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D04543



Distr.
LIMITED

ID/WG.113/44
16 January 1973

ENGLISH
ORIGINAL: SPANISH

United Nations Industrial Development Organization

Regional Seminar on Machine Tools
for Countries in Latin America

Buenos Aires, Argentina
16 - 25 October 1972

Sao Paulo, Brazil
26 - 27 October 1972

**SOME COMMENTS ON DECISION NO. 57 OF THE
CARTAGENA AGREEMENT**

**Sectoral industrial development programme for the
metalworking and engineering sector ^{1/}**

10 July - 20 August 1972, Lima, Peru

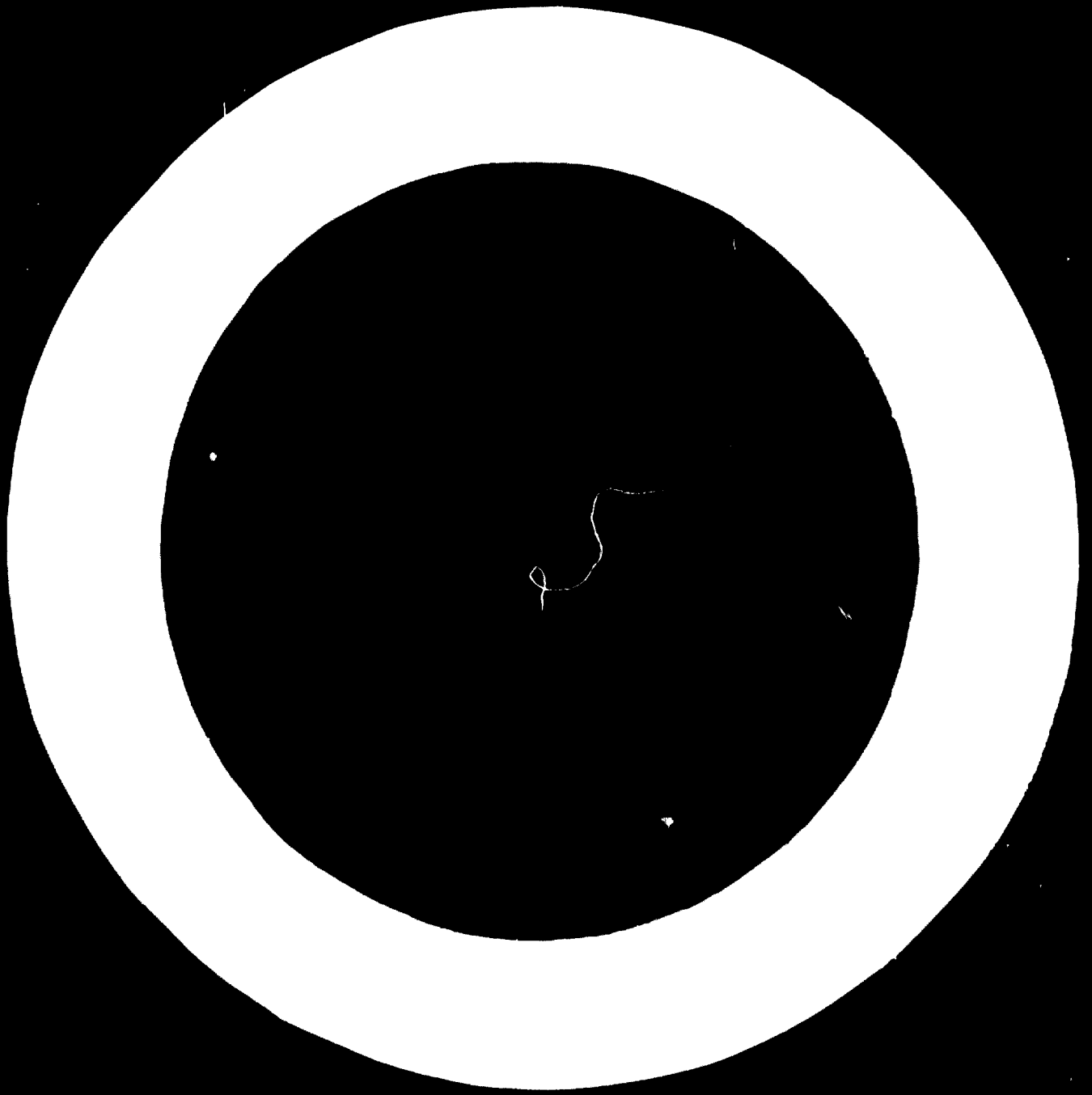
by

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^{1/} The views and opinions expressed in this paper are those of the author and do not necessarily reflect the views of the secretariat of UNIDO.

id.72-7372

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Buenos Aires

16-27 October 1972

REGIONAL SEMINAR ON MACHINE TOOLS FOR COUNTRIES IN LATIN AMERICA

SOME COMMENTS ON DECISION No. 57 OF THE
CARTAGENA AGREEMENT

Sectoral industrial development programme for the
metalworking and engineering sector

10 July - 20 August 1972, Lima, Peru ^{1/}

Working paper submitted by Carlos Martín-Alcalá,
UNIDO Consultant, Industrial Policies and
Programming Division, for the investment promotion
programme of the Regional Seminar on Machine Tools
for countries in Latin America

Buenos Aires, 16 - 25 October 1972

^{1/} Data from document JUN/PROPUESTA 26 and Decision No. 57 of the Board of the Cartagena Agreement.

Number	Designation
31.1	Dental apparatus (shared with Colombia)
31.2	Medical and surgical apparatus (shared with Colombia)
35.2	Hermetically sealed compressor units for refrigeration (shared with Colombia)

1-4 ECUADOR:

Number	Designation
7	Machinery for the dairy industry
12.1	Drill bits, reamers, etc.
14	Hydraulic presses
16	Reciprocating chip-removal machines
22.2	Forming presses for the plastics industry
24	Measuring and checking instruments (electrical or electronic)
26	Centrifuges
28.1	Electrical circuit-breaking apparatus of less than 1,000 volts (shared with Bolivia)
32	Clocks, watches, etc.
34	Hydraulic systems
35.12	Pressure gauges

1-5 PERU:

Number	Designation
3.2	Packing and wrapping machinery
4	Machinery for the ceramics industry
5.1	Lifting machinery; tackle, hoists and winches
8.1	Generators and motors (shared with Chile)
8.2	Rectifiers (shared with Chile)
8.3	Transformers (shared with Chile)
9.2	Machinery for the production and processing of oils, soap, etc.
13	Mechanical presses

Number	Designation
19.1	Drilling machines
21.1A	Drill bits for mining (shared with Chile)
21.1B	Complete drills
21.3	Boring apparatus
21.4	Crushers, etc.
21.5	Centrifugal pumps and turbo-pumps (shared with Chile and Colombia)
25.2	Fuel-dispensing pumps
28.2	Electrical circuit-breaking apparatus of more than 1,000 volts
29.1	Drawing and calculating instruments
33	Variable speed gears
35.1	Gas containers
35.3	Semi-hermetic compressors for refrigeration
35.5	Evaporators "roll-bond"
35.9	Manual looms (shared with Colombia and Chile)
35.11	Still projectors
35.13	Thermostats
35.14	Taximeters and parking meters

2-0 DESCRIPTION OF THE CATEGORIES ALLOCATED COVERED BY THIS REPORT

2-1 BOLIVIA:

Number	Designation
2.2	Pneumatic tools
12.2	Tapping tools
12.3	Sintered plates, rods, etc.
19.2	Radial drilling machines and tapping machines
20	Sawing machines

Description and economic and commercial information

2-2 Pneumatic tools

Pneumatic tools for placing and removing screws, bolts and nuts

NABANDINA: 84.49.01.02

NABALALC: 84.49. 1.02

Common external tariff: 75 per cent ad valorem

Existing production: Colombia (as one of various lines of production of an enterprise)

- Parts for pneumatic tools for placing and removing screws, bolts and nuts

NABANDINA: 84.49.90.00

NABALALC: 84.49. 8.01

Common external tariff: 65 per cent ad valorem

Existing production: Colombia (as one of several lines of production of an enterprise)

Subregional demand for 1967: US\$500,000 (current prices)

Projection of demand for 1972: US\$770,000 (1970 prices)

Projection of demand for 1980: US\$1,080,000 (1970 prices)

Annual rate of growth for 1972-1980: 10.2

Proportion of demand met by the subregion: 1980 = 60 per cent

Proportion of inputs imported directly in the form of parts and components: 50 per cent of the value of production (1980)

Value of production for 1980: US\$1,180,000 (1970 prices)

Type of allocation: Exclusive

12.2 Tapping tools

This comprises tools with characteristics similar to those described in the group covering drills, broachers, etc., except that the main purpose of the tools included under this heading is internal or external tapping, and the main products are threading taps, tap dies and chasers.

NABANDINA: 82.05.89.00

NABALALC: 82.05.05.99

Common external tariffs: 45 per cent ad valorem

Existing production: None identified in the subregion

Demand in the subregion for 1967: US\$900,000 (current prices)

Projection of demand for 1972: US\$1,470,000 (1970 prices)

Projection of demand for 1980: US\$3,800,000 (1970 prices)

Annual rate of growth for 1972 - 1980: 12.6

Proportion of demand satisfied by the subregion: 70 per cent by 1980

Proportion of inputs imported directly as parts and components: 10 per cent of the value of production for 1980

Value of production for 1980: US\$2,660,000 (1970 prices)

Type of allocation: Exclusive

12.3. Sintered plates, rods, etc.

Other plates, rods, tips and similar objects made of metal carbides, except tungsten carbide.

NABANDINA: 82.07.89.00

NABALALC: 82.07.0.01

Common external tariffs: 45 per cent ad valorem

Existing production: None identified in the subregion

General description of products

The objects comprised by this group are made of metal carbides (products obtained directly in the electric furnace from carbon and metallic elements such as molybdenum, titanium, tantalum, vanadium, niobium, etc.), agglomerated by sintering, generally using another metal, called an auxiliary, which plays the part of binder (usually cobalt or nickel) in a hydrogen atmosphere or a vacuum. These metal carbides are formed into plates or parts with various shapes (rods, tips, tablets, rings, etc.) and are sintered pseudo-alloys which have great cold and hot hardness and a very high resistance to bending.

In view of these special properties, these objects are used a great deal in the production of tools, to which they are welded. Owing to their great cutting speed, the tools are used for working metals and other hard materials. These items may or may not be sharpened or prepared in some other way for attachment to the tools, but in order to be included in this allocation, they must not be mounted.

Demand in the subregion for 1967: US\$100,000 (current prices)
Projection of demand for 1972: US\$150,000 (1970 prices)
Projection of demand for 1980: US\$390,000 (1970 prices)
Annual rate of growth for 1972 - 1980: 12.6
Proportion of demand met subregionally: 20 per cent by 1980
Proportion of inputs imported directly as parts and components: None
Value of production for 1980: US\$80,000 (1970 prices)
Type of allocation: Exclusive

19.2. Radial drilling machines and tapping machines

Products

Radial drilling machines, boring machines, etc. (except those included in the first part of the common list)

NABANDINA: 84.45.03.00

NABALALC: 84.45. 5.01 (99)

Common external tariff: 60 per cent ad valorem

Tapping and threading machines

NABANDINA: 84.45.04.00

NABALALC: 84.45. 5.99

Common external tariff: 70 per cent ad valorem

Parts and components for tapping and threading machines

NABANDINA: 84.48.00.00

NABALALC: 84.48. C.01

Common external tariff: 55 per cent ad valorem

Existing production for the whole category allocated: None identified as yet.

General description of the products

Radial drills: These are drills in which the relative positions of the spindle of the tool and the body of the machine may vary as the spindle moves radially along an arm mounted on a saddle, which can itself rotate around the vertical axis of the machine.

Tapping machines: These are machines specifically intended for the production of internal and external screw threads using threading taps, dies and chasers.

Exclusion: Thread millers, threading lathes, thread grinding machines and machines specifically intended for the threading of screws and nuts, thread rolling machines and boring mills are excluded.

Demand in the subregion for 1967: US\$250,000 (current prices)

Projection of demand for 1972: US\$690,000 (1970 prices)

Projection of demand for 1980: US\$4,520,000 (1970 prices)

Annual rate of growth for 1972-1980: 26.6

Proportion of demand met by the subregion: 20 per cent by 1980

Proportion of inputs imported directly as parts and components: 20 per cent

Value of production for 1980: US\$900,000 (1970 prices)

Type of allocation: Exclusive

20. Sawing machines

Product

Saws

NABANDINA: 84.45.06.00

NABALALC: 84.45.7

Common external tariff: 65 per cent ad valorem

Parts and components for saws

NABANDINA: 84.48.00.00

NABALALC: 84.48.0.01

Common external tariff: 55 per cent ad valorem

Existing production: Production of the simplest types has been identified in Chile, Colombia and Peru.

General description of products

This group consists of machines for sawing metals, including hack saws, band saws and circular saws.

Cutting machines which use high-speed metal discs which cut by fusion or abrasive discs are also included in this group.

Demand in the subregion for 1967:	US\$300,000 (current prices)
Projection of demand for 1972:	US\$560,000 (1970 prices)
Projection of demand for 1980:	US\$1,800,000 (1970 prices)
Annual rate of growth for 1972-1980:	13.1
Proportion of demand met by the subregion:	20 per cent by 1980
Proportion of inputs imported directly as parts and components:	10 per cent
Value of production for 1980:	US\$360,000 (1970 prices)
Type of allocation:	Exclusive

In Bolivia, productive activity in the metalworking and engineering sector is now in the beginning stages. In view of the fact that this sector has wide application in the field of mining, workshops have been developed for founding and rough machining for the purpose of maintaining mining equipment.

To take advantage of the proposed allocations, the country will have to improve its foundry work and its technologies; forging should be developed at almost all levels of technology, and heat treatment, which is now in an initial and uncertain stage, must be developed at a high level of technology.

As a consequence of the allocations made, Bolivia will have to undertake the manufacturing of dies and jigs of all degrees of technological sophistication and machining will have to be developed to meet the requirements of finishing, adjustments and tolerances.

The foregoing indicates that Bolivia will have to develop the highest levels of technology in founding, forging, heat treatment, machining and the manufacturing of dies and jigs. Although a great effort will be demanded of the country to acquire these technologies and train specialists at all levels, it will mean that the country will achieve technological levels similar to those of industrialized countries.

An analysis of the allocations for Bolivia makes it possible to predict that the country's main line of production will be compressed air equipment.

2-2 COLOMBIA:

Number	Designation
9.1	Machinery for the bakery and cocoa industries
11	Scissors, blades, etc.
17	Forging machines
18	Surface-finishing machines
22.1	Machinery for the plastics industry
31.1	Dental apparatus (shared with Chile)
31.2	Medical and surgical apparatus (shared with Chile)
35.8	Sewing machines (shared with Chile)
35.16	Machinery for the production of footwear and other leather manufactures

Description and economic and commercial information

9.1 Machinery for the bakery and cocoa industry

Products

Machinery and equipment for the bakery, pastry and biscuit industries

NABANDINA: 84.30.01.00

NABALALC: 84.30. 1.01

Common external tariff: 50 per cent ad valorem

Machinery and equipment for the spaghetti, macaroni and noodle industry

NABANDINA: 84.30.02.00

NABALALC: 84.30. 1.01

Common external tariff: 50 per cent ad valorem

Machinery and equipment for the confectionery industry

NABANDINA: 84.30.03.00

NABALALC: 84.30. 1.01

Common external tariff: 50 per cent ad valorem

Machinery and equipment for cocoa and chocolate processing

NABANDINA: 84.30.04.00

NABALALC: 84.30. 2.01

Common external tariff: 50 per cent ad valorem

Existing productions: It is known that enrobers, kneading machines, dryers and cutters are manufactured in Chile.

General description of products

Machinery and equipment for the bakery, pastry and biscuit industries

These include:

1. Dough mixers, consisting of rotating or stationary receptacles equipped with internal mixing devices taking the form of bent arms or blades for kneading the dough.
2. Dough-dividing machines, in which the dough, delivered through a hopper, is moulded mechanically into portions of equal size. These machines sometimes also weigh and roll the dough.
3. Dough-moulding machines, for the manufacture of certain breads.
4. Slicing machines, for bread, cake, etc.
5. Special machines for crumbing bread, which crush pre-dried bread.
6. Machines for preparing, working, moulding, filling, or cutting cakes, biscuits, etc.
7. Cake depositing machines for delivering given quantities of batter into the tins, for manufacturing cakes, etc.

Machinery and equipment for preparing macaroni, spaghetti, noodles, etc.

These include in particular:

1. Mixing machines, for mixing the dough.
2. Machines for cutting and stamping out shapes from the rolled dough; these machines often have their own devices for rolling the dough.
3. Continuous presses for extruding spaghetti, macaroni, etc., and for manufacturing small soup noodles (letters, numbers, stars), cut with a revolving knife on the outside of the die plates.

4. Machines for filling ravioli, cannelloni, etc.
5. Machines for twisting spaghetti, macaroni, etc. into hanks, etc.

Machinery and equipment for confectionery

These include in particular:

1. Special mills for icing sugar.
2. Mixing machines consisting of stirring mechanisms which move in receptacles which are sometimes equipped with water coils and jackets for heating or cooling the materials during operation.
3. Sugar beating and pulling machines, for kneading and pulling plastic sugar mixtures by means of revolving bars and hooks.
4. Dragee pans, used for covering various items used in confectionery (e.g. almonds, walnuts, various hard pastries, etc.) with a hard smooth coating of sugar or chocolate. These consist essentially of hemispherical pans made of copper, or sometimes even of glass, which rotate on an inclined axis and are usually heated either by an external source of heat (hot air blast onto the pan or heating of the walls by an independent gas burner), or more rarely by incorporated heating elements (gas burner, steam coil, etc.)
5. Machines for cutting, moulding and shaping candies and various confectionery products.

Machinery and equipment for the manufacture of cocoa and chocolate

These include:

1. Machines for husking, crushing and removing the germ from roasted cocoa beans.
2. Machines for mixing and grinding the crushed beans to reduce them to a paste and grinder mills with grinding wheels or rollers to refine the paste.
3. Presses for extracting the cocoa butter from the cocoa paste, equipped with heating devices to liquify the butter, thereby facilitating its extraction.
4. Machines for producing cocoa powder, which grind the cakes left after the extraction of the cocoa butter, grade the powder and sometimes mix it with products to improve solubility and aroma.
5. Machines for mixing chocolate paste, with or without devices for measuring the cocoa powder, sugar, cocoa butter, etc.

6. Holler machines for refining the chocolate paste
7. "Conches" for grinding and kneading, consisting of vats which are usually hemispherical, equipped with heating devices and power driven grinders in which chocolate paste undergoes heat treatment and prolonged grinding.
8. Press/mills, which homogenize the chocolate paste and deliver it in regular portions, ready for moulding.
9. Chocolate moulding machines, generally equipped with vibrating tables (tappers) for preparing drops, bars, etc., sometimes equipped with auxiliary heating devices and cooling tables.
10. "Enrobing" machines, used to coat biscuits, cakes, candies, etc. with chocolate or other sugar confectionery; these machines, which always have heating elements, usually consist of a conveyor belt which dips the products into a bath or subjects them to a spray of the liquid with which they are to be coated.

Demand in the subregion for 1967: US\$1 million (current prices)
Projection of demand for 1972: US\$1,370,000 (1970 prices)
Projection of demand for 1980: US\$2,770,000 (1970 prices)
Annual rate of growth for 1972-1980: 9.2
Proportion of demand met by the subregions: 20 per cent by 1980
Proportion of inputs imported directly as parts and components: 20 per cent
Value of production for 1980: US\$7,560,000 (1970 prices)
Type of allocation: Exclusive

11. Soissors, blades, etc.

Products

Pruning shears

NABANDINA: 82.01.02.04

NABALALC: 82.01. 0.06

Common external tariff: 40 per cent ad valorem

Shears for metals

NABANDINA: 82.03.04.00

NABALALC: 82.03. 0.01

Common external tariff: 40 per cent ad valorem

Tools for masons, founders, cement-workers, plasterers and painters such as trowels, spatulas, polishers, scrapers, etc.

NABANDINA: 82.04.07.00

NABALALC: 82.04. 0.99

Common external tariff: 40 per cent ad valorem

Special tools for carpentry and cabinet-making, such as planes, smoothing planes, chisels, etc.

NABANDINA: 82.04.08.00

NABALALC: 82.04. 0.99

Common external tariff: 40 per cent ad valorem

Special tools for jewellers and watch-makers

NABANDINA: 82.04.09.00

NABALALC: 82.04. 0.10

Common external tariff: 40 per cent ad valorem

Tools for drilling, threading and tapping, such as bit braces, drills, threading taps, etc.

NABANDINA: 82.04.10.00

NABALALC: 82.04. 0.99

Common external tariff: 40 per cent ad valorem

Other hand tools

NABANDINA: 82.04.89.00

NABALALC: 82.04. 0.99

Common external tariff: 40 per cent ad valorem

Pruning and grafting knives

NABANDINA: 82.09.01.01

NABALALC: 82.09. 0.02

Common external tariff: 40 per cent ad valorem

Other penknives and blades

NABANDINA: 82.09.01.99

NABALALC: 82.09. 0.01

Common external tariff: 40 per cent ad valorem

Other blades for knives under heading 82.09, except for blades for table knives.

NABANDINA: 82.10.89.00

NABALALC: 82.10. 0.99

Common external tariff: 40 per cent ad valorem

Scissors and scissor blades

NABANDINA: 82.12.00.00

NABALALC: 82.12

Common external tariff: 40 per cent ad valorem

Pruning shears

NABANDINA: 82.13.01.01

NABALALC: 82.13. 0.01

Common external tariff: 40 per cent ad valorem

Manicure, pedicure and other similar implements

NABANDINA: 82.13.01.04

NABALALC: 82.13. 0.04

Common external tariff: 40 per cent ad valorem

Existing production: The production of ordinary scissors and some professional type scissors has been identified in Colombia.

General description of the products:

These include:

1. Pruning shears (82.01.0.06) and other similar pruning shears (82.13.0.01)

These include:

- (a) Pruning shears, usually composed of two blades articulated on a pin about three-quarters of the way along their length. One of these blades usually has a convex and the other a solid concave cutting edge. They differ from ordinary scissors in that they do not end in finger rings.

In addition, these shears almost always have a spring which forces the blades apart when they are not being pressed together and a hook or clamp lock which makes it possible to open and close the pruner easily with one hand. They have powerful cutting action. This heading includes: gardeners' and horticulturists' pruning shears, small flower and

fruit shears, vintagers' shears with straight and very sharp blades, poultry shears and choppers which have several blades, operate like shears and are used for cutting and grinding food into small pieces, etc.

2. Shears for metals, to cut metal sheets, wires, etc., such as sheet-metal workers' shears, type-setters' shears, stove-makers' shears, etc.
3. Tweezers (for watch-makers, florists, palatologists, etc.), depilating tweezers, etc.
4. Special tools for watch-makers, including tools for mounting stones or riveting wheels, balancers for wheels and springs, pivot tools, regulating tools, etc.
5. Other hand tools, including:
 - Tools for mines and quarries, mining drill bits, crowbars, stone chisels, stone drill upindles, stone wedges, etc.
 - Tools for masons, moulders, cement-workers, plasterers and painters, including trowels, palettes, stopping knives, scrapers, moulding gaggors or lifters, smoothers, cement-working rollers, knives, palettes, spatulas, palette knives, spatulas, putty knives, etc.
 - Tools for carpenters, cabinet-makers, joiners, coopers, makers of wooden shoes, wood carvers and wood engravers, including carpenters' planes, long planes and miter planes, moulding planes, grooving planes, fillisters, gravers, chisels, parquet floor planers and miter boxes without saws, etc.
 - Hand tools for drilling, threading and tapping, including bit braces, drills, bits, pawls (ratchet or locking), screw plates, tongs, etc.
6. Blades and penknives, including folding knives of all types with handles of base metal, wood, horn, synthetic plastics, etc., such as ordinary pocket knives and penknives, travellers' and campers' knives, sports and hunting knives, etc. All these articles may have one, two or more blades or other components (bodkins, corkscrews, screwdrivers, scissors, can openers, etc.); pruning knives (pocket type) for farmers and gardeners, and also grafting knives (including those for budding), etc. This heading also covers blades for the manufacture of penknives, pruning knives etc. in the crude form as they come on the dies, freed of burr, polished or completely finished.
7. Scissors and their blades; the scissors included under this sub-heading consist of two steel blades, sometimes serrated, crossed in the form of an X and jointed on a screw or a pin.

Exceptionally, the scissors may be in the form of a V with a single ring fixed on one of the blades, the other being moved by pressure from another finger. This is the case with some scissors used in the textile industry.

This sub-heading covers in particular:

- (a) Ordinary scissors for domestic uses (sewing, office, kitchen, etc.) with straight, curved or other blades.
- (b) Scissors for professional use, e.g. tailors' and dressmakers' scissors (including special button hole scissors), hairdressers' scissors (including thinning scissors), scissors for fancy goods, upholstery, glove-making, harness-making and hat-making, etc.
- (c) Scissors and pinners of all types for cutting skin and nails, including those with one side forming a file, for private individuals and manicurists.
- (d) Manicure, pedicure and other similar sets of instruments.
- (e) Pocket scissors and embroidery scissors, including folding ones; flower scissors, grape scissors and cigar-cutting scissors.
- (f) Special pinking shears, scissors for marking livestock and cutting the hooves of livestock; scissors with double sets of blades (four blades) for cutting strips of cloth; pruning scissors with two blades, one concave and one convex, which do not have the finger rings characteristic of the items under this sub-heading.

Scissor blades, including unfinished ones are also included under this heading.

Exclusion: On the other hand, the following are not covered by this allocation category:

- Shears for metals which are in the nature of machine tools;
- Interchangeable tools (drill bits, screw-threading dies, taps, etc.) intended to be mounted on drilling, threading and tapping tools.

Demand in the subregion, 1967:	US\$2,200,000 (current prices)
Projection of demand for 1972:	US\$3,510,000 (1970 prices)
Projection of demand, 1980:	US\$7,190,000 (1970 prices)
Annual rate of growth, 1972-1980:	US\$10,500,000 (1970 prices)
Proportion of demand met subregionally:	50 per cent by 1980
Proportion of inputs imported directly as parts and components:	10 per cent by 1980

Value of production, 1980:

US\$3,000,000 (1970 prices)

Type of allocation: Exclusive

17. Forging machines

Products

Forge hammers and stamping hammers

NABANDINA: 84.45.09.00

NABALALC: 84.45. 4.011.02

Common external tariff: 60 per cent ad valorem

Existing production: No production has been identified.

General description of the products

These products are machine tools which hot or cold form the material being worked, imparting to it in the process a kinetic energy which changes the crystalline structure of the material.

They may be free falling (using the kinetic energy of a weight which falls freely), i.e. drop hammers with mechanical, steam, pneumatic, hydraulic or other lift; or they may be of the forced falling type, with the energy of the free fall supplemented by a positive steam, compressed air, hydraulic or other impulse; or they may be mechanical forging presses in which the energy is transmitted by mechanical means (on a similar pattern, but on a different energy scale than in the case of presses).

In contrast to presses, which are of the continuous-action type, forging machines impart energy by means of repeated blows.

Demand in the subregion for 1967: US\$400,000 (current prices)

Projection of demand for 1972: US\$570,000 (1970 prices)

Projection of demand for 1980: US\$1,250,000 (1970 prices)

Annual rate of growth for 1972-1980: 10.3

Proportion of demand met by the subregion: 10 per cent by 1980

Proportion of inputs directly imported as parts and components: 40 per cent by 1980

Value of production, 1980: US\$130,000 (1970 prices)

Type of allocation: Exclusive

18. Surface-finishing machines

Grinding machines

NABANDINA: 84.45.07.00

NABALALC: 84.45.1.19.99

Common external tariff: 70 per cent ad valorem

Existing productions: None yet identified.

General description of the products

These products are machine tools intended to form metal parts by removing microscopic particles by means of synthetic grinding stones or wheels with abrasives agglomerated with ceramic or plastic binders, abrasive strips, or cloths impregnated with abrasives or wire brushes.

SHARPENERS: For the specific purpose of sharpening the edges of cutting tools.

GRINDERS: For the purpose of shaping flat, cylindrical or irregular surfaces, with narrow dimensional tolerances and/or high surface quality by means of grinding wheels or strips.

POLISHERS: These are intended to produce a high-brilliance surface finish or prepare a surface for subsequent coating or plating.

Exclusion: Ordinary grinders are not included.

Demand in the subregion for 1967: US\$1,300,000 (current prices)

Projection of demand for 1970: US\$2,890,000 (1970 prices)

Projection of demand for 1980: US\$17,070,000 (1970 prices)

Annual rate of growth for 1972-1980: 24.8

Proportion of demand met by the subregion: 10 per cent by 1980

Proportion of inputs imported directly as parts and components: 40 per cent by 1980

Value of production for 1980: US\$1,710,000 (1970 prices)

Type of allocation: Exclusive

22.1 Machinery for the plastics industry

Products

Mechanical machinery, fixtures and devices for the plastics, rubber and similar industries, with the exception of hydraulic presses for compression moulding.

NABANDINA: 84.59.12.00

NABALALC: 84.59. 2.99

Common external tariff: 65 per cent ad valorem

Parts and components for mechanical machines, fixtures and devices for the plastics, rubber and similar industries, with the exception of hydraulic presses for compression moulding.

NABANDINA: 84.59.90.00

NABALALC: 84.59. 8.01

Common external tariff: 55 per cent ad valorem

Existing industry: Production of extrusion machines for plastics has been identified in Colombia.

General description of products

This heading covers machinery and devices for the synthetic plastics, rubber and other similar industries.

Exclusions: Hydraulic presses specifically intended for the compression moulding of plastics are excluded.

Demand in the subregion for 1967: US\$5,200,000 (current prices)

Projection of demand for 1972: US\$8,420,000 (1970 prices)

Projection of demand for 1980: US\$20,840,000 (1970 prices)

Annual rate of growth for 1972-1980: 12.0

Proportion of demand met by the subregion: 10 per cent by 1980

Proportion of inputs imported directly as parts and components: 20 per cent by 1980

Value of production, 1980: US\$2,080,000 (1970 prices)

Type of allocation: Exclusive

31.1 Dental apparatus

Products

Dental equipment on stands and its parts and components.

NABANDINA: 90.17.02.01

NABALALC: 90.17. 2.01

Common external tariff: 50 per cent ad valorem

Dentists' drills and their parts and components.

NABANDINA: 90.17.02.11

NABALALC: 90.17. 2.02

Common external tariff: 50 per cent ad valorem

Existing production: There is no known production.

General description of products

Dentists' drills, with articulated arms, mounted singly on a foot, of the wall-mount type or intended to be adapted to the pedestal equipment described in the following paragraph.

Dental equipment on pedestal (with fixed base or on wheels), which generally consists essentially of a common base on which a compressor, a transformer, a control panel and other electric devices are mounted, and on which one or more of the following devices can also be mounted: swivel arm drill, spittoon and mouth rinser, cauterizer, instrument tray, diffused lighting, electric burner, hot air insufflator, spray, shadowless lamps, diathermic fan, X-ray apparatus, etc.

Some of this equipment is designed to operate using abrasive materials (usually aluminium oxide) projected against the teeth by a compressed gas (e.g. carbon dioxide) instead of a drill.

Demand in the subregion for 1967: US\$500,000 (current prices)

Projection of demand for 1972: US\$840,000 (1970 prices)

Projection of demand for 1980: US\$2,080,000 (1970 prices)

Annual rate of growth for 1972-1980: 12.0

Proportion of demand met by the subregion: 50 per cent by 1980

Proportion of inputs imported directly as parts and components: 50 per cent by 19

Value of production for 1980: US\$1,040,000 (1970 prices)

Type of allocation: Shared with Chile.

31.2 Medical and surgical apparatus

Products

Needles

NABANDINA: 90.17.01.01

NABALALC: 90.17. 9.99

Common external tariff: 40 per cent ad valorem

Sounds, cannulae and drainage tubes

NABANDINA: 90.17.01.11

NABALALC: 90.17. 9.02.99

Common external tariff: 40 per cent ad valorem

Syringes and their parts and components

NABANDINA: 90.17.01.21

NABALALC: 90.17. 9.01

Common external tariff: 40 per cent ad valorem

Other instruments and apparatus used in human medicine and surgery and their parts and components

NABANDINA: 90.17.01.99

NABALALC: 90.17. 9.99

Common external tariff: 40 per cent ad valorem

Dental drills, discs, burrs and brushes

NABANDINA: 90.17.02.21

NABALALC: 90.17. 2.99

Common external tariff: 40 per cent ad valorem

Other dental instruments and apparatus and their parts and components

NABANDINA: 90.17.02.99

NABALALC: 90.17. 2.99

Common external tariff: 40 per cent ad valorem

Instruments and apparatus used in veterinary medicine and their parts and components

NABANDINA: 90.17.03.00

NABALALC: 90.17.3

Common external tariff: 40 per cent ad valorem

Existing production: no manufacture is known in the subregion.

General description of products

This heading covers medical and surgical instruments in general, whether used in medicine, dentistry or veterinary medicine, including:

For medicine:

- Needles, lancets, scalpels, shears, scissors, pincers, forceps, chisels,allets, hammers, knives, spatulas, dilators, ophthalmoscopes, etc.

For dentistry:

- Forceps and pincers of all kinds, mouth-openers, tongue depressors and mouth mirrors, spatulas, nerve-treatment instruments and instruments for cleaning gums and sockets, etc., chisels and bone files, devices especially manufactured for use on dentists' drills, etc.

For veterinary medicine:

- Instruments similar to those listed for medicine and dentistry, but designed for animals of any size.

Demand in the subregion for 1967: US\$ 3 million (current prices)

Projection of demand for 1972: US\$ 4,770,000 (1970 prices)

Projection of demand for 1980: US\$11,810,000 (1970 prices)

Annual rate of growth for 1972-1980: 12.0

Proportion of demand met by the subregion: 20 per cent by 1980

Proportion of inputs imported directly as parts and components: 20 per cent by 1980

Value of production, 1980: US\$ 2,360,000 (1970 prices)

Type of allocation: Shared with Chile.

35.8 Sewing machines

Products

Sewing machines for domestic use

NABANDINA: 84.41.01.00

NABALALC: 84.41. 1.01

Common external tariff: 75 per cent ad valorem

Sewing machine heads, for domestic use

NABANDINA: 84.41.03.00

NABALALC: 84.41. 2.01

Common external tariff: 75 per cent ad valorem

Sewing machine heads, for industrial use

NABANDINA: 84.41.04.00

NABALALC: 84.41. 8.99

Common external tariff: 75 per cent ad valorem

Parts and components

NABANDINA: 84.41.90.00

NABALALC: 84.41. 8.99

Common external tariff: 65 per cent ad valorem

Existing production: manufacture has been identified in Colombia and Chile, and assembly in Peru.

General description of products

This allocation includes machines or machine heads which, thanks to a movable needle, make it possible to join two or more pieces of cloth, leather, paper, etc. with a seam.

It also includes machines which, in addition to their seaming work, can perform other purely decorative operations such as embroidery.

This heading also includes so-called electric sewing machines.

Demand in the subregion for 1967: US\$ 7,200,000 (current prices)
Projection of demand for 1972: US\$11,500,000 (1970 prices)
Projection of demand for 1980: US\$25,560,000 (1970 prices)
Annual rate of growth for 1972-1980: 10.5

Proportion of demand met by the subregion: 60 per cent by 1980

Proportion of inputs imported directly as parts and components: 30 per cent by 1980

Value of production for 1980: US\$ 7,670,000 (1970 prices)

Type of allocation: Shared with Chile.

35.16 Machinery for the production of footwear and other leather manufactures

Products

Machinery and equipment for the manufacture of footwear and other leather and hide manufactures

NABANDINA: 84.42.02.00

NABALALC: 84.42. 2.01

Common external tariff: 60 per cent ad valorem

Parts and components:

NABANDINA: 84.42.90.00

NABALALC: 84.42. 8.01

Common external tariff: 50 per cent ad valorem

Existing production: production of the simplest types, e.g. of shoe stretchers, has been identified.

General description of products

This heading covers machinery and equipment used for the production of leather and hide manufactures, including fur products, such as footwear, gloves, clothing and fancy goods, handbags, brief-cases, saddlery, travel goods, etc. It includes, inter alia:

- (a) Pairing and skiving machines, which are used to thin the edges or certain other parts of pieces of leather or hide in order to make it easier to sew or glue them together.
- (b) Machines for cutting out shapes from leather and hides (shoe uppers, hides for gloves, etc.). The most common models are the machines with flexible cutters or knives and special presses with punches.
- (c) Perforating machines for ornamenting glove backs, shoe uppers and toe caps, etc.
- (d) Pricking machines to make stitching holes in the leather.
- (e) Machines for the production of leather footwear, including:
 - 1. Splitting machines used to make an oblique channel along the edge of the sole for the purpose of accommodating and protecting the seam stitches, and also machines for opening or closing the edges of the channel before and after sewing.
 - 2. Assembling machines which, using pressure clamp devices, join the upper to the insole and temporarily tack or glue them together on the wooden last to prepare them for subsequent permanent joining by stitching, tacking or gluing.
 - 3. Welt beating machines for beating the edges of the shoe upper and the bottom surface of the insole, which have been assembled on the last.
 - 4. Bottom filling machines used to trim the insole with cambric and the filling materials (leather, rubber and other wastes) before attaching the outer sole.
 - 5. Welt tacking machines used during assembly to hold the welt temporarily on the last pending final stitching.
 - 6. Machines for attaching outer soles designed to attach the outer sole to the inner sole and the shoe upper (already assembled on the last) temporarily, pending permanent assembly.
 - 7. Machines for pegging or screwing the outer sole to the inner sole and the shoe upper, and also machines used for tacking on heels.

8. Trimming and polishing machines for the edges of the soles and heels, operating by means of oscillating grinders or files.
9. Polishing and finishing machines, comprising a series of grindstones, brushes and discs for polishing and finishing uppers, edges and bottoms of soles, including similar machines used by cobblers.
10. Small shoe stretching machines: It is possible to use some machines under this heading such as those for graining, cutting out, perforating or pricking and also some shoe-making machines for working materials other than leather, but these are none the less classified here because they are obviously intended primarily for working leathers and hides (with or without hair).

A comparison between the allocations made to Colombia and its current production shows that, while existing metalworking and engineering production primarily relates to tools and instruments and consumer goods, the allocations are focused particularly on general and specific machinery and emphasize technological requirements with respect to consumer goods (instruments and tools), and variety in capital goods (machine tools).

Since a wide range is covered in the sector, it will be necessary to consolidate current basic technologies, especially with regard to scope, intensity and variety of founding, heat treatment, machining and design and die-making processes.

With few exceptions, the allocations with regard to machine tools, bakery machinery and machinery for footwear and leather products will be technologically demanding, especially in connexion with design and knowledge of materials. The increase in volume of production will make necessary the introduction of mass production techniques, with the relevant die-making and machining processes. This is particularly true with regard to the allocations of tools and instruments.

One effect of the allocations will be the emergence of a horizontal structure which will gradually win out over the current markedly vertical trend in enterprises.

An immediate development is expected in supporting industries, for which there is a good infrastructure in Colombia.

2-3 CHILE:

Description and economic and commercial information

13. Mechanical presses

Presses, except hydraulic presses

NABANDINA: 84.45.08.00

NABALALC: 84.45. 4.03.99

Common external tariff: 65 per cent ad valorem

Existing production: Production has been identified in Chile and Peru, and sporadic manufacture has been found in Colombia and Ecuador.

General description of products

This group includes machine tools intended for the cold or hot forming of metals in all forms by means of energy transmitted to the tool through mechanical devices (crank, cross joint, screw, toothed rack, etc.).

Eccentric presses are mechanical presses in which the main transmission mechanism consists of a crank device with or without a cross joint.

Exclusion

Presses which use an intermediary fluid as the vehicle for energy transmission (hydraulic presses) are excluded, as are drop hammers and forging presses.

Demand in the subregion for 1967: US\$1 million (current prices)

Projection of demand for 1972: US\$1,720,000 (1970 prices)

Projection of demand for 1980: US\$7,400,000 (1970 prices)

Annual rate of growth for 1972-1980: 20.0

Proportion of demand met by the subregion: 20 per cent by 1980

Proportion of inputs imported directly as parts and components: 20 per cent by 1980

Value of production for 1980: US\$ 740,000 (1970 prices)

Type of allocation: Shared with Peru.

15. Milling machines for metals

Milling machines:

NABANDINA: 84.45.05.00

NABALALC: 84.45. 3

Common external tariff: 70 per cent ad valorem

Existing production: None has been identified.

General description of products

These are machine tools designed to form metal workpieces by stock removal, using rotating tools (cutters) with two or more cutting edges which are made to move in a direction (straight or curved) relative to the workpiece.

In copying millers, this relative movement follows the contours of a model prepared for the purpose (universal: if the model is three-dimensional).

Demand in the subregion for 1967: US\$ 800,000 (current prices)

Projection of demand for 1972: US\$ 1,840,000 (1970 prices)

Projection of demand for 1980: US\$12,450,000 (1970 prices)

Annual rate of growth for 1972-1980: 27.0

Proportion of demand met by the subregion: 10 per cent by 1980

Proportion of inputs imported directly as parts and components: 40 per cent by 1980.

Value of production for 1980: US\$ 1,250,000 (1970 prices)

Type of allocation: Exclusive.

21.1.A Drill bits for mining

Drill bits for mining

NABANDINA: 82.05.01.00

NABALALC: 82.05. 0.06

Common external tariff:

Existing production: None identified.

General description of products

This includes the manufacture of bits for drilling used as tools incorporated into machines for drilling in the ground. They are used for the most part in mining, although they also have uses in other activities such as construction and road building type of work.

(Data for 21.1, bits and complete drills)

Demand in the subregion for 1967: US\$1,700,000 (current prices)

Projection of demand for 1972: US\$2,470,000 (1970 prices)

Projection of demand for 1980: US\$5,990,000 (1970 prices)

Annual rate of growth for 1972-1980: 11.7

Proportion of demand met by the subregion: 50 per cent by 1980

Proportion of inputs imported directly as parts and components: 10 per cent by 1980

Value of production for 1980: US\$3 million

Type of allocation: Shared with Peru.

21.2.A "Tricones" with metallic carbide inserts (for mining)

"Tricones" with metallic carbide inserts (for mining)

NABANDINA: 82.05.01.00

NABALALC: 82.05.0.06

Common external tariff: 50 per cent ad valorem

Existing production: None identified.

General description of products

These are drilling tools with rotary action which have a system by which, as the drill advances, the material cut away is removed. They are used above all in mining drilling. Their use is more limited in the petroleum industry.

Exclusion

Tricones without metallic carbide inserts as cutting elements are excluded from this group.

Demand in the subregion for 1967: US\$2,700,000 (current prices)
Projection of demand for 1972: US\$4,030,000 (1970 prices)
Projection of demand for 1980: US\$9,770,000 (1970 prices)
Annual rate of growth for 1972-1980: 11.7

Proportion of demand met by the subregion: 70 per cent by 1980

Proportion of inputs imported directly as parts and components: 20 per cent by 1980

Value of production for 1980: US\$6,840,000

Type of allocation: Shared with Bolivia, except for the metallic carbide inserts.

29.2 Measuring and checking instruments, appliances and machines

Dynamic or static machines for balancing mechanical parts

NABANDINA: 90.16.02.01

NABALALC: 90.16. 2.01

Common external tariff: 75 per cent

Micrometers and other calibrators

NABANDINA: 90.16.02.02

NABALALC: 90.16. 2.01

Common external tariff: 75 per cent

Instruments for linear measurement

NABANDINA: 90.16.02.03

NABALALC: 90.16. 2.01

Common external tariff: 50 per cent

Planimeters

NABANDINA: 90.16.02.04

NABALALC: 90.16. 2.01

Common external tariff: 50 per cent

Profile projectors

NABANDINA: 90.16.02.05

NABALALC: 90.16. 2.01

Common external tariff: 75 per cent

Other measuring and checking instruments, appliances and machines

NABANDINA: 90.16.02.99

NABALALC: 90.16. 2.01

Common external tariff: 75 per cent

Parts and components for measuring and checking instruments, appliances and machines and for profile projectors

NABANDINA: 90.16.90.00

NABALALC: 90.16. 8.01

Common external tariff: 40 per cent

Existing production: None yet identified.

General description of products

This heading covers, inter alia:

1. Rulers,
2. Slide rules,
3. Micrometers,
4. Callipers and gauges,
5. Dividing rules,
6. Planimeters,
7. Dial comparators,
8. Conformators,
9. Measuring column gauges,
10. Dynamic or static balancers for mechanical parts,
11. Test benches,
12. Protractors,
13. Bubble levels, including micrometric, block and liquid levels,
14. Spherometers,

15. Instruments for centring spectacle lenses,
16. Dynamometers,
17. Surface testers or roughometers and similar instruments,
18. Gear testing machines.

This heading also covers optical measuring and checking instruments and appliances such as:

Profile projectors,
"Optical" comparators,
Comparator benches,
Measuring benches,
Alignment telescopes,
Optical rules,
Focimeters.

The instruments and appliances listed above are included in this group even if they are designed to be incorporated into machines.

Demand in the subregion for 1967: US\$ 2,600,000 (current prices)

Projection of demand for 1972: US\$ 4,410,000 (1970 prices)

Projection of demand for 1980: US\$11,400,000 (1970 prices)

Annual rate of growth for 1972-1980: 12.6

Proportion of demand met by the subregion: 30 per cent by 1980

Proportion of inputs imported directly as parts and components: 40 per cent by 1980

Value of production for 1980: US\$ 3,420,000 (1970 prices)

Type of allocation: Exclusive.

31.1 Dental apparatus

Type of allocation: Shared with Colombia (see Colombia, page 22).

31.2 Medical and surgical apparatus

Type of allocation: Shared with Colombia (see Colombia, page 23).

35.8 Sewing machines

Type of allocation: Shared with Colombia (see Colombia, page 25).

The production figures for Chile for 1967 show that it was the country with the most highly developed - although not the most highly diversified - metalworking and engineering industry in the subregion.

In Chile, this production has a long tradition, and as a consequence of the demands arising out of the manufacture of products for the motor vehicle sector, it has developed and absorbed sophisticated technologies for the basic processes in certain industries.

From the technological point of view, progress will have to be made with regard to new specific lines of production and the development of series production, as well as to the use of new materials and processes.

As a result of the allocations, there is expected to be a rapid development in the fields of electromechanics and micromechanics.

2-4 ECUADOR

Description and economic and commercial information

12.1 Drill bits, reamers, etc.

Drew plates for drawing metals

NABANDINA: 82.05.02.00

NABALALC: 82.05. 0.07

Common external tariff: 45 per cent ad valorem

Drill bits, drills and reamers

NABANDINA: 82.05.04.00

NABALALC: 82.05. 0.02

Common external tariff: 40 per cent

Other interchangeable tools for machine tools and hand tools, except threading tools

NABANDINA: 82.05.89.00

NABALALC: 82.05. 0.05.99

Common external tariff: 45 per cent

Existing production: None yet identified.

General description of products

This heading covers an important group of interchangeable tools without which it would be virtually impossible to carry out any work in the manner currently used. They are designed to be adapted to hand-tools (mechanical or non-mechanical), pneumatic tools, electromechanical tools and, above all, machine tools.

These tools are generally manufactured from steel alloys or carbon steel. They may also, without being excluded from this allocation, comprise the working part consisting of metallic carbides or diamond or other precious or semi-precious stones in a base metal support.

Some of the tools covered by this heading are:

- Tools for drilling and reaming, including bits (spiral or centring, etc.), reamers, boring bars, etc.

This heading also covers tools with abrasive parts, provided they are tools whose teeth, edges or other cutting parts have not lost their proper function through the addition of abrasive powders, in other words tools which could operate as such without the use of such powders.

Some of the tools covered by this heading are:

- (1) Tools for mortising, making mouldings, grooves, etc. in wood and also cutter chains for mortising wood;
- (2) Tools for milling, broaching and boring, including millers (with straight, spiral, alternating, club and other types of teeth), milling cutters for making gears, bits for boring, etc., rotary files;
- (3) Tools for turning including those used for machining cylindrical surfaces, grinding, reaming, thread finishing, cutting, grooving, etc. and similar tools for metal planing machines, (including shaping and slotting machines);
- (4) Plates for drawing metals and dies (or plates) for metalworking extrusion presses.

Exclusion: Threading tools are excluded.

Demand in the subregion for 1967: US\$ 3,500,000 (current prices)

Projection of demand for 1972: US\$ 5,880,000 (1970 prices)

Projection of demand for 1980: US\$15,180,000 (1970 prices)

Annual rate of growth for 1972-1980: 12.6

Proportion of demand met by the subregion: 90 per cent by 1980

Proportion of inputs imported directly as parts and components: 10 per cent by 1980

Value of production for 1980: US\$10,630,000 (1970 prices)

Type of allocation: Exclusive.

14. Hydraulic presses

Hydraulic presses:

NABANDINA: 84.45.08.00

NABALALC: 84.45. 4.04

Common external tariff: 65 per cent ad valorem

Hydraulic presses

NABANDINA: 84.47.05.00

NABALALC: 84.47. 3.01/99

Common external tariff: 65 per cent ad valorem

Parts and components for hydraulic presses under headings 84.45 and 84.47:

NABANDINA: 84.48.00.00

NABALALC: 84.48. 0.01-03

Common external tariff: 55 per cent ad valorem

Existing production: None identified.

General description of products

These are machine tools intended to cold or hot form metals and also to work wood and other similar hard materials by means of energy transmitted to the tool through an intermediate fluid driven by a pump.

Exclusion: Drop hammers and mechanical presses

Demand in the subregion for 1967: US\$ 900,000 (current prices)
Projection of demand for 1972: US\$1,560,000 (current 1970 prices)
Projection of demand for 1980: US\$6,710,000 (1970 prices)
Annual rate of growth for 1972-1980: US\$20
Proportion of demand met by the subregion: 20 per cent by 1980
Proportion of inputs imported directly as parts and components: 30 per cent by 1980
Value of production for 1980: US\$1,340,000 (1970 prices)
Type of allocation: Exclusive.

16. Reciprocating chip-removal machines

Planers and shapers

HABANDINA: 84.45.02.00

NABALALC: 84.45. 2

Common external tariff: 65 per cent ad valorem

Parts and components for planers and shapers

HABANDINA: 84.48.00.00

NABALALC: 84.48. 0.01

Common external tariff: 55 per cent ad valorem

Existing production: Small-scale sporadic production has been identified mainly in technical training centres.

General description of products

These are machine tools with which one or more straight single-edge tools which move in a reciprocating straight line relative to the workpiece are used. Planers are machines in which the workpiece moves with the table which holds it and the tool remains motionless (with the exception of the feed movements). Shapers are machines in which the tool moves in relation to the workpiece, which remains stationary (except for the feed movement). A slotter is a planer in which the tool moves vertically.

Demand in the subregion for 1967: US\$ 500,000 (current prices)
Projection of demand for 1972: US\$ 960,000 (1970 prices)
Projection of demand for 1980: US\$2,740,000 (1970 prices)
Annual rate of growth for 1972-1980: 14.0
Proportion of demand met by the subregion: 20 per cent by 1980
Proportion of inputs imported directly as parts and components: 30 per cent by 1980
Value of production for 1980: US\$ 550,000 (1970 prices)
Type of allocation: Exclusive.

22.2 Forming presses for the plastics industry

Hydraulic presses for compression moulding of plastics, rubber and similar materials

NABANDINA: 84.59.12.00

NABALALC: 84.59. 2.01

Common external tariff: 65 per cent ad valorem

Parts and components for hydraulic presses for compression moulding of plastics, rubber and similar materials

NABANDINA: 84.59.90.00

NABALALC: 84.59. 2.01

Common external tariff: 55 per cent ad valorem

Existing production: None yet identified.

General description of products

This heading covers only hydraulic presses for the compression moulding of plastics.

Demand in the subregion for 1967: US\$1,300,000 (current prices)
Projection of demand for 1972: US\$2,100,000 (1970 prices)
Projection of demand for 1980: US\$5,210,000 (1970 prices)
Annual rate of growth for 1972-1980: 12.0

Proportion of demand met by the subregion: 20 per cent by 1980

Proportion of inputs imported directly as parts and components: 20 per cent by 1980

Value of production for 1980: US\$1,040,000 (1970 prices)

Type of allocation: Exclusive.

3.4 Hydraulic systems

Lifting jacks for operating the dump bodies of trucks and similar apparatus

NABANDINA: 84.22.02.00

NABALALC: 84.22. 2.02

Common external tariff: 60 per cent ad valorem

Hydraulic apparatus for operating machines and equipment such as hydraulic presses, etc.

NABANDINA: 84.59.89.99

NABALALC: 84.59. 9.99 (99)

Common external tariff: 60 per cent ad valorem

Parts and components for lifting jacks for operating the dump bodies of trucks

NABANDINA: 84.22.91.00

NABALALC: 84.22. 8.99

Common external tariff:

Existing production: A little production with a low degree of integration has been identified in Peru.

General description of products

This heading covers parts for operating mechanisms belonging to hydraulic circuits which perform a job by the hydraulic transmission of power. These include dumping systems for dump trucks; lifting systems for power shovels, lifts and bulldozers; driving systems for hydraulic presses; etc.

Demand in the subregion for 1967: US\$1,500,000 (current prices)

Projection of demand for 1972: US\$2,080,000 (1970 prices)

Projection of demand for 1980: US\$4,530,000 (1970 prices)

Annual rate of growth for 1972-1980: 10.2

Proportion of demand met by the subregion: 40 per cent by 1980
Proportion of inputs imported directly as parts and components: 20 per cent by 1980
Value of production for 1980: US\$1,810,000 (1970 prices)
Type of allocation: Exclusive.

The development of the metalworking and engineering sector is in the beginning stages, and the sector's activity is focused on maintenance and preparation and on the production of goods derived from work on rolled steel or profiles. Consequently, the basic technologies are in an elementary stage and must be developed at all levels in order to make it possible to take advantage of the allocations made. The effort which the country will have to make to achieve the development provided for will call for the training of specialized labour of a high calibre on a large numerical scale. In the initial stage, assistance will be required from foreign skilled personnel. The specialization is directed towards light mechanics and micromechanics.

2.5 PERU

Description and economic and commercial information

19.1 Drilling machines

Drilling machines, boring machines, etc. (except radial drills)

NABANDINA: 84.45.03.00

NABALALC: 84.45. 5

Common external tariff: 60 per cent ad valorem

Existing production: In Chile, Peru, Colombia and Ecuador, there is only small-scale production of the most common types.

General description of products

Drilling or boring machines:

Machine tools intended for making or enlarging drill holes using circular tools, bits, expanders, flaring tools, reamers, etc.

Bench type: Small drills intended to be used at a workbench.

Column type: Pedestal drills.

Both the column and the bench drills can have one or several vertical or horizontal chucks.

Demand in the subregion for 1967: US\$ 250,000 (current prices)

Projection of demand for 1972: US\$ 690,000 (1970 prices)

Projection of demand for 1980: US\$4,520,000 (1970 prices)

Annual rate of growth for 1972-1980: 26.6

Proportion of demand met by the subregion: 20 per cent by 1980

Proportion of inputs imported directly as parts and components: 20 per cent by 1980

Value of production for 1980: US\$ 910,000 (1970 prices)

Type of allocation: Exclusive

21.1.A Drill bits for mining (Shared with Chile: see Chile, page 30)

21-1.B Complete drills

Complete drills

NABANDINA: 82.05.01.00

NABALALC: 82.05.0.06

Common external tariff: 40 per cent ad valorem

Existing production: None identified.

General description of products

This heading covers the manufacture of complete drills for perforation used as tools incorporated into machines for drilling in the ground. They are primarily used in mining, but may also have other uses, e.g. in construction and road building types of activities.

Demand in the subregion for 1967

Projection of demand for 1972

Projection of demand for 1980

Annual rate of growth for 1972-1980

Proportion of demand met by the subregion

Proportion of inputs imported directly as parts and components

Value of production for 1980

Type of allocation: Exclusive.

2.9.1 Drawing and calculating instruments

Pantographs

NABANDINA: 90.16.01.01

NABALALC: 90.16. 1.01

Common external tariff: 50 per cent ad valorem

Mathematicians' kits (cases of compasses)

NABANDINA: 90.16.01.02

NABALALC: 90.16. 1.01

Common external tariff: 50 per cent ad valorem

Rulers, discs and cylindrical calculators

NABANDINA: 90.16.01.03

NABALALC: 90.16. 1.01

Common external tariff: 50 per cent ad valorem

Parts and components for drawing, plotting and calculating instruments

NABANDINA: 90.16.90.00

NABALALC: 90.16. 9.01

Common external tariff: 40 per cent ad valorem

Existing production: Some production of simple types in Colombia and Chile.

General description of products

This heading covers:

(1) Drawing instruments

Pantographs for reproducing maps, plans, drawings and articles to be worked with on a smaller, larger or unchanged scale. This heading includes such instruments used in navigation for course plotting.

Drawing instruments, which generally consist of a system of jointed parallelograms, with or without drawing boards or tables.

Drawing compasses (divider, reduction, spring, etc.), drawing pens, dotting wheels, etc., whether singly or in mathematical instrument kits.

(2) Calculating instruments

Rules, disc calculators and cylindrical calculators, including all other instruments (particularly in the form of kits) operating on the principle of the slide rule, and also rules and discs for calculating the length of photographic exposure, combining data for the state of the sky, hour, diaphragm aperture, nature of the subject and sensitivity of the emulsion. The instruments, independent of their components and materials, are included in this allocation.

Exclusion

Other drawing and plotting instruments such as triangles, cast templates, scribes, etc. are excluded from this allocation.

Demand in the subregion for 1967:	US\$ 900,000 (current prices)
Projection of demand for 1972:	US\$1,470,000 (1970 prices)
Projection of demand for 1980:	US\$3,800,000 (1970 prices)
Annual rate of growth for 1972-1980:	US\$12.6
Proportion of demand met by the subregion:	30 per cent by 1980
Proportion of inputs imported directly as parts and components:	20 per cent by 1980
Value of production for 1980:	US\$1,140,000 (1970 prices)
Type of allocation:	Exclusive.

In 1967, metalworking and engineering production in Peru, which was smaller in scope than that in Chile and Colombia, was primarily concentrated on tools and consumer goods. The allocations will establish specializations directed towards important user activities.

In fact, its economic activities, which are primarily concentrated in the mining, fishing and seafood processing sectors have given rise to a number of production activities in the metalworking and engineering sector which are directed towards meeting the requirements of these activities, and have thereby established a technological infrastructure which has made it possible to undertake the manufacture of other products as well.

These allocations will give the country the opportunity to supplement the inadequate number and variety of basic processes which it uses, achieving the highest degrees of sophistication, given the scale on which it operates.





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