

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

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

**Guidance heading:****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 }

#### Guidance heading:

#### **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 ( <a href="#">chip breaking projections in general B23C 2200/323</a> )
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 ( <a href="#">with chip-breaking grooves in general B23C 2200/326</a> )
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 ( <a href="#">with lines to permit indexing of round inserts B23C 2200/363</a> )
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 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

#### Guidance heading:

#### **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

<a href="#">B23C 2220/16</a>	. Chamferring
<a href="#">B23C 2220/20</a>	. Deburring
<a href="#">B23C 2220/24</a>	. Production of elliptical holes
<a href="#">B23C 2220/28</a>	. Finishing ( <a href="#">roughing and finishing B23C 2220/605</a> )
<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

B23C 2222/64	. Nickel
B23C 2222/76	. Silver
B23C 2222/78	. Sodium
B23C 2222/84	. Steel ( <a href="#">details of high speed steel B23C 2222/32</a> )
B23C 2222/88	. Titanium
B23C 2222/98	. Zinc
<b>B23C 2224/00</b>	<b>Materials of tools or workpieces composed of a compound including a metal</b>
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)
<b>B23C 2226/00</b>	<b>Materials of tools or workpieces not comprising a metal</b>
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

<a href="#">B23C 2226/41</a>	. Gypsum
<a href="#">B23C 2226/42</a>	. Gem, i.e. precious stone
<a href="#">B23C 2226/45</a>	. Glass ( <a href="#">milling glass B28D 1/18</a> )
<a href="#">B23C 2226/54</a>	. Paper
<a href="#">B23C 2226/61</a>	. Plastics not otherwise provided for, e.g. nylon
<a href="#">B23C 2226/62</a>	. Polystyrene foam
<a href="#">B23C 2226/72</a>	. Silicon carbide
<a href="#">B23C 2226/73</a>	. Silicon nitride
<a href="#">B23C 2226/75</a>	. Stone, rock or concrete ( <a href="#">milling stone or like materials B28D 1/18</a> )
<b>B23C 2228/00</b>	<b>Properties of materials of tools or workpieces, materials of tools or workpieces applied in a specific manner</b>
<a href="#">B23C 2228/04</a>	. applied by chemical vapour deposition (CVD)
<a href="#">B23C 2228/08</a>	. applied by physical vapour deposition (PVD)
<a href="#">B23C 2228/10</a>	. Coating
<a href="#">B23C 2228/12</a>	. Cast, i.e. in the form of a casting
<a href="#">B23C 2228/14</a>	. Flexible
<a href="#">B23C 2228/24</a>	. Hard, i.e. after being hardened
<a href="#">B23C 2228/25</a>	. Honeycomb
<a href="#">B23C 2228/26</a>	. Hot
<a href="#">B23C 2228/49</a>	. Sintered
<a href="#">B23C 2228/50</a>	. Soft metal
<b>B23C 2230/00</b>	<b>Details of chip evacuation (<a href="#">chip evacuation in cutting inserts B23C 2200/32</a>)</b>
<a href="#">B23C 2230/04</a>	. Transport of chips
<a href="#">B23C 2230/045</a>	. . . to the middle of the cutter or in the middle of a hollow cutter
<a href="#">B23C 2230/08</a>	. Using suction
<b>B23C 2235/00</b>	<b>Details of milling keys</b>

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
<b>B23C 2240/00</b>	<b>Details of connections of tools or workpieces</b> (fixation of the cutting insert or bit in the tool <a href="#">B23C 2210/16</a> )
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
<b>B23C 2245/00</b>	<b>Details of adjusting inserts or bits in the milling cutter</b>
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