

Symbol	Typ	Titel
B	Sektion	PERFORMING OPERATIONS; TRANSPORTING
B21	Untersektion	SHAPING
B21	Klasse	MECHANICAL METAL-WORKING WITHOUT ESSENTIALLY REMOVING MATERIAL; PUNCHING METAL (casting, powder metallurgy B22; shearing B23D; working of metal by the action of a high concentration of electric current B23H; soldering, welding, flame-cutting B23K; other working of metal B23P; punching sheet material in general B26F; processes for changing of physical properties of metals C21D , C22F; electroforming C25D 1/00)
B21C	Unterklasse	MANUFACTURE OF METAL SHEETS, WIRE, RODS, TUBES OR PROFILES, OTHERWISE THAN BY ROLLING; AUXILIARY OPERATIONS USED IN CONNECTION WITH METAL-WORKING WITHOUT ESSENTIALLY REMOVING MATERIAL <u>Metal drawing (continuous casting B22D 11/00; pressure welding by means of a rolling mill B23K 20/04)</u>
B21C 1/00	Hauptgruppe	Manufacture of metal sheets, metal wire, metal rods, metal tubes by drawing
B21C 1/02	1-Punkt Untergruppe	. Drawing metal wire or like flexible metallic material by drawing machines or apparatus in which the drawing action is effected by drums
B21C 1/04	2-Punkt Untergruppe	. . with two or more dies operating in series
B21C 1/06	3-Punkt Untergruppe	. . . in which the material slips on the drums
B21C 1/08	3-Punkt Untergruppe	. . . in which the material does not slip on the drums
B21C 1/10	4-Punkt Untergruppe	 with accumulation of material between consecutively-arranged dies
B21C 1/12	2-Punkt Untergruppe	. . Regulating or controlling speed of drawing drums, e.g. to influence tension; Drives; Stop or relief mechanisms (couplings for drums B21C 1/14; design or construction of electrical equipment, see the relevant classes)
B21C 1/14	2-Punkt Untergruppe	. . Drums, e.g. capstans (capstans or winches in general B66D); Connection of grippers thereto; Grippers specially adapted for drawing machines or apparatus of the drum type; Couplings specially adapted for these drums
B21C 1/16	1-Punkt Untergruppe	. Metal drawing by machines or apparatus in which the drawing action is effected by other means than drums, e.g. by a longitudinally-moved carriage pulling or pushing the work or stock for making metal sheets, bars, or tubes
B21C 1/18	2-Punkt Untergruppe	. . from stock of limited length (B21C 1/22 takes precedence)
B21C 1/20	2-Punkt Untergruppe	. . from stock of essentially unlimited length (B21C 1/22 takes precedence)
B21C 1/22	2-Punkt Untergruppe	. . specially adapted for making tubular articles (bending sheet metal into tubular form by drawing B21D 5/10)
B21C 1/24	3-Punkt Untergruppe	. . . by means of mandrels (mandrels B21C 3/16)
B21C 1/26	4-Punkt Untergruppe	 Push-bench drawing
B21C 1/27	2-Punkt Untergruppe	. . Carriages; Drives
B21C 1/28	3-Punkt Untergruppe	. . . Carriages; Connections of grippers thereto; Grippers (for drawing machines of the drum type B21C 1/14)
B21C 1/30	3-Punkt Untergruppe	. . . Drives, e.g. carriage-traversing mechanisms; Driving elements, e.g. drawing chains; Controlling the drive
B21C 1/32	2-Punkt Untergruppe	. . Feeding or discharging the material or mandrels
B21C 1/34	2-Punkt Untergruppe	. . Guiding or supporting the material or mandrels
B21C 3/00	Hauptgruppe	Profiling tools for metal drawing; Combinations of dies and mandrels

Symbol	Typ	Titel
B21C 3/02	1-Punkt Untergruppe	. Dies; Selection of material therefor; Cleaning thereof
B21C 3/04	2-Punkt Untergruppe	. . with non-adjustable section (B21C 3/08 takes precedence)
B21C 3/06	2-Punkt Untergruppe	. . with adjustable section (B21C 3/08 takes precedence)
B21C 3/08	2-Punkt Untergruppe	. . with section defined by rollers, balls, or the like
B21C 3/10	2-Punkt Untergruppe	. . with hydraulic forces acting immediately on work
B21C 3/12	2-Punkt Untergruppe	. . Die holders; Rotating dies
B21C 3/14	3-Punkt Untergruppe	. . . Die holders combined with devices for guiding the drawing material or combined with devices for cooling, heating, or lubricating
B21C 3/16	1-Punkt Untergruppe	. Mandrels (separating mandrels from work B21C 45/00); Mounting or adjusting same
B21C 3/18	1-Punkt Untergruppe	. Making tools by operations not covered by a single other subclass; Repairing
B21C 5/00	Hauptgruppe	Pointing; Push-pointing
B21C 9/00	Hauptgruppe	Cooling, heating or lubricating drawing material (B21C 3/14 takes precedence)
B21C 9/02	1-Punkt Untergruppe	. Selection of compositions therefor
B21C 19/00	Hauptgruppe	Devices for straightening wire or like work combined with or specially adapted for use in connection with drawing or winding machines or apparatus
		<u>Metal extruding (continuous casting B22D 11/00)</u>
B21C 23/00	Hauptgruppe	Extruding metal; Impact extrusion
B21C 23/01	1-Punkt Untergruppe	. starting from material of particular form or shape, e.g. mechanically pre-treated (B21C 23/22 takes precedence; heat treatment or combinations thereof with mechanical treatments, see appropriate classes)
B21C 23/02	1-Punkt Untergruppe	. Making uncoated products
B21C 23/03	2-Punkt Untergruppe	. . by both direct and backward extrusion
B21C 23/04	2-Punkt Untergruppe	. . by direct extrusion
B21C 23/06	3-Punkt Untergruppe	. . . Making sheets
B21C 23/08	3-Punkt Untergruppe	. . . Making wire, bars, tubes
B21C 23/10	4-Punkt Untergruppe	 Making finned tubes
B21C 23/12	4-Punkt Untergruppe	 Extruding bent tubes or rods
B21C 23/14	3-Punkt Untergruppe	. . . Making other products
B21C 23/16	4-Punkt Untergruppe	 Making turbo blades or propellers
B21C 23/18	2-Punkt Untergruppe	. . by impact extrusion [2]
B21C 23/20	2-Punkt Untergruppe	. . by backward extrusion
B21C 23/21	1-Punkt Untergruppe	. Presses specially adapted for extruding metal (extrusion presses in general B30B 11/22)
B21C 23/22	1-Punkt Untergruppe	. Making metal-coated products; Making products from two or more metals
B21C 23/24	2-Punkt Untergruppe	. . Covering indefinite lengths of metal or non-metal material with a metal coating
B21C 23/26	3-Punkt Untergruppe	. . . Applying metal coats to cables, e.g. to insulated electric cables
B21C 23/28	4-Punkt Untergruppe	 on intermittently-operating extrusion presses

Symbol	Typ	Titel
B21C 23/30	4-Punkt Untergruppe	. . . on continuously-operating extrusion presses
B21C 23/32	1-Punkt Untergruppe	. Lubrication of metal being extruded or of dies, or the like, e.g. physical state of lubricant, location where lubricant is applied (chemical composition, see appropriate classes)
B21C 25/00	Hauptgruppe	Profiling tools for metal extruding
B21C 25/02	1-Punkt Untergruppe	. Dies
B21C 25/04	1-Punkt Untergruppe	. Mandrels
B21C 25/06	1-Punkt Untergruppe	. Press heads, dies, or mandrels for coating work
B21C 25/08	1-Punkt Untergruppe	. Dies or mandrels with section variable during extruding, e. g for making tapered work; Controlling variation
B21C 25/10	1-Punkt Untergruppe	. Making tools by operations not covered by a single other subclass
B21C 26/00	Hauptgruppe	Rams or plungers; Discs therefor [2]
B21C 27/00	Hauptgruppe	Containers for metal to be extruded (B21C 29/02 takes precedence)
B21C 27/02	1-Punkt Untergruppe	. for making coated work
B21C 27/04	1-Punkt Untergruppe	. Venting metal-container chamber
B21C 29/00	Hauptgruppe	Cooling or heating work or parts of the extrusion press
B21C 29/02	1-Punkt Untergruppe	. of containers for metal to be extruded
B21C 29/04	1-Punkt Untergruppe	. of press heads, dies, or mandrels
B21C 31/00	Hauptgruppe	Control devices, e.g. for regulating the pressing speed or temperature of metal (B21C 25/08 takes precedence); Measuring devices, e.g. for temperature of metal, combined with or specially adapted for use in connection with extrusion presses (measuring devices of more general interest within subclass B21C , see group B21C 51/00)
B21C 33/00	Hauptgruppe	Feeding extrusion presses with metal to be extruded
B21C 33/02	1-Punkt Untergruppe	. the metal being in liquid form
B21C 35/00	Hauptgruppe	Removing work or waste from extruding presses; Drawing-off extruded work (in connection with the extruding of bent tubes or rods B21C 23/12); Cleaning dies, ducts, containers, or mandrels [2]
B21C 35/02	1-Punkt Untergruppe	. Removing or drawing-off work
B21C 35/03	2-Punkt Untergruppe	. . Straightening the work (metal straightening in general B21D)
B21C 35/04	1-Punkt Untergruppe	. Cutting-off or removing waste
B21C 35/06	1-Punkt Untergruppe	. Cleaning dies, ducts, containers or mandrels [2]
B21C 37/00	Hauptgruppe	Manufacture of metal sheets, bars, wire, tubes or like semi-manufactured products, not otherwise provided for (by rolling B21B; by working or processing semi-finished sheet metal, profiles, tubes, or wire B21D , B21F; by casting B22; by material-removing machine tools B23; by welding, e.g. cladding or plating, B23K; by grinding or polishing B24; by electroforming C25D 1/00; by drawing or extruding, see the relevant groups); Manufacture of tubes of special shape [2]
B21C 37/02	1-Punkt Untergruppe	. of sheets
B21C 37/04	1-Punkt Untergruppe	. of bars or wire
B21C 37/06	1-Punkt Untergruppe	. of tubes or metal hoses; Combined procedures for making tubes, e.g. for making multi-wall tubes (bending sheets for making tubes B21D 5/00; seaming by folding B21D 39/02)
B21C 37/08	2-Punkt Untergruppe	. . Making tubes with welded or soldered seams (involving only a soldering or welding operation B23K)
B21C 37/083	3-Punkt Untergruppe	. . . Supply, or operations combined with supply, of strip material
B21C 37/087	3-Punkt Untergruppe	. . . using rods or strips of soldering material

Symbol	Typ	Titel
B21C 37/09	3-Punkt Untergruppe	. . . of coated strip material
B21C 37/10	2-Punkt Untergruppe	. . Making tubes with riveted seams
B21C 37/12	2-Punkt Untergruppe	. . Making tubes or metal hoses with helically arranged seams
B21C 37/14	2-Punkt Untergruppe	. . Making tubes from doubled flat material
B21C 37/15	2-Punkt Untergruppe	. . Making tubes of special shape; Making the fittings
B21C 37/16	3-Punkt Untergruppe	. . . Making tubes with varying diameter in longitudinal direction
B21C 37/18	4-Punkt Untergruppe	 conical tubes
B21C 37/20	3-Punkt Untergruppe	. . . Making helical or similar guides in or on tubes without removing material, e.g. by drawing same over mandrels, by pushing same through dies
B21C 37/22	3-Punkt Untergruppe	. . . Making finned or ribbed tubes by fixing strip or like material to tubes (making heat exchangers B21D 53/02)
B21C 37/24	4-Punkt Untergruppe	 annularly-ribbed tubes
B21C 37/26	4-Punkt Untergruppe	 helically-ribbed tubes
B21C 37/28	3-Punkt Untergruppe	. . . Making tube fittings for connecting pipes, e.g. U-pieces
B21C 37/29	4-Punkt Untergruppe	 Making branched pieces, e.g. T-pieces
B21C 37/30	2-Punkt Untergruppe	. . Finishing tubes, e.g. sizing, burnishing
B21C 43/00	Hauptgruppe	Devices for cleaning metal products combined with or specially adapted for use with machines or apparatus provided for in this subclass
B21C 43/02	1-Punkt Untergruppe	. combined with or specially adapted for use in connection with drawing or winding machines or apparatus
B21C 43/04	2-Punkt Untergruppe	. . Devices for de-scaling wire or like flexible work
		<u>Auxiliary operations used in connection with metal working without essentially removing material</u>
B21C 45/00	Hauptgruppe	Separating mandrels from work or vice versa
B21C 47/00	Hauptgruppe	Winding-up, coiling or winding-off metal wire, metal band or other flexible metal material characterised by features relevant to metal processing only (coiling wire into particular forms B21F 3/00; hot coilers in connection with heat-treatment apparatus C21D 9/68)
B21C 47/02	1-Punkt Untergruppe	. Winding-up or coiling
B21C 47/04	2-Punkt Untergruppe	. . on or in reels or drums, without using a moving guide (reels or drums B21C 47/28)
B21C 47/06	3-Punkt Untergruppe	. . . with loaded rollers, bolts, or equivalent means holding the material on the reel or drum
B21C 47/08	2-Punkt Untergruppe	. . without making use of a reel or drum, the first turn being formed by a stationary guide
B21C 47/10	2-Punkt Untergruppe	. . by means of a moving guide
B21C 47/12	3-Punkt Untergruppe	. . . the guide moving parallel to the axis of the coil (B21C 47/14 takes precedence)
B21C 47/14	3-Punkt Untergruppe	. . . by means of a rotating guide, e.g. laying the material around a stationary reel or drum
B21C 47/16	1-Punkt Untergruppe	. Unwinding or uncoiling
B21C 47/18	2-Punkt Untergruppe	. . from reels or drums
B21C 47/20	3-Punkt Untergruppe	. . . the unreeled material moving transversely to the tangent line of the drum, e.g. axially, radially
B21C 47/22	2-Punkt Untergruppe	. . Unwinding coils without reels or drums

Symbol	Typ	Titel
B21C 47/24	1-Punkt Untergruppe	. Transferring coils to or from winding apparatus or to or from operative position therein; Preventing uncoiling during transfer
B21C 47/26	1-Punkt Untergruppe	. Special arrangements with regard to simultaneous or subsequent treatment of the material
B21C 47/28	1-Punkt Untergruppe	. Drums or other coil-holders (gripping means B21C 47/32)
B21C 47/30	2-Punkt Untergruppe	. . expansible or contractible
B21C 47/32	1-Punkt Untergruppe	. Tongs or gripping means specially adapted for reeling operations
B21C 47/34	1-Punkt Untergruppe	. Feeding or guiding devices not specially adapted to a particular type of apparatus
B21C 49/00	Hauptgruppe	Devices for temporarily accumulating material
B21C 51/00	Hauptgruppe	Measuring, gauging, indicating, counting, or marking devices specially adapted for use in the production or manipulation of material in accordance with subclasses B21B to B21F