



PROCESS INDUSTRIES /
TRANSPORTATION / ENERGIES

ELECTRICAL
SOLUTIONS
FOR MOTORS
AND GENERATORS



INNOVATIVE APPROACH

At Mersen, innovation is driven by close cooperation with our customers. Our understanding of the challenges, environments and applications, and our ability to develop highly complex and unique components to meet the specific needs of the leading players in each of our markets ensure our ongoing success.



CONTINUOUS RESEARCH AND DEVELOPMENT EFFORTS

TESTING FACILITIES FOR POWER & SIGNAL TRANSFER AND CURRENT COLLECTION

Mersen has an outstanding capability attracting product development from international OEMs in the Energy and Transportation sectors.

- Environmental chamber (2 x 1.5 x 2 m / 6.6 x 5 x 6.6 ft)
- High speed performance simulation with / without controlled temperature
- Thermal fatigue test
- Multiple signal protocol injection



CHEMICAL LABORATORY



CURRENT COLLECTION TEST BENCH



ENVIRONMENTAL CHAMBER

PATENTED INNOVATIONS

Some recent examples in the energy and transportation markets



MERSEN DUSTCOLLECTOR



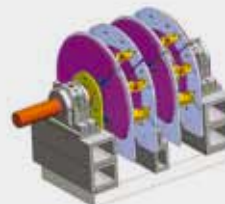
ECO DESIGN THIRD RAIL SHOES

WINNER OF THE INNOVATION TROPHY

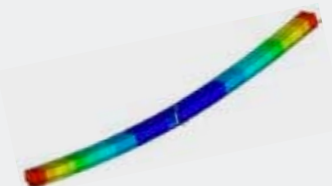


DESIGN AND NUMERICAL ANALYSIS

- Mechanical, thermal, electrical, fluid dynamic and multi-physic simulations
- Ventilation simulations for brush gear and carbon dust collection systems
- Analysis of the thermo-mechanic behaviour of contact strips
- Standard and internally developed design and calculation softwares



BRUSH GEAR TEST BENCH DESIGN



CONTACT STRIP SIMULATION

EXTERNAL CERTIFICATIONS

LIGHTNING PROTECTION SYSTEMS FOR WIND TURBINES

Our dedicated carbon brushes and brush-holders passed the "Class 1 lightning protection tests" of the Kiel University of Applied Sciences laboratory in Germany.





A WORLD LEADER COMMITTED TO INDUSTRY

Mersen's electrical solutions and services for motors and generators contribute to the safety, reliability and performance of electrical installations and power electronics in our leading markets (Energy, Transportation and Process Industries).

We provide our customers with high quality engineered solutions tailored to various operating conditions (temperature, dust, corrosive atmosphere, etc.), designed and tested for reliability and optimum performance.

EXPERTISE, KNOWLEDGE AND EXPERIENCE

Our company has been working with electrical rotating machinery for over 120 years. We know motors and generators very well and this is one of the reasons why our customers come to us. They know that we provide solutions that are controlled through the complete product life cycle (development, manufacture of materials, product design, quality control, distribution, technical expertise and training). We offer reliable solutions and the benefit of our extensive knowledge, years of experience and strong expertise.

SOLUTION-ORIENTATED APPROACH AND R&D POLICY

We work in partnership with our suppliers to create the solution needed to improve the performance of our customers' applications. This solution-orientated approach drives our R&D facilities and enables us to provide innovative solutions. Our R&D teams are international and combined with our comprehensive test facilities work on a wide range of subjects for our sectors of activity, allowing us to meet today the market requirements of tomorrow.

SERVICES

On the 5 continents, our engineers and technicians provide specific services to optimize the performance of our customers' plants.

QUALITY AND ENVIRONMENT

Our 60 manufacturing facilities in 40 countries are registered to ISO quality and environmental standards. This ensures that we can provide our customers with manufacturing sites implementing quality manufacturing processes and respecting environmental standards.

SUSTAINABLE DEVELOPMENT

Here at Mersen, we believe it is possible to bring together our company's interests while respecting environmental issues and social progress. For this reason, we make sure that an environmental approach is adopted during the life cycle of every solution.

As an example, we have developed lead free carbon brushes and can offer recycling programs to our customers.

LIMITLESS PRODUCT CONFIGURATIONS

CARBON BRUSHES

ALONGSIDE STANDARD PRODUCTS, CUSTOMIZED CONFIGURATIONS FOR ANY APPLICATION

<p>Contact the Mersen Experts to determine the carbon grades adapted to your applications (see contacts on back cover page)</p>	TURBO GENERATORS	WIND POWER	TRACTION	STEEL	FHP	
BRUSH GRADES SUITED TO ANY ENVIRONMENTS AND OPERATING CONDITIONS	CURRENT DENSITY	PERIPHERAL SPEED	TEMPERATURE	HUMIDITY	CONTAMINANTS	VIBRATIONS
SOME FEATURED GRADES & APPLICATIONS	ELECTROGRAPHITIC EG34D • EG387 • 2192 • CB86 • AC137 • EG313 • EG8220 • EG7655	CARBOGRAPHITIC A121 • A176 • A252	LFC LFC554	RESIN-GRAPHITE BG412 • BG469 • BG348	METAL-GRAPHITE CA38 • C7788 • CG607 CG626 • CG657 • CG677 • MC79P	

BRUSH-HOLDERS

ORIGINAL EQUIPMENT OR RETROFIT

<p>Manufacturing Capabilities</p> <p>Die Casting</p> <p>Stamping</p> <p>Machining</p>	HYDRO POWER	TRACTION	TURBO GENERATORS	INDUSTRY	PRESSURE SYSTEMS
MAIN FEATURES	<ul style="list-style-type: none"> • Customized products or standard per our catalogue • Constant force pressure systems • Brush-holder plug sets • Brush wear monitoring devices • DustCollector systems 				

SLIP RING ASSEMBLIES

KEY FEATURES IN A MODULAR CONSTRUCTION

<p>Manufacturing Capabilities</p> <p>From 1 to X rings</p> <p>Diameter: Up to 2500 mm (98 inches)</p>	WIND POWER	HYDRO POWER	RAIL TRANSPORT	ROTARY JOINT	HOISTING
AVAILABLE RING MATERIALS	<ul style="list-style-type: none"> • Copper • Bronze • Brass • Steel • Stainless steel 				

CURRENT COLLECTORS

FOR TRANSPORTATION OR INDUSTRIAL MACHINES

CONTACT STRIPS	CONTACT STRIPS WITH INTEGRATED HORNS	KASPEROWSKI TYPE STRIPS	3 RD RAIL SHOES	INDUSTRIAL CURRENT COLLECTORS
SPECIFICATIONS	<ul style="list-style-type: none"> • Plain or copper impregnated, mounted on metal carriers • Automatic Dropping Device (ADD) for impact or wear detection 			



ELECTRICAL ROTATING MACHINES

The performance of your electrical equipment depends on the efficient interaction of components such as slip ring assemblies, brush-holders and carbon brushes. Mersen's integrated solutions are designed with parts that complement each other's performance.



BRUSH GEAR HOUSINGS

We design and produce complete brush gear housings, including slip ring assemblies and smart enclosures to protect the brush gear against unfavorable environmental conditions.



SLIP RING AND BRUSH ROCKER ASSEMBLIES

Many parameters must be taken into consideration in order to attain maximum performance from slip ring assemblies: slip ring material, brush coverage ratios, spring pressure...



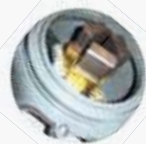
PLUG SETS

Plug set brush-holders guarantee a perfect contact between the plug set and the brush bar as well as full protection with associated PPE when replacing carbon brushes under load.



CURRENT COLLECTION SYSTEMS

Our 3rd rail shoes and current collectors are tailored to the operating conditions of either 3rd rail or pantograph current collection.



EARTH RETURN CURRENT UNITS

Earth return current units (ERCU) are designed to transfer the traction motor currents to ground via the wheels and not the motor bearing. From our long-standing relationships with all major OEMs we can develop and manufacture the finest ERCUs for any machine.

RAIL TRANSPORT

Motivated by the challenge for ever increasing demands, Mersen equipped the high-speed train that broke the world speed record on rails in 2007. Mersen's contact strips and earth return current units were mounted on the French TGV that reached 574.8 km/h (357 mph). Mersen can now provide products benefiting from these experiences obtained in such extreme conditions.

TO INTEGRATED SOLUTIONS

TRANSFER



ELECTRICAL SOLUTIONS FOR HIGH-CURRENT APPLICATIONS

These applications produce an extremely corrosive atmosphere that impacts both brush and brush-holder performance. Mersen designs and manufactures special carbon brushes, specific brush-holders and plug set assemblies for galvanic and electrolytic treatment lines as well as annealers.



BRUSH ROCKERS AND SLIP RING ASSEMBLIES FOR HYDRO GENERATORS

Designed jointly with major OEMs, Mersen slip ring assemblies & rocker rings are fitted to the world's largest hydro-electric generators. The available diameters range from 400 to 2,500 mm (16 to 98 inches).



SIGNAL & POWER TRANSFER

When it comes to transferring signal and power between static and rotating parts, reliability is always a key issue. Signal & power transfer systems can be found in numerous applications like wind turbines, cranes or cable bunching machines. Since all these applications do not have the same requirements, Mersen has developed a flexible range of solutions, each adapted to suit your requirements.



SLIP RING ASSEMBLIES (ROTARY JOINTS)



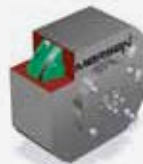
BRUSH SYSTEMS



HYBRID SYSTEMS



WIRE CONTACT SYSTEMS



NON-CONTACT CAPACITIVE SIGNAL TRANSMISSION SYSTEMS



FIBER OPTIC SYSTEMS

SERVICE AS A CORE VALUE

MOTOR MAINTENANCE SERVICE AND TRAINING: A COMPLETE RANGE OF SERVICES

RE-ENGINEERED SOLUTIONS

- Long term involvement with OEMs and aftermarket worldwide
- Technological solutions making our customers more competitive
- Redesign to reduce brush wear, maintenance and downtime
- Complete retrofit solutions (carbon brushes, brush-holders, slip ring assemblies, brush gear housings)

ON-SITE INTERVENTIONS / DIAGNOSTICS

- In-situ commutator and slip ring machining (approved and licensed technology)
- Motor inspection
 - Diagnostics (specific expertise capabilities)
 - Commutator and slip ring analysis (profile, surface roughness)
 - Brush-holder pressure measurements
 - Commutation study, control and adjustment
- Technical support, recommendations with documented written report

TRAINING

- High quality technical training programs provided by Expert teams will help you maximize the efficiency of your equipment and minimize your operating and maintenance costs. Training sessions can take place either at our location or at yours.

WINDTRACKER™: DEDICATED WIND SERVICES

As a leading supplier to the wind industry, Mersen built a global team of sales and technical experts to assist customers in their challenge to improve wind turbine performance and reliability.

- Reactive fast service
- Hundreds of wind turbines inspected every year
- Data collection and shared intelligence reservoir
- Carbon brush / brush-holder / slip ring re-engineering
- Carbon brush recycling programs

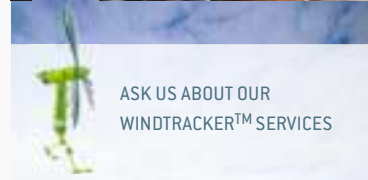
MAINTENANCE TOOLS AND MEASURING DEVICES

A FULL RANGE OF MAINTENANCE TOOLS

- Brush seating stones and garnet paper
- Grinding stones and accessories
- Portable mica undercutters
- Alarm boxes
- Scrapers, slotting files, saws...

SPECIFICALLY DESIGNED MEASURING DEVICES

- CL-Profiler, the smart solution for profiling slip ring assemblies and commutators
- DiaMeter, the essential tool for measuring the commutator/wheel diameter of all types of rolling stock prior to any possible machining
- ComPro2000™, non-contact high speed diagnostic tool to quickly and easily determine the health of your motor's commutator
- Dynamometers, stroboscopes, roughness meters
- Commutation indicator
- Brush wear monitoring devices



ASK US ABOUT OUR
WINDTRACKER™ SERVICES





PTT-solutions-EN-1605 - Design by HENRY & SIEGLER - Credits Photos : @Rene Jansa - Prochasson Frederic - Shutterstock / @Michaellung / @Matthieu Riegler-CC-BY / @Tillo & Paolo - Petr Malyshev - Fotolia / @RICAgular - Inaki antoñana plaza - iStock



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