

**27<sup>th</sup> Voorburg Group Meeting  
on Services Statistics**

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**Updated Sector Paper on  
Industry ISIC 712  
TECHNICAL TESTING AND ANALYSIS**

Aspasia Papa  
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UK

## **1.0 Introduction**

NACE rev. 2 describes the Technical Testing and Analysis as follows:

“the performance of physical, chemical and other analytical testing of all types of materials and products.”

Examples given include: acoustics and vibration testing; testing of composition and purity of minerals etc.; testing activities in the field of food hygiene, including veterinary testing and control in relation to food production; testing of physical characteristics and performance of materials, such as strength, thickness, durability, radioactivity etc.; qualification and reliability testing.

This class excludes:

- testing of animal specimens, which is covered in Veterinary Services (division 75.00)
- diagnostic imaging, testing and analysis of medical and dental specimens, which are included in Human Health Activities, within division 86.

This paper describes the international progress and challenges in measuring turnover and price change in this sector. The paper aims to highlight international good practice, serving as an aid to those countries developing or improving their own data collection and statistical production in this sector. It is important to note that countries will need to pay due regard to their own domestic circumstances in terms of how this sector operates as the amount of market regulation is a particular factor.

This paper draws heavily on the mini presentations on the collection of turnover and price data in this sector at the 26<sup>th</sup> Voorburg Group (VG) meeting in Newport, South Wales and sector specific information gathered as part of the update to the OECD/Eurostat guide for SPPIs, which is due to be published later this year. It has also been informed by information gathered in the VG survey on country progress 2011, and a sector specific questionnaire of VG members.

## **2.0 Classification**

The technical testing sector, as defined above, varies between the various international classification systems. This is in part due to differing regulatory basis of

this sector internationally. Certification for certain tests, such as road vehicle worthiness, are mandatory in most countries and service providers are heavily regulated.

**2.1 Industry classification**

The latest International Standard Industrial Classification (ISIC Rev. 4) and the European statistical classification of economic activities (NACE Rev. 2) are identical for this sector: 7120 *Technical Testing and Analysis*.

The Australian and New Zealand Standard Industrial Classification (ANZSIC) 6925, *Scientific testing and analysis*, is broadly comparable with one notable exception: It excludes units mainly engaged in providing motor vehicle roadworthy inspections, which are included in ANZIC 7720, *Regulatory services*.

In the North American Industrial Classification System (NAICS), the equivalent to industry 7120 is spread across NAICS 541380, *Testing Laboratories*, and part of 811190, *All Other Automotive Repair and Maintenance*, which includes automobile emission inspection services and safety inspection services.

For the Japanese Standard Industrial Classification, 7120 is split between section R Services N.E.C. and section L, industry 74 Technical Services N.E.C.

**2.2 Product classification**

The product classifications presented here are the Central Product Classification (CPC v.2) and the Classification of Products by Activity (CPA 2008), which are equivalent.

CPA 2008	CPCV2	Description
71.20.11	83561	Composition and purity testing and analysis services
71.20.12	83562	Testing and analysis services of physical properties
71.20.13	83563	Testing and analysis services of integrated mechanical and electrical systems
71.20.14	83564	Technical inspection services of road transport vehicles
71.20.19	83569	Other technical testing and analysis services

**Table 1. CPA 2008 and CPC v.2**

One of the main issues discussed at the 26<sup>th</sup> Voorburg group meeting is the need to decompose the level of detail of current classification systems to represent the national activities of technical testing more accurately. It was therefore suggested that where there is clear evidence that the current classification system is inadequate, or doesn't accurately capture an important, diverse set of services then the National Statistical Agency should attempt to define and collect appropriate data at this detailed level in their price and turnover surveys.

Indeed, some countries may have their own classifications, which better suit the way the industry operates nationally. The Dutch SBI 2008 is one such classification system, which has the following service lines:

71201 Testing and analysis of agricultural products and food

71202 Technical testing and analysis of machinery, equipment and materials

71203 Other technical testing and analysis

Furthermore, the Norwegian statistics office has created an additional product covering 'certification services' due to the relevant importance of this specialised service to the Norwegian technical testing industry. Certification is a collective term for services which includes an issue of a certificate or an attestation from a third party.

### **3.0 Turnover Statistics**

Turnover is defined as the sum of remuneration for rendering of services to customers and sales of merchandise, and gross income from other activities. Rental income, commissions and special taxes are included, while subsidies and profits from sales of business assets and VAT are excluded.

Industry level turnover data are also required for the technical testing industry under the Structural Business Statistics (SBS) and the Short Term Statistics (STS) regulations. For the purpose of the former, annual turnover is collected alongside other variables such as number of employees, number of companies, investments etc. to describe the structure and performance of economic activities to show elementary structural shifts. At the same time, short-term statistics (STS) data

provide an idea of the short term economic trends. Timeliness is important for short term statistics as data are published soon after the end of the reporting period.

In addition to surveys, some administrative data can be used to collect turnover, particularly in order to reduce the response burden for smaller companies. Data can also be collected less frequently. For example, in Germany, as a large number of companies in the service sector are small or medium-sized, short-term statistics are carried out on a quarterly basis. Administrative data are also used where feasible so that smaller companies only have to answer to a reduced number of questions in the structural business survey.

### **3.1 Data availability**

Of the 23 countries that reported progress to the VG in 2011, 22 of them collected turnover data for the technical testing industry at the industry level. This is in line with the results generated from the survey carried out for the purpose of this paper. The majority of the countries collect data through surveys and only a small proportion uses administrative sources. Similarly, only a limited number of countries produce product level information. The periodicity of data also varies with most countries collecting data on annual basis whereas a small proportion also collects data more frequently (at a monthly or quarterly basis).

Three countries presented turnover and output measures on the 26<sup>th</sup> Voorburg group meeting, namely Norway, Poland and Germany.

Statistics Norway collects detailed turnover information on a yearly basis, with less detailed data collected on a quarterly basis. In addition, yearly information concerning CPA is gathered and published. More specifically, Norway uses a mix-model approach where SBS as well as STS data are used in tandem with administrative data. SBS produces absolute, yearly data concerning turnover, gross value added and economical variables. In essence, the SBS is a census survey, this is because survey data are combined with administrative sources. Indeed, a probability proportional to size sample is drawn where enterprise is the sampling unit. From these units the yearly accounts as well as a turnover questionnaire are

received. In addition, annual accounts for units outside the sample are received from the tax authorities. If information is missing for units in the population, turnover data are collected from the VAT-register and Brønøysund register (which includes only joint-stock companies). At the same time, the STS produces only an index and no absolute values. The survey is a census survey. All data from the VAT-register are collected at enterprise level and this information is broken down to establishment level, based on data from the latest SBS, at micro level.

In a similar vein, in Poland three surveys have been developed to collect data for the purpose of SBS, namely the Annual survey on enterprises (SP), the Survey of small enterprises (SP-3) and the Business Services survey. The *Annual survey on enterprises (SP)* collects information from companies with more than 10 employees. Information included in financial statements, such as balance sheet and profit and loss account is collected along with additional information, e.g. number of persons employed, type of book-keeping system etc. The *Survey of small enterprises (SP-3)* covers enterprises with less than 9 employees. Information is collected from the sample of businesses (about 5%) which are selected randomly within the settled strata. Finally, annual information on turnover by product and turnover by residence of client are obtained through “Business services” survey. This comprises all enterprises employing more than 10 people which run business services related activities including, among others, technical testing and analysis activities, but also legal activities, IT, book-keeping and auditing activities etc.

The *Monthly report on activity (DG-1)* is used to collect short-term information on turnover. The sample consists of all enterprises employing more than 50 staff and a 10% sample of enterprises employing between 10 and 49 people. This is based on the assumption that the results for the enterprises which employ more than 10 people are representative for the entire population. Poland is in the process of investigating the use of administrative data for estimating short-term data, particular turnover of the smallest units. It can be stated that data on turnover, obtained from those various data sources are coherent and could, in principle, be used for estimation. However, there are issues with the timeliness according to which VAT data are disseminated to public statistics (about 110 days after end of reference quarter).

In Germany, two surveys collect information on turnover of technical testing and analysis, i.e. structural business statistics are produced annually while short-term statistics quarterly. For the purpose of business statistics turnover is collected by product breakdown every two years from enterprises having at least 20 employees. Turnover is broken down according to the CPA classification. Sample selection is based on information from the Business Register. Those enterprises that are drawn are obliged to provide information about a number of variables, ranging from their principal economic activity, to turnover and investments. To reduce response burden small enterprises with an annual turnover of less than 250,000 Euro in the reporting year are surveyed only with a shortened questionnaire. In addition, in order to take into account the federal structure of Germany a survey is conducted decentralized by the Statistical Offices of the Länder in close cooperation with the Federal Statistical Office. Final results are available 18 months after the end of the reporting period.

Turnover data in short-term statistics are obtained through a multiple-source mixed mode design. This combines a primary survey conducted among large enterprises (i.e. with an annual turnover of at least 15 million Euro or with at least 250 employees) with administrative data for small and medium-sized enterprises. Enterprises are obligated by national law to provide information. Turnover administrative data are provided by the tax authorities of the 16 German states (Länder), the data obtained from value added tax (VAT) prepayment notice and payment procedure.

### **3.2 Evaluation of main methods**

Table 2 below provides an overview of best, good and minimum development options recommended for countries which aim to develop or review existing turnover programs.

Category	Data source	Level of detail	Frequency	Advantages	Cost
Best	Survey/Census	Industry and product turnover detail	Annual and sub-annual (quarterly and monthly) collection	Turnover data on a detailed level is collected Timely data	Most expensive Largest respondent burden
Good	Survey/Census combined with administrative data	Industry detail <u>only</u>	Annual and sub-annual	Turnover data on a detailed level is collected Timely data	High cost High response burden Product detail may be necessary Reconciling administrative variables with survey variables might be difficult
Minimum	Administrative data (e.g. tax data, industry association data etc)	Industry detail <u>only</u>	Annual	Low cost Little respondent burden Large coverage	Product detail may be necessary Timely data maybe required Suitability for turnover measurement must be validated

**Table 2: Options for Developing Turnover Statistics**

From the discussion above it can be deduced that the majority of countries appear to have programs classified into the *good* category whilst also supplementing this using administrative sources. This ensures that data are collected in a timely fashion and higher response burden is placed to larger companies.

### 3.3 Data issues

One of the main issues associated with turnover statistics is the definition of turnover. This is particularly the case for administrative data, which might involve the definition of turnover within the tax prepayment notice that differs in some respects from the statistical definition of turnover. For instance, some receipts such as rental income for company-owned machinery,



dwelling or land used by third parties or sales of land or used machines are not included according to the statistical definition but are included in the tax prepayment notice.

Furthermore, the statistics agencies need to take into account that the technical testing service sectors is quite heterogeneous containing a variety of service activities carried out by diverse enterprises of different sizes and that it underlies a “constant change”. The statistics should therefore thoroughly monitor structure and development of the services without putting too much burden on the enterprises

#### **4.0 SPPI Development**

The technical testing and analysis industry is quite heterogeneous because of the large variety of products and characters being tested, testing methods and standards. The price of provided service depends on a number of factors, including transaction partners (new/existing, resident/non-resident, large/small), type and complexity of service (test/analysis/certification), type of tested object (materials/cars/etc.), the size of the item(s) being tested (in number, weight, depth, and/or volume); time spent, etc. As a result, choosing the most appropriate pricing method(s) depends on service provided, on availability of alternative data sources as well as on the response burden the statistical agency can impose on respondent.

Another key issue that needs to be taken into account is the distinction between administratively regulated and freely negotiated prices. For example, in Germany prices for periodic safety tests for motor vehicles and periodic mission tests for motor vehicles are decided by federal regulation. Price information for this sub-sector can therefore be obtained from online price information of main market players and these presented list prices are also real transaction prices. Similarly, in the Netherlands, in the testing and analysis of agricultural products subsector, the majority of the companies work for the Dutch government and therefore the prices are not monitored.

## 4.1 Pricing methods used

### *Contract pricing*

This method could be feasible for large (representative) customers of a dominant market-leader firm, where the producer sells the same or very similar (representative) service to the same client in several survey periods (e.g. standard tests). Contract prices are agreed for the whole period when the contract is concluded or renewed. In the case of a framework agreement, prices may change according to the conditions of the agreement in each survey period. Contract pricing measures real transactions prices of services, however one of the disadvantages is that it is difficult to apply to the full range of services provided by the industry, in particular when enterprises produce unique services. At the same time, the service provider may change the contract prices quite frequently which would call for quality adjustment.

### *Model pricing*

The price of a certification consists of the initial and annual testing to ensure that the characteristics of a product have not changed. Thus, in addition to the first testing payment, a company has to pay an annual fee in order to keep a certificate. Because required tests depend on the characteristics of a product, every product needs a different set of tests. Companies providing testing services usually base their pricing on time used on testing which depends on the complexity, size etc. of a product. Therefore the preferred method for pricing these services is **model pricing**. The main advantage of model pricing is that any improvements in productivity should be captured in price changes. However, it is necessary to ensure the representativeness of the models, as well as including all applicable discounts when repricing the model services each period. On the other hand, the main disadvantage of model pricing is that companies usually find it hard to fill in the questionnaire as this method is more time consuming than others.

In the Netherlands the main pricing method used is “model pricing”. The model is set up to be an activity which is representative for the company at hand, and as such will occur on a regular basis. In a sense, this method is very close to “contract prices” or “transaction prices” where prices are followed for repeated services. The difference

with model pricing however is, that – in a period where the activity was not performed – the model is still priced (fictitious). For the models used, it is important to control the price determining factors. If a price determining factor is not controlled, unrealistic price developments may be captured.

An example of a model in Netherlands that is used for testing a power supply:

Testing a Power Supply according to UL 60950

Price determining factors: certificate to be issued

Work activities: Certification requirements per standards UL 60950 – construction analysis, testing, bill-of-materials, report

Total amount invoiced to the customer (incl. possible discounts) for an existing customer

#### *Pricing based on working time*

A possible alternative pricing method is **pricing based on working time**, particularly since companies providing testing and analysis services sometimes base their pricing on time use, this kind of information could be rather easily available. For example, in Germany in the case of not-recurring tests, records either list price charge out rates, realized charge out rates or computed charge out rates for personnel special machinery and research inventory. Pricing based on working time might, however, a poor price indicator because tests and analysis performed during an hour can vary extremely.

#### *Direct use of repeated services*

Given that periodic road-safety testing services are rather simple and quite homogeneous in nature; **direct use of prices of repeated services** seems to be an appropriate pricing method. Existing tariff systems on the most important testing services can easily be used as price quotations. Thus this pricing method is quite simple and effective and is used in a number of countries, such as Finland and Norway.

#### *Use of CPI proxies*

The CPI could also be used as a proxy for SPPI for services provided to final consumers (e.g. periodic road-safety testing services for cars). It is important to note, that the use of consumer prices (CPIs) may need additional transformation prior to being combined with SPPI because of the differences in periodicity (monthly for CPI, quarterly for SPPI), in methodology (taxes e.g. VAT is included in the CPI, but not in the SPPI) or in weighting structure. The CPI proxy can also provide a good starting point for SPPI data collection. For instance, in Finland, the national CPI already covered partly periodic road-safety testing of motor vehicles, so it provided a natural starting point for data collection and was thus expanded to cover SPPI relevant data.

### 4.2 Evaluation of current methods

Table 2 below provides an overview of best, good and minimum development options recommended for countries seeking to either develop new or re-evaluate existing SPPI programs.

Category	Pricing method	Data type in the survey	Quality and accuracy
Best	<ul style="list-style-type: none"> <li>• Direct use of repeated services</li> <li>• Model pricing,</li> <li>• Contract pricing</li> </ul>	A combination of charge out rates, actual transaction prices, prices estimated by the respondent and/or CPI series	<p><b>Advantages:</b></p> <ul style="list-style-type: none"> <li>• It can be useful for companies offering heterogeneous services</li> <li>• Pricing methods can be tailored to the nature of the service offered and the type/size of company</li> <li>• It can identify any potential changes in quality</li> </ul> <p><b>Disadvantages</b></p> <ul style="list-style-type: none"> <li>• It can be expensive</li> <li>• Data can be complex to analyse</li> <li>• Questionnaire might be time-consuming to develop</li> </ul>
Good	Time-based methods	List price charge out rates, realized charge out rates or computed charge out rates	<p><b>Advantages:</b></p> <ul style="list-style-type: none"> <li>• Particularly applicable when prices depend on charge out rates of machinery and personnel (e.g. certification)</li> <li>• Quality changes can be easily identified</li> </ul> <p><b>Disadvantages:</b></p> <ul style="list-style-type: none"> <li>• Difficult to apply for heterogeneous services</li> <li>• Changes in productivity are not captured</li> </ul>

Minimum	List prices	List prices without additional information discounts and surcharges on	<b>Advantages:</b> <ul style="list-style-type: none"> <li>• Relatively simple pricing method for NSIs and respondents</li> </ul> <b>Disadvantages:</b> <ul style="list-style-type: none"> <li>• No real transaction prices</li> </ul>
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**Table 3. Recommended options for developing a Technical Testing and Analysis SPPI**

Not surprisingly, a combination of contract pricing, model pricing and model pricing/prices of repeated services are classified as the best approach. Hourly charge-out rates are rather applicable for services where the ultimate price is a function of time of the machinery or personnel. List prices are categorised as ‘minimum’ because they capture neither productivity changes nor discounts and surcharges.

### 4.3 Quality issues

Technical testing and analysis services evolve with technology and new services replacing outdated ones. Once the services selected to price for data collection are well defined, any quality issues are made more apparent and can be easily addressed. As such, it is essential to carefully define all the factors that influence pricing, aim to select those services that are that are representative to what a company provides and control for the continuous representativeness of services over time. Finally, as new services evolve the demand for old services declines, prompting for regular updating of services and weights in price data collection.

To maintain the quality of the data it is suggested that companies are contacted to further investigate any significant price change or change to the existing service. A number of countries (e.g. The Netherlands or Hungary) use the overlap methods, particularly where model pricing is used. This method can be applied, because new and old services are generally sold simultaneously, or if not, enterprises can price the old services. For direct use of repeated services, option pricing or alternatively indirect option pricing via expert judgement can be applied to treat quality change. It should be noted that where an official regulation changes (e.g. in-/exclusion of services to the obligatory annual car safety tests by the government), the indirect option pricing via expert judgement will be the only method to account for quality change as no comparable prices of the previous period can be observed.

If most services are performed on an ongoing basis, quality adjustment is needed infrequently. However most of countries also make cross-comparisons, mainly on an ad hoc basis with data from other sources (e.g. CPI, SPPI from other countries, regulatory or administrative data, and exchange rate movements), prior to dissemination.

For treating missing values countries follow mainly two methods; namely, carrying forward the price from the previous period (especially for contract pricing), or using the average price development of similar products/enterprises.

#### **4.4 Issues with pricing methods used**

One of the main issues in this industry is the export of services. For example in Poland in 2009 more than 10% of turnover was generated by sale to clients residing abroad. According to the STS Regulation, prices should be computed at national currency. However companies, especially for non-domestic customers offer services at a foreign currency. In this case apart from pure price changes, exchange rates movements should be controlled as well. For example, in the Netherlands, prices are partly influenced by the dollar exchange rate since some tests are “international”, concerning import/export or internationally standardized certificates.

Another key issue that needs to be taken into account is that many of the major companies are subsidiaries of multinational companies that provide services only for a parent company and thus their prices don't usually follow the subsidiary's market prices. For instance, in Netherlands some companies are part of an international organization where prices are set abroad, mostly in US dollars.

#### **5.0 Summary**

The paper presented the main development and issues on technical testing to inform countries aiming to develop or review an index in this industry. In terms of classifications, there is a fair degree of harmonization for industry and product classifications. However, there is some evidence across countries that the current classification system is inadequate, or does not accurately capture an important,

diverse set of services. The National statistical agencies are thus strongly encouraged to decompose the level of detail of current classification systems to represent the national activities of technical testing more accurately.

The most efficient method of collecting turnover data is a combination of census and administrative data. This ensures the timeliness of data whilst placing higher response burden to larger companies rather than smaller ones. Certainly, particular care should be taken to validate that the data used are fit for purpose.

In developing a price index for technical testing, a mixed method approach encompassing a number of pricing methods, such as direct use of repeated services, model pricing and contract pricing would be the most recommended method for collecting prices data. The charge out method is also applied where the ultimate price depends on time used for the machinery and personnel whereas list prices which do not capture any additional discount data are classified as a suboptimal method. In terms of quality adjustment methods, the overlapping method and the indirect option pricing method are often used. Particular care should be taken for services offered to non-domestic customers to ensure that any price change is genuine rather than attributable to changes in the exchange rate.

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## Appendix 1- Industry classification

### ISIC Rev 4

- Section: M - Professional, scientific and technical activities
- Division: 71 - Architectural and engineering activities; technical testing and analysis
- Group: 712 - Technical testing and analysis
- Class: 7120 - Technical testing and analysis

#### Explanatory note

This class includes:

- performance of physical, chemical and other analytical testing of all types of materials and products (see below for exceptions):
- acoustics and vibration testing
- testing of composition and purity of minerals etc.
- testing activities in the field of food hygiene, including veterinary testing and control in relation to food production
- testing of physical characteristics and performance of materials, such as strength, thickness, durability, radioactivity etc.
- qualification and reliability testing
- performance testing of complete machinery: motors, automobiles, electronic equipment etc.
- radiographic testing of welds and joints
- failure analysis
- testing and measuring of environmental indicators: air and water pollution etc.
- certification of products, including consumer goods, motor vehicles, aircraft, pressurized containers, nuclear plants etc.
- periodic road-safety testing of motor vehicles
- testing with use of models or mock-ups (e.g. of aircraft, ships, dams etc.)
- operation of police laboratories

*This class excludes:*

- *testing of animal specimens, see 7500*
- *medical laboratory testing, see 8690*

### NACE Rev 2

#### 71.2 Technical testing and analysis

##### 71.20 Technical testing and analysis

This class includes the performance of physical, chemical and other analytical testing of all types of materials and products, such as:

- acoustics and vibration testing
- testing of composition and purity of minerals etc.
- testing activities in the field of food hygiene, including veterinary testing and control in relation to food production
- testing of physical characteristics and performance of materials, such as strength, thickness, durability, radioactivity etc.
- qualification and reliability testing
- performance testing of complete machinery: motors, automobiles, electronic equipment etc.
- radiographic testing of welds and joints
- failure analysis
- testing and measuring of environmental indicators: air and water pollution etc.
- certification of products, including consumer goods, motor vehicles, aircraft, pressurised containers, nuclear plants etc.
- periodic road-safety testing of motor vehicles
- testing with use of models or mock-ups (e.g. of aircraft, ships, dams etc.)
- operation of police laboratories

This class excludes:

- testing of animal specimens, see 75.00
- diagnostic imaging, testing and analysis of medical and dental specimens, see 86

#### 2012 NAICS Definition

##### Sector 54 -- Professional, Scientific, and Technical Services

##### 54138 Testing Laboratories

This industry comprises establishments primarily engaged in performing physical, chemical, and other analytical testing services, such as acoustics or vibration testing, assaying, biological testing (except medical and veterinary), calibration testing, electrical and electronic testing, geotechnical testing, mechanical testing, non destructive testing, or thermal testing. The testing may occur in a laboratory or on-site.

Establishments primarily engaged in--

- Laboratory testing for the medical profession--are classified in Industry 62151, Medical and Diagnostic Laboratories;
- Veterinary testing services--are classified in Industry 541940, Veterinary Services; and
- Auto emissions testing--are classified in U.S. Industry 811198, All Other Automotive Repair and Maintenance

### **ANZSIC 2006, Rev 1**

Division M PROFESSIONAL, SCIENTIFIC AND TECHNICAL SERVICES  
Subdivision 69 PROFESSIONAL, SCIENTIFIC AND TECHNICAL SERVICES (EXCEPT COMPUTER SYSTEM DESIGN AND RELATED SERVICES)

Group 692 ARCHITECTURAL, ENGINEERING AND TECHNICAL SERVICES

### **Class 6925 Scientific Testing and Analysis Services**

This class consists of units mainly engaged in providing scientific testing and analysis services such as physical or chemical testing, calibration testing, mechanical testing, thermal testing and biological testing (except medical or veterinary). The testing may occur in a laboratory or on site.

Primary activities

- Chemical analysis service n.e.c.
- Forensic science service (except pathology service)
- Geology and geophysical testing service
- Laboratory operation (providing chemical, food, electrical engineering or other technical services)
- Materials strength testing service
- Non-destructive testing service
- Pollution monitoring service
- Seismic survey data analysis service
- Testing or assay service on fee or contract
- Wine testing
- Wool testing service

### **Exclusions/references**

#### **Units mainly engaged in**

- providing engineering consulting services, including building inspection services, are included in Class 6923 Engineering Design and Engineering Consulting Services;
- providing medical pathology or diagnostic services are included in Class 8520 Pathology and Diagnostic Imaging Services;
- providing veterinary pathology services are included in Class 6970 Veterinary Services;
- providing motor vehicle roadworthy inspection (issuing road warrants of fitness in NZ) services are included in Class 7720 Regulatory Services; and
- providing geotechnical engineering services are included in class 6923 Engineering Design and Engineering Consulting Services.

## Appendix 2 - Product classification

### CPCv2 extract

#### **8356 Technical testing and analysis services**

#### **83561 Composition and purity testing and analysis services**

This subclass includes:

- testing and analysis services for the chemical and biological properties of materials such as air, water, waste (municipal and industrial), fuels, metal, soil, minerals, food and chemicals
- testing and analysis services in related scientific fields such as microbiology, biochemistry, bacteriology, etc.

This subclass does not include:

- medical and dental testing services, cf. 93199

#### **83562 Testing and analysis services of physical properties**

This subclass includes:

- testing and analysis services of physical properties such as strength, ductility, electrical conductivity and radioactivity of materials such as metals, plastics, textiles, woods, glass, concrete and other materials
- tests for tension, hardness, impact resistance, fatigue resistance and high-temperature effects

#### **83563 Testing and analysis services of integrated mechanical and electrical systems**

This subclass includes:

- testing and analysis services for the mechanical and electrical characteristics of complete machinery, motors, automobiles, tools, appliances, communication equipment and other equipment incorporating mechanical and electrical components. The results of the testing and analysis generally take the form of an assessment of the performance and behavioural characteristics of the object tested. Tests may be performed using models or mock-ups of ships, aircraft, dams, etc.

#### **83564 Technical inspection services of road transport vehicles**

This subclass includes:

- periodical technical inspection services for automobiles, motorcycles, buses, lorries, trucks and other road transport vehicles

This subclass does not include:

- damage assessment services, cf. 71620
- maintenance and repair services for motor vehicles and motorcycles, cf. 8714

#### **83569 Other technical testing and analysis services**

This subclass includes:

- testing and analysis services of a technical or scientific nature that do not alter the object being tested
- radiographic, magnetic, and ultrasonic testing of machine parts and structures in order to identify defects. These tests are often conducted on site.
- certification of ships, aircraft, dams, etc.
- certification and authentication of works of art
- radiological inspection of welds
- all other technical testing and analysis services not elsewhere classified

This subclass does not include:

- assessment of damages services on behalf of insurance companies, cf. 71620
- technical inspection services for automobiles, cf. 83564
- medical analyses and testing services, cf. 93199

## CPA 2008

### **71.2 Technical testing and analysis services**

#### **71.20 Technical testing and analysis services**

##### **71.20.1 Technical testing and analysis services**

This subcategory includes:

- testing and analysis services for the chemical and biological properties of materials such as air, water, waste (municipal and industrial), fuels, metal, soil, minerals, food and chemicals
- testing and analysis services in related scientific fields such as microbiology, biochemistry, bacteriology, etc.

This subcategory excludes:

- testing services related to animal health care and control, see 75.00.1
- medical and dental testing services, see 86.90.15

#### **71.20.11 Composition and purity testing and analysis services**

This subcategory includes:

- testing and analysis services of physical properties such as strength, ductility, electrical conductivity and radioactivity of materials such as metals, plastics, textiles, woods, glass, concrete and other materials
- tests for tension, hardness, impact resistance, fatigue resistance and high-temperature effects

#### **71.20.12 Testing and analysis services of physical properties**

This subcategory includes:

- testing and analysis services for the mechanical and electrical characteristics of complete machinery, motors, automobiles, tools, appliances, communication equipment and other equipment incorporating mechanical and electrical components

The results of the testing and analysis generally take the form of an assessment of the performance and behavioural characteristics of the object tested. Tests may be performed using models or mock-ups of ships, aircraft, dams, etc.

#### **71.20.13 Testing and analysis services of integrated mechanical and electrical systems**

#### **71.20.14 Technical inspection services of road transport vehicles**

This subcategory includes:

- testing and analysis services of a technical or scientific nature that do not alter the object being tested
- radiographic, magnetic and ultrasonic testing of machine parts and structures in order to identify defects. These tests are often conducted on site.
- certification of ships, aircraft, dams, etc.
- certification and authentication of works of art
- radiological inspection of welds
- analysis services of police laboratories
- all other technical testing and analysis services not elsewhere classified

This subcategory excludes:

- assessment of damages services on behalf of insurance companies, see 66.21.10
- technical inspection services for automobiles, see 71.20.14
- medical analyses and testing services, see 86.90.15

### **NAPCS Product List for NAICS 54199: All Other Professional, Scientific, and Technical Services**

Please note the list is too lengthy to be included in this paper. More details can be found in the link below:

[http://www.census.gov/eos/www/napcs/finalized/web\\_54199\\_final\\_reformatted\\_edited\\_US082208.pdf](http://www.census.gov/eos/www/napcs/finalized/web_54199_final_reformatted_edited_US082208.pdf)