

Universal Decimal Classification —

English full edition —
FID publication no. 483 —

UDC 62/62-9. Engineering, technology in
general —
Characteristics and details of machines,
equipment, plant, processes and
products

UDC 025.45:62/62-9

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This British Standard, having been prepared under the direction of the Documentation Standards Committee, was published under the authority of the Board of BSI and comes into effect on 28 February 1986

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First published June 1980
First revision

The following BSI reference relates to the work on this standard:
Committee reference DOS/3

ISBN 0 580 14554 9

Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

	Page
Committees responsible	Inside front cover
Foreword	ii
Scope	1
Principal divisions of UDC 62	1
Related subjects	1
Auxiliary signs and subdivisions	2
Typographic presentation	2
Schedule	3
Special auxiliary subdivisions	3
62-1 General characteristics of machines, apparatus and equipment	3
62-2 Fixed and movable components of machines, apparatus and equipment	6
62-3 Valve parts. Valve drives. Closure etc.	10
62-4 State, condition, form of materials, surfaces, objects and products	12
62-5 Operation and control of machines and processes	14
62-6 Fuel and other heat source characteristics of machinery and installations	20
62-7 Servicing, maintenance, protection of machines, apparatus, plant and installations	21
62-8 Motive force or motive power characteristics of machines and installations	25
62-9 Process, plant operating characteristics and conditions	26
Alphabetical subject index	28
Related BSI publications	Inside back cover

Foreword

The English version of the Universal Decimal Classification (UDC) is being prepared and published as BS 1000 by the British Standards Institution (BSI) at the original joint request of the British Society for International Bibliography (BSIB) and the Association of Special Libraries and Information Bureaux (ASLIB), now amalgamated as Aslib. It has the approval of the Lake Placid Education Foundation, New York, proprietors of the Dewey Decimal Classification, from which the UDC derives. The English full edition of the UDC is authorized by the International Federation for Documentation (FID), PO Box 90402, 2509 LK The Hague, Netherlands.

This section is part of the English full edition. It should be used in conjunction with the English text of the International Medium Edition, BS 1000M, which refers to many other subjects of interest not listed in this schedule, and provides a conspectus of the whole scheme, together with an introduction to its use. For further practical information about the principles, application and utilization of the scheme, users should refer to BS 1000C.

This edition of BS 1000[62/62-9], which supersedes the 1980 edition, includes modifications authorized in *“Extensions and Corrections to the UDC”* (FID publication no. 248) up to and including Series 12, No. 1, dated May 1984. Subsequent issues of *“Extensions and Corrections to the UDC”* should be consulted to keep the schedule up to date. British Standards related to this Part of BS 1000 are listed on the inside back cover.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 56, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Scope

Under 62 is classed information about engineering and technology in general. Under 62-1/-9 is classed information about various characteristics and details of engineering equipment, plant, machinery and processes, and the states and forms of materials, surfaces, objects and products.

Chemical technology is classed in the divisions of 66.

Principal divisions of UDC 62

- 621 Mechanical engineering. Nuclear technology. Electrical engineering. Machinery
- 622 Mining
- 623 Military engineering
- 624 Civil and structural engineering in general
- 625 Civil engineering of land transport. Railway engineering. Highway engineering
- 626 General hydraulic engineering. Canal engineering. Agricultural hydraulics
- 627 Natural waterway, port, harbour and shore engineering
- 628 Public health engineering. Water. Sanitation. Illumination engineering
- 629 Transport vehicle engineering

Related subjects

- 347.77 Industrial (commercial, scientific) property and property law. Patent and trade mark law
- 5 Mathematics and natural sciences
- 613.6 Occupational health hazards. Occupational health and hygiene
- 614.8 Accidents. Risks or hazards. Prevention, personal protection and safety
- 63 Agriculture and related sciences and techniques. Forestry. Farming. Wildlife exploitation
- 64 Home economics. Domestic science. Housekeeping
- 654 Telecommunication and telecontrol (organization, services)
- 655 Graphic industries. Printing. Publishing. Book trade
- 656 Transport and postal services. Traffic organization and control
- 66.0 Chemical engineering, production and processing, operations and plant

- 661 Chemical products
- 662 Explosives. Fuels
- 663 Industrial microbiology. Industrial mycology. Fermentation industry. Beverage industry. Stimulant industry
- 664 Preparation and preservation of solid foodstuffs
- 665 Oils. Fats. Waxes. Adhesives. Gums. Resins
- 666 Glass industry. Ceramics. Cement and concrete
- 667 Colour industries (dyes, inks, paints etc.)
- 669 Metallurgy
- 674 Timber and woodworking industry
- 675 Leather industry (including fur and imitation leather)
- 676 Pulp, paper and board industry
- 677 Textile industry
- 678 Industries based on macromolecular materials. Rubber industry. Plastics industry
- 679 Industries based on various processable materials
- 681 Precision mechanisms and instruments
- 682 Smithery. Farriery. Hand-forged ironwork
- 683 Ironmongery. Hardware. Locksmithing. Gunsmithing. Bottling. Lamps. Stoves
- 684 Furniture and allied industries. Furniture manufacture. Upholstery
- 687 Clothing industry. Beauty culture
- 691 Building materials. Building components
- 692 Structural parts and elements of buildings
- 693 Bricklaying and similar building crafts
- 694 Timber construction. Carpentry. Carpenter's work. Joinery. Joiner's work
- 697 Heating, ventilating and air conditioning of buildings
- 698 Finishing and decorating trades
- 699.8 Protection of and in buildings. Emergency precautions
- 71 Physical planning
- 72 Architecture
- 73 Plastic arts
- 74 Drawing. Design. Applied arts and crafts
- 77 Photography and similar processes

Auxiliary signs and subdivisions

Full information about the common and special auxiliary signs and subdivisions (often abbreviated to “common and special auxiliaries”) will be found in BS 1000M and BS 1000C.

Colon sign of relation. For the classification of information for the public, as in abstracts and bibliographies, maximum use of colon combination rather than of common or special auxiliaries is recommended. The use of the colon sign of relation is preferable for multiple entry systems, as it will help prevent the concealment of information. This usually results in longer notation, however, and for information for more restricted use the application of auxiliaries, where available, may be simpler and more convenient provided that there is an adequate alphabetical subject index.

Common auxiliaries. The common auxiliaries of language = . . . , form (0 . . .), place (1/9), race and nationality (= ...), time “. . . ”, point of view . 00 . . . , materials –03 . . . and persons –05 . . . are applicable throughout the UDC. However, they should be used mainly to express concepts not otherwise provided for in the schedules.

Special auxiliaries. The –1/–9 numbers listed in this section are all special auxiliary subdivisions. Except where otherwise indicated (under 62-1, 62-2, 62-3 etc.) they may be detached and applied throughout 62/69 where the result forms a meaningful combination, e.g.

62-181.2 Large. Giant

621.798.1 Containers. Wrappers

621.798.1-181.2 Large, giant containers

Typographic presentation

Small type is used for cancelled numbers and text. The arrow → means either “see” or “see also” according to the context. The symbol $\cong$ “subdivide as” means that the number preceding it may be subdivided in the same way as, and with meanings analogous to the subdivisions of, the number which follows it.

Schedule

62 Engineering. Technology in general**Special auxiliary subdivisions****62-1/-9 Characteristics and details of machines, equipment, plant, processes and products**

These special auxiliaries are applicable throughout 62/69 except where otherwise indicated

62-1	GENERAL CHARACTERISTICS OF MACHINES, APPARATUS AND EQUIPMENT <i>62-1 and its subdivisions are not applicable to 624 (except -11 and -18), 627.8 (except -11 and -18), 633/635, 66, 677, 678 and 687</i>	62-113	Single-operation, single-movement machines, e.g. single-workpiece machine tools →62-589 Movement of tool and workpiece. Direction. Forward and reverse control. Guiding devices
		.1	Single-tool machines
		.2	Multiple-tool, multi-tool machines
62-11	GENERAL DESIGN AND CONSTRUCTION CHARACTERISTICS. ARRANGEMENT OF PRINCIPAL PARTS	-114	Multi-operation, multi-movement machines, e.g. multi-workpiece machine tools →62-589.2 Movement of tool in several (different) directions
-111	Machines according to the alignment of the working axis or axis of rotation	-115	Multi-purpose machines. Dual-purpose machines. Universal machines
.1	Vertical	-117	Machines without crank drive
.2	Horizontal	-118	Crank-driven machines
.3	Inclined. Oblique	.1	With direct application of force
-112	Machines according to kind of construction →62-182 Characterization according to mobility, interchangeability and convertibility 62-772 Individual components. Units <i>Further particulars may be denoted by colon combination with the subdivisions of 621 or by -2/-9 special auxiliaries, e.g.</i> 62-112.5:621.951 Unit (interchangeable) drill components -112.5-589 Units for guiding the movement of tool and workpiece	.2	With indirect application of force
.3	Self-supporting construction	-119	Other machines, e.g. with oscillating drive, flexible drive
.4	Simple construction, e.g. one-piece (monobloc) construction	62-12	GENERALITIES ON RECIPROCATING MACHINES. ARRANGEMENT OF MAIN COMPONENTS
.5	Sectional construction. Built-up, multi-unit construction	-121	Single-cylinder machines
.6	Prefabricated construction	.1	With vertical cylinder
.8	Characterization according to the type of connection or joint	.2	With horizontal cylinder
.81	Welded, soldered, brazed joints 62-112.81 $\cong$ 621.791, e.g. 62-112.813.6 Brazed joints	.3	With inclined cylinder
.82	Bonded →621.792 Joining by adhesion or pressure. Bonding, gluing etc.	-122	Machines with in-line cylinders
.83	Screwed. Bolted →621.882 Bolts. Screws. Nuts. Washers	.1	With vertical cylinders
.84	Riveted →621.884 Rivets. Riveting. Riveters	.2	With horizontal cylinders
.85	Shrunk-on →621.88.084 Shrinking-on fasteners	-123	Machines with cylinders arranged at an angle to each other. V-arrangement
.86	Tenoned. Dovetailed	-124	Machines with axial cylinders
.87	Dowelled. Pinned	.1	Tandem arrangement
.89	Other types of connection or joint	.2	Opposed arrangement
.9	Machines according to other kinds of construction	-125	Machines with compound cylinders
		-126	Machines with stationary radial cylinders around one crank
		-127	Machines with parallel cylinders arranged in a circle. Swashplate machines
		-128	Machines with rotating cylinders
		.2	Radial on one crank
		.3	Radial on more than one crank
		.4	Non-radial
		.5	With cylinders rotating eccentrically
		.9	With rotating cylinders in other arrangements

62-129	Machines with other cylinder arrangements	62-133.65	With two piston vanes
.1	With oscillating cylinders	-135	Generalities on turbomachines.
.2	With more than one cylinder in one block.		Turbomachines according to the number of blade-rings
	U-piston machines		.1 With one blade-ring
.21	With pistons working in opposite directions (opposed pistons)	.1	.2 With two blade-rings
.22	With pistons working in the same direction	.2	.3 With three blade-rings
.3	With two pistons working in one cylinder	.3	.4 With four or more blade-rings
.31	With pistons working in opposite directions (opposed pistons)	.4	Turbomachines according to the type of casing
.32	With pistons working in the same direction	-136	.1 With single casing
.5	With auxiliary pistons	.1	.4 With more than one casing
.51	With uncontrolled auxiliary pistons	.4	.41 With casings arranged in parallel
.52	With controlled auxiliary pistons	.41	.42 With casings arranged in series
.6	With stepped pistons (differential pistons)	.42	Centrifugal machines in general
.8	Machines according to the valve arrangement	-137	
.81	Side valves on one side of the cylinder.	62-14/-15	CHARACTERIZATION OF MACHINES ACCORDING TO THE MODE OF ACTION OF THE WORKING MEDIUM (FLUID)
	L-head arrangement		Characterization of reciprocating machines according to the mode of action of the working medium (fluid)
.82	Side valves on both sides of the cylinder.	-14	Single-acting machines
	T-head arrangement	-141	Double-acting machines
.83	Overhead valves. I-head arrangement	-142	Uniflow machines
.84	One side valve, one overhead valve. F-head arrangement	-143	Machines operated by combustion
.87	With cylinders without valves	-144	Four-stroke machines
62-13	GENERALITIES ON ROTARY MOTION MACHINES. ARRANGEMENT OF MAIN COMPONENTS	.3	Two-stroke machines
-131/-131.3	[cancelled] →, 62-111/-111.3	.4	Compound machines. Action of the working medium by stages
-133	Machines with rotary, semi-rotary or pendulum motion	-146	.1 Single stage
62-133.2	With simple rotor. Rotary piston machines with uniform rotation	.2	.21 Two or more stages
.22	With sealing vanes in the housing wall	.21	.22 One pre-stage
.221	With one vane	.22	.23 Two pressure stages
.222	With two vanes	.23	.24 Three pressure stages
.225	With vanes sliding in rectilinear motion	.24	.28 Four or more pressure stages
.227	With rotating vanes	.28	One after-stage
.24	With sealing vanes in the rotor drum	-147	Machines operating in parallel
.241	With one vane	-15	Characterization of turbomachines according to the mode of action of the working medium (fluid)
.242	With two vanes	-151	Impulse effect
.245	With vanes sliding in rectilinear motion	-152	Reaction effect
.247	With rotating vanes	-153	Combined impulse and reaction effect
.26	With rotor rotating eccentrically	-154	Axial admission
.3	With rotor rotating in non-uniform fashion	-155	Radial admission
.32	With rotor alternately rotating and stopping	-156	Combined axial and radial admission
.33	With rotor of variable angular velocity	-157	Tangential admission
.4	With two or more rotors intermeshing like gear wheels	-158	Full admission. Partial admission
.42	With two engagements per revolution	.1	Full admission
.44	With four engagements per revolution	.2	Partial admission
.46	With three rotors in star arrangement	-159	Other modes of action of the working medium
.5	With screw-shaped rotors	.3	Utilization of the Magnus effect. Flettner rotors
.52	With one screw-shaped rotor	62-16/-17	CHARACTERIZATION OF MACHINES ACCORDING TO THE USE OF THE WORKING MEDIUM (FLUID)
.54	With more than one screw-shaped rotor		Machines with single-stage expansion
.6	With semi-rotary or oscillating rotor	-161	
.61	With one single-acting piston vane		
.62	With one double-acting piston vane		

62-162	Machines with multi-stage expansion in one cylinder	62-182	Characterization according to mobility, interchangeability and convertibility
.2	With more than one piston in one cylinder	.1	Fixed components of a structural installation, e.g. fixed lifting apparatus, fixed containers
.4	With stepped one-piece pistons	.2	Stationary
-164	Machines with multi-stage expansion in more than one cylinder	.22	Built-in
.2	With two-stage expansion	.3	Mobile. Transportable
.21	With parallel cylinders	.31	On air cushion. Hovering (ground effect)
.22	With tandem cylinders	.32	On skids, runners. Sliding
.23	With cylinders arranged in V-form	.34	On rolling elements. On balls, rollers
.3	With three-stage expansion	.35	On wheels (but not on rails)
.4	With four-stage expansion	.36	On flanged wheels (on rails)
-168	Back pressure. Dimensioning and regulation of clearance space. Variation of clearance space	.38	On caterpillar tracks
.7	Reducing the effect of the clearance space	.4	Portable
-169	Machines with condensation	.5	Swivelling
-171	Machines with free exhaust or mechanical extraction of exhaust	.52	Fully swivelling
-172	Machines with intermediate extraction of the working fluid	.54	Partially swivelling
-173	Machines with superheated steam or with intermediate superheating	.6	Foldable. Collapsible. Dismantlable. Stackable
-174	Steam engines according to pressure	.63	Foldable. Collapsible
.1	High-pressure steam engines	.633	With rigid, articulated components
.2	Low-pressure steam engines	.634	With flexible components
-175	Machines operating on mixed working fluids, e.g. steam and water	.66	Dismantlable
-176	Machines operating on vapours other than steam	.68	Stackable
.1	On working media with a high boiling point, e.g. mercury	.7	With adjustable or movable parts. Unit-built appliances. Convertible equipment
.2	On working media with a low boiling point	.73	With extensible parts
62-18	CHARACTERIZATION OF MACHINES ACCORDING TO DIMENSIONS, MOBILITY, WEIGHT, SPEED AND PRECISION	.74	With parts rotatable about an axis
	→62-11 General design and construction characteristics. Arrangement of principal parts	.76	With detachable parts
-181	Characterization according to dimensions	.77	Made of built-up parts, including emergency quick release assemblies
.1	According to linear dimensions	.78	Convertible
.12	Length. Width. Breadth	.8	Removable. Detachable. Replaceable. Interchangeable
.13	Height	-183	Characterization according to weight
.2	Large. Giant	.2	Heavy
.4	Small. Dwarf. Miniature	.4	Light
.48	Microminiature	-184	Characterization according to numbers
.6	According to dimension ratios	-185	Characterization according to speed. Speed of rotation in general
.61	Two dimensions large in comparison with the third. Flat. Wide		→62-94 Direction and velocity (rate) of processes
	→62-41 Flat objects, e.g. blocks, plates, sheet, strip	.3	Slow speed
.62	One dimension large in comparison with the other two. Stretched. Long	.4	High speed
	→62-42 Profiled objects. Sectional material	.6	With a wide speed range, insensitive to racing. Machines insensitive to the dangers of critical speeds of rotation
.63	Of equal proportions	.7	Critical speeds of rotation
		-187	Characterization according to precision
		.2	Low precision
		.3	Average precision
		.4	High precision
		-188	Characterization according to dimensional variability
		.2	Invariable. Unchangeable. Stable
		.4	Variable. Changeable
		.42	Slightly variable
		.44	Appreciably variable

62-188.46	(almost) Infinitely variable	62-214.749	Counterweights
-189.2	Dosing. Motoring. Metered quantities	.8	Tables. Plates. Trays etc.
62-19	CHARACTERIZATION OF MACHINES ACCORDING TO OTHER ASPECTS	.82	Troughs
-192	Reliability	.83	Tool receptacles
62-2	FIXED AND MOVABLE COMPONENTS OF MACHINES, APPARATUS AND EQUIPMENT	.84	Holders and supports for tables, trays etc.
	<i>62-2 and its subdivisions are not applicable to 633/635</i>	-217	Bedplates. Baseplates. Foundation plates
62-21	FIXED COMPONENTS. ENCLOSURES. HOUSINGS. CASINGS. FRAMES. MOUNTINGS ETC.	-218	Foundations. Mountings
	→62-758 Boxes, cases, screens and similar protective devices	.1	Foundation on a horizontal surface
-213	Machine enclosures or housings generally	.2	Brick, concrete etc. foundations for mounting of machines and apparatus
.1	Open	.3	Suspension from a vertical surface, e.g. wall mountings
.2	Partially enclosed. Drip-proof. Splash-proof. Spray-proof. Water-jet-proof. Weatherproof	.4	Suspension from a horizontal surface, e.g. ceiling mountings
.3	Totally enclosed	.8	Fasteners. Attachments
.32	Watertight. Immersible		62-218.8 $\cong$ 621.88
.34	Gastight. Flameproof. Explosion-proof	.9	Other methods of attachment
.6	Machines encapsulated in casings resistant to internal and external pressure	-219	Adjustable or movable support or bearing arrangements for adjustable components
.9	Other types of protective casing	.1	Platforms. Soleplates
-214	Component housing, casing or frame	.11	Fixed
	<i>For simple and sectional or multi-unit construction of machines → 62-112.4/.5</i>	.12	Adjustable in one plane
	→62-76 Protection of individual parts of machines, apparatus and installations	.121	Adjustable by sliding
	621.3.085.6 Casings (of instruments) — Electrical engineering	.122	Adjustable by rolling
.2	Monobloc (one-piece)	.123	Adjustable by rotating
.3	Sectional. Composite	.13	Adjustable in three dimensions
.4	Specially shaped, e.g. for pumps, fans, hydraulic turbines	.131	Adjustable by sliding
	<i>Further particulars may be denoted by -4 special auxiliaries</i>	.132	Adjustable by rolling
.6	Filled with oil or other liquid, e.g. engine sumps	.133	Adjustable by rotating
-216	Elements of housings, frames or mountings	.134	Adjustable by universal joints
.5	Beds	.2	Slides
.52	Straight. Flat	.3	Support columns
.53.	Not straight. Not flat	.31	Solid
.54	With indentations. With notches	.32	Hollow
.57	With guide bars	.33	Lattice. Trellis
.6	Posts. Columns. Standards. Pillars etc.	.34	Tripods. Two-legged supports
.61	Types of vertical support	.36	Telescopic supports
.612	Solid	.37	Column heads
.613	Hollow	.4	Movable brackets
.614	Lattice. Trellis	.49	Counterweights
.617	Column heads	.5	Suspensions
.62	Main supports	.51	Rigid suspensions
.63	Guide supports	.52	Non-rigid suspensions
.64	Steady rests. Back stays	.521	On cords, wires, ropes etc.
.7	Cross-members. Traverses	.1	On cords or ropes of animal, vegetable or man-made fibres
.72	Arms. Jibs. Outriggers. Extensions	.2	On wires or wire ropes
.723	Flat	.3	On quartz filaments
.724	Articulated	.9	On cords etc. of other materials
.74	Brackets	.523	On chains
		.524	According to the number of threads, wires etc.
		.1	One
		.2	Two
		.3	More than two
		.527	Electromagnetic suspension
		.529	Attachment of non-rigid suspension devices

62-22	FIXED PARTS ASSOCIATED WITH MOVING ELEMENTS	62-229.211.6	Sockets
-222	Cylinders	.212	Handles
.1	Cylinder bodies	.213	Arches. Yokes. Stirrups. Trestles. Frames
.2	Cylinder jackets	.22	Simple supports. Tool shanks, e.g. Morse taper shanks
.4	Cylinder covers	.222	Straight shanks
.7	Scavenging of cylinders	.224	Taper shanks
-224	Cylinder heads. Cylinder chambers. Manifolds	.225	Taper sleeves, bushes →621.887.81 Plain (solid) tapered bushes etc., e.g. as tool holders
.2	Cylinder heads	.227	Collets for tools with straight shanks
.3	Auxiliary chambers. Precombustion chambers	.23	Jig, template or former rests
.4	Arrangement of distributing devices on the cylinder <i>For dimensioning, regulation and variation of clearance space → 62-168</i> <i>For regulation and control components → 62-3</i>	.24	Multiple tool holders. Capstan heads. Turret heads
.7	Headers. Manifolds. Inlet and exhaust chambers. Receivers. Inlet and exhaust arrangements in general	.25	Steady rests. Tool back rests. Stays
-225	Ducts. Nozzles. Jets	.27	Thread-cutting dies. Diestocks
.1	Inlet and outlet ducts (ports). Inlet and outlet nozzles	.272	Die heads. Screwing chucks
.12	Inlets. Inlet ducts (ports). Inlet nozzles	.274	Diestocks
.14	Outlets. Outlet ducts (ports). Outlet nozzles	.29	Other types of tool holder
.2	Throttling nozzles	.3	Workplace holders. Fastening devices
.3	Adjustable nozzles	.31	Clamping, wedging and aligning equipment. Vices. Work tables
.4	Flow reversing nozzles	.311	Work tables with T-slots or fixing holes (also with built-in or built-on clamping equipment)
.5	Acceleration nozzles	.312	Various types of clamping equipment
.6	Idling nozzles	.2	Fixing screws, bolts. Set screws. Clamping eccentrics. Clamp plates
.7	Arrangement of duct and nozzle systems	.4	Vices (screw vices, eccentric vices), centring or non-centring (also with built-in or built-on power drive)
.78	Devices for varying the cross-section	.6	Clamping devices for specific workpieces (in which the clamping force is an essential part of the machining process, e.g. milling devices), as opposed to centring or locating devices
.8	Types of nozzle construction 62-225.8 $\cong$ 621.643	.313	Devices for distributing and equalizing the clamping forces
.9	Nozzle shapes	.314	Support plates. Wedges. Step blocks
.97	Rectangular. Cylindrical. Annular	.315	Magnetic clamping devices (permanent magnet or electromagnet), and blocks for these devices. Vacuum or suction clamping devices
.98	Tapered (narrowing or widening)	.316	Various adjusting or locating devices
-226	Guide rings and guide blades of turbomachines and similar machines	.2	Devices for adjusting the workpiece during clamping, but which may be removed for machining, e.g. adjusting mandrels
.1	Guide rings	.6	Aligning devices (workpiece holders in which the spatial positioning of the workpiece is of great importance, e.g. drilling jigs)
.2	Blades, vanes in general	.32	Workpiece mountings and clamping devices primarily for rotating the workpiece
.3	Guide blades. Guide vanes	.321	Faceplates and their claw boxes
.31	Simple	.322	Collets (conical grips) for gripping the outside of the workpiece
.32	Adjustable	.323	Various types of chuck
.37	Pitch adjustment devices for guide blades <i>For pitch adjustment devices for propellers → 62-253.67</i>	.2	Jaw chucks (two or more jaws), including those with built-in drive, e.g. electric motor inside the chuck
.4	Reversing blades	.3	Swivelling chucks (two-jaw chuck with swivelling jaws)
.41	With helical reversal of flow	.4	Chucks for bar work (jaw or collet chucks which can be opened or closed from outside, even with the spindle turning, without a key)
.42	With loop reversal of flow	.6	End chucks (axial clamping)
-229	Tool holders. Workplace holders. Feed devices. Emptying devices		
.2	Tool holders. Supporting elements. Rests		
.21	Elements of hand tools and machine tools by which they are gripped or held		
.211	Intermediate elements		
.2	Tongues. Tangs		
.4	Lugs. Eyes		

62-229.323.8	Chucks for gripping toothed wheels or screw threads by the flanks	62-229.83	Devices for trimming the edges of the cut-off pieces. Finishing devices as components of machine tools
.324	Mandrels	.85	Removal of work
.2	Lathe mandrels for mounting between centres (cylindrical, conical, expanding)	.88	Removal of waste, scrap
.4	Mandrels attached to the machine tool or its spindle (cylindrical, conical, fixed, expanding, with jaws, expanding collets or clamping pins)	62-23	GEAR MECHANISMS. MECHANICAL POWER TRANSMISSION ELEMENTS. CONVEYING DEVICES AS PARTS OF MACHINES. FASTENING, FIXING DEVICES
.326	Clamping devices for turning wheel sets	-231	Construction of mechanisms
.329	Other workpiece mountings and clamping devices for rotating workpieces	.1	Applications of kinematics
.33	Headstocks. Tailstocks. Centres	.2	Linear systems
.331	Headstocks	.21	Systems without degrees of freedom
.332	Tailstocks	.215	Automatic coupling. Automatic centring
.335	Centres	.1	Kelim system with point, groove and plane
.34	Dogs. Driving plates. Catches. Ratchet dogs. Chucks with clamping pressure equalization (balanced chucks)	.2	Systems with three radial grooves or slots
.35	Steady rests, back stays for workpieces	.3	Systems with three radial jaws or claws
.36	Rivet dies. Rivet dollies	.22	Systems with one degree of freedom
.37	Anvils	.221	Revolute pair, turning pair, with one degree of rotation, e.g. journal and bearing
.38	Actuating devices for clamping purposes, other than those attached to or built into the clamping device itself	.222	Prismatic pair, with one degree of translation, e.g. rectilinear slide bars
.381	Clamping spanners, keys. Ratchets	.223	Screw pair, helical pair, with one degree of rotation and a forced degree of translation, e.g. bolt and nut
.382	Lever-operated quick-acting chucks, e.g. for gauge lathes	.228	Systems with more than one degree of freedom, with connections reducing them to one
.383	Electrical equipment for operating chucks and other clamping devices	.23	Systems with two degrees of freedom
.384	Hydraulic pressure cylinders: associated controls, fittings and pumps for clamping	.231	With two degrees of rotation
.385	Compressed air cylinders, vacuum cylinders: associated controls and fittings	.232	With one degree of rotation, one degree of translation
.39	Other workpiece holders	.233	With two degrees of translation
.4	Special equipment for setting-up particular objects. Supports. Stands	.238	With more than two degrees of freedom, with connections reducing them to two
.41	Frames. Supports. Step supports etc.	.24	Systems with three degrees of freedom
.42	Devices for holding the workpiece at the angle	.241	With three degrees of rotation. Spherical joints. Ball and socket joints. Knuckle joints
.43	Supports for workpieces of special shape	.242	With two degrees of rotation, one degree of translation
.5	[cancelled] → 62-229.4	.243	With one degree of rotation, two degrees of translation
.6	Feed mechanisms and devices	.248	With more than three degrees of freedom, with connections reducing them to three
.61	Stock feed devices	.25	Systems with four degrees of freedom
.612	Supply and feed devices for bar stock	.251	With three degrees of rotation, one degree of translation
.62	Automatic magazines	.252	With two degrees of rotation, two degrees of translation
.64	Devices for aligning objects, for placing objects in parallel. Devices for arranging workpieces	.253	With one degree of rotation, three degrees of translation
.68	Feed devices for auxiliary materials, e.g. polishing materials	.258	With more than four degrees of freedom, with connections reducing them to four
.7	Devices for handling objects between successive operations. Transfer, handling devices within the machine	.26	Systems with five degrees of freedom
.72	Devices for turning over, turning round, e.g. for ingots	.261	With three degrees of rotation, two of translation. Suspension on a thread. Support, point and plane
.73	Folding devices. Doubling devices	.3	Linked mechanisms
.74	Devices for handling and changing tool parts inside the machine	.31	Four-bar chains
.76	Other handling devices	.311	Slider-crank mechanisms
.8	Discharging, unloading, emptying devices	.1	Using the motion of the member or component guided in the frame (crank, rocker arm, slide)
.82	Parting-off of workpieces. Cutting-off the finished work. Cutting-off appliances		

62-231.311.2	Using the motion of the member or component with general movement (coupler cams)	62-233.2	Bearings. Bushings →621.822 Bearings. Bushes <i>Further particulars may be denoted by the -7 special auxiliaries, e.g. 62-233.2-752 Bearings with anti-vibration devices</i>
.3	With human (or animal) limbs as part of the mechanism		
.312	Double crank mechanisms	.21	Bearings and bushings for axles and shafts
.1	Using the motion of the member or component guided in the frame (cranks)	.22	Bearings for pivots and journals
.2	Using the motion of the member or component with general movement (crank or rocker-arm cams)	.23	Thrust bearings
.32	Wedge chains	.24	Bearings for knife edges
.321	Wedge slide mechanisms <i>For coupler cams → 62-231.311.2</i>	.27	Ball bearings
.1	Simple wedge slide mechanisms	.28	Roller bearings
.2	Compound wedge slide mechanisms. Cam mechanisms. Metal contours	.3/.9	Gearing. Gears. Friction drives. Slideways 62-233.3/.9 ≅ 621.833/.839
.322	Locking mechanisms. Couplings. Toothed couplings. Belt couplings	-234	Components for converting rectilinear motion into rotary motion, e.g. Z-axes, swashplates <i>For crankshafts → 62-233.132</i>
.1	Locking mechanisms	-235	Transmissions 62-235 ≅ 621.85
.2	Couplings	-236	Conveying devices as parts of machines 62-236 ≅ 621.86, e.g. 62-236.58 Manipulators
.3	Toothed couplings. Friction wheel drives	-237	Cranes and hoists as components of machines 62-237 ≅ 621.87
.5	Belt couplings	-238	Fastening, fixing devices. Fasteners 62-238 ≅ 621.88
.323	Guide mechanisms	.9	Means for limiting movement
.1	Displacement guides, e.g. for film	62-24	COMPONENTS FOR RECIPROCATING MOTION
.2	Deforming guides, e.g. for paper tape or textile ribbons	-242	Pistons
.33	Multi-link chains	.1	Classification of pistons
.331	Using the motion of the member or component guided in the frame	.12	Pistons according to shape
.332	Using the motion of the member or component with general movement	.122	Conical pistons
-232	Connecting rods. Coupling rods. Cranks	.123	Truncated conical pistons
.1	Connecting rods	.124	Flat pistons
.12	Shape: plain or forked connecting rods	.129	Other shapes
.13	Connection to crankpin	.2	Piston body
.14	Coupling rods	.3	Piston rings <i>For piston packing, cuffs → 62-762.63</i>
.17	Parts of connecting rods and coupling rods	.4	Piston rods
.171	Crank ends	.41	Shaft. Shank
.172	Crosshead ends	.42	Ends. Tailpiece
.173	Shanks	.43	Bearings. Gudgeon pins
.174	Bolts. Bushings	.44	Crossheads
.175	Pressure plates. Connecting pieces	62-25	ROTATING COMPONENTS
.2	Cranks. Crank discs. Return cranks	-251	Rotary pistons
.23	Safety cranks	-252	Drums
.3	Parallel mechanisms	.1	Cylindrical drums
-233	Components of rotary motions	.2	Conical drums
.1	Axles. Shafts. Pivots. Knife edges →621.824 Shafts. Axles	.3	Stepped drums
.11	Axles	.6	Rotor (runner) hub
.12	Plain shafts	.7	Rotor (runner) boss or nose
.13	Eccentric shafts. Shafts with drive elements	-253	Rotors (runners)
.132	Crankshafts	.1	With one blade ring
.133	Camshafts	.2	With two blade rings
.137	Individual parts		
.16	Pivots. Journals		
.18	Knife edges		

62-253.4	With more than two blade rings	62-272.382	Inclined
.5	Vanes. Blades. Buckets	.383	Transverse
.51	Simple	.384	Vertical
.52	Double	.4	Annular springs
.58	Reduction of clearance between rotor blades	.41	Disc springs
.6	Screws. Propellers	.43	Ring springs
.65	Blades	.5	Bar springs. Torsion springs
.67	Mechanism for adjusting propeller blade angle (pitch adjustment devices) <i>For pitch adjustment devices for guide blades → 62-226.37</i>	.6	Rubber springs
.7	Impellers with straight blades or vanes	.8	Pneumatic springs. Hydraulic springs
.8	Impellers with articulated blades or vanes	.82	Pneumatic springs. Air springs, gas springs
-254	Wheels	.84	Hydraulic springs
.2	Spoked wheels (wire wheels)	-278	Diaphragms. Elastic membranes
.3	Disc wheels	62-29	COMPONENTS ACTING AS TOOLS
.6	Components of wheels	-293	Devices for handling workpieces without deformation
.61	Rims	-294	Devices causing a change in the shape of the workpiece
.62	Spokes	.2	Plastic deformation
.63	Discs	.4	Size reduction
.64	Hubs	62-3	VALVE PARTS. VALVE DRIVES. CLOSURE ETC.
62-26	OSCILLATING COMPONENTS		<i>62-3 and its subdivisions are not applicable to 626, 661.185, 662.2 and 681.6</i>
62-27	FLEXIBLE, ELASTIC COMPONENTS	62-31	REGULATION COMPONENTS WITH RECIPROCATING MOTION. SLIDE VALVES
-272	Springs	-311	Generalities
	<i>For springs in electrical measuring instruments → 621.3.085.5</i>	-312	Slide valves with invariable expansion
.1	<i>[cancelled]</i> use 62-272.001	.1	Three-port slide valves. D-slide valves
.2	Coil springs	.2	Double slide valves with by-pass. B-slide valves. Allan valves. Hick valves. Trick valves
.22	Of round wire	-313	Distributing slide valves with expansion slide valves
.23	Of profiled wire	.1	Manual expansion regulation
.24	Of flat-section material	.2	Expansion regulation by governor
.25	Of other types of coil spring material	.3	Meyer valves and their variants
.27	Shapes of coil springs	.4	Rider valves and their variants
.272	Cylindrical (helical)	.5	Slide valves with regulators or other parts
.273	Conical (volute)	.6	Expansion slide valves with longitudinal and transverse motion
.274	Spiral	-314	Cylindrical valves, piston valves and the like
.28	Arrangement: vertical, horizontal, inclined	.1	Piston valves
.3	Leaf springs. Plate springs	.2	Concentric piston valves for internal combustion engines
.31	<i>[cancelled]</i> use 62-272.3.001	-315	Annular slide valves (for turbines)
.32	Spring leaves	-318	Balancing devices. Pressure compensating devices
.322	Main leaves	62-32	REGULATION COMPONENTS WITH ROTARY MOTION
.325	Other leaves	-322	Regulating valves. Corliss valves
.33/.345	<i>[cancelled]</i> use 62-272.3-238	-323	Hollow cylindrical valves (concentric to the cylinder)
.35	Devices for limiting bending. Stops	-324	Disc regulating valves
.36	<i>[cancelled]</i> use 62-272.3-72 or 62-272.3-75	-327	Arrangement of rotary slide valves in the cylinder head
.37	Shapes of leaf springs	-328	Balancing devices. Pressure compensating devices
.372	Straight leaf springs		
.373	Elliptical leaf springs		
.374	Leaf springs with struts, braces		
.375	Semi-elliptical leaf springs		
.376	C-springs		
.377	Cantilever leaf springs		
.379	Other types of leaf spring		
.38	Arrangement of leaf springs		
.381	Longitudinal		

62-33	REGULATION COMPONENTS WITH LIFTING MOTION	62-366.1	Valve gear actuation by a fluid under pressure
-331	Inlet valves	.2	Cataract valve gear actuation
-332	Exhaust valves	-368	Individual components of valve gears.
-333	Valves with flat seat. Valves with tapered seat		Method of regulation. Linking to the governor
.1	Valves with flat seat	-37	Actuators for rotary valve gear
.2	Valves with conical seat	-371	For various dispositions of the valve gear components
-334	Balanced valves	.1	For valve gear components arranged at right angles to cylinder axis
.1	Double seat valves. Multi-seat valves	.2	For valve gear components arranged parallel with cylinder axis
.2	Valves with rim or bell	-372	For cylindrical valves concentric with cylinder axis
.3	Ring valves	-373	For disc-shaped valve gear components arranged in the cylinder head, on the same axis as the cylinder
.31	With one ring	-374	For valve gear components with an oscillating circular motion
.32	With more than one ring	-375	For valve gear components with a uniform rotary motion
.9	Other types of balanced valve	-376	For Corliss valves and the like
-335	Clack valves, flap valves (with or without spring)	.1	Trip gear actuators
-336	Valve seats. Valve boxes	.5	Positively driven actuators
-337	Arrangement in the cylinder head	-377	Auxiliary components of rotary valve gear.
-338	Balancing devices. Pressure compensating devices	-378	Brakes. Damping devices
62-34/-38	VALVE GEARS, ACTUATORS	-38	Regulation of rotary valve gear. Linking to the governor
-34	Valve gears and actuators in general (without specifying the regulating organs actuated)	-381	Actuators for valve gear with lifting motion. Flap control gear
-341	Motion by means of cranks, eccentrics, counterweights		Valve control gear that controls only the admission of the working medium
-342	Motion by means of gearwheels	.1	With invariable opening stroke, mechanically direct-actuated
-343	Motion by means of cams	.2	With variable opening stroke, mechanically direct-actuated
-344	With feed regulation	.21	With positively actuated opening and closing
.1	With variable stroke, without trip gear	.22	With positively actuated opening and uncontrolled closing
.2	With variable stroke, with trip gear	.3	With opening and closing actuated by the pressure of the working medium
-345	For parallel cylinders	-382	Valve gear with special features
-346	For turbines	.1	With a common inlet and exhaust valve
-347	Electrical	.2	With scavenging of the cylinder by compressed air through the valve (on internal combustion engines)
-35/-36	Actuators for slide valve gear	.3	With valve in the piston
-351	For flat slide valves	.4	With several types of valve
-352	For piston valves	-383	Valve gear according to the type of machine
-353	For cylindrical slide valves concentric with cylinder axis (on "valveless" engines)	.1	For reciprocating piston machines
-354	With compensation, damping	.2	For rotary piston machines
-355	Decompression devices	.3	For turbines
-356	Valve actuators for four-stroke internal combustion engines not actuated by the crankshaft	.4	For machines arranged in star formation, e.g. radial engines
-358	Mechanical drives for valve gear with or without expansion. Arrangements for central drive of valve gear components	.5	→62-126 Machines with stationary radial cylinders around one crank
-359	Valve gear actuation by the piston or piston rod	-384	For machines arranged linearly, e.g. in-line engines
-361	Valve gear actuation by the working medium, with or without regulating piston		→62-122 Machines with in-line cylinders
-362	Valve gear control with pilot control by steam		Various actuation methods for valve gear
-363	Valve gear control with pilot control by the piston rod	.41	Positive actuation by adjustable eccentric
-364	Movement of slide valve by the piston striking it		
-365	Movement of slide valve by means of the piston rod		
.1	For valve gear without expansion		
.2	For valve gear with expansion		
-366	Other types of slide valve gear		

62-384.42	Positive actuation by rocker arm and one or two eccentrics	62-408	SURFACE CONDITION OF OBJECTS
.43	Positive actuation with kinematic combustion of opening and closing gear		→621.798 Packaging and packaging equipment
.44	Actuation by rotating levers		621.9.015 Surface finish. Resultant condition of workpiece
.45	Actuation by oscillating levers		621.9.016 Working conditions (of materials and surface)
.46	Actuation by levers with locking pawls	.2	Covered. Clad
-387	Damping devices. Balancing devices	.3	Plated. Lined
-388	Linking to the governor. Method of regulation	.4	Wrapped. Wound
62-39	DEVICES FOR POSITIVE CLOSURE OF PIPELINES. SPRINKLING DEVICES. FLUSHING DEVICES	.6	Shape of surface
-396	Devices for positive closure of pipelines	.62	Plane
	62-396 ≅ 621.646	.64	Curved
-397	Sprinkling devices. Flushing devices	.66	Irregular
	62-397 ≅ 621.647	.7	Smooth
-398	Various draining and overflow devices	.8	Rough. Granular. Grooved. Ribbed. Corrugated. Scored
	62-398 ≅ 621.648	62-41	FLAT OBJECTS, E.G. BLOCKS, PLATE, SHEET, STRIP
62-4	STATE, CONDITION, FORM OF MATERIALS, SURFACES, OBJECTS AND PRODUCTS		<i>The surface condition may be denoted by the -408 special auxiliaries, e.g. 62-41-408.3 Plated sheet etc.</i>
	<i>62-4 and its subdivisions are not applicable to 621.4 (especially 621.43) and 629.1</i>	-412	Forms for further processing, e.g. in metallurgy, ingots, slabs, billets, bars, sheet bars, plate bars, blanks; in the woodworking industry, tree trunks
	<i>Properties of objects may be denoted by colon combination with the subdivisions of 539.41. 5, e.g.</i>	-413	Thick plate and sheet (4.75 mm and above), e.g. heavy plate, armour plate, thick board, floorboards, planks
	62-423.7:539.538 Z-sections of wear-resistant material		<i>For bricks, tiles → 62-431</i>
	<i>If necessary, the -4 special auxiliaries may be combined, e.g.</i>		<i>The surface condition may be denoted by the -408 special auxiliaries, e.g.</i>
	62-462.3-408.7 Seamless smooth tube		62-413-408.8 Corrugated thick plate
	62-462.3-408.8 Seamless ribbed tube	-414	Medium thick plate and sheet (3 mm to below 4.75 mm)
	678-423.7-405.8 Z-section of porous plastic	-415	Thin plate and sheet (0.5 mm to below 3 mm), e.g. cardboard, woven sheets, webs
62-403/-405	STATE OF AGGREGATION OF MATERIALS		<i>For veneers → 62-416</i>
	<i>For process and operating characteristics and conditions according to state of aggregation → 62-911, 66-911</i>		<i>The surface condition may be denoted by the -408 special auxiliaries, e.g.</i>
-403	Gaseous state, also solids and liquids in gaseous state		62-415-408.3 Lined cardboard
	62-403 ≅ 54-13, e.g.	-416	Very thin flat objects (below 0.5 mm), e.g. very thin sheet, paper, foil, veneers
	62-403.2 Rarefied	-417	Non-uniform flat objects
	.3 Compressed		<i>For non-uniform strip → 62-418.7</i>
-404	Liquid state. Liquefied state	.2	Corrugated plate and sheet, e.g. corrugated iron
	62-404 ≅ 54-14, e.g.	.4	Expanded plate and sheet, e.g. sheet formed by partial cutting of the material and deformation
	62-404. 1 Mobile	.5	Curved or dished plate and sheet
	.2 Viscous	-418	Strip. Band. Ribbon
	.5 In solution		<i>For multilayer strip → 62-419</i>
	.8 Colloidal state in the liquid phase. Gels. Foams		<i>For solid sections → 62-422</i>
	.9 Semi-colloidal state (coarse suspensions). Pastes. Mashers. Doughs. Sticky		<i>The surface condition may be denoted by the -408 special auxiliaries, e.g.</i>
-405	Solid state. Solidified state		62-418-408.3 Plated strip
	<i>To be used only when it is necessary to emphasize the contrast with gaseous and liquid states</i>	.1	Strip. Tube skelp
.6	In bulk	.2	Strip, band according to width
.8	Porous. Cellular. Sponge-like	.22	Narrow strip, band
		.25	Wide strip, band

62-418.3	Thick strip, band	62-426.2	Round
.5	Thin strip, band	.3	Shaped
.7	Non-uniform strip, band, e.g. corrugated strip, profiled sectional strip	.4	Hollow
-419	Multilayer plate, sheet, strip, band		<i>For closed hollow sections → 62-462</i>
.3	Of more than two layers, joined with adhesive, e.g. sheets of wood glued together, plywood 62-419.3 ≅ 674-419.3	-427	Objects made from wires or threads, e.g. rope, yarn, laces, nets
.4	Of two layers, joined without adhesive, e.g. bimetallic strip		<i>For forms and make-up of yarns → 62-487</i>
.5	Of more than two layers, joined without adhesive, e.g. triplex sheet, multiplex sheets, sandwich construction		<i>For uninsulated stranded conductors → 621.315.145</i>
.7	Of two layers, joined with adhesive, e.g. compound metal		<i>For insulated stranded conductors → 621.315.34</i>
.8	Strengthened by woven materials, fibres etc.	.4	Ropes. Cables. Bundles
62-42	PROFILED OBJECTS. SECTIONAL MATERIAL	.42	Of circular cross-section
-422	Solid sections	.43	Of sector-shaped cross-section
.1	Solid sections with curved boundaries. Rounds	.44	Of hollow cross-section
.11	Circular. Round	.47	Of parallel wires or threads
.12	Curved polygonal, e.g. fluted sections	.48	Of wires or threads pressed together
.13	Elliptical	.5	Nets, sieves and similar objects
.14	Lenticular		<i>For expanded plate and sheet 62-417.4</i>
.15	Drop-shaped. Streamlined	-428	Helical, spiral and twisted objects, e.g. screw-shaped objects
.2	Solid sections with straight boundaries in general, e.g. beams, posts, rods	.2	Helical objects
.3	Triangular	.3	Spiral objects
.4	Quadrangular. Tetragonal	.4	Twisted objects
.41	Square	62-43/-49	OBJECTS NOT LISTED UNDER 62-41/-42
.42	Rectangular <i>For strip and band → 62-418</i>	62-43	SOLID OBJECTS OF VARIOUS SHAPES
.44	Rhomboidal	-431	Short prismatic objects (with relatively small differences between their various dimensions), e.g. bricks, tiles, cubes
.45	Parallelogrammatic	-433	Edge shapes. Chamfers. Bevels. Mouldings. Roundings
.46	Trapezoidal		<i>For shaped mouldings, mitres, dovetails → 62-44</i>
.5	Pentagonal	.1/.3	According to disposition
.6	Hexagonal	.1	On plane surfaces
.7	With more than six sides	.2	On convex surfaces
.9	Solid sections with both straight and curved sides. Quarter-rounds. Half-rounds. Round flats (half-lenticular)	.3	On concave surfaces
-423	Sections with shaped profiles <i>For rail sections → 62-424</i>	.4/.6	According to shape
.1	I-sections. H-sections	.4	Plane. Chamfers. Bevels
.2	Angles. L-sections. V-sections. Quarter-circle channels	.5	Curved. Mouldings. Roundings
.3	S-sections	.52	Convex
.4	T-sections	.53	Concave
.5	U-sections. C-sections. Semicircular channels <i>For open hollow sections → 62-461</i>	.6	Combination of plane and curved
.7	Z-sections	-434	Short cylindrical and conical objects (length less than three times the diameter)
.9	Other shaped profile sections, e.g. A-sections	.1	Cylindrical objects
-424	Rail sections →625.143 Rails and rail fastenings	.5	Conical objects
-426	Wires. Threads <i>For forms of fibres and filaments → 62-486</i>	-436	Spherical and spheroidal objects <i>For grains and shot → 62-492.3</i>
		.1	Spheres. Balls. Beads
		.2	Spheroids (ellipsoids of rotation)
		.21	Axis of rotation greater than diameter
		.22	Axis of rotation smaller than diameter

62-436.4	Ellipsoids (three different axes)	62-49	OBJECTS WITH SHAPES OTHER THAN THOSE LISTED ABOVE
.5	Ovoids		
.7	Barrel-shaped solid objects	-492	Powders. Grains
-437	Streamlined objects	.2	Powders
	<i>For streamlined solid sections → 62-422.15</i>	.3	Grains. Shot
62-44	SHAPED MOULDINGS, INCLUDING SERRATED MOULDINGS. MITRES. DOVETAILS	-493	Small objects of irregular shape, e.g. splinters, shavings, chips
62-45	SLOTTED, GROOVED AND SPLINED OBJECTS	.5	Flakes
62-46	HOLLOW OBJECTS. MATERIAL OF HOLLOW SECTION	-494	<i>For fibrous material in flock form → 62-486.5</i>
-461	Open hollow sections, e.g. open channels, gutters	62-5	Objects made of irregular fibres, e.g. felt products
	<i>For U-section, C-sections → 62-423.5</i>		OPERATION AND CONTROL OF MACHINES AND PROCESSES
-462	Closed hollow sections, e.g. pipes, tubes, hoses		<i>For electrical regulation → 621.3.07, 621.316</i>
	<i>For hollow wires → 62-426.4</i>		<i>For data processing equipment → 681.3</i>
.2	Seamed	62-50	<i>For automatic control engineering → 681.5</i>
	62-462.2 $\cong$ 62-422, e.g.		DIFFERENT TYPES OF CONTROL AND REGULATION
	62-462.241 Square seamed pipe	-503.5	Determinate input control
	→621.774.2 Seamed tube manufacture	.51	Stabilizing control
.3	Seamless	.54	Servo-control
	62-462.3 $\cong$ 62-422, e.g.	.55	Program control and regulation
	62-462.313 Elliptical seamless tubes	.56	Optimal control and regulation
	→621.774.3 Seamless tube manufacture	.57	Adaptive control and regulation
	621.774.4 Electrolytic manufacture of seamless tube	62-51	GENERAL OPERATION AND CONTROL OF MACHINES AND PROCESSES. MANUAL CONTROL. REMOTE CONTROL
-463	Closed hollow objects of irregular cross-section	-512	Direction of motion of control (indications etc.)
-464	Spherical hollow objects, e.g. balloons	-514	Hand (manual) controls. Foot controls. Levers, pedals, wheels etc.
	62-464 $\cong$ 62-436	.1	Hand controls in general
-465	Hemispherical, cylindrical and similar open hollow objects, e.g. crucibles, beakers, pots, bottles, barrels	.2	Levers
62-47	PERFORATED OBJECTS, E.G. SIEVES MADE OF PERFORATED PLATE. RINGS. ANNULAR OBJECTS	.3	Foot controls. Pedals
	<i>For sieves made from wires or threads → 62-427.5</i>	.32	Construction details. Heel clips, toe clips. Foot grips
-472	Objects with holes, bores	.322	Pedal bearings
.1	With blind holes	.33	Pedals of self-adjusting length (during motion)
.2	With through holes	.34	Pedal cranks of adjustable length
.3	With depressions	.35	Pedal cranks of fixed length
-477	Annular objects, e.g. rings	.38	Auxiliary fittings. Devices enabling cranks to be rotated through 180° to act as footrests
-478	Objects with perforations for weight reduction, air circulation etc. e.g. hollow bricks	.4	Crankhandles
62-48	FORMS AND MAKE-UP OF FIBROUS MATERIALS AND PRODUCTS	.43	Safety crankhandles
	62-48 $\cong$ 677-48, e.g.	.5	Steering controls. Handlebars. Steering wheels. Steering bars. Steering rods
	62-485 Spinning solution	.52	Flexible or springy (shock absorbing) types
	-486 Forms and make-up of fibres and filaments	.53	Adjustable, movable steering controls
	.5 Fibrous material in flock form	.54	Main steering columns. Rigid steering bars
	-487 Forms and make-up of yarns	.55	Steering linkages
	-488 Forms of fabric including film	.56	Steering devices with provision for heating
	<i>For wires, threads → 62-426</i>	.57	Removable steering devices, e.g. as precaution against theft
	<i>For objects made from wires or threads → 62-427</i>	.58	Hand grips for handlebars
		.59	Handwheels. Steering wheels

62-515	Various control devices, particularly for vehicles	.5	Control of masses
.5	Actuated by movement of seats or footboards	62-531.6	Control of velocity, acceleration
.7	Actuated independently of driver by a passenger (guard, instructor etc.)	.7	Control of oscillation
		.8	Control of pressures, forces
-519	Remote steering. Remote control		→66.042.95 Pressure regulation
			66.073.4 Pressure and flow regulation
62-52	AUTOMATICALLY OPERATED, AUTOMATICALLY CONTROLLED MACHINES AND PROCESSES		66.083 Operations involving pressure
	<i>Further particulars may be denoted by colon combination with the subdivisions of 681.521.53</i>	.9	Control of output, energy
-521	Mechanically controlled machines etc.	-533	Control of physical quantities
	→62-86 Machines, apparatus and installations driven lay mechanical power	.4	Sound control. Tone control. Noise control
	681.522 Indirect-action (power-assisted) automatic control systems	.5	Control of optical quantities
		.52	Control of light intensity
		.56	Control of colouring
-522	Fluidically, hydraulically and pneumatically controlled machines etc.	.6	Control of thermal quantities
	→681.523 Fluid-action automatic control systems	.65	Temperature control
			→536.58 Production of constant temperatures. Temperature control
.2	Hydraulically controlled	.66	Heat control
.7	Pneumatically controlled	.7	Control of electrical quantities
		.8	Control of magnetic quantities
-523	Electrically controlled machines etc.	-539	Precision (mechanical) control
	→621.316.7 Regulation in general. Regulators — Electrical engineering	.1	By means of screws
	681.527 Electrical and magnetic automatic control systems	.11	For height adjustment
		.12	For lateral adjustment
.1	Electrostatic	.2	By means of levers and reduction systems
.2	Electromagnetic. Electrodynamic	.3	By means of gearwheels
.3	Electrohydraulic	.4	By means of cams
.6	Electrothermal	62-54	METHODS OF CONTROL. GENERALITIES ON THE COMPONENTS LINKING THE CONTROLLER TO THE POINT OF CONTROL
.8	Electronic	-541	Control by mechanical action
-524	Thermally controlled machines etc. (except electrothermally controlled)	.2	By engaging and disengaging
	<i>For electrothermally controlled machines → 62-523.6</i>	.3	By brakes
	<i>For machines driven by combustion engines → 62-84</i>		<i>For braking devices → 62-59</i>
	→681.526 Thermal action automatic control systems	.4	By discharge of liquids or gases
-526	Servo-controlled machines etc.	.42	With the aid of pumps
-527	Machines etc. acting at periodic intervals. Time controls	.44	By outflow of water. Cataracts
		.45	By outflow of gases. Gas cataracts
.3	With clockwork mechanism	.46	By elasticity of air
.5	Without clockwork mechanism	.7	Applied to a shaft. Axial governors
.7	On a time basis without clockwork mechanism	-543	Control by influencing the working medium or the medium conveyed
-529	Automatic sequential control	.2	By throttling the working medium, by pressure reduction. Throttle control
62-53	GENERALITIES ON CONTROL	.3	By varying the feed quantity. Feed control
-531	Control of mechanical quantities	.4	By interruption of the feed, supply
.1	Control of lengths	.6	By discharge of the working medium or the medium conveyed
.2	Control of surfaces and cross-sections	.64	By varying the valve timing
.3	Control of volumes. Control of capacities (flow quantities) of pumps, compressors etc.	.67	By varying the back pressure
.32	Partial control of machines with divided flow distribution	.7	By means of nozzles with adjustable orifices
.4	Control of angles. Control of position. Centring devices	-544	On-off control
		-545	Various control methods, particularly for reciprocating machines
		.2	Combined control of quantity and composition of the mixture