

I Plant and equipment for joining, surfacing and cutting processes

1 Plant and equipment, including automation, mechanization and industrial robots, for the welding of metal, ceramic and composite materials

- 10 Flash welding
- 20 Stud welding
- 30 Projection welding
- 40 Diffusion welding
- 50 Electrogas welding
- 60 Electron beam welding
- 70 Electroslag welding
- 80 Narrow gap welding
- 90 Tubular wire welding
- 100 Flux cored arc welding
- 110 Gas pressure welding
- 120 Gas welding
- 130 Thermit welding
- 140 Induction welding
- 150 Cold pressure welding
- 160 Enclosed resistance fusion welding
- 170 Capacitor discharge welding
- 180 Laser welding
- 190 Manual metal arc welding
- 200 Pulsed arc welding
- 210 Light beam welding
- 220 Linear friction welding, Friction stir Welding
- 230 Magnetic pulse welding
- 240 Multiple-wire welding
- 250 MIG/MAG (GMA) welding
- 260 Microwelding
- 270 Plasma-TIG welding
- 280 Plasma welding
- 290 Resistance butt welding
- 300 Seam welding
- 310 Butt seam welding with rotary transformer
- 320 Friction stir welding
- 330 Explosive welding
- 340 Butt seam welding with sliding contacts
- 350 Magnetically impelled arc butt (MIAB) welding
- 360 Tandem welding
- 370 Ultrasonic welding
- 380 Firecracker welding
- 390 Submerged arc welding
- 400 Roll butt seam welding
- 410 Resistance spot welding
- 420 TIG (GTA) welding

2 Plant and equipment, including automation, mechanization and industrial robots, for weld surfacing and cladding

- 430 Additive manufacturing
- 440 Electroslag cladding
- 450 Laser cladding
- 460 Plasma cladding
- 470 Friction cladding
- 480 Explosive and roll cladding
- 490 Gas shielded arc cladding
- 500 Submerged arc cladding

3 Plant and equipment, including automation, mechanization and industrial robots, for brazing and soldering

- 510 Surfacing by brazing and soldering
- 520 Hot bar reflow soldering
- 530 Electron beam brazing
- 540 Debrazing, desoldering
- 550 Flame brazing and soldering
- 560 High-temperature brazing
- 570 Induction brazing and soldering
- 580 Bit soldering, block brazing, roller tinning
- 590 Laser beam brazing
- 600 Arc brazing

- 610 Light beam brazing and soldering
- 620 Bath, wave and drag soldering
- 630 Microbrazing and soldering
- 640 Furnace brazing and soldering
- 650 Friction soldering
- 660 Salt bath brazing
- 670 Wave soldering
- 680 Wave Soldering
- 690 Dip brazing and soldering
- 700 Ultrasonic soldering
- 710 Hot gas soldering
- 720 Resistance brazing
- 730 Reflow soldering

4 Plant and equipment, including automation, mechanization and industrial robots, for the welding of plastics

- 740 Extrusion welding
- 750 Heated tool welding
- 760 High frequency welding of plastics
- 770 Infrared-welding
- 780 Laser welding of plastics
- 790 Light beam welding of plastics
- 800 Friction welding of plastics
- 810 Rotational friction welding
- 820 Ultrasonic welding of plastics
- 830 Vibration welding of plastics
- 840 Hot gas welding of plastics

5 Plant and equipment and joining elements, including automation, mechanization and industrial robots, for positive and non-positive joining

- 850 Flanging
- 860 Wire netting, wire weaving
- 870 Tamp joining
- 880 Hanging, expanding, clamping, wedging, extending
- 890 Seaming
- 900 Joining by extrusion or drawing
- 910 Joining by forming
- 920 Joining by lockforming (lockseaming)
- 930 Joining by compression or squeezing
- 940 Joining by widening or tightening (rolling in of tubes, botting, beading)
- 950 Joining by winding
- 960 Stapeling (using by wirestaples)
- 970 Riveting
- 980 Pressure joining (press-fitting, shrink-fitting, expansion-fitting)
- 990 Screwing
- 1000 Joining elements (rivets, tubular rivets, tap rivets, pop rivets, blind rivet nuts, bolts, screws)

6 Plant and equipment, including automation, mechanization and industrial robots, for special applications

- 1010 Torch cleaning, automatic torch cleaning systems
- 1020 Systems for feeding, positioning, tipping or conveying (e.g. nut feeding systems)
- 1030 Production equipment and production lines
- 1040 Orbital welding equipment
- 1050 Stack cutting
- 1060 Repair welding and cutting
- 1063 Welding trainer
- 1070 Underwater cutting
- 1080 Underwater welding
- 1090 Welding, brazing, soldering and thermal cutting and surfacing in aerospace applications

7 Services

- 1091 Leasing of welding plant and welding Equipment

- 1092 Leasing of welding manipulators

II Plant and equipment for heat treatment and other production processes

1 Plant and equipment, including automation, mechanization and industrial robots, for heat treatment

- 1100 Diffusion annealing
- 1110 Flame stress relieving
- 1120 Flame straightening
- 1130 Flame heating
- 1140 Hardening, tempering, annealing
- 1150 Induction heating
- 1160 Normalizing
- 1170 Furnace heating
- 1180 Stress relief annealing
- 1190 Soft annealing
- 1200 Resistance heating

2 Plant and equipment, including automation, mechanization and industrial robots, for other production processes

- 1210 Bending, pipe bending
- 1220 Milling, compressing, drawing
- 1230 Drilling
- 1240 Turning, milling, planing
- 1250 Edge preparation (e.g. plate and pipe chamfering machines)
- 1260 Casting
- 1270 Surface preparation and finishing
- 1280 Polishing
- 1290 Cold dressing
- 1300 Sawing
- 1310 Sintering and hot isostatic pressing
- 1320 Grinding
- 1330 Cutting (e.g. plate shearing), slamping, nibbling
- 1340 Welding conditioning
- 1345 Impact treatment
- 1350 Blasting
- 1360 Vibratory stress relieving
- 1370 Pumping

3 Workshop and workplace equipment, safety equipment

- 1380 Slinging gear, cranes and elevators (crane systems, lifting forks and beams, slewing cranes, lifting magnets, electric chain hoists)
- 1390 Work tables (e.g. welding and cutting tables)
- 1400 Heat recovery systems
- 1410 Load turning devices
- 1420 Transparent/opaque screens
- 1430 Soldering fume filters
- 1440 Machine protection gates
- 1450 At-source welding fume extraction systems (stationary, mobile)
- 1460 Sound absorbing materials, soundproof chambers
- 1470 Safety device for industrial robots (e.g. door locking systems, control boards, visual supervision systems)
- 1480 Welding booths
- 1490 Welding curtains
- 1500 Protective screens
- 1510 Weld fume filters and filtration systems
- 1520 Protection devices against fires and explosions
- 1530 Protection equipment against high energy radiation (e.g. X-rays, laser radiation)
- 1540 Stationary vacuum cleaners for industrial use
- 1550 Exhaust and ventilation systems
- 1560 Work benches, workshop lockers

- ❑ 1570 Workshop stools, aids to stability
- ❑ 1580 Workshop trolleys, cylinder trolleys
- ❑ 1590 Tools
- ❑ 1600 Other protective and safety devices (e.g. signs warning against possible Hazards, fire extinguishers, fire blankets)

4 Health and safety (personal protective equipment)

- ❑ 1610 Respiratory protection (filters-, insulating devices)
- ❑ 1620 First aid equipment, medicines
- ❑ 1630 Externally ventilated welding helmets
- ❑ 1640 Ear protection (wadding, ear plugs, ear muffs)
- ❑ 1650 Laser protection
- ❑ 1660 Protective clothing (helmets, aprons, garments, shoes, gloves)
- ❑ 1670 Welder's head screens and shields, protective goggles, eye protective filters
- ❑ 1680 Other protective equipment

5 General accessories

- ❑ 1690 Equalizing systems (e.g. for spot welding guns)
- ❑ 1700 Weld backings and adhesive tapes (for one sided welding)
- ❑ 1710 Torch-neck changing systems
- ❑ 1720 Torch and welding head manipulation systems
- ❑ 1730 Controlled feeding devices (e.g. for adhesives, solders and powders)
- ❑ 1740 Wire-guide spiral
- ❑ 1750 Wire feeders
- ❑ 1760 Turntables and tilt-turn positioners, lift tables
- ❑ 1770 Pressure cylinders for pressure and resistance welding
- ❑ 1780 Workpiece storage equipment (belts, pallets, stores)
- ❑ 1790 Resistance welding electrodes
- ❑ 1800 Materials for resistance welding electrodes
- ❑ 1810 TIG (GTA) welding electrodes
- ❑ 1820 Electrode holders
- ❑ 1830 Electrode grinding devices
- ❑ 1840 Gas lighters
- ❑ 1850 Globoidal drive
- ❑ 1860 Clamps (terminals, earthing, workpiece) and polarity testers
- ❑ 1870 Cooling systems
- ❑ 1880 Magnetic valves
- ❑ 1890 Water-, oil-, air-cooler
- ❑ 1900 Magnets for welding, magnetic handling equipment
- ❑ 1910 Assembly systems, assembling and positioning devices (clamps, roller blocks, line-up clamps)
- ❑ 1920 Plasma valves
- ❑ 1930 Spot welding guns
- ❑ 1940 Robot holding bracket
- ❑ 1950 Chipping hammers and wire brushes
- ❑ 1960 Hoses, hose couplings, hose connections, hose packages
- ❑ 1970 Hose press
- ❑ 1980 Welding-sets, diesel or gasoline driven
- ❑ 1990 Filler, wire spools
- ❑ 2000 Welding flux feeding and recovery devices
- ❑ 2010 Welding mirrors
- ❑ 2020 Welding leads and connectors
- ❑ 2030 Secondary cables for resistance welding
- ❑ 2040 Clamping systems, clamping elements
- ❑ 2050 Steel-wire brushes and hand brushes for welds
- ❑ 2060 Drying cabinets (electrodes and fluxes), heated quivers, baking ovens
- ❑ 2070 Workpiece handling systems (lift and shift systems, dial tables) other accessories, pumps and other auxiliary equipment
- ❑ 2080 Tool changing systems
- ❑ 2090 Tools for joint preparation
- ❑ 2100 Other accessories, pumps and other auxiliary equipment

6 Gas supply accessories

- ❑ 2110 Gas sources/tanks with pipework and valves (storage tanks, tankers, containers, cylinder racks and batteries, individual cylinders)
- ❑ 2120 Central switching, pressure regulating and safety units, gas mixing units and valves for supply pipework (switching, pressure regulating and safety devices, valves, gas filters, gas flow and pressure meters)
- ❑ 2130 Equipment for gas take-off stations (stop valves, pressure regulators, gas mixers, safety devices, take-off boards)
- ❑ 2140 Individual cylinders (pressure reducers and anti-flashback and backflow devices)
- ❑ 2150 Special equipment and general accessories (automatic switching and pressure control systems, gas analyzers, pipe identification stickers, clamps etc.)

7 Filler materials for welding and coating specific materials (classified by material groups)

- ❑ 2160 Filler materials for high alloy steels
- ❑ 2170 Filler materials for high alloy cast steels
- ❑ 2180 Filler materials for plastics
- ❑ 2190 Filler materials for non-ferrous metals and alloys
- ❑ 2200 Filler materials for unalloyed and low alloy steels
- ❑ 2210 Filler materials for unalloyed and low alloy cast steels
- ❑ 2220 Filler materials for wear and corrosion resisting deposits
- ❑ 2230 Filler materials for underwater welding
- ❑ 2240 Filler materials for other materials

8 Filler materials for welding, cutting and coating (classified by types)

- ❑ 2250 Wires, strips and plates for submerged arc and electroslag welding
- ❑ 2260 Wires and strips for micro welding
- ❑ 2270 Wire electrodes for gas metal-arc welding
- ❑ 2280 Flux cored wires and strips
- ❑ 2290 Tubular stick electrodes
- ❑ 2295 Metal powder for welding, coating and additive finishing as well as cored wire and rod electrode manufacture
- ❑ 2300 Welding fluxes
- ❑ 2310 Gas welding rods
- ❑ 2320 TIG (GTA) welding rods
- ❑ 2330 Gouging and thermal cutting electrodes
- ❑ 2340 Underwater welding and cutting electrodes
- ❑ 2350 Thermit welding materials
- ❑ 2360 Covered electrodes (manual metal arc welding)
- ❑ 2370 Filler materials for laser beam welding

9 Filler materials for thermal spraying (classified by composition)

- ❑ 2380 Carbide powders
- ❑ 2390 Ceramic powders (metal oxides/nitrides)
- ❑ 2400 Metal powders and wires
- ❑ 2410 Powder mixtures
- ❑ 2420 Suspensions
- ❑ 2430 Thermoplastics

10 Filler materials for thermal spraying (classified by process and type of spray material)

- ❑ 2440 Filler materials for flame spraying (wires, rods, powders)
- ❑ 2450 Filler materials for arc spraying(wires)
- ❑ 2460 Filler materials for plasma spraying (powders)
- ❑ 2470 Filler materials for molten metal spraying
- ❑ 2480 Filler materials for HVOF-spraying (powder)

- ❑ 2490 Filler materials for coldgas spraying (powder)
- ❑ 2500 Filler materials for suspension spraying (suspension)

11 Solders (classified by composition)

- ❑ 2510 Lead-tin solders
- ❑ 2520 Solders for aluminium
- ❑ 2530 Tin-lead solders with or without Cu, Ag, P additions
- ❑ 2540 Leadfree solders
- ❑ 2550 Other solders

12 Brazing fillers (classified by composition)

- ❑ 2560 Aluminium brazing fillers
- ❑ 2570 Gold containing brazing fillers
- ❑ 2580 Copper/brass brazing fillers
- ❑ 2590 Nickel base brazing fillers
- ❑ 2600 Palladium containing brazing fillers
- ❑ 2610 Phosphorus containing brazing fillers
- ❑ 2620 Platinum containing brazing fillers
- ❑ 2630 Silver brazing fillers
- ❑ 2640 Special brazing fillers (cobalt, titanium, zirconium base)
- ❑ 2650 Other brazing fillers

13 Forms of solders and brazing filler

- ❑ 2660 Flux cored rods
- ❑ 2670 Flux coated rods
- ❑ 2680 Brazing and soldering wires, rods and strips
- ❑ 2690 Preforms and foils
- ❑ 2700 Brazing and soldering pastes
- ❑ 2710 Filler precoated plates
- ❑ 2720 Brazing and soldering powders
- ❑ 2730 Stranded rods

III Plant equipment, including automation, mechanization and industrial robots, for thermal cutting and erosion

1 Plant equipment, including automation, mechanization and industrial robots, for thermal cutting and erosion

- ❑ 2740 Oxy-fuel gas cutting
- ❑ 2750 Oxygen lancing
- ❑ 2760 Flame scarfing
- ❑ 2770 Flame gouging
- ❑ 2780 Spark erosion and chemical machining
- ❑ 2790 Flame cleaning
- ❑ 2800 Carbon arc cutting
- ❑ 2810 Laser beam cutting and drilling, electron beam drilling
- ❑ 2820 Air arc gouging
- ❑ 2830 Arc-oxygen cutting
- ❑ 2840 Flame and fusion cutting with metal or mineral powder
- ❑ 2850 Plasma scarfing
- ❑ 2860 Plasma cutting
- ❑ 2870 Water jet cutting, water abrasive jet cutting

2 Plant for production of filler materials

- ❑ 2880 Acetylene generators and filling stations
- ❑ 2890 Conveying systems
- ❑ 2900 Gas manufacturing and liquefying plants

3 *Plant for production of consumables*

- 2910 Brazing filler and solder production plants
- 2920 Welding wire production plants
- 2930 Welding electrode and flux cored wire production plants
- 2940 Welding flux production plants

IV **General productions equipment for automation**

1 *General productions equipment, systems for computer aided manufacture, data processing, manual and automatic control engineering*

- 2950 CAD, CAM, CAQ, CIM and CAP systems
- 2960 Capture, checking and processing of process and production parameters
- 2970 Industrial plant
- 2980 Camera systems for monitoring design and production processes
- 2990 Seam tracking and welding head guidance systems
- 3000 Optics for laser beam welding and/or cutting
- 3010 Programs (software)
- 3020 Computers and other hardware (mini and microcomputers, PCs, mainframes, process computers, printers, plotters, processors, etc.)
- 3030 Mass production, flexible production facilities and welding lines
- 3040 Control engineering (pressure switches, solenoid and plasma valves, etc.)

2 *Adhesives*

- 3050 Epoxy resins (1C, 2C)
- 3060 Polyurethanes (1C, 2C)
- 3070 Reactive hotmelts
- 3080 Cyanoacrylates
- 3090 Anaerobically curing adhesives
- 3100 Curing on demand via UV radiation
- 3110 Silan netted polymer adhesives
- 3120 Phenol-formaldehyde resol adhesives
- 3130 Pressure sensitive adhesives
- 3140 Acrylate adhesives
- 3150 Silicones
- 3160 MS-polymers
- 3170 Structural pressure sensitive adhesives (PSA)
-

3 *Adhesive application*

- 3180 Cartridges
- 3190 Application systems
- 3200 Automatisation
- 3210 Control system adhesive application
- 3220 Metering appliances
- 3230 Supply/Metering pumps
- 3240 Mixers (dynamic, static)

4 *Surface treatment*

- 3250 Solvent containing systems
- 3260 Mechanical processes (grinding, blasting)
- 3270 Water based systems (neutral, acid, alkaline)
- 3280 Wet chemical processes (etching, phosphatating, anodizing, others)
- 3290 Dry chemical processes (silicoater, low pressure plasma, atmospheric pressure plasma, others)
- 3300 Primer/Adhesion promoters

5 *Consulting*

- 3310 Adhesive selection

- 3320 Design in adhesive bonding
- 3330 Characterisation of adhesives
- 3340 Quality management
- 3350 Auditing of processes
- 3360 Auditing of companies
- 3370 Plant construction (Plasma equipment)
- 3380 Paint/lacquer technology
- 3390 Fibre reinforced plastic technology
- 3400 Adhesive application
- 3410 Integration into the production (production planning)
- 3420 Health and safety
- 3430 Surface analysis
- 3440 Adhesive development
- 3450 Electrochemistry/corrosion
- 3460 Testing of materials and components
- 3470 Simulation and calculation of adhesive bonded joints

6 *Research and development*

- 3480 Adhesive selection
- 3490 Design in adhesive bonding
- 3500 Characterisation of adhesives
- 3510 Plant construction (plasma equipment)
- 3520 Paint/lacquer technology
- 3530 Fibre reinforced plastic technology
- 3540 Adhesive application
- 3550 Integration into the production (production planning)
- 3560 Surface analysis
- 3570 Molecular modelling
- 3580 Adhesive development
- 3590 Electrochemistry/corrosion
- 3600 Testing of materials and components
- 3610 Simulation and calculation of adhesive bonded joints

7 *Workforce qualification*

- 3620 European Adhesive Bonder (EAB)
- 3630 European Adhesive Specialist (EAS)
- 3640 European Adhesive Engineer (EAE)
- 3650 Fiber Composite Assembler

8 *Others*

- 3660 Specialist printer
- 3670 Technology broker
- 3680 Certification body of the Federal Railway Authority

9 *Gases*

- 3690 Fuel gases (acetylene, butane, natural gas, methane)
- 3700 Active gas
- 3710 Doping and test gas
- 3720 Compressed air
- 3730 Liquid gas
- 3740 Hydrogen-nitrogen mixture
- 3750 Inert gases (argon, neon, helium)
- 3760 Carbon dioxide
- 3761 lasing gas
- 3762 gas for laser welding and cutting processes
- 3770 Gas mixtures
- 3780 Oxygen
- 3790 Nitrogen
- 3800 Hydrogen

10 *Other consumables*

- 3810 Asbestos substitutes
- 3820 (weld) backing
- 3830 Pickling pastes
- 3840 Calcium carbide
- 3850 Leak-test materials

- 3860 Anti-spatter compounds
- 3870 Electro-burnish chemicals
- 3880 Paints and varnishes
- 3890 Brazing and soldering fluxes
- 3900 Auxiliary materials for thermit welding
- 3910 Heat protection equipment for welding work
- 3920 Impregnating compounds
- 3930 Ceramic performs
- 3940 Ceramic powders
- 3950 Solvents
- 3960 Solder masks and resists
- 3970 Surface cleaner
- 3980 Deadener
- 3990 Cleaning agents
- 4000 Raw materials for electrode coatings
- 4010 Anti-rust compounds
- 4020 Oxygen and powder lances
- 4030 Marking paints
- 4040 Explosives
- 4050 Lubricants
- 4060 Cutting powders for concrete, cast iron and other materials
- 4070 Chalk
- 4080 Weld primers
- 4090 Weld cleaning
- 4100 Sprays, technical
- 4110 Abrasives
- 4120 Cutting and snagging wheels

11 *Measurement and sensor technology*

- 4130 Chemical analysis
- 4140 Elongation, path and angle measurement
- 4150 Throughput and flow-rate measurement
- 4160 Scanning electron microscopes
- 4170 Ferrite-content measuring devices
- 4180 Photography and cinematography
- 4190 Speed and rotational-speed measurement
- 4200 Manual and miscellaneous measuring devices for arc welding (current, voltage, wire-feed rate, gas-feed rate, welding speed and energy per unit length)
- 4210 Holography
- 4220 Calibration
- 4230 Capacitance and inductance measurement
- 4240 Force measuring systems
- 4250 Gauges and weld gauges
- 4260 Power measurement
- 4270 Mass, density, force, torque and pressure measurement
- 4280 Measuring devices for gases, fumes and dusts
- 4290 Measuring devices for sound/noise
- 4300 Measuring devices for radiation
- 4310 Measuring devices for resistance welding (pulses, periods, current and voltage) and Rogovski belts
- 4320 Measuring and monitoring devices for the electrode-penetration depth in resistance welding
- 4330 Microscopy
- 4340 Surface quality (cut-surface quality)
- 4350 Specimen-preparation installations
- 4360 Roughness measurement of surfaces / roughness depths
- 4370 Coat-thickness, wall-thickness and crack-depth measurement
- 4380 Sensor technology
- 4390 Miscellaneous measurement technology and measuring devices
- 4400 Photoelasticity
- 4410 Current and voltage measurement
- 4420 Temperature measurement (optical, electrical, chemical and mechanical)
- 4430 Thermography
- 4440 Monitoring devices for arc welding
- 4450 Monitoring devices for resistance welding
- 4460 Hydrogen determination
- 4470 Resistance and insulation measurement
- 4480 Time, event-number and frequency measurement

12 *Testing Technology – Non-Destructive Testing*

- 4490 Acoustic measuring devices
- 4500 Acoustic microscopy
- 4510 Analysis devices
- 4520 Atomic-absorption spectrometers
- 4530 Auger probes
- 4540 Automation and computer assistance for non-destructive testing
- 4550 Automatic testing systems
- 4560 Automation in measurement and testing technology
- 4561 Determination and testing of products, joining processes and fabrication operations
- 4562 consultancy and planning of fabrication and application of materials, energy and processes
- 4570 Betatron and linear accelerators
- 4580 Image-processing installations
- 4590 Image intensifiers
- 4600 CAQ
- 4610 CCD cameras
- 4620 CIM
- 4630 Computerised tomography
- 4640 Elongation and stress determination methods
- 4650 Elongation gauges
- 4660 Densitometers Leak-testing installations and devices
- 4670 Leak testing
- 4680 Thickness measuring devices
- 4690 Dose and dose-rate measuring devices
- 4700 Darkroom facilities
- 4710 Radiographic testing
- 4720 Real-time radiographic systems
- 4730 Borescope
- 4740 Residual-stress measuring devices
- 4750 Penetration testing installations
- 4760 Electrical testing
- 4770 Electrodynamical testing
- 4780 Scanning electron microscopy
- 4790 Electronic measuring devices
- 4800 Demagnetization installations
- 4810 Dye penetrants
- 4820 Dye-penetration testing
- 4830 Color measuring devices
- 4840 Field-strength measuring devices
- 4850 Production measuring devices
- 4860 Production monitoring
- 4870 Configuration measuring devices
- 4880 Photographic devices
- 4890 Filling-level measuring devices
- 4900 Structural testing
- 4905 Design and analysis of welded structures
- 4910 Gammagraphic devices
- 4920 Hardness testing
- 4930 ICP spectrometers
- 4940 Information systems
- 4950 Infrared measurement technology
- 4960 Infrared thermography
- 4970 Calibration
- 4980 Parameter determination
- 4990 Nuclear magnetic resonance
- 5000 Corrosion testing
- 5010 Laboratory quality assurance
- 5020 Length measuring and testing devices
- 5030 Laminography
- 5040 Laser-beam testing
- 5050 Laser technology
- 5060 Leak detection
- 5070 Light measuring devices
- 5080 Light microscopy
- 5090 Magnetic powders
- 5100 Magnetic-powder testing devices and installations
- 5110 Magnetic testing
- 5120 Manipulators
- 5130 Marking systems
- 5140 Mathematics, statistics and computers
- 5150 Measured-data collection
- 5160 Measuring systems
- 5170 Metallography
- 5180 Metallographic tests
- 5190 Microfocus x-ray installations

- 5200 Mobile spectrometers
- 5210 Neutron-beam testing
- 5220 Surface testing devices
- 5230 Optical testing
- 5240 Penetration installations and penetrants
- 5250 Physical tests
- 5260 Testing documentation
- 5270 Testing machines
- 5280 Testing agents for magnetic-powder testing
- 5290 Testing-agent monitoring
- 5300 Testing of welded joints
- 5310 Quality control
- 5320 Quality planning
- 5330 Quality assurance in process monitoring
- 5340 Quality assurance in repair/maintenance
- 5350 Quality assurance in series production
- 5360 Radioactive materials
- 5370 Radiography
- 5380 X-ray film
- 5390 X-ray apparatus
- 5400 X-ray diffractometers
- 5410 X-ray-film viewers
- 5420 X-ray fluorescence analysis
- 5430 X-ray tubes
- 5440 X-ray carriages
- 5450 X-ray accessories
- 5460 Scanners
- 5470 Damage analysis
- 5480 Acoustic-emission analysis
- 5490 Acoustic-emission devices
- 5500 Coat-thickness measuring devices
- 5505 Supervision of welding and fabrication operations, on site and in-plant

- 5510 Weld testing
- 5520 Vibration measurement
- 5530 Safety technology
- 5540 Visual inspection
- 5550 Signal and image processing
- 5560 Computational Modelling/Simulation
- 5570 Software packages
- 5580 Miscellaneous non-destructive testing procedures
- 5590 Spectral analysis
- 5600 Spectral-analysis devices
- 5610 Spectral photometers
- 5620 Spectrometers
- 5630 Radiation measuring devices
- 5640 Radiation-protection measuring devices, components and materials
- 5650 Control systems
- 5660 Stray-flux testing devices
- 5670 Temperature measuring devices
- 5680 Thermal analysis
- 5690 Thermal testing
- 5700 Thermographic installations
- 5710 Ultrasonic applications
- 5720 Ultrasonic testing devices and installations
- 5730 Ultrasonic testing
- 5740 Ultrasonic cleaning installations
- 5750 Ultrasonic transducers
- 5755 ultraviolet lamps
- 5760 Wear tests / erosion tests
- 5770 Confusion testing
- 5780 Vibration analysis
- 5790 Video installations and cameras
- 5800 Thermal-conductivity measuring devices
- 5810 Materials testing
- 5820 Eddy-current testing
- 5830 Eddy-current testing devices and installations
- 5840 Non-destructive testing
- 5850 Accessories for testing facilities

13 *Testing Technology – Destructive Testing*

- 5860 Dynamic fracture testing (Battelle, drop-weight, double-torsion, explosion-bulge, Esso notched-bar bend impact, notched-bar tensile impact, Niblink and Robertson tests)
- 5870 Hardness testing
- 5880 Resources, automation and computer assistance for destructive testing

- 5890 Kic test and crack-opening displacement (COD) test
- 5900 Weldability testing (cold-cracking and hot-cracking testing and others)
- 5910 Miscellaneous and mechanical-technological tests
- 5920 Static fracture testing (longitudinal-weld bend, bursting, deep-notch, bend, notched-bar bend, notched-bar tensile and wide-plate tests)
- 5930 Universal testing facilities
- 5940 Creep rupture and fatigue-endurance strength testing and vibration-fatigue testing installations
- 5950 Tensile, pressure, torsion and bend testing

14 *Testing Technology – Materials Testing*

- 5960 Plant monitoring and production monitoring
- 5970 Parameter determination
- 5980 Quality and defect testing
- 5990 Environmental-protection tests
- 6000 Properties to be tested
- 6010 Materials to be tested
- 6020 Components to be tested (areas of application)

15 *Testing Technology – Testing Procedures/ Testing Facilities*

- 6030 Component testing / design testing
- 6040 Fracture-mechanical parameters
- 6050 Chemical tests
- 6060 Strength and toughness
- 6070 Structural investigations
- 6080 Resources for metallography (etching agents, polishing agents and embedding compounds)
- 6090 Mechanical testing procedures
- 6100 Physical tests
- 6110 Weldability tests
- 6120 Technological testing procedures

16 *Quality Assurance (According to Mas-ing's "QA Manual")*

- 6130 A+F in QM
- 6140 Bilatometry
- 6150 Ergonomics of workplaces
- 6160 Instructions for use
- 6170 Mathematics, statistics and computers
- 6180 Measurement technology
- 6190 Organization for QA and insurance policies
- 6200 Quality planning and assessment
- 6210 Quality assurance in packing, storage and transport
- 6220 Quality assurance in small and medium-sized businesses and in skilled trades
- 6230 Quality assurance of software

17 *Miscellaneous*

- 6240 Training and education
- 6250 Consultancy companies
- 6260 Data processing
- 6270 Service companies
- 6280 Trade journals / specialist books
- 6290 Research institutes
- 6300 Information systems
- 6310 Calculation systems
- 6320 Societies and organizations
- 6330 Certification

V Contract work and services for joining, separating and coating

2 Sub-contracting – Processing of specific materials

- 7030 Aluminum
- 7040 Free machining steels
- 7050 Coated and plated materials
- 7060 Concrete
- 7070 Concrete reinforcing bars
- 7080 Lead, bismuth, cobalt, cadmium
- 7090 Cermets
- 7100 Chromium
- 7110 Duplex steels
- 7120 Termosets
- 7130 Elastomers
- 7140 Fiber reinforced materials
- 7150 Fine grained structural steels
- 7160 Refractory materials
- 7170 Glass
- 7180 Cast iron
- 7190 High alloy steels
- 7200 High temperature materials
- 7210 Ceramics
- 7220 Carbon
- 7230 Copper
- 7240 Laminates
- 7250 Leather
- 7260 Magnesium
- 7270 Brass
- 7280 Nickel
- 7290 Low alloy steels
- 7300 Niobium, manganese
- 7310 Cardboard, paper
- 7320 Platinum, gold, silver
- 7330 Compression moulding compounds (polymers)
- 7340 Pipe steels
- 7350 Rail steels
- 7360 Shipbuilding steels
- 7370 Sintered materials
- 7380 Cast steel
- 7390 Superalloys (hot isostatic pressure)
- 7400 Thermoplastics
- 7410 Titanium
- 7420 Unalloyed steels
- 7430 Tool steels
- 7440 Weathering steels
- 7450 Tungsten, tantalum, molybdenum
- 7460 Tin, zinc
- 7470 Zirconium, vanadium, beryllium
- 7480 New materials (high strength, light weight constructions and superhard materials, nanomaterials, light and electricity conducting materials, magnetic materials, implant materials etc.)

3 Sub-contracting – Processing of specific semi-finished products

- 7490 Strip and wide strip
- 7500 Reinforcing bars and mesh
- 7510 Sheet, plate, checker plate, perforated plate
- 7520 Wires
- 7530 Springs
- 7540 Foils, thin strip
- 7550 Castings
- 7560 Plastic films, strips, sheets
- 7570 Plastic pipes, flanges and other plastic semi-finished products
- 7580 Plastic tubes and sleeving
- 7590 Plastic products
- 7600 Copper pipes
- 7610 Brass pipes
- 7620 Sections (girders)
- 7630 Pipes and flanges
- 7640 Circular blanks
- 7650 Rails
- 7660 Hoses (metal)
- 7670 Forgings

- 7680 Sintered parts
- 7690 Extruded products

4 Sub-contracting – Application of joining and other manufacturing processes

- 7700 Flash welding
- 7710 Surfacing
- 7720 Pickling, sand blasting, polishing, deburring and/or grinding
- 7730 Stud welding
- 7740 Flame cleaning
- 7750 Flame cutting blanks
- 7760 Spark erosion
- 7770 Electron, laser beam welding
- 7780 Electroslag welding
- 7790 Gas pressure welding
- 7800 Gas welding
- 7810 Adhesive bonding of plastics
- 7820 Adhesive bonding of metals
- 7830 Welding of plastics
- 7840 Plastic spraying
- 7850 Laser beam welding and/or cutting
- 7860 Manual metal arc welding
- 7870 Brazing and soldering
- 7880 Metallizing, dip coating and anodizing
- 7890 Metal spraying
- 7900 Oxidized ceramic spraying
- 7910 Computational modeling of processes
- 7920 Resistance spot and/or projection welding
- 7930 Friction welding
- 7940 Robot welding TIG/MIG/MAG
- 7950 Seam welding
- 7960 Friction stir welding
- 7970 Gas shielded arc welding
- 7980 Magnetically impelled arc butt welding (MIAB)
- 7990 Computational modeling/Simulation of weld processes
- 8000 Computational modeling/Simulation of structures
- 8010 Thermal cutting
- 8020 Ultrasonic welding
- 8030 Firecracker, electrogas and/or submerged arc welding
- 8040 Scrapping
- 8050 Vibratory stress relieving
- 8060 Heat treating and/or quenching and tempering
- 8070 Maintenance, servicing, repair
- 8080 Computational modeling of materials
- 8085 waste containing precious metal

5 Organizations, education and training, certification, research, information transfer, technical literature and regulations

- 8090 Accreditation and certification organizations
- 8100 Acceptance, approval, examination and supervisory organizations
- 8110 Training, continuing education and examination of specialist personnel
- 8120 Supervisory bodies, Chambers of Trade, Employers Associations
- 8130 Technical publishers, Libraries (literature, codes of practice, educational films, software, CD-ROM and diskette services, audiovisual media)
- 8140 Joining research and education
- 8150 Consultants, experts
- 8160 Information services (literature and factual database searches, expert systems, expert certification, literature appraisal, state of the art and trend analyses)
- 8170 Codes of practice, standardization, patents (incl. organizations)
- 8180 Technical and scientific associations, industrial associations

VI Plant and equipment, including automation, mechanization and industrial robots, for thermal spraying

1 Plant and equipment, including automation, mechanization and industrial robots, for thermal spraying

- 6340 Flame spraying with wire or rod
- 6350 Flame spraying with powder
- 6360 Plastic Flame spraying
- 6370 High-velocity oxy-fuel spraying (HVOF)
- 6380 Detonation spraying
- 6390 Plasma spraying
- 6400 Suspension spraying
- 6410 Laser spraying
- 6420 Arc spraying
- 6430 Cold gas spraying
- 6440 Plasma transfer arc welding (PTA)
- 6450 Pressure & vacuum blasting
- 6460 Masking compounds & tapes
- 6470 Blasting media
- 6480 Finishing tools/grinding wheels
- 6490 Sand-blasting equipment
- 6500 Sealants
- 6510 Exhaust systems / bag houses
- 6520 Automated spraying systems
- 6530 Flow controller
- 6540 Air compressors
- 6550 Manipulators
- 6560 Wet collectors
- 6570 Testing equipment
- 6580 Powder feeder
- 6590 Robotics
- 6600 Soundproof rooms
- 6610 Spray booths
- 6620 Other powders
- 6630 Wires
- 6640 Intermetallic powders
- 6650 Carbide powders
- 6660 Ceramic powders (metal oxides/nitrides)
- 6670 Ceramic rods
- 6680 Metal powders
- 6690 Self Fluxing powders
- 6700 Powder mixtures
- 6710 Suspensions
- 6720 Thermoplastics
- 6730 Superfinishing
- 6740 Grinding
- 6750 Machining
- 6760 Other
- 6770 Education
- 6780 Market research
- 6790 Test coupons
- 6800 Testing services / equipment / supplies
- 6810 Virtual spraying
- 6820 Atmospheric corrosion
- 6830 Abradable applications
- 6840 Electrical / electronics
- 6850 Clearance control
- 6860 High temperature corrosion
- 6870 Reclamation
- 6880 Vacuum plasma
- 6890 Wear resistance
- 6900 Thermal barrier
- 6910 Aluminizing
- 6920 Anodizing
- 6930 CVD (chemical vapor deposition)
- 6940 Electrolytic oxidation
- 6950 Enameling
- 6960 Painting, varnishing
- 6970 Flame cleaning and phosphatising
- 6980 Plastic coating
- 6990 Metallizing
- 7000 PVD (physical vapor deposition)
- 7010 Dip coating
- 7020 Tin, zinc, nickel, copper and chromium plating

Pricelist

Publication in:



Circulation: 6,000 copies
 Frequency: in 6 of 11 issues annual
 Language: German



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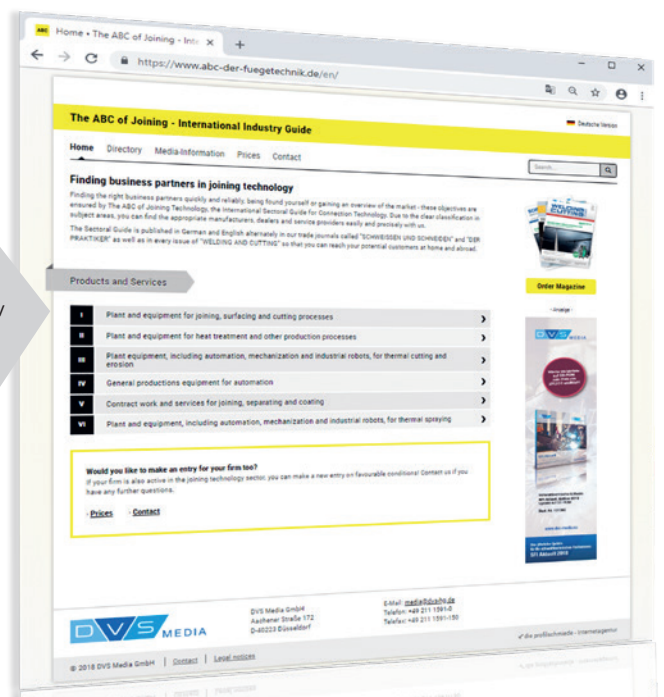
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