

**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](#)

. ( 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 [B23B 5/42](#) )
  
- 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 ( <a href="#">B23C 5/2252</a> , <a href="#">B23C 5/2256</a> , <a href="#">B23C 5/226</a> 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 ( <a href="#">B23C 5/2278</a> , <a href="#">B23C 5/2286</a> , <a href="#">B23C 5/2291</a> 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 ( <a href="#">B23C 5/241</a> , <a href="#">B23C 5/2413</a> , <a href="#">B23C 5/2417</a> 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 ( <a href="#">B23C 5/2427</a> , <a href="#">B23C 5/2431</a> , <a href="#">B23C 5/2434</a> 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 ( <a href="#">B23C 5/2444</a> , <a href="#">B23C 5/2448</a> , <a href="#">B23C 5/2451</a> 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
<b>B23C 7/00</b>		<b>Milling devices able to be attached to a machine tool, whether or not replacing an operative portion of the machine tool</b>
B23C 7/02	.	to lathes
B23C 7/04	.	to planing or slotting machines
<b>B23C 9/00</b>		<b>Details or accessories so far as specially adapted to milling machines or cutter ( drives, control devices, or accessories, in general <a href="#">B23Q</a> )</b>
B23C 9/005	.	{ milling heads }
<b>B23C 2200/00</b>		<b>Details of milling cutting inserts</b>
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

<a href="#">B23C 2200/0472</a>	..	Trapezium
<a href="#">B23C 2200/0477</a>	..	Triangular
<a href="#">B23C 2200/0483</a>	...	rounded
<a href="#">B23C 2200/0488</a>	..	Heptagonal
<a href="#">B23C 2200/0494</a>	..	Rectangular
<a href="#">B23C 2200/08</a>	.	Rake or top surfaces
<a href="#">B23C 2200/081</a>	..	with projections ( <a href="#">chip breaking projections in general B23C 2200/323</a> )
<a href="#">B23C 2200/082</a>	..	with an elevated clamping surface
<a href="#">B23C 2200/083</a>	..	curved
<a href="#">B23C 2200/085</a>	..	discontinuous
<a href="#">B23C 2200/086</a>	..	with one or more grooves
<a href="#">B23C 2200/087</a>	...	for chip-breaking ( <a href="#">with chip-breaking grooves in general B23C 2200/326</a> )
<a href="#">B23C 2200/088</a>	..	spherical
<a href="#">B23C 2200/12</a>	.	Side or flank surfaces
<a href="#">B23C 2200/121</a>	..	with projections
<a href="#">B23C 2200/123</a>	..	curved
<a href="#">B23C 2200/125</a>	..	discontinuous
<a href="#">B23C 2200/126</a>	...	stepped
<a href="#">B23C 2200/128</a>	..	with one or more grooves
<a href="#">B23C 2200/16</a>	.	Supporting or bottom surfaces
<a href="#">B23C 2200/161</a>	..	with projections
<a href="#">B23C 2200/162</a>	..	curved
<a href="#">B23C 2200/164</a>	..	discontinuous
<a href="#">B23C 2200/165</a>	..	with one or more grooves
<a href="#">B23C 2200/167</a>	..	star form
<a href="#">B23C 2200/168</a>	..	with features related to indexing ( <a href="#">with lines to permit indexing of round inserts B23C 2200/363</a> )
<a href="#">B23C 2200/20</a>	.	Top or side views of the cutting edge
<a href="#">B23C 2200/201</a>	..	Details of the nose radius and immediately surrounding areas
<a href="#">B23C 2200/203</a>	..	Curved cutting edges
<a href="#">B23C 2200/205</a>	..	Discontinuous cutting edges
<a href="#">B23C 2200/206</a>	..	Cutting edges having a wave-form
<a href="#">B23C 2200/208</a>	..	Wiper, i.e. an auxiliary cutting edge to improve surface finish
<a href="#">B23C 2200/24</a>	.	Cross section of the cutting edge
<a href="#">B23C 2200/243</a>	..	bevelled or chamfered
<a href="#">B23C 2200/246</a>	..	rounded
<a href="#">B23C 2200/28</a>	.	Angles
<a href="#">B23C 2200/283</a>	..	Negative cutting angles
<a href="#">B23C 2200/286</a>	..	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 200/32**
- 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

<a href="#">B23C 2210/123</a>	.. Bevelled cutting edges
<a href="#">B23C 2210/126</a>	.. Rounded cutting edges
<a href="#">B23C 2210/16</a>	. Fixation of inserts or cutting bits in the tool ( details of connections <a href="#">B23C 2240/00</a> )
<a href="#">B23C 2210/161</a>	.. Elastically deformable clamping members
<a href="#">B23C 2210/163</a>	.. Indexing
<a href="#">B23C 2210/165</a>	.. Fixation bolts
<a href="#">B23C 2210/166</a>	.. Shims
<a href="#">B23C 2210/168</a>	.. Seats for cutting inserts, supports for replacable cutting bits
<a href="#">B23C 2210/20</a>	. Number of cutting edges
<a href="#">B23C 2210/201</a>	.. one
<a href="#">B23C 2210/202</a>	.. three
<a href="#">B23C 2210/203</a>	.. four
<a href="#">B23C 2210/204</a>	.. five
<a href="#">B23C 2210/205</a>	.. six
<a href="#">B23C 2210/206</a>	.. seven
<a href="#">B23C 2210/207</a>	.. eight
<a href="#">B23C 2210/208</a>	.. ten
<a href="#">B23C 2210/209</a>	.. twelve
<a href="#">B23C 2210/24</a>	. Overall form of the milling cutter ( angles <a href="#">B23C 2210/04</a> ; top or side views of cutting edges <a href="#">B23C 2210/08</a> ; cross sections of cutting edges <a href="#">B23C 2210/12</a> )
<a href="#">B23C 2210/241</a>	.. Cross sections of the whole milling cutter
<a href="#">B23C 2210/242</a>	.. Form tools, i.e. cutting edges profiles to generate a particular form
<a href="#">B23C 2210/243</a>	.. Cutting parts at both ends
<a href="#">B23C 2210/244</a>	.. Milling cutters comprised of disc-shaped modules or multiple disc-like cutters
<a href="#">B23C 2210/245</a>	.. Milling cutters comprising a disc having a wave form
<a href="#">B23C 2210/246</a>	.. Milling cutters comprising a hole or hollow in the end face or between the cutting edges
<a href="#">B23C 2210/247</a>	.. Stepped milling cutters
<a href="#">B23C 2210/248</a>	... with enlarged cutting heads
<a href="#">B23C 2210/28</a>	. Arrangement of teeth
<a href="#">B23C 2210/282</a>	.. Unequal angles between the cutting edges, i.e. cutting edges unequally spaced in the circumferential direction
<a href="#">B23C 2210/285</a>	.. Cutting edges arranged at different diameters
<a href="#">B23C 2210/287</a>	.. Cutting edges arranged at different axial positions or having different lengths in the axial direction
<a href="#">B23C 2210/32</a>	. Details of teeth
<a href="#">B23C 2210/321</a>	.. Lands, i.e. the area on the rake face in the immediate vicinity of the cutting edge
<a href="#">B23C 2210/323</a>	.. Separate teeth, i.e. discrete profiled teeth similar to those of a hob
<a href="#">B23C 2210/325</a>	.. 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
<b>B23C 2215/00</b>		<b>Details of workpieces</b>
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](#) )

<a href="#">B23C 2220/32</a>	. Five-axis
<a href="#">B23C 2220/36</a>	. Production of grooves
<a href="#">B23C 2220/363</a>	. . Spiral grooves
<a href="#">B23C 2220/366</a>	. . Turbine blade grooves
<a href="#">B23C 2220/40</a>	. Using guiding means
<a href="#">B23C 2220/44</a>	. High speed milling
<a href="#">B23C 2220/48</a>	. Methods of milling not otherwise provided for
<a href="#">B23C 2220/52</a>	. Orbital drilling, i.e. use of a milling cutter moved in a spiral path to produce a hole
<a href="#">B23C 2220/56</a>	. Plunge milling
<a href="#">B23C 2220/60</a>	. Roughing
<a href="#">B23C 2220/605</a>	. . Roughing and finishing
<a href="#">B23C 2220/64</a>	. Using an endmill, i.e. a shaft milling cutter, to generate profile of a crankshaft or camshaft
<a href="#">B23C 2220/68</a>	. Whirling
<b><a href="#">B23C 2222/00</a></b>	<b>Materials of tools or workpieces composed of metals, alloys or metal matrices</b>
<a href="#">B23C 2222/04</a>	. Aluminium
<a href="#">B23C 2222/06</a>	. Babbitt metal
<a href="#">B23C 2222/12</a>	. Brass
<a href="#">B23C 2222/14</a>	. Cast iron
<a href="#">B23C 2222/16</a>	. Cermet
<a href="#">B23C 2222/28</a>	. Details of hard metal, i.e. cemented carbide
<a href="#">B23C 2222/32</a>	. Details of high speed steel ( <a href="#">steel B23C 2222/84</a> )
<a href="#">B23C 2222/52</a>	. Magnesium
<a href="#">B23C 2222/61</a>	. Metal matrices with metallic or non-metallic particles or fibres
<a href="#">B23C 2222/64</a>	. Nickel
<a href="#">B23C 2222/76</a>	. Silver
<a href="#">B23C 2222/78</a>	. Sodium
<a href="#">B23C 2222/84</a>	. Steel ( <a href="#">details of high speed steel B23C 2222/32</a> )

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** **Compensating adverse effects during milling**
- B23C 2250/04 . Balancing the cutter ( vibration damping [B23C 2250/16](#) )
- B23C 2250/08 . compensating centrifugal force
- B23C 2250/12 . Cooling and lubrication

B23C 2250/16 . Damping vibrations ( [balancing B23C 2250/04](#) )

B23C 2250/21 . compensating wear of parts not designed to be exchanged as wear parts

### **B23C 2255/00 Regulation of depth of cut**

B23C 2255/04 . Depth indicators

B23C 2255/08 . Limitation of depth of cut

B23C 2255/12 . Depth stops

### **B23C 2260/00 Details of constructional elements**

B23C 2260/04 . Adjustable elements

B23C 2260/08 . Bearings

B23C 2260/12 . Cams

B23C 2260/28 . Differential screw threads

B23C 2260/40 . Harmonic gearboxes, i.e. reduction gearing including a wave generator, a flex spline or a circular spline

B23C 2260/48 . Indication scales

B23C 2260/52 . Keys, e.g. spanners or Allen keys, especially for assembling or disassembling tooling

B23C 2260/56 . Lasers ( [improving machinability with laser whilst milling B23P 25/003](#) )

B23C 2260/68 . Rings

B23C 2260/72 . Seals

B23C 2260/76 . Sensors

B23C 2260/80 . Serrations

B23C 2260/84 . Springs

B23C 2260/88 . Steadies

### **B23C 2265/00 Details of general geometric configurations**

B23C 2265/08 . Conical

B23C 2265/12 . Eccentric

B23C 2265/16 . Elliptical

- B23C 2265/32 . Polygonal
- B23C 2265/36 . Spherical
- B23C 2265/40 . Spiral
- B23C 2270/00** **Details of milling machines, milling processes or milling tools not otherwise provided for**
- B23C 2270/02 . Use of a particular power source
- B23C 2270/022 . . 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