

# **Patent Statistics: Concordance IPC V8 – NACE REV.2**

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## 1. Introduction

In December 2006, the revision to NACE Rev. 2 was introduced. The implementation of this modified classification scheme has implications when mapping or analysing the relationship between industries, on the one hand, and technology, on the other. Such activities necessitate the presence of a concordance scheme which relates industries to relevant technological classes. A concordance scheme has been developed in the past, based on the original NACE classification and the IPC classification v7 (Schmoch, U., LaVille, F., Patel, P., Frietsch, R., 2003. Linking technology areas to industrial sectors: final reports to the European commission. DG Research November). Revising the NACE calls for revisiting and adapting this concordance scheme. This document outlines the approach followed to arrive at the updated concordance, and it includes the updated concordance table and identifies some notable changes.

This exercise has been initiated by Eurostat and executed by KU Leuven (INCENTIM & ECOOM). As part of the process, experts at Eurostat (Bernard Félix), Sogeti (Gaëtan Châteaugiron) and EPO (Geert Boedt) were consulted. Last but not least, Ulrich Schmoch and Rainer Frietsch participated by systematically reviewing and validating suggested changes.

## 2. Overview of the methodology

In December 2006, the revision to NACE Rev. 2 was introduced. Any shift/conversion in the NACE classification system has an impact on concordance tables used to arrive at patent statistics by industry. Over the last decade, patent indicators reporting activity by industry have been built on the well-known concordance table between industries and technologies developed by Schmoch et al (2003)<sup>1</sup>. This concordance scheme has been developed and validated by matching IPC classes to industries via an assessment of a representative sample of firm-owned patents<sup>2</sup>. This exercise has resulted in an allocation of IPC codes to NACE categories.

Initiated by Eurostat, the IPC-NACE concordance has been updated by INCENTIM/ECOOM (KU Leuven). This work has relied on two sources: (1) the existing concordance between 44 technology sectors of the Fraunhofer classification<sup>1</sup> with corresponding IPC classes (International Patent Classification) and NACE 1.1 industries, and (2) the official conversion table NACE 1.1 to NACE Rev. 2<sup>3</sup>, edited and published by Eurostat.

The conversion table from NACE 1.1 to NACE Rev.2 was the starting point.

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<sup>1</sup> Schmoch, U., LaVille, F., Patel, P., Frietsch, R., 2003. Linking technology areas to industrial sectors: final reports to the European Commission. DG Research November. [ftp://ftp.cordis.europa.eu/pub/indicators/docs/ind\\_report\\_isi\\_ost\\_spru.pdf](ftp://ftp.cordis.europa.eu/pub/indicators/docs/ind_report_isi_ost_spru.pdf)

<sup>2</sup> Alternative approaches rely on the probabilities calculated based on the frequency of 'industrial' keywords observed in patent documents. See: Lybbert T. & Zolas N. (2013) Getting patents and economic data to speak to each other: An 'Algorithmic Links with Probabilities' approach for joint analysis of patenting and economic activity. Research Policy.

<sup>3</sup> [http://epp.eurostat.ec.europa.eu/portal/page/portal/nace\\_rev2/correspondence\\_tables](http://epp.eurostat.ec.europa.eu/portal/page/portal/nace_rev2/correspondence_tables)

Table 1: overview of NACE 1.1 and NACE Rev.2 concordance

Values in the Table correspond to the number of unique NACE 1.1/NACE Rev.2 combinations on the 3- or 4-digit level.

The cells in light red represent the highest values in a row and uncover the most significant correspondence between NACE 1.1 and NACE Rev.2.

	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	38	41	43	58	59	62	95	Grand Total	Count of NACE Rev.2/NACE 1.1 on 2-digit level	
Food products and Beverages	15	34	8								1																				43	3		
Tobacco products	16		1																												1	1		
Textiles	17			20	3			1															1	2							1	28	6	
Wearing apparel; dressing and dyeing of fur	18			2	6	1																	2									11	4	
Tanning and dressing of leather; luggage, handbags, saddlery, harness and footwear	19					3	1						2										1									7	4	
Wood and of products of wood and cork, except furniture; articles of straw and plaiting materials	20						7																2	2		1	2					14	5	
Pulp, paper and paper products	21							7	2																							9	2	
Publishing, printing and reproduction of recorded media	22							1	8														1					6	1			17	5	
Coke, refined petroleum products and nuclear fuel	23									2	1	1			1																	7	5	
Chemicals and chemical products	24								1	19	2						2						1									26	6	
Rubber and plastic products	25												7					2					3	4		1	1					18	6	
Other non-metallic mineral products	26													25																		31	2	
Basic metals	27														16	1																17	2	
Fabricated metal products, except machinery and equipment	28														1	19							3	30								37	7	
Machinery and equipment n.e.c.	29															2		3	30		2	1	23				1				1	63	8	
Office machinery and computers	30																	1	1				1									4	4	
Electrical machinery and apparatus n.e.c.	31												1		1	5	13	2	2	1				6								31	8	
Radio, television and communication equipment and apparatus	32															8	1	1						3								1	14	5
Medical, precision and optical instruments, watches and clocks	33															5	1	3					6	8								23	5	
Motor vehicles, trailers and semi-trailers	34																	2	3	1			2									8	4	
Other transport equipment	35																	2		8	1		8									19	4	
Furniture; manufacturing n.e.c.	36			1		1	1	1			1		4				1	1		3	1	4	7	9	3						5	43	15	
Recycling	37																								3							3	1	
<b>Grand Total</b>		34	8	1	23	9	5	9	10	10	3	22	3	13	26	18	24	22	20	47	6	16	8	28	79	6	3	5	6	1	1	8	474	112

The column 'Count of NACE Rev.2/NACE 1.1' on the right side, shows the amount of NACE Rev.2 industries per NACE 1.1 industry, on the 2-digit level.

Two cases can occur: i) a 1:1 relationship between the old and the new NACE category exists on the 2-digit level (e.g. Tobacco Products is relabelled from 16 (NACE 1.1) to category 12 (NACE Rev.2)) or ii) NACE 1.1 codes on the 2-digit level are classified into different NACE Rev.2 categories (e.g. Food Products and Beverages used to be classified together (label 15) under NACE 1.1 while the constituent industries are classified under Food Products (label 10), Beverages (label 11), and even Chemicals and chemical products (label 20) in the NACE Rev.2 classification. As soon as industries are regrouped, the question arises which IPC codes – previously related to NACE 1.1 (Schmoch et al.) categories – need to be transferred to which NACE Rev.2 code.

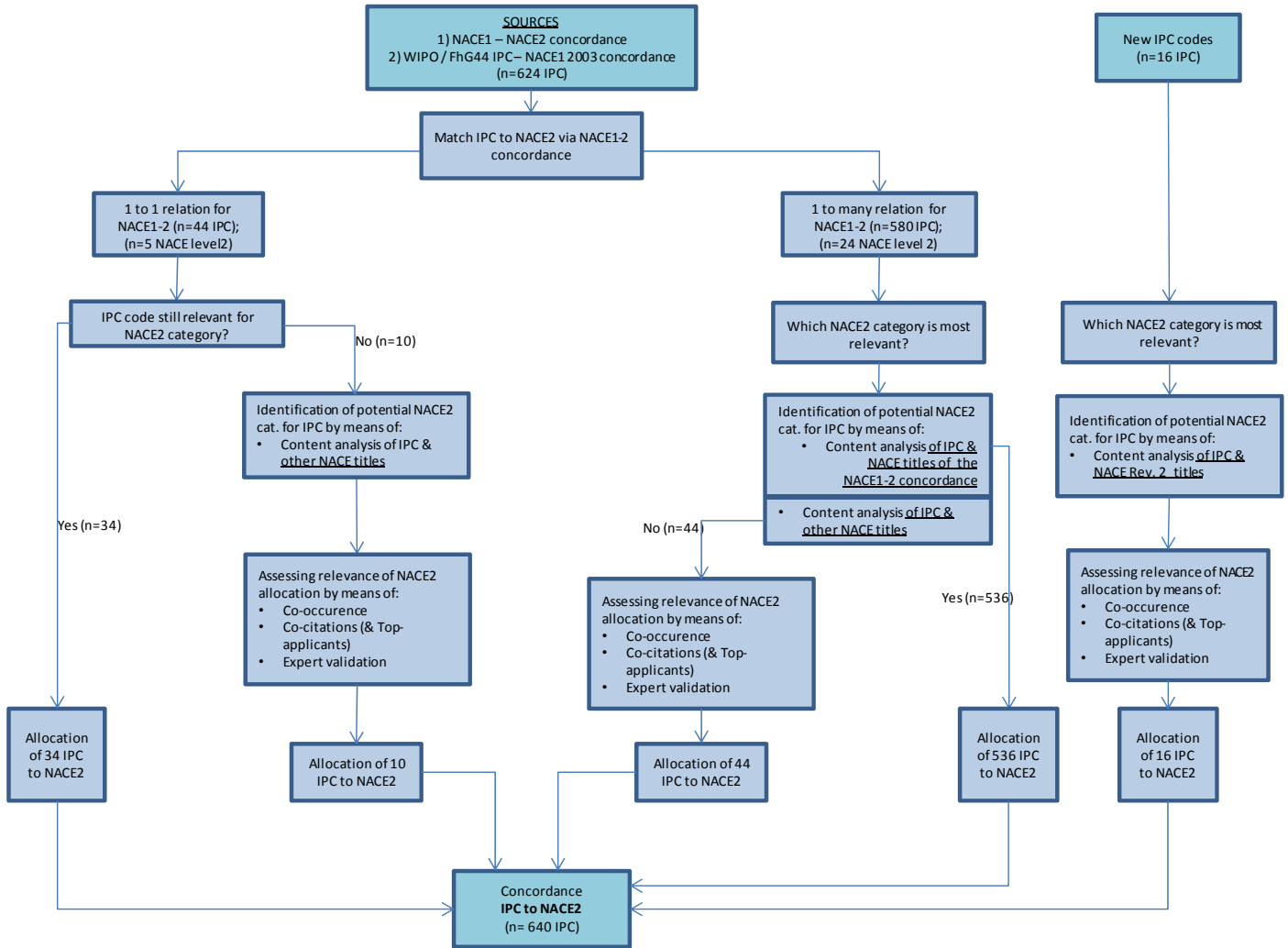
In case a 1:1 relationship exists between the old and the new NACE version, the relevance of the IPC code for the NACE Rev.2 category has been inspected, relying on a content analysis of the IPC description as well as potential relevant NACE Rev.2 categories. In cases where doubt existed, co-occurrence and co-citation patterns of IPC codes have been inspected and used (whereby IPC classes that are highly related are allocated to one and the same NACE Rev.2 category). In total, 44 of the IPC codes have been allocated in this manner.

In case (NACE Rev. 2) categories do not display a 1:1 relationship with old NACE 1.1 categories, all the IPC codes involved (previously allocated to one NACE category) are assessed in terms of relevance to multiple NACE categories. The majority of IPC codes are situated here (n=580). NACE categories that have been considered stem initially from the concordance scheme from NACE 1.1 to NACE Rev.2. In a limited number of cases (n=44), IPC codes shifted to another industry. Decisions on allocating IPC codes to industries have been based on co-occurrence and co-citation patterns as well as an assessment of the industries in which main patent applicants are active.

Finally, a limited number of novel IPC codes (n=16) had to be included. For these codes, content analysis of the IPC description, combined with inspecting the co-occurrence/co-citation patterns and an analysis of main players, has also been used to arrive at allocation decisions.

The outcomes of this exercise have been inspected and validated by a team of experts, operating independently (Eurostat, EPO, Fraunhofer-Gesellschaft). Figure 1 summarizes the approach adopted and reports the number of IPC codes (total = 640) that have been allocated to the different situations encountered.

Figure 1: Overview of the methodology adopted to allocate IPC codes to NACE Rev.2 categories.





### 3. Concordance Table IPC V8 - NACE Rev.2

In Table 2, the outcomes of this exercise can be found on the NACE 2-digit level. For a number of IPC codes, it was feasible to allocate them more precisely to the NACE 3-digit level. This more fine-grained classification scheme can be found in Annex 1.

Table 2: NACE Rev. 2 – IPC V8 concordance (NACE 2-digit level)

10	Manufacture of Food Products [10]	A01H A21D A23B A23C A23D A23F A23G A23J A23K A23P C12J C13F C13J C13K A23L 1/* A23L 3/* C13B A01J
11	Manufacture of Beverages [11]	C12C C12F C12G C12H A23L 2/*
12	Manufacture of Tobacco Products [12]	A24B A24D A24F
13	Manufacture of Textiles [13]	B65D (5,88%) D06C D04G D04H D06J D06M D06P D06Q D04D D06N
14	Manufacture of Wearing Apparel [14]	A41B A41C A41D A41F
15	Manufacture of Leather and Related Products [15]	A43B A43C B68B B68C
16	Manufacture of Wood and of Products of Wood and Cork, except Furniture; Manufacture of Articles of Straw and Plaiting Materials [16]	B27D B27H B27M B27N B65D (1,25%)
17	Manufacture of Paper and Paper Products [17]	B42F B65D (20,44%) D21C D21H D21J
18	Printing and Reproduction of Recorded Media [18]	B41M B42D B44F
19	Manufacture of Coke and Refined Petroleum Products [19]	C10G C10L
20	Manufacture of Chemicals and Chemical Products [20]	C07B not A61K except A61K 8/* C07C not A61K except A61K 8/* C07F not A61K except A61K 8/* C07G not A61K except A61K 8/* C12S not A61K except A61K 8/* C08B C08F C08G C08K C08L C05B C05C C05D C05F C05G C09B C09C C09K C10B C10C C10H C10J C10K C01B C01C C01D C01F C01G C25B B01J F25J B09B B09C C02F G21F C08J F17C F17D A01N A01P C09D B27K C09F C11D D06L A61K 8/* A61Q C08H C06D C09G C09H C09J C10M C11B C11C C23F C23G C14C A62D D01C C10N C40B not A61K except A61K 8/* C06C C06B F42B F42D D01F

21	Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations [21]	A61P C12Q	C07D A61K (except A61K 8/*)	C07H	C07J	C07K	C12N	C12P
22	Manufacture of Rubber and Plastic Products [22]	B67D B65D (35.96%)	B29C	B29D	B60C	C08C	B29B	
23	Manufacture of Other Non-Metallic Mineral Products [23]	B32B C03C	B65D (21.31%) C03B	B28B	B28C	E03D	C04B	
24	Manufacture of Basic Metals [24]	B22D C25C	C21B C25F	C21C B21C	C21D G21H	C22B	C22C	C22F
25	Manufacture of Fabricated Metal Products, except Machinery and Equipment [25]	B21G F27D F17B F41C B22F A01L	B65D (15.17%) A44B G21C F41F C23D F16B	A47H G21D F41G C25D E05C	F22B G21B F41H E05B	F22G B63G F41J E05D	F24J F41A F42C E05F	F16T F41B G21J E06B
26	Manufacture of Computer, Electronic and Optical Products [26]	G11C C30B G06E G09C H04L G03H H01Q G01C G01R G01K G04D G02B	H01C B82B G06F G08B H03B H03J H01S G01D G01S G01L G04F G02C	H01F B81B G06G H04B H03C H04H H03K G01F G01W G05B G04G G03B	H01G B81C G06J H04J H03D H04N H03L G01H G12B G08C A61N G03C	H01J B82Y G06N H04K H03G H04R H03F G01J G01Q G05F H05G	H01L G06C G06T H04M H03H H04S F15C G01M G04R G04B G21K	H05K G06D G02F H04Q H03M H04W G01B G01N G01V G04C H05H
27	Manufacture of Electrical Equipment [27]	H02K H02G F21S A21B E06C B60M H05C	H02N H01H F21V A45D F24B B61L H01P	H02P H01R H01K A47G F24C G08G	H02B F21H F21P A47J F24D G10K	H02J F21K F21Q A47L F25C H01T	H01M F21L F21W B01B F25D H02H	H01B F21M F21Y D06F H05B H02M
28	Manufacture of Machinery and Equipment N.E.C. [28]	B23F F03G F16D F01K A47K B60S G09D G06M G01G B65G F23H	F01B F04B F16F F01M F23G E02C G09G G10L C10F B66C F23K	F01C F04C F16H F01N F27B G07B G11B G03G B01D C12L F23L	F01D F04D F16K F01P B66B G07C B41J F24F B04C F22D F23M	F03B F23R F16M F02G B66D G07D B41K F24H B05B F23B F25B	F03C F15B G05D F02C B66F B43M F28F A62C F23C F28B	F03D F16C G05G F02K B61B G07G G06K H05F F23J F23D F28C

		F28D F28G F16G F23N A01B A01C A01D A01F A01G A01K A01M B27L B24D B21K B21L B25B B25C B25F B25G B25H B26B B27G B21D B21F B21H B21J B23B B23C B23D B23G B23H B23K B23P B23Q B24B B24C B25D B25J B26F B27B B27C B27F B27J B28D B30B B44C B65F 1/* B65F 5/* B65F 7/* B65F 9/* F15D A21C A22B A22C A23N A24C A41H A42C A43D B02B B02C B05C B05D B06B B07B B07C B08B B21B B22C B26D B31B B31C B31D B31F B41B B41C B41D B41F B41G B41L B41N B42B B42C B44B B65B B65C B65H B67B B67C B68F C13C C13D C13G C13H C23C D06G D06H D21B D21D D21G E01C E02D E02F E21B E21D E21F F04F F16N F26B E01D E01F E21C D01B D01D D01G D01H D02G D02H D02J D03C D03D D03J D04B D04C D05B D05C D06B D21F E05G E01H B01F B03B B03C B03D C14B F16P
29	Manufacture of Motor Vehicles, Trailers and Semi-Trailers [29]	B60B B60D B60G B60H B60J B60K B60L B60N B60P B60Q B60R B60T B62D F01L F02B F02D F02F F02M F02N F02P F16J G01P B60W
30	Manufacture of Other Transport Equipment [30]	B65F 3/* B60F B60V B61C B61D B61F B61G B61H B61J B61K B62C B62H B62J B62K B62L B62M B63B B63C B63H B63J B64B B64C B64D B64F B64G E01B F03H
31	Manufacture of Furniture [31]	A47B A47C A47D A47F
32	Other Manufacturing [32]	F16L A45C D07B A41G A42B A44C A45B A45F A46B A46D A63B A63C A63D A63F A63G A63H A63J A63K B43K B43L B44D B62B B68G C06F F23Q G10B G10C G10D G10F G10G G10H A61B A61C A61D A61F A61G A61H A61J A61L A61M C12M not A61K except A61K 8/* B01L B04B G01T G21G A62B G09B G09F G03D G03F
42	Civil Engineering [42]	E03B E03C E02B
43	Specialised Construction Activities [43]	E04G E04B E04C E04D E04F E03F E04H
62	Computer Programming, Consultancy and Related Activities [62]	G06Q
Co-IPC	remove this code and allocate by following the co-IPC	F16S B29K B29L C12R

#### 4. Explanatory comments on the concordance

##### 4.1. Food & Beverages

- The class 'Food & Beverages', present in the NACE 1.1 classification, has been disaggregated into 'Manufacture of Food Products' and 'Manufacture of Beverages' in the NACE Rev.2 classification. For IPC A23L (foods, foodstuffs, or non-alcoholic beverages, not covered by subclasses A23B to A23J) that spans both foods/foodstuffs and beverages, the more fine-grained IPC 'main group' level (IPC5-digit) is used to arrive at a correct classification under either 'Food' or 'Beverages'.

Table 3: Distribution of IPC A23L over NACE Rev.2 industries

Subclass (IPC4-digit)	NACE 1.1	Main group (IPC5-digit)	IPC5 Description	NACE Rev.2	NACE Rev.2 Description
<b>A23L</b>	Food & Beverages 15	A23L 1/*	Foods or foodstuffs; Their preparation or treatment (preservation thereof in general A23L 3/00) [4]	10	Food
<b>A23L</b>	Food & Beverages 15	A23L 2/*	Non-alcoholic beverages; Dry compositions or concentrates thereof; Their preparation (soup concentrates A23L 1/40; preparation of non-alcoholic beverages by removal of alcohol C12H 3/00) [2]	11	Beverages
<b>A23L</b>	Food & Beverages 15	A23L 3/*	Preservation of foods or foodstuffs, in general, e.g. pasteurising, sterilising, specially adapted for foods or foodstuffs (preserving foods or foodstuffs in association with packaging B65B 55/00 )	10	Food

- Whereas parts of C13B (production of sucrose; apparatus specially adapted thereof) explicitly deal with juice, the majority of patents with this IPC code are related to the food industry. Hence, this IPC code is attributed to NACE code 10, 'Manufacture of Food Products'.

##### 4.2. Pharmaceuticals/Cosmetics/Chemicals

- For A61K (Preparations for Medical, Dental, or Toilet purposes) the more fine-grained IPC main group level is used to separate A61K 8/ from all other main groups under A61K. All A61K groups

belong to the 'Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations' (NACE Rev.2 21) except A61K 8/, which belongs to NACE Rev.2 20.4, the 'Manufacture of Soap and Detergents. Cleaning and Polishing Preparations. Perfumes and Toilet Preparations' industry. Therefore, the concordance table contains a Boolean condition:

- If any group under A61K, except for group A61K 8/, appears in a patent application, the NACE industry 21 'Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations' is assigned to the patent.
  - If A61K 8/ appears in a patent application, the NACE industry 20.4 'Manufacture of Soap and Detergents. Cleaning and Polishing Preparations. Perfumes and Toilet Preparations' is assigned to the patent.
  - If any group under A61K appears together with A61K 8/ in a patent application, both industries are assigned to the patent ('Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations' (NACE 21) and 'Manufacture of Soap and Detergents. Cleaning and Polishing Preparations. Perfumes and Toilet Preparations' (NACE 20.4)).
- Moreover, some IPC codes C07B (general methods of organic chemistry; apparatus thereof), C07C (acyclic or carbocyclic compounds), C07F (acyclic, carbocyclic, or heterocyclic compounds containing elements other than carbon, hydrogen, halogen, oxygen, nitrogen, sulphur, selenium or tellurium), C07G (compounds of unknown composition), C12M (apparatus for enzymology or microbiology), C12S (processes using enzymes or micro-organisms to liberate, separate or purify a pre-existing compound or composition) and C40B (combinatorial chemistry; libraries, e.g. chemical libraries, in-silico libraries) contain another Boolean condition regarding A61K that stems from the Fraunhofer 35 Classification developed by Schmoch U. in 2008<sup>4</sup>. The NACE Rev.2 industries (NACE 20.1 'Manufacture of Basic Chemicals. Fertilisers and Nitrogen Compounds. Plastics and Synthetic Rubber in Primary Forms', NACE 20.5 'Manufacture of Other Chemical Products', and NACE 32.5 'Manufacture of Medical and Dental Instruments and Supplies') of these IPC codes are valid, only when they do not co-occur with any group of A61K (except with group A61K 8/ because of the condition specified in the previous bullet point):
    - If C07B, C07C, C07F, C07G, C12M, C12S and C40B do co-occur with any group of A61K (except with group A61K 8/) in a patent application, the NACE industry 21 'Manufacture of Basic Pharmaceutical Products and Pharmaceutical

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<sup>4</sup> Schmoch U. (2008) Concept of a Technology Classification for Country Comparisons.  
[http://www.wipo.int/export/sites/www/ipstats/en/statistics/patents/pdf/wipo\\_ipc\\_technology.pdf](http://www.wipo.int/export/sites/www/ipstats/en/statistics/patents/pdf/wipo_ipc_technology.pdf)

Preparations' corresponding to any group of A61K except A61K 8/ is assigned to the patent and not the original NACE industry of C07B, C07C, C07F, C07G, C12M, C12S and C40B.

- In case these 7 IPC codes co-occur with A61K 8/, both industries are assigned to the patent. (e.g. C07B (original industry, NACE 20.1 Basic Chemicals) and A61K 8/ (NACE 20.4 'Manufacture of Soap and Detergents. Cleaning and Polishing Preparations. Perfumes and Toilet Preparations')).
- In case these 7 IPC codes co-occur with A61K as well as A61K 8/, all three industries are assigned to the patent. (e.g. C07B (original industry, NACE 20.1 Basic Chemicals) and e.g. A61K6 (NACE 21 Pharma) and A61K 8/ (NACE 20.4 'Manufacture of Soap and Detergents. Cleaning and Polishing Preparations. Perfumes and Toilet Preparations'))

#### 4.3. Measuring Instruments & Industrial Control

- Two technology fields (Measuring Instruments and Industrial Control), which were separate categories on the NACE 3-digit level in the previous NACE 1.1 classification, are brought together in the NACE Rev.2 classification under the category Manufacture of Instruments and Appliances for Measuring, Testing and Navigation; Watches and Clocks (NACE Rev.2 26.5).

Table 4: FhG38 and FhG39 under 1 and the same NACE Rev.2

FhG44	FhG44_title	NACE 1.1	NACE 1.1_title	NACE Rev.2	NACE Rev.2_title
<b>38</b>	Measuring instruments	33.2	Measuring instruments	26.5	Manufacture of Instruments and Appliances for Measuring, Testing and Navigation; Watches and Clocks [26.5]
<b>39</b>	Industrial control	33.3	Industrial process control equipment	26.51	Manufacture of Instruments and Appliances for Measuring, Testing and Navigation [26.51]

#### 4.4. Indexing schemes and IPC F16S

- The following IPC codes, have been allocated to the NACE industries associated with the co-IPC codes : F16S (constructional elements in general; structures built-up from such elements, in general), B29K (indexing scheme associated with subclasses B29B, B29C or B29D, relating to moulding materials or to materials for reinforcements, fillers or preformed parts), B29L (indexing scheme associated with subclass B29C, relating to particular articles) and C12R (indexing scheme associated with subclasses C12C-C12Q or C12S, relating to micro-organisms). All these IPC classes are new, have a limited number of patent applications, hardly occur alone, and mostly co-occur in a secondary position.

#### 4.5. Containers

- B65D (containers) can be affiliated to different industries, depending on the material used to construct containers (plastic, metal, glass, wood, textile, and paper). For these IPC codes, we categorized patent documents (from EPO & USPTO) based on terms reflecting the material used into plastic, glass, paper, metal, textile and wood. This resulted in the following frequencies and, hence, proportions. Thus, we suggest allocating this IPC code proportionally to the various industries that are suggested.

Table 5: Fractional count for B65D (Containers)

CATEGORY	NACE Rev.2 code & title	PT CNT	%
Plastic containers	22.22 - Manufacture of Plastic Packing Goods	3188	35,96%
Glass containers	23.13 - Manufacture of Hollow Glass	1889	21,31%
Paper containers	17.21 - Manufacture of Corrugated Paper and Paperboard and of Containers of Paper and Paperboard	1812	20,44%
Metal containers	25.91 - Manufacture of Steel Drums and Similar Containers	1345	15,17%
Textile containers	13.9 - Manufacture of Other Textiles	521	5,88%
Wooden containers	16.24 - Manufacture of Wooden Containers	111	1,25%
<b>TOTAL</b>		<b>8866</b>	<b>100,00%</b>

#### 4.6. Nuclear Technology

- G21B (fusion reactors) has been attributed to NACE 25.30 (Manufacture of steam generators, except central heating hot water boilers) as this industry covers the manufacture of nuclear reactors.
- G21H (obtaining energy from radioactive sources; applications of radiation from radioactive sources; utilising cosmic radiation): As most applicants have a 'nuclear' profile, this IPC code is associated with NACE class 24.46 (Processing of Nuclear Fuel).

#### 4.7. Nano-Technology

- B81B (micro-structural devices or systems), B82Y (specific uses or applications of nano-structures; measurement or analysis of nano-structures; manufacture or treatment of nano-structures) and B82B (nano-structures formed by manipulation of individual atoms, molecules, or limited collections of atoms or molecules as discrete units; manufacture or treatment thereof) are rather broad technological fields, which might result in applications being situated in different industries. Currently, B81B has been associated with NACE class 26.11 (Manufacture

of Electronic Components and Boards). Depending on co-occurring IPC codes, other options might be considered (within the 26 category).

#### 4.8. Services

- E02B (hydraulic engineering), E03B (installations or methods for obtaining, collecting, or distributing water), E03C (domestic plumbing installations for fresh water or waste water), E03F (sewers; cesspools), E04B (general building constructions), E04C (structural elements; building materials), E04D (roof coverings; sky-lights; gutters; roof-working tools), E04F (finishing work on buildings), E04G (scaffolding; forms; shuttering), E04H (buildings or like structures for particular purposes; swimming or splash baths or pools; masts; fencing; tents or canopies) and G06Q (data processing systems or methods, specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes) are classified under a service related NACE Rev.2 category since no appropriate match was found in the industrial categories.

Table 6: IPC codes classified under service related NACE categories

Subclass (IPC4-digit)	Subclass (IPC4-digit) Description	NACE Rev.2	NACE Rev.2_title
<b>E02B</b>	Hydraulic Engineering	42.91	Construction of Water Projects
<b>E03B</b>	Installations or Methods for obtaining, collecting, or distributing water), E03C (domestic plumbing installations for fresh water or waste water)	42.2	Construction of Utility Projects
<b>E03F</b>	Sewers; Cesspools	43	Specialised Construction Activities
<b>E04B</b>	General Building Constructions	43	Specialised Construction Activities
<b>E04C</b>	Structural Elements; Building Materials	43	Specialised Construction Activities
<b>E04D</b>	Roof coverings; Sky-lights; Gutters; Roof-working tools	43	Specialised Construction Activities
<b>E04F</b>	Finishing work on Buildings	43	Specialised Construction Activities
<b>E04G</b>	Scaffolding; Forms; Shuttering	43	Specialised Construction Activities
<b>E04H</b>	Buildings or like structures for Particular purposes; Swimming or Splash baths or Pools; Masts; Fencing; Tents or Canopies	43	Specialised Construction Activities
<b>G06Q</b>	Data processing Systems or Methods, specially adapted for administrative, commercial, financial, managerial, supervisory or forecasting purposes	62	Computer Programming, Consultancy and Related Activities



#### 4.9. Miscellanea

- B65F (Gathering or Removal of Domestic or Like Refuse) was previously allocated to 1 NACE 1.1 code 28 (Fabricated Metal Products). During validation, it became clear that this IPC code covers not only the Metal industry but also the Transport Equipment industry. Therefor B65F was analysed on the more fine grained Main group IPC level. Table 7 below shows the results of the analysis.

Table 7: Distribution of IPC B65F over NACE Rev.2 industries

Subclass (IPC4-digit)	NACE 1.1	Main group (IPC5-digit)	IPC5 Description	NACE Rev.2	NACE Rev.2 Description
<b>B65F</b>	28	B65F 1/*	Refuse receptacles (containers not specially adapted for refuse, features of refuse receptacles of general interest B65D)	28.9	Manufacture of Other Special Purpose Machinery [28.9]
<b>B65F</b>	28	B65F 3/*	Vehicles particularly adapted for collecting refuse (vehicles in general B60; driving vehicle equipment or auxiliaries B60K; discharging contents by tilting entire vehicles B65G; wheeled apparatus for emptying sewers or cesspools E03F 7/10)	30	Manufacture of Other Transport Equipment [30]
<b>B65F</b>	28	B65F 5/*	Gathering or removal of refuse otherwise than by receptacles or vehicles (storage silos, charging or discharging thereof B65G)	28.9	Manufacture of Other Special Purpose Machinery [28.9]
<b>B65F</b>	28	B65F 7/*	Cleaning or disinfecting devices combined with refuse receptacles or refuse vehicles (such devices per seA61L, B08B)	28.9	Manufacture of Other Special Purpose Machinery [28.9]
<b>B65F</b>	28	B65F 9/*	Transferring of refuse between vehicles or containers with intermediate storage or pressing (presses for baling per seB30B 9/30) [4]	28.9	Manufacture of Other Special Purpose Machinery [28.9]

- H03K (pulse technique) and H03L (automatic control, starting, synchronisation, or stabilisation of generators of electronic oscillations or pulses) are relevant to electronic circuits, telecommunications, audio-visual electronics, computers etc., hence, the corresponding NACE Rev.2 categories 26.2, 26.3, 26.4. Currently, most applications seem to be situated in audio-visual electronics and, therefore, the IPC is allocated to NACE Rev.2 26.4 (Manufacture of

Consumer Electronics). These IPC codes can, however, be considered relevant to other industries.

- H05H (plasma technique) can be affiliated to several NACE Rev.2 codes. NACE Rev.2 class 26.60 (Manufacture of Irradiation Equipment) seems the most suitable class although a part of this IPC deals with metal welding.
- C30B (single-crystal growth) covers all materials made into single crystals/homogeneous polycrystals, and the applications are far-ranging from pharmaceuticals to aeronautics. Currently, most applications are situated in (opto-) electronics so NACE Rev.2 code 26.1 (Manufacture of Electronic Components and Boards) has been affiliated to this IPC code.
- E03D (water-closets or urinals with flushing devices; flushing valves thereof) is classified under NACE Rev.2 23.42 (Manufacture of Ceramic Sanitary Fixtures) rather than 22.23 (Manufacture of Builders' Ware of Plastic).
- F16P (safety devices in general): Within the NACE Rev.2 classification, no separate category dealing with safety is discerned. Therefore, F16P is classified under NACE Rev.2 28.99 (Manufacture of Other Special Purpose Machinery N.E.C.).

## ANNEX

Annex 1. Concordance IPC V8 - NACE Rev. 2 on the 3-digit level

10	Manufacture of Food Products [10]	A01H A23J A23L 1/*	A21D A23K	A23B A23P A23L 3/*	A23C C12J	A23D C13F C13B	A23F C13J	A23G C13K
10.5	Manufacture of Dairy Products [10.5]	A01J						
11	Manufacture of Beverages [11]	C12C	C12F	C12G	C12H	A23L 2/*		
12	Manufacture of Tobacco Products [12]	A24B	A24D	A24F				
13	Manufacture of Textiles [13]	D06C D04D	D04G D06N	D04H	D06J	D06M	D06P	D06Q
13.9	Manufacture of Other Textiles [13.9]	B65D (5,88%)						
14	Manufacture of Wearing Apparel [14]	A41B	A41C	A41D	A41F			
15	Manufacture of Leather and Related Products [15]	A43B	A43C	B68B	B68C			
16	Manufacture of Wood and of Products of Wood and Cork. Except Furniture; Manufacture of Articles of Straw and Plaiting Materials [16]	B27D	B27H	B27M	B27N			
16.2	Manufacture of Products of Wood, Cork, Straw and Plaiting Materials [16.2]	B65D (1,25%)						
17	Manufacture of Paper and Paper Products [17]	B42F	D21C	D21H	D21J			
17.2	Manufacture of Articles of Paper and Paperboard [17.2]	B65D (20,44%)						
18.1	Printing and Service Activities Related to Printing [18.1]	B41M	B42D	B44F				
19	Manufacture of Coke and Refined Petroleum Products [19]	C10G	C10L					
20.1	Manufacture of Basic Chemicals. Fertilisers and Nitrogen Compounds. Plastics and Synthetic Rubber in Primary Forms [20.1]	C07B not A61K except A61K 8/* C07C not A61K except A61K 8/* C07F not A61K except A61K 8/* C07G not A61K except A61K 8/* C12S not A61K except A61K 8/* C08B C08F C08G C08K C08L C05B C05C C05D C05F C05G C09B C09C C09K C10B C10C C10H C10J C10K C01B C01C C01D C01F C01G C25B B01J F25J B09B B09C C02F G21F C08J F17C F17D						
20.2	Manufacture of Pesticides and Other Agrochemical Products [20.2]	A01N	A01P					
20.3	Manufacture of Paints. Varnishes and Similar Coatings. Printing Ink and Mastics [20.3]	C09D	B27K					
20.4	Manufacture of Soap and Detergents. Cleaning and Polishing Preparations. Perfumes and Toilet Preparations [20.4]	C09F	C11D	D06L	A61K 8/*		A61Q	
20.5	Manufacture of Other Chemical Products [20.5]	C08H C11C	C06D C23F	C09G C23G	C09H C14C	C09J A62D	C10M D01C	C11B C10N

		C40B not A61K except A61K 8/* F42D	C06C	C06B	F42B			
20.6	Manufacture of Man-Made Fibres [20.6]	D01F						
21	Manufacture of Basic Pharmaceutical Products and Pharmaceutical Preparations [21]	A61P C12Q	C07D A61K (except A61K 8/*)	C07H	C07J	C07K	C12N	C12P
22	Manufacture of Rubber and Plastic Products [22]	B67D	B29C	B29D	B60C			
22.1	Manufacture of Rubber Products [22.1]	C08C						
22.2	Manufacture of Plastics Products [22.2]	B29B B65D (35.96%)						
23	Manufacture of Other Non-Metallic Mineral Products [23]	B32B						
23.1	Manufacture of Glass and Glass Products [23.1]	B65D (21,31%) C03C	C03B					
23.3	Manufacture of Clay Building Materials [23.3]	B28B	B28C					
23.4	Manufacture of Other Porcelain and Ceramic Products [23.4]	E03D						
23.5	Manufacture of Cement, Lime and Plaster [23.5]	C04B						
24	Manufacture of Basic Metals [24]	B22D C25C	C21B C25F	C21C B21C	C21D	C22B	C22C	C22F
24.4	Manufacture of Basic Precious and Other Non-Ferrous Metals [24.4]	G21H						
25.1	Manufacture of Structural Metal Products [25.1]	B21G	F27D	A44B	A47H			
25.2	Manufacture of Tanks, Reservoirs and Containers of Metal [25.2]	F22B	F22G	F24J	F16T	F17B		
25.3	Manufacture of Steam Generators. Except Central Heating Hot Water Boilers [25.3]	G21C	G21D	G21B				
25.4	Manufacture of Weapons and Ammunition [25.4]	B63G F41J	F41A F42C	F41B G21J	F41C	F41F	F41G	F41H
25.5	Forging, Pressing, Stamping and Roll-Forming of Metal; Powder Metallurgy [25.5]	B22F						
25.6	Treatment and Coating of Metals; Machining [25.6]	C23D	C25D					
25.7	Manufacture of Cutlery, Tools and General Hardware [25.7]	E05B	E05D	E05F	E06B			
25.9	Manufacture of Other Fabricated Metal Products [25.9]	A01L F16B	B65D (15,17%) E05C					
26.1	Manufacture of Electronic Components and Boards [26.1]	G11C C30B	H01C B82B	H01F B81B	H01G B81C	H01J B82Y	H01L	H05K
26.2	Manufacture of computers and peripheral equipment [26.2]	G06C G06T	G06D G02F	G06E G09C	G06F	G06G	G06J	G06N
26.3	Manufacture of Communication Equipment [26.3]	G08B H03B H03J	H04B H03C H04H	H04J H03D H04N	H04K H03G H04R	H04M H03H H04S	H04Q H03M H04W	H04L G03H H01Q

		H01S						
26.4	Manufacture of Consumer Electronics [26.4]	H03K	H03L	H03F				
26.5	Manufacture of Instruments and Appliances for Measuring, Testing and Navigation; Watches and Clocks [26.5]	F15C G01M G04R G04B	G01B G01N G01V G04C	G01C G01R G01K G04D	G01D G01S G01L G04F	G01F G01W G05B G04G	G01H G12B G08C	G01J G01Q G05F
26.6	Manufacture of irradiation. Electro-medical and electrotherapeutic equipment [26.6]	A61N	H05G	G21K	H05H			
26.7	Manufacture of Optical Instruments and Photographic Equipment [26.7]	G02B	G02C	G03B				
26.8	Manufacture of Magnetic and Optical Media [26.8]	G03C						
27.1	Manufacture of Electric Motors, Generators, Transformers and Electricity Distribution and Control Apparatus [27.1]	H02K	H02N	H02P	H02B	H02J		
27.2	Manufacture of Batteries and Accumulators [27.2]	H01M						
27.3	Manufacture of Wiring and Wiring Devices [27.3]	H01B	H02G	H01H	H01R			
27.4	Manufacture of Electric Lighting Equipment [27.4]	F21H F21P	F21K F21Q	F21L F21W	F21M F21Y	F21S	F21V	H01K
27.5	Manufacture of Domestic Appliances [27.5]	A21B E06C	A45D F24B	A47G F24C	A47J F24D	A47L F25C	B01B F25D	D06F H05B
27.9	Manufacture of other electrical equipment [27.9]	B60M H05C	B61L H01P	G08G	G10K	H01T	H02H	H02M
28.1	Manufacture of General Purpose Machinery [28.1]	B23F F03G F16D F01K A47K	F01B F04B F16F F01M	F01C F04C F16H F01N	F01D F04D F16K F01P	F03B F23R F16M F02G	F03C F15B G05D F02C	F03D F16C G05G F02K
28.2	Manufacture of Other General Purpose Machinery [28.2]	F23G E02C G09G G10L C10F B66C F23K F28G	F27B G07B G11B G03G B01D C12L F23L F16G	B66B G07C B41J F24F B04C F22D F23M F23N	B66D G07D B41K F24H B05B F23B F25B B28D	B66F G07F B43M F28F A62C F23C F28B	B61B G07G G06K H05F F23J F23D F28C	B60S G09D G06M G01G B65G F23H F28D
28.3	Manufacture of Agricultural and Forestry Machinery [28.3]	A01B B27L	A01C	A01D	A01F	A01G	A01K	A01M
28.4	Manufacture of Metal Forming Machinery and Machine Tools [28.4]	B24D B25H B23B B23Q B27C	B21K B26B B23C B24B B27F	B21L B27G B23D B24C B27J	B25B B21D B23G B25D B28D	B25C B21F B23H B25J B30B	B25F B21H B23K B26F	B25G B21J B23P B27B
28.9	Manufacture of Other Special Purpose Machinery [28.9]	B44C F15D A42C B07B	B65F 1/* A21C A43D B07C	B65F 5/* A22B B02B B08B	B65F 7/* A22C B02C B21B	B65F 9/* A23N B05C B22C	A24C B05D B26D	A41H B06B B31B

		B31C	B31D	B31F	B41B	B41C	B41D	B41F
		B41G	B41L	B41N	B42B	B42C	B44B	B65B
		B65C	B65H	B67B	B67C	B68F	C13C	C13D
		C13G	C13H	C23C	D06G	D06H	D21B	D21D
		D21G	E01C	E02D	E02F	E21B	E21D	E21F
		F04F	F16N	F26B	E01D	E01F	E21C	D01B
		D01D	D01G	D01H	D02G	D02H	D02J	D03C
		D03D	D03J	D04B	D04C	D05B	D05C	D06B
		D21F	E05G	E01H	B01F	B03B	B03C	B03D
		C14B	F16P					
29.1	Manufacture of Motor Vehicles [29.1]	B60B	B60D	B60G	B60H	B60J	B60K	B60L
		B60N	B60P	B60Q	B60R	B60T	B62D	F01L
		F02B	F02D	F02F	F02M	F02N	F02P	F16J
		G01P						
29.3	Manufacture of Parts and Accessories for Motor Vehicles [29.3]	B60W						
30	Manufacture of Other Transport Equipment [30]	B65F 3/*		B60F	B60V	B61C	B61D	B61F
		B61G	B61H	B61J	B61K	B62C	B62H	B62J
		B62K	B62L	B62M	B63B	B63C	B63H	B63J
		B64B	B64C	B64D	B64F	B64G	E01B	F03H
31	Manufacture of Furniture [31]	A47B	A47C	A47D	A47F			
32	Other Manufacturing [32]	F16L	A45C	D07B	A41G	A42B	A44C	A45B
		A45F	A46B	A46D	A63B	A63C	A63D	A63F
		A63G	A63H	A63J	A63K	B43K	B43L	B44D
		B62B	B68G	C06F	F23Q	G10B	G10C	G10D
		G10F	G10G	G10H				
32.5	Manufacture of Medical and Dental Instruments and Supplies [32.5]	A61B	A61C	A61D	A61F	A61G	A61H	A61J
		A61L	A61M	C12M not B04B	A61K except A61K 8/* B01L			
			G01T	G21G	A62B			
32.9	Manufacturing N.E.C. [32.9]	G09B	G09F	G03D	G03F			
42.2	Construction of Utility Projects [42.2]	E03B		E03C				
42.9	Construction of Other Civil Engineering Projects [42.9]	E02B						
43	Specialised Construction Activities [43]	E04G	E04B	E04C	E04D	E04F	E03F	E04H
62	Computer Programming, Consultancy and Related Activities [62]	G06Q						
NACE of Co-IPC	NACE-allocation by following the Co-IPC	F16S	B29K	B29L	C12R			