

### 1 Wire manufacturing and finishing machinery

- 1.1** Casting
  - 1.1.1 Standard casting
  - 1.1.2 Continuous casting
  - 1.1.3 Continuous Cast Rod Process (CCR-Process)
- 1.2** Rolling, pressing, forming
  - 1.2.1 Hot rolling
  - 1.2.2 Cold rolling
  - 1.2.3 Extruding presses
    - 1.2.3.1 Metal extrusion technology
  - 1.2.4 Single-stage presses
  - 1.2.5 Multi-stage presses
  - 1.2.6 Hammering machines
  - 1.2.7 Chipless forming
  - 1.2.8 Forging
  - 1.2.9 Reduction rolling
  - 1.2.10 Warm forming
- 1.3** Drawing
  - 1.3.1 Wire drawing machines (dry, fine, multi)
  - 1.3.2 Continuous drawing machines
- 1.4** Surface and heat treatment
  - 1.4.1 Drying and baking ovens
  - 1.4.2 Annealing without inert gas (furnaces)
  - 1.4.3 Annealing with inert gas (furnaces)
  - 1.4.4 Vacuum annealing (furnaces)
  - 1.4.5 Induction annealing
  - 1.4.6 Salt bath furnaces
  - 1.4.7 Burnishing and phosphating installations
  - 1.4.8 Metal coating (chemical, electroplating etc.)
  - 1.4.9 Hardening, tempering
  - 1.4.10 Shot peening
  - 1.4.11 Continuous resistance annealer
  - 1.4.12 Lubricant application
  - 1.4.13 Preheater
- 1.5** Wire cleaning, machining, forming and coating
  - 1.5.1 Pickling, blasting, scale removal by bending, cleaning, scale removal
  - 1.5.2 Coating
  - 1.5.3 Turning, milling, grinding, spinning
  - 1.5.4 Enamelling
  - 1.5.5 Deburring, peeling, upsetting
  - 1.5.6 Spark erosion
  - 1.5.7 Grinding, pointing, lapping
  - 1.5.8 Blanking and stamping
  - 1.5.9 Heat exchangers/acid heating
  - 1.5.10 Chemical pumps
- 1.6** Machinery to solve logistical problems
  - 1.6.1 Coiling, winding
  - 1.6.2 De-coiling, unwinding
  - 1.6.3 Spooling
  - 1.6.4 Dividing
  - 1.6.5 Cutting
  - 1.6.6 Straightening
  - 1.6.7 Bending
  - 1.6.8 Counting, weighing, sorting
  - 1.6.9 Size reduction, granulation
  - 1.6.10 Auxiliaries (guides, discharge tables)

- 1.6.11 Feed devices, handling equipment
- 1.6.12 Packaging (coil forming, storing)
- 1.6.13 Material Handling
- 1.6.14 Wire connection of coils
- 1.6.15 Spooling and unspooling of flat wire
- 1.6.16 Automatic reel swap
- 1.7** Fastener machinery (bolts, nuts, rivets, nails)
  - 1.7.1 Bending, forming
  - 1.7.2 Hot upsetting
  - 1.7.3 Cold upsetting, forging
  - 1.7.4 Soldering
  - 1.7.5 Welding
  - 1.7.6 Separating
  - 1.7.7 Pressing
  - 1.7.8 Twisting
  - 1.7.9 Cutting (threads etc.)
  - 1.7.10 Rolling (threads)
  - 1.7.11 Heat treatment
- 1.8** Spring manufacturing machinery
  - 1.8.1 Simple spring manufacturing machines (for bed, curtain, mattress springs)
    - 1.8.2 Coil springs
    - 1.8.3 Tension spring machines
    - 1.8.4 Leaf and flat spiral springs
    - 1.8.5 Leg and shaped spring machines
    - 1.8.6 Spring end grinding machines
- 1.9** Cable and stranding machines
  - 1.9.1 Cable filling
  - 1.9.2 Cable sheathing and insulating
  - 1.9.3 Stranding
  - 1.9.4 Twisting, bunching
  - 1.9.5 Cable cutting machines
  - 1.9.6 Cable marking/printing machines
  - 1.9.7 Cable extrusion machines
  - 1.9.8 Insulation strippers for cables
  - 1.9.9 Powder applicators
  - 1.9.10 Tape Application machinery, with/without auto-splicing
  - 1.9.11 fibre glass cables manufacturing machinery
- 1.10** Wire product manufacturing machinery
  - 1.10.1 Wire rope machines
  - 1.10.2 Reinforcing mesh machines
  - 1.10.3 Wire fence machines
  - 1.10.4 Plaiting/braiding and weaving machines
  - 1.10.5 Ring, hook and eye wire machines
  - 1.10.6 Hairclip and paperclip machines (office accessories)
  - 1.10.7 Chain making machines (industrial chains and jewellery)
  - 1.10.8 Steel and knitting needle machines
  - 1.10.9 Screw and nail machines
  - 1.10.10 Transformer wire winding
  - 1.10.11 Special-purpose machines (bag ties, belt fasteners, drawing pins, clothes hangers, can openers, buckles, lead shot etc.)
  - 1.10.12 Machinery and equipment for the manufacture of cables connections
  - 1.10.13 Wire knitting/weaving machines
  - 1.10.14 Machinery for the manufacture of bowden cables



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### 1.11 Welding and electrode manufacturing machinery

- 1.11.1 Wire and rope welding machines
- 1.11.2 Mesh welding machines
- 1.11.3 Special-purpose welding machines
- 1.11.4 Electrode manufacturing machines
- 1.11.5 Lead wire and solder wire production plant
- 1.11.6 Cold pressure welding

### 1.12 Special machinery and equipment

- 1.12.1 Drawing dies - repairing and machining
- 1.12.2 Polishing drawing dies
- 1.12.3 Reprocessing drawing oils
- 1.12.4 Filtering equipment
- 1.12.5 Cleaning facilities (incl. shot-blasting equipment)
- 1.12.6 Fibre optic manufacturing machinery
- 1.12.7 Airwipes
- 1.12.8 Laser processing and microdrilling of draw dies
- 1.12.9 Lubricant application equipment
- 1.12.10 Fiber colouring systems/plants
- 1.12.11 Cable Termination Equipment and Tooling
- 1.12.12 Crosslinking equipment
- 1.12.13 Preparation/processing of cable compounds

### 1.13 Used, rebuilt and reconditioned machinery (all machines from 1.1 to 1.12)

### 1.14 Spare parts for wire and cable machines

- 1.14.1 Haul-off-belts for Caterpillar-machines
- 1.14.2 Timing-belts

## 2

### Process technology tools

#### 2.1 for casting

#### 2.2 for extruding

- 2.2.1 Extrusion dies
- 2.2.2 Extrusion heads

#### 2.3 for drawing

- 2.3.1 Diamond drawing dies
- 2.3.2 Hard metal drawing dies
- 2.3.3 Ceramic drawing dies
- 2.3.4 Polycrystalline drawing dies
- 2.3.5 Enamelled drawing dies
- 2.3.6 Adjustable drawing dies
- 2.3.7 Cleaning, repairing and polishing drawing dies
- 2.3.8 Cold upsetting and blanking drawing dies
- 2.3.9 Tube and rod drawing dies
- 2.3.10 Pulling in dogs

#### 2.4 for rolling

#### 2.5 for power transmission purposes (cones, rings, guide and bearing pulleys)

- 2.5.1 Steel/cast, chrome-plated
- 2.5.2 Stainless steel
- 2.5.3 Hard metal, hard-faced
- 2.5.4 Ceramics, ceramic-coated
- 2.5.5 Plastics
- 2.5.6 Other materials

#### 2.6 for rolling

- 2.6.1 Steel

- 2.6.2 Hard metal, hard-faced
- 2.6.3 Ceramics, ceramic-coated
- 2.6.4 Turks head rolls
- 2.6.5 Plain rolls
- 2.6.6 Shape rolls
- 2.6.7 Other materials

#### 2.7 for cable manufacturing and processing

- 2.7.1 Flat cores
- 2.7.2 Round cores

#### 2.8 for spring manufacturing

- 2.9 Other
- 2.9.1 Complete welding wire lines

#### 2.10 for chipless shaping

## 3

### Auxiliary process technology materials

#### 3.1 Lubricants

- 3.1.1 Oils, greases, lubricants
- 3.1.2 Auxiliary drawing materials
- 3.1.3 Process lubricants

#### 3.2 Cleaning and wetting agents

- 3.2.1 Pickling chemicals, acids
- 3.2.2 Degreasing and wetting
- 3.2.3 Bleaching

#### 3.3 Dyes

- 3.3.1 Masterbatches

#### 3.4 Auxiliary hardening materials

#### 3.5 Grinding and lapping materials

#### 3.6 Adhesives and packaging

#### 3.7 Auxiliary galvanizing materials

#### 3.8 Coiling, uncoiling and rewinding spools and reels

- 3.8.1 Metal/steel coils
- 3.8.2 Wooden coils
- 3.8.3 Plastic coils
- 3.8.4 Cable drums
- 3.8.5 Other special coils, spools and reels

#### 3.9 Auxiliary welding materials

#### 3.10 Other chemicals

- 3.10.1 Binding agents
- 3.10.2 Acid protection agents
- 3.10.3 Protective agents

#### 3.11 Conductive auxiliary materials

## 4

### Materials, special wires and cables

#### 4.1 Raw iron and steelbased products

- 4.1.1 Carbon content (low)
- 4.1.2 Carbon content (high)



- 4.1.3 Stainless steel
- 4.1.4 Special alloys

#### 4.2 Processed iron and steelbased products

- 4.2.1 Non-coated (bright)
- 4.2.2 With metallic coatings (zinc, tin, copper, bronze etc.)
- 4.2.3 With non-metallic coatings (paint, plastic, bitumen etc.)
- 4.2.4 Annealed
- 4.2.5 Tempered
- 4.2.6 Strain hardened

#### 4.3 Non-ferrous-based

- 4.3.1 Aluminium
- 4.3.2 Nickel
- 4.3.3 Copper
- 4.3.4 Brass, bronze
- 4.3.5 Zinc
- 4.3.6 Tin

#### 4.4 Speciality wires made from

- 4.4.1 Beryllium
- 4.4.2 Gold, platinum, silver
- 4.4.3 Molybdenum
- 4.4.4 Niobium
- 4.4.5 Tantalum
- 4.4.6 Titanium
- 4.4.7 Tungsten
- 4.4.8 Zirconium
- 4.4.9 Glass
- 4.4.10 Stainless steel
- 4.4.11 Special steels
- 4.4.12 Magnesium

#### 4.5 Application-specific speciality wires for

- 4.5.1 Bolts, rivets, cold extruded parts
- 4.5.2 Springs
- 4.5.3 Wire ropes, wire strands, cables
- 4.5.4 Wire intermediaries (rubber, plastic, fabric)
- 4.5.5 Reinforcements (construction industry)
- 4.5.6 Wire mesh, wire grating
- 4.5.6.1 Woven wire mesh cloth (S.S. + P.B.)
- 4.5.6.2 Disc filters, candle filters, test sieves, shale shaker screen
- 4.5.7 Wire cloth, strainers, filters
- 4.5.8 Auxiliary welding materials
- 4.5.9 Wire bending products, small parts
- 4.5.10 Other (medical purposes, music, packaging)
- 4.5.11 Chain steels
- 4.5.12 Wire products for use in the automotive and aircraft industries
- 4.5.13 Machining steel
- 4.5.14 Hardening and tempering steel
- 4.5.15 Cold drawn steel
- 4.5.16 Profiled wire
- 4.5.17 Rolled wire
- 4.5.18 Safety wire, barbed wire

#### 4.6 Cables

- 4.6.1 High-voltage cables
- 4.6.2 Low-voltage cables
- 4.6.3 Communication cables
- 4.6.4 Computer and control cables
- 4.6.5 Plastic and paper-insulated cables
- 4.6.6 Marine cables

- 4.6.7 Fibre glass cables
- 4.6.8 Special and adapted cables

#### 4.7 Plastic materials for cable sheathing and insulating

- 4.7.1 Thermoplastic materials
- 4.7.1.1 Flameretardant, halogenfree thermoplastic materials
- 4.7.2 Crosslinked plastics
- 4.7.3 Permanently flexible plastics
- 4.7.4 Dyestuffs and pigments

#### 4.8 Yarns for cables/wire ropes

- 4.8.1 Armouring and filler yarns for cables
- 4.8.1.1 Waterswellable yarns
- 4.8.2 Yarns for steel ropes

#### 4.9 Shielding materials

- 4.9.1 Film, film/foil, laminates
- 4.9.1.1 Shielding nonwoven tapes

#### 4.10 Strengthening materials

- 4.10.1 FRP strength elements
- 4.10.2 Aramid rod strength elements
- 4.10.3 Flexible FRP strength elements

#### 4.11 Wire ropes

- 4.11.1 Galvanized and stainless steel wire ropes
- 4.11.2 Ready-made wire ropes
- 4.11.3 Accessories for wire ropes

#### 4.12 Insulation materials, film, strips, fibre, paper

- 4.12.1 Stuffer and armouring yarns
- 4.12.2 Paper, tissue and fleece band
- 4.12.2.1 Nonwoven tapes
- 4.12.3 Insulating, separating and special tapes
- 4.12.3.1 Waterblocking tapes
- 4.12.4 Plastic foils/film/sheet
- 4.12.5 Foils of paper and other materials
- 4.12.6 Anti-moisture systems
- 4.12.7 Rubber
- 4.12.8 Plastics
- 4.12.9 Fibre glass
- 4.12.10 Other
- 4.12.11 Enamels/resins for wire insulation
- 4.12.12 Flame protection strips
- 4.12.12.1 Flame retardant tapes
- 4.12.13 Printed films
- 4.12.14 Other wrapping materials
- 4.12.15 Cable filling compound

## 5

### Measuring and control technology

- 5.1 Batching and mixing installations

- 5.2 Counters

- 5.3 Temperature measuring and control equipment

- 5.4 Torsion control equipment

- 5.5 Tension measuring equipment

- 5.6 Equipment for measuring the diameter, width, height and length

<b>5.7</b>	Capacity measuring systems	<b>7.3</b>	Safety technology
<b>5.8</b>	Drive and control technology	7.3.1	Acid protection
<b>5.9</b>	Process monitoring systems	7.3.2	Safety equipment
<b>5.10</b>	Quality assurance systems (incl. factory data acquisition)	<b>7.4</b>	Environmental protection
<b>5.11</b>	Analysers	7.4.1	Recycling
<b>5.12</b>	Laser measuring equipment	7.4.2	Acid degradation
<b>5.13</b>	Measuring systems for electric cables	<b>7.5</b>	Cross linking agents
<b>5.14</b>	Spark Tester	<b>7.6</b>	Data technology/Production control
<b>6</b>	<b>Test engineering</b>	<b>7.7</b>	Consulting and services
<b>6.1</b>	Materials	7.7.1	Galvanizing
6.1.1	Destructive material testing	7.7.2	Product testing and certification
6.1.2	Non-destructive material testing	<b>7.8</b>	Research and training
<b>6.2</b>	Wire manufacturing machines	<b>7.9</b>	Trade literature/Publishers
<b>6.3</b>	Finished product testing	<b>7.10</b>	Associations
6.3.1	Wire products and supplies		
6.3.2	Springs		
6.3.3	Optical Fibre Cables		
6.3.4	Insulated Wire Cables		
6.3.5	Bare wire, rod and wire ropes		
6.3.6	Fasteners		
6.3.7	Tools		
6.3.8	Hardness tester		
<b>6.4</b>	Auxiliary materials		
<b>6.5</b>	Laboratory test equipment		
<b>6.6</b>	Other		
<b>7</b>	<b>Specialist areas</b>		
<b>7.1</b>	plant engineering and construction		
<b>7.2</b>	Logistics		
7.2.1	Packaging		
7.2.1.1	Plant and Machinery		
7.2.1.2	Materials		
7.2.1.3	Counting, weighing, sorting		
7.2.2	Stock automation		
7.2.2.1	Control and monitoring installations		
7.2.2.2	Racking systems		
7.2.2.3	Storing (automatic, mechanical)		
7.2.3	Transport automation		
7.2.3.1	Auxiliaries (guides, feed devices, brakes etc.)		
7.2.3.2	Small capacity lifting devices		
7.2.3.3	Conveying systems		
7.2.3.4	Coiling and decoiling		
7.2.4	Industrial identification, Labels		