



14<sup>th</sup> International  
Foundry Trade Fair  
with WFO Technical  
Forum

Düsseldorf  
25/06 – 29/06/19

**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 Betonite-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 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
  - 10.3.4 Release agents for die-casting
  - 10.3.5 Operating and auxiliary materials for die-casting



14<sup>th</sup> International  
Foundry Trade Fair  
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25/06 – 29/06/19

- 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 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
- 16** Manipulation
  - 16.1** Manipulators
  - 16.2** Industrial robots
  - 16.3** Manipulators, mechanical



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#### 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

### 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



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<b>22.11</b>	Environmental protection and waste removal, further installations	<b>25.3.1.6</b>	LMD (Laser Metal Disposition )
<b>23</b>	<b>Industrial safety and ergonomics</b>	<b>25.3.1.6.1</b>	LPF (Laser Powder Forming)
<b>23.1</b>	Protective clothing	<b>25.3.2</b>	Binder Jetting
<b>23.2</b>	Body protection	<b>25.3.3</b>	Surface coating
<b>23.3</b>	Alarms	<b>25.3.3.1</b>	Laser Material Processing / DED Directed Energy Deposition
<b>23.4</b>	Protection equipment, other	<b>25.3.3.2</b>	CLAD Process / Cladding
<b>23.5</b>	Sound control devices	<b>25.3.3.3</b>	Turning, grinding, milling
<b>23.6</b>	Work station layout	<b>25.3.4</b>	Other installations and procedures for additive manufacturing
<b>24</b>	<b>Information processing</b>	<b>25.4</b>	Post Processing
<b>24.1</b>	Data processing, product development and optimisation software CAD/CAE	<b>25.4.1</b>	Machining
<b>24.2</b>	Simulation of casting processes	<b>25.4.2</b>	EDM (electrical discharge machining)
<b>24.3</b>	Computer programs for the construction of models and moulds	<b>25.4.3</b>	Peening
<b>24.4</b>	Software for business and process data capture	<b>25.4.4</b>	Grinding
<b>24.5</b>	Quality assurance software	<b>25.4.5</b>	Polishing
<b>24.6</b>	e-business, e-commerce, IT solutions	<b>25.4.6</b>	Surface treatment
<b>24.7</b>	Engineering services	<b>25.4.7</b>	Heat treatment
<b>25</b>	<b>Additive Manufacturing</b>	<b>25.4.8</b>	HIP (hot isostatic pressing)
<b>25.1</b>	Software	<b>25.4.9</b>	controlling
<b>25.1.1</b>	3D-Visualization	<b>25.5</b>	Research, development, associations, institutions
<b>25.1.2</b>	3D-Modelling	<b>26</b>	Consultation, planning, services
<b>25.1.3</b>	Data Preparation	<b>27</b>	Associations, trade publishers, trade journals
<b>25.2</b>	Manufacturer of Metal Powders	<b>28</b>	Training, further education
<b>25.2.1</b>	Aluminium based powders		
<b>25.2.2</b>	Stainless Steel based powders		
<b>25.2.3</b>	Cobalt-Chromium based powders		
<b>25.2.4</b>	Copper based powders		
<b>25.2.5</b>	Nickel based powders		
<b>25.2.6</b>	Titanium based powders		
<b>25.2.7</b>	Carbon Steel based powders		
<b>25.2.8</b>	Other metal powders		
<b>25.3</b>	Machinery, equipment and process for additive manufacturing		
<b>25.3.1</b>	Powder bed printing		
<b>25.3.1.1</b>	SLS (Selective Laser Sintering)		
<b>25.3.1.2</b>	SLM (Selective Laser Melting)		
<b>25.3.1.3</b>	LBM (Laser Beam Melting)		
<b>25.3.1.4</b>	LMF Laser Metal Fusion		
<b>25.3.1.5</b>	DMLS (Direct Metal Laser Sintering)		