

## **Identifying R&D in software development, in the social sciences and humanities and in service activities and industries**

The model on which the Manual was originally based was that of institutionally structured R&D in the natural sciences and engineering leading to tangible technological innovations in primary and secondary industries. Software development has since become a major intangible innovation activity with a high R&D content. In addition, an increasing share of relevant activities draws on the social sciences and humanities, and, together with advances in computing, leads to intangible innovations in service activities and products, with a growing contributions by service industries in the business enterprise sector.

The tools developed for identifying R&D in traditional fields and industries are not always easy to apply to these new areas. This section deals with the problems of identifying R&D in software development, in the social sciences and humanities and in service activities.

### **Identifying R&D in software development**

For a software development project to be classified as R&D, its completion must be dependent on the development of a scientific and/or technological advance, and the aim of the project must be the systematic resolution of a scientific and/or technological uncertainty.

In addition to the software that is part of an overall R&D project, the R&D associated with software as an end product should also be classified as R&D.

The nature of software development is such as to make identifying its R&D component, if any, difficult. Software development is an integral part of many projects which in themselves have no element of R&D. The software development component of such projects, however, may be classified as R&D if it leads to an advance in the area of computer software. Such advances are generally incremental rather than revolutionary. Therefore, an upgrade, addition or change to an existing programme or system may be classified as R&D if it embodies scientific and/or technological advances that result in an increase in the stock of knowledge. Use of software for a new application or purpose, however, does not by itself constitute an advance.

A scientific and/or technological advance in software may be achieved even if a project is not completed, because a failure can increase knowledge of the technology of computer software by showing, for example, that a particular approach will not succeed given the limits of the business environment.

Advances in other fields resulting from a software project do not determine whether an advance in computer software has occurred.

The following examples illustrate the concept of R&D in software and should be included in R&D:

- ◆ R&D producing new theorems and algorithms in the field of theoretical computer science.
- ◆ Development of information technology at the level of operating systems, programming languages, data management, communications software and software development tools.
- ◆ Development of Internet technology.
- ◆ Research into methods of designing, developing, deploying or maintaining software.
- ◆ Software development that produces advances in generic approaches for capturing, transmitting, storing, retrieving, manipulating or displaying information.
- ◆ Experimental development aimed at filling technology knowledge gaps as necessary to develop a software programme or system.



- ◆ R&D on software tools or technologies in specialised areas of computing (image processing, geographic data presentation, character recognition, artificial intelligence and other areas).

Software-related activities of a routine nature which do not involve scientific and/or technological advances or resolution of technological uncertainties are not to be included in R&D. Examples are:

- ◆ Business application software and information system development using known methods and existing software tools.
- ◆ Support for existing systems.
- ◆ Converting and/or translating computer languages.
- ◆ Adding user functionality to application programmes.
- ◆ Debugging of systems.
- ◆ Adaptation of existing software.
- ◆ Preparation of user documentation.

In the systems software area, individual projects may not be considered as R&D but their aggregation into a larger project may qualify for inclusion. For example, changes in file structure and user interfaces in a fourth-generation language processor may be made necessary by the introduction of relational technology. The individual changes may not be considered R&D if viewed in their own right, but the entire modification project may result in the resolution of scientific and/or technological uncertainty and thus be classified as R&D.

### Identifying R&D in the social sciences and humanities

The social sciences and humanities are covered in the Frascati Manual by including in the definition of R&D “knowledge of humanity, culture and society”. For the social sciences and humanities, an appreciable element of novelty or a resolution of scientific/technological uncertainty is again a useful criterion for defining the boundary between R&D and related (routine) scientific activities. This element could be related to the conceptual, methodological or empirical part of the project concerned. Related activities of a routine nature can only be included in R&D if they are undertaken as an integral part of a specific research project or undertaken for the benefit of a specific research project. Therefore, projects of a routine nature, in which social scientists bring established methodologies and facts of the social sciences to bear on a particular problem, cannot be classified as research.

The following are examples of work which might fall into this routine category are generally not R&D: commentary on the probable economic effects of a change in the tax structure, using existing economic data; use of standard techniques in applied psychology to select and classify industrial and military personnel, students, etc., and to test children with reading or other disabilities.

### Special problems for identifying R&D in service activities

Defining the boundaries of R&D in service activities is difficult, for two main reasons: first, it is difficult to identify projects involving R&D; and, second, the line between R&D and other innovative activities which are not R&D is a tenuous one.

Among the many innovative projects in services, those that constitute R&D result in new knowledge or use of knowledge to devise new applications, in keeping with the definition in the first paragraph under “What is R&D” earlier in this guide.

Identifying R&D is more difficult in service activities than in manufacturing because it is not necessarily “specialised”. It covers several areas: technology-related R&D, R&D in the social sciences and humanities (SSH), including R&D relating to the knowledge of behaviour and organisations. This last notion is already



included under the knowledge of “man, culture and society” criterion, but it is particularly important in the case of service activities. Because these types of R&D may be combined in a given project, it is important to circumscribe clearly the various forms of R&D involved. If the analysis is confined to technology-related R&D, for example, R&D may be understated. In many cases, R&D findings in service industries are embodied in software which is not necessarily innovative from the technical point of view but innovates by virtue of the *functions* that it performs.

Also, in service companies, R&D is not always organised as formally as in manufacturing companies (*i.e.* with a dedicated R&D department, researchers or research engineers identified as such in the establishment's personnel list, etc.). The concept of R&D in services is still relatively little known and sometimes goes unrecognised by the enterprises involved. As more experience becomes available on surveying R&D in services, the criteria for identifying R&D and examples of service-related R&D may require further development.

### **Criteria for identifying R&D in services**

The following are among the criteria that can help to identify the presence of R&D in service activities:

- ◆ Links with public research laboratories.
- ◆ The involvement of staff with PhDs, or PhD students.
- ◆ The publication of research findings in scientific journals, organisation of scientific conferences or involvement in scientific reviews.
- ◆ The construction of prototypes or pilot plants.

### **Examples of R&D in selected service activities**

The R&D activities listed below may serve as examples of R&D in service activities. The general and supplementary criteria for distinguishing R&D presented earlier have also to be taken into account.

The general boundaries of R&D as defined earlier in this document regarding problems at the borderline of R&D, activities to be excluded from R&D etc. also largely apply to service activities. The element of novelty is a basic criterion for distinguishing R&D from related activities.

### **Examples of R&D in banking and insurance**

- ◆ Mathematical research relating to financial risk analysis.
- ◆ Development of risk models for credit policy.
- ◆ Experimental development of new software for home banking.
- ◆ Development of techniques for investigating consumer behaviour for the purpose of creating new types of accounts and banking services.
- ◆ Research to identify new risks or new characteristics of risk that need to be taken into consideration in insurance contracts.
- ◆ Research on social phenomena with an impact on new types of insurance (health, retirement, etc.), such as on insurance cover for non-smokers.
- ◆ R&D related to electronic banking and insurance, Web-related services and e-commerce applications.
- ◆ R&D related to new or significantly improved financial services (new concepts for accounts, loans, insurance and saving instruments).

### **Examples of R&D in some other service activities**

- ◆ Analysis of the effects of economic and social change on consumption and leisure activities.
- ◆ Development of new methods for measuring consumer expectations and preferences.
- ◆ Development of new survey methods and instruments.
- ◆ Development of tracking and tracing procedures (logistics).
- ◆ Research into new travel and holiday concepts.
- ◆ Launch of prototype and pilot stores.

### **Research Field (or Field of Science & Technology)**

Resources should be allocated to the various fields of science and technology on the basis of the focus of R&D activities, measured in terms of expenditure or field in which R&D personnel actually work, usually at project level. Where appropriate, e.g. in the case of projects with a multidisciplinary character, a breakdown of resources by several fields of science and technology should be made. (For Codes see Codes Book)

### **Standard Industrial Classification (SIC) (or Product Field)**

In distributing R&D by Standard Industrial Classification (SIC) (also called Product Field), the distribution should take the nature of the product into consideration (for SIC codes see Codes Book)

### **Nature of product**

When applying the “nature of product” criterion, the R&D input is distributed according to the type of product being developed.

The guidelines formerly used by the National Science Foundation (USA) to survey applied research and experimental development in industry are good examples of operational criteria:

“Costs should be entered in the field or product group in which the research and development project was carried out, regardless of the classification of the field of manufacturing in which the results are to be used. For example, research on an electric component for a farm machine should be reported as research on electrical machinery. Also, research on refractory bricks to be used by the steel industry should be reported as research on stone, clay, glass and concrete products rather than primary ferrous metals, whether performed in the steel industry or the stone, clay, glass and concrete industry.”

(National Science Foundation, 1983)

These guidelines should pose few problems for most R&D projects on product development. R&D on processes may be more difficult to deal with. If the results of the R&D will clearly be embodied in materials or equipment, then the guidelines should be applied to those products. If not, then the process should be allocated to the product it is destined to produce. Furthermore, for enterprises engaged in broad R&D programmes, quite detailed records or consultations with R&D personnel are needed in order to provide complete estimates.



## Socio Economic Objective (SEO)

### Distribution by socio-economic objective

Two approaches to distribution are possible:

- a) according to the purpose of the R&D programme or project;
- b) according to the general content of the R&D programme or project.

However, **R&D should be classified according to its primary objective.**

Where there are problems in identifying the primary purpose of the funder of the R&D or where there seem to be differences between the "purpose" and the "content" of a programme, two principles may be of use:

- **Direct derivation:** A project which owes its existence solely to the technical needs of another programme is directly derived from the said programme and should be classified with it.
- **Indirect spin-off:** Where the results of R&D undertaken for one purpose are subsequently reworked to give an application relevant to another objective, this is indirect spin-off and should be credited to the objective to which the subsequent R&D is oriented.

### R&D Personnel

All persons employed directly on R&D should be counted, as well as those providing direct services such as R&D managers, administrators, and clerical staff.

Persons providing an indirect service, such as canteen and security staff, should be excluded, even though their wages and salaries are included as an overhead cost when measuring expenditure.

When measuring human resources devoted to R&D, notice has to be taken of the increased use of on-site consultants as well as the outsourcing of R&D to other units or firms. With the greater use of consultants, human resources devoted to R&D may be underestimated when it is difficult to determine whether consultants are on-site or part of an outsourcing arrangement. To remedy this underestimate, it is proposed to request on-site consultants' full-time equivalence (FTE) on R&D in R&D surveys and to highlight the corresponding costs in "other current costs" in R&D survey results. In the case of outsourcing, consultant costs clearly fall under extramural expenditures.

### Categories of R&D Personnel

**Researchers** are professionals engaged in the conception or creation of new knowledge, products, processes, methods, and systems, and in the management of the projects concerned.

**Technicians and equivalent staff** are persons whose main tasks require technical knowledge and experience in one or more fields of engineering, physical and life science, or social sciences and humanities. They participate in R&D by performing scientific and technical tasks involving the application of concepts and operational methods, normally under the supervision of researchers. Equivalent staff perform the corresponding R&D tasks under the supervision of researchers in the social sciences and humanities.

**Other supporting staff** include skilled and unskilled artisans, secretarial and clerical staff participating in R&D projects or directly associated with such projects.

### Percentage time on R&D as a proxy for FTE (Full Time Equivalent)

It is important to note that the Frascati Manual requests data on FTE while this survey asks for the percentage time that personnel groups (researchers, technicians & other support) devote to R&D. The percentage figure submitted by you will be used to derive FTE to ensure compliance with Frascati.



For example. If you state that 4 (four) technicians spend 50% (fifty percent) of their time on R&D for your company, this would imply that the equivalent of 2 (two) full-time R&D technicians work for your company. Thus, even though four people work for your company, their efforts account for two FTEs.

In this way, the percentage time spent on R&D will be used by us to calculate FTE. This fact is mentioned because you may be concerned that the Frascati Manual asks for FTE's, while this survey does not ask for FTE's directly.

## **R&D Expenditures**

### **Measurement of in-house R&D expenditure**

Please note that your best intelligent and careful estimate may be necessary in providing data where company information is not available.

### **Capital expenditures**

Capital expenditures are the annual gross expenditures on fixed assets used in the R&D programmes. They should be reported in full for the period when they took place and should not be registered as an element of depreciation. They are composed of expenditures on:

**Land, buildings.** This comprises land acquired for R&D (e.g. testing grounds, sites for laboratories and pilot plants) and buildings constructed or purchased, including major improvements, modifications, and repairs.

**Instruments and equipment.** This comprises equipment acquired for use in the performance of R&D including software.

### **Labour costs.**

These comprise annual wages and salaries and all associated costs or fringe benefits such as bonus payments, holiday pay, contributions to pension funds and other social security payments, payroll taxes, etc. The labour costs of persons providing indirect services and which are not included in the personnel data (such as security and maintenance personnel or the staff of central libraries, computer departments, or head offices) should be excluded and included in other current costs.

Labour costs are often the largest component of current costs

### **Other current expenditure.**

These comprise non-capital purchases of materials, supplies and equipment to support R&D performed by the statistical unit in a given year. Examples are: water and fuel (including gas and electricity); books, journals, reference materials, subscriptions to libraries, scientific societies and so on; imputed or actual cost of small prototypes or models made outside the research organisation; materials for laboratories (chemicals, animals, etc.). Administrative and other overhead costs (such as interest charges and office, post and telecommunications, and insurance costs) should also be included, prorated if necessary to allow for non-R&D activities within the same statistical unit. All expenditures on indirect services should be included here, whether carried out within the organisation concerned or hired or purchased from outside suppliers. Examples of such services are security; storage; use, repair and maintenance of buildings and equipment; computer services; and printing of R&D reports.

Data on R&D expenditure on both a provider and funder basis should be at factor cost. This means **excluding VAT** and similar sales taxes from the measured cost of the R&D and specifically of R&D financed by government.

All **depreciation** provisions for building, plant, and equipment, whether real or imputed, should be excluded from the measurement of intramural expenditures.





Department of Science and Technology



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**SOUTH AFRICAN SURVEY OF  
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**CODES**  
(SIC, RF & SEO Codes)

**PRIVATE & PUBLIC SECTOR BUSINESS ENTERPRISES**

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These Codes have been compiled with reference to the Organisation for Economic Cooperation and Development (OECD) Frascati Manual and the South Africa Department of Trade and Industry (DTI) version 5 SIC Codes.

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## STANDARD INDUSTRIAL CLASSIFICATION (SIC) OF ECONOMIC ACTIVITIES -INDEX

<b>10000</b>	<b>Agriculture, Hunting, Forestry and Fishing</b>
<b>20000</b>	<b>Mining &amp; Quarrying</b>
<b>30000</b>	<b>Manufacturing</b>
30000	Manufacture of Food Products, Beverages and Tobacco Products
31000	Manufacture of Textiles, Clothing and Leather Goods
32000	Manufacture of Wood and Products of Wood and Cork, <u>except furniture</u> Manufacture of Articles of Straw and Plaiting Materials Manufacture of Paper & Paper Products Manufacture of Publishing, Printing and Reproduction of Recorded Material
33000	Manufacture of Refined Petroleum, Coke and Nuclear Fuel Manufacture of Chemicals and Chemical Products (incl. Pharmaceuticals) Manufacture of Rubber and Plastic Products
34000	Manufacture of Non-Metallic Mineral Products
35000	Manufacture of Basic Metals, Fabricated Metal Products, Machinery & Equipment Manufacture of Office, Accounting and Computing Machinery
36000	Manufacture of Electrical Machinery and Apparatus (n.e.c.*)
37000	Manufacture of Radio, Television and Communication Equipment and Apparatus Manufacture of Medical, Precision and Optical Instruments, Watches and Clocks
38000	Manufacture of Transport Equipment
39000	Manufacture of Furniture Manufacturing n.e.c.* Recycling
<b>40000</b>	<b>Electricity, Gas &amp; Water Supply</b>
<b>50000</b>	<b>Construction</b>
<b>60000</b>	<b>Wholesale &amp; Retail Trade</b>
61000	Wholesale and Commission Trade, <u>except of Motor Vehicles and Motor Cycles</u>
62000	Retail Trade, <u>except of Motor Vehicles and Motor Cycles</u> Repair of Personal and Household Goods
63000	Sale, Maintenance and Repair Of Motor Vehicles And Motor Cycles Retail Trade in Automotive Fuel
64000	Hotels and Restaurants
<b>70000</b>	<b>Transport, Storage &amp; Communication</b>
<b>80000</b>	<b>Financial Intermediation, Real Estate &amp; Business Services</b>
81000	Financial Intermediation, <u>except Insurance and Pension Funding</u>
82000	Insurance and Pension Funding <u>except Compulsory Social Security</u>
83000	Activities Auxiliary to Financial Intermediation
84000	Real Estate Activities
85000	Renting of Machinery and Equipment Without Operators Renting of Personal and Household Goods
86000	Computer and Related Activities
87000	Research and Development
88000	Other Business Activities
88100	Legal, Accounting, Bookkeeping and Auditing Activities Tax Consultancy; Market Research And Public-Opinion Research Business and Management Consultancy
88200	Architectural, Engineering and Other Technical Activities
88300	Advertising
88900	Business Activities n.e.c.*
<b>90000</b>	<b>Community, Social and Personal Services</b>
91000	Defence and Public Administration Activities.
92000	Education
93000	Health and Social Work
94000	Other Community, Social and Personal Service Activities
95000	Activities of Membership Organisations n.e.c.*
96000	Recreational, Cultural and Sporting Activities
99000	Other Service Activities

\*Note: n.e.c. denotes "not elsewhere classified"



## APPENDIX A: STANDARD INDUSTRIAL CLASSIFICATION (SIC) OF ECON ACTIVITIES

<b>11000</b>	<b>Division</b>	<b>AGRICULTURE, HUNTING AND RELATED SERVICES</b>
11100	Major group	GROWING OF CROPS; MARKET GARDENING; HORTICULTURE
11110	Group	Growing of cereals and other crops n.e.c.
11120	Group	Growing of vegetables, horticultural specialities and nursery products
11130	Group	Growing of fruit, nuts, beverage and spice crops
11200	Major group	FARMING OF ANIMALS
11210	Group	Farming of cattle, sheep, goats, horses, asses, mules and hinnies; dairy farming
11220	Group	Other animal farming; production of animal products n.e.c.
11300	Major group	GROWING OF CROPS COMBINED WITH FARMING OF ANIMALS (MIXED FARMING)
11400	Major group	AGRICULTURAL AND ANIMAL HUSBANDRY SERVICES, EXCEPT VETERINARY ACTIVITIES
11500	Major group	HUNTING, TRAPPING AND GAME PROPAGATION, INCLUDING RELATED SERVICES
11510	Group	Game propagation
11520	Group	Hunting and trapping, including related services
11600	Major group	PRODUCTION OF ORGANIC FERTILIZER
<b>12000</b>	<b>Division</b>	<b>FORESTRY, LOGGING AND RELATED SERVICES</b>
12100	Major group	FORESTRY AND RELATED SERVICES
12200	Major group	LOGGING AND RELATED SERVICES
<b>13000</b>	<b>Division</b>	<b>FISHING, OPERATION OF FISH HATCHERIES AND FISH FARMS</b>
13100	Major group	OCEAN AND COASTAL FISHING
13200	Major group	FISH HATCHERIES AND FISH FARMS
<b>21000</b>	<b>Division</b>	<b>MINING OF COAL AND LIGNITE</b>
<b>22000</b>	<b>Division</b>	<b>EXTRACTION OF CRUDE PETROLEUM AND NATURAL GAS; SERVICE ACTIVITIES INCIDENTAL TO OIL AND GAS EXTRACTION, EXCLUDING SURVEYING</b>
22110	Group	Extraction of crude petroleum and natural gas
22120	Group	Service activities incidental to oil and gas extraction, excluding surveying
<b>23000</b>	<b>Division</b>	<b>MINING OF GOLD AND URANIUM ORE</b>
<b>24000</b>	<b>Division</b>	<b>MINING OF METAL ORES, EXCEPT GOLD AND URANIUM</b>
24100	Major group	MINING OF IRON ORE
24200	Major group	MINING OF NON-FERROUS METAL ORES, EXCEPT GOLD AND URANIUM
24210	Group	Chrome
24220	Group	Copper
24230	Group	Manganese
24240	Group	Platinum group metals
24290	Group	Other metal ore mining, except gold and uranium
<b>25000</b>	<b>Division</b>	<b>OTHER MINING AND QUARRYING</b>
25100	Major group	STONE QUARRYING, CLAY AND SANDPITS
25110	Group	Dimension stone (granite, marble, slate, and wonderstone)
25120	Group	Limestone and limeworks
25190	Group	Other stone quarrying, including stone crushing and clay and sandpits
25200	Major group	MINING OF DIAMONDS (INCLUDING ALLUVIAL DIAMONDS)
25300	Major group	MINING AND QUARRYING N.E.C.
25310	Group	Mining of chemical and fertilizer minerals
25311	Subgroup	Phosphates
25319	Subgroup	Other chemical and fertilizer mineral mining
25320	Group	Extraction and evaporation of salt
25390	Group	Other mining and quarrying n.e.c.
25391	Subgroup	Mining of precious and semi-precious stones, except diamonds
25392	Subgroup	Asbestos
25399	Subgroup	Other minerals and materials n.e.c.
<b>29000</b>	<b>Division</b>	<b>SERVICE ACTIVITIES INCIDENTAL TO MINING OF MINERALS</b>



<b>30000</b>	<b>Division</b>	<b>MANUFACTURE OF FOOD PRODUCTS, BEVERAGES AND TOBACCO PRODUCTS</b>
30100	Major group	PRODUCTION, PROCESSING AND PRESERVATION OF MEAT, FISH, FRUIT, VEGETABLES, OILS AND FATS
30110	Group	Production, processing and preserving of meat and meat products
30111	Subgroup	Slaughtering, dressing and packing of livestock, including poultry and small game for meat
30112	Subgroup	Manufacture of prepared and preserved meat, including sausage; by-products (hides, bones, etc.)
30113	Subgroup	Production of lard and other edible fats
30120	Group	Processing and preserving of fish and fish products
30120	Subgroup	Manufacture of canned, preserved and processed fish, crustacea and similar foods (except soups)
30130	Group	Processing and preserving of fruit and vegetables
30130	Subgroup	Manufacture of canned, preserved, processed and dehydrated fruit and vegetables (except soups), including fruit juices, juice extracts and potato flour meal
30140	Group	Manufacture of vegetable and animal oils and fats
30141	Subgroup	Manufacture of crude oil and oilseed cake and meal
30142	Subgroup	Manufacture of compound cooking fats, margarine and edible oils
30200	Major group	MANUFACTURE OF DAIRY PRODUCTS
30201	Subgroup	Processing of fresh milk (pasteurising, homogenising, sterilising and vitaminising)
30202	Subgroup	Manufacture of butter and cheese
30203	Subgroup	Manufacture of ice cream and other edible ice, whether or not containing cream or chocolate
30204	Subgroup	Manufacture of milk powder, condensed milk and other edible milk products, e.g. ghee, casein or lactose
30300	Major group	MANUFACTURE OF GRAIN MILL PRODUCTS, STARCHES AND STARCH PRODUCTS AND PREPARED ANIMAL FEEDS
30310	Group	Manufacture of grain mill products
30311	Subgroup	Manufacture of flour and grain mill products, including rice and vegetable milling; grain mill residues
30312	Subgroup	Manufacture of breakfast foods
30320	Group	Manufacture of starches and starch products
30330	Group	Manufacture of prepared animal feeds
30400	Major group	MANUFACTURE OF OTHER FOOD PRODUCTS
30410	Group	Manufacture of bakery products
30420	Group	Manufacture of sugar, including golden syrup and castor sugar
30430	Group	Manufacture of cocoa, chocolate and sugar confectionery
30440	Group	Manufacture of macaroni, noodles, couscous and similar farinaceous products
30490	Group	Manufacture of other food products n.e.c.
30491	Subgroup	Manufacture of coffee, coffee substitutes and tea
30492	Subgroup	Manufacture of nut foods
30499	Subgroup	Manufacture of spices, condiments, vinegar, yeast, egg products, soups and other food products n.e.c.
30500	Major group	MANUFACTURE OF BEVERAGES
30510	Group	Distilling, rectifying and blending of spirits; ethyl alcohol production from fermented materials; manufacture of wine
30520	Group	Manufacture of beer and other malt liquors and malt
30521	Subgroup	Breweries, except sorghum beer breweries
30522	Subgroup	Sorghum beer breweries
30523	Subgroup	Manufacture of malt
30530	Group	Manufacture of soft drinks; production of mineral waters
30600	Major group	MANUFACTURE OF TOBACCO PRODUCTS
<b>31000</b>	<b>Division</b>	<b>MANUFACTURE OF TEXTILES, CLOTHING AND LEATHER GOODS</b>
31100	Major group	SPINNING, WEAVING AND FINISHING OF TEXTILES
31110	Group	Preparation and spinning of textile fibres; weaving of textiles
31111	Subgroup	Preparatory activities in respect of animal fibres, including washing, combing and carding of wool
31112	Subgroup	Preparatory activities in respect of vegetable fibres
31113	Subgroup	Spinning, weaving and finishing of yarns and fabrics predominantly of wool and other animal fibres
31114	Subgroup	Spinning, weaving and finishing of yarns and fabrics predominantly of vegetable fibres



31120	Group	Finishing of textiles
31120	Subgroup	Finishing of purchased yarns and fabrics
31200	Major group	MANUFACTURE OF OTHER TEXTILES
31210	Group	Manufacture of made-up textile articles, except apparel
31211	Subgroup	Manufacture of blankets, made-up furnishing articles and stuffed articles
31212	Subgroup	Manufacture of tents, tarpaulins, sails and other canvas goods
31213	Subgroup	Manufacture of automotive textile goods (including safety belts, and seat covers)
31219	Subgroup	Manufacture of other textile articles (except apparel)
31220	Group	Manufacture of carpets, rugs and mats
31230	Group	Manufacture of cordage, rope, twine and netting
31290	Group	Manufacture of other textiles n.e.c.
31300	Major group	MANUFACTURE OF KNITTED AND CROCHETED FABRICS AND ARTICLES
31301	Subgroup	Garment and hosiery knitting mills
31309	Subgroup	Other knitting mills
31400	Major group	MANUFACTURE OF WEARING APPAREL, EXCEPT FUR APPAREL
31401	Subgroup	Manufacture of men's and boys' clothing
31402	Subgroup	Manufacture of women's, girls' and infants' clothing
31403	Subgroup	Bespoke tailoring
31404	Subgroup	Manufacture of hats, caps and ties
31500	Major group	DRESSING AND DYEING OF FUR; MANUFACTURE OF ARTICLES OF FUR
31500	Subgroup	Dressing and dyeing of fur, manufacture of artificial fur, fur apparel and other articles of fur
31600	Major group	TANNING AND DRESSING OF LEATHER; MANUFACTURE OF LUGGAGE, HANDBAGS, SADDLERY AND HARNESS
31610	Group	Tanning and dressing of leather
31620	Group	Manufacture of luggage, handbags and the like, saddlery and harness
31621	Subgroup	Manufacture of travel goods and ladies' handbags
31629	Subgroup	Manufacture of other general and small goods of leather and leather substitutes, including harness and saddlery
31700	Major group	MANUFACTURE OF FOOTWEAR
32000	Division	<b>MANUFACTURE OF WOOD AND OF PRODUCTS OF WOOD AND CORK, EXCEPT FURNITURE; MANUFACTURE OF ARTICLES OF STRAW AND PLAITING MATERIALS; MANUFACTURE OF PAPER AND PAPER PRODUCTS; PUBLISHING, PRINTING AND REPRODUCTION OF RECORDED MEDIA</b>
32100	Major group	SAWMILLING AND PLANING OF WOOD
32101	Subgroup	Sawmilling and preserving of timber
32109	Subgroup	Other mill products, including wattle bark grinding and compressing
32200	Major group	MANUFACTURE OF PRODUCTS OF WOOD, CORK, STRAW AND PLAITING MATERIALS
32210	Group	Manufacture of veneer sheets; manufacture of plywood, laminboard, particle board and other panels and boards
32220	Group	Manufacture of builders' carpentry and joinery
32230	Group	Manufacture of wooden containers
32290	Group	Manufacture of other products of wood; manufacture of articles of cork, straw and plaiting materials
32291	Subgroup	Coffins (excluding the manufacture of coffins by funeral undertakers)
32292	Subgroup	Picture frames and framing
32299	Subgroup	Other articles of wood, cork, straw and plaiting materials, including woodcarving and woodturning
32300	Major group	MANUFACTURE OF PAPER AND PAPER PRODUCTS
32310	Group	Manufacture of pulp, paper and paperboard
32320	Group	Manufacture of corrugated paper and paperboard and of containers of paper and paperboard
32321	Subgroup	Manufacture of corrugated paper and paperboard
32322	Subgroup	Manufacture of containers of paper and paperboard
32390	Group	Manufacture of other articles of paper and paperboard
32391	Subgroup	Stationery
32399	Subgroup	Other paper products
32400	Major group	PUBLISHING
32410	Group	Publishing of books, brochures, musical books and other publications
32420	Group	Publishing of newspapers, journals and periodicals
32430	Group	Publishing of recorded media



32490	Group	Other publishing
32500	Major group	PRINTING AND SERVICE ACTIVITIES RELATED TO PRINTING
32510	Group	Printing
32520	Group	Service activities related to printing
32600	Major group	REPRODUCTION OF RECORDED MEDIA
<b>33000</b>	<b>Division</b>	<b>MANUFACTURE OF COKE, REFINED PETROLEUM PRODUCTS AND NUCLEAR FUEL; MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS; MANUFACTURE OF RUBBER AND PLASTIC PRODUCTS</b>
33100	Major group	MANUFACTURE OF COKE OVEN PRODUCTS
33200	Major group	PETROLEUM REFINERIES/SYNTHESISERS
33210	Group	Petrol, fuel oils, lubricating oils and greases, primarily from crude oil
33220	Group	Petrol, fuel oils, lubricating oils and greases, primarily from coal
33230	Group	Petrol, fuel oils, lubricating oils and greases, primarily from natural gas
33240	Group	Lubricating oils and greases, primarily from other organic products
33250	Group	Compounded and blended lubricating oils and greases from purchased materials other than crude petroleum
33290	Group	Other petroleum/synthesised products n.e.c.
33300	Major group	PROCESSING OF NUCLEAR FUEL
33400	Major group	MANUFACTURE OF BASIC CHEMICALS
33410	Group	Manufacture of basic chemicals, except fertilizers and nitrogen compounds
33420	Group	Manufacture of fertilizers and nitrogen compounds
33430	Group	Manufacture of plastics in primary form and of synthetic rubber
33500	Major group	MANUFACTURE OF OTHER CHEMICAL PRODUCTS
33510	Group	Manufacture of pesticides and other agro-chemical products
33520	Group	Manufacture of paints, varnishes and similar coatings, printing ink and mastics
33530	Group	Manufacture of pharmaceuticals, medicinal chemicals and botanical products
33540	Group	Manufacture of soap and detergents, cleaning and polishing preparations, perfumes and toilet preparations
33541	Subgroup	Manufacture of soap and other cleaning compounds
33542	Subgroup	Manufacture of perfumes, cosmetics and other toilet preparations
33549	Subgroup	Manufacture of other preparations such as polishes, waxes and dressings
33590	Group	Manufacture of other chemical products n.e.c.
33591	Subgroup	Manufacture of edible salt
33592	Subgroup	Manufacture of explosives and pyrotechnic products
33593	Subgroup	Manufacture of adhesives, glues, sizes and cements
33599	Subgroup	Manufacture of other chemical products n.e.c.
33600	Major group	MANUFACTURE OF MAN-MADE FIBRES
33700	Major group	MANUFACTURE OF RUBBER PRODUCTS
33710	Group	Manufacture of rubber tyres and tubes; retreading and rebuilding of rubber tyres
33711	Subgroup	Manufacture of tyres and tubes
33712	Subgroup	Rebuilding and retreading of tyres
33790	Group	Manufacture of other rubber products
33800	Major group	MANUFACTURE OF PLASTIC PRODUCTS
<b>34000</b>	<b>Division</b>	<b>MANUFACTURE OF OTHER NON-METALLIC MINERAL PRODUCTS</b>
34100	Major group	MANUFACTURE OF GLASS AND GLASS PRODUCTS
34111	Subgroup	Manufacture of sheet and plate glass, glass blocks, tubes and rods; glass fibres and glass wool
34112	Subgroup	Manufacture of glass containers; glass kitchenware and tableware; scientific and laboratory glassware, clock and watch glasses and other glass products n.e.c.
34200	Major group	MANUFACTURE OF NON-METALLIC MINERAL PRODUCTS N.E.C
34210	Group	Manufacture of non-structural non-refractory ceramicware
34220	Group	Manufacture of refractory ceramic products
34230	Group	Manufacture of structural non-refractory clay and ceramic products
34240	Group	Manufacture of cement, lime and plaster
34250	Group	Manufacture of articles of concrete, cement and plaster
34260	Group	Cutting, shaping and finishing of stone
34290	Group	Manufacture of other non-metallic mineral products n.e.c.
34291	Subgroup	Abrasives
34299	Subgroup	Other non-metallic mineral products n.e.c.



<b>35000</b>	<b>Division</b>	<b>MANUFACTURE OF BASIC METALS, FABRICATED METAL PRODUCTS, MACHINERY AND EQUIPMENT AND OF OFFICE, ACCOUNTING AND COMPUTING MACHINERY</b>
35100	Major group	MANUFACTURE OF BASIC IRON AND STEEL
35101	Subgroup	Basic iron and steel industries, except steel pipe and tube mills
35102	Subgroup	Steel pipe and tube mills
35200	Major group	MANUFACTURE OF BASIC PRECIOUS AND NON-FERROUS METALS
35201	Subgroup	Refining of precious metals, e.g. gold, silver, platinum
35202	Subgroup	Manufacture of primary non-ferrous metal products, excluding precious metals
35300	Major group	CASTING OF METALS
35310	Group	Casting of iron and steel
35320	Group	Casting of non-ferrous metals
35400	Major group	MANUFACTURE OF STRUCTURAL METAL PRODUCTS, TANKS, RESERVOIRS AND STEAM GENERATORS
35410	Group	Manufacture of structural metal products
35411	Subgroup	Manufacture of metal structures or parts thereof
35419	Subgroup	Other structural metal products, e.g. metal doors, windows and gates
35420	Group	Manufacture of tanks, reservoirs and similar containers of metal
35430	Group	Manufacture of steam generators, except central heating hot water boilers
35500	Major group	MANUFACTURE OF OTHER FABRICATED METAL PRODUCTS; METALWORK SERVICE ACTIVITIES
35510	Group	Forging, pressing, stamping and roll-forming of metal; powder metallurgy
35520	Group	Treatment and coating of metals; general mechanical engineering on a fee or contract basis
35521	Subgroup	Treating and coating of metals
35522	Subgroup	General mechanical engineering on a fee or contract basis
35530	Group	Manufacture of cutlery, hand tools and general hardware
35590	Group	Manufacture of other fabricated metal products n.e.c.
35591	Subgroup	Manufacture of metal containers, e.g. cans and tins
35592	Subgroup	Manufacture of cables and wire products
35593	Subgroup	Manufacture of springs (all types)
35594	Subgroup	Manufacture of metal fasteners
35599	Subgroup	Manufacture of other metal products n.e.c.
35600	Major group	MANUFACTURE OF GENERAL PURPOSE MACHINERY
35610	Group	Manufacture of engines and turbines, except aircraft, vehicle and motor cycle engines
35620	Group	Manufacture of pumps, compressors, taps and valves
35630	Group	Manufacture of bearings, gears, gearing and driving elements
35640	Group	Manufacture of ovens, furnaces and furnace burners
35650	Group	Manufacture of lifting and handling equipment
35690	Group	Manufacture of other general purpose machinery
35700	Major group	MANUFACTURE OF SPECIAL PURPOSE MACHINERY
35710	Group	Manufacture of agricultural and forestry machinery
35720	Group	Manufacture of machine tools
35730	Group	Manufacture of machinery for metallurgy
35740	Group	Manufacture of machinery for mining, quarrying and construction
35750	Group	Manufacture of machinery for food, beverage and tobacco processing
35760	Group	Manufacture of machinery for textile, apparel and leather production
35770	Group	Manufacture of weapons and ammunition
35790	Group	Manufacture of other special purpose machinery
35800	Major group	MANUFACTURE OF HOUSEHOLD APPLIANCES N.E.C.
35900	Major group	MANUFACTURE OF OFFICE, ACCOUNTING AND COMPUTING MACHINERY
<b>36000</b>	<b>Division</b>	<b>MANUFACTURE OF ELECTRICAL MACHINERY AND APPARATUS N.E.C.</b>
36100	Major group	MANUFACTURE OF ELECTRIC MOTORS, GENERATORS AND TRANSFORMERS
36200	Major group	MANUFACTURE OF ELECTRICITY DISTRIBUTION AND CONTROL APPARATUS
36300	Major group	MANUFACTURE OF INSULATED WIRE AND CABLE
36400	Major group	MANUFACTURE OF ACCUMULATORS, PRIMARY CELLS AND PRIMARY BATTERIES
36500	Major group	MANUFACTURE OF ELECTRIC LAMPS AND LIGHTING EQUIPMENT
36501	Subgroup	Manufacture of electric bulbs and fluorescent tubes
36502	Subgroup	Manufacture of illuminated signs and advertising displays
36503	Subgroup	Manufacture of lamps and lampshades



36600	Major group	MANUFACTURE OF OTHER ELECTRICAL EQUIPMENT N.E.C.
<b>37000</b>	<b>Division</b>	<b>MANUFACTURE OF RADIO, TELEVISION AND COMMUNICATION EQUIPMENT AND APPARATUS AND OF MEDICAL, PRECISION AND OPTICAL INSTRUMENTS, WATCHES AND CLOCKS</b>
37100	Major group	MANUFACTURE OF ELECTRONIC VALVES AND TUBES AND OTHER ELECTRONIC COMPONENTS
37200	Major group	MANUFACTURE OF TELEVISION AND RADIO TRANSMITTERS AND APPARATUS FOR LINE TELEPHONY AND LINE TELEGRAPHY
37300	Major group	MANUFACTURE OF TELEVISION AND RADIO RECEIVERS, SOUND OR VIDEO RECORDING OR REPRODUCING APPARATUS AND ASSOCIATED GOODS
37400	Major group	MANUFACTURE OF MEDICAL APPLIANCES AND INSTRUMENTS AND APPLIANCES FOR MEASURING, CHECKING, TESTING, NAVIGATING AND FOR OTHER PURPOSES, EXCEPT OPTICAL INSTRUMENTS
37410	Group	Manufacture of medical and surgical equipment and orthopaedic appliances
37411	Subgroup	Orthopaedic appliances
37412	Subgroup	Surgical, medical and dental supplies
37420	Group	Manufacture of instruments and appliances for measuring, checking, testing, navigating and for other purposes, except industrial process control equipment
37430	Group	Manufacture of industrial process control equipment
37500	Major group	MANUFACTURE OF OPTICAL INSTRUMENTS AND PHOTOGRAPHIC EQUIPMENT
37600	Major group	MANUFACTURE OF WATCHES AND CLOCKS
<b>38000</b>	<b>Division</b>	<b>MANUFACTURE OF TRANSPORT EQUIPMENT</b>
38100	Major group	MANUFACTURE OF MOTOR VEHICLES
38200	Major group	MANUFACTURE OF BODIES (COACHWORK) FOR MOTOR VEHICLES; MANUFACTURE OF TRAILERS AND SEMI-TRAILERS
38300	Major group	MANUFACTURE OF PARTS AND ACCESSORIES FOR MOTOR VEHICLES AND THEIR ENGINES
38301	Subgroup	Manufacture of radiators
38302	Subgroup	Activities of specialised automotive engineering workshops working primarily for the motor trade
38309	Subgroup	Manufacture of other motor vehicle parts and accessories
38400	Major group	BUILDING AND REPAIRING OF SHIPS AND BOATS
38410	Group	Building and repairing of ships
38420	Group	Building and repairing of pleasure and sporting boats
38500	Major group	MANUFACTURE OF RAILWAY AND TRAMWAY LOCOMOTIVES AND ROLLING STOCK
38600	Major group	MANUFACTURE OF AIRCRAFT AND SPACECRAFT
38700	Major group	MANUFACTURE OF TRANSPORT EQUIPMENT N.E.C.
38710	Group	Manufacture of motor cycles
38720	Group	Manufacture of bicycles and invalid carriages
38790	Group	Manufacture of other transport equipment n.e.c.
<b>39000</b>	<b>Division</b>	<b>MANUFACTURE OF FURNITURE; MANUFACTURING N.E.C.; RECYCLING</b>
39100	Major group	MANUFACTURE OF FURNITURE
39101	Subgroup	Manufacture of furniture made predominantly of metal
39102	Subgroup	Manufacture of furniture made predominantly of plastic materials
39103	Subgroup	Manufacture of furniture made predominantly of materials other than metal, plastic or concrete
39200	Major group	MANUFACTURING N.E.C.
39210	Group	Manufacture of jewellery and related articles
39211	Subgroup	Jewellery and related articles composed of precious metals, precious and semi-precious stones and pearls
39212	Subgroup	Diamond cutting and polishing
39219	Subgroup	Other precious and semi-precious stone cutting and polishing
39220	Group	Manufacture of musical instruments
39230	Group	Manufacture of sports goods
39240	Group	Manufacture of games and toys
39290	Group	Other manufacturing n.e.c
39291	Subgroup	Brushes and brooms
39292	Subgroup	Crayons, chalk, pens and pencils
39293	Subgroup	Buttons, buckles, slide fasteners, etc.