

SERVICES

## TOOLS & DEVICES FOR THE MAINTENANCE OF ELECTRIC MACHINES

PREVENTIVE MAINTENANCE  
FOR SLIP RINGS  
AND COMMUTATORS



**MERSEN**  
SERVICES

PREVENTION

MAINTENANCE  
SAVINGS

SAFETY



**REGULAR CONTROLS WILL REDUCE  
THE FREQUENCY OF MAINTENANCE OPERATIONS**

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## MEASURING DEVICES

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

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

The devices, tools and accessories presented in this catalog were not only tested in laboratory, but on-site, as well. They have been expertly selected to give you complete satisfaction .

### CL-PROFILER PROFILOMETER

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



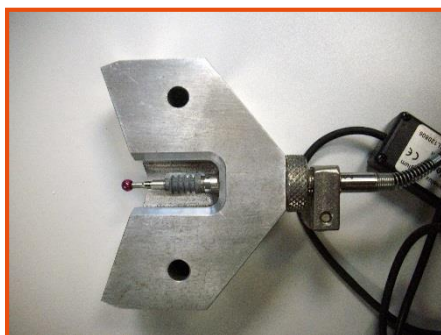
#### CL-Profilometer

| Reference | Description                          |
|-----------|--------------------------------------|
| 90333N    | CL-Profilometer with magnetic tablet |
| 90328N    | CL-Profilometer without tablet       |
| 90324N    | ViRoTi probe                         |
| 90355N    | 2.5 mm ruby tip                      |
| 90340N    | 5 mm ruby tip (standard)             |
| 90341N    | 8 mm ruby tip                        |
| 90358N    | 18 mm ceramic tip                    |
| 90371N    | Magnetic foot                        |
| 90360N    | Analysis software                    |

2.5 mm, 5 mm, 8 mm ruby tips. 18 mm ceramic tip.

### DIAMETER

The DiaMeter will enable you to measure the diameter of slip ring assemblies, commutators and rolling stock wheels prior to any potential 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 as well as an extension to its software.



#### DiaMeter

| Reference | Description   |
|-----------|---|
| 90372N    | Tool for 50 to 400 mm diameters                     |
| 90373N    | Tool for 300 to 950 mm diameters                    |
| 90374N    | Customized DiaMeter tool for 50 to 350 mm diameters |
| 90324N    | ViRoTi probe  |

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## MEASURING DEVICES

### CL-DynamoMeter ELECTRONIC DYNAMOMETER

For optimal carbon brush performance, it is necessary to check that pressure springs ensure sufficient contact of the carbon brushes on the rotor.

In addition, these pressures must be the same of all motor brushes to obtain an equal current distribution and therefore balanced carbon brush wear.

To perform these measurements we recommend using the device developed and also used by Mersen's experts.



CL-DynamoMeter electronic Dynamometer

| Reference | Description                               |
|-----------|---|
| 90316N    | CL-DynamoMeter                            |
| 90321N    | CL-DynamoMeter with V-block magnetic foot |

The 90349N dynamometer is available upon request.

### ROUGHNESS METER

Proper ring or commutator roughness will give carbon brushes the right mechanical seating base and will ensure optimum current transmission.



SJ210M Roughness meter

| Reference | Description            |
|-----------|------------------------|
| 90317N    | SJ210M roughness meter |

The 90357N roughness meter is available upon request.

### ALARM BOX

Commutators and slip rings may 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 |

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## MEASURING DEVICES

### STROBOSCOPE

Out roundness can be easily located and identified with our stroboscope on deformed slip rings or commutators that cause strong brush vibrations



Stroboscope

| Reference | Description         |
|-----------|---------------------|
| 90313N    | Digital stroboscope |
| 90315N    | Spare lamp          |

## TOOLS FOR THE MAINTENANCE OF ELECTRIC MACHINES

### GRINDING STONES

The commutator or slip ring of an electric machine must have the right roughness to give the carbon brushes a proper seating base and to ensure satisfactory current transmission.

To achieve this roughness, the commutator or the slip ring must be «ground» after machining with a medium grinding stone such as P/N 90623N. If you wish to grind without dismantling the machine, you could 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 large grains, it does not erode much and works well 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 to achieve the correct roughness for a proper brush seating base and film deposit.
- **Finish grinding stone (F)** : with fine grains suitable for commutator cleaning or for achieving the correct roughness on certain types of soft copper.
- **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     |

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## TOOLS FOR THE MAINTENANCE OF ELECTRIC MACHINES



Single-handle grinding stone

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

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



Double-handle grinding stone

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

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



Grinding stone for use on lathe

Stone for grinding commutators and rings on lathe

| 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   |

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## TOOLS FOR THE MAINTENANCE OF ELECTRIC MACHINES



Abrasive strip

### Abrasive strip for carbon brush seating

This abrasive strip is made for 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 |

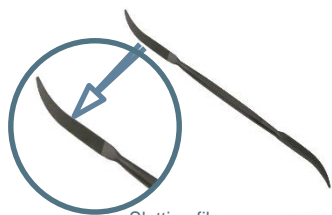


Brush seater

### Brush seaters

Meant for seating carbon brushes, this material hardly wears the metal. It should not be used intensively except 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

| Reference | Description                  |
|-----------|------------------------------|
| 90553N    | Slotting file without handle |



Slotter

### Slotter

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

| 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 patinas on small machines. It cannot be used as a machining tool.

| Reference | Dimensions in mm |
|-----------|------------------|
| 90652N    | 10x12x120        |
| 90653N    | 10x20x120        |
| 90655N    | 15x25x120        |
| 90654N    | 25x50x120        |
| 90658N    | 20x30x200        |

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## PATINA WAX



Patina wax

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

| Reference | Description                       |
|-----------|-----------------------------------|
| 90213N    | Wax stick, 40 mm x 16 mm x 120 mm |

## PORTABLE MICA UNDERCUTTER



Portable mica undercutter

Portable mica undercutter

- Compressed air angle grinder, with built-in sound-insulating features and adjustable air outlet. Easy to use with depth adjustment and protective cap for offhand grinding up to 60 N. Supplied with a spanner set.
- Power: 75 W, Weight: 180 g, No-load speed: 70,000 rpm
- Couplings: R 1/8, Air consumption: 0,2 m³/min
- Air pack and connector piece are not included

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



Ø19 mm diamond disc

19 mm diameter diamond discs for our 90570N portable mica undercutter

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



Ø22 mm diamond disc

22 mm diameter diamond discs for our 90570N portable mica undercutter

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



Maintenance tool case

Maintenance tool case for commutators and rings

This case includes a set of grinding stones and slotters for all types of commutators and slip rings.

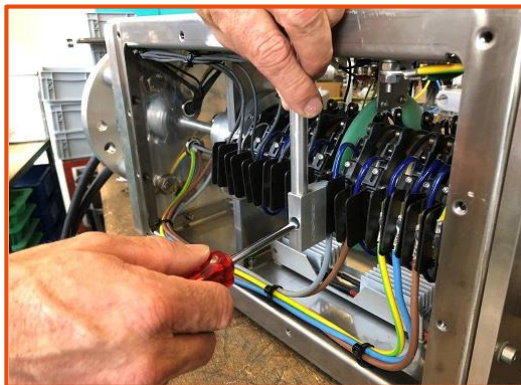
| Reference | N° | Description                                       |
|-----------|----|---|
| 90205N    |    | Complete carrying case including following tools: |
| 90607N    | 1  | Two-grade combination grinding stone              |
| 90655N    | 2  | Flexible abrasive                                 |
| 90665N    | 3  | Brush seater                                      |
| 90605N    | 4  | Pencil-type grinding stone                        |
| 90623N    | 5  | Stone for grinding commutators and rings on lathe |
| 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                                     |

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## TOOLS FOR THE MAINTENANCE OF CARBON BRUSH SIGNAL & POWER TRANSFER SYSTEMS

### KIT OF 3 TOOLS FOR BRUSH-HOLDER REPLACEMENTS AND CARBON BRUSH MAINTENANCE

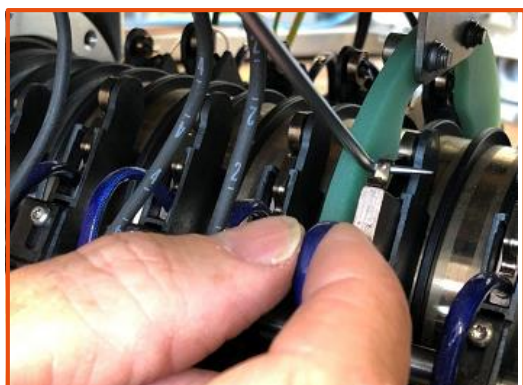
| Reference  | Description               |
|------------|---------------------------|
| 1606-51908 | Kit including the 3 tools |



Tool for brush-holder replacement



Tool for brush-holder replacement



Tool for lifting the spring and checking the condition of the brush

- Contact us for more information on our other measurement tools and devices
- Please request our guide on « How to maintain carbon brushes, brush-holders, commutators and slip rings »

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