

TOOLS & DEVICES FOR MAINTENANCE OF ELECTRICAL MACHINES

Preventive maintenance of slip rings and commutators

MAINTENANCE TOOLS & MEASURING DEVICES

PREVENTION

ECONOMY

SECURITY



Regular controls reduce the frequency of maintenance operations

For over 120 years, Mersen has been developing carbon brush grades and manufacturing carbon brushes for electrical machines. Our expertise of motors and our experience of industrial maintenance enables us to offer you a global range of solutions adapted to your requirements:

- Brush-holders, carbon brushes and slip rings
- A team specialized in on site motor technical assistance (in-situ machining operations)
- A whole range of tools selected for maintenance of slip rings and commutators
- A Customer Technical Assistance Service
- Training in maintenance of electrical machines and in knowledge of commutation

The devices, tools and accessories displayed in this catalogue were not only tested in the laboratory, but above all on site. Our experts selected them for your full and entire satisfaction.

CL-PROFILER PROFILOMETER

It is necessary to check regularly that the deformation of slip rings and commutators (out of round) remains within acceptable limits. The CL-Profilometer, easy to use in the field, will give you a very clear image of this deformation, and will enable you to follow the evolution of the wear of your electrical rotating machinery.

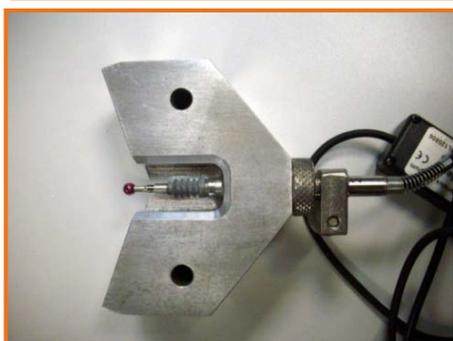


CL-Profilometer

Reference	Description
90328N	CL-Profilometer without PC
90324N	ViRoTi probe
90355N	2.5 mm ruby tip
90340N	5 mm ruby tip
90341N	8 mm ruby tip
90358N	18 mm ceramic tip
90356N	10 mm roller tip
90360N	Analysis software

DIAMETER

The DiaMeter will enable you to measure the diameter of slip ring assemblies, commutators and rolling stock wheels prior to any possible machining. This is a portable tool, adaptable to the size of your commutators and/or wheels. It uses the same probe as the CL-Profilometer and a specific extension of its software.



DiaMeter

Reference	Description
90372N	Tool for 50 to 350 mm diameters
90373N	Tool for 300 to 950 mm diameters
90374N	Customized DiaMeter tool for 50 to 350 mm diameters
90324N	ViRoTi probe

COMMUTATION INDICATOR

Incorrect commutation can generate sparking which can damage your slip rings and commutators. The Commutation Indicator is the solution to accurately measure the spark intensity on DC electrical machines. It is sold with 2 sensors, 2 isolating contacts for sensors and 1 magnetic stand.



Commutation Indicator

Reference	Description
90375N	Commutation Indicator and its accessories in their protective carrying case

DYNAMOMETER

Carbon brush pressure determines electrical and mechanical losses, commutation quality, current distribution between the carbon brushes, brush and commutator wear, and therefore influences the machine's whole performance. It is important to make periodic pressure measurements on the brush-holder springs and to check spring pressure between brushes of the same polarity on commutators and between brushes on the same slip ring. Pressure differences cause unequal current distribution and therefore unequal brush wear, increasing the frequency of maintenance operations. Mersen can refurbish or change your brush-holders, and propose you a whole range pressure systems.



Electronic dynamometer

Reference	Description
90349N	Dynamometer 1,000 measurements
90351N	Brown probe - 0.5 to 10 N A = 6.5 mm B = 48 mm C = 8 mm
90350N	Red probe - 10 to 20 N A = 7.5 mm B = 85 mm C = 10 mm
90352N	Blue probe - 20 to 60 N A = 9.5 mm B = 95 mm C = 12 mm

ROUGHNESS METER

Optimum carbon brush performance depends on the surface roughness of slip rings or commutators being maintained within recommended values.



M300C roughness meter

Reference	Description
90357N	M300C roughness meter with lengthwise drive unit
90363N	M300C roughness meter without drive unit
90361N	Transversal drive unit
90362N	Additional probe

ALARM BOX

Commutators and slip rings are likely to get damaged by worn out carbon brushes. The alarm carbon brush includes, in addition to its shunt, a thin copper braid, entirely protected by an insulated sleeve; it is located deeper than the carbon brush tamping. When the carbon brush is worn, the alarm shunt comes into contact with the commutator / slip ring (without causing any damage to the sliding surface), the short-circuit triggers the warning light.



Alarm box

Reference	Description
90702N	Brush wear detection alarm box

STROBOSCOPE

On badly deformed slip rings or commutators causing important brush vibrations, out roundness can be easily located and identified with our stroboscope.



Stroboscope

Reference	Description
90313N	Digital stroboscope
90315N	Spare lamp

GRINDING STONES

The commutator or the slip rings of an electrical machine must have a proper roughness to give the carbon brushes an adequate seating base and enable them to ensure a good current transmission.

To achieve this proper roughness, the commutator or the slip ring has to be «ground» after machining with a medium grinding stone such as P/N 90623N. If you wish to work without dismantling the machine, rather use a grinding stone with a handle. P/N 90602N is ideal for motors up to 15 kW, while P/N 90651N is suitable for motors up to 150 kW. For bigger motors, use P/N 90612N or 90607N, which are larger.

Our grinding stones have four different grain sizes, each adapted to the work to be done. These stones are suitable for copper, bronze and steel.

- **Coarse grinding stone (C):** with big grains, it does not erode much and is good for removing large quantities of material.
- **Medium grinding stone (M):** with an average grain size which is suitable for removing minor defects, it is recommended for finishing any commutator or slip ring machining. Its grain size is designed for achieving the right roughness for a good brush seating base and film deposit.
- **Finish grinding stone (F):** with fine grains suitable for commutator cleaning or for achieving the right roughness on certain types of soft copper commutator.
- **Polish grinding stone (P):** with very fine grains



Two-grade combination grinding stone

Two-grade combination grinding stones

Reference	Dimensions in mm	Grain
90608N	50x25x200	C/M
90607N	50x25x200	M/F



Grinding stone with adjustable handle

Grinding stones with three-position adjustable handle and thrust knob

Reference	Dimensions in mm	Grain
90612N	50x40x50	M
90611N	50x40x50	F

Single-handle grinding stones. The handle is mounted lengthwise.



Single-handle grinding stone

Reference	Dimensions in mm	Grain
90613N	130x80x50	C
90614N	130x80x50	M

Double-handle grinding stones. The two handles are mounted crosswise.



Double-handle grinding stone

Reference	Dimensions in mm	Grain
90618N	100x200x80	C
90619N	100x200x80	M

Tower-type grinding stones for commutators and slip rings



Tower-type grinding stone

Reference	Dimensions in mm	Grain
90635N	20x20x80	C
90637N	20x20x80	M
90636N	20x20x80	F
90621N	25x40x160	C
90623N	25x40x160	M
90622N	25x40x160	F
90629N	25x40x280	C
90631N	25x40x280	F
90627N	50x50x200	C
90625N	50x50x200	M
90626N	50x50x200	F
90640N	30x30x200	C
90641N	30x30x200	M



Straight-handle grinding stone

Straight-handle grinding stones (two different grades)

Reference	Dimensions in mm	Grain
90601N	10x12x20	M and F
90602N	10x12x20	F and P
90603N	10x12x20	M and C



Pencil-type grinding stone

Pencil-type grinding stones

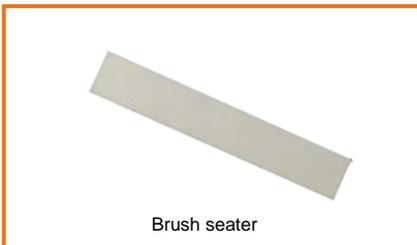
Reference	Dimensions in mm	Grain
90604N	10x15x150	C
90606N	10x15x150	M
90605N	10x15x150	F



Commutator polisher

Commutator polisher with curved plastic handle

Reference	Dimensions in mm	Grain
90651N	8x22x17,5	F/P

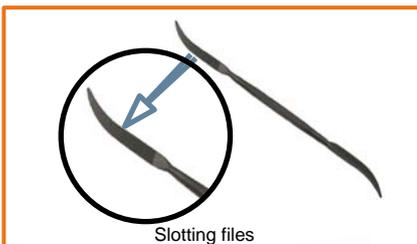


Brush seater

Brush seaters

Meant for seating carbon brushes, this material does not wear metal much. It must not be used intensively, unless with a dust collection device.

Reference	Dimensions in mm	Grain
90661N	6x6x120	M (Medium)
90662N	6x12x120	M
90663N	10x10x120	H (Hard/Dur)
90664N	10x10x120	M
90665N	12x20x120	H
90666N	15x30x120	H
90667N	15x30x120	M
90668N	15x30x120	S (Tendre/Soft)
90669N	50x25x120	S
90672N	80x50x150	S



Slotting files

Slotting files

Files designed to chamfer bar edges.

Reference	Description
90553N	Slotting file without handle



Slotter

Slotter

Hand tool meant for mica undercutting, burr removal and bar edge chamfering. This steel tool provides a "V" and a "U" cutting edges.

Reference	Description
90554N	Three-side slotter with blade
90555N	Spare blade for 90554N



Flexible abrasive

Flexible abrasives

Fine-grain insulating material, specifically meant for cleaning commutator or slip ring skin of small machines. It cannot be used as a grinding tool.

Reference	Description
90652N	10x12x120
90653N	10x20x120
90655N	15x25x120
90654N	25x50x120
90658N	20x30x200

PORTABLE MICA UNDERCUTTER



Portable mica undercutter

Portable mica undercutter

- Compressed air angle grinder, with built-in sound-insulating features and adjustable air outlet. Very handy with depth adjustment and protective cap for offhand grinding up to 60 N. Supplied with a spanner set.
- Power: 75 W
- Weight: 180 g
- Couplings: R 1/8
- Air consumption: 0.2 m³/min
- No-load speed: 70,000 rpm
- Supplied without air pack nor connector piece
- Used cutters: Diameter 19 mm and diameter 22 mm diamond discs

Reference	Description
90570N	Mica undercutter for 19 mm and 22 mm diameter diamond discs



Ø19 mm diamond disc

19 mm diameter diamond discs

These diamond discs are adapted to our 90570N portable mica undercutter.

Reference	Thickness
90571N	0.5 mm
90572N	0.6 mm
90573N	0.8 mm
90574N	1 mm



Ø22 mm diamond disc

22 mm diameter diamond discs

These diamond discs are adapted to our 90570N portable mica undercutter.

Reference	Thickness
90575N	0.5 mm
90576N	0.6 mm
90577N	0.8 mm
90578N	1 mm



Abrasive strip

Abrasive strip

This abrasive strip is particularly adapted to on site carbon brush seating. It ensures a quick and efficient work, with no abrasive grain erosion.

Reference	Description
90206N	Grain 80 abrasive strip, width 9 cm x 10 m

PATINA WAX



Patina wax

Patina wax

Applied to the commutator after a grinding operation, patina wax contributes to a quick film deposit.

Reference	Description
90202N	Wax stick

TOOLING KITS



Maintenance kit

Maintenance kit

This kit includes a selection of tools meant for maintenance and repair specialists in charge of slip rings, commutators and carbon brushes.

Reference	N°	Description
90201N		Complete kit including following tools:
90285N	1	Insulating probe
90286N	2	Facom LED lamp
90287N	3	Set of gauges
90288N	4	Graduated rule
90554N	5	Slotter
90651N	6	Commutator polisher with curved plastic handle
90668N	7	Brush seater

Maintenance tool case



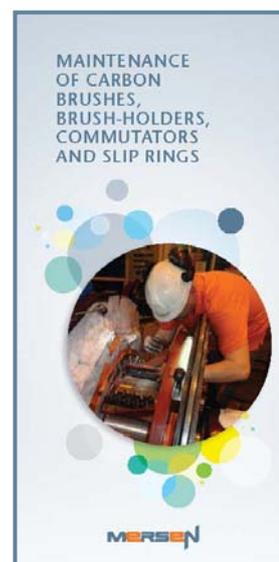
Maintenance tool case

It includes a set of grinding stones and slotters for the preparation of all types of commutators and slip rings.

Reference	N°	Description
90205N		Complete carrying case including following tools:
90607N	1	Two-grade combination grinding stone
90655N	2	Flexible abrasive
90665N	3	Brush seater
90605N	4	Pencil-type grinding stone
90623N	5	Tower-type grinding stone
90553N	6	Slotting file
90554N	7	Slotter
90601N	8	Straight-handle grinding stones
90651N	9	Commutator polisher with curved plastic handle
90612N	10	Adjustable handle grinding stone
90285N	11	Insulating probe
90287N	12	Set of gauges

❖ Do not hesitate and contact us to find out more about our other maintenance tools and measuring devices. Mersen can also provide you with various types of technical training and motor maintenance services.

❖ Ask for our « Maintenance of carbon brushes, brush-holders, commutators and slip rings » guide



Tools and Devices for maintenance of electrical machines

Mersen Services, servicing your electrical rotating machinery

For any technical expertise, maintenance or training, Mersen experts offer their extensive knowledge, years of experience and global reach, linked with a reactive proximity service.



MERSEN
SERVICES

- **On-site service calls** throughout the world
- **Commutation expertise**
- **Measurements and diagnostics**
- **Support services** on a daily basis
- Phone **technical assistance**
- Technical literature on line of our site www.mersen.com or on request (infos.amiens@mersen.com)



MERSEN
SERVICES | TRAINING

Mersen provides **training courses for maintenance of electric motors**. For over 25 years, more than 3,000 technicians have been undergone training, either at our facility or theirs.



MERSEN
SERVICES | MOTOR MAINTENANCE

- **Diagnostics**
- **In situ commutator, slip ring and brush-holder refurbishment:**
 - Surface re-conditioning
 - Mica undercutting (commutators)
 - Bar edge chamfering (commutators)
 - Helical groove edge chamfering (slip rings)
 - Out-of-round machining
 - Carbon brush pressure measurement
 - Proposal of suitable carbon brush grade
 - Redesign of the complete carbon brush, brush-holder and commutator / slip ring system
 - Installation of features to improve the performance of your machines (remote carbon brush wear monitoring, dust extraction solutions...)
 - Retrofit solutions
- **Support services on a daily basis**

A GLOBAL PLAYER

Mersen is a Global Expert in electrical specialties and graphite-based materials.

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