels submitted to in-ladle secondary refining are those submitted
to processes outside the steelmaking furnace, such as vacuum degassing, refining
in ladle or in special vessels and some special technologies for ingot production.

No secondary refined steel has been produced in Venezuela from 1960 to 1982. If
it had been produced in some of those years, it was not a significant amount.

C. Total steel consumption

Items 7 to 11. The measure used for the production of Venezuelan steel consuming
sectors is the total value of production, at current prices, in millions of bolivares.
It was not possible to obtain the value added of production or physical production
data by sectors.

The data were provided by the Central Bank of Venezuela. The data for 1983 were
not available. The data for item 383, "Manufacture of electrical machinery..."
from 1960 to 1967 were included in item 382.

Items 12 to 16. The information about steel consumption by sectors corresponds to
the following sources: for 1969, a special study prepared in 1971 by C.V.G. Siderúr-
gica del Orinoco C.A. (SIDOR). For 1975 and 1980, the data were partly estimated
from a sectorial breakdown and other data supplied by SIDOR. For 1982, special
study prepared in 1983 by SIDOR. There were other steel consuming sector, as the
Mining, and Petroleum industries, which were excluded from this part of the
questionaire but not from total actual consumption.

Item 17. The 1969 and 1982 data were taken directly from the Market Research Department of SIDOR in Caracas. The 1975 to 1980 data were partly estimated from data supplied by SIDOR. These data on actual consumption of finished steel products were obtained by the algebraic sum of sales for domestic market by steelworks (including imports), direct imports and variations in stored supplies (of consumers or dealers). It was not possible to make a breakdown in alloy · steels, non-alloy steels and heat treated steels. The item "Cold rolled flat products" includes coated plates. "Heavy long products" includes medium and heavy shapes and rails. "Light long products" includes reinforcing bars, wire rod and bars for other uses.

The figures given in item 17 correspond to actual consumption of final steel products in Venezuela. They do not include data on semi-finished steel products neither of cast steel or cast iron products. There are no data available on actual steel consumption before 1969 because no in-depth studies had been made of sectorial demand.

Item 18. Final actual steel utilization is equal to the direct actual steel consumption minus the balance of indirect trade of steel manufactured products. These latter include imports and exports of tools, machines an mechanical and electrical devices (motors, assemblies, etc.), transport material and other products that contain steel.

Item 19. The final actual steel consumption was calculated by the algebraic subtraction of the balance of indirect trade of steel in all goods from the figures, for direct actual consumption. The import and export items as regards the steel products contained in them were calculated to determine indirect steel trade.

Item 22. Corresponding to the actual consumption data of end steel products of the non-electrical machinery sector, in thousands of tons. The figures for "long products" include bars, wire rod and light, medium and heavy sections but do not include seamless tubes.

Items 23 to 43. There are no specific data about steel losses as percentage of steel consumption. There are only global indicators of steel losses in the transformation process from ingots to end products, which are estimated in 25 to 30% for "long products", 35 to 40% for "flat products" and 43% for "tin plates". The available information does not allow a breakdown of steel consumption for sub-sectors like ISIC 3823, 3824, 3825 and 3829 since it is differently grouped. For instance, mechanical machinery includes the consumption of steel products in machinery for the following industrial sectors: mining, metallurgy, wood, paper, chemical, electric

power, cement, textiles, sugar, etc. The same happens with the information available for other sub-sectors.

There are no data available about the activity in the sub-sectors of the non-electrical machinery sector (items 36 to 42) because no studies have been carried out to that respect.

General

Answers to the questions

1. Actual steel consumption is equal to the algebraic sum of the companies' sales to the domestic market (including these latter imports), plus direct imports, plus (or minus) the variations in stocks (consumers' and distributors'). The consumption of a steel consuming sector is measured in Venezuela by the sum of the consumption of the different sub-sectors.

2. The production of a steel consumer sector is measured by the total value of the production, in terms of current bolivares.

3. I believe that the most accurate approximation to analize the evolution of specific annual steel consumption is the quotient between final actual steel consumption (item 19) and the total production of the steel consumer sectors (expressed in constant values). Both should be measured in indexes.