

CPC**COOPERATIVE PATENT CLASSIFICATION****B23C**

MILLING (broaching [B23D](#); broach-milling in making gears [B23F](#); arrangement for copying or controlling [B23Q](#))

B23C 1/00**Milling machines not designed for particular work or special operations**

B23C 1/002

. {Gantry-type milling machines}

B23C 1/005

. {with a tool moving in a closed path around the workpiece}

B23C 1/007

. {movable milling machines, e.g. on rails}

B23C 1/02

. with one horizontal working-spindle

B23C 1/025

. . with working-spindle movable in a fixed position

B23C 1/027

. . with working-spindle movable in a vertical direction

B23C 1/04

. with a plurality of horizontal working-spindles

B23C 1/045

. . {Opposed - spindle machines}

B23C 1/06

. with one vertical working-spindle

B23C 1/08

. with a plurality of vertical working-spindles

B23C 1/10

. with both horizontal and vertical working-spindles

B23C 1/12

. with spindle adjustable to different angles, e.g. either horizontal or vertical

B23C 1/14

. with rotary work-carrying table ([work tables for machine tools in general B23Q 1/00](#))

B23C 1/16

. specially designed for control by copying devices {(not used; see [B23Q 35/00](#))}

B23C 1/18

. . for milling while revolving the work

B23C 1/20

. Portable devices or machines ([details or components, e.g. casings, bodies, of portable power-driven tools not particularly related to the operation performed B25F 5/00](#)); Hand-driven devices or machines**B23C 3/00****Milling particular work; Special milling operations; Machines therefor** (milling gear-teeth [B23F](#), {[heat assisted machining B23P 25/00](#)})

B23C 3/002

. {Milling elongated workpieces}

B23C 3/005

. . {Rails}

B23C 3/007

. {Milling end surfaces of nuts or tubes}

B23C 3/02

. Milling surfaces of revolution ([B23C 3/06](#), [B23C 3/08](#) take precedence)

B23C 3/023

. . {Milling spherical surfaces}

B23C 3/026

. . . {Milling balls}

B23C 3/04

. . while revolving the work

B23C 3/05

. . Finishing valves or valve seats {(machines for grinding seat surfaces, e.g. in [valve housings, B24B 15/00](#))}

B23C 3/051

. . . {Reconditioning of valve seats}

B23C 3/053

. . . . {having means for guiding the tool carrying spindle}

B23C 3/055

. {for engines}

B23C 3/056

. {for taps or valves}

B23C 3/058

. . . {Reconditioning of valves}

- B23C 3/06 . Milling crankshafts
- B23C 3/08 . Milling cams, camshafts, or the like
- B23C 3/10 . Relief milling ([lathes or turning devices for relieving B23B5/42](#))
- B23C 3/12 . Trimming or finishing edges, e.g. deburring welded corners
- B23C 3/122 . . {of pipes or cylinders}
- B23C 3/124 . . . {internally}
- B23C 3/126 . . {Portable devices or machines for chamfering edges}
- B23C 3/128 . . {Trimming or finishing edges of doors and windows}
- B23C 3/13 . Surface milling of plates, sheets or strips
- B23C 3/14 . Scrubbing or peeling ingots or similar work-pieces
- B23C 3/16 . Working surfaces curved in two directions
- B23C 3/18 . . for shaping screw-propellers, turbine blades, or impellers
- B23C 3/20 . . for shaping dies
- B23C 3/22 . Forming overlapped joints, e.g. of the ends of piston-rings
- B23C 3/24 . Making square or polygonal ends on work-pieces, e.g. key studs on tools
- B23C 3/26 . Making square or polygonal holes in work-pieces, e.g. key holes in tools
- B23C 3/28 . Grooving workpieces ([tread-cutting by milling B23G 1/32](#))
- B23C 3/30 . . Milling straight grooves, e.g. keyways
- B23C 3/305 . . . {in which more than one milling tool is used simultaneously, e.g. for sheet material}
- B23C 3/32 . . Milling helical grooves, e.g. in making twist-drills
- B23C 3/34 . . Milling grooves of other forms, e.g. circumferential
- B23C 3/35 . . Milling grooves in keys
- B23C 3/355 . . . {Holders for the template keys}
- B23C 3/36 . Milling milling-cutters ([B23C 3/28 takes precedence](#))

- B23C 5/00** **Milling-cutters** ([for cutting gear-teeth B23F 21/12](#))
- B23C 5/003 . {with vibration suppressing means}
- B23C 5/006 . {Details of the milling cutter body}
- B23C 5/02 . characterised by the shape of the cutter
- B23C 5/04 . . Plain cutters, i.e. having essentially a cylindrical or tapered cutting surface of substantial length ([B23C 5/10 takes precedence](#))
- B23C 5/06 . . Face-milling cutters, i.e. having only or primarily a substantially flat cutting surface
- B23C 5/08 . . Disc-type cutters
- B23C 5/10 . . Shank-type cutters, i.e. with an integral shaft
- B23C 5/1009 . . . {Ball nose end mills}
- B23C 5/1018 {with permanently fixed cutting inserts}
- B23C 5/1027 {with one or more removable cutting inserts}
- B23C 5/1036 {having a single cutting insert, the cutting edges of which subtend 180 degrees}

B23C 5/1045	. . . . . {having a cutting insert, the cutting edge of which subtends substantially 90 degrees}
B23C 5/1054	. . . {T slot cutters}
B23C 5/1063	. . . . {with permanently fixed cutting inserts}
B23C 5/1072	. . . . {with removable cutting inserts}
B23C 5/1081	. . . {with permanently fixed cutting inserts (B23C 5/1054 and B23C 5/1081 take precedence)}
B23C 5/109	. . . {with removable cutting inserts}
B23C 5/12	. . Cutters specially designed for producing particular profiles (B23C 5/10 takes precedence)
B23C 5/14	. . . essentially comprising curves {(B23C 5/1009 takes precedence)}
B23C 5/16	. characterised by physical features other than shape
B23C 5/165	. . {with chipbreaking or chipdividing equipment (for turning machines B23B 25/02 ; turning tools B23B 27/00 ; drilling machines B23B 47/34)}
B23C 5/18	. . with permanently-fixed cutter-bits or teeth
B23C 5/20	. . with removable cutter bits or teeth {or cutting inserts}
B23C 5/202	. . . {Special by shaped plate-like cutting inserts, i.e. length greater than or equal to width, width greater than or equal to thickness (with removable plate-like turning cutting inserts of special form B23B 27/141)}
B23C 5/205	. . . . {having chip-breakers}
B23C 5/207	. . . . {having a special shape}
B23C 5/22	. . . Securing arrangements for bits or teeth {or cutting inserts}
B23C 5/2204	. . . . {with cutting inserts clamped against the walls of the recess in the shank by a clamping member acting upon the wall of a hole in the insert}
B23C 5/2208	. . . . . {for plate-like cutting inserts (B23C 5/2226 , B23C 5/223 , B23C 5/2234 take precedence)}
B23C 5/2213	. . . . . {Special by shaped cutting inserts}
B23C 5/2217	. . . . . {having chip-breakers}
B23C 5/2221	. . . . . {having a special shape}
B23C 5/2226	. . . . . {for plate-like cutting inserts fitted on an intermediate carrier}
B23C 5/223	. . . . . {for plate-like cutting inserts fitted on a shank, fixed in the cutter body}
B23C 5/2234	. . . . . {for plate-like cutting inserts fitted on a ring or ring segment}
B23C 5/2239	. . . . {with cutting inserts clamped by a clamping member acting almost perpendicular on the cutting face}
B23C 5/2243	. . . . . {for plate-like cutting inserts (B23C 5/2252 , B23C 5/2256 , B23C 5/226 take precedence)}
B23C 5/2247	. . . . . {having a special shape}
B23C 5/2252	. . . . . {for plate-like cutting inserts fitted on an intermediate carrier}
B23C 5/2256	. . . . . {for plate-like cutting inserts fitted on a shank, fixed in the cutter body}
B23C 5/226	. . . . . {for plate-like cutting inserts fitted on a ring or ring segment}
B23C 5/2265	. . . . {by means of a wedge}

B23C 5/2269	. . . . .	{for plate-like cutting inserts (B23C 5/2278 , B23C 5/2286 , B23C 5/2291 take precedence)}
B23C 5/2273	. . . . .	{having a special shape}
B23C 5/2278	. . . . .	{for plate-like cutting inserts fitted on an intermediate carrier}
B23C 5/2282	. . . . .	{having a special shape}
B23C 5/2286	. . . . .	{for plate-like cutting inserts fitted on a shank, fixed in the cutter body}
B23C 5/2291	. . . . .	{for plate-like cutting inserts fitted on a ring or ring segment}
B23C 5/2295	. . . . .	{the cutting elements being clamped simultaneously}
B23C 5/24	. . . . .	adjustable
B23C 5/2403	. . . . .	{with cutting inserts clamped against the walls of the recess in the shank by a clamping member acting upon the wall of a hole in the insert}
B23C 5/2406	. . . . .	{for plate-like cutting inserts (B23C 5/241 , B23C 5/2413 , B23C 5/2417 take precedence)}
B23C 5/241	. . . . .	{for plate-like cutting inserts fitted on an intermediate carrier}
B23C 5/2413	. . . . .	{for plate-like cutting inserts fitted on a shank, fixed in the cutter body}
B23C 5/2417	. . . . .	{for plate-like cutting inserts fitted on a ring or ring segment}
B23C 5/242	. . . . .	{with cutting inserts clamped by a clamping member acting almost perpendicularly on the cutting face}
B23C 5/2424	. . . . .	{for plate-like cutting inserts (B23C 5/2427 , B23C 5/2431 , B23C 5/2434 take precedence)}
B23C 5/2427	. . . . .	{for plate-like cutting inserts fitted on an intermediate carrier}
B23C 5/2431	. . . . .	{for plate-like cutting inserts fitted on a shank, fixed in the cutter body}
B23C 5/2434	. . . . .	{for plate-like cutting inserts fitted on a ring or ring segment}
B23C 5/2437	. . . . .	{clamping by means of a wedge}
B23C 5/2441	. . . . .	{for plate-like cutting inserts (B23C 5/2444 , B23C 5/2448 , B23C 5/2451 take precedence)}
B23C 5/2444	. . . . .	{for plate-like cutting inserts fitted on an intermediate carrier}
B23C 5/2448	. . . . .	{for plate-like cutting inserts fitted on a shank, fixed in the cutter body}
B23C 5/2451	. . . . .	{for plate-like cutting inserts fitted on a ring or ring segment}
B23C 5/2455	. . . . .	{The adjusting means being serrated teeth on the cutter and the cutting insert}
B23C 5/2458	. . . . .	{the cutting elements being clamped or adjusted simultaneously}
B23C 5/2462	. . . . .	{the adjusting means being oblique surfaces}
B23C 5/2465	. . . . .	{the adjusting means being notches}
B23C 5/2468	. . . . .	{the adjusting means being serrations}
B23C 5/2472	. . . . .	{the adjusting means being screws}
B23C 5/2475	. . . . .	{the adjusting means being distance elements, e.g. shims or washers}
B23C 5/2479	. . . . .	{the adjusting means being eccentrics}

- B23C 5/2482 {the adjusting means being hydraulic cylinders}
- B23C 5/2486 {where the adjustment is made by balancing the toolholders}
- B23C 5/2489 {where the adjustment is made by changing the inclination of the inserts}
- B23C 5/2493 {where the adjustment is made by deforming the seating surfaces}
- B23C 5/2496 {where the adjusting means are gears and racks}
- B23C 5/26 . . Securing milling cutters to the driving spindle
- B23C 5/265 . . {by fluid pressure means}
- B23C 5/28 . . Features relating to lubricating or cooling

B23C 7/00 **Milling devices able to be attached to a machine tool, whether or not replacing an operative portion of the machine tool**

- B23C 7/02 . . to lathes
- B23C 7/04 . . to planing or slotting machines

B23C 9/00 **Details or accessories so far as specially adapted to milling machines or cutter (drives, control devices, or accessories, in general [B23Q](#))**

- B23C 9/005 . . {milling heads}

B23C 2200/00 **Details of milling cutting inserts**

- B23C 2200/04 . . Overall shape
- B23C 2200/0405 . . Hexagonal
- B23C 2200/0411 . . . irregular
- B23C 2200/0416 . . Irregular
- B23C 2200/0422 . . Octagonal
- B23C 2200/0427 . . . rounded
- B23C 2200/0433 . . Parallelogram
- B23C 2200/0438 . . . rounded
- B23C 2200/0444 . . Pentagonal
- B23C 2200/045 . . Round
- B23C 2200/0455 . . Square
- B23C 2200/0461 . . . rounded
- B23C 2200/0466 . . Star form
- B23C 2200/0472 . . Trapezium
- B23C 2200/0477 . . Triangular
- B23C 2200/0483 . . . rounded
- B23C 2200/0488 . . Heptagonal
- B23C 2200/0494 . . Rectangular
- B23C 2200/08 . . Rake or top surfaces
- B23C 2200/081 . . with projections ([chip breaking projections in general B23C 2200/323](#))
- B23C 2200/082 . . with an elevated clamping surface
- B23C 2200/083 . . curved

- B23C 2200/085 . . discontinuous
- B23C 2200/086 . . with one or more grooves
- B23C 2200/087 . . . for chip-breaking (with chip-breaking grooves in general [B23C 2200/326](#))
- B23C 2200/088 . . spherical
- B23C 2200/12 . Side or flank surfaces
- B23C 2200/121 . . with projections
- B23C 2200/123 . . curved
- B23C 2200/125 . . discontinuous
- B23C 2200/126 . . . stepped
- B23C 2200/128 . . with one or more grooves
- B23C 2200/16 . Supporting or bottom surfaces
- B23C 2200/161 . . with projections
- B23C 2200/162 . . curved
- B23C 2200/164 . . discontinuous
- B23C 2200/165 . . with one or more grooves
- B23C 2200/167 . . star form
- B23C 2200/168 . . with features related to indexing (with lines to permit indexing of round inserts [B23C 2200/363](#))
- B23C 2200/20 . Top or side views of the cutting edge
- B23C 2200/201 . . Details of the nose radius and immediately surrounding areas
- B23C 2200/203 . . Curved cutting edges
- B23C 2200/205 . . Discontinuous cutting edges
- B23C 2200/206 . . Cutting edges having a wave-form
- B23C 2200/208 . . Wiper, i.e. an auxiliary cutting edge to improve surface finish
- B23C 2200/24 . Cross section of the cutting edge
- B23C 2200/243 . . bevelled or chamfered
- B23C 2200/246 . . rounded
- B23C 2200/28 . Angles
- B23C 2200/283 . . Negative cutting angles
- B23C 2200/286 . . Positive cutting angles
- B23C 2200/32 . Chip breaking or chip evacuation
- B23C 2200/323 . . by chip-breaking projections (with projection on top surface [B23C 2200/081](#))
- B23C 2200/326 . . by chip breaking grooves (with grooves on top surface for chip-breaking [B23C 2200/087](#))
- B23C 2200/36 . Other features of the milling insert not covered by [B23C 2200/04](#) to [B23C 2200/32](#)
- B23C 2200/361 . . Fixation holes
- B23C 2200/362 . . . Having two fixation holes
- B23C 2200/363 . . Lines to permit indexing of round insert (bottom surface with features relating to indexing [B23C 2200/168](#))
- B23C 2200/365 . . Lands, i.e. the outer peripheral section of rake faces

- B23C 2200/366 . . . Variable
- B23C 2200/367 . . Mounted tangentially, i.e. where the rake face is not the face with largest area
- B23C 2200/368 . . Roughened surfaces

B23C 2210/00**Details of milling cutters**

- B23C 2210/02 . Connections between the shanks and detachable cutting heads
- B23C 2210/03 . Cutting heads comprised of different material than the shank irrespective of whether the head is detachable from the shank
- B23C 2210/04 . Angles
 - B23C 2210/0407 . . Cutting angles
 - B23C 2210/0414 . . . different
 - B23C 2210/0421 . . . negative
 - B23C 2210/0428 axial rake angle
 - B23C 2210/0435 radial rake angle
 - B23C 2210/0442 . . . positive
 - B23C 2210/045 axial rake angle
 - B23C 2210/0457 radial rake angle
 - B23C 2210/0464 . . . neutral
 - B23C 2210/0471 axial rake angle
 - B23C 2210/0478 radial rake angle
 - B23C 2210/0485 . . Helix angles
 - B23C 2210/0492 . . . different
- B23C 2210/08 . Side or top views of the cutting edge
 - B23C 2210/082 . . Details of the corner region between axial and radial cutting edges
 - B23C 2210/084 . . Curved cutting edges
 - B23C 2210/086 . . Discontinuous or interrupted cutting edges
 - B23C 2210/088 . . Cutting edges with a wave form
- B23C 2210/12 . Cross section of the cutting edge
 - B23C 2210/123 . . Bevelled cutting edges
 - B23C 2210/126 . . Rounded cutting edges
- B23C 2210/16 . Fixation of inserts or cutting bits in the tool ([details of connections B23C 2240/00](#))
 - B23C 2210/161 . . Elastically deformable clamping members
 - B23C 2210/163 . . Indexing
 - B23C 2210/165 . . Fixation bolts
 - B23C 2210/166 . . Shims
 - B23C 2210/168 . . Seats for cutting inserts, supports for replacable cutting bits
- B23C 2210/20 . Number of cutting edges
 - B23C 2210/201 . . one
 - B23C 2210/202 . . three

B23C 2210/203	. . four
B23C 2210/204	. . five
B23C 2210/205	. . six
B23C 2210/206	. . seven
B23C 2210/207	. . eight
B23C 2210/208	. . ten
B23C 2210/209	. . twelve
B23C 2210/24	. Overall form of the milling cutter (angles B23C 2210/04 ; top or side views of cutting edges B23C 2210/08 ; cross sections of cutting edges B23C 2210/12)
B23C 2210/241	. . Cross sections of the whole milling cutter
B23C 2210/242	. . Form tools, i.e. cutting edges profiles to generate a particular form
B23C 2210/243	. . Cutting parts at both ends
B23C 2210/244	. . Milling cutters comprised of disc-shaped modules or multiple disc-like cutters
B23C 2210/245	. . Milling cutters comprising a disc having a wave form
B23C 2210/246	. . Milling cutters comprising a hole or hollow in the end face or between the cutting edges
B23C 2210/247	. . Stepped milling cutters
B23C 2210/248	. . . with enlarged cutting heads
B23C 2210/28	. Arrangement of teeth
B23C 2210/282	. . Unequal angles between the cutting edges, i.e. cutting edges unequally spaced in the circumferential direction
B23C 2210/285	. . Cutting edges arranged at different diameters
B23C 2210/287	. . Cutting edges arranged at different axial positions or having different lengths in the axial direction
B23C 2210/32	. Details of teeth
B23C 2210/321	. . Lands, i.e. the area on the rake face in the immediate vicinity of the cutting edge
B23C 2210/323	. . Separate teeth, i.e. discrete profiled teeth similar to those of a hob
B23C 2210/325	. . Different teeth, i.e. one tooth having a different configuration to a tooth on the opposite side of the flute
B23C 2210/326	. . File like cutting teeth, e.g. the teeth of cutting burrs
B23C 2210/328	. . Treated cutting edges
B23C 2210/40	. Flutes, i.e. chip conveying grooves
B23C 2210/402	. . of variable depth
B23C 2210/405	. . . having decreasing depth in the direction of the shank from the tip of the tool
B23C 2210/407	. . . having increasing depth in the direction of the shank from the tip of the tool
B23C 2210/44	. Margins, i.e. the part of the peripheral surface immediately adjacent the cutting edge
B23C 2210/445	. . variable
B23C 2210/48	. Chip breakers

- B23C 2210/483 . . Chip breaking projections
- B23C 2210/486 . . Chip breaking grooves or depressions
- B23C 2210/50 . Cutting inserts
- B23C 2210/503 . . mounted internally on the cutter
- B23C 2210/506 . . mounted so as to be able to rotate freely
- B23C 2210/52 . Bushings
- B23C 2210/54 . Configuration of the cutting part
- B23C 2210/56 . Supporting or guiding sections located on the periphery of the tool
- B23C 2210/58 . Brushes
- B23C 2210/60 . Axis of the cutter inclined with respect to the axis of rotation
- B23C 2210/62 . Selectable cutting diameters
- B23C 2210/64 . End milling cutters having a groove in the end cutting face, the groove not being present so as to provide a cutting edge
- B23C 2210/66 . Markings, i.e. symbols or indicating marks
- B23C 2210/68 . Reground to nominal diameter by removal of material from both the front of the insert and the back of insert carrier
- B23C 2210/70 . Pilots
- B23C 2210/72 . Rotatable in both directions
- B23C 2210/74 . Slits

B23C 2215/00**Details of workpieces**

- B23C 2215/04 . Aircraft components
- B23C 2215/045 . . Propellers
- B23C 2215/08 . Automotive parts ([B23C 2215/16](#), [B23C 2215/20](#) and [B23C 2215/24](#) take precedence)
- B23C 2215/085 . . Wheels
- B23C 2215/12 . Propellers for boats
- B23C 2215/16 . Camshafts
- B23C 2215/20 . Crankshafts
- B23C 2215/24 . Components of internal combustion engines
- B23C 2215/242 . . Combustion chambers
- B23C 2215/245 . . Connecting rods
- B23C 2215/247 . . Components of diesel engines
- B23C 2215/28 . Nipples
- B23C 2215/32 . Railway tracks
- B23C 2215/36 . Railway wheels
- B23C 2215/40 . Spectacles
- B23C 2215/44 . Turbine blades
- B23C 2215/48 . Kaplan turbines
- B23C 2215/52 . Axial turbine wheels
- B23C 2215/56 . Radial turbine wheels

B23C 2215/60

- Valve guides in combination with the neighbouring valve seat

B23C 2215/64

- Well pipe windows, i.e. windows in tubings or casings for wells

B23C 2220/00**Details of milling processes**

B23C 2220/04

- Milling with the axis of the cutter inclined to the surface being machined

B23C 2220/08

- Milling with the axis of the tool perpendicular to the workpiece axis

B23C 2220/12

- Cutting off, i.e. producing multiple discrete components from a single piece of material

B23C 2220/16

- Chamferring

B23C 2220/20

- Deburring

B23C 2220/24

- Production of elliptical holes

B23C 2220/28

- Finishing ([roughing and finishing B23C 2220/605](#))

B23C 2220/32

- Five-axis

B23C 2220/36

- Production of grooves

B23C 2220/363

- . Spiral grooves

B23C 2220/366

- . Turbine blade grooves

B23C 2220/40

- Using guiding means

B23C 2220/44

- High speed milling

B23C 2220/48

- Methods of milling not otherwise provided for

B23C 2220/52

- Orbital drilling, i.e. use of a milling cutter moved in a spiral path to produce a hole

B23C 2220/56

- Plunge milling

B23C 2220/60

- Roughing

B23C 2220/605

- . Roughing and finishing

B23C 2220/64

- Using an endmill, i.e. a shaft milling cutter, to generate profile of a crankshaft or camshaft

B23C 2220/68

- Whirling

B23C 2222/00**Materials of tools or workpieces composed of metals, alloys or metal matrices**

B23C 2222/04

- Aluminium

B23C 2222/06

- Babbitt metal

B23C 2222/12

- Brass

B23C 2222/14

- Cast iron

B23C 2222/16

- Cermet

B23C 2222/28

- Details of hard metal, i.e. cemented carbide

B23C 2222/32

- Details of high speed steel ([steel B23C 2222/84](#))

B23C 2222/52

- Magnesium

B23C 2222/61

- Metal matrices with metallic or non-metallic particles or fibres

B23C 2222/64

- Nickel

B23C 2222/76

- Silver

B23C 2222/78

- Sodium

- B23C 2222/84 . Steel ([details of high speed steel B23C 2222/32](#))
- B23C 2222/88 . Titanium
- B23C 2222/98 . Zinc

B23C 2224/00**Materials of tools or workpieces composed of a compound including a metal**

- B23C 2224/04 . Aluminium oxide
- B23C 2224/13 . Chromium nitride
- B23C 2224/14 . Chromium aluminium nitride (CrAlN)
- B23C 2224/20 . Tantalum carbide
- B23C 2224/22 . Titanium aluminium carbide nitride (TiAlCN)
- B23C 2224/24 . Titanium aluminium nitride (TiAlN)
- B23C 2224/28 . Titanium carbide
- B23C 2224/32 . Titanium carbide nitride (TiCN)
- B23C 2224/36 . Titanium nitride
- B23C 2224/56 . Vanadium aluminium nitride (VAlN)

B23C 2226/00**Materials of tools or workpieces not comprising a metal**

- B23C 2226/12 . Boron nitride
- B23C 2226/125 . . cubic [CBN]
- B23C 2226/18 . Ceramic
- B23C 2226/27 . Composites, e.g. fibre reinforced composites
- B23C 2226/31 . Diamond
- B23C 2226/315 . . polycrystalline [PCD]
- B23C 2226/33 . Elastomers, e.g. rubber
- B23C 2226/37 . Fibreglass
- B23C 2226/41 . Gypsum
- B23C 2226/42 . Gem, i.e. precious stone
- B23C 2226/45 . Glass ([milling glass B28D 1/18](#))
- B23C 2226/54 . Paper
- B23C 2226/61 . Plastics not otherwise provided for, e.g. nylon
- B23C 2226/62 . Polystyrene foam
- B23C 2226/72 . Silicon carbide
- B23C 2226/73 . Silicon nitride
- B23C 2226/75 . Stone, rock or concrete ([milling stone or like materials B28D 1/18](#))

B23C 2228/00**Properties of materials of tools or workpieces, materials of tools or workpieces applied in a specific manner**

- B23C 2228/04 . applied by chemical vapour deposition [CVD]
- B23C 2228/08 . applied by physical vapour deposition [PVD]
- B23C 2228/10 . Coating
- B23C 2228/12 . Cast, i.e. in the form of a casting

- B23C 2228/14 . Flexible
- B23C 2228/24 . Hard, i.e. after being hardened
- B23C 2228/25 . Honeycomb
- B23C 2228/26 . Hot
- B23C 2228/49 . Sintered
- B23C 2228/50 . Soft metal

B23C 2230/00 **Details of chip evacuation** ([chip evacuation in cutting inserts B23C 2200/32](#))

- B23C 2230/04 . Transport of chips
- B23C 2230/045 . . to the middle of the cutter or in the middle of a hollow cutter
- B23C 2230/08 . Using suction

B23C 2235/00 **Details of milling keys**

- B23C 2235/04 . Keys with blind holes
- B23C 2235/08 . Brushes
- B23C 2235/12 . Using a database to store details of the key, the information in the database being used for the generation of the profile of the key
- B23C 2235/16 . Dial indicators
- B23C 2235/21 . Calibration by electronic detection of position of probes and cutting wheels
- B23C 2235/24 . Electronic sensors
- B23C 2235/28 . Key blanks
- B23C 2235/32 . Measurement systems
- B23C 2235/36 . Ring keys
- B23C 2235/41 . Scanning systems
- B23C 2235/44 . Templates for the simulation of keys
- B23C 2235/48 . Tracers, probes or styli

B23C 2240/00 **Details of connections of tools or workpieces** ([fixation of the cutting insert or bit in the tool B23C 2210/16](#))

- B23C 2240/04 . Bayonet connections
- B23C 2240/08 . Brazed connections
- B23C 2240/12 . Connections using captive nuts
- B23C 2240/16 . Welded connections
- B23C 2240/21 . Glued connections
- B23C 2240/24 . Connections using screws
- B23C 2240/245 . . hollow screws, e.g. for the transmission of coolant
- B23C 2240/32 . Connections using screw threads

B23C 2245/00 **Details of adjusting inserts or bits in the milling cutter**

- B23C 2245/04 . Adjustable wedge surfaces
- B23C 2245/08 . Setting gauges
- B23C 2245/12 . Spiral discs

B23C 2250/00

B23C 2250/04

B23C 2250/08

B23C 2250/12

B23C 2250/16

B23C 2250/21

Compensating adverse effects during milling

- . Balancing the cutter ([vibration damping B23C 2250/16](#))
- . compensating centrifugal force
- . Cooling and lubrication
- . Damping vibrations ([balancing B23C 2250/04](#))
- . compensating wear of parts not designed to be exchanged as wear parts

B23C 2255/00

B23C 2255/04

B23C 2255/08

B23C 2255/12

Regulation of depth of cut

- . Depth indicators
- . Limitation of depth of cut
- . Depth stops

B23C 2260/00

B23C 2260/04

B23C 2260/08

B23C 2260/12

B23C 2260/28

B23C 2260/40

B23C 2260/48

B23C 2260/52

B23C 2260/56

B23C 2260/68

B23C 2260/72

B23C 2260/76

B23C 2260/80

B23C 2260/84

B23C 2260/88

Details of constructional elements

- . Adjustable elements
- . Bearings
- . Cams
- . Differential screw threads
- . Harmonic gearboxes, i.e. reduction gearing including a wave generator, a flex spline or a circular spline
- . Indication scales
- . Keys, e.g. spanners or Allen keys, especially for assembling or disassembling tooling
- . Lasers ([improving machinability with laser whilst milling B23P 25/003](#))
- . Rings
- . Seals
- . Sensors
- . Serrations
- . Springs
- . Steadies

B23C 2265/00

B23C 2265/08

B23C 2265/12

B23C 2265/16

B23C 2265/32

B23C 2265/36

B23C 2265/40

Details of general geometric configurations

- . Conical
- . Eccentric
- . Elliptical
- . Polygonal
- . Spherical
- . Spiral

B23C 2270/00

B23C 2270/02

B23C 2270/022

Details of milling machines, milling processes or milling tools not otherwise provided for

- . Use of a particular power source
- . . Electricity

- B23C 2270/025
 - . . Hydraulics
- B23C 2270/027
 - . . Pneumatics
- B23C 2270/04
 - . Use of centrifugal force ([compensation of effect of centrifugal force B23C 2250/08](#))
- B23C 2270/06
 - . Use of elastic or plastic deformation ([B23C 2210/161](#) takes precedence)
- B23C 2270/08
 - . Clamping mechanisms or provision for clamping ([B23C 2210/16](#) takes precedence)
- B23C 2270/10
 - . Use of ultrasound
- B23C 2270/12
 - . Centering of two elements relative to one another
- B23C 2270/14
 - . Constructions comprising exactly two similar components
- B23C 2270/16
 - . Constructions comprising three or more similar components
- B23C 2270/18
 - . Milling internal areas of components
- B23C 2270/20
 - . Milling external areas of components