PARTZSCH

SPEZIALDRÄHTE

# LIVE WIRES AT YOUR SERVICE

**CHRISTIAN PARTZSCH**

*» The special wires manufactured with passion and expertise at PARTZSCH Spezialdrähte GmbH are up to meet any challenge. Over many years, we have built up extensive know-how in order to realise individual production requirements for copper wires in a wide range of dimensions and insulation designs. In our work, we benefit from our close collaboration with engineers from the development, design and production departments in electrical engineering.*

*Our customers in the fields of renewable energies, electromobility, the rail sector and transformer, generator and electric motor manufacturing have been relying on our high-quality special wires for years. We hope you will, too.*

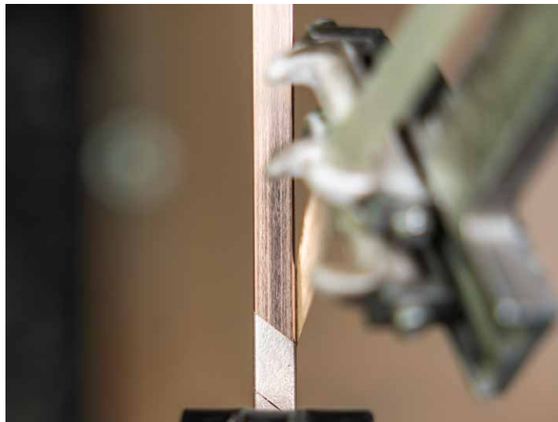
*We look forward to working with you! «*

# PARTZSCH SPEZIALDRÄHTE

Live wires at your service: Since the 1990s, PARTZSCH Spezialdrähte GmbH has been manufacturing and finishing copper wires, supplying a key component for electrical machines and drive systems. Over the years, we have continuously developed into one of the leading companies in the copper wire processing industry.

Meeting our customers' requirements is our top priority. We manufacture products that fulfil your precise specifications. Continuous quality monitoring – both through our state-of-the-art production facilities and permanent supervision of our testing department – ensures compliance with all required parameters.

Our quality management system is certified according to DIN EN ISO 9001:2015 and guarantees outstanding production results. Sustainability is equally important to us: the requirements of DIN EN ISO 14001:2015 are fulfilled and externally verified. Individual customer service and the shortest possible delivery times are a matter of course for us.



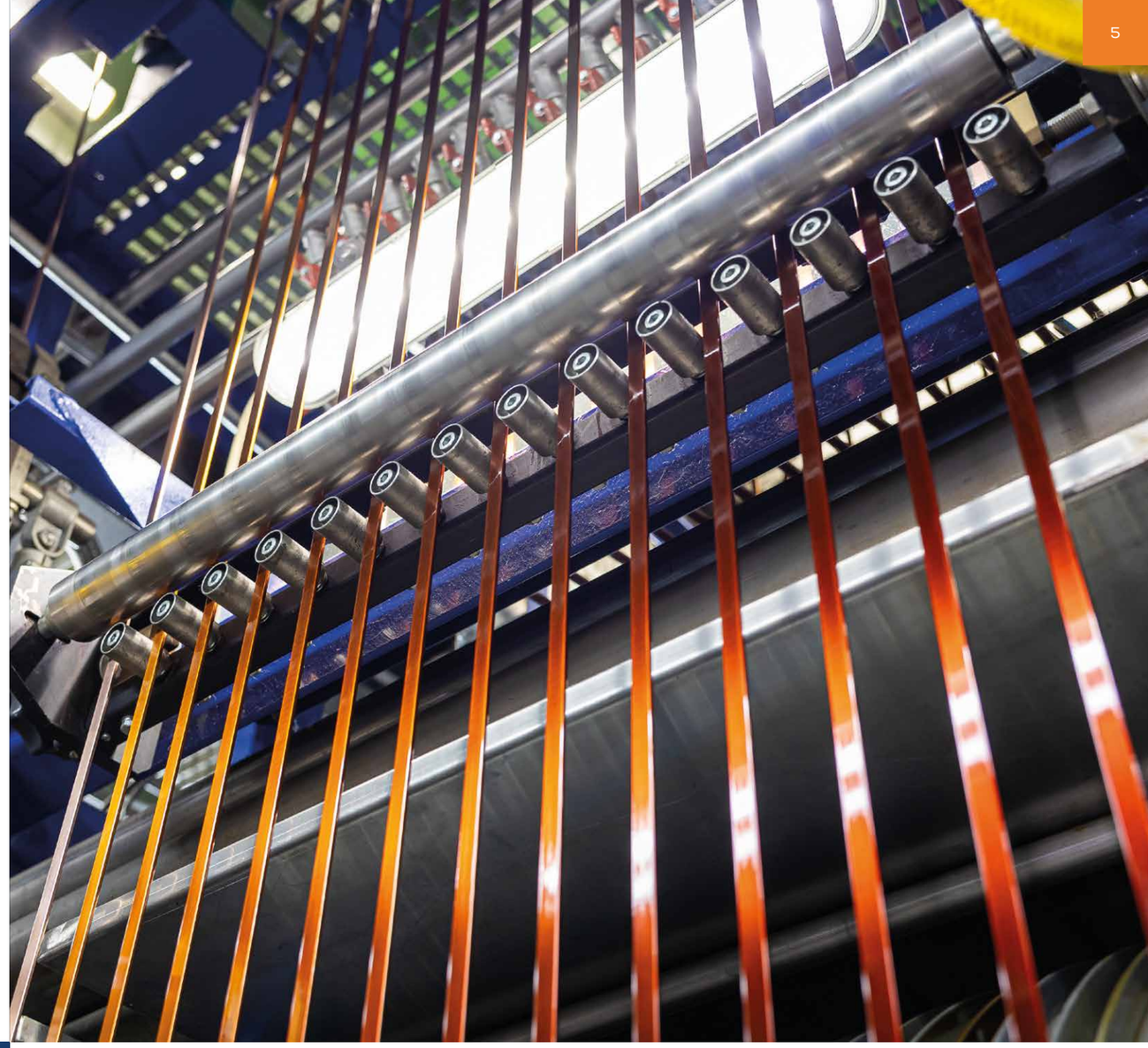
# OUR PRODUCTS AND SERVICES

PARTZSCH Spezialdrähte GmbH manufactures approximately 10,000 tonnes of copper wire annually for industrial applications worldwide – in precisely the dimensions, qualities and insulation types required by our customers. Our particular strength lies in the production of rectangular and round copper wires, bare or insulated, for a wide range of applications in generators, transformers, electric motors and other electro-technical components.

Our winding wires are predominantly based on high-conductivity copper (Cu-ETP or Cu-OF), characterised by excellent electrical conductivity, mechanical strength and outstanding workability.

Thanks to cutting-edge production processes and a high vertical range of manufacture, we realise both standard products and customised special solutions.

For use in highly demanding electrical applications, we offer a broad spectrum of insulation materials, including: Polyimide film, Mica, Aramid paper (Nomex®), Glass filament and Temperature-resistant enamels. The resulting winding wires are used worldwide in coils, reactors, traction motors, generator windings and transformers. For reliable downstream processing, we supply our wires on suitable industry-standard spools.



## YOUR ADVANTAGES AT A GLANCE

- Many years of experience in wire production
- One of the most modern machinery bases in Europe
- Uncomplicated and flexible order processing
- Fast and on-time deliveries
- Short decision-making paths
- Certified according to DIN EN ISO 9001:2015
- Highest quality standard – made in Germany
- Part of a successful company group
- Laboratory testing in our qualified in-house laboratory

# PRODUCTION AT THE HIGHEST LEVEL

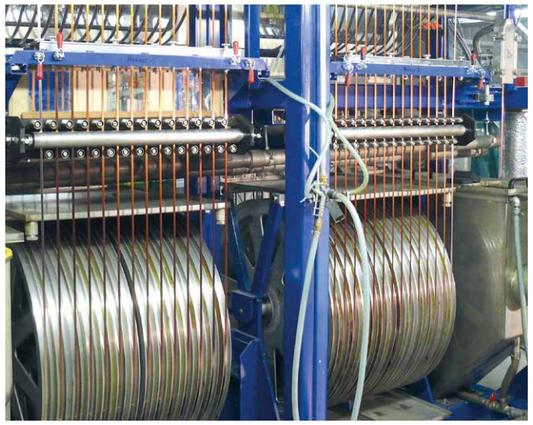
Our bare copper wires are manufactured in our modern production facility in finely coordinated process steps. The outstanding properties of the copper used allow significantly greater deformation without intermediate annealing. To relieve any stress peaks that may nevertheless occur and to achieve the application-specific deformability required, we carry out subsequent heat treatment in our specialised machinery park comprising annealing furnaces and cooling stations. The resulting deformability is also a distinctive quality feature of our copper wires. All wires are manufactured in accordance with DIN standards and correspond as standard to R200 quality. Customer-specific requirements can be realised upon consultation.

## OUR COMPREHENSIVE STANDARD PROGRAM

- Manufacturing according to DIN standards
- Rectangular wires: Width 3.35 ... 30.00 mm
  Thickness: 1.00 ... 7.00 mm
- Round wires: Diameter 2.80 ... 11.00 mm
- Customised wire dimensions available upon request







# ENAMELLING AND INSULATION

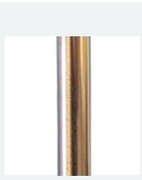
***Wire enamelling***
Depending on requirements, we apply enamel coatings of various layer thicknesses. We manufacture enamelled rectangular wires with minimal tolerances in widths from 3.35 to 14.00 mm and thicknesses from 1.00 to 6.00 mm.

***Wire insulation with various tape types***
We insulate rectangular and round wires with a wide range of insulation materials, including polyimide film, mica film, paper and aramid paper.
Paper or film insulation is available for round wires: diameter 0.85 – 6.00 mm and rectangular wires in widths from 3.35 to 25.00 mm and thickness from 1.00 to 7.00 mm.

***Wire insulation with glass filament or mixed yarn***
Wires exposed to high mechanical stress, vibration, elevated temperatures and temperature fluctuations are primarily braided with yarns resistant to such influences.
For these purposes, we use glass filament and mixed yarns (Daglas) with varying numbers of individual threads, which can be impregnated with epoxy resin or polyester-imide enamel. These specifications allow us to manufacture wires precisely according to your requirements in a wide variety of designs.

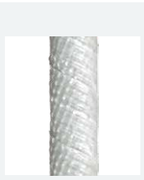
# SPECIAL WIRES IN ALL VARIANTS

While round wires are frequently used for standard windings where processing convenience is more critical than space requirements. Rectangular wires are often used in high-performance applications such as powerful direct drives or electrical machines requiring high power density and efficiency.

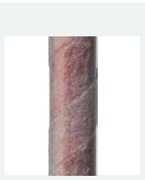


**Copper round wire**
Bare

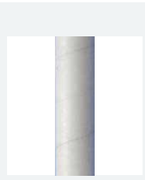
**Round wire**
Insulated with polyimide sheet



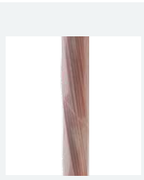
**Round wire**
Insulated with glass fibre mica tape



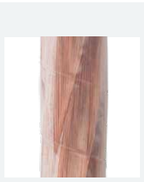
**Round wire**
Enamelled with mica tape



**Round wire**
Insulated with Nomex® aramid paper



**Stranded copper wire**
6 mm²
Insulated with PET film

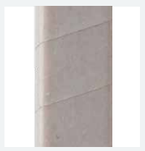


**Stranded copper wire**
35 mm²
Insulated with PET film

**Copper rectangular wire**
Bare

**Copper rectangular wire**
Insulated with 2 layers of polyimide sheet

**Copper rectangular wire**
Mica-insulated



**Copper rectangular wire**
Insulated with Nomex® aramid paper

**Copper rectangular wire**
Enamelled

**Copper rectangular wire**
Enamelled and braided with 1 layer of mixed yarn



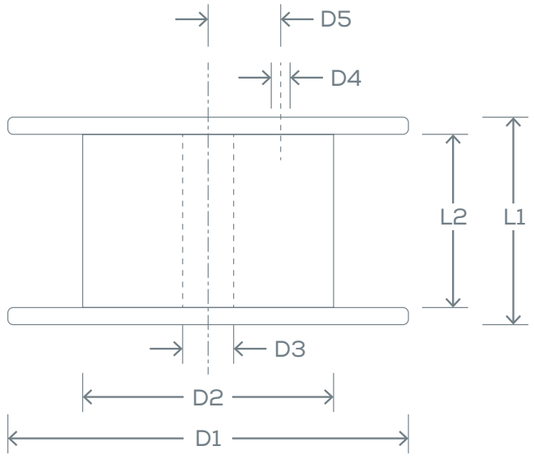


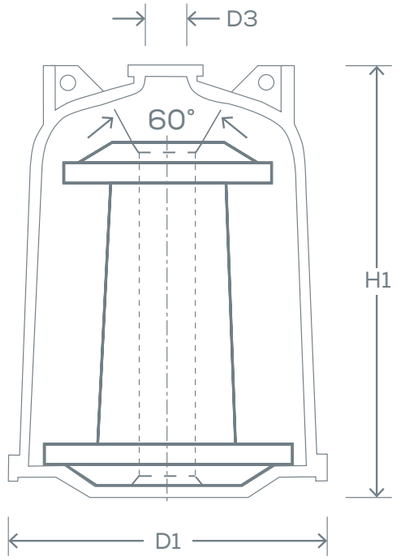
# OVERVIEW OF OUR ASSORTMENT OF WIRES

| | **Bare wires** (in mm) | **Rectangular and round wires** insulated with polyimide sheet (in mm) * | **Rectangular and round wires** insulated with mica sheet (in mm) * | **Rectangular and round wires** insulated with paper or aramid paper (in mm) * | **Rectangular and round wires** enamelled (in mm) | **Rectangular wires** insulated with glass filament and/or mixed yarn (in mm) * | **Litz wire** insulated with mica and/or PET sheet |
|---|---|---|---|---|---|---|---|
| Conductor material | Rectangular wire<br>Round wire | Rectangular wire<br>Round wire | Rectangular wire<br>Round wire | Rectangular wire<br>Round wire | Rectangular wire<br>Round wire | Rectangular wire | Single round wire |
| **Rectangular wire** **<br>acc. to DIN EN<br>Width (W)<br>Thickness (T) | W: 3.35 … 30.00<br>T: 1.00 … 7.00 | W: 3.35 … 16.00<br>T: 1.00 … 7.00 | W: 3.35 … 25.00<br>T: 1.00 … 7.00 | W: 3.35 … 20.00<br>T: 1.00 … 7.00 | W: 3.35 … 14.00<br>T: 1.00 … 6.00 | W: 3.35 … 20.00<br>T: 1.00 … 5.00 | **Single wire**<br>Cross section of litz wire:<br>6 mm² … 70 mm² |
| **Round wire**<br>acc. to DIN EN | Ø: 2.80 … 11.00 | Ø: 2.00 … 6.00 | Ø: 0.85 … 6.00 | Ø: 2.00 … 6.00 | | | |
| Insulation / design | | ▪ Polyimide sheet, FEP coated and hot-sealed, also corona resistant (TI 240°C) | ▪ Mica with PET-liner (TI 155°C)<br>▪ Mica with PI-liner (TI 180°C)<br>▪ Mica with glass fibre liner (TI on request)<br>▪ Combinations with enamelled wire and/or PET sheet possible *** | ▪ Kraft paper<br>▪ Nomex® (TI 120°C)<br>▪ Possible in combination with enamelled | ▪ Enamel Polyamidimide acc. to DIN EN (TI 220°C) | ▪ Combinations with bare, enamelled or polyimide-sheet insulated wires possible (TI 155°C … 180°C)<br>▪ Glass filament and/or mixed yarn, impregnated | ▪ PET sheet<br>▪ Mica sheet (TI 155°C) *** |
| Increase | | Acc. to the customer's specifications | Acc. to the customer's specifications | Acc. to the customer's specifications | ▪ Class 1, 2 and 3 acc. to DIN EN or to the customer's specifications | Acc. to the customer's specifications | Acc. to the customer's specifications |
| Number of layers / taping | | ▪ 1 … 2 layers opposite directions | ▪ 1 … 4 layers same and opposite directions *** | ▪ 1 … 8 layers same and opposite directions *** | | ▪ 1 … 2 layers opposite directions | ▪ 1 … 3 layers same direction<br>▪ 2 layers opposite direction |
| Overlap | | Steplessly variable, max. 75% | Edge to edge, steplessly variable, max. 75% | Edge to edge, steplessly variable<br>▪ Rectangular wire max. 80%<br>▪ Round wire max. 50% | | | Steplessly variable, min. 30% to max. 80% |
| Application examples | ▪ Conductor material for further insulation<br>▪ Rotor bars | ▪ Traction motors<br>▪ Special-purpose motors<br>▪ Motors for high-temperature applications | ▪ High- and low-voltage machines<br>▪ Frequency-converter-proof extraction<br>▪ Gas motors<br>▪ Fire resistant cables<br>▪ Transformers | ▪ Transformer windings<br>▪ Reactors | ▪ Motors<br>▪ Generators<br>▪ Transformers | ▪ Traction motors<br>▪ Generators<br>▪ High-voltage motors<br>▪ Special-purpose motors | ▪ HF motors<br>▪ Reactors<br>▪ Transformers |

* Insulated round wire is not suited for drawing-in technology! ** Feasibility depends on the W/T ratio *** Further variants possible at the customer's specifications

# OUR ASSORTMENT OF SPOOLS




## Cylindrical spools

| Type | Material | D1 (in mm) | D2 (in mm) | D3 (in mm) | D4 (in mm) | D5 (in mm) | L1 (in mm) | L2 (in mm) | Deadweight | Weight |
|---|---|---|---|---|---|---|---|---|---|---|
| K250 | Plastic | 250 | 160 | 22 | 13 | 43 | 200 | 160 | Approx. 1.5 kg | Approx. 20 kg |
| K355 | Plastic | 355 | 225 | 35 | 26 | 80 | 200 | 160 | Approx. 3.5 kg | Approx. 40 kg |
| K500 | Plastic | 500 | 320 | 35 | 26 | 80 | 250 | 180 | Approx. 8 kg | Approx. 100 kg |
| VM710 | Plastic | 710 | 500 | 55 | 26 | 140 | 250 | 180 | Approx. 15 kg | Approx. 200 kg |
| VM630 | Plastic | 630 | 315 | 44 | 26 | 80 | 230 | 180 | Approx. 9.5 kg | Approx. 200 kg |
| VM800 | Plastic | 800 | 400 | 85 | 26 | 140 | 320 | 250 | Approx. 20 kg | Approx. 400 kg |
| H1150 | Wood | 1,150 | 630 | 80 | 22 | 80 | 340 | 280 | Approx. 52 kg | Approx. 1,000 kg |
| ND630 | Steel | 630 | 355 | 127 | 28 | 140 | 445 | 405 | Approx. 64 kg | Approx. 350 kg |
| EGE762 | Steel | 762 | 355 | 127 | 28 | 140 | 550 | 500 | Approx. 107 kg | Approx. 950 kg |

Cylindrical barrelled delivery spools acc. to IEC 60264-2, DIN 46399 or 46395 and other customised specifications are possible upon request.

## Long spools with container

| Type | D1 (in mm) | H1 (in mm) | D3 (in mm) | Deadweight | Weight Cu |
|---|---|---|---|---|---|
| A250 | 315 | 500 | 100 | 4.7 kg | Approx. 45 kg |

Long spools acc. to IEC 60264-3 with container acc. to IEC 60264-3-5





MADE
IN
GERMANY

# QUALITY IS MANU-FACTURED, NOT SIMPLY MEASURED

***Our credo: Quality is manufactured, not simply measured! This is the reason why the most important components for measuring are already installed on our machines. In addition, we perform initial sample and series tests with creation of the appropriate reports.***

Customer satisfaction is the objective of our work. On-time delivery of products meeting all quality requirements is therefore one of our primary corporate goals.

Quality defines the thinking and actions of our employees, who actively contribute to continuous improvement across the entire process chain.

DIN EN ISO 9001:2015 requirements and customer-specific specifications form the basis of our work. Internal audits and monitoring by accredited certification bodies ensure the effectiveness of our quality system – from goods receipt to final dispatch.

***Mechanical tests***

- Tensile strength
- Elongation at break
- Verification of yield strength
- Spring-back behaviour

***Electrical tests***

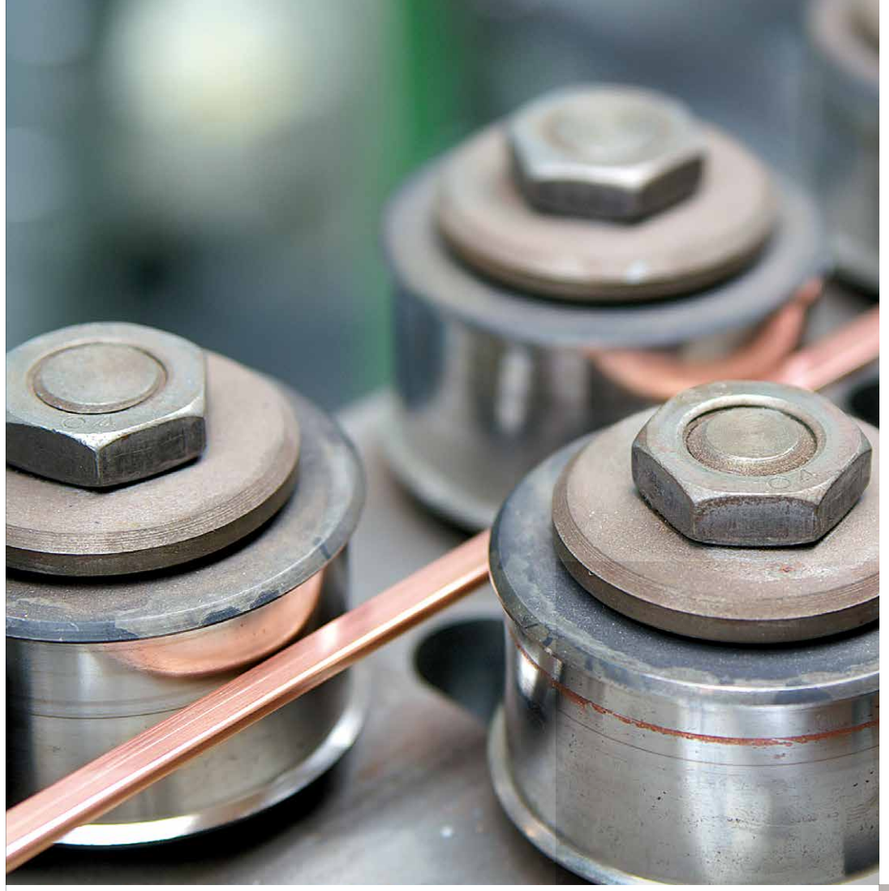
- Breakdown voltage (room temperature and elevated temperature)
- Resistance tests

***Profile tests***

***Ductility and adhesion tests***

***Additional tests***

- Determination of the content of glass and binders
- Behaviour against solvents
- Thermal shock tests
- Determination of the degree of enamelling in the case of enamelled wires
- Tests in A/C chambers
- Special tests upon request



## OUR QUALIFICATIONS

- Certified according to DIN EN ISO 9001:2015
- Environmental management verified according to DIN EN ISO 14001:2015
- Approved »Class A« supplier to numerous renowned companies

## OUR MODERN FLEET OF MACHINES

- Rolling, continuous extrusion and drawing lines
- Annealing furnace systems
- Wire enamelling lines
- Insulation systems for rectangular and round wires


Modern high-precision testing equipment ensures that our special wires are manufactured within the narrowest tolerances

# EVERYTHING FROM A SINGLE SOURCE – POWER FOR YOUR VISION

We as a member of the PARTZSCH Group can proudly say that the spirit of innovation meets the idea of service, enabling all customer wishes to become reality.

As one of the leading mid-size companies in the electrical engineering branch, the PARTZSCH Group manufactures a broad spectrum of products related to electric motors and generators – from its own range of wires to wind turbine generators.

Our comprehensive expertise and high vertical integration enable us to reliably and efficiently realise even complex and demanding customer projects.

PARTZSCH

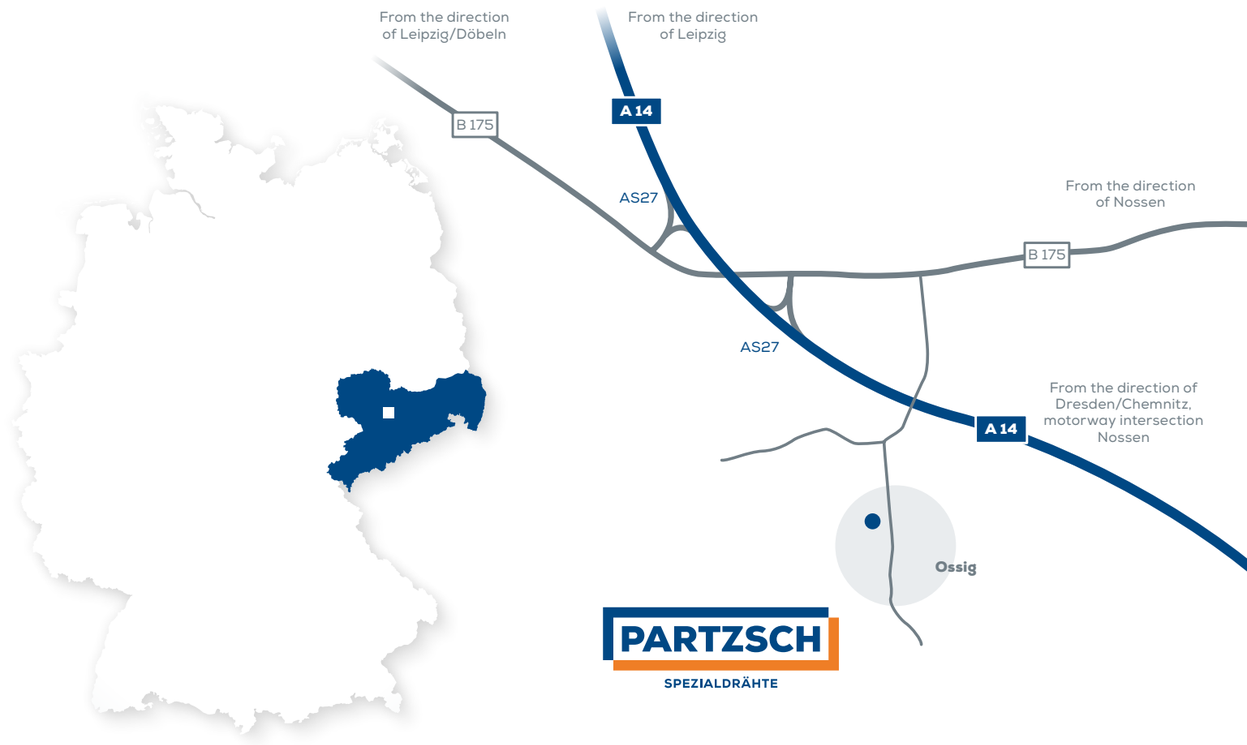
- PARTZSCH ELEKTROMOTOREN
- PARTZSCH WINDGENERATOREN SERVICE
- PAMO REPARATURWERK
- PARTZSCH SPEZIALDRÄHTE

## SERVICE MAKES THE DIFFERENCE

Our qualified team will be pleased to develop solutions together with you and tailor them precisely to your product requirements. Contact us – we look forward to hearing from you.

## FAST AND FLEXIBLE

Our central location and excellent connection to the A14 motorway enable flexible and fast inbound and outbound deliveries.



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SPEZIALDRÄHTE

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