

# Berkenhoff GmbH

Company profile

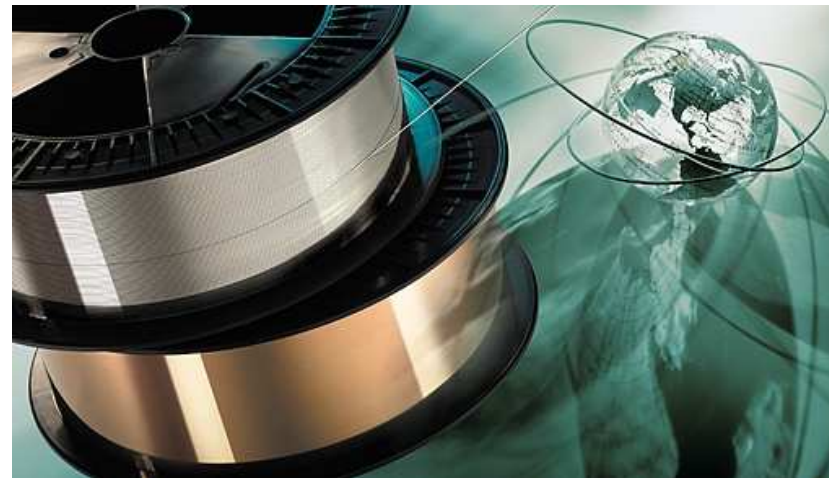
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Under its corporate trademark **bedra** (**B**erkenhoff **D**raht)  
Berkenhoff produces and distributes innovative non-ferrous wires for

- **spark erosion**

- **welding**

- **electronics &  
special applications**



# Berkenhoff in detail

- 2 production sites
  - 70 km north of Frankfurt
- distribution agencies and partners in more than 80 countries

1889–2009

**120**  
*years*  
**BERKENHOFF**

- Tradition
- Innovation
- Know-How
- Quality



## Key figures Berkenhoff

### Employees

▪ 470



### Areal

▪ 346.110 m<sup>2</sup>



### Turnover

▪ 111 Mio. €

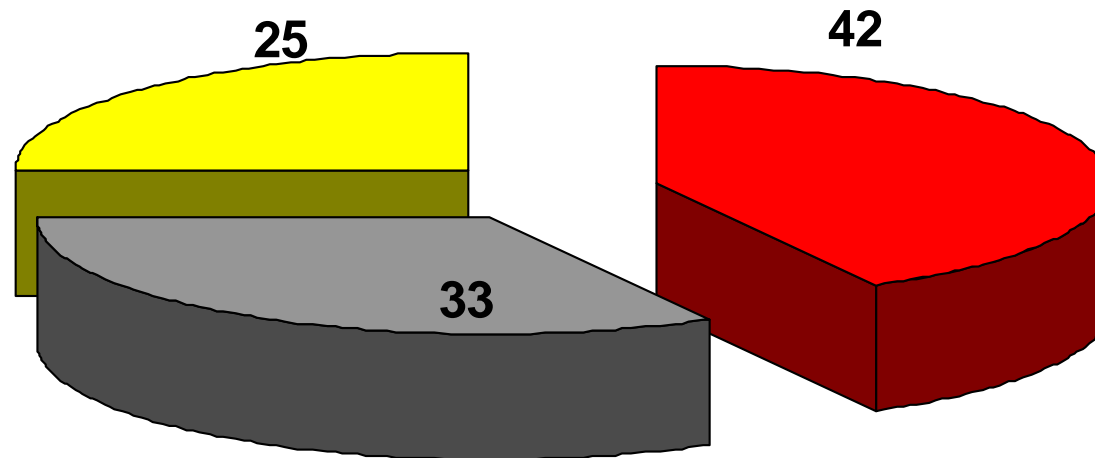


### Capacity

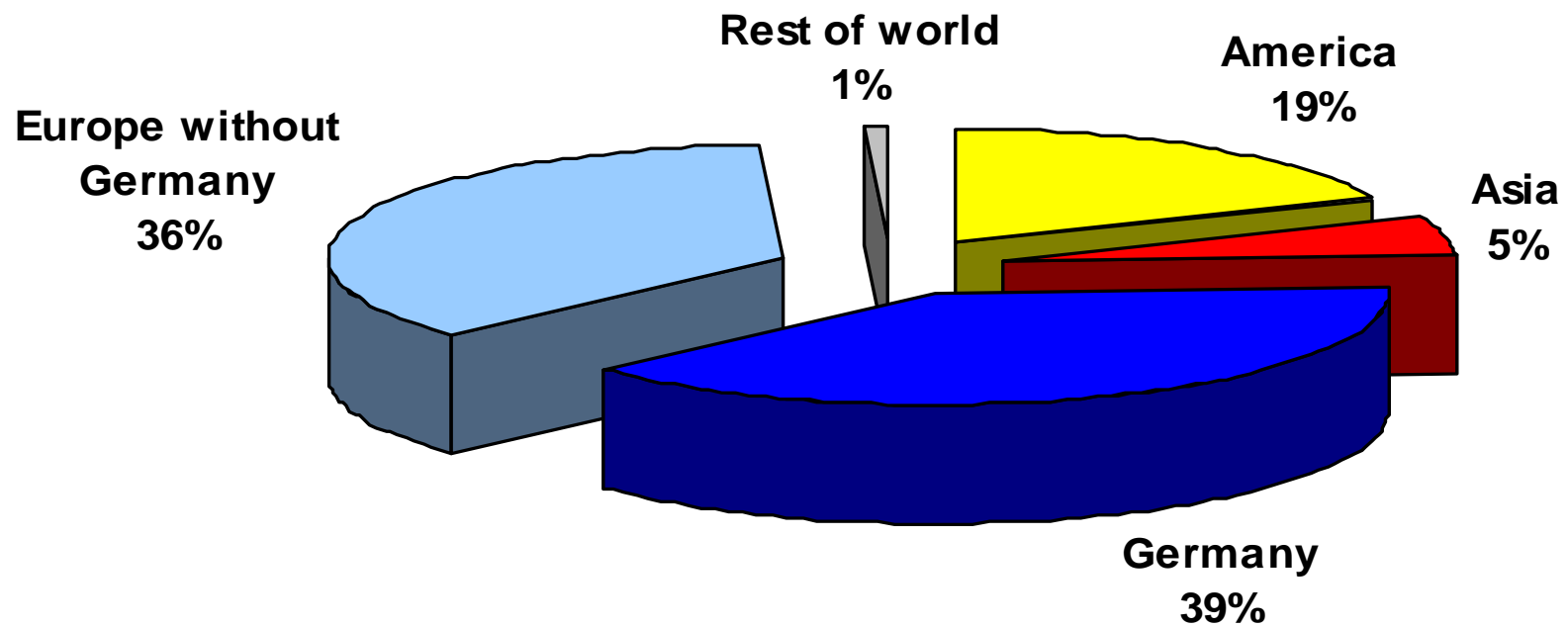
▪ 11.000 to / year



## Turnover by business unit (%)



## Turnover by region



# Production Process

## Plant Kinzenbach



smelting, continuous casting,  
cold rolling, annealing, drawing

welding wire, optical & special  
wire, redrawing wire



## Plant Merkenbach



primary drawing, annealing,  
electroplating, fine drawing,  
profiling

EDM wire, electronic wire  
anchor wire, special wire

- **All from one source: the Berkenhoff in-house concept**
- **Own R&D department, numerous patents**
- **Certificated allover quality testing programme**
  - **DIN EN ISO 9001:2008**
- **From melting to final packaging:  
bedra products are completely made in Germany**
- **Our in-house concept allows complete traceability and quality control**
- **The production process at a glance:**





- **Foundry**

- More than 100 different alloys
  - Only high-grade virgin metals are used
  - Extensive analysis
- High-level quality, reproducible alloys
- Tightest alloy tolerances



- **Annealing**

- Prior to rod drawing:  
long-time annealing under  
protective atmosphere
  - Gentle microstructure  
transformation
  - Embrittlement of the metal  
excluded
- Followed by: Annealing passes  
after each rolling / drawing pass  
if required
  - Optimal formability



- **Wire drawing / rolling**

- Fine drawing with diamond dies
- Permanent laser monitoring
- Process integrated annealing

- Optimal wire surface, e.g. no grooves
- Highly precise wire diameter
- constant quality



drawing



rolling

- **Electroplating**

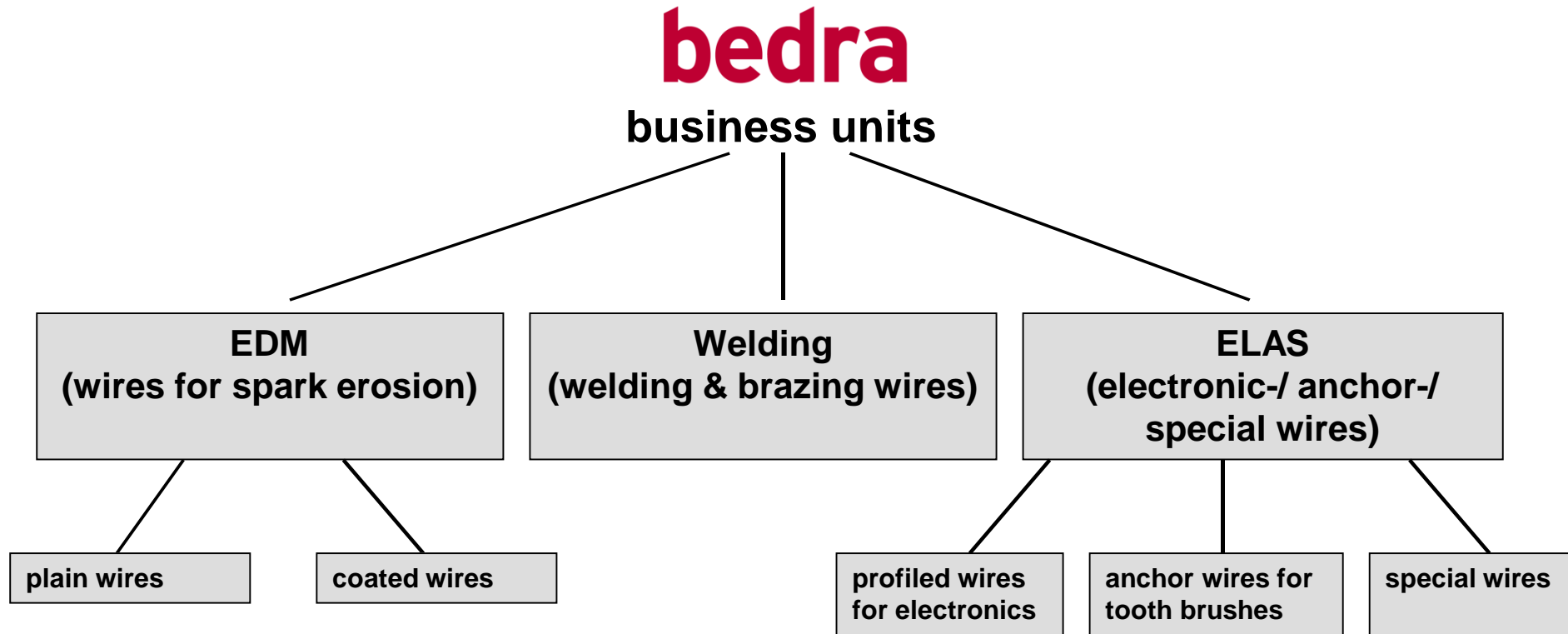
- Modern, high performance electrolytes
  - Highly pure tin anodes
  - Multilayer -, Reflow technology
  - Internal inspections in own laboratory
- Various coating variants
  - Consistent surface quality
  - Certified quality on the highest level
  - Strict fulfilment of all environmental guidelines



# Overview of the alloys

<b>Copper wires</b>	<b>Brass wires</b>	<b>Tin bronze wires</b>	<b>Nickel silver wires</b>
0,10 mm to 8,00 mm	0,05 mm to 8,00 mm	0,02 mm to 8,00 mm	0,05 mm to 11,50 mm
plain, electro tin-plated, silver-plated and zinc-plated	plain, electro tin-plated and zinc-plated, with Ni and/or Cu barrier layer	plain, electro tin-plated and silver-plated, with Ni and/or Cu barrier layer	plain, electro tin-plated and silver-plated, with Ni and/or Cu barrier layer

Special alloys on request



## Wire electrodes for spark erosion



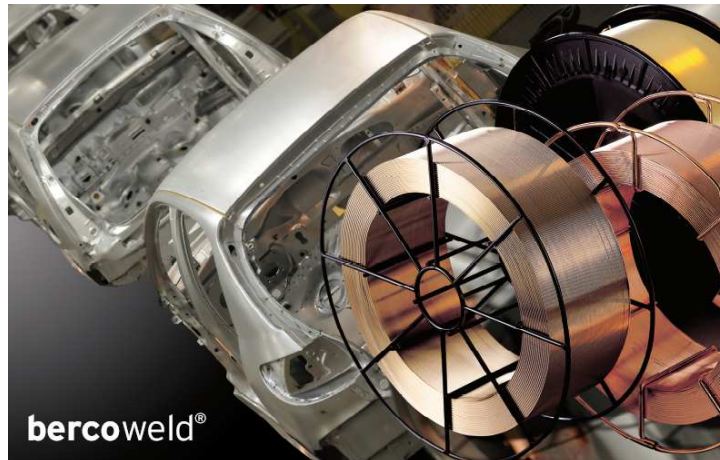
### Materials

- Plain brass alloys
- Coated brass alloys
- Diffusion annealed brass alloys
- Composite materials

### bedra markets

- Tool- and Mouldmaking industry
- Automotive industry
- Household appliances
- Electronics industry
- Machine building ind.
- Mechanical engineering
- Telecommunications
- Packaging industry
- Watch making industry
- Toys industry
- Aviation industry
- Optical industry
- Medical technology

## Wires for brazing & welding



### Materials:

- Low alloyed copper alloys
- Tin bronzes
- Aluminium bronzes
- Copper nickel alloys

### bedra markets

#### Transportation engineering

- Automotive industry
- Track construction
- Shipbuilding
- Motor bike industry
- Bicycle industry
- Agricult. mach. ind.
- Military engineering

#### Plant engineering

- Offshore / Onshore
- Turbine building
- Mould and tool making
- Mining
- Container building

#### Building industry

- Civil engineering
- Building machinery

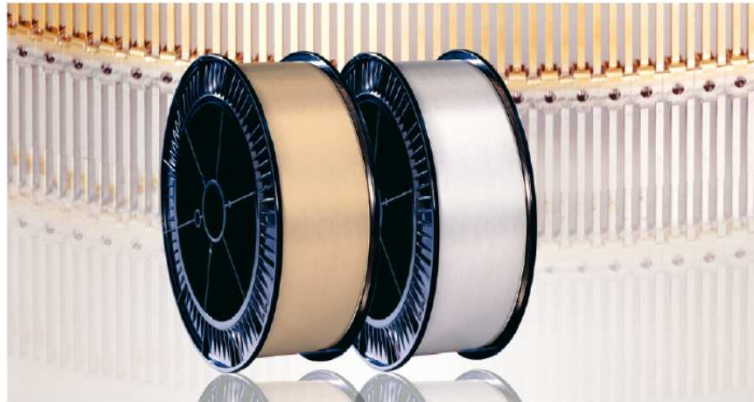
### bedra customers

- VW
- Audi
- Fiat
- Seat
- BMW
- Skoda
- Opel
- Ford
- PSA
- Daimler
- Hyundai
- Daewoo
- Renault
- Honda
- Suzuki
- Yamaha
- Maersk
- MTU
- ABB





## Profiled wires for electronics



### Materials

- Tin bronze alloys
- Brass alloys
- Nickel silver alloys
- Copper materials
- Highly conductive alloys
- Spinodal alloys
- Special alloys

### bedra markets

- Automotive industry
- Industrial electronics
- Telecommunications
- Information technology
- Consumer electronics
- Medical technology
- Military engineering
- Aviation and aerospace technology
- Lighting engineering
- Civil engineering
- Agriculture & forestry

### bedra customers

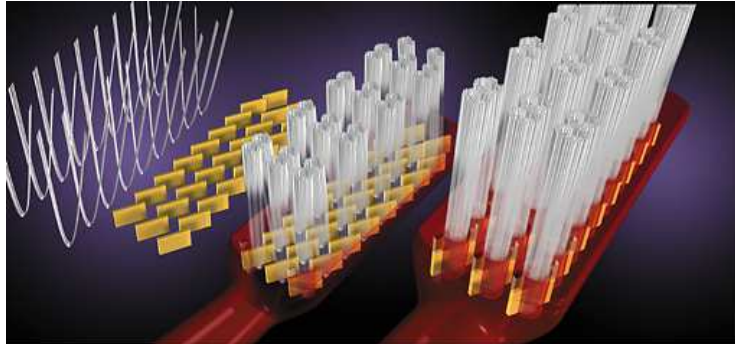
- Tyco
- Molex
- Bosch
- FCI
- Delphi
- Valeo



Wire geometries: Round wires, Square profiles, Flat profiles, Serrated wires, Special profiles on request

Surface refinement: Electroplated wires, Multi-layer technology, Reflow technology

## Anchor wires



### Materials

- Nickel silver alloys
- Brass alloys
- Special alloys

Wire geometries: Flat profile grooved, Flat profile ungrooved

### bedra markets

- Toothbrush industry



### bedra customers

- Colgate-Palmolive
- Oral-B
- Braun
- Gillette
- Procter & Gamble

# Business Units

## Special wires



### bedra markets

- Medical instruments
- Optical industry
- Jewellery
- Bottle nets
- Springs, pins, rivets
- Decoration, gift articles

# Summary of the key facts

## What makes **bedra** a premium product?

### Product range:

- More than 100 alloys
- All packagings
- Varied diameters

### Berkenhoff:

- Made in Germany
- Complete in-house production
- Highly qualified employees
- Expertise in wire
- 120 years of experience
- Environmental Management System certified acc. to ISO 14001
- Own R&D department

### Quality:

- Certified Quality Management System acc. to ISO 9001
- Complex product inspection at each stage of manufacture
- Tightest tolerances for optimum processing results

### Service:

- Global sales
- On-site Service
- Customized solutions
- Extensive sampling
- Free 3.1 inspection certificate

## What makes **bedra** a premium product?

### Berkenhoff:

### Competition:

<b>Own foundry</b> – homogeneous initial microstructure, extensive alloy quality control	Purchase of redrawing material – variations in quality
<b>Use of virgin metals</b> – high-purity alloys	Use of scrap – undesired accompanying elements
<b>Tightest alloy tolerances</b> – highest process stability	Wide alloy tolerances acc. to international standards– instable process
<b>Use of natural diamonds</b> as drawing dies, <b>own die polishing shop</b> – homogeneous surfaces	Industrial diamonds, die polishing performed by outside contractors – non-uniform wire surfaces
<b>Long-time annealing</b> – gentle microstructural transformation – homogeneous, fine-grained microstructure, reliable straightness	Fast continuous annealing – high porosity of the surface, embrittlement of the wire
<b>Inhouse R&amp;D</b> – customized alloys	Production of standard alloys
<b>Reproducible quality at the highest level</b>	Variations in quality, lack of process stability