

TRANSPORTATION

Ports & Marine

PROVIDING
ELECTRICAL SOLUTIONS
FOR PORTS AND MARINE



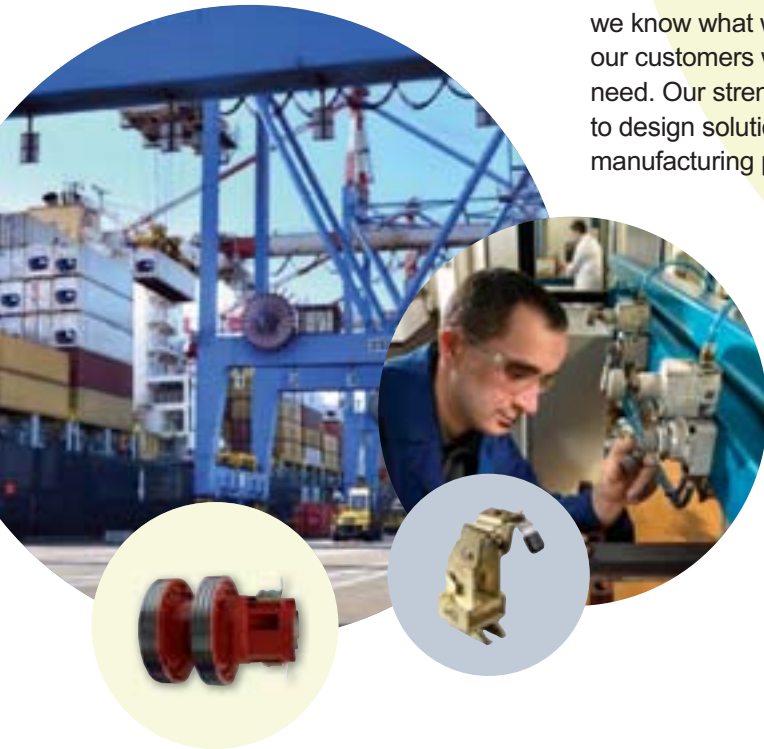
MERSEN

HIGH QUALITY ENGINEERED SOLUTIONS

● Our solutions are based on over 100 years of experience gained in the field. Working in different countries, applications and environments, we know what works and how to improve performance. We provide our customers with a large range of solutions, each adapted to a specific need. Our strength is our experience, our knowledge and our ability to design solutions paying attention to detail in every step of the manufacturing process.

● We work in partnership with our suppliers to select high quality materials for our solutions dedicated to Ports and Marine equipment. Manufactured on cutting-edge equipment (CNC machines, broaching machines, computer aided measuring instruments, high precision microscopes...), they benefit from high precision assembling and respect industrial international standards (IEC, NEMA, ASTM, SAE, DIN...).

● We test our solutions for optimum performance in a variety of load and environmental conditions, helping our customers to reduce their maintenance costs. We have the knowledge to re-engineer existing solutions and create new maintenance tools to improve the performance of Ports and Marine equipment.



Mersen is a global Expert in materials and solutions for extreme environments as well as in the safety and reliability of electrical equipment.

Our markets:

- **Energy:** • Wind • Hydro • Photovoltaic • Nuclear Power • Conventional Thermal Power • Oil & Gas
- **Transportation:** • Railways • Aerospace & Aeronautics • Ports & Marine • Electrical Vehicles
- **Electronics:** • Polysilicon • Power Electronics • Semiconductors • Compound Semiconductors • Optical Fiber Production
- **Chemicals & Pharmaceuticals:** • Organic Chemicals • Inorganic Chemicals • Fine Chemicals & Pharmaceuticals
- **Process industries:** • Metallurgy • Mining • Oil & Gas • Cement • Pulp & Paper • Rubber & Plastic
 - Water & Wastewater Treatment • Assembly Manufacturing • Mould Industry • Glass Industry • Sintering
 - Furnace Industry
- **Other Markets:** • Commercial • Residential • Data Communication • Elevators • Forklifts



MERSEN



A world leader committed to support Ports and Marine

● A world leading supplier of power and signal transfer solutions, Mersen contributes to the well functioning of Ports and Marine equipment. We provide Ports and Marine operators, maintenance and repair specialists with high quality engineered solutions tailored to various operating conditions (humidity, dryness, heat, etc.), designed and tested for reliability and optimum performance.

Expertise, Knowledge and Experience

● Our company has been working with electrical rotating machinery for more than 100 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 them reliable solutions and the benefit of our extensive knowledge, years of experience and strong expertise.

Solution-orientated approach and R&D policy

● Our objective is to create the solution needed to improve the performance of our customers' applications. This solution-orientated approach drives our Research & Development facilities and enables us to provide innovative solutions. Our Research & Development teams are international and combined with our comprehensive test facilities work on a wide range of subjects, 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 Ports and Marine equipment:
- On site services (cutting, grinding, bevelling and undercutting of commutators, etc.)
 - Diagnostics (commutator and slip ring profile analysis, surface roughness and carbon brush pressure measurements, axial and circumferential stagger analysis, carbon brush studies considering the machine and its environment)
 - Technical support
 - Training
 - Specifically designed measuring tools

Quality and Environment

● Our 56 manufacturing facilities 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.



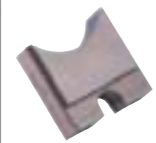
POWER SOLUTIONS AND SERVICES FOR PORTS AND MARINE



TROLLEY



Brush-holders



Carbon brushes



Slip ring assemblies



LIFTING



Brush-holders



Carbon brushes



MOVING



Brush-holders



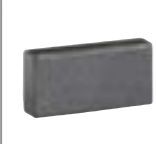
Carbon brushes



POWER SUPPLY



Brush-holders



Carbon brushes



Slip ring assemblies



CARGO MOTOR



Brush-holders



Slip ring assemblies



Brush-holders



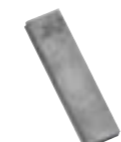
Carbon brushes



EARTHING



Brush-holders



Carbon brushes



FOCUS ON

Current Collectors

for cranes

- Selected material: carbon, graphite, copper, bronze
- Good mechanical performances even for high intensity
- Special impregnation for dry or very humid climate
- Mechanically robust
- Lubricating power

CARBON BRUSHES

- Selected materials: graphite, copper, silver...
- Lead free carbon brushes available
- Good mechanical stability
- Good commutation
- High electrical conductivity
- High quality tamping
- Long life
- Wide speed range (15 to 55 m/s)
- Brush wear warning systems
- Optimized cable dimensions
- Specific design

BRUSH-HOLDERS

- A full range of materials: non ferrous-alloys, anti-corrosion...
- Moulded
- Fitted with independent pressure system (constant force or clock spring)
- Single or multiple pockets
- Complete brush-holders and rocker rings
- Customized designs
- Cutting-edge equipment and software (CNC machines, broaching machines)
- Spark eroding technologies
- Die casting
- High precision inspection instruments (three-dimensional CMM...)
- International standards (ISO 9001, IEC, NEMA, DIN)
- New designs, refurbishing existing designs, re-engineering design solutions

SLIP RING ASSEMBLIES

- Selected materials: non ferrous-alloys, stainless steel, dielectric materials...
- Customised design
- Reinforced plastic injection moulding
- Finished product compliance: balance, dielectric testing
- International standards (ISO 9001, IEC, NEMA, ASTM, SAE, DIN)

CURRENT COLLECTORS

- Lead-free carbon material (pure or impregnated with metal, copper or bronze)
- Extrusion or stamped and machined
- Welded, bonded or crimped
- Mechanically robust
- Lubricating power

SERVICES

MOTOR & MAINTENANCE SERVICES

- Expertise
- Diagnostics
- On site interventions
- Refurbishing & re-engineering of solutions and components

TRAINING

- Led by technical experts
- According to a defined curriculum or adapted to specific needs
- Transfer of skills
- At either our location or our clients'

TOOLS & MEASURING DEVICES

- CL-Profilor
- Com-Pro2000™
- Grinding stones
- Mica undercutters
- Dynamometers
- Stroboscopes
- Alarm boxes
- Roughness meters
- Grinders & accessories
- Saws
- Scrapers
- Slotting files



MERSEN
Expertise, our source of energy

A GLOBAL PLAYER

Global expert in materials and solutions for extreme environments as well as in the safety and reliability of electrical equipment, Mersen designs innovative solutions to address its clients' specific

needs to enable them to optimize their manufacturing process in sectors such as energy, transportation, electronics, chemical, pharmaceutical and process industries.

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