

**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

2.5.6

Power Electronics/Converter

2.5.7

Automation

2.5.8

Safety Engineering

2.5.9

Service

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

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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

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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 precoatng 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

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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

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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
 - 10.1.8 Precision fine casting units
- 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



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10.3.3	Die spraying units
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
10.7	Accessories
10.7.1	Inductors
10.7.2	Pouring Control System
10.7.3	Power Electronics
10.7.4	Automation
10.7.5	Safety Engineering
10.7.6	Service
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	Decorating 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
14.6	Microwave dryer
15	Transportation and storage
15.1	Trucks, industrial
15.2	Cranes, hoists, rack trucks and accessories
15.3	Pneumatic conveyors
15.4	Roller conveyors



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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
16	Manipulation
16.1	Manipulators
16.2	Industrial robots
16.3	Manipulators, mechanical
16.4	Positioning devices
17	Pattern and die making
17.1	Pattern and die making, machines and tools
17.1.1	Wood working machines
17.1.2	Metal machining, machine-tools
17.1.3	Foam pattern production, machines
17.1.4	Spotting presses
17.1.5	Wax pattern injection machines
17.1.6	Patternmaking and die making tools
17.1.7	Cleaning equipment for permanent moulds
17.2	Pattern and die making materials and standard elements
17.2.1	Metals and alloys
17.2.2	Standard elements for permanent moulds and dies
17.2.3	Hot working steels for diecasting dies
17.2.4	Die making, accessories
17.2.5	Heating and cooling devices for moulding and castings tools
17.2.6	Plastics
17.2.7	Ceramics
17.2.8	Pattern wood
17.2.9	Pattern varnishes
17.2.10	Pattern making sundries
17.2.11	Plaster
17.2.12	Investment casting waxes, waxes for wax injection machines, special waxes
17.3	Pattern equipment, permanent moulds and accessories
17.3.1	Diecasting dies
17.3.2	Permanent moulds, gravity dies
17.3.3	Gauges and fixtures
17.3.4	Patterns and core boxes made of wood and plastic
17.3.5	Metal patterns and core boxes
17.3.6	Pattern plates
17.3.7	Lost foam patterns
17.4	Solid Freeform Manufacturing
17.4.1	Object generation, equipment and processes
17.4.2	Rapid prototyping, equipment and processes
17.4.3	Rapid tooling, materials, technologies and processes

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
19.1.2	Thermal analysis equipment
19.1.3	Aluminium melt testing equipment
19.2	Scales and weighing machines
19.3	Testing of materials and workpieces
19.3.1	Tightness testers
19.3.2	Endoscopes
19.3.3	Hardness testers
19.3.4	Crack detection equipment, test media
19.3.5	X-ray testing equipment
19.3.6	Ultrasonic testing equipment
19.3.7	Materials testing, further equipment
19.3.8	Surface inspection
19.4	Chemical analyses and metallography
19.4.1	Gas analysis apparatus
19.4.2	Laboratory equipment
19.4.3	Spectrographic analysis equipment
19.4.4	Metallographic testing equipment
19.4.5	Microscopes
19.4.6	Grinding and polishing installations for metallography
19.4.7	Analytical apparatus, others
19.5	Mould and moulding sand testing
19.5.1	Mould testing equipment
19.5.2	Moulding sand testing equipment
19.6	Quality control
20	Compressed-air technology
20.1	Compressed-air plants and accessories
20.2	Pneumatic tools
20.3	Compressors and accessories
21	Exhaust and ventilation technology
21.1	Exhaust systems
21.2	Blowers and fans
21.3	Ventilating and air-conditioning equipment



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22 Environmental protection and waste removal

- 22.1 Flue gas cleaning plants
- 22.2 Waste water cleaning plants
- 22.3 Dust extraction systems
- 22.4 Filters and filter materials
- 22.5 Operating supplies for waste management plants
- 22.6 Foundry waste preparation plants
- 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