

**CPC****COOPERATIVE PATENT CLASSIFICATION****B22F****WORKING METALLIC POWDER; MANUFACTURE OF ARTICLES FROM METALLIC POWDER; MAKING METALLIC POWDER**

(processes or devices for granulating materials in general [B01J 2/00](#); making ceramics by compacting or sintering [C04B](#), e.g. [C04B 35/64](#); for the production of metals as such, see class [C22](#); reduction or decomposition of metal compounds in general [C22B](#); making alloys by powder metallurgy [C22C](#); electrolytic production of metal powder [C25C 5/00](#))

**NOTES**

1. This subclass covers the making of metallic powder only insofar as powder with specific physical characteristics is made;
2. In this subclass, the following terms or expressions are used with the meanings indicated:
  - "metallic powder" covers powders containing a substantial proportion of non-metallic material;
  - "powder" includes somewhat larger particles which are worked, obtained or behave in a manner similar to powder, e.g. fibres.

**WARNING**

The following IPC groups are not used in the CPC scheme. Subject matter covered by these groups is classified in the following CPC groups:

[B22F 3/035](#) covered by [B22F 3/03](#)

**B22F 1/00**

**Special treatment of metallic powder, e.g. to facilitate working, to improve properties** {(treatment of powder by mechanical means, e.g. by grinding, milling, rolling [B22F 9/04](#))}; **Metallic powders per se, e.g. mixtures of particles of different composition** ([C04](#), [C08](#) take precedence; {amorphous powder [B22F 9/002](#)})

**B22F 1/0003**

- {Metallic powders per se; Mixtures of metallic powders; Metallic powders mixed with a lubricating or binding agent (making ferrous alloys using a mixture of prealloyed powders [C22C 33/0207](#))}

**B22F 1/0007**

- • {Metallic powder characterised by its shape or structure, e.g. fibre structure}

**B22F 1/0011**

- • • {Metallic powder characterised by size or surface area only}

**B22F 1/0014**

- • • • {by size mixtures or distribution}

**B22F 1/0018**

- • • • {Nanometer sized particles}

**B22F 1/0022**

- • • • • {Dispersions or suspensions thereof}

**B22F 1/0025**

- • • • • {Nanofibres or nanotubes}

**B22F 2001/0029**

- • • • • {Hollow particles, including tubes and shells}

**B22F 2001/0033**

- • • • • {Flake form nanoparticles}

**B22F 2001/0037**

- • • • • {Complex form nanoparticles , e.g.. prism, pyramid, octahedron}

**B22F 1/004**

- • • {Fibre structure ([B22F 1/0025](#) takes precedence)}

**B22F 1/0044**

- • • {Nanometer size structures}

**B22F 1/0048**

- • • {Spherical powder}

**B22F 1/0051**

- • • • {Hollow particles}

- B22F 1/0055 . . . {Flake form powders}
- B22F 1/0059 . . {Metallic powders mixed with a lubricating or binding agent or organic material}
- B22F 1/0062 . . . {Powders coated with organic material}
- B22F 2001/0066 . . . {Organic binder comprising a mixture or obtained by reaction of more than one component other than solvent, lubricant}
- B22F 1/007 . . . {Non-organic or metal salt binders or lubricants}
- B22F 1/0074 . . . {Organic materials comprising a solvent e.g. for slip casting}
- B22F 1/0077 . . . {Mixtures obtained by warm mixing}
- B22F 1/0081 . {Special treatment of metallic powder, e.g. to facilitate working, to improve properties (coating with organic material [B22F 1/0062](#))}
- B22F 1/0085 . . {Thermal or thermo-mechanical treatment}
- B22F 1/0088 . . {Chemical treatment, e.g. passivation}
- B22F 2001/0092 . . . {Making a dispersion}
- B22F 1/0096 . . {Treatment resulting in the production of agglomerates}
- B22F 1/02 . comprising coating of the powder {(coating with organic material [B22F 1/0062](#); chemical surface treatment [B22F 1/0088](#))}
- B22F 1/025 . . {Metallic coating}
  
- B22F 3/00** **Manufacture of workpieces or articles from metallic powder characterised by the manner of compacting or sintering; Apparatus specially adapted therefor; {Presses and furnaces}**
- B22F 3/001 . {Starting from powder comprising reducible metal compounds (making ferrous alloys starting from compounds [C22C 33/0235](#))}
- B22F 3/002 . {Manufacture of articles essentially made from metallic fibres}
- B22F 3/003 . {Apparatus, e.g. furnaces (in general [F27B](#))}
- B22F 3/004 . {Filling molds with powder (feeding material to presses in general [B30B 15/302](#))}
- B22F 3/005 . {Loading or unloading powder metal objects (transport in general [B65G](#))}
- B22F 3/006 . {Amorphous articles}
- B22F 3/007 . . {by diffusion starting from non-amorphous articles prepared by powder metallurgy}
- B22F 3/008 . {Selective deposition modelling ([B22F 3/1055](#) takes precedence)}
- B22F 3/02 . Compacting only
- B22F 2003/023 . . {Lubricant mixed with the metal powder}
- B22F 2003/026 . . {Mold wall lubrication or article surface lubrication}
- B22F 3/03 . . Press-moulding apparatus therefor
- B22F 2003/031 . . . {with punches moving in different directions in different planes}
- B22F 2003/033 . . . {with multiple punches working in the same direction}
- B22F 3/04 . . by applying fluid pressure (e.g. by cold isostatic pressing [CIP])
- B22F 3/045 . . . {Semi-isostatic pressure}
- B22F 3/06 . . by centrifugal forces
- B22F 3/08 . . by explosive forces {(generating shock waves in general [G10K 15/043](#))}

- B22F 3/087 . . using high energy impulses, e.g. magnetic field impulses
- B22F 3/093 . . using vibrations {or friction}
- B22F 3/10 . Sintering only
- B22F 3/1003 . . {Use of special medium during sintering, e.g. sintering aid}
- B22F 3/1007 . . . {Atmosphere ([B22F 3/1021](#) takes precedence)}
- B22F 3/101 . . . . {Changing atmosphere}
- B22F 2003/1014 . . . {Getter}
- B22F 3/1017 . . {Multiple heating or additional steps ([B22F 3/101](#) takes precedence)}
- B22F 3/1021 . . . {Removal of binder or filler (removal of binder from ceramics [C04B 35/638](#))}
- B22F 3/1025 . . . . {not by heating only}
- B22F 3/1028 . . . {Controlled cooling}
- B22F 2003/1032 . . {comprising a grain growth inhibitor}
- B22F 3/1035 . . {Liquid phase sintering}
- B22F 3/1039 . . {by reaction ([B22F 3/001](#), [B22F 3/23](#) take precedence)}
- B22F 2003/1042 . . {with support for articles to be sintered}
- B22F 2003/1046 . . . {with separating means for articles to be sintered}
- B22F 3/105 . . by using electric current {other than for infra-red radiant energy}, laser radiation or plasma ([B22F 3/11](#) takes precedence); {by ultrasonic bonding ([B22F 3/115](#) takes precedence)}
- B22F 2003/1051 . . . {by electric discharge}
- B22F 2003/1052 . . . {assisted by energy absorption enhanced by the coating or powder}
- B22F 2003/1053 . . . {by induction}
- B22F 2003/1054 . . . {by microwave}
- B22F 3/1055 . . . {Selective sintering, i.e. stereolithography (selective sintering of powdered plastics [B29C 67/0077](#))}
- B22F 2003/1056 . . . . {Apparatus components, details or accessories}
- B22F 2003/1057 . . . . . {for control or data processing, e.g. algorithms}
- B22F 2003/1058 . . . . . {Support structures for the 3D object during manufacturing, e.g. using sacrificial material}
- B22F 2003/1059 . . . . . {for cleaning or recycling}
- B22F 3/11 . Making porous workpieces or articles
- B22F 3/1103 . . . {with particular physical characteristics}
- B22F 2003/1106 . . . . {Product comprising closed porosity}
- B22F 3/1109 . . . . {Inhomogenous pore distribution (composite layers of porous nature [B22F 7/002](#))}
- B22F 3/1112 . . . . {comprising hollow spheres or hollow fibres}
- B22F 3/1115 . . . . {comprising complex forms, e.g. honeycombs}
- B22F 3/1118 . . . . {comprising internal reinforcements}
- B22F 3/1121 . . . {by using decomposable, meltable or sublimatable fillers}
- B22F 3/1125 . . . . {involving a foaming process}

B22F 2003/1128	. . . . . {Foaming by expansion of dissolved gas, other than with foaming agent}
B22F 2003/1131	. . . . . {Foaming in a liquid suspension and decomposition}
B22F 3/1134	. . . . . {Inorganic fillers (carbonaceous or paper filler <a href="#">B22F 3/1121</a> )}
B22F 3/1137	. . . . . {by coating porous removable preforms}
B22F 3/114	. . . {the porous products being formed by impregnation ( <a href="#">B22F 3/1137</a> , <a href="#">B22F 3/26</a> take precedence)}
B22F 3/1143	. . . {involving an oxidation, reduction or reaction step}
B22F 3/1146	. . . {After-treatment maintaining the porosity ( <a href="#">B22F 3/114</a> takes precedence)}
B22F 3/115	. by spraying molten metal, i.e. spray sintering, spray casting
B22F 3/12	. Both compacting and sintering (by forging <a href="#">B22F 3/17</a> )
B22F 3/1208	. . {Containers or coating used therefor}
B22F 3/1216	. . . {Container composition}
B22F 3/1225	. . . . {Glass}
B22F 3/1233	. . . . {Organic material}
B22F 3/1241	. . . . {layered}
B22F 3/125	. . . {Initially porous container}
B22F 3/1258	. . . {Container manufacturing}
B22F 3/1266	. . . . {by coating or sealing the surface of the preformed article, e.g. by melting}
B22F 3/1275	. . . . {by coating a model and eliminating the model before consolidation}
B22F 3/1283	. . . . {Container formed as an undeformable model eliminated after consolidation}
B22F 3/1291	. . . . {Solid insert eliminated after consolidation}
B22F 3/14	. . simultaneously
B22F 2003/145	. . . {by warm compacting, below debinding temperature}
B22F 3/15	. . . Hot isostatic pressing
B22F 2003/153	. . . . {apparatus specific to HIP}
B22F 3/156	. . . . {by a pressure medium in liquid or powder form}
B22F 3/16	. . in successive or repeated steps
B22F 3/162	. . . {Machining, working after consolidation}
B22F 3/164	. . . {Partial deformation or calibration}
B22F 2003/166	. . . . {Surface calibration, blasting, burnishing, sizing, coining}
B22F 3/168	. . . . {Local deformation}
B22F 3/17	. by forging
B22F 3/172	. . {Continuous compaction, e.g. rotary hammering (with axial pressure and without reduction of section <a href="#">B22F 3/204</a> )}
B22F 2003/175	. . {by hot forging, below sintering temperature}
B22F 3/177	. . {Rocking die forging}
B22F 3/18	. by using pressure rollers
B22F 2003/185	. . {by hot rolling, below sintering temperature}

- B22F 3/20 . by extruding
- B22F 2003/202 . . {with back pressure}
- B22F 3/204 . . {Continuous compaction with axial pressure and without reduction of section}
- B22F 2003/206 . . {Hydrostatic or hydraulic extrusion}
- B22F 2003/208 . . {Warm or hot extruding}
- B22F 3/22 . for producing castings from a slip
- B22F 3/222 . . {by freeze-casting or in a supercritical fluid}
- B22F 3/225 . . {by injection molding}
- B22F 3/227 . . {by organic binder assisted extrusion}
- B22F 3/23 . involving a self-propagating high-temperature synthesis or reaction sintering step {(making cermets by reaction sintering [C22C 1/058](#))}
- B22F 3/24 . After-treatment of workpieces or articles {(B22F 3/1146 takes precedence)}
- B22F 2003/241 . . {Chemical after-treatment on the surface}
- B22F 2003/242 . . . {Coating}
- B22F 2003/244 . . . {Leaching}
- B22F 2003/245 . . {Making recesses, grooves etc on the surface by removing material}
- B22F 2003/247 . . {Removing material: carving, cleaning, grinding, hobbing, honing, lapping, polishing, milling, shaving, skiving, turning the surface}
- B22F 2003/248 . . {Thermal after-treatment}
- B22F 3/26 . . Impregnating {(making ferrous alloys by impregnation [C22C 33/0242](#))}

**B22F 5/00      Manufacture of workpieces or articles from metallic powder characterised by the special shape of the product**

- B22F 2005/001 . {Cutting tools, earth boring or grinding tool other than table ware}
- B22F 2005/002 . {Tools other than cutting tools}
- B22F 5/003 . {Articles made for being fractured or separated into parts}
- B22F 2005/004 . {Article comprising helical form elements ([B22F 5/085](#) takes precedence)}
- B22F 2005/005 . {Article surface comprising protrusions}
- B22F 5/006 . {of flat products, e.g. sheets ([B22F 3/1103](#) takes precedence; by using pressure rollers only see [B22F 3/18](#))}
- B22F 5/007 . {of moulds}
- B22F 5/008 . {of engine cylinder parts or of piston parts other than piston rings (of piston rings [B22F 5/02](#))}
- B22F 5/009 . {of turbine components other than turbine blades (of turbine blades [B22F 5/04](#))}
- B22F 5/02 . of piston rings
- B22F 5/04 . of turbine blades
- B22F 5/06 . of threaded articles, e.g. nuts
- B22F 5/08 . of toothed articles, e.g. gear wheels; of cam discs
- B22F 5/085 . . {with helical contours}
- B22F 5/10 . of articles with cavities or holes, not otherwise provided for in the preceding subgroups

B22F 2005/103	<ul style="list-style-type: none"> <li>. . {Cavity made by removal of insert}</li> </ul>
B22F 5/106	<ul style="list-style-type: none"> <li>. . {Tube or ring forms}</li> </ul>
B22F 5/12	<ul style="list-style-type: none"> <li>. of wires {(of tubes <a href="#">B22F 5/10</a>)}</li> </ul>
<b>B22F 7/00</b>	<b>Manufacture of composite layers, workpieces, or articles, comprising metallic powder, by sintering the powder, with or without compacting {wherein at least one part is obtained by sintering or compression (application of coating layers by use of metal powders, see <a href="#">C23C</a>)}</b>
B22F 7/002	<ul style="list-style-type: none"> <li>. {of porous nature}</li> </ul>
B22F 7/004	<ul style="list-style-type: none"> <li>. . {comprising at least one non-porous part}</li> </ul>
B22F 7/006	<ul style="list-style-type: none"> <li>. . . {the porous part being obtained by foaming}</li> </ul>
B22F 7/008	<ul style="list-style-type: none"> <li>. {characterised by the composition}</li> </ul>
B22F 7/02	<ul style="list-style-type: none"> <li>. of composite layers {(<a href="#">B22F 7/002</a> takes precedence)}</li> </ul>
B22F 7/04	<ul style="list-style-type: none"> <li>. . with one or more layers not made from powder, e.g. made from solid metal</li> </ul>
B22F 2007/042	<ul style="list-style-type: none"> <li>. . . {characterised by the layer forming method}</li> </ul>
B22F 2007/045	<ul style="list-style-type: none"> <li>. . . . {accompanied by fusion or impregnation}</li> </ul>
B22F 2007/047	<ul style="list-style-type: none"> <li>. . . . {non-pressurised baking of the paste or slurry containing metal powder}</li> </ul>
B22F 7/06	<ul style="list-style-type: none"> <li>. of composite workpieces or articles from parts, e.g. to form tipped tools {(<a href="#">B22F 7/002</a> takes precedence)}</li> </ul>
B22F 7/062	<ul style="list-style-type: none"> <li>. . {involving the connection or repairing of preformed parts}</li> </ul>
B22F 7/064	<ul style="list-style-type: none"> <li>. . . {using an intermediate powder layer}</li> </ul>
B22F 2007/066	<ul style="list-style-type: none"> <li>. . . {using impregnation}</li> </ul>
B22F 2007/068	<ul style="list-style-type: none"> <li>. . . {repairing articles}</li> </ul>
B22F 7/08	<ul style="list-style-type: none"> <li>. . with one or more parts not made from powder {(<a href="#">B22F 7/062</a> takes precedence)}</li> </ul>
<b>B22F 8/00</b>	<b>Manufacture of articles from scrap or waste metal particles</b>
<b>B22F 9/00</b>	<b>Making metallic powder or suspensions thereof</b>
B22F 2009/001	<ul style="list-style-type: none"> <li>. {from scrap particles}</li> </ul>
B22F 9/002	<ul style="list-style-type: none"> <li>. {amorphous or microcrystalline}</li> </ul>
B22F 9/004	<ul style="list-style-type: none"> <li>. . {by diffusion, e.g. solid state reaction}</li> </ul>
B22F 9/005	<ul style="list-style-type: none"> <li>. . . {Transformation into amorphous state by milling}</li> </ul>
B22F 9/007	<ul style="list-style-type: none"> <li>. . {Transformation of amorphous into microcrystalline state}</li> </ul>
B22F 9/008	<ul style="list-style-type: none"> <li>. . {Rapid solidification processing}</li> </ul>
B22F 9/02	<ul style="list-style-type: none"> <li>. using physical processes</li> </ul>
B22F 9/023	<ul style="list-style-type: none"> <li>. . {Hydrogen absorption}</li> </ul>
B22F 9/026	<ul style="list-style-type: none"> <li>. . {Spray drying of solutions or suspensions}</li> </ul>
B22F 9/04	<ul style="list-style-type: none"> <li>. . starting from solid material, e.g. by crushing, grinding or milling ((<a href="#">C22C 1/1084</a> takes precedence); crushing, grinding or milling, in general, see the relevant subclasses, e.g. <a href="#">B02C</a>)</li> </ul>
B22F 2009/041	<ul style="list-style-type: none"> <li>. . . {by mechanical alloying , e.g. blending, milling}</li> </ul>

B22F 2009/042	. . .	{using a particular milling fluid}
B22F 2009/043	. . .	{by ball milling}
B22F 2009/044	. . .	{by jet milling}
B22F 2009/045	. . .	{by other means than ball or jet milling}
B22F 2009/046	. . . .	{by cutting}
B22F 2009/047	. . . .	{by rolling}
B22F 2009/048	. . .	{by pulverising a quenched ribbon}
B22F 2009/049	. . .	{by pulverising at particular temperature}
B22F 9/06	. .	starting from liquid material
B22F 2009/065	. . .	{Melting inside a liquid, e.g. making spherical balls}
B22F 9/08	. . .	by casting, e.g. through sieves or in water, by atomising or spraying (using electric discharge <a href="#">B22F 9/14</a> )
B22F 2009/0804	. . . .	{Dispersion in or on liquid, other than with sieves}
B22F 2009/0808	. . . . .	{Mechanical dispersion of melt, e.g. by sieves}
B22F 2009/0812	. . . . .	{Pulverisation with a moving liquid coolant stream, by centrifugally rotating stream}
B22F 2009/0816	. . . . .	{by casting with pressure or pulsating pressure on the metal bath}
B22F 9/082	. . . . .	{atomising using a fluid (using centrifugal force <a href="#">B22F 9/10</a> )}
B22F 2009/0824	. . . . .	{with a specific atomising fluid}
B22F 2009/0828	. . . . .	{with water}
B22F 2009/0832	. . . . .	{Handling of atomising fluid, e.g. heating, cooling, cleaning, recirculating}
B22F 2009/0836	. . . . .	{with electric or magnetic field or induction}
B22F 2009/084	. . . . .	{combination of methods}
B22F 2009/0844	. . . . .	{in controlled atmosphere}
B22F 2009/0848	. . . . .	{Melting process before atomisation}
B22F 2009/0852	. . . . .	{Electroslag melting}
B22F 2009/0856	. . . . .	{Skull melting}
B22F 2009/086	. . . . .	{Cooling after atomisation}
B22F 2009/0864	. . . . .	{by oil, other non-aqueous fluid or fluid-bed cooling}
B22F 2009/0868	. . . . .	{by injection of solid particles in the melt stream}
B22F 2009/0872	. . . . .	{by water}
B22F 2009/0876	. . . . .	{by gas}
B22F 2009/088	. . . . .	{Fluid nozzles , e.g. angle, distance}
B22F 2009/0884	. . . . .	{Spiral fluid}
B22F 2009/0888	. . . . .	{casting construction of the melt process, apparatus, intermediate reservoir e.g. tundish, devices for temperature control}
B22F 2009/0892	. . . . .	{casting nozzle; controlling metal stream in or after the casting nozzle}
B22F 2009/0896	. . . . .	{particle transport, separation: process and apparatus}
B22F 9/10	. . . .	using centrifugal force



- B22F 9/12 . . starting from gaseous material
- B22F 9/14 . . using electric discharge
- B22F 9/16 . using chemical processes
- B22F 2009/165 . . {Chemical reaction in an Ionic Liquid [IL] ([B22F 2009/245](#) takes precedence)}
- B22F 9/18 . . with reduction of metal compounds
- B22F 9/20 . . . starting from solid metal compounds
- B22F 9/22 . . . . using gaseous reductors
- B22F 9/24 . . . starting from liquid metal compounds, e.g. solutions
- B22F 2009/245 . . . . {Reduction reaction in an Ionic Liquid [IL]}
- B22F 9/26 . . . . using gaseous reductors
- B22F 9/28 . . . starting from gaseous metal compounds
- B22F 9/30 . . with decomposition of metal compounds, e.g. by pyrolysis
- B22F 9/305 . . . {of metal carbonyls}

**B22F 2201/00****Treatment under specific atmosphere**

- B22F 2201/01 . Reducing atmosphere
- B22F 2201/013 . . Hydrogen
- B22F 2201/016 . . NH<sub>3</sub>
- B22F 2201/02 . Nitrogen
- B22F 2201/03 . Oxygen
- B22F 2201/04 . CO or CO<sub>2</sub>
- B22F 2201/05 . Water or water vapour
- B22F 2201/10 . Inert gases
- B22F 2201/11 . . Argon
- B22F 2201/12 . . Helium
- B22F 2201/20 . Use of vacuum
- B22F 2201/30 . Carburising atmosphere
- B22F 2201/32 . Decarburising atmosphere
- B22F 2201/40 . Metal compounds
- B22F 2201/50 . air

**B22F 2202/00****Treatment under specific physical conditions**

- B22F 2202/01 . Use of vibrations
- B22F 2202/03 . Treatment under cryogenic or supercritical conditions
- B22F 2202/05 . Use of magnetic field
- B22F 2202/06 . Use of electric fields
- B22F 2202/07 . by induction
- B22F 2202/09 . Use of non-gravitational conditions
- B22F 2202/11 . Use of irradiation
- B22F 2202/13 . Use of plasma



- B22F 2202/15 . Use of fluidised beds
- B22F 2202/17 . use of centrifugal or vortex forces

**B22F 2203/00****Controlling**

- B22F 2203/01 . To-be-deleted with administrative transfer to [B22F 2203/00](#)
- B22F 2203/03 . for feed-back
- B22F 2203/05 . thermal expansion
- B22F 2203/11 . temperature, temperature profile
- B22F 2203/13 . pressure
- B22F 2203/15 . weight

**B22F 2207/00****Aspects of the compositions, gradients**

- B22F 2207/01 . Composition gradients
- B22F 2207/03 . . of the metallic binder phase in cermets
- B22F 2207/05 . . . eta-phase
- B22F 2207/07 . . Particles with core-rim gradient
- B22F 2207/11 . Gradients other than composition gradients, e.g. size gradients
- B22F 2207/13 . . Size gradients
- B22F 2207/15 . . Temperature gradients
- B22F 2207/17 . . density or porosity gradients
- B22F 2207/20 . Cooperating components

**B22F 2301/00****Metallic composition of the powder or its coating**

- B22F 2301/05 . Light metals
- B22F 2301/052 . . Aluminium
- B22F 2301/054 . . Alkali metals, i.e. Li, Na, K, Rb, Cs, Fr
- B22F 2301/056 . . Alkaline metals, i.e. Ca, Sr, Ba, Ra
- B22F 2301/058 . . Magnesium
- B22F 2301/10 . Copper
- B22F 2301/15 . Nickel or cobalt
- B22F 2301/155 . . Rare Earth - Co or -Ni intermetallic alloys
- B22F 2301/20 . Refractory metals
- B22F 2301/205 . . Titanium, zirconium or hafnium
- B22F 2301/25 . Noble metals, i.e. Ag, Au, Ir, Os, Pd, Pt, Rh, Ru
- B22F 2301/255 . . Silver or gold
- B22F 2301/30 . Low melting point metals, i.e. Zn, Pb, Sn, Cd, In, Ga
- B22F 2301/35 . Iron
- B22F 2301/355 . . Rare Earth - Fe intermetallic alloys
- B22F 2301/40 . Intermetallics other than rare earth-Co or -Ni or -Fe intermetallic alloys
- B22F 2301/45 . Rare earth metals, i.e. Sc, Y, Lanthanides (57-71)

<b>B22F 2302/00</b>	<b>Metal Compound , non-Metallic compound or non-metal composition of the powder or its coating</b>
B22F 2302/05	. Boride
B22F 2302/10	. Carbide
B22F 2302/105	. . Silicium carbide (SiC)
B22F 2302/15	. Carbonitride
B22F 2302/20	. Nitride
B22F 2302/205	. Cubic boron nitride
B22F 2302/25	. Oxide
B22F 2302/253	. . Aluminum oxide (Al <sub>2</sub> O <sub>3</sub> )
B22F 2302/256	. . Silicium oxide (SiO <sub>2</sub> )
B22F 2302/30	. Oxynitride
B22F 2302/35	. Complex boride, carbide, carbonitride, nitride, oxide or oxynitride
B22F 2302/40	. Carbon, graphite
B22F 2302/403	. . Carbon nanotube
B22F 2302/406	. . Diamond
B22F 2302/45	. Others, including non-metals
<b>B22F 2303/00</b>	<b>Functional details of metal or compound in the powder or product,</b>
B22F 2303/01	. Main component
B22F 2303/05	. Compulsory alloy component
B22F 2303/10	. Optional alloy component
B22F 2303/15	. Intermetallic
B22F 2303/20	. Coating by means of particles
B22F 2303/25	. Coating by means of fibres
B22F 2303/30	. Coating alloy
B22F 2303/35	. Molten metal infiltrating a metal preform
B22F 2303/40	. Layer in a composite stack of layers, workpiece or article
B22F 2303/405	. . Support layer
B22F 2303/45	. Part of a final mixture to be processed further
<b>B22F 2304/00</b>	<b>Physical aspects of the powder</b>
B22F 2304/05	. Submicron size particles
B22F 2304/052	. . Particle size below 1nm
B22F 2304/054	. . Particle size between 1 and 100 nm
B22F 2304/056	. . Particle size above 100 nm up to 300 nm
B22F 2304/058	. . Particle size above 300 nm up to 1 micrometer
B22F 2304/10	. Micron size particles, i.e. above 1 micrometer up to 500 micrometer
B22F 2304/15	. Millimeter size particles, i.e. above 500 micrometer

- B22F 2998/00**      **Supplementary information concerning processes or compositions relating to powder metallurgy**
- B22F 2998/10**      .    Processes characterised by the sequence of their steps
- B22F 2999/00**      **Aspects linked to processes or compositions used in powder metallurgy**