

CPC COOPERATIVE PATENT CLASSIFICATION

Y GENERAL TAGGING OF NEW TECHNOLOGICAL DEVELOPMENTS; GENERAL TAGGING OF CROSS-SECTIONAL TECHNOLOGIES SPANNING OVER SEVERAL SECTIONS OF THE IPC; TECHNICAL SUBJECTS COVERED BY FORMER USPC CROSS-REFERENCE ART COLLECTIONS [XRACs] AND DIGESTS

(NOTES omitted)

Y02 TECHNOLOGIES OR APPLICATIONS FOR MITIGATION OR ADAPTATION AGAINST CLIMATE CHANGE

(NOTES omitted)

Y02P CLIMATE CHANGE MITIGATION TECHNOLOGIES IN THE PRODUCTION OR PROCESSING OF GOODS

NOTE

This subclass covers climate change mitigation technologies in any kind of industrial processing or production activity, including the agroalimentary industry, agriculture, fishing, ranching and the like.

10/00	Technologies related to metal processing	10/259	. . . . in electric arc furnaces
10/10	. Reduction of greenhouse gas [GHG] emissions	10/262	. . . . in electrolytic cells
10/12	. . CO ₂	10/265	. . . by heat recovery
10/122	. . . by capturing CO ₂	10/268	. . . . with by-product gas in energy cycle
10/124	. . . . Recycling of CO ₂ -rich gas	10/271	. . . . . low temperature heat recovery
10/126	. . . . Recycling of CO ₂ -lean gas	10/274	. . . . . medium temperature heat recovery
10/128	. . . . Oxycombustion	10/277	. . . . . high temperature heat recovery
10/13	. . . . Post-combustion	10/28	. . . . using by-product gases
10/132	. . . . CO ₂ storage	10/283	. . . . using water, e.g. for cooling
10/134	. . . by CO ₂ avoidance	10/286	. . . by process control or by modelling
10/136	. . . . using hydrogen, e.g. H ₂	10/29	. . . Additive manufacturing
10/138	. . . . Electrolysis	10/292	. . . . of casting moulds
10/14	. . Greenhouse gases [GHG] other than CO ₂	10/295	. . . . of metals
10/143	. . . Methane [CH ₄]	10/30	. . characterised by the energy source
10/146	. . . Perfluorocarbons [PFC]; Hydrofluorocarbons [HFC]; Sulfur hexafluoride [SF ₆]	10/32	. . . the energy source being renewable
		10/34	. . . Cogeneration with other industries
10/20	. Process efficiency	20/00	Technologies relating to chemical industry
10/21	. . by recovering materials	20/10	. General improvement of production processes causing greenhouse gases [GHG] emissions
10/212	. . . Recovering metals from waste	20/12	. . Energy input
10/214	. . . . by pyro metallurgy	20/121	. . . Energy efficiency measures, e.g. energy management
10/216	. . . . . of Fe	20/122	. . . . characterised by the type of apparatus
10/218	. . . . . of Al	20/123	. . . . . Motor systems
10/22	. . . . . of Cu	20/124	. . . . . Boilers, furnaces, lighting or vacuum systems
10/224	. . . . . of Co or Ni	20/125	. . . . Process integration
10/226	. . . . . of Mg	20/126	. . . . Membrane separation
10/228	. . . . . of Sn	20/127	. . . . Reactive distillation
10/23	. . . . . of refractory metals	20/128	. . . Alternative fuel sources, e.g. for process heat or steam
10/232	. . . . . of Zn or ZnO	20/129	. . . Energy recovery
10/234	. . . . by hydro metallurgy	20/13	. . . . Cogeneration
10/236	. . . . . of Cu	20/131	. . . . Pressure recovery turbines
10/238	. . . . by means other than pyro metallurgy or hydro metallurgy	20/132	. . . . H ₂ recovery
10/24	. . . . . powder metallurgy	20/133	. . . Renewable energy sources
10/242	. . . Slag reuse in metallurgical processes	20/134	. . . . Sunlight
10/25	. . by increasing the energy efficiency of the process	20/135	. . . . . Photoelectrochemical processes
10/253	. . . using induction furnaces		
10/256	. . . Design or operational measures for increasing the efficiency of electric conversion		

20/136	. . . . of biological origin, e.g. biomass, biofuels, biogas	20/59	. . Biological synthesis; Biological purification
20/14	. . Reagents; Educts; Products	30/00	Technologies relating to oil refining and petrochemical industry
20/141	. . . Feedstock	30/10	. Reduction of greenhouse gas [GHG] emissions during production processes
20/142	. . . . the feedstock being CO ₂	30/20	. Bio-feedstock
20/143	. . . . the feedstock being recycled plastics	30/30	. Carbon capture or storage [CCS] specific to hydrogen production
20/144	. . . . . to generate syngas, i.e. H ₂ + CO	30/40	. Ethylene production
20/145	. . . . the feedstock being materials of biological origin	30/42	. . using bio-feedstock
20/146	. . . Changing the product type or product distribution	30/44	. . Cracking, e.g. steam cracking
20/147	. . . Using materials efficiently	30/442	. . . Furnace or cracking tube materials, e.g. chemical composition of the tubes; Controlling or regulating the tube furnaces
20/148	. . . . Recycling	30/444	. . . Cogeneration using furnace exhaust
20/149	. . . . Reduced process losses	30/446	. . . Catalytic cracking
20/15	. . . . Reduced transportation losses	30/46	. . Separation
20/151	. . . Reduction of greenhouse gas [GHG] emissions	30/462	. . . using low temperature distillation
20/152	. . . . CO ₂	30/464	. . . using absorption or adsorption techniques
20/153	. . . . N ₂ O	30/48	. . Compression
20/154	. . . . Halogenated hydrocarbons	40/00	Technologies relating to the processing of minerals
20/155	. . . . . Perfluorocarbons [PFC]; Hydrofluorocarbons [HFC]; Hydrochlorofluorocarbons [HCFC]; Chlorofluorocarbons [CFC]	40/10	. Production of cement
20/156	. . . . Methane [CH ₄]	40/12	. . Clinker production
20/20	. Improvements relating to chlorine production	40/121	. . . Energy efficiency measures, e.g. improving or optimising the production methods
20/22	. . Optimization of Deacon process	40/123	. . . . Integrated production plants
20/224	. . . by process design	40/125	. . . Fuels from renewable energy sources
20/228	. . . by improving the materials, e.g. gauze composition or structure	40/126	. . . . Waste
20/30	. Improvements relating to adipic acid or caprolactam production	40/128	. . . . Biomass
20/32	. . Technologies aiming at reducing N ₂ O emissions	40/14	. . Reduction of clinker content in cement
20/324	. . . by thermal destruction of N ₂ O	40/141	. . . Blended cements
20/328	. . . by catalytic reduction of N ₂ O	40/143	. . . . Clinker replacement by slag
20/40	. Improvements relating to chlorodifluoromethane [HCFC-22] production	40/145	. . . . Clinker replacement by combustion residues
20/42	. . Reducing fluoroform [HFC-23] emissions	40/146	. . . . Clinker replacement by ground limestone
20/424	. . . by capture and subsequent thermal oxidation	40/148	. . . Belite cements
20/50	. Improvements relating to the production of products other than chlorine, adipic acid, caprolactam, or chlorodifluoromethane, e.g. bulk or fine chemicals or pharmaceuticals	40/16	. . Non-limestone based cements, e.g. alkali-activated cements
20/51	. . Bulk chemicals	40/165	. . . Geopolymers
20/514	. . . Aldehydes; Alcohols	40/18	. . Carbon capture and storage [CCS]
20/518	. . . Hydrocyanation products, e.g. adipodinitrile	40/20	. Cement grinding
20/52	. . using catalysts, e.g. selective catalysts	40/30	. Manufacturing or processing of sand or stone
20/54	. . characterised by the solvent	40/40	. Production or processing of lime
20/542	. . . the solvent being an ionic liquid	40/42	. . Limestone calcination
20/544	. . . Supercritical solvents, e.g. supercritical H ₂ O or CO ₂	40/44	. . Regeneration of lime in pulp and sugar mills
20/546	. . . Mixtures of ionic liquids and supercritical solvents	40/45	. . using fuels from renewable energy sources
20/55	. . Synthetic design, e.g. reducing the use of auxiliary or protecting groups	40/47	. . Reduction of lime consumption, e.g. in sugar industry
20/57	. . Efficient separation techniques	40/49	. . . Limestone grinding
20/572	. . . Membranes	40/50	. Glass production
20/58	. . Recycling	40/51	. . Producing or shaping of glass
20/582	. . . of unreacted starting or intermediate materials	40/52	. . Use of cullet or other waste
20/584	. . . of catalysts	40/53	. . Reusing waste heat during processing or shaping
20/586	. . . of reagents, e.g. co-catalysts, adjuvants	40/535	. . . Regenerative heating
20/588	. . . involving immobilised starting materials, reagents or catalysts	40/55	. . Oxy-fuel
		40/56	. . Batch or cullet pre-heating
		40/57	. . Reduction of reject rates; Improving the yield
		40/58	. . Fuels from renewable energy sources
		40/59	. . CO ₂ capture, e.g. for large oxy-fuel furnaces
		40/60	. Production of ceramic materials or ceramic elements

- 40/61 . . Manufacturing of materials for construction, e.g. beams, bricks or tiles
- 40/615 . . . Bricks made from lime and sand
- 40/63 . . Improving processing, storage or transport systems
- 40/65 . . Improving kilns
- 40/67 . . Fuels from renewable energy sources
- 40/69 . . Substitution of clay or shale by alternative raw materials, e.g. ashes

- 60/00 Technologies relating to agriculture, livestock or agroalimentary industries**
- 60/10 . Agricultural machinery or equipment
- 60/12 . . using renewable energies
- 60/122 . . . for irrigation, e.g. solar water pumping
- 60/124 . . . Collecting solar energy in greenhouses
- 60/14 . . Measures for saving energy
- 60/141 . . . in irrigation, i.e. motor control
- 60/142 . . . Reduction of fuel consumption
- 60/144 . . . Combined machines, e.g. seeder combined with fertilizers
- 60/146 . . . in greenhouses
- 60/147 Heating, ventilation or air conditioning
- 60/148 Constructive measures, e.g. light structures or improved insulation
- 60/149 Efficient lighting, e.g. LED lighting
- 60/15 . . . in preparing or milling grain
- 60/16 . . Machines for direct seeding, i.e. sod or grassland seeding
- 60/18 . . Activities not otherwise provided for, e.g. storage
- 60/20 . Reduction of greenhouse gas [GHG] emissions in agriculture
- 60/21 . . N₂O
- 60/212 . . . Reducing the use of fertilizers
- 60/214 Efficient applying machines
- 60/215 Efficient spraying methods
- 60/216 Aquaponics or hydroponics
- 60/218 . . . use of additives, e.g. nitrification inhibitors, biochar
- 60/22 . . Reducing methane [CH₄] emissions from agricultural lands, e.g. from rice paddies
- 60/23 . . Reduction of CO₂ emissions from biota and soils
- 60/24 . . Enhancing carbon sequestration in biota and soils
- 60/242 . . . Roof greening
- 60/244 . . . Wall greening
- 60/246 . . . Use of plant growth regulators to improve carbon dioxide up-take by crop plants
- 60/247 . . . Plants with high carbon sequestration potential
- 60/25 . . Biomass with low greenhouse gas [GHG] emissions
- 60/30 . Land use policy measures
- 60/40 . Afforestation or reforestation
- 60/50 . Livestock or poultry management
- 60/52 . . use of renewable energies
- 60/521 . . . Solar lighting, e.g. for poultry
- 60/524 . . . for pumping or supplying water to livestock
- 60/526 . . . for electric energy supply
- 60/528 for electric livestock fences
- 60/54 . . Environmental control in livestock or poultry housing
- 60/542 . . . using renewable energy
- 60/56 . . Methane [CH₄] capture
- 60/60 . Fishing

- 60/62 . . Fishing equipment
- 60/64 . . Aquaculture; Aquafarming
- 60/642 . . . combined with aquaponics or hydroponics
- 60/70 . Apiculture
- 60/80 . Food processing
- 60/81 . . Use of renewable energies or variable speed drives in handling, conveying or stacking
- 60/83 . . Warming or cooking
- 60/831 . . . using steam
- 60/833 using microwave ovens
- 60/835 by boiling
- 60/85 . . Food storage or conservation
- 60/851 . . . Cooling, refrigeration or freezing
- 60/853 . . . Drying
- 60/855 . . . Ice production, e.g. for conservation purposes
- 60/87 . . Re-use of by-products of food processing for fodder production
- 60/871 . . . from molasses
- 60/873 . . . from distillers' or brewers' waste
- 60/875 . . . from waste products of dairy plants
- 60/877 . . . from by-products of vegetal origin
- 60/89 . . characterised by the product
- 60/891 . . . Dairy products

- 70/00 Climate change mitigation technologies in the production process for final industrial or consumer products**
- 70/10 . Greenhouse gas [GHG] capture, material saving, heat recovery or other energy efficient measures, e.g. motor control, characterised by manufacturing processes
- 70/12 . . related technologies for improving processes or machines for shaping products
- 70/121 . . . Machines for rolling metal, e.g. rolling mills
- 70/123 Motor control
- 70/125 Removing fumes from rolling mills
- 70/127 using heat shields
- 70/129 Heat recovery during rolling
- 70/131 using liquid recovering devices
- 70/133 for recovering coolants
- 70/135 for recovering lubricants
- 70/137 . . . relating to forging, hammering, pressing or riveting
- 70/139 . . . relating to the manufacture or working of metal sheets or profiles
- 70/141 . . . relating to pressing processes or machines therefore
- 70/143 Optimisation of energy consumption
- 70/145 by control of drive motors
- 70/16 . . related technologies for metal working by removing or adding material
- 70/161 . . . Power management, e.g. limiting power to tools
- 70/163 . . . Power down for energy saving
- 70/167 . . . relating to the design or operation of machining centres or machine tools
- 70/169 using minimal quantities of coolants or lubricants
- 70/171 Devices or processes for removing and reusing chips
- 70/173 Machine centres provided for turning, boring or milling

- 70/175 . . . relating to the design or operation of machines for dry cutting gears or toothed racks
- 70/177 . . . Grinding or polishing
- 70/179 Treatment of used abrasive materials aiming at a further reuse
- 70/181 . . . relating to the design or operation of machines for soldering, welding or cutting by applying heat locally
- 70/183 . . . relating to the design or operation of machines for machines for sawing, cutting, perforating, punching or severing
- 70/185 . . . relating to the operation of machines combining different processes for working of metal
- 70/187 . . . relating to the design or operation of machines for working metal not otherwise provided for
- 70/20 . . related technologies for printing, lining or stamping machines
- 70/22 . . Technologies for working on wood, veneer or plywood
- 70/24 . . related technologies for saving energy and raw materials during the production of paper or paper articles
- 70/26 . . related technologies for working on or processing of plastics
- 70/261 . . . recovering energy or power from drive motors in injection moulding
- 70/263 . . . recovering energy or reusing materials in extrusion moulding
- 70/265 . . . relating to blow moulding
- 70/267 Means for recycling or reusing auxiliaries or materials
- 70/269 reducing blowing fluid consumption
- 70/271 by recycling blow fluid
- 70/273 recycling reactive gas
- 70/275 reusing heat
- 70/277 . . . relating to thermoforming
- 70/279 Recycling or reuse of materials
- 70/281 Reuse of pressure or vacuum
- 70/30 . . related to technologies for conveying, packing or storing of goods or handling thin or filamentary material
- 70/32 . . relating to mixing
- 70/34 . . relating to separation, flotation or differential sedimentation
- 70/36 . . Recycling or reuse of a liquid sprayed or atomised
- 70/38 . . Apparatus or processes for applying liquids or other fluent materials
- 70/40 . . Drying by removing liquid
- 70/405 . . . Drying with heating arrangements using waste heat
- 70/50 . Manufacturing or production processes characterised by the final manufactured product
- 70/52 . . Manufacturing of products or systems for producing renewable energy
- 70/521 . . . Photovoltaic generators
- 70/523 . . . Wind turbines
- 70/525 . . . Hydropower turbines
- 70/527 for tidal streams or dam-less hydropower, e.g. sea flood and ebb or stream current
- 70/54 . . Manufacturing of lithium-ion, lead-acid or alkaline secondary batteries
- 70/56 . . Manufacturing of fuel cells
- 70/58 . . Greenhouse gas [GHG] capture, heat recovery or other energy efficient measures relating to manufacturing or assembling of vehicles, e.g. motor control
- 70/585 . . . Aircraft Eco design, i.e. taking into account the full life cycle of the aircraft including re-use, recyclability and disposal
- 70/60 . . Greenhouse gas [GHG] capture, heat recovery or other energy efficient measures relating to production or assembly of electric or electronic components or products, e.g. motor control
- 70/601 . . . the product being a basic electric component or element, i.e. cables, resistors, capacitors, switches, connectors, relays or protections
- 70/603 . . . the product being a lighting component
- 70/605 . . . the product being a semiconductor or solid state device or parts thereof
- 70/607 Manufacturing of electronic silicon based components
- 70/609 . . . the product being a dynamo-electric machine, i.e. electrical generators or motors
- 70/611 . . . the product being a printed circuit board [PCB]
- 70/613 . . . involving the assembly of several electronic elements
- 70/62 . . related technologies for production or treatment of textile or flexible materials or products thereof, including footwear
- 70/621 . . . Production or treatment of artificial filaments or the like
- 70/623 Energy efficient measures, e.g. motor control or heat recovery
- 70/625 Recovery of starting material, waste material or solvents during the manufacturing process
- 70/627 of cellulose, cellulose derivatives or proteins
- 70/629 of synthetic polymers
- 70/631 . . . Production or treatment of lace, e.g. knitting or braiding
- 70/633 Saving materials
- 70/635 Saving energy by reducing inertia of moving parts
- 70/637 . . . Treatment of textiles
- 70/639 Energy efficient measures, e.g. motor control or heat recovery
- 70/641 Recovery of solvents
- 70/643 Treatment of textiles using a short bath ratio
- 70/645 . . . Manufacturing of wall or floor covering materials or the like
- 70/647 Energy efficient measures, e.g. motor control or heat recovery
- 70/649 using scraps or recycled materials
- 70/651 the materials being particles
- 70/653 . . . Footwear made at least partially of recyclable material
- 70/66 . . Greenhouse gas [GHG] capture, use of renewable energies, heat recovery or other energy efficient measures for manufacturing or preparation of tobacco products, e.g. motor control
- 80/00 Climate change mitigation technologies for sector-wide applications**
- 80/10 . Efficient use of energy
- 80/11 . . of electric energy

- 80/112 . . . Power supplies with power electronics for efficient use of energy, e.g. power factor correction [PFC] or resonant converters
- 80/114 . . . Control systems or methods for efficient use of energy
- 80/116 Electronic drive motor controls
- 80/12 . . using compressed air as energy carrier, e.g. for pneumatic systems
- 80/13 . . using pressurized fluid as energy carrier, e.g. for hydraulic systems
- 80/14 . . District level solutions, i.e. local energy networks
- 80/15 . . On-site combined power, heat or cool generation or distribution, e.g. combined heat and power [CHP] supply
- 80/152 . . . for heat recovery
- 80/154 . . . for steam generation or distribution
- 80/156 . . in fluid distribution systems
- 80/158 . . . Solar or wind-powered water pumping not specially adapted for irrigation
- 80/20 . Sector-wide applications using renewable energy
- 80/21 . . Biomass as fuel
- 80/22 . . Wind energy
- 80/23 . . Solar energy
- 80/24 . . . Solar thermal energy
- 80/25 . . . Photovoltaic energy
- 80/30 . Reducing waste in manufacturing processes; Calculations of released waste quantities
- 80/40 . Minimising material used in manufacturing processes

- 90/00 Enabling technologies with a potential contribution to greenhouse gas [GHG] emissions mitigation**
- 90/02 . Total factory control, e.g. smart factories, flexible manufacturing systems [FMS] or integrated manufacturing systems [IMS]
- 90/04 . . characterised by the assembly processes
- 90/06 . . characterised by direct numerical control [DNC]
- 90/08 . . characterised by the cooperation between machine tools, manipulators or work piece supply systems
- 90/083 . . . Manipulators cooperating with conveyors
- 90/087 . . . Manipulators cooperating with machine tools
- 90/10 . . characterised by identification, e.g. of work pieces or equipment
- 90/12 . . characterised by programme execution
- 90/14 . . characterised by fault tolerance, reliability of production system
- 90/16 . . characterised by system universality, i.e. configurability or modularity of production units
- 90/18 . . characterised by the network communication
- 90/185 . . . using local area networks [LAN]
- 90/20 . . characterised by job scheduling, process planning or material flow
- 90/205 . . . Tool management
- 90/22 . . characterised by quality surveillance of production
- 90/24 . . characterised by computer integrated manufacturing [CIM], planning or realisation
- 90/26 . . characterised by modelling or simulation of the manufacturing system
- 90/265 . . . Product design therefor
- 90/28 . . characterised by transport systems
- 90/285 . . . using automatic guided vehicles [AGV]
- 90/30 . Computing systems specially adapted for manufacturing
- 90/40 . Fuel cell technologies in production processes
- 90/45 . Hydrogen technologies in production processes
- 90/50 . Energy storage in industry with an added climate change mitigation effect
- 90/60 . Electric or hybrid propulsion means for production processes
- 90/70 . Combining sequestration of CO₂ and exploitation of hydrocarbons by injecting CO₂ or carbonated water in oil wells
- 90/80 . Management or planning
- 90/82 . . Energy audits or management systems therefor
- 90/84 . . Greenhouse gas [GHG] management systems
- 90/845 . . . Inventory and reporting systems for greenhouse gases [GHG]
- 90/86 . . Maintenance planning
- 90/90 . Financial instruments for climate change mitigation, e.g. environmental taxes, subsidies or financing
- 90/95 . . CO₂ emission certificates or credits trading