

DWPI Manual Code Revision 2021 - CPI Codes

New / Changed / Retired	Code	Date Range	Title	Scope Notes	Keyword/Search Terms
SECTION A					
New	A04-B12	(2021-)	Diallyl dimethylammonium chloride copolymers	Copolymers formed from diallyl dimethylammonium chloride.	Polydiallyl dimethylammonium chloride, PDADMAC
Change Scope Note	A08-S08	(1977-)	Absorption agents; repellance agents	Including scale inhibitors, antifog agents. For use of polymeric repellent finishes on fibres see A12-G03 only. Prior to 1977 see A08-S.	
SECTION B					
Change Scope Note	B04-C02D	(1986-)	Polysaccharides from plant	Excluding cellulose, starch, dextran, dextrin. Including pectin, plant gums, alginate, agar. Code(s) for the appropriate plant division(s) are also applied, if source plant(s) known.	
New	B04-E14	(2021-)	Bacterial nucleic acid		
New	B04-E15	(2021-)	Viral nucleic acid		
New	B04-F11B2	(2021-)	Coronavirus	Coronavirus, including COVID-19.	
New	B04-F11B2E	(2021-)	Coronavirus (genetically engineered)	Coronavirus, including COVID-19.	
New	B04-G27W	(2021-)	Immunoglobulin W	Found in sharks and skates; related to mammalian IgD. May be searched in conjunction with additional codes from B04-G.	
New	B04-G27W0E	(2021-)	Immunoglobulin W (genetically engineered)	Found in sharks and skates; related to mammalian IgD. May be searched in conjunction with additional codes from B04-G.	
New	B11-B03D	(2021-)	Method or device for extraction of active substance from animals, arthropods	Extraction of active substance from animals, arthropods, etc.	
New	B11-C15A	(2021-)	Computerised teaching models	Includes computer simulations used to show drug effects.	
New	B12-K04G2K	(2021-)	Diagnosis of metabolic disorders		
Change Title/Scope Note	B14-H00X	(2014-)	Treatment resistant cancers	To be applied in conjunction with other code(s) from B14-H where the cancer(s) to be treated are stated to be drug-, radiotherapy- and/or chemotherapy resistant.	
New	B14-H06C	(2021-)	Chemosensitizers		
Change Scope Note	B15-E	(2011-)	Vitamin E, tocopherols, tocotrienols	Includes Tocodienols and Tocotrienols.	
SECTION C					
Change Scope Note	C04-C02D	(1986-)	Polysaccharides from plant	Excluding cellulose, starch, dextran, dextrin. Including pectin, plant gums, alginate, agar. Code(s) for the appropriate plant division(s) are also applied, if source plant(s) known.	
New	C04-E14	(2021-)	Bacterial nucleic acid		
New	C04-E15	(2021-)	Viral nucleic acid		
New	C04-F11B2	(2021-)	Coronavirus	Coronavirus, including COVID-19.	
New	C04-F11B2E	(2021-)	Coronavirus (genetically engineered)	Coronavirus, including COVID-19.	
New	C04-G27W	(2021-)	Immunoglobulin W	Found in sharks and skates; related to mammalian IgD. May be searched in conjunction with additional codes from C04-G.	
New	C04-G27W0E	(2021-)	Immunoglobulin W (genetically engineered)	Found in sharks and skates; related to mammalian IgD. May be searched in conjunction with additional codes from C04-G.	
New	C11-B03D	(2021-)	Method or device for extraction of active substance from animals, arthropods	Extraction of active substance from animals, arthropods, etc.	
New	C12-K04G2K	(2021-)	Diagnosis of metabolic disorders		
Change Title/Scope Note	C14-H00X	(2014-)	Treatment resistant cancers	To be applied in conjunction with other code(s) from C14-H where the cancer(s) to be treated are stated to be drug-, radiotherapy- and/or chemotherapy resistant.	
New	C14-H06C	(2021-)	Chemosensitizers		
Change Scope Note	C15-E	(2011-)	Vitamin E, tocopherols, tocotrienols	Includes Tocodienols and Tocotrienols.	
SECTION D					
New	D05-C24	(2021-)	Saponins		
New	D05-C25	(2021-)	Terpenes		
Change Scope Note	D05-H04	(1972-)	Newly discovered, testing of, isolation of, identification of and detection of Bacteria	May also be used in combination with D05-H18B code. Mutants code here but recombinant bacteria are searched under D05-H14A.	
Change Scope Note	D05-H05	(1972-)	Newly discovered, testing of, isolation of, identification of and detection of Fungi	May also be used in combination with D05-H18B code. Mutants code here but recombinant fungi are searched under D05-H14A2.	
Change Scope Note	D05-H06A	(2002-)	Newly discovered, testing of, isolation of, identification of and detection of Viruses	May also be used in combination with D05-H18B code. Mutants code here but recombinant viruses are searched under D05-H12F.	
New	D05-H18C	(2021-)	Protein sequencing technique	For protein sequencing methods of genetic engineering.	
SECTION E					
New	E05-Y	(2021-)	Metal-organic framework	Metal organic framework / MOFs.	
New	E06-S	(2021-)	Spiro-fused fused heterocycles	To be applied in conjunction with specific ring code(s) from E06-A to E06-G.	
New	E07-S	(2021-)	Spiro-fused monocyclic heterocycles	To be applied in conjunction with specific ring code(s) from E07-A to E07-G.	
Change Scope Note	E12-A06	(2012-)	Pellet	Pellet, prill, granule.	
New	E12-A15	(2021-)	Core-shell	Formulation containing core-shell structure.	
New	E25-G	(2021-)	Reactive Dye General	Includes reactive dyes without any specific chromophore and may also be applied with other codes for general classes of reactive dyes.	
SECTION H					
New	H04-E18	(2021-)	(Unconventional) upgrading of heavy oil / bitumen	May be applied in conjunction with other H04 manual codes.	
New	H04-E18A	(2021-)	Upgrading using supercritical water		
New	H04-E18B	(2021-)	Upgrading by other means		
SECTION N					
New	N07-F07A	(2021-)	Carbocyclic cyclisation	Formation of carbocyclic rings.	
New	N07-F07B	(2021-)	Heterocyclic cyclisation	Formation of heterocyclic rings.	

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SECTION P					
Change Scope Note	P21-D	(2015-)	Sportswear (excludes sport shoes)	Includes swimwear (including swimming aids), wristbands and headbands used during sporting activities. Swimming aids are also coded under P21-N. Sport shoes, e.g. running shoes, are coded under P22 only. Swimming gloves, boxing/golf gloves are also coded under P21-H. See also P36-A08A for sportswear.	Bathing suits, trunks
Change Scope Note	P21-F	(2015-)	Headwear	Includes hats, caps, helmets (including chin straps and visors), wigs, masks and dominoes, veils and fascinators. Also includes artificial eyelashes and eyebrows. Includes face coverings worn in public places (shops, banks, public transport, etc) to protect the public against germs/viruses spread through coughing or sneezing. These protective masks are also coded under P35-A03C.	Toupee, hair extensions, hairpiece
Change Scope Note/Search Terms	P27-A99	(2015-)	Other furniture and fittings for shops, restaurants and warehouses	Includes plastic protective screens for use in areas such as checkout areas or bank counters to protect staff and customers against germs and viruses spread through coughing or sneezing.	Changing rooms, sneeze guards, protective counter screens
Change Scope Note	P34-A01	(2015-)	Sterilization and disinfection devices	For sterilization, disinfection, sanitizing and deodorizing of substances and materials including air, refuse, bandages and dressings (See P32-A60 for bandages per se), and contact lenses. Also includes sanitising stations placed in public spaces to dispense e.g. antibacterial gel/wipes.	
Change Scope Note	P35-A03C	(2015-)	Protective clothing	Includes helmets, masks, and the like to provide protection for humans and animals from adverse environments. Includes face coverings worn in public places (shops, banks, public transport, etc.) to protect the public against germs and viruses spread through coughing or sneezing. Face coverings are also coded under P21-F. Fireproof clothing is also assigned P35-C05. Arrangements for facilitating or enabling breathing are covered by P35-A05E which is also assigned as necessary. Systems and equipment for treating hazardous chemicals or biological agents to make them safe or to contain them are covered by P35-A03G.	Environmental suit, hazmat suit, NBC suit
Change Scope Note	P36-A08A	(2015-)	Sports equipment and clothing	Includes items used by a player of a sport, e.g. horse racing, or a participant in leisure activities such as horse riding. See also P21-D for sportswear. Electrical details of sports equipment are coded under W04-X01E, and electrical details of clothing are coded under X27-A02B1.	Ball, bat, boots, bow, bowls, crampons, crossbow, cue, fishing rod, goggles, golf clubs, harness, kit, racquet, riding boots, running shoes, saddle, skateboard, skates, ski binding, skis, surfboard, training shoes, wetsuit, whip
Change Scope Note	P36-A08C	(2015-)	Sports facilities	Covers buildings, sports halls, pitches, sports grounds etc. Electrical details of sport facilities are coded under W04-X01F. Details of ice manufacture for e.g. ice rinks are coded under X27-F04.	AstroTurf®, arena, changing rooms, club, clubhouse, court, field, floodlights, goals, grass, gymnasium, ice rink, lockers, race course, race track, swimming pool, track
Change Title/Scope Note	P54-D05	(2015-)	Filing; Rasping; Grinding	Also includes abrading, honing, lapping and sharpening of e.g. metal blades, razors or engine cylinders. Prior to 2021, grinding, filing and rasping of metal elements were coded by the combination of P61-A01 codes and P61-V26.	
New	P54-D06	(2021-)	Polishing; Burnishing	Prior to 2021, polishing and burnishing of metal elements were coded by the combination of P61-A03 and P61-V26.	Stropping, buffing
Change Scope Note	P55-D01	(2015-)	Solder, flux	Includes details of solder manufacture. See also X24-A01A.	
Change Title/Scope Note	P61	(1980-)	Grinding and polishing of non-metals	From 2015, P61 has been subdivided to cover mechanical details of grinding and polishing equipment and processes. See also X25-A03C codes for electrical details. Shaping and working of metals are coded by P51 to P56 codes.	
Change Scope Note	P61-A01	(2015-)	Grinding, abrading, honing, lapping, sharpening	Prior to 2021, grinding, filing and rasping of metal elements were coded by the combination of P61-A01 codes and P61-V26. From 2021, these are now coded under P54-D05 only.	Sanding
Change Scope Note	P61-A03	(2015-)	Polishing, burnishing	Prior to 2021, polishing and burnishing of metal elements were coded by the combination of P61-A03 and P61-V26. From 2021, these are now coded under P54-D03 only.	Stropping, buffing
Change Title/Scope Note/Search Terms	P61-T12	(2015-)	Dust extraction and suppression; Debris collection	Includes devices for collecting/recovering materials resulting from grinding or polishing. Recycling of grinding and polishing media is covered by P61-R.	Dust cover
Retired	P61-V26	(2015-2020)	Metals	This code is now discontinued and transferred to P54-D05 for grinding, honing and sharpening of metal elements, and P54-D06 for polishing and burnishing of metal elements. It remains searchable for records prior to 2021.	
Change Title/Scope Note	P77	(1980-)	Writing, drawing appliances; bureau / desk accessories	Covers all aspects of writing or drawing appliances. Includes inventions characterized by type, core material, constructional details and manufacture for writing or drawing appliances. From 2021, P77 also covers bureau / desk accessories.	
New	P77-D	(2021-)	Bureau / desk accessories	Includes devices for opening or closing envelopes, paperweights, drawing pins, pen holders etc. Desk furniture per se is not covered by this code, see P25-A01A instead.	
SECTION Q					
Change Scope Note	Q32-A05B	(2012-)	Drums; Tanks	Tank containers are coded under Q32-A30 only.	
Change Scope Note	Q32-A09	(2012-)	Trays	Includes drawer-and-shell containers.	
New	Q32-A30	(2021-)	Large containers	Includes tank containers, cargo containers, bulk storage containers and shipping containers.	Tanktainer, silo
Change Scope Note/Search Terms	Q32-B99	(2012-)	Other constructional details	Includes linings, drip catchers, internal/external coatings, inspection windows, spacers between containers, label holders. Details of handles are coded under Q32-B06 only.	Label / coupon holders, legs
Change Search Terms	Q33-B	(2012-)	Plastic; Polymer; Polystyrene; Thermocol		Fiberglass
Change Search Terms	Q34-C06D	(2012-)	Sugar and sweeteners	Includes packaging of sugar cubes, loose sugar, syrups, sugar substitutes and artificial sweeteners.	Caramel, honey
Change Title/Search Terms	Q34-J03	(2012-)	Cosmetics; Toiletries; Skincare	Packaging details of toilet paper is also coded under Q34-F.	Antibacterial hand gel, baby wipes, make-up, razor blades, shampoo, soap, sun lotion, toothpaste
Change Search Terms	Q34-J04	(2012-)	Cleaning products	Does not include packaging of toiletries; these are coded under Q34-J03 only.	Antibacterial wipes, antibacterial spray, cleaning foam, cleaning wipes, washing up liquid, clothes conditioner
Change Search Terms	Q34-N	(2012-)	Household/domestic	Includes packaging of non-electrical items, such as crockery, furniture, cleaning accessories (e.g. cleaning mops, cloths, washing gloves, etc.). Packaging of kitchen appliances, white goods (washing machines, microwaves, etc) and electrical beauty products is coded under Q34-M codes only. Packaging of household waste/garbage is coded under Q34-H05 only.	Watch, jewellery, clock
New	Q42-P	(2021-)	Pumping station	Includes fuel and water supply station arrangement.	
New	Q42-S	(2021-)	Service/Cleaning/Maintenance	Includes water supply, sewage pipeline cleaning.	
Change Title/Scope Note	Q43-A01	(2015-)	Walls and partitions	Includes load-bearing and non-load-bearing walls and partitions within buildings.	
New	Q43-H	(2021-)	Rain water harvesting systems	Include apartments, home water conservation aspects.	
Change Scope Note	Q46-A05	(2015-)	Material handling and building repair	Preparation of concrete, brick-laying equipment. Repair and cleaning of existing buildings.	
New	Q46-A05A	(2021-)	Building demolition		
New	Q46-A05B	(2021-)	Building relocation / moving	For transportation and relocation of an entire building.	
Change Search Terms	Q67-C	(2006-)	Pipe accessories	Includes e.g. pipe supports and holders such as hose clips.	Clamps, cleats, brackets
Change Search Terms	Q68-A03	(2015-)	Stands; Trestles; Supports	Includes movable stands and trestles for supporting various articles/equipment in various locations or orientations.	Brackets
Change Scope Note	Q74-T02	(2015-)	Pipes	Includes refrigerant pipings. Pipeline attachments (clamps, etc.) are coded under Q67-C.	
SECTION S					
Change Search Terms	S01-J09	(1980-)	Other instrument details (including vibration dampening)	Includes supports, arrangements adjusting position or attitude, compensating for effects of tilting.	Mount, vibration, isolation, installation, bracket
Change Search Terms	S02-B01A	(2005-)	Large scale position and location measurement	Includes mining and pipeline machinery position location. Does not include RADAR, GPS systems (see W06).	Co-ordinate measurement
Change Title/Scope Note/Search Terms	S02-B02	(1980-)	Measuring height; Leveling; Profile tracing	Includes leveling between separated points using e.g. direct/barometric/stradia/fly leveling. Also includes measuring distances transverse to line of sight and tracing profiles of land surfaces using e.g. a vehicle moving along the profile to be traced, or cavities (such as tunnels).	Surveyor's level, differential leveling

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New / Changed / Retired	Code	Date Range	Title	Scope Notes	Keyword/Search Terms
SECTION S (continued)					
Change Search Terms	S03-E09F	(2005-)	Immunoassay techniques and biological indicators	Includes all novel reagents and techniques. See also S03-E04D and S03-E04E for fluorescence detection and observation techniques. For radiopharmaceutical immunoassay indicators, see also S03-G02B9. For microarray and biochip techniques, see also S03-H01 codes. Prior to 2005 coded in S03-E14H4.	Antibody, assay, antigen, binding, ligand, fluorophore, monoclonal, conjugate, PCR testing, polymerase chain reaction testing
Change Search Terms	S03-E13B	(1980-)	Sampling liquid or fluent material	Also includes sampling of granular solids, e.g. sand, flour, salt etc.	Flow, water, liquid, powder
Change Scope Note	S03-E14H2	(2005-)	Medical analysis of biological fluids	Includes urine, semen, saliva, phlegm etc.	
Change Scope Note	S04-B	(1980-)	Electrical aspects of clocks and watches	Smartwatch devices are primarily classed as wearable computers (T01-M06A1D). See also S05-D01 codes for physiological measurements, and W04-X01A1 for performance-related measurements during sports or fitness training.	
Change Search Terms	S04-B09	(1980-)	Other (Electrical aspects)	Includes casings and manufacture for electronic timepieces. Clocks/watches integral with gaming, cooking, medical etc. devices. All aspects of circuitry specifically for timepieces.	Memory, radio, dial, smartwatch
Change Scope Note	S05-B07	(2005-)	Remote control and automated/robotic surgical systems	All aspects of automated / robotic systems used in surgical procedures including 5G wireless network-enabled telesurgery devices.	
Change Scope Note/Search Terms	S05-C02	(1997-)	Biological fluids	For medical analysis of biological fluids such as urine, semen, saliva, phlegm. See also S03-E14H9.	
Change Scope Note	S05-F09	(1992-)	Other (prostheses)	Includes medical splints and face masks.	
New	S05-G02H	(2021-)	Nursing trolleys, carts	Electrical details of trolleys and similar equipment used in hospitals.	
Change Title	S06-K03C	(2010-)	Cooling, ventilation & humidifying mechanisms	Previously coded as S06-A19B.	Fan
SECTION T					
Change Search Terms	T01-J16	(1992-)	Artificial intelligence (AI)	Covers knowledge processing, inexact reasoning e.g. fuzzy logic.	Chatbot
New	T01-L01D	(2021-)	Wireless power charging	See also U24-H02 for general low power non-contact power distribution aspects and X12-H01E for higher power levels. Non-contact battery charging in general is covered by X16-G03.	
Change Title/Scope Note	T01-L02A	(1997-)	Cooling and ventilation	Includes electrical and mechanical cooling and ventilation systems for computer equipment, including data centre facilities. See also T01-G11B for temperature measurement and control aspects, and V04-T03 for electronic equipment cooling and heating arrangements in general.	
Change Title/Scope Note	T01-N01B	(2002-)	Education, information and entertainment	From 2005 includes on-line educational systems. Pre-2002 see T01-H07C together with T01-H07C5E.	
Change Scope Note	T01-N01B1	(2002-)	Gaming	Includes network, on-line gaming, cloud gaming and on-line gambling (see also T01-N01A1, T01-N01D3, T05-L02 and W04). See T01-H07C3B, T01-H07C3D and T01-H07C5E prior to 2002. See T01-J30 for off-line systems.	Internet gaming, MUD, multi user dungeon, MMOG, MMORPG, massive multi-user on-line game
Change Title	T01-N01B9	(2002-)	Other internet education, information and entertainment		
Change Scope Note	T01-N01F	(2017-)	Internet of Things	Interconnection / Internetworking of computers, devices and systems used in applications such as home automation (see also X27-V), smart grids. For cellular IoT technology such as 5G wireless network-based systems see W05-D06 codes.	
Change Search Terms	T01-N03A3	(2005-)	Meeting co-ordination and organiser/calendar applications	Covers applications to arrange meetings with groups of people through software. Covers a personal calendar application linked to an email program. See T01-J11E for off-line. See also T01-N01C for email.	Microsoft Outlook®, MS Teams®, Lotus Notes®
Change Scope Note	T04-D07F2	(2006-)	Fingerprint recognition	Includes palm recognition.	
Change Scope Note	T04-K01C	(2007-)	Antenna	See also W02-B codes for aerials, V04-Q for PCB details and U13 for integrated circuit details.	
Change Scope Note	T06-D05A1	(1987-)	Shaping; rolling; hammering; bending; punching	Includes shaping of materials (excluding cutting), e.g. rolling (see also X25-A02B), bending, punching and hammering (see also X25-A02D), and extruding.	
Change Scope Note/Search Terms	T07-A01B	(1997-)	Detecting presence of vehicle	This code is for detecting the presence of a vehicle in a known local position, e.g. using cameras or inductive loops embedded in roadway that detect change in magnetic field caused by presence of the vehicle. For detecting the presence of vehicles specifically for traffic signal control, e.g. traffic light control, see T07-C03A only. For detecting free parking space see T07-F also. For systems detecting an unknown geographic location of the vehicle see T07-A05 codes instead.	Video camera
Change Scope Note	T07-H	(2002-)	Intelligent highway systems	Includes general details of intelligent roadways, such as roadside infrastructure, e.g. beacons or transponders beside or embedded in road, to assist with automatic vehicle steering (see also T07-D01) or vehicle separation distance control (see also T07-D03). For vehicle control via a central traffic centre, see T07-A05 codes instead. See X21-K and X22-K codes for motor vehicle and electric vehicle to infrastructure communications and connectivity.	V2I, C-V2I
SECTION U					
Change Scope Note/Search Terms	U12-A01A2	(1987-)	LED manufacture	Includes manufacture of single LED device of LED display, or more specific aspects e.g. polarizing/optical film, electrodes, arrays of LEDs. If deposition/etching techniques are emphasised, see also U11-C01/U11-C07 codes.	LED, OLED, QLED display manufacture
Change Scope Note	U12-A02A3	(1987-)	Characterised by solar cell manufacture	Includes manufacture of single or assembly of solar cells and manufacturing apparatus. If material manufacturing details are emphasized use U12-A02A2 section. See also U11-C18B9 for photovoltaic devices manufacture.	
New	U14-L	(2021-)	Non-display switchable glass panels	Includes electronic switching glass panels used for non-display purposes, e.g. for privacy, or light dimming in places such as building windows, privacy screens, vehicle windows, dimming mirrors etc.	Smart glass, Electrolytic PDLC Film, Electrochromic glass, LCD Glass
Change Title/Scope Note/Search Terms	U24-H02	(2005-)	Wireless/non-contact power distribution	Includes low level non-contact power transfer. For non-contact high power distribution see X12-H01E codes. See X16-G03 for non-contact battery charging, W01-C01E5E for wireless phone charging and X21-B01A1C for offboard non-contact charging of electric vehicle batteries.	WPT, near-field
New	U24-H02A	(2021-)	Using capacitive coupling		
New	U24-H02B	(2021-)	Using inductive coupling	Also see V02 for novel inductive components, e.g. V02-G01D for inductive connections. See S05 for biomedical and implant applications.	
New	U24-H02C	(2021-)	Using radio waves or microwaves	Also see W02 codes for novel RF details such as directional array or Yagi antennae, satellite communications and telemetry.	
New	U24-H02D	(2021-)	Using light	Includes use of off-board mains supply. See X16-G01 for mains battery charging.	
New	U24-H02E	(2021-)	Using ultrasonic waves	Also see V06 codes for novel ultrasonic transducers.	
New	U24-H02L	(2021-)	Wireless power transmission control, monitoring and optimization	Includes optimizing position for non-contact power transfer; reducing electric, magnetic or electromagnetic leakage/interference; detecting foreign objects; as well as transmitting data during power transfer.	
SECTION V					
Change Scope Note	V04-R17	(1992-)	Board conveying and handling between processing stages	See X12-H01E8 for holding board in optimized position for non-contact power transfer.	
SECTION W					
New	W01-A01B1E	(2021-)	Low Density Parity Check	Includes channel coding in a 5G system for which W02-C03C1L is also assigned.	LDPC
New	W01-A01B1G	(2021-)	Polar Codes	Includes channel coding for control channels in 5G system for which W02-C03C1L is also assigned.	
New	W01-A01B4A	(2021-)	Hybrid Automatic Repeat Request	This code indicates the use of HARQ in a 4G or 5G communication system for which W02-C03C1H or W02-C03C1L are also assigned.	HARQ
Change Scope Note/Search Terms	W01-A06C4E	(2005-)	IEEE 802.11 radio link	Includes systems using 802.11x standards e.g. 802.11p that uses 5.9 GHz frequency for communication between vehicles (Dedicated Short-Range Communications). See also X21-K.	DSRC
New	W01-A06C4L	(2021-)	Millimetre radio link	This code covers the use of millimetre waves, typically operating between 3GHz to 300GHz for communication e.g. in a 5G system for which W02-C03C1L is also assigned.	
New	W01-A06C4N	(2021-)	Terahertz radio link	This code covers the use of electromagnetic waves with band of frequencies operating between 300GHz to 3THz.	
New	W01-A06C4P	(2021-)	Long range radio link	For communication systems which operate in frequencies below 1GHz, possibly for long range and low power consumption.	LoRa, LPWAN, LoRa Gateway, LoRaWAN
Change Scope Note/Search Terms	W02-C03C1A	(1992-)	Cellular radio system/operating/method	This code is normally assigned along with W01-B05A1A to indicate layout or design of a cellular telephone system, the arrangement of cells and base stations, or novel methods of operating the network involving call set-up procedures, signalling, paging, and the like. This code is also applied for all communication between the network node and the user equipment. For example, beam management procedures such as beam sweeping, beam reporting, and beam failure recovery are covered here along with W02-C03C1L. Also includes control and shared data channels for 4G and 5G networks. Appropriate codes for 3G, 4G and 5G are also assigned to highlight the type of system.	Synchronization Signals, P-SS, S-SS, RACH, PDSCH, PDCCH, PUSCH, PUCCH, Beam Sweeping, Beam reporting, Beam failure recovery, Beam scheduling

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SECTION W (continued)					
Change Title/Scope Note	W02-C03G1	(2010-)	Resource allocation, carrier aggregation and dual connectivity	From 2021, this code has sub-codes which cover resource allocation along with carrier aggregation and dual connectivity in 4G and 5G networks.	
New	W02-C03G1A	(2021-)	General resource allocation	This code covers general resource allocation in a radio system. See also W01-A06E1L for resource allocation related to data networks.	
New	W02-C03G1C	(2021-)	Carrier Aggregation	Includes carrier aggregation for 4G and 5G systems for which W02-C03C1H or W02-C03C1L are also assigned.	CA, Supplementary uplink, Bandwidth Parts (BWP)
New	W02-C03G1E	(2021-)	Dual Connectivity	Appropriate codes for 4G and 5G i.e. W02-C03C1H and W02-C03C1L are also assigned to highlight the type of system.	DC
New	W02-C03H	(2021-)	Unlicensed radio network	This code is used to denote radio systems which use available unlicensed frequency bands such as 2.4GHz, 5-6GHz for communication.	LTE-U, NR-U
New	W02-G03J7	(2021-)	Based on power level per se	Includes arrangements to measure the received power.	RSRP, SS RSRP, CSI RSRP
New	W02-G03J7A	(2021-)	Applications of power level measurement		
New	W02-G03J7C	(2021-)	Novel power measurement		
Change Scope Note/Search Terms	W02-K07C	(1997-)	Orthogonal Frequency Division Multiplexing	This code covers the use of OFDM for communication e.g. in a 5G system for which W02-C03C1L is also assigned. See also W02-C03D5 for access methods, e.g. OFDMA is denoted by W02-K07C along with W02-C03D5 code. Pre-1997 this topic was covered by W02-D05, W02-K01 and W02-K09. Receivers for DAB are covered in W03-B codes.	OFDM, CP-OFDM, DFT-S-OFDM, SC-FDMA
Change Title/Scope Note/Search Terms	W04-W05	(1992-)	Educational and conference equipment	Includes e.g. electronic blackboards.	Audio-visual aid, classroom equipment
Change Scope Note	W04-X	(1980-)	Sports, games, toys	Electrical aspects only are included. Non-electrical details are coded by P36 codes.	Leisure, recreation, pastime
Change Scope Note	W04-X01E	(1992-)	Sports equipment per se	Covers equipment used by player. Includes fishing rods, bats, skis and electrical aspects of hunting rifles and paintball guns. For electrical aspects of firearms see also W07. Includes walking sticks for hiking (see also X27-A02E). General details of sport equipment are coded under P36-A08A.	
Change Title/Search Terms	W04-X01K3P	(2012-)	Skiing, snowboarding, curling	Electrical aspects of skis are also assigned W04-X01E and testing of ski binding release force is also assigned S02-F03A and W04-X01H.	
Change Scope Note/Search Terms	W05-D07A	(1992-)	For home automation	Includes home bus systems. See also X27-V for home automation.	Heating, ventilating, air conditioning, water heater, lighting, intelligent home
New	W06-B03L	(2021-)	Spacecraft launching systems		
New	W06-B15H	(2021-)	Emergency services aircraft	Includes fire fighting and disaster response aircraft and helicopters; police, law enforcement and border security helicopters and drones; and coastguard search and rescue helicopters (see also W06-B15B for helicopters and W06-B15U for drones and UAV).	
Change Scope Note	W06-B15U	(2007-)	Unmanned aerial vehicles	Includes UAVs and micro UAVs used for geophysical surveying, imaging, military reconnaissance (see also W07-F04), logistics such as food and commodity delivery (see X25-F12), etc.	
Change Scope Note	W06-B15X	(2006-)	Other aircraft types	Includes sea planes, motor vehicles convertible into aircraft, agricultural and crop dusting aircraft (see X25-N01 for insecticide and pesticide spraying per se) and electrical aspects of other aircraft such as hang gliders, ornithopters or parachutes.	
SECTION X					
Change Scope Note/Search Terms	X12-H01E	(2007-)	Non-contact power distribution	Includes distribution of energy by electromagnetic waves (See X12-H09 for records prior to 1992). See X21-B01A1C and X16-G03 for non-contact electric vehicle battery charging. Low power non-contact power distribution is coded in U24-H02 codes.	WPT, near-field
New	X12-H01E1	(2021-)	Using capacitive coupling		
New	X12-H01E2	(2021-)	Using inductive coupling	Also see X12-C codes for novel high power inductive components.	
New	X12-H01E3	(2021-)	Using radio waves or microwaves	Also see W02 codes for novel RF details such as directional array or Yagi antennae.	
New	X12-H01E4	(2021-)	Using light	Includes use of off-board mains supply. See X16-G01 for mains battery charging.	
New	X12-H01E5	(2021-)	Using ultrasonic waves	Also see V06 codes for novel ultrasonic transducers.	
New	X12-H01E8	(2021-)	Wireless power transmission control, monitoring and optimization	Includes optimizing position for non-contact power transfer; reducing electric, magnetic or electromagnetic leakage/interference; detecting foreign objects; as well as transmitting data during power transfer.	
Change Scope Note/Search Terms	X15-E	(1997-)	Biomass, biofuel and waste fuel combustion power generation	Includes electrical details of power generation using biomass, waste fuel and biofuels. Biofuels, including their production, are covered by CPI codes. Also includes systems such as electrostatic precipitators for reducing nitrogen oxides, volatile organic compounds and particulate emissions.	Waste-to-Energy
New	X21-A01R	(2021-)	Recreational vehicle	Includes electric recreational vehicles such as camper, go-kart, RV, snowmobile, ATV.	
New	X21-A02C	(2021-)	Thermal management of transmission systems	Includes transmission cooling arrangements. See also X11-J codes for high power motor/transmission cooling.	
New	X21-A06A	(2021-)	Speed and slip sensor	Includes sensing of wheel speed or general vehicle speed.	
New	X21-A06B	(2021-)	Acceleration and shock sensor	Includes measurement of acceleration, deceleration and shock or impact sensing.	
New	X21-A06C	(2021-)	Temperature sensor	Includes measurement of battery, motor and other system temperatures.	
New	X21-A06D	(2021-)	Current and voltage sensors	Includes remaining battery capacity measurement, and other electrical apparatus parameters measurement.	
New	X21-A06F	(2021-)	Distance and deviation sensors	Includes measurement of distance to object and distance between vehicles to maintain safe distance. Also includes lane deviation measurement. See also X21-A05 codes for safety and monitoring per se.	
New	X21-A06H	(2021-)	Position or angle sensors	Includes rotary or angular position sensing (see also S02-A10D codes); resolvers; encoders (See also U21-A03J).	
New	X21-A06X	(2021-)	Other vehicle measurements		
Change Title/Scope Note	X21-A07	(1997-)	Electric traction motor; Motor-generator	Includes details of the traction motor per se. See also V06-M and X11 codes for further detailed breakdown of motor details. Also includes motor-generator. See X11-H20 for motor-generators per se.	
Change Title/Scope Note/Search Terms	X21-B01A	(1997-)	Traction battery; Fuel cell	Includes novel battery and fuel cell details and their grouping to attain higher operating voltage. See also X16 codes for a more detailed breakdown of batteries and fuel cells (X16-C), per se.	
Change Scope Note/Search Terms	X21-B01A1C	(1997-)	Off-board charging systems	Includes use of off-board mains supply. See X16-G01 for mains battery charging. Also see X16-G03 for wireless battery charging and X12-H01E codes for non-contact power distribution.	Wireless, inductive
New	X21-B01B1	(2021-)	Battery thermal management	Includes heating and cooling arrangements for batteries and fuel cells. Also see X16-K01 and X16-K02 for battery cooling and heating respectively.	
Change Title/Scope Note/Search Terms	X21-K	(2010-)	Electric vehicle communications and connectivity; multiplexing; networking; V2X	Includes vehicle to everything communications (V2X; C-V2X). Includes all communications, connectivity, networking and multiplexing, including cellular (also see W02-C03C1L) and dedicated short range communication (also see W01-A06C4E). Includes communication within an electric vehicle (intra-vehicle); communications between vehicle and: other vehicles (inter-vehicle); roadside (V2I); pedestrians (V2P) etc. Includes electric vehicle telephones and hands-free systems. See W01 and W02 codes for telecommunications per se.	Multiplex, DSRC; 5G, cellular; data transmission, LAN, local area network, WAN, wide area network, Bluetooth®, CAN bus, controller area network, bus, ethernet, VAN, UART, universal asynchronous receiver/transmitter
New	X21-K02	(2021-)	Electric vehicle to network; Vehicle to cloud communications	Includes electric/hybrid vehicle to cloud (V2C) communication that uses V2N access to broadband cellular mobile networks to enable data exchange with the cloud (also see T01-N codes). Includes over the air (OTA) updates to vehicle software; Remote vehicle diagnostics (also see X22-X16).	V2N, V2C, IoT
New	X21-K03	(2021-)	Intra-vehicle; vehicle to device communications networking/connectivity	Includes in-car high speed, integrated communications networks and multiplexing arrangements for interconnecting various vehicle systems, e.g. using wireless LANs or serial data buses, Bluetooth® etc. (see also W01 codes), avoiding the need for dedicated point-to-point wiring. Includes vehicle to device (V2D) and cellular vehicle to device (C-V2D) communications to e.g. connect smartphone, tablet or wearable to e.g. vehicle infotainment system. Includes app for controlling vehicle locking.	V2D, C-V2D, App, mobile phone
New	X21-K05	(2021-)	Inter-vehicle communications; V2V	Includes communication between different electric/hybrid vehicles to enable them to wirelessly exchange information about their speed, location, and heading. Includes DSRC V2V and C-V2V communication providing 360 degree awareness of other vehicles. Includes vehicle to motorcycle communication.	Platooning, cooperative adaptive cruise control, V2M, C-V2M
New	X21-K06	(2021-)	Electric vehicle to pedestrian communications; V2P	Includes communication between vehicle and persons, pedestrians or cyclists including V2P and cellular V2P communication. Includes warning pedestrian, cyclist or electric scooter rider of dangers such as approaching vehicle and for warning drivers of presence of other road users.	V2P, C-V2P, cyclist, e-bike, bicycle, scooter
New	X21-K08	(2021-)	Electric vehicle to offboard/infrastructure communications; V2I	Includes communication between electric/hybrid vehicle and offboard infrastructure, roadside units or traffic signals (also see T07-B codes) or device. Includes cellular vehicle-to-infrastructure (C-V2I) communications. Also includes dedicated short range communication (DSRC) based V2I.	Infrastructure; offboard, V2I, C-V2I; traffic signal

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New / Changed / Retired	Code	Date Range	Title	Scope Notes	Keyword/Search Terms
SECTION X (continued)					
New	X21-K08G	(2021-)	Electric vehicle to grid communications; V2G	Includes communication between vehicle and grid (V2G) to enable plug-in hybrid and electric vehicles to supply vehicle electric power to electricity grid for peak load levelling or to stabilise intermittent renewable power supplies. Also see X12-H codes for power distribution and X21-B01A1C for smart charging, e.g. charging vehicle battery at night while supplementing grid load during the day. Also includes vehicle to home (V2H) power transfer e.g. for emergency power supply (see X12-H02) or supplementing renewable wind/solar power.	Sell electricity, load-levelling, bidirectional V2G, unidirectional V2G, V1G, smart charging, backup power
New	X22-A03A2B	(2021-)	Variable compression ratio	Includes control of engine compression ratio so that lower ratios are used at higher loads to increase power and higher ratios are used at lower loads to increase fuel efficiency.	
Change Title/Scope Note	X22-E	(1980-)	Instrumentation for dashboard and steering wheel	Includes touch-sensitive screens (see also T04-F codes). Also includes internal display for passengers e.g. in a bus indicating approaching stops (see also T07-A05D). For more details about general instrumentation for vehicles, section S codes must be searched. For example, S01-G06 for battery charge indicator, S02-G codes for speed sensors, S02-J codes for brake and transmission testing, and S02-K06 for recording or indicating in general. Also includes control of all information/warnings presented to driver according to driving situation, e.g. to prioritise important warnings and prevent driver from being distracted by display of minor warnings during emergency situations. For haptic feedback also see W05-A01A1 and for voice warnings see W04-V04C codes. For mechanical aspects of dashboard construction or mechanical instrumentation, see Q17-A11 instead.	Displays, panels, instruments
Change Title/Scope Notes/Search Terms	X22-F05	(2002-)	Use of cigar lighter socket or auxiliary output as power supply, e.g. for vehicle accessories	Includes kettle, perfume dispenser, portable light and other devices that are powered from cigar lighter socket. Includes Non-contact charging pad to charge mobile phone (also see U24-H02 and W01-C01E5E codes). Used in conjunction with other X22 and cross-reference codes as appropriate.	Mobile phone charging, wireless charging
New	X22-J05M	(2021-)	External sensor mountings; cleaning	Includes external environmental sensor motorized mountings and positioning systems. Includes sensor cleaning arrangements such as wipers or washers for LIDAR (see also X22-J05C), SONAR, or camera (see also X22-E09A).	
Change Title/Scope Note/Search Terms	X22-K	(1987-)	Vehicle communications and connectivity; multiplexing; networking; V2X	Includes vehicle to everything communications (V2X; C-V2X) and all communications, connectivity, networking and multiplexing including cellular (see also W02-C03C1L) and dedicated short range communication (see also W01-A06C4E). Includes communication within a motor vehicle (intra-vehicle), and between vehicles (inter-vehicle); roadside (V2I); pedestrians (V2P) etc. Also includes vehicle telephones and hands-free systems. See W01 and W02 codes for telecommunications per se.	Multiplex, DSRC; 5G, cellular; data transmission, LAN, WAN, Bluetooth®, CAN bus, controller area network, bus, Ethernet, VAN, UART, universal asynchronous receiver/transmitter, V2X, C-V2X
New	X22-K02	(2021-)	Vehicle to network; Vehicle to cloud communications	Includes vehicle to cloud (V2C) communication that uses V2N access to broadband cellular mobile networks to enable data exchange with the cloud (also see T01-N codes). Includes over the air (OTA) updates to vehicle software; Remote vehicle diagnostics (also see X22-X16). Includes browsing and downloading information such as navigation data (see X22-E06F), local tourist information, shop opening times (see X22-J12),, restaurant menus, music files (see X22-J13) and making hotel reservations or booking tickets using in-car connectivity to the cloud. See X22-K08 for connectivity to e.g. wifi hotspot in service station.	V2N, V2C, IoT
Change Title/Scope Note/Search Terms	X22-K03	(2007-)	Intra-vehicle; vehicle to device communications networking/connectivity; multiplexing	Includes in-car high speed, integrated communications networks and multiplexing arrangements for interconnecting various vehicle systems, e.g. using wireless LANs or serial data buses, Bluetooth® etc. (see also W01 codes), avoiding the need for dedicated point-to-point wiring. For enabling internal communications between previously standalone vehicle control systems such as engine and braking systems. Includes DSRC vehicle to device (V2D) and cellular vehicle to device (C-V2D) communications to e.g. connect smartphone, tablet or wearable to vehicle infotainment system. Includes app for controlling vehicle locking/starting.	CAN bus, CAN 2.0, LAN, LIN, Ethernet, wireless, UART, VAN, ABUS, SAE J1850, local interconnect network, controller area network, universal asynchronous receiver/transmitter, V2D, C-V2D, mobile phone
Change Title/Scope Note/Search Terms	X22-K05	(2007-)	Inter-vehicle communications; V2V	Includes communication between different vehicles to enable them to wirelessly exchange information about their speed, location, and heading. Includes DSRC V2V and C-V2V communication providing 360 degree awareness of other vehicles. Also includes systems such as Bluetooth® ad-hoc networks for allowing communication between different vehicles, e.g. for passing traffic or navigation data between vehicles (see also X22-E06F, for informing vehicle of presence of nearby vehicles e.g. by transmitting GPS position data between vehicles, or for automatic collision avoidance (see also X22-J05 codes) or other safety purposes.	Platooning, cooperative adaptive cruise control, wireless, piconet, cellular V2V
New	X22-K06	(2021-)	Vehicle to pedestrian communications; V2P	Includes communication between vehicle and persons, pedestrians or cyclists including DSRC V2P and cellular V2P communication. Includes warning pedestrian or cyclist of dangers such as approaching vehicle and for warning drivers of presence of other road users.	V2P, C-V2P, cyclist, bicycle
Change Title/Scope Note/Search Terms	X22-K08	(2007-)	Vehicle to offboard/infrastructure communications; V2I	Includes communication between motor vehicle and offboard infrastructure, roadside units or traffic signals (also see T07-B codes). Includes cellular vehicle-to-infrastructure (C-V2I) communications. Also includes dedicated short range communication (DSRC) based V2I. Includes systems for communication between vehicle and external systems such as wifi hotspot in service station for downloading information via offboard system that provides connectivity.	Infrastructure; offboard, V2I, C-V2I
Change Search Terms	X22-X12	(2002-)	Pedal arrangements	Includes pedals that are electrically positioned according to driver's requirements and other electrical arrangements connected to pedal operation or adjustment. See X22-X06L for control pedals' position sensors per se.	Electronic accelerator pedal
Change Search Terms	X22-X20E	(2008-)	Vehicle design	Includes all electrical details of vehicle design and simulation. Also see T01-J15 codes for computer aided design (CAD).	Simulation testing
Change Scope Note	X24-A01A	(1992-)	Solder, flux	Includes details of solder manufacture. See also P55-D01.	
Change Scope Note	X25-A02D	(1992-)	Hammering, bending, punching	For control details see T06-D05A. See X25-X10 instead for engraving systems.	Stamping
Change Title/Scope Note	X25-A08	(2006-)	3D / 4D printing; Additive manufacturing	Details of 3D scanners are coded under T04-M05. See also X25-A06 for electrical aspects of working plastics.	3D replicator, rapid prototyping, solid freeform fabrication, SFF, 3D modelling, active origami
Change Title	X25-A08A	(2016-)	3D / 4D printing and additive manufacturing methods		
Change Title	X25-A08B	(2016-)	3D / 4D printing and additive manufacturing apparatus	Computer control details of 3D printing / additive manufacturing machines are coded under T01-J07B3. For details of 3D scanners see T04-M05. For ink-jet printhead details see S06-G03.	Extruder
Change Title	X25-A08C	(2016-)	Types of 3D / 4D printing and additive manufacturing		
Change Title	X25-A08C2	(2016-)	Fused deposition modelling / 3D / 4D printing using inkjet technology	Inkjet technology is also coded under S06-G10.	FDM®, extruders, extrusion tips, fused filament fabrication, FFF
Change Title	X25-A08C9	(2016-)	Other types of 3D / 4D printing and additive manufacturing		
Change Title	X25-A08M	(2016-)	3D / 4D printing and additive manufacturing materials	Codes in X25-A08M section indicate the type of material used to produce the printed object. For novel material compositions, see the relevant codes in classes A-M.	
Change Title/Scope Note/Search Terms	X25-A08M9	(2016-)	Other 3D / 4D printing and additive manufacturing materials	Includes specific materials not covered by other X25-A08M codes, e.g. concrete, silica sand, magnesium sand, chromite sand, etc.	
Change Title/Scope Note	X25-A08U	(2016-)	3D / 4D printing and additive manufacturing applications	Codes in X25-A08U section are used in conjunction with other X25-A08 codes to highlight what is manufactured using the 3D printing / 4D printing additive manufacturing system.	
Change Title	X25-A08X	(2016-)	Other details of 3D / 4D printing and additive manufacturing		
Change Scope Note	X25-W01	(1997-)	Industrial waste disposal	Includes details of large scale garbage disposal control system and large non-domestic bins. Domestic waste disposal, such as kitchen waste disposal unit and electrical rubbish bins, are coded under X27-K only. Recycling processes/systems are coded under X25-W04 only. Does not include radioactive waste disposal (see K07-B or X14-D).	
Change Scope Note/Search Terms	X25-X10	(2002-)	Engraving systems	Includes engraving using mechanical means as well as laser marking. Also includes stamping. See X25-A02D for punching/stamping.	Laser coding
Change Scope Note/Search Terms	X25-X14	(2005-)	Manufacturing/assembly plants	Includes assembly line systems and general manufacturing plants. For novel assembly/manufacturing devices such as manipulators or conveyors see X25-A03E and X25-F01 respectively. Control details of manufacturing processes using 5G technology are also covered by W02-C03C1L.	Industry 4.0, vehicle assembly line, car manufacturing plant
Change Scope Note	X27-A02B1A	(2002-)	Garments	Includes electrical aspects of e.g. shirts, buttons, protective helmets, heated gloves, life jackets. Non-electrical details of garments are coded by P21 codes.	
Change Scope Note	X27-A02B1B	(2002-)	Footwear and its manufacture	Includes safety boots and shoes (see X25-X07 for electrical aspects of leather cutting). Non-electrical details of footwear are coded by P22 codes.	

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New / Changed / Retired	Code	Date Range	Title	Scope Notes	Keyword/Search Terms
SECTION X (continued)					
Change Scope Note	X27-F04	(2006-)	Ice manufacture	Includes domestic and industrial ice manufacture. For ice cube trays per se see X27-F01 only. Also includes working / handling of ice and production of ice or snow for winter sports etc. See also P36-A08C for ice rinks.	
Change Scope Note	X27-K	(1997-)	Domestic waste disposal	Includes only electrical aspects of domestic waste disposal, such as kitchen waste disposal unit and electrical rubbish bin. Large non-domestic bins are coded under X25-W01 only.	