

**1****Foundry plants and installations, planning, construction, engineering****2****Melting shop****2.1****Cupolas**

2.1.1

Cupolas, coke-fired

2.1.2

Cupolas, cokeless, gas-fired or oil-fired

2.2**Electric melting and holding furnaces**

(pouring equipment see 10.1)

2.2.1

Electric arc furnaces for foundries

2.2.2

Crucible induction furnaces

2.2.3

Channel type induction furnaces

2.2.4

Melting and holding furnaces, electric resistance type

2.2.5

Hearth-type electric melting and holding furnaces

2.2.6

Crucible lifting furnaces

2.2.7

Bale-out furnaces, electric

2.2.8

Vacuum melting furnaces

2.2.9

Other electric melting and holding furnaces

2.3**Fuel-heated melting and holding furnaces**

2.3.1

Crucible melting and holding furnaces, fuel-heated

2.3.2

Hearth-type melting and holding furnaces, fuel-heated

2.3.3

Rotary furnaces

2.3.4

Bale-out furnaces, fuel-heated

2.3.5

Melting and holding furnaces, fuel heated

2.4**Auxiliary melting and melt processing facilities**

2.4.1

Charging plants

2.4.2

Charge preheating facilities

2.4.3

Electromagnetic conveying channels for molten metal

2.4.4

Blowing-in equipment for cupolas

2.4.5

Oxygen addition equipment for cupolas

2.4.6

Inoculation devices, injection equipment

2.4.7

Induction stirring installations

2.4.8

Recuperators

2.4.9

Slag treatment equipment

2.4.10

Melt treatment stations

2.4.11

Inert gas installations

2.4.12

Gas flushing installations

2.4.13

Vacuum degassing equipment

2.5**Melting and holding furnaces, accessories**

2.5.1

Crucibles

2.5.2

Graphite electrodes

2.5.3

Heating wires and heating bars for electric resistance type furnaces

2.5.4

Emergency collecting pit

2.5.5

Other accessories

2.6**Operating materials and supplies for the melting shop**

2.6.1

Foundry coke

2.6.2

Slag-forming additives

2.6.3

Melt additives and covering fluxes for ferrous cast alloys

2.6.4

Melt additives and covering fluxes for non-ferrous cast alloys

2.6.5

Recarburizers

2.6.6

Gas, industrial

3**Refractories technology****3.1****Refractory materials and products, insulating materials**

3.1.1

Refractory ramming mixtures

3.1.2

Refractory bricks

3.1.3

Refractory gating system parts

3.1.4

Insulating materials and products

3.2**Equipment for the lining of melting and pouring equipment**

3.2.1

Compaction apparatus for refractory ramming materials

3.2.2

Spraying machines for refractory material

3.2.3

Break-out equipment for furnace and ladle lining

4**Metallic charge materials****4.1****Charge materials for iron, steel and malleable iron casting**

4.1.1

Pig iron

4.1.2

Scrap, scrap iron

4.1.3

Ferro-alloys

4.1.4

Alloying metals, master alloys

4.1.5

Inoculants

4.1.6

Nodularizing additions for spheroidal graphite cast iron

4.2**Charge materials for non-ferrous metal castings**

4.2.1

Aluminium, aluminium alloys

4.2.2

Magnesium, magnesium alloys

4.2.3

Copper, copper alloys

4.2.4

High-grade zinc alloys

4.2.5

Tin, zinc, alloys

4.2.6

Alloying metals, master alloys

4.2.7

Alloys for thixocasting and squeeze-casting

4.2.8

Non-ferrous metal scraps

5**Moulding and core making****5.1****Moulding machines and plants for bentonite-bonded sands**

5.1.1

Moulding machines

5.1.2

Moulding plants, flaskless

5.1.3

Moulding plants with flasks

5.2**Moulding machines and plants for non bentonite-bonded moulds**

5.2.1

Cold-setting resin moulding processes, equipment

5.2.2

Shell moulding process, equipment

5.2.3

Waterglass process, equipment

5.2.4

Lost-foam processes, equipment

5.2.5

Vacuum moulding process, equipment

5.2.6

Investment casting processes, equipment

5.2.7

Moulding machines and plants, other processes

5.3**Core making machines and plants**

5.3.1

Core blowing and shooting machines and plants

5.3.2

Core making machines, other

5.4**Moulding and core making machines, accessories**

5.4.1

Gassing equipment for moulds and cores



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- 5.4.2 Dosing devices for binders and additives
- 5.4.3 Mould handling equipment
- 5.4.4 Core handling equipment
- 5.4.5 Core treatment equipment (deflashing, coating, drilling), core glueing equipment
- 5.4.6 Automated core/mould manipulation systems
- 5.4.7 Coating preparation
- 5.4.8 Moulding and coremaking machines, other accessories

5.5 Moulding boxes and accessories

6 Moulding sands

- 6.1 Sands
 - 6.1.1 Silica sand
 - 6.1.2 Chromite sand and flour
 - 6.1.3 Zircon sand and flour
 - 6.1.4 Moulding sands with natural clay binder
 - 6.1.5 Sands, other

- 6.2 Moulding sand binders
 - 6.2.1 Bentonites and clays
 - 6.2.2 Synthetic resin binders for cold setting processes
 - 6.2.3 Synthetic resin binders for gassing processes
 - 6.2.4 Synthetic resin binders for thermosetting processes
 - 6.2.5 Sodium silicate binders
 - 6.2.6 Cement binders
 - 6.2.7 Binders for investment casting
 - 6.2.8 Moulding sand binders, others

- 6.3 Moulding sand additives, coatings for moulds and cores
 - 6.3.1 Lustrous carbon formers
 - 6.3.2 Moulding sand additives, others
 - 6.3.3 Mould and core coatings

- 6.4 Moulding sands ready-to-use
 - 6.4.1 Precoated sands for shell moulding
 - 6.4.2 Bentonite-bonded sands ready-to-use, waterless
 - 6.4.3 Moulding sands ready-to-use, others

7 Moulding sand preparation and sand reclama-

- 7.1 Moulding sand preparation
 - 7.1.1 Moulding sand preparation machines and plants
 - 7.1.2 Moulding sand mixer
 - 7.1.3 Crushing and grinding plants
 - 7.1.4 Magnetic separators
 - 7.1.5 Measuring and control equipment for moulding sand preparation
 - 7.1.6 Sand coolers
 - 7.1.7 Sand aerators
 - 7.1.8 Sand precoat plants (for shell moulding)
 - 7.1.9 Screening machines and installations (silos and hoppers see 15.7)
 - 7.1.10 Separators for chromite and silica sand, zircon and silica sand
 - 7.1.11 Moulding sand preparation, further equipment

- 7.2 Sand reclamation, plants and machines
 - 7.2.1 Sand reclamation of clay bonded moulding sands
 - 7.2.2 Sand reclamation of sodium silicate and cement bonded sands

- 7.2.3 Sand reclamation of synthetic resin bonded sands
- 7.2.4 Crushing and grinding plants for used sand

8 Moulding auxiliaries

- 8.1 Pneumatic rammers
- 8.2 Moulding auxiliaries, general
- 8.3 Foundry tools
- 8.4 Mould and core adhesives
- 8.5 Cores, prefabricated
- 8.6 Chaplets

9 Gating and feeding

- 9.1 Covering compounds for feeders
- 9.2 Breaker cores
- 9.3 Filterelements for liquid metals
- 9.4 Exothermic materials
- 9.5 Cooling elements
- 9.6 Strainer cores
- 9.7 Feeder sleeves
- 9.8 Funnels and filter Systems
- 9.9 Other auxiliaries

10 Casting machines and pouring equipment

- 10.1 Pouring equipment
 - 10.1.1 Pouring equipment, mechanical
 - 10.1.2 Pouring equipment, dosing
 - 10.1.3 Pouring equipment, heated (pouring furnaces)
 - 10.1.4 Pouring ladles
 - 10.1.5 Launderers
 - 10.1.6 Pig casting machines
 - 10.1.7 Pouring equipment and plants, other
- 10.2 Die-casting machinery and plant
 - 10.2.1 Cold chamber die-casting machinery
 - 10.2.2 Vacuum die-casting machinery
 - 10.2.3 Thixocasting die-casting machinery
 - 10.2.4 Squeeze casting die-casting machinery
 - 10.2.5 Warm chamber die-casting machinery
 - 10.2.6 Complete die-casting plant
- 10.3 Peripheral equipment and auxiliary materials for die casting (die casting dies see 17.3.1)
 - 10.3.1 Ladling and dosing equipment for die-casting
 - 10.3.2 Die heater/-cooler units and accessories
 - 10.3.3 Die spraying units



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- 10.3.4 Release agents for die-casting
- 10.3.5 Operating and auxiliary materials for die-casting
- 10.3.6 Extracting equipment for die-castings
- 10.3.7 Trimming machines for die casting
- 10.3.8 Trimming tools for die casting
- 10.3.9 Ascension pipes for dosing installations and low pressure casting
- 10.3.10 Other accessories for die-casting
- 10.4** Diecasting machines and accessories
 - 10.4.1 Gravity diecasting machines/plants
 - 10.4.2 Low pressure diecasting machines/plants
 - 10.4.3 Accessories, operating and auxiliary material for diecasting machines
- 10.5** Centrifugal casting machines and accessories
 - 10.5.1 Centrifugal casting machines
 - 10.5.2 Centrifugal casting moulds
- 10.6** Continuous casting machines and accessories
 - 10.6.1 Continuous casting machines and plants
 - 10.6.2 Continuous casting moulds
- 11** Knock-out, fettling and finishing
 - 11.1** Knock-out
 - 11.1.1 Knock-out and cooling drums and conduits
 - 11.1.2 Knock-out machines
 - 11.1.3 Cooling conveyors
 - 11.1.4 Decoring equipment
 - 11.2** Blasting plant and accessories
 - 11.2.1 Pneumatic blast cleaning machines
 - 11.2.2 Airless shot-blasting machines
 - 11.2.3 Pressure water blasting plants
 - 11.2.4 Dry ice blasting machines
 - 11.3** Shot-blasting abrasives
 - 11.3.1 Shot-blasting abrasives, metallic
 - 11.3.2 Shot-blasting abrasives, inorganic, nonmetallic
 - 11.3.3 Shot-blasting abrasives, organic
 - 11.3.4 Shot-blasting abrasives, others
 - 11.4** Fettling installations
 - 11.4.1 Deflashing machines
 - 11.4.2 Sawing machines
 - 11.4.3 Gating and feeding system separator machines and installations
 - 11.4.4 Abrasive cut-off machines and wheels
 - 11.4.5 Fettling facilities, other
 - 11.5** Grinding machines and accessories
 - 11.5.1 Grinding machines, automatic controlled
 - 11.5.2 A-type grinding machines, hand operated or mechanized
 - 11.5.3 Hand-grinding machines
 - 11.5.4 Grinding wheels
 - 11.5.5 Abrasives, others
 - 11.5.6 Grinding technology, others
 - 11.6** Fettling tools and fettling accessories, general
 - 11.6.1 Fettling chambers, fettling benches, fettling cabins
 - 11.6.2 Fettling tools and sundries

- 11.7** Interlacing and automation of fettling shops
- 11.8** As-cast casting inspection equipment
- 12** Surface treatment
 - 12.1** Enamelling plants
 - 12.2** Paint spraying units and tools
 - 12.3** Impregnation plants
 - 12.4** Galvanizing plants
 - 12.5** Surface treatment materials
 - 12.6** Surface treatment plants
- 13** Welding and cutting
 - 13.1** Flame cutting installations and accessories
 - 13.2** Welding installations and accessories
 - 13.3** Filler metals
- 14** Heat treating and drying furnaces
 - 14.1** Mould and ladle dryers
 - 14.2** Core drying stoves
 - 14.3** Sand drying plants and stoves
 - 14.4** Heat treating furnaces and installations
 - 14.5** Burners and heaters
- 15** Transportation and storage
 - 15.1** Trucks, industrial
 - 15.2** Cranes, hoists, rack trucks and accessories
 - 15.3** Pneumatic conveyors
 - 15.4** Roller conveyors
 - 15.5** Oscillating conveyors
 - 15.6** Continuous conveyors (belt conveyors, bucket conveyors and others)
 - 15.7** Bunkers, silos and accessories
 - 15.8** Transport containers, pallets, racks



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16	Manipulation	19.1.2	Thermal analysis equipment
16.1	Manipulators	19.1.3	Aluminium melt testing equipment
16.2	Industrial robots	19.2	Scales and weighing machines
16.3	Manipulators, mechanical	19.3	Testing of materials and workpieces
16.4	Positioning devices	19.3.1	Tightness testers
17	Pattern and die making	19.3.2	Endoscopes
17.1	Pattern and die making, machines and tools	19.3.3	Hardness testers
17.1.1	Wood working machines	19.3.4	Crack detection equipment, test media
17.1.2	Metal machining, machine-tools	19.3.5	X-ray testing equipment
17.1.3	Foam pattern production, machines	19.3.6	Ultrasonic testing equipment
17.1.4	Spotting presses	19.3.7	Materials testing, further equipment
17.1.5	Wax pattern injection machines	19.3.8	Surface inspection
17.1.6	Patternmaking and die making tools	19.4	Chemical analyses and metallography
17.1.7	Cleaning equipment for permanent moulds	19.4.1	Gas analysis apparatus
17.2	Pattern and die making materials and standard elements	19.4.2	Laboratory equipment
17.2.1	Metals and alloys	19.4.3	Spectrographic analysis equipment
17.2.2	Standard elements for permanent moulds and dies	19.4.4	Metallographic testing equipment
17.2.3	Hot working steels for diecasting dies	19.4.5	Microscopes
17.2.4	Die making, accessories	19.4.6	Grinding and polishing installations for metallography
17.2.5	Heating and cooling devices for moulding and castings tools	19.4.7	Analytical apparatus, others
17.2.6	Plastics	19.5	Mould and moulding sand testing
17.2.7	Ceramics	19.5.1	Mould testing equipment
17.2.8	Pattern wood	19.5.2	Moulding sand testing equipment
17.2.9	Pattern varnishes	19.6	Quality control
17.2.10	Pattern making sundries	20	Compressed-air technology
17.2.11	Plaster	20.1	Compressed-air plants and accessories
17.2.12	Investment casting waxes, waxes for wax injection machines, special waxes	20.2	Pneumatic tools
17.3	Pattern equipment, permanent moulds and accessories	20.3	Compressors and accessories
17.3.1	Diecasting dies	21	Exhaust and ventilation technology
17.3.2	Permanent moulds, gravity dies	21.1	Exhaust systems
17.3.3	Gauges and fixtures	21.2	Blowers and fans
17.3.4	Patterns and core boxes made of wood and plastic	21.3	Ventilating and air-conditioning equipment
17.3.5	Metal patterns and core boxes	22	Environmental protection and waste removal
17.3.6	Pattern plates	22.1	Flue gas cleaning plants
17.3.7	Lost foam patterns	22.2	Waste water cleaning plants
17.4	Solid Freeform Manufacturing	22.3	Dust extraction systems
17.4.1	Object generation, equipment and processes	22.4	Filters and filter materials
17.4.2	Rapid prototyping, equipment and processes	22.5	Operating supplies for waste management plants
17.4.3	Rapid tooling, materials, technologies and processes	22.6	Foundry waste preparation plants
18	Control systems		
18.1	Process control, models, simulation		
18.2	Control equipment, automation technology		
19	Measurement and test technology		
19.1	Measuring instruments		
19.1.1	Temperature measuring instruments		



22.7	Pelletization plants
22.8	Residue recycling
22.9	Slag dressing plants
22.10	Water treatment plants
22.11	Environmental protection and waste removal, further installations
23	Industrial safety and ergonomics
23.1	Protective clothing
23.2	Body protection
23.3	Alarms
23.4	Protection equipment, other
23.5	Sound control devices
23.6	Work station layout
24	Information processing
24.1	Data processing, product development and optimisation software CAD/CAE
24.2	Simulation of casting processes
24.3	Computer programs for the construction of models and moulds
24.4	Software for business and process data capture
24.5	Quality assurance software
24.6	e-business, e-commerce, IT solutions
24.7	Engineering services
25	Additive Manufacturing
25.1	Software
25.1.1	3D-Visualization
25.1.2	3D-Modelling
25.1.3	Data Preparation
25.2	Manufacturer of Metal Powders
25.2.1	Aluminium based powders
25.2.2	Stainless Steel based powders
25.2.3	Cobalt-Chromium based powders
25.2.4	Copper based powders
25.2.5	Nickel based powders
25.2.6	Titanium based powders
25.2.7	Carbon Steel based powders
25.2.8	Other metal powders

25.3	Machinery, equipment and process for additive manufacturing
25.3.1	Powder bed printing
25.3.1.1	SLS (Selective Laser Sintering)
25.3.1.2	SLM (Selective Laser Melting)
25.3.1.3	LBM (Laser Beam Melting)
25.3.1.4	LMF Laser Metal Fusion
25.3.1.5	DMLS (Direct Metal Laser Sintering)
25.3.1.6	LMD (Laser Metal Disposition)
25.3.1.6.1	LPF (Laser Powder Forming)
25.3.2	Binder Jetting
25.3.3	Surface coating
25.3.3.1	Laser Material Processing / DED Directed Energy Deposition
25.3.3.2	CLAD Process / Cladding
25.3.3.3	Turning, grinding, milling
25.3.4	Other installations and procedures for additive manufacturing
25.4	Post Processing
25.4.1	Machining
25.4.2	EDM (electrical discharge machining)
25.4.3	Peening
25.4.4	Grinding
25.4.5	Polishing
25.4.6	Surface treatment
25.4.7	Heat treatment
25.4.8	HIP (hot isostatic pressing)
25.4.9	controlling
25.5	Research, development, associations, institutions
26	Consultation, planning, services
27	Associations, trade publishers, trade journals
28	Training, further education