

# Metallography

Consumables for sample preparation



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# Microdiamant – Your first choice for high-performance diamond products.

## Comprehensive product range

From blades to engineered diamond slurries – Microdiamant offers a competitive product range of consumables for metallography.

## Quality

Microdiamant consumables for metallographic sample preparation are your guarantee of consistent performance and perfect surfaces. With more than 60 years of experience, the quality of Microdiamant products sets the benchmark in our industry. Worldwide.

## High performance

Microdiamant is synonymous for maximized surface finishing performance. Our products help you to obtain the desired result in the least amount of time. Customized diamond products have set a new standard for process results and economics.

## Competent application consulting

The optimal use of our products is our goal – and your profit. With our extensive product range we can offer you a complete preparation proposal offer for a variety of materials. Ask about our preparation instructions.

## Product range



### Cutting



### Mounting



### Grinding



### Diamond slurries



### Polishing



### Diamond compounds





# Cutting

Diamond-, CBN- and bakelite-bonded cutting blades



# Cutting

## **Bakelite-bonded cutting discs**

The sample preparation starts with the cutting. Depending on the composition and hardness of the sample, we recommend cutting discs with different bonding hardness.

For ductile metals like titanium, we use cutting discs with a special geometry that enable free cutting.



## **Diamond- or CBN-bonded cutting discs**

Diamond or CBN (cubic boron nitride) cutting discs are suitable for very hard and brittle materials due to the better quality and long tool life.

## **Cooling lubricant for the cutting**

In order to achieve optimal cooling of the bakelite-bonded cutting discs, and the best possible lubrication of the diamond / CBN cutting discs, we advise the use of cooling lubricants.

## **Application recommendations**

The following points should be observed to obtain an optimal separation cut:

- Clamp every cutting disc with a flange that has a diameter of at least  $\frac{2}{3}$  of the cutting disc.
- For diamond / CBN cutting discs, check the openness of the bonding regularly and sharpen with a dressing stone if necessary.
- For the use of the cooling lubricant, it is not the quantity but the correct pressure (minimum 2 bar) that is crucial for the best possible result.
- Pay attention to continuous cooling during the cutting; no flying sparks or copious smoke formation must occur.



# Mounting

Hot and cold mounting consumables, accessories



# Mounting

## Hot mounting consumables

Microdiamant only uses granulates as hot mounting consumables so that less soiling from dust arises during the machining. All products are shipped with instructions and comply with the current safety regulations.

The following hot mounting consumables are available from stock:

### Packaging unit

Standard container:  
2.5, 20 or 25 kg in airtight plastic buckets.

Other container sizes  
by agreement.

### EPO

Mineral-filled epoxy resin (>80 °C) with good edge sharpness and minimal shrinkage.  
Color: black

### BAK

Phenolic resin filled with wood chips (>100 °C) for standard samples.  
Color: black, red, green

### BAK-L

Phenolic resin filled with graphite (>100 °C), electrically conductive.  
Color: black

### BAK-S

Phenolic resin filled with glass fibers (>100 °C), small gap width and high embedding quality.  
Color: black

### DAP

Reinforced diallyl phthalate –resin (>80 °C) for small parts with tighter requirements for gap width.  
Color: black

### CLEAR

Transparent methacrylate– resin (>100 °C) for transparent mounting of specimens.  
Color: transparent





### Cold mounting consumables

Cold mounting consumables are suitable for preparing samples of heat-sensitive materials as well as for the simultaneous, efficient manufacture of multiple individual samples.

The following 2-component mounting materials are available from stock:

#### MDG-K

MDG-K is a transparent standard mounting material consisting of powder and hardener. It is typically processed in a 2:1 mixture and has a hardening time of 8 to 10 minutes.

MDG-KP Powder in 2.5, 5 and 10 kg containers

MDG-KL Hardener in 500 ml and 1 l bottles

#### MDG-B

MDG-B is a blue colored, liquid mounting material. The standard mixing ratio is 2:1, the hardening time is 8 to 10 hours.

MDG-BP Resin in 1, 5 and 10 l bottles

MDG-BL Hardener in 500 ml and 1 l bottles

#### MDG-CBP

MDG-CB is an mounting material that allows sample preparation with small gap width and low shrinkage. It is white and has a hardening time of 6 to 8 minutes.

MDG-CBP Powder in 2.5, 5 and 10 kg containers

MDG-CBL Hardener in 500 ml and 1 l bottles

#### C1000

C1000 is an mounting material that does not develop any harmful vapors during hardening and thus can also be used without a fume extractor. The mounting material is colored blue and has a hardening time of 6 to 8 minutes.

C1000 Powder in 1, 5 and 10 kg containers

C1000 MMA Hardener, MMA-free, in 500 ml bottles

#### Order information

All cold mounting materials are also available as a set (resin plus hardener). Please refer to our price list for details.



### **Mounting accessories**

The range of accessories for mounting include silicone molds, fixing clips and gloves. These products are characterized by an outstanding price/performance ratio. Please refer to our price list for the various items and sizes.



# Grinding

Resin- and metal-bond diamond grinding pads, abrasive paper



# Grinding with diamond grinding pads

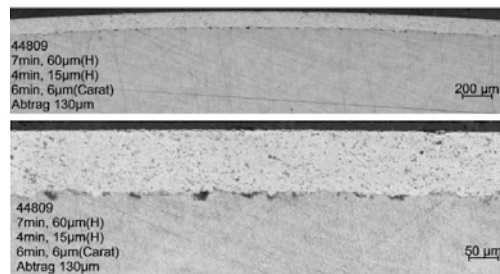
## Diamond grinding pads

In addition to the already well-known PLATO, APOLLO and CARAT diamond grinding pads that have been used successfully for sample machining in metallography for many years, Microdiamant has now expanded the range of grinding pads with the SQUADRO fine grinding pad. Microdiamant is thus setting new standards in the trend to fine grinding that is increasingly replacing polishing.

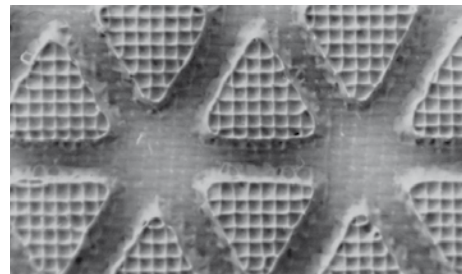
With the range of grinding pads from Microdiamant it is possible to machine up to 80% of all sample materials and coatings. Thanks to the wide range of diamond grain sizes from 3  $\mu\text{m}$  to 251  $\mu\text{m}$ , all process steps from rough grinding to fine grinding can be covered. Afterwards, it is only necessary to perform one or at the most two polishing steps using diamond slurries and polishing pads.

## Advantages of diamond grinding pads

- The tool lifetimes of the APOLLO and SQUADRO diamond grinding pads are approx. 500 to 1,000 times longer than those of SiC grinding papers.
- APOLLO diamond grinding pads have a high removal rate and thus save a great amount of machining time.
- SQUADRO diamond grinding pads achieve a surface quality that allows polishing to be performed immediately afterwards. A lapping process is no longer necessary.
- Only water is needed for the cooling. For very demanding applications, SQUADRO can be used together with the lubricant LUB1 X20 to increase the material removal rate and surface quality.
- Microdiamant diamond grinding pads have a unique structure and can be used immediately without sharpening.
- The diamond grinding pads are self-sharpening thanks to the special resin bond.



HVOF coating



SQUADRO structure



## PLATO

### Metal-bond diamond grinding pad

**For non-metallic samples such as ceramics, glass and rock samples we recommend the diamond grinding pad PLATO. The diamond particles on the surface are metal-bonded and ensure a high and steady removal, even in very hard materials. PLATO diamond grinding pads do not need to be pre-processed or dressed. Due to the high diamond concentration and quality the pad is self-sharpening. This grinding pad is suitable for almost all cooling lubricants because of its metal binding. In the field of stone processing even the dry usage is possible.**

#### Properties

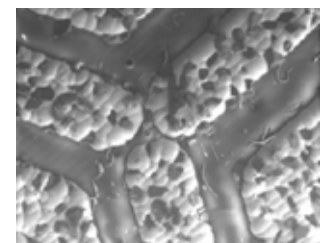
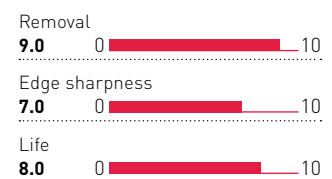
|              |  |
|--------------|--|
| Diameter     | 200/250/300 mm, larger diameters on request (up to 760 mm) |
| Diamond size | 125/75/54/10 µm  |
| Diamond type | RBM  |
| Bond type    | metal-bond   |
| Mounting     | stainless steel carrier / self-adhesive (PSA)              |

#### Application recommendations

|                      |  |
|----------------------|--|
| Max speed            | 15 m/s   |
| Grinding pressure    | 13 N/cm <sup>2</sup> for ceramics  |
| Coolant              | water, alcohol, oil, emulsion  |
| Typical applications | rough and fine grinding of non-metallic samples, embedded and non embedded samples |

**Self-sharpening** The PLATO diamond grinding pads do not have to be dressed thanks to the self-sharpening effect. This prolongs the service life, minimizes costs and increases reproducibility.

**Precision size range** Due to the narrow grain size spread, the number of particles with the same size is maximized, or fine and big grain fraction is reduced. This allows high material removal rates and excellent surface qualities.



**Flexible backing** The flexible backing absorbs vibrations and reduces material fracturing, at the same time corrosion is prevented.

**Consumption indicator** The wear of the abrasive pad is indicated by the white coloration of the pellets.

**Clean work** For cooling only running water is required. The pellets can be cleaned with a brush (without the addition of acid) under running water.

#### Order information

Part number 30630  
PLATO diamond grinding pad  
250 mm – 75 µm  
self-adhesive (PSA)

#### Packing unit

1 piece per box

#### PLATO

| Diameter | Grit size | Part number<br>self-adhesive (PSA) | Part number<br>metal carrier |
|----------|-----------|------------------------------------|------------------------------|
| 200 mm   | 125 µm    | 30420                              | 304201                       |
| 250 mm   | 125 µm    | 30620                              | 306201                       |
| 300 mm   | 125 µm    | 30720                              | 307201                       |
| 200 mm   | 75 µm     | 30430                              | 304301                       |
| 250 mm   | 75 µm     | 30630                              | 306301                       |
| 300 mm   | 75 µm     | 30730                              | 307301                       |
| 200 mm   | 54 µm     | 30471                              | 304711                       |
| 250 mm   | 54 µm     | 30673                              | 306731                       |
| 300 mm   | 54 µm     | 30773                              | 307731                       |
| 200 mm   | 10 µm     | 30472                              | 304721                       |
| 250 mm   | 10 µm     | 30672                              | 306721                       |
| 300 mm   | 10 µm     | 30772                              | 307721                       |

Larger diameters on request





## APOLLO-S

### Resin-bond diamond grinding pad

**APOLLO-S is a self-sharpening, flexible diamond grinding pad for flat- and fine grinding applications, replacing traditional SiC paper pad in grinding of various materials. Precision graded diamond and optimized grit concentration lead to short process times, flat surfaces and superior edge sharpness.**

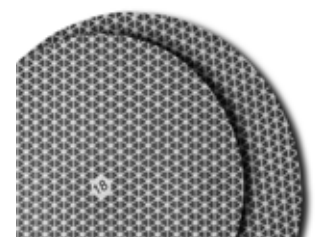
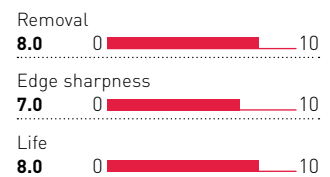
| Pad diameter | Bond  | Diamond size | Diamond type |
|--------------|-------|--------------|--------------|
| 200mm        | resin | 125 µm       | FRD          |
| 250mm        | resin | 75 µm        | FRD          |
| 300mm        | resin | 54 µm        | FRD          |
| 350mm        | resin | 18 µm        | RBM          |

larger diameters on request

|                     |   |
|---------------------|---|
| Max speed           | 15m/s   |
| Grinding pressure   | 5-7 N/cm <sup>2</sup> for steel and comparable materials<br>13 N/cm <sup>2</sup> for ceramics     |
| Typical application | Rough and fine grinding of metallic and non-metallic materials<br>Embedded and unembedded samples |
| Mounting            | Stainless steel plate with special grip surface/flexible adhesive backing                         |
| Coolant             | Water   |

**Self-sharpening** Dressing is not necessary due to the self-sharpening characteristics, leading to prolonged life time, reduced costs and high repeatability.

**Precision graded micron diamond sizes** Narrow particle size distribution maximizes the amount of particles of the same size while fine and coarse particles are minimized. This feature allows for both high process reproducibility and superior results in surface quality.





**Flexible base** The flexible base absorbs vibrations and thus reduces material fractures and prevents corrosion.

**Usage indicator** The surface of the diamond grinding pad turns white to indicate end of life.

**Clean workspace** Only water needed as coolant, resulting in clean workspace and easy cleaning of workpiece.

**Order information**

Part number 32200  
 APOLLO-S diamond  
 grinding pad  
 200mm - 125 µm  
 with adhesive backing

**Packing unit**

1 piece per box

| Pad diameter | Diamond size | Part number      |                         |
|--------------|--------------|------------------|-------------------------|
|              |              | Adhesive backing | Stainless steel backing |
| 200mm        | 125 µm       | 32200            | 322001                  |
| 250mm        | 125 µm       | 32210            | 322101                  |
| 300mm        | 125 µm       | 32220            | 322201                  |
| 350mm        | 125 µm       | 32230            | 322301                  |
| 200mm        | 75 µm        | 32250            | 322501                  |
| 250mm        | 75 µm        | 32260            | 322601                  |
| 300mm        | 75 µm        | 32270            | 322701                  |
| 350mm        | 75 µm        | 32280            | 322801                  |
| 200mm        | 54 µm        | 32010            | 320101                  |
| 250mm        | 54 µm        | 32110            | 321101                  |
| 300mm        | 54 µm        | 32170            | 321701                  |
| 350mm        | 54 µm        | 32190            | 321901                  |
| 200mm        | 18 µm        | 32011            | 320111                  |
| 250mm        | 18 µm        | 32111            | 321111                  |
| 300mm        | 18 µm        | 32171            | 321711                  |
| 350mm        | 18 µm        | 32191            | 321911                  |



## SQUADRO-M / SQUADRO-H

### Resin-bond diamond grinding pad

**SQUADRO-M and SQUADRO-H are innovative diamond grinding pads that extends fine grinding to single-micron grit sizes. They replace conventional lapping processes, achieving superior results in terms of material removal rate, surface quality, work piece geometry and tool life. SQUADRO diamond grinding pads provide for an easy, clean and efficient fine grinding process.**

#### Properties

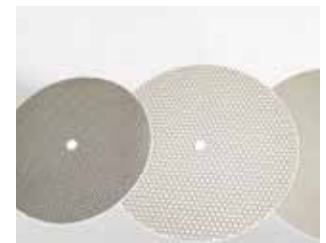
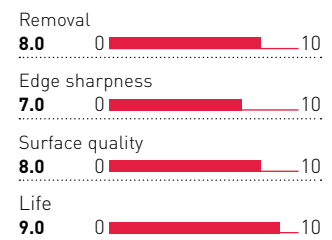
|                          |   |
|--------------------------|---|
| Diameter                 | 200/ 250/ 300/ 350 mm, larger diameters (up to 760 mm) on request |
| Diamond size             | 60 µm/ 30 µm/ 15 µm/ 6 µm/ 3 µm                                   |
| Diamond type             | RBM   |
| Bond type                | SQUADRO-M: resin, medium hard; SQUADRO-H: resin, hard             |
| Base                     | textile base  |
| Mounting                 | stainless steel carrier/ self-adhesive (PSA)                      |
| Abrasive layer thickness | 0,4 mm  |

#### Application recommendations

|                      |   |
|----------------------|---|
| Max speed            | 15 m/s  |
| Grinding pressure    | 5-7 N/cm <sup>2</sup> for steel and comparable materials<br>13 N/cm <sup>2</sup> for ceramics   |
| Coolant              | Water   |
| Typical applications | SQUADRO-M: Fine grinding of metals, ceramics and glasses<br>SQUADRO-H: Fine grinding of hard materials, ceramics and sharp-edged workpieces |

**Fine grinding with unmatched precision** SQUADRO-M and SQUADRO-H enable fine grinding of various materials with diamond micron sizes down to 3 µm and matches surface qualities previously only achieved with lapping processes – easy, clean, efficient.

**Innovative design** SQUADRO diamond grinding pads consist of micron diamond abrasives embedded in a structured matrix of high-performance polymers. The resin structures are mounted on a textile base, which absorbs vibrations and thus improves surface quality.



**Precision graded micron diamond sizes** A narrow particle size distribution allows for both superior surface quality and highest material removal rate.

**Easy handling** SQUADRO can be used on any standard lapping or polishing machine. The mounting options (stainless steel carrier or self-adhesive backing) are designed for quick and easy changes of grit size.

**Long tool life** The massive abrasive layer allows for long tool life, minimal set-up time and low process cost.

**Self-sharpening** SQUADRO diamond grinding pads can be used out of the box without dressing. Thanks to the self-sharpening bond system, the diamond grinding pads do not require conditioning during the process to continuously achieve excellent grinding results.

**Clean process** Working with SQUADRO is environmentally friendly and clean. Cooling is done by water or our lubricant LUBX20, no diamond slurries or lubricants are needed.

**Versatile** SQUADRO can be used to grind a wide range of materials such as steel, stainless steel, steel alloys, optical glasses, various crystals, industrial ceramics, ceramic seals and other materials.

#### Order information

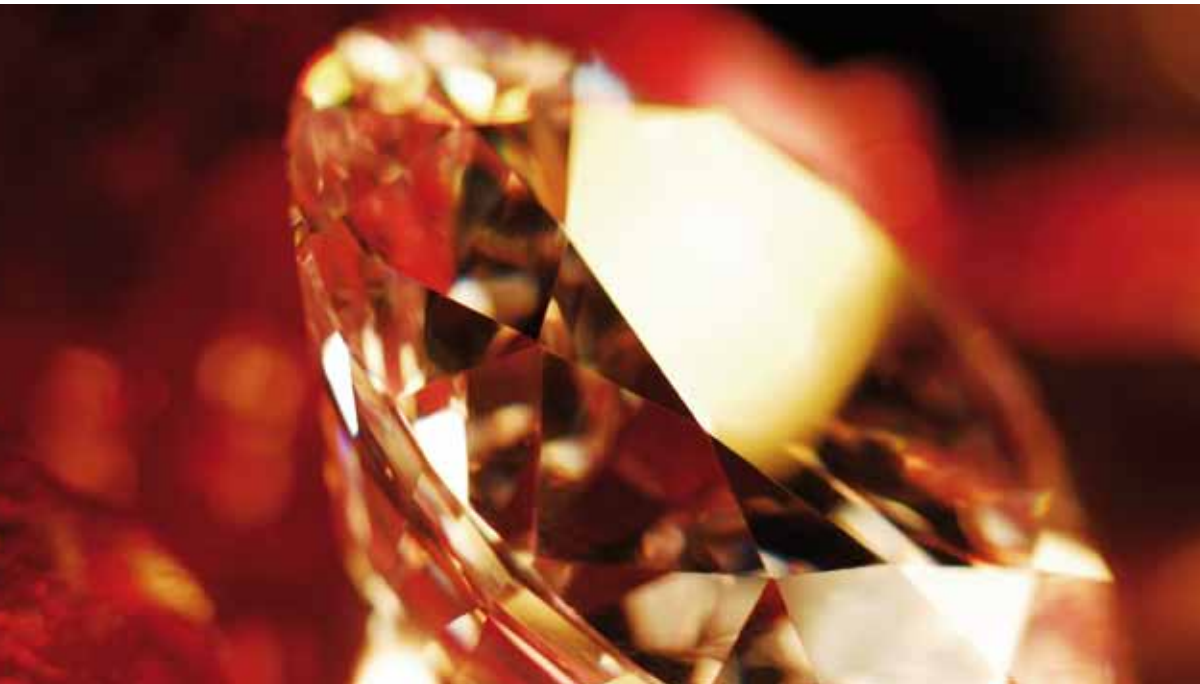
Part number 3344152  
SQUADRO-H diamond  
grinding pad  
250 mm – 15 µm  
self-adhesive (PSA)

#### Packing unit

1 piece per box

| Diamond size | Diameter | SQUADRO-M                 |                           | SQUADRO-H                 |                           |
|--------------|----------|---------------------------|---------------------------|---------------------------|---------------------------|
|              |          | Part number self-adhesive | Part number Metal carrier | Part number self-adhesive | Part number Metal carrier |
| 60 µm        | 200 mm   | 334601                    | 335601                    | 3344601                   | 3354601                   |
|              | 250 mm   | 334602                    | 335602                    | 3344602                   | 3354602                   |
|              | 300 mm   | 334603                    | 335603                    | 3344603                   | 3354603                   |
|              | 350 mm   | 334604                    | 335604                    | 3344604                   | 3354604                   |
| 30 µm        | 200 mm   | 334301                    | 335301                    | 3344301                   | 3354301                   |
|              | 250 mm   | 334302                    | 335302                    | 3344302                   | 3354302                   |
|              | 300 mm   | 334303                    | 335303                    | 3344303                   | 3354303                   |
|              | 350 mm   | 334304                    | 335304                    | 3344304                   | 3354304                   |
| 15 µm        | 200 mm   | 334151                    | 335151                    | 3344151                   | 3354151                   |
|              | 250 mm   | 334152                    | 335152                    | 3344152                   | 3354152                   |
|              | 300 mm   | 334153                    | 335153                    | 3344153                   | 3354153                   |
|              | 350 mm   | 334154                    | 335154                    | 3344154                   | 3354154                   |
| 6 µm         | 200 mm   | 334061                    | 335061                    | 3344061                   | 3354061                   |
|              | 250 mm   | 334062                    | 335062                    | 3344062                   | 3354062                   |
|              | 300 mm   | 334063                    | 335063                    | 3344063                   | 3354063                   |
|              | 350 mm   | 334064                    | 335064                    | 3344064                   | 3354064                   |
| 3 µm         | 200 mm   | 334031                    | 335031                    | 3344031                   | 3354031                   |
|              | 250 mm   | 334032                    | 335032                    | 3344032                   | 3354032                   |
|              | 300 mm   | 334033                    | 335033                    | 3344033                   | 3354033                   |
|              | 350 mm   | 334034                    | 335034                    | 3344034                   | 3354034                   |

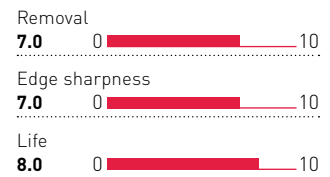
Larger diameters on request (max. 760 mm)



# CARAT

## Resin-bond diamond grinding pad

**CARAT is a self-sharpening diamond grinding pad for fine-grinding applications, replacing traditional SiC paper. Brittle materials such as nitride and oxide layers on steel can be ground without chipping, materials with low dimensional stability can be processed without deformation. Short process times, flat surfaces and superior edge sharpness are achieved due to precision graded diamond and optimized grit concentration.**



| Pad diameter | Bond  | Diamond size | Diamond type |
|--------------|-------|--------------|--------------|
| 200mm        | resin | 15 µm        | MSY          |
| 250mm        | resin | 6 µm         | MSY          |
| 300mm        | resin | 3 µm         | MSY          |

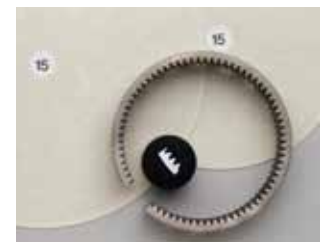
larger diameters on request

|                     |   |
|---------------------|---|
| Max speed           | 15m/s   |
| Grinding pressure   | 5 – 7 N/cm <sup>2</sup> for steel and comparable materials<br>13 N/cm <sup>2</sup> for ceramics |
| Typical application | Fine grinding of metallographic samples and brittle materials                                   |
| Mounting            | Stainless steel plate with special grip surface/flexible adhesive backing                       |
| Coolant             | Water   |

**Self-sharpening** Dressing is not necessary due to the self-sharpening characteristics, leading to prolonged life time, reduced costs and high repeatability.

**Precision graded micron diamond sizes** Narrow particle size distribution maximizes the amount of particles of the same size while fine and coarse particles are minimized. This feature allows for both high process reproducibility and superior results in surface quality.

**Flexible base** The flexible base absorbs vibrations and thus reduces material fractures and prevents corrosion.



**Clean workspace** Only water needed as coolant, resulting in clean workspace and easy cleaning of workpiece. Important, do not use alcohol as coolant or for cleaning!

**Order information**

Part number 33001  
CARAT diamond grinding pad  
200 mm – 15 µm  
with adhesive backing

**Packing unit**

1 piece per box

| Pad diameter | Diamond size | Part number<br>Adhesive backing | Part number<br>Stainless steel backing |
|--------------|--------------|---------------------------------|--|
| 200mm        | 15 µm        | 33001                           | 330011                                 |
| 250mm        | 15 µm        | 33002                           | 330021                                 |
| 300mm        | 15 µm        | 33003                           | 330031                                 |
| 200mm        | 6 µm         | 33011                           | 330111                                 |
| 250mm        | 6 µm         | 33012                           | 330121                                 |
| 300mm        | 6 µm         | 33013                           | 330131                                 |
| 200mm        | 3 µm         | 33021                           | 330211                                 |
| 250mm        | 3 µm         | 33022                           | 330221                                 |
| 300mm        | 3 µm         | 33023                           | 330231                                 |

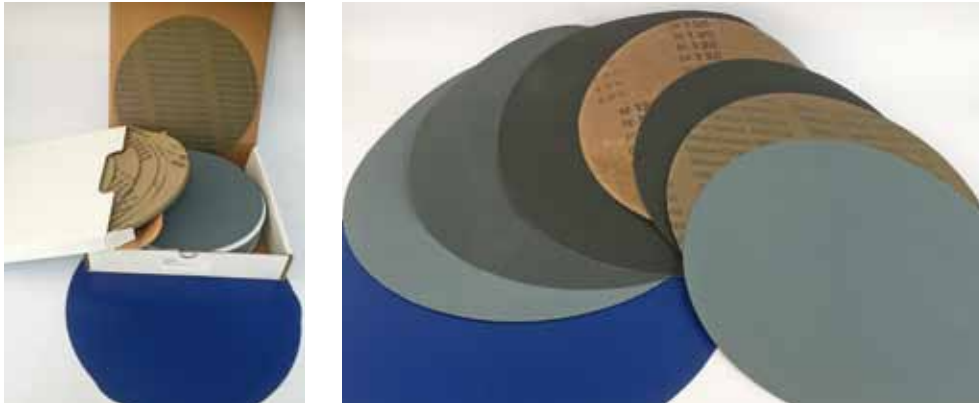
larger diameters on request

# Grinding with grinding paper and foil

## Grinding paper

In addition to the diamond grinding pads, Microdiamant also provides the complete range of conventional, high-quality wet grinding papers. These are available with various backings: standard for clamping ring systems, self-adhesive and with PET backing for silicone mounting discs such as our Fast Fix.

The diameters 200, 230, 250, 300 and 350 mm, in the grain size range from P80 to P4000, are available from stock.



Wet grinding paper

## Grinding foils

Grinding foils are better if long tool life and high quality are required. These are available with two different backings: self-adhesive, and with PET backing for silicone mounting discs. The grinding foils are available from stock in the diameters 200, 250, 300 and 350 mm.

Microdiamant provides grinding foils in 3 grain types:

- Ceramic bonding with zirconium for the pre-grinding with a high material removal rate from P100 to P800
- Silicon for fine grinding from 3 to 40  $\mu\text{m}$
- Diamond for fine grinding of minerals and rock samples from 0.5 to 40  $\mu\text{m}$



Grinding foils





# Diamond slurries

Engineered and universal-use slurries



# Diamond slurries

Ready-to-use diamond slurries from Microdiamant achieve constantly high material removal rates and best surface qualities. The costs for manufacturing and finishing can be reduced. The innovative slurry technology enables one to fully utilize the potential of the precision size ranged micron diamond powder. Performance-enhancing additives increase the removal rates. Stabilizers prevent the sedimentation of the diamond particles, thus increasing the process stability and simplifying the handling. Specially developed dispersion technologies prevent surface defects caused by diamond agglomerates.

## **Diamond slurries with integrated lubricant**

Diamond slurries with integrated lubricants are easy to use and guarantee consistently good process results. The water-based, stabilized formulation is odorless and keeps the diamond particles stabilized in slurry over a long time. Due to the low viscosity, very high removal rates are achieved with low consumption.

## **Diamond slurries for use with lubricant**

Diamond slurries for use with lubricants have a high concentration of diamonds. They are used with an appropriate lubricant so the polishing processes can be exactly matched to the particular requirements.



## Diamond slurry type APEX-TOP / APEX-TOP-DUO

Water soluble diamond slurry  
for metallographic sample preparation

### Description

APEX-TOP and APEX-TOP-DUO are water soluble high-performance diamond slurries, optimized for metallographic applications. The novel formulation employs SmartMicron diamond abrasives to create mirror-finish, defect-free surfaces at unrivalled material removal rates. The APEX-TOP and APEX-TOP-DUO slurry family is available in precision-graded diamond sizes from 1 to 6 micron. Typical application is the polishing of all metallic and ceramic samples, as well as coated or composite samples.

APEX-TOP diamond slurries are used in combination with separate Microdiamant lubricants. APEX-TOP-DUO is formulated as a 2-in-1 slurry with integrated lubricants.

| Slurry type         | Diamond type      | Viscosity | Stability  | pH Value |
|---------------------|-------------------|-----------|------------|----------|
| APEX-TOP 1-6 µm     | SMP (SmartMicron) | 125 cP    | stabilized | 8.0      |
| APEX-TOP-DUO 1-6 µm | SMP (SmartMicron) | 150 cP    | stabilized | 8.0      |

|                       |   |
|-----------------------|---|
| Carrier liquid        | APEX-TOP: water soluble, for usage with lubricants<br>APEX-TOP-DUO: water soluble, with integrated lubricants |
| Typical application   | lapping and polishing of metallographic samples, metal and ceramic parts                                      |
| Typical lapping plate | polishing pad or metal lapping plate  |
| Density               | 1.00 g/cm <sup>3</sup>  |

APEX-TOP and APEX-TOP-DUO diamond slurries are available in the polishing sizes from 1 to 6 micron, in concentrations adapted for metallographic sample preparation. They achieve significantly higher performance than conventional mono- and polycrystalline diamond slurries, both on polishing pads and on metallic lapping plates. The water soluble slurry is formulated to meet highest standards for work safety and environmental properties.

Note: The slurries are **not** suitable for use in slurry-circulation processes.

| APEX-TOP lubricant | Base           | Remarks               |
|--------------------|----------------|-----------------------|
| LUBRICANT YELLOW   | Water, alcohol | standard applications |
| LUBRICANT BLUE     | Alcohol        | standard applications |

The APEX-TOP-DUO 2-in-1 diamond slurries are single-bottle, ready-to-use slurries with lubricants integrated into the slurry formulation.

**Order example**

Part number 4W3S1000V1  
 APEX-TOP 3 µm  
 Quantity 7 l  
 Packing unit 1 l  
 Shipment 7 x 1 l

**Packing units**

Bottles 250 ml, 500 ml, 1 l  
 If not specified, we use 1 l bottles

| Diamond size | Packing unit | APEX-TOP<br>Part number | APEX-TOP-DUO<br>Part number |
|--------------|--------------|-------------------------|-----------------------------|
| 1 µm         | 250 ml       | 4W1S250V1               | 4W1S250V2                   |
|              | 500 ml       | 4W1S500V1               | 4W1S500V2                   |
|              | 1 l          | 4W1S1000V1              | 4W1S1000V2                  |
| 2 µm         | 250 ml       | 4W2S250V1               | 4W2S250V2                   |
|              | 500 ml       | 4W2S500V1               | 4W2S500V2                   |
|              | 1 l          | 4W2S1000V1              | 4W2S1000V2                  |
| 3 µm         | 250 ml       | 4W3S250V1               | 4W3S250V2                   |
|              | 500 ml       | 4W3S500V1               | 4W3S500V2                   |
|              | 1 l          | 4W3S1000V1              | 4W3S1000V2                  |
| 6 µm         | 250 ml       | 4W6S250V1               | 4W6S250V2                   |
|              | 500 ml       | 4W6S500V1               | 4W6S500V2                   |
|              | 1 l          | 4W6S1000V1              | 4W6S1000V2                  |

| Lubricant | Packing unit | YELLOW<br>Part number | BLUE<br>Part number |
|-----------|--------------|-----------------------|---------------------|
|           | 1 l          | 47200                 | 47010               |
|           | 10 l         | 47201                 | 47011               |



## Diamond slurry type POLY-TOP-DUO / MAGNUM-TOP-DUO

Water soluble diamond slurry with integrated lubricants

### Description

POLY-TOP-DUO and MAGNUM-TOP-DUO are water soluble diamond slurries with integrated lubricants (2-in-1). Designed as cost-effective, universal application diamond slurries, they are available in precision-graded diamond sizes from  $1/10$  to 30 micron. While POLY-TOP-DUO slurries use high-performance polycrystalline diamond type DP as abrasive, MAGNUM-TOP-DUO slurries contain monocrystalline diamond type MSY. Excellent wetting properties and low viscosity of the formulation guarantee very high material removal rates and low slurry consumption. Typical applications include lapping and polishing of metallographic samples, metals (ferrous or non-ferrous), optical components and ceramic parts.

| Slurry type                            | Diamond type          | Viscosity | Stability  | pH Value |
|--|-----------------------|-----------|------------|----------|
| POLY-TOP-DUO $1/10$ -6 $\mu\text{m}$   | DP (polycrystalline)  | 150 cP    | stabilized | 8.0      |
| POLY-TOP-DUO 9-15 $\mu\text{m}$        | DP (polycrystalline)  | 470 cP    | stabilized | 8.0      |
| MAGNUM-TOP-DUO $1/10$ -6 $\mu\text{m}$ | MSY (monocrystalline) | 150 cP    | stabilized | 8.0      |
| MAGNUM-TOP-DUO 9-30 $\mu\text{m}$      | MSY (monocrystalline) | 470 cP    | stabilized | 8.0      |

|                       |  |
|-----------------------|--|
| Carrier liquid        | water soluble, with integrated lubricants                                  |
| Typical application   | lapping and polishing of metallographic specimens, metal and ceramic parts |
| Typical lapping plate | polishing pad or metal lapping plate                                       |
| Density               | 1.03 g/cm <sup>3</sup>   |

POLY-TOP-DUO and MAGNUM-TOP-DUO diamond slurries are available in standard sizes between 1/10 and 30 micron, in specifically matched concentrations. They can be used effectively on polishing pads as well as on metallic lapping plates. The water soluble slurry is formulated to meet highest standards for work safety and environmental properties.

Note: The slurries are not suitable for use in slurry-circulation processes.

#### Order example

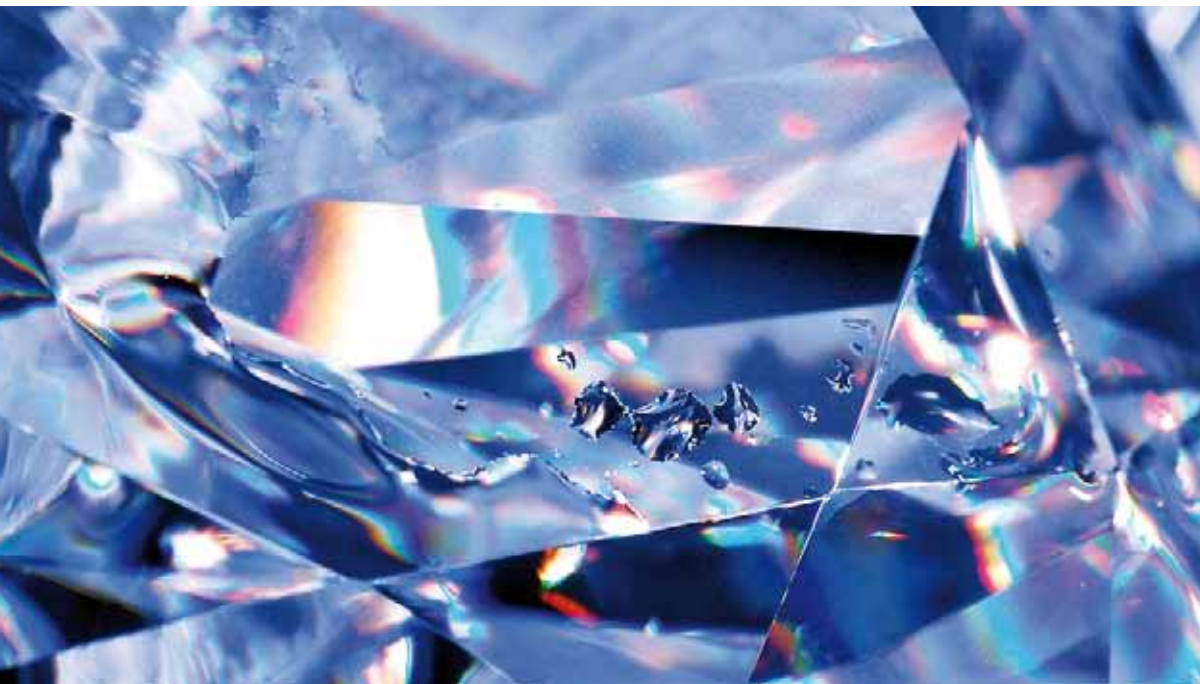
Part number 4W9P2500V2  
POLY-TOP-DUO 9 µm  
Quantity 5 l  
Packing unit 2.5 l  
Shipment 2 × 2.5 l

#### Packing units

Bottles 250 ml, 500 ml, 1 l, 2.5 l  
Containers 10 l  
If not specified, we use 2.5 l bottles

| Diamond size | Packing unit | POLY-TOP-DUO<br>Part number | MAGNUM-TOP-DUO<br>Part number |
|--------------|--------------|-----------------------------|-------------------------------|
| 1/10 µm      | 250 ml       | 4W010P250V2                 | 4W010M250V2                   |
|              | 500 ml       | 4W010P500V2                 | 4W010M500V2                   |
|              | 1 l          | 4W010P1000V2                | 4W010M1000V2                  |
|              | 2.5 l        | 4W010P2500V2                | 4W010M2500V2                  |
|              | 10 l         | 4W010P10000V2               | 4W010M10000V2                 |
| 1/4 µm       | 250 ml       | 4W025P250V2                 | 4W025M250V2                   |
|              | 500 ml       | 4W025P500V2                 | 4W025M500V2                   |
|              | 1 l          | 4W025P1000V2                | 4W025M1000V2                  |
|              | 2.5 l        | 4W025P2500V2                | 4W025M2500V2                  |
|              | 10 l         | 4W025P10000V2               | 4W025M10000V2                 |
| 1 µm         | 250 ml       | 4W1P250V2                   | 4W1M250V2                     |
|              | 500 ml       | 4W1P500V2                   | 4W1M500V2                     |
|              | 1 l          | 4W1P1000V2                  | 4W1M1000V2                    |
|              | 2.5 l        | 4W1P2500V2                  | 4W1M2500V2                    |
|              | 10 l         | 4W1P10000V2                 | 4W1M10000V2                   |
| 3 µm         | 250 ml       | 4W3P250V2                   | 4W3M250V2                     |
|              | 500 ml       | 4W3P500V2                   | 4W3M500V2                     |
|              | 1 l          | 4W3P1000V2                  | 4W3M1000V2                    |
|              | 2.5 l        | 4W3P2500V2                  | 4W3M2500V2                    |
|              | 10 l         | 4W3P10000V2                 | 4W3M10000V2                   |
| 6 µm         | 250 ml       | 4W6P250V2                   | 4W6M250V2                     |
|              | 500 ml       | 4W6P500V2                   | 4W6M500V2                     |
|              | 1 l          | 4W6P1000V2                  | 4W6M1000V2                    |
|              | 2.5 l        | 4W6P2500V2                  | 4W6M2500V2                    |
|              | 10 l         | 4W6P10000V2                 | 4W6M10000V2                   |
| 9 µm         | 250 ml       | 4W9P250V2                   | 4W9M250V2                     |
|              | 500 ml       | 4W9P500V2                   | 4W9M500V2                     |
|              | 1 l          | 4W9P1000V2                  | 4W9M1000V2                    |
|              | 2.5 l        | 4W9P2500V2                  | 4W9M2500V2                    |
|              | 10 l         | 4W9P10000V2                 | 4W9M10000V2                   |
| 15 µm        | 250 ml       | 4W15P250V2                  | 4W15M250V2                    |
|              | 500 ml       | 4W15P500V2                  | 4W15M500V2                    |
|              | 1 l          | 4W15P1000V2                 | 4W15M1000V2                   |
|              | 2.5 l        | 4W15P2500V2                 | 4W15M2500V2                   |
|              | 10 l         | 4W15P10000V2                | 4W15M10000V2                  |
| 30 µm        | 250 ml       | -                           | 4W30M250V2                    |
|              | 500 ml       | -                           | 4W30M500V2                    |
|              | 1 l          | -                           | 4W30M1000V2                   |
|              | 2.5 l        | -                           | 4W30M2500V2                   |
|              | 10 l         | -                           | 4W30M10000V2                  |





## Diamond slurry type POLY-TOP/ MAGNUM-TOP

Water soluble diamond slurry for usage with lubricants

### Description

POLY-TOP and MAGNUM-TOP are water soluble, universal application diamond slurries, available in precision-graded diamond sizes from  $1/10$  and 45 micron. They are used in combination with separate lubricants, allowing for optimal in-process control and minimal slurry consumption. While POLY-TOP slurries use high-performance polycrystalline diamond type DP as abrasive, MAGNUM-TOP slurries contain monocrystalline diamond type MSY. The sophisticated slurry formulation guarantees excellent surface quality, highest material removal rate and easy handling thanks to robust stabilization. Typical applications include lapping and polishing of metallographic samples, metals (ferrous or non-ferrous), optical components and ceramic parts.

| Slurry type                        | Diamond type          | Viscosity | Stability  | pH Value |
|------------------------------------|-----------------------|-----------|------------|----------|
| POLY-TOP $1/10$ -1 $\mu\text{m}$   | DP (polycrystalline)  | 90 cP     | stabilized | 8.0      |
| POLY-TOP 3-15 $\mu\text{m}$        | DP (polycrystalline)  | 125 cP    | stabilized | 8.0      |
| MAGNUM-TOP $1/10$ -1 $\mu\text{m}$ | MSY (monocrystalline) | 90 cP     | stabilized | 8.0      |
| MAGNUM-TOP 3-45 $\mu\text{m}$      | MSY (monocrystalline) | 125 cP    | stabilized | 8.0      |

|                       |  |
|-----------------------|--|
| Carrier liquid        | water soluble, for usage with lubricants                                   |
| Typical application   | lapping and polishing of metallographic specimens, metal and ceramic parts |
| Typical lapping plate | polishing pad or metal lapping plate                                       |
| Density               | 1.00 g/cm <sup>3</sup>   |



POLY-TOP and MAGNUM-TOP diamond slurries are available in standard sizes between 1/10 and 45 micron, in specifically matched concentrations. They can be used effectively on polishing pads as well as on metallic lapping plates. The water soluble slurry is formulated to meet highest standards for work safety and environmental properties.

Note: The slurries are not suitable for use in slurry-circulation processes.

| Lubricant          | Base           | Remarks               |
|--------------------|----------------|-----------------------|
| LUBRICANT YELLOW   | Water, alcohol | standard applications |
| LUBRICANT YELLOW-S | Water          | usage on pitch plates |

Slurries with integrated lubricants: the 2-in-1 slurries POLY-TOP-DUO and MAGNUM-TOP-DUO are single-bottle, ready-to-use slurries with lubricants integrated into the slurry formulation.

#### Order example

Part number 4W6P1000V1  
POLY-TOP 6 µm  
Quantity 5 l  
Packing unit 1 l  
Shipment 5 × 1 l

#### Packing units

Bottles 250 ml, 500 ml, 1 l  
If not specified, we use 1 l bottles

| Diamond size | Packing unit | POLY-TOP<br>Part number | MAGNUM-TOP<br>Part number |
|--------------|--------------|-------------------------|---------------------------|
| 1/10 µm      | 250 ml       | 4W010P250V1             | 4W010M250V1               |
|              | 500 ml       | 4W010P500V1             | 4W010M500V1               |
|              | 1 l          | 4W010P1000V1            | 4W010M1000V1              |
| 1/4 µm       | 250 ml       | 4W025P250V1             | 4W025M250V1               |
|              | 500 ml       | 4W025P500V1             | 4W025M500V2               |
|              | 1 l          | 4W025P1000V1            | 4W025M1000V1              |
| 1 µm         | 250 ml       | 4W1P250V1               | 4W1M250V1                 |
|              | 500 ml       | 4W1P500V1               | 4W1M500V1                 |
|              | 1 l          | 4W1P1000V1              | 4W1M1000V1                |
| 3 µm         | 250 ml       | 4W3P250V1               | 4W3M250V1                 |
|              | 500 ml       | 4W3P500V1               | 4W3M500V1                 |
|              | 1 l          | 4W3P1000V1              | 4W3M1000V1                |
| 6 µm         | 250 ml       | 4W6P250V1               | 4W6M250V1                 |
|              | 500 ml       | 4W6P500V1               | 4W6M500V1                 |
|              | 1 l          | 4W6P1000V1              | 4W6M1000V1                |
| 9 µm         | 250 ml       | 4W9P250V1               | 4W9M250V1                 |
|              | 500 ml       | 4W9P500V1               | 4W9M500V1                 |
|              | 1 l          | 4W9P1000V1              | 4W9M1000V1                |
| 15 µm        | 250 ml       | 4W15P250V1              | 4W15M250V1                |
|              | 500 ml       | 4W15P500V1              | 4W15M500V1                |
|              | 1 l          | 4W15P1000V1             | 4W15M1000V1               |
| 30 µm        | 250 ml       | –                       | 4W30M250V1                |
|              | 500 ml       | –                       | 4W30M500V1                |
|              | 1 l          | –                       | 4W30M1000V1               |
| 45 µm        | 250 ml       | –                       | 4W45M250V1                |
|              | 500 ml       | –                       | 4W45M500V1                |
|              | 1 l          | –                       | 4W45M1000V1               |
| Lubricant    | Packing unit | YELLOW                  | YELLOW-S                  |
|              |              | Part number             | Part number               |
|              |              | 1 l                     | 47200                     |
| 10 l         | 47201        | 47207                   |                           |



## Diamond slurry type POLY / MAGNUM-GREEN

### Alcohol-based diamond slurry

#### Description

POLY and MAGNUM-GREEN are alcohol-based diamond slurries, available in precision-graded diamond sizes from 1/4 to 15 micron. Polycrystalline diamond type DP is used as abrasive in POLY slurries, while MAGNUM GREEN slurries use monocrystalline diamond type MSY. The water-free formulation qualifies these slurries for polishing corrosion-sensitive materials such as zinc and others.

Both slurries can be used in combination with LUBRICANT BLUE to enhance in-process control and minimize slurry consumption.

| Slurry type            | Diamond type          | Viscosity | Stability  |
|------------------------|-----------------------|-----------|------------|
| POLY 1/4-15 µm         | DP (polycrystalline)  | 90 cP     | stabilized |
| MAGNUM-GREEN 1/4-15 µm | MSY (monocrystalline) | 90 cP     | stabilized |

|                       |  |
|-----------------------|--|
| Carrier liquid        | alcohol-based, water-free  |
| Typical application   | lapping and polishing of metallographic specimens<br>high removal rate |
| Typical lapping plate | polishing pad  |
| Density               | 0.82 g/cm <sup>3</sup>   |

POLY and MAGNUM-GREEN slurries are simply sprayed onto the polishing pad prior to processing. During the actual process only LUBRICANT BLUE is added. Alternatively, LUBRICANT YELLOW (water-based) can be used.

Due to the very low viscosity and surface tension, alcohol-based diamond slurries achieve higher material removal rates compared to water-based diamond slurries.

#### Order example

Part number 4A6P1000A2  
Diamond slurry  
POLY 6 µm  
Quantity 5 ltr  
Packing unit 1 ltr  
Shipment 5 × 1 ltr

#### Packing units

Bottles 250 ml, 500 ml, 1 ltr  
If not specified, we use 1 ltr

| Diamond size | Packing unit | POLY<br>Part number | MAGNUM-GRÜN<br>Part number |
|--------------|--------------|---------------------|----------------------------|
| ¼ µm         | 250 ml       | 4A025P250A2         | 4A025M250A1                |
|              | 500 ml       | 4A025P500A2         | 4A025M500A1                |
|              | 1 l          | 4A025P1000A2        | 4A025M1000A1               |
| 1 µm         | 250 ml       | 4A1P250A2           | 4A1M250A1                  |
|              | 500 ml       | 4A1P500A2           | 4A1M500A1                  |
|              | 1 l          | 4A1P1000A2          | 4A1M1000A1                 |
| 3 µm         | 250 ml       | 4A3P250A2           | 4A3M250A1                  |
|              | 500 ml       | 4A3P500A2           | 4A3M500A1                  |
|              | 1 l          | 4A3P1000A2          | 4A3M1000A1                 |
| 6 µm         | 250 ml       | 4A6P250A2           | 4A6M250A1                  |
|              | 500 ml       | 4A6P500A2           | 4A6M500A1                  |
|              | 1 l          | 4A6P1000A2          | 4A6M1000A1                 |
| 9 µm         | 250 ml       | 4A9P250A2           | 4A9M250A1                  |
|              | 500 ml       | 4A9P500A2           | 4A9M500A1                  |
|              | 1 l          | 4A9P1000A2          | 4A9M1000A1                 |
| 15 µm        | 250 ml       | 4A15P250A2          | 4A15M250A1                 |
|              | 500 ml       | 4A15P500A2          | 4A15M500A1                 |
|              | 1 l          | 4A15P1000A2         | 4A15M1000A1                |

| Lubricant        | Base    | Remarks   |
|------------------|---------|---|
| LUBRICANT BLUE   | alcohol | to be used only with POLY/MAGNUM-GREEN  |
| LUBRICANT BLUE-K | glycol  | Concentrate without alcohol<br>(mixing ratio 1 part lubricant: 9 parts alcohol) |
| LUBRICANT YELLOW | water   | to be used only with POLY/MAGNUM-GREEN<br>water-based lubricant                 |

| Lubricant | Packing unit | BLUE<br>Part number | BLUE-K<br>Part number | YELLOW<br>Part number |
|-----------|--------------|---------------------|-----------------------|-----------------------|
|           | 1 l          | 47010               | 47012                 | 47200                 |
|           | 10 l         | 47011               | –                     | 47201                 |



## OPS Slurry / AF Slurry for final polishing

### Description

The final polishing step of metallographic samples is determined by the material. In order to achieve the required surface quality for micro-evaluations, Microdiamant provides oxide polishing slurries with colloidal silica or aluminum oxide (alumina).

### OPS Slurries

also known as «Silica»

| Description                   | Volume | Grit size | Part number |
|-------------------------------|--------|-----------|-------------|
| O.P.S. oxide polishing slurry | 1 l    | 0,05 µm   | 48210       |
| O.P.S. oxide polishing slurry | 10 l   | 0,05 µm   | 48211       |

### AF Slurries

also known as «Alumina»

| Description                            | Volume | Grit size | Part number |
|--|--------|-----------|-------------|
| Aluminum oxide slurry concentrate AF-2 | 1 l    | 0,5 µm    | 48010       |
| Aluminum oxide slurry concentrate AF-2 | 10 l   | 0,5 µm    | 480101      |
| Aluminum oxide slurry concentrate AF-2 | 1 l    | 0,2 µm    | 480102      |
| Aluminum oxide slurry concentrate AF-1 | 1 l    | 0,2 µm    | 48011       |
| Aluminum oxide slurry concentrate AF-1 | 10 l   | 0,2 µm    | 48012       |
| Aluminum oxide slurry ready-to-use OPA | 10 l   | 0,5 µm    | 48152       |

### Application recommendation

Mixing ratio concentrate/DI water 1:5

In addition to ready-to-use slurries Microdiamant also offers pure Alumina powder. Thus, the customer has the option to mix the application-specific water-based slurry themselves. There are grit sizes in the range of 0.1 to 1 µm in packing units of 1, 5, 10 or 20 kg available.





## Diamond spray

### Spray for metallography

#### Description

Microdiamant has developed highly concentrated polycrystalline diamond sprays for hand polishes or sample preparation without the use of a suspension dosing system. The diamond spray in pressurized spray cans with a volume of 200 ml is an universally usable product for polishing cloths as well as on lapping plates and discs.

The excellent formulation of the spray and the high pressure of the spray can guarantee optimal diamond distribution. In grains of  $\frac{1}{4}$  to 15 microns, a good stock removal is achieved with high-gloss polish.

The polycrystalline diamond sprays are available from stock.



# Polishing pads

Standard products Metallography





# Matching diamond type and size with your process requirements ensures first-class results.

## Diamond type selection

Polycrystalline diamond is best suited for lapping and polishing of both extremely hard and soft materials. Thanks to its unique characteristics, maximum material removal rates and superior surface quality are achieved. Monocrystalline synthetic diamond is relatively inexpensive to produce and therefore widely used for grinding, lapping and polishing applications. Natural diamond is preferred for the production of electroplated diamond tools. Nanodiamond is a nano-material used in a variety of applications and research projects.

|                          | Stock removal  |  | Polishing  |  |
|--------------------------|--|--|--|--|
| Polishing pad            | QUICK-STEP   | JIVE-PLUS EB (embossed)                                | STEP-PLUS  | SAMBA-N  |
| Material                 | Hard synthetic fibre   | High density laminated polishing pad                   | Medium hard synthetic fiber cloth  | Medium hard woven wool polishing cloth                                       |
| Typical applications     | First choice for pre-polishing. Very high removal rate on all materials      | Double-side or single-side polishing of hard materials | Good removal rate and superb finishing on almost all materials               | Fine polishing of larger workpieces, excellent for manual preparation        |
| Typical diamond size     | 6-20 µm  | 2-20 µm  | 1-6 µm   | 1-15 µm  |
| Thickness                | 0.5 mm   | 2.0 mm   | 0.65 mm  | 0.33 mm  |
| Shore hardness (Shore A) | 97 Shore A   | 96 Shore A   | 96 Shore A   | 87 Shore A   |
| Diameter (Standard)      | 200/250/300/350 mm   | N/A  | 200/250/300/350 mm   | 200/250/300/350 mm   |
| Diameter (Custom)        | max. 1300 mm   | max. 1250 mm   | max. 1300 mm   | max. 1300 mm   |
| Backing                  | self-adhesive (PSA)<br>diameter 200/250/300/350<br>available with metal disc | self-adhesive (PSA)                                    | self-adhesive (PSA)<br>diameter 200/250/300/350<br>available with metal disc | self-adhesive (PSA)<br>diameter 200/250/300/350<br>available with metal disc |





Polishing

Superfine polishing

**JAZZ-PLUS**

Non woven polishing pad,  
PU impregnated

Good removal rate and superb  
finish on metals and optical  
materials

1-6 µm

0.7 mm

75 Shore A

200/250/300/350 mm  
max. 1300 mm

self adhesive (PSA)  
diameter 200/250/300/350  
available with metal disc

**FOX-PLUS**

Flocked universal polishing pad

Good removal rate and superb  
finishing on all kinds of metals

1-15 µm

0.85 mm

59 Shore A

200/250/300/350 mm  
max. 1300 mm

self-adhesive (PSA)  
diameter 200/250/300/350  
available with metal disc

**SWING-PLUS**

Flocked universal polishing  
cloth with very low flock density

Polishing pad for superfinish-  
ing.

0.1-6 µm

0.7 mm

88 Shore A

200/250/300/350 mm  
max. 400 mm

self-adhesive (PSA)  
diameter 200/250/300/350  
available with metal disc

**ALUPOL-PLUS**

Flocked universal polishing  
cloth with extremely high flock  
density

Perfect cross-over pad, for  
diamond and oxide polishing.

0.1-3 µm, CMP

0.6 mm

82 Shore A

200/250/300/350 mm  
max. 1300mm

self-adhesive (PSA)  
diameter 200/250/300/350  
available with metal disc

**MAMBO**

Chemically resistant, spongy  
oxide polishing cloth

Final finishing with oxide pol-  
ishing slurries

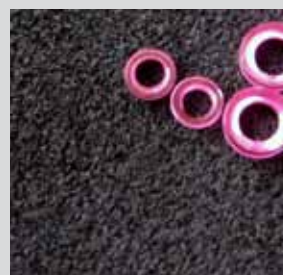
CMP

1.5 mm

65 Shore A

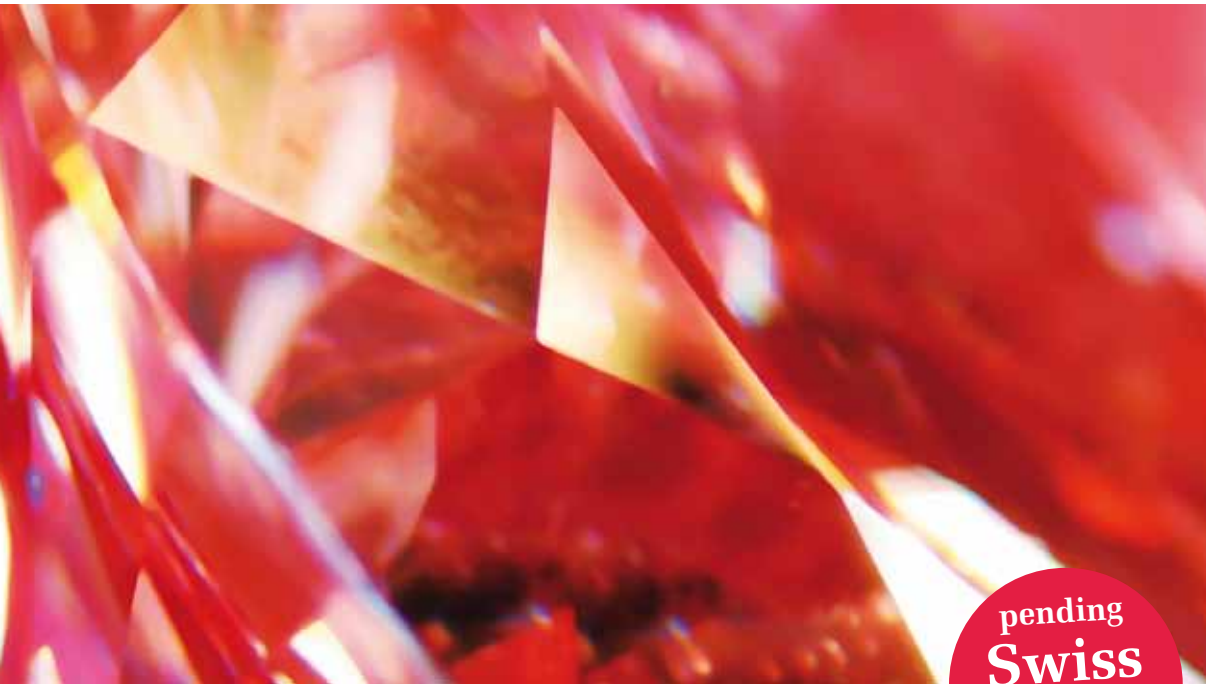
200/250/300/350 mm  
max. 1300 mm

self-adhesive (PSA)  
diameter 200/250/300/350  
available with metal disc



Microdiamant not only offers polishing pads but as well high performance diamond slurries that work best with the corresponding pad. We gladly assist you in selecting the best suited combination of diamond slurry and polishing pad to achieve best process results.

| Part number   | QUICK-STEP | JIVE-PLUS <sup>1</sup> | STEP-PLUS | SAMBA-N | JAZZ-PLUS | FOX-PLUS | SWING-PLUS | ALUPOL-PLUS | MAMBO   |
|---|------------|------------------------|-----------|---------|-----------|----------|------------|-------------|---------|
| <b>Self-adhesive, standard dimensions (packing unit=5 pieces)</b>                         |            |                        |           |         |           |          |            |             |         |
| D=200 mm  | 49010      | –                      | 49110     | 49724   | 49450     | 49600    | 49210      | 49730       | 49310   |
| D=250 mm  | 49020      | –                      | 49120     | 49725   | 49451     | 49601    | 49220      | 49731       | 49320   |
| D=300 mm  | 49030      | –                      | 49130     | 49726   | 49542     | 49602    | 49230      | 49732       | 49330   |
| D=350 mm  | 49033      | –                      | 49135     | 49727   | 49453     | 49604    | 49235      | 49733       | 49342   |
| <b>Self-adhesive, non-standard dimensions available on request (packing unit=1 piece)</b> |            |                        |           |         |           |          |            |             |         |
| Dmax  | 1300 mm    | 1250 mm                | 1300 mm   | 1300 mm | 1300 mm   | 1300 mm  | 400 mm     | 1300 mm     | 1300 mm |
| <sup>1</sup> Only available in custom diameters, self-adhesive                            |            |                        |           |         |           |          |            |             |         |
| <b>Metal disc, standard dimensions (packing unit=5 pieces)</b>                            |            |                        |           |         |           |          |            |             |         |
| D=200 mm  | 49800      | –                      | 49810     | 49860   | 49845     | 49850    | 49820      | 49870       | 49830   |
| D=250 mm  | 49801      | –                      | 49811     | 49861   | 49846     | 49851    | 49821      | 49871       | 49831   |
| D=300 mm  | 49802      | –                      | 49812     | 49862   | 49847     | 49852    | 49822      | 49872       | 49832   |
| D=350 mm  | 49803      | –                      | 49814     | 49863   | 49848     | 49853    | 49823      | 49873       | 49833   |



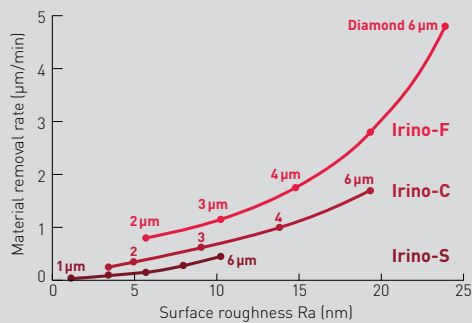
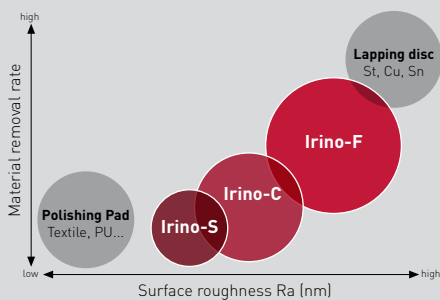
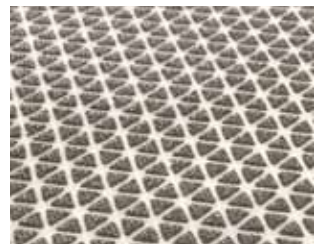
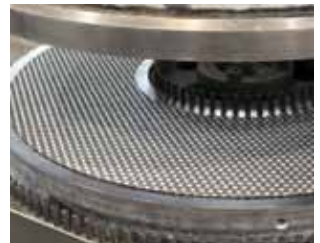
pending  
**Swiss  
patent**

# IRINO

## Composite polishing pad

The novel IRINO composite polishing pad is closing the gap between lapping on metal plates and polishing on pads. Combined with application tailored diamond slurries from Microdiamant, IRINO allows for high surface qualities and impressive stock removal rates at the same time. The polishing pad comes with a self-adhesive or magnetic backing. As such, it can be applied to any existing metal carrier plate, which makes it very user friendly.

|                | IRINO-F   | IRINO-C  | IRINO-S  |
|----------------|---|--|--|
|                | hard bonding  | medium-hard bonding                                | soft bonding   |
| Matrix         | Steel resin   | Copper resin                                       | Tin resin  |
| Base           | woven base, self-adhesive backing   |  |  |
| Hardness       | 50–55 Shore A   | 48–52 Shore A                                      | 45–50 Shore A  |
| Film thickness | 0.6 ± 0.04 mm   |  |  |
| Diameter       | 200 to 760 mm one-piece, larger than 760 mm multi-piece                                     |  |  |
| Applications   | Stock removal/polishing<br>Sapphire, steel (soft or hardened), optical components, ceramics | Polishing<br>Optical components<br>ceramics, steel | Fine polishing<br>Optical components<br>ceramics, non-ferrous metals |



IRINO composite polishing pads are used with diamond slurries. Microdiamant offers application tailored, stabilized diamond slurries in both water soluble and oil based carriers. We will gladly assist you in the selection of the most suitable product.

### IRINO Highlights

- Innovative composite polishing pad combines lapping and polishing principles
- Surface finishes down to 1 nm Ra
- Material removal rates similar to soft metal lapping plates
- Provides excellent work piece geometry and flatness, without edge round-off
- Dressable system, suitable for single-side and double-side machines
- Best results if used with water soluble or oil based diamond slurries from Microdiamant

### Design and working principle

IRINO polishing pads consist of a polymer matrix in which the finest metal powders are embedded. The polishing pad is being charged with diamond particles by the supply of diamond suspension. The embedded diamond grains facilitate the stock removal on the work piece. The continuous wear of the polishing pad over its service life prevents clogging of the pad. The patterned surface of the IRINO pad helps to improve the slurry flow and exchange, even for double sided machines.

#### Order information

Part number 354301  
IRINO-F, Ø 300 mm  
self-adhesive

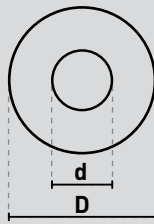
#### Packing unit

1 piece per box

### Standard sizes (Metallography)

|                                       | Diameter | Part number self-adhesive (PSA) | Part number Metal Carrier |
|---------------------------------------|----------|---------------------------------|---------------------------|
| <b>IRINO-F</b><br>hard bonding        | 200 mm   | 354201                          | 355201                    |
|                                       | 250 mm   | 354251                          | 355251                    |
|                                       | 300 mm   | 354301                          | 355301                    |
|                                       | 350 mm   | 354351                          | 355351                    |
| <b>IRINO-C</b><br>medium-hard bonding | 200 mm   | 354202                          | 355202                    |
|                                       | 250 mm   | 354252                          | 355252                    |
|                                       | 300 mm   | 354302                          | 355302                    |
|                                       | 350 mm   | 354352                          | 355352                    |
| <b>IRINO-S</b><br>soft bonding        | 200 mm   | 354203                          | 355203                    |
|                                       | 250 mm   | 354253                          | 355253                    |
|                                       | 300 mm   | 354303                          | 355303                    |
|                                       | 350 mm   | 354353                          | 355353                    |

Custom-engineered IRINO composite polishing pads on request.



#### Diameter please specify when ordering.

**D** = Outer diameter in mm

**d** = Inner diameter in mm, only if central opening desired

**Order  
Diamond  
slurry**



#### Diamond slurries

Microdiamant offers application tailored, stabilized diamond slurries in both water soluble and oil based carriers. We will gladly assist you in the selection of the most suitable product.

# Diamond compounds

Water, oil and alcohol based diamond compounds



Best results are achieved if diamond compound type and size are carefully matched with your process requirements.

### Diamond type selection

Polycrystalline diamond is best suited for lapping and polishing of both extremely hard and soft materials. Thanks to its unique characteristics, maximum material removal rates and superior surface quality are achieved. Monocrystalline synthetic diamond is relatively inexpensive to produce and therefore widely used for grinding, lapping and polishing applications. Nanocluster diamond is a nano-material used in a variety of optical applications and research projects.

Key properties of diamond compound types:

#### Solubility

The solubility depends on the carrier. Water- and alcohol soluble carrier ensure easy cleaning, where as oil-based carrier prevent corrosion.

#### Diamond type

The diamond type defines the performance of the diamond compound directly. Polycrystalline diamond (DP) has an amorphous structure with no cleavage planes and provides higher rates of material removal. Monocrystalline diamond (MSY) is relatively inexpensive in production and therefore widely used for grinding, lapping and polishing applications.

#### Grading

The particle size distribution has a direct influence on results in surface roughness and quality. Precision grading with narrow particle size distribution ensures a high performance and allows to fine tune the diamond size in order to meet surface roughness specifications.

#### Diamond concentration

Material removal rate and thus processing time depend on diamond concentration. A high diamond concentration guarantees optimum processing results.

| Compound type         | Sparkling U/P  | Sparkling U/M  | Sparkling O/P   | Sparkling O/M   |
|-----------------------|--|--|---|---|
| Solubility            | Oil- water- alcohol  | Oil- water- alcohol  | Oil   | Oil   |
| Diamond type          | DP - polycrystalline   | MSY -monocrystalline   | DP -polycrystalline   | MSY -monocrystalline  |
| Grading               | Precision size range   | Precision size range   | Precision size range  | Precision size range  |
| Diamond concentration | High   | High   | High  | High  |
| Packing               | Syringe  | Syringe  | Syringe   | Syringe   |
| Packing unit          | 5 - 10 - 20 gram   | 5 - 10 - 20 gram   | 5 - 10 - 20 gram  | 5 - 10 - 20 gram  |
| Applications          | Universal compound for polishing of mold and other surfaces, all materials, no lubricant needed. | Universal compound for polishing of mold and other surfaces, all materials, no lubricant needed. | Corrosion-free polishing of all materials, automatic and hand polishing processes, no lubricant needed. | Corrosion-free polishing of all materials, automatic and hand polishing processes, no lubricant needed. |





| <b>Sparkling W/M</b>   | <b>Sparkling FAS/P</b>  | <b>Sparkling FAS/M</b>   | <b>Sparkling BUP/M</b>  | <b>Sparkling OPT/XP</b>   | <b>Sparkling OPT/DP</b>   | <b>Sparkling ST/M</b>  |
|--|---|--|---|---|---|--|
| Water  | Oil- alcohol  | Oil- alcohol   | Oil- alcohol  | Water   | Water   | Oil- alcohol   |
| MSY -monocrystalline   | DP -polycrystalline   | MSY -monocrystalline   | MSY -monocrystalline  | XP -nanocluster   | DP -polycrystalline   | MSY -monocrystalline   |
| Precision size range   | Precision size range  | Precision size range   | Precision size range  | Precision size range  | Precision size range  | Precision size range   |
| High   | High  | High   | Extra high  | Extra high  | Extra high  | Extra high   |
| Syringe  | Syringe   | Syringe  | Jar   | Syringe   | Syringe   | Stick  |
| 5 - 10 - 20 gram   | 5 - 10 - 20 gram  | 5 - 10 - 20 gram   | 400 - 1000 gram   | 5 - 10 - 20 gram  | 5 - 10 - 20 gram  | 10 - 20 - 40 gram  |
| Polishing of nonferrous alloys and HSS steels, heat resistant, automatic and hand polishing, with or without lubricant yellow. | For all hard steel coatings, automatic and hand polishing, without lubricant. | For all steels, automatic and hand polishing, without lubricant. | Used on fiber, nylon and hair brushes, for de burring of cutting tools or polishing of surfaces, without lubricant. | Polishing of optical lenses and prism, hard optical materials, automatic and hand polishing, without lubricant. | Polishing of optical lenses and prism, hard optical materials, automatic and hand polishing, without lubricant. | For all materials, hand polishing, easy handling, without lubricant. |



Diamond compounds are used in various applications. Microdiamant has an extensive know-how of the different uses and can assist you in selecting the best product for your application.

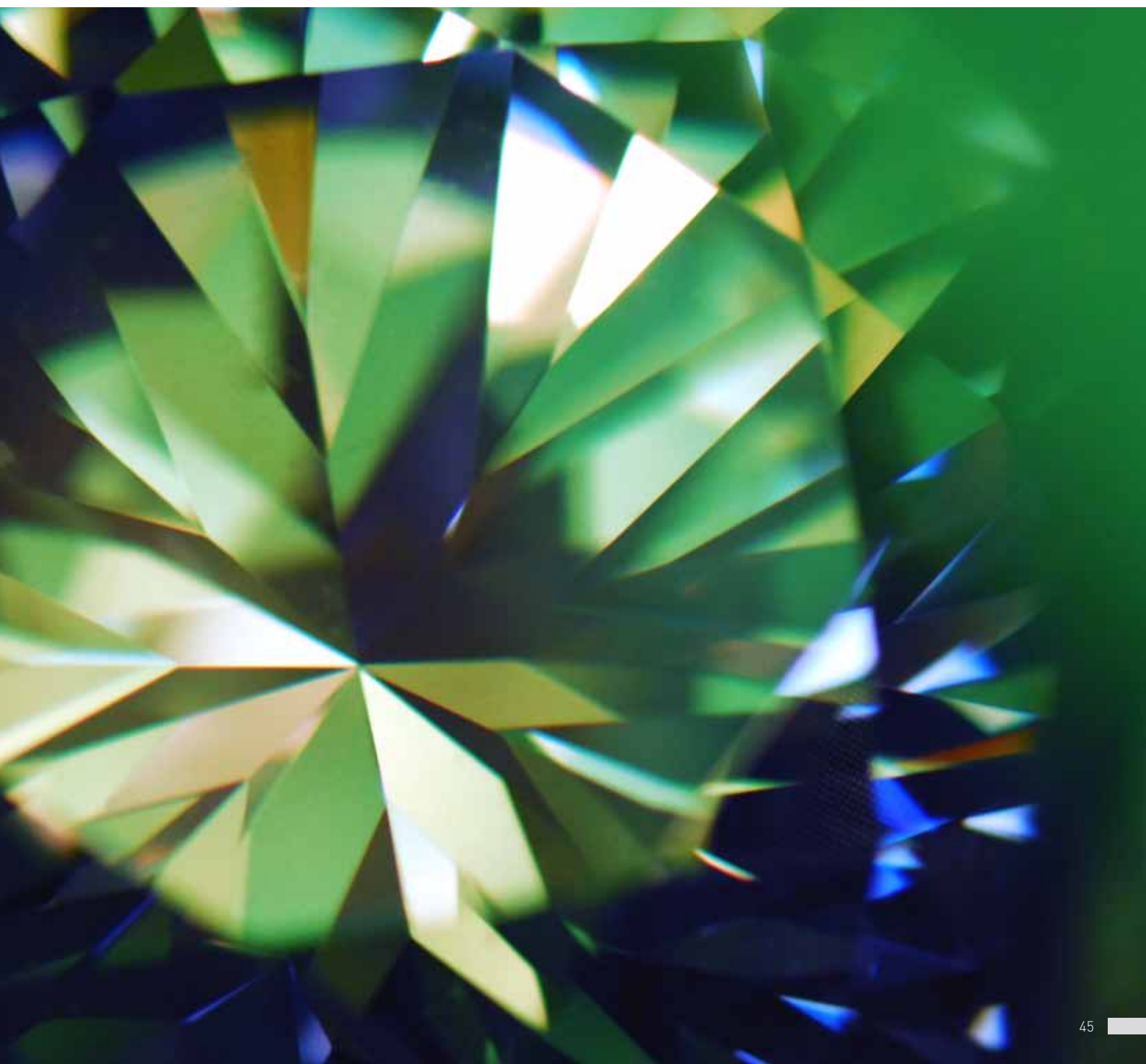
**Selecting the right diamond size**

The choice of the diamond size is determined by the surface quality requirements, or respectively, by the function of the surface coating. Precision graded diamond guarantee the highest performance and reproducibility levels.

| Syringe<br>(polycrystalline diamond) | Syringe<br>(monocrystalline diamond) | Stick          | Jar             |
|--------------------------------------|--------------------------------------|----------------|-----------------|
| Sparkling U/P <sup>1</sup>           | Sparkling U/M                        | Sparkling ST/M | Sparkling BUP/M |
| Sparkling O/P <sup>1</sup>           | Sparkling O/M                        |                |                 |
| Sparkling FAS/P <sup>1</sup>         | Sparkling FAS/M                      |                |                 |
|                                      | Sparkling OPT/XP                     |                |                 |
| 1/4 µm                               | 1/4 µm                               |                |                 |
| 1 µm                                 | 1 µm                                 | 1 µm           |                 |
| 3 µm                                 | 3 µm                                 | 3 µm           | 3 µm            |
| 6 µm                                 | 6 µm                                 | 6 µm           | 6 µm            |
| 9 µm                                 | 9 µm                                 | 9 µm           | 9 µm            |
| 15 µm                                | 15 µm                                | 15 µm          |                 |
| 20 µm                                | 20 µm                                | 25 µm          |                 |
| 30 µm                                | 30 µm                                |                |                 |
|                                      | 45 µm                                |                |                 |
|                                      | 70 µm                                |                |                 |
|                                      | 90 µm                                |                |                 |

# Preparation instructions

Non-binding recommendations for sample preparation



# Preparation instructions

## **Sample preparation**

The preparation of metallographic samples has the objective of providing the true structure for the qualitative and quantitative analysis. Increasingly fine layers of material are removed in a succession of work operations. Microdiamant has developed various preparation instructions, matched to the specific material used in each case, so that the results are reproducible and the structure is presented without artifacts.

## **Systematic preparation**

The sample must meet the following requirements to achieve a significant form of preparation:

- No deformation
- No scratches
- No chipping
- No mixing with foreign elements
- No relief formed
- No edge rounding
- No thermal influence

In order to meet these requirements, in a systematic preparation procedure the individual preparation steps must be executed in the correct sequence and without preparation errors. In addition to clean, consistent working methods, it is important to check the polishing pressure, process time, direction and speed of rotation, and to precisely control the addition of diamond slurry and lubricant.

## **Consumables**

Only high-quality consumables are suitable for these demanding objectives. Microdiamant represents maximum performance in matters of surface quality and removal rate. Specifically optimized to the particular application, Microdiamant products achieve first-class process results and cost-effectiveness.

## Preparation instruction for Al 2

Material: Al + Al alloys

Examination: Structure

Sample: Bakelite mounted sample 40 mm Diameter

| Step                   | Medium                           | Type of abrasive               | Lubricant                 | Time (min) | Force (N) | Speed (rpm) | Direction head/ platen |
|------------------------|----------------------------------|--------------------------------|---------------------------|------------|-----------|-------------|------------------------|
| <b>Grinding I</b>      | <b>SiC grinding paper / foil</b> | <b>P240</b>                    | Water                     | till plane | 35        | 300         | ⇒                      |
| <b>Grinding II</b>     | <b>SiC grinding paper / foil</b> | <b>P600</b>                    | Water                     | 3          | 30        | 300         | ⇒                      |
| <b>Grinding III</b>    | <b>SiC grinding paper / foil</b> | <b>P1200</b>                   | Water                     | 3          | 25        | 300         | ⇒                      |
| <b>Polishing I</b>     | <b>QUICK-STEP</b>                | <b>MAGNUM-TOP-DUO<br/>6 µm</b> | Lubricant Yellow          | 3          | 35        | 300         | ⇄                      |
| <b>Polishing II</b>    | <b>SWING-PLUS</b>                | <b>POLY-TOP-DUO<br/>1 µm</b>   | Lubricant Yellow          | 4-5        | 25        | 150         | ⇄                      |
| <b>Final Polishing</b> | <b>MAMBO</b>                     | <b>O.P.S.</b>                  | rinse water<br>last 20 s. | 2-3        | 25        | 150         | ⇄                      |

### Notes

Step 1,2,3 Use water as coolant/lubricant LUBX20

Step 4,5 MAGNUM-TOP-DUO/POLY-TOP-DUO: water-based suspension for manual or automatic dosage.  
Can be used without lubricants.

Step 6 Moisten MAMBO pad before usage with de-ionized water.  
After O.P.S. polishing rinse with de-ionized water for 10 s.

Preparation instructions for other materials are also available.  
We will be pleased to provide these as required.

## Preparation instruction for Cast iron

Material: Cast iron

Examination: Structure, spheritic graphite, micro view, defects

Sample: Bakelit mounted sample 40 mm Diameter

| Step                         | Medium         | Type of abrasive     | Lubricant                 | Time (min) | Force (N) | Speed (rpm) | Direction head/ platen |
|------------------------------|----------------|----------------------|---------------------------|------------|-----------|-------------|------------------------|
| <b>Rough grinding</b>        | <b>SQUADRO</b> | <b>60 µm (P220)</b>  | Water                     | till plane | 35        | 300         | ⇒                      |
| <b>Intermediate grinding</b> | <b>SQUADRO</b> | <b>15 µm (P1200)</b> | Water                     | 3          | 30        | 300         | ⇒                      |
| <b>Fine grinding</b>         | <b>SQUADRO</b> | <b>15 µm (P1200)</b> | Water                     | 3          | 25        | 300         | ⇒                      |
| <b>Final polishing</b>       | <b>MAMBO</b>   | <b>AF-2</b>          | rinse water<br>last 20 s. | 2-3        | 25        | 150         | ⇄                      |

### Notes

<sup>1/3</sup> Use water as coolant/lubricant LUBX20

<sup>4</sup> Moisten MAMBO pad before usage with de-ionized water. After AF-2. polishing rinse with de-ionized water for 10 s.

Preparation instructions for other materials are also available.  
We will be pleased to provide these as required.



## Preparation instruction for Ceramic

Material: Ceramics

Examination: Structure, porosity, macro view

Sample: Akrylis/Epoxy-mounted sample 40 mm Diameter

| Step                         | Medium            | Type of abrasive             | Lubricant        | Time (min) | Force (N) | Speed (rpm) | Direction head/platen |
|------------------------------|-------------------|------------------------------|------------------|------------|-----------|-------------|-----------------------|
| <b>Rough Grinding</b>        | <b>PLATO II</b>   | <b>54 µm (P220)</b>          | Water            | till plane | 35        | 300         | ⇒                     |
| <b>Intermediate Grinding</b> | <b>PLATO II</b>   | <b>25 µm (P600)</b>          | Water            | 3          | 30        | 300         | ⇒                     |
| <b>Polishing I</b>           | <b>QUICK-STEP</b> | <b>POLY-TOP-DUO<br/>9 µm</b> | Lubricant Yellow | 3          | 30        | 300         | ⇄                     |
| <b>Polishing II</b>          | <b>STEP-PLUS</b>  | <b>POLY-TOP-DUO<br/>3 µm</b> | Lubricant Yellow | 4-5        | 30        | 150         | ⇄                     |
| <b>Polishing III</b>         | <b>FOX-PLUS</b>   | <b>POLY-TOP-DUO<br/>1 µm</b> | Lubricant Yellow | 4-5        | 30        | 150         | ⇄                     |

### Notes

<sup>1/2</sup> Use water as coolant/lubricant LUBX20

<sup>3/5</sup> POLY-TOP-DUO: water-based suspension for manual or automatic dosage. Can be used without lubricants.

Preparation instructions for other materials are also available.  
We will be pleased to provide these as required.

## Preparation instruction for Cu + Brass

Material: Copper, Brass, Zn/Sn alloys

Examination: Structure, micro view, defects

Sample: Bakelite mounted sample 40 mm Diameter

| Step                         | Medium                           | Type of abrasive           | Lubricant                 | Time (min) | Force (N) | Speed (rpm) | Direction head/ platen |
|------------------------------|----------------------------------|----------------------------|---------------------------|------------|-----------|-------------|------------------------|
| <b>Rough Grinding</b>        | <b>SiC grinding paper / foil</b> | <b>P360</b>                | Water                     | till plane | 35        | 300         | ⇒                      |
| <b>Intermediate Grinding</b> | <b>SiC grinding paper / foil</b> | <b>P600</b>                | Water                     | 3          | 35        | 300         | ⇒                      |
| <b>Polishing I</b>           | <b>QUICK-STEP</b>                | <b>MAGNUM-TOP-DUO 9 µm</b> | Lubricant Yellow          | 3-4        | 35        | 150         | ⇔                      |
| <b>Polishing II</b>          | <b>STEP-PLUS</b>                 | <b>MAGNUM-TOP-DUO 3 µm</b> | Lubricant Yellow          | 3-4        | 25        | 150         | ⇔                      |
| <b>Final Polishing</b>       | <b>MAMBO</b>                     | <b>O.P.S.</b>              | rinse water<br>last 20 s. | 3-4        | 25        | 150         | ⇔                      |

### Notes

<sup>1/2</sup> Use water as coolant/lubricant

<sup>2/3</sup> MAGNUM-TOP-DUO: water-based suspension for manual or automatic dosage. Can be used without lubricants.

<sup>4</sup> Moisten MAMBO pad before usage with de-ionized water. After O.P.S. polishing rinse with de-ionized water for 10 s.

Preparation instructions for other materials are also available.  
We will be pleased to provide these as required.

## Preparation instruction for Hard Steel 2

Material: Hard steel, HSS, HRC > 65

Examination: Structure, Inclusions, Micro view / defects

Sample: Bakelite mounted sample, 40 mm Diameter

| Step                         | Medium            | Type of abrasive             | Lubricant                 | Time (min) | Force (N) | Speed (rpm) | Direction head/ platen |
|------------------------------|-------------------|------------------------------|---------------------------|------------|-----------|-------------|------------------------|
| <b>Rough Grinding</b>        | <b>APOLLO-S</b>   | <b>(P150)</b>                | Water                     | till plane | 35        | 300         | ⇒                      |
| <b>Intermediate Grinding</b> | <b>SQUADRO</b>    | <b>30 µm (P500)</b>          | Water                     | 3          | 35        | 300         | ⇒                      |
| <b>Polishing I</b>           | <b>SQUADRO</b>    | <b>15 µm (P1200)</b>         | Water                     | 3          | 35        | 300         | ⇒                      |
| <b>Polishing II</b>          | <b>SQUADRO</b>    | <b>6 µm</b>                  | Water                     | 3          | 35        | 300         | ⇒                      |
| <b>Polishing III</b>         | <b>SWING-PLUS</b> | <b>POLY-TOP-DUO<br/>1 µm</b> | Lubricant Yellow          | 4-5        | 25        | 150         | ⇄                      |
| <b>Final polishing</b>       | <b>MAMBO</b>      | <b>AF-2</b>                  | rinse water<br>last 20 s. | 2-3        | 25        | 150         | ⇄                      |

### Notes

<sup>Step.4</sup> Use water as coolant/lubricant LUBX20

<sup>Step.5</sup> POLY-TOP-DUO: water-based suspension for manual or automatic dosage. Can be used without lubricants.

<sup>Step.6</sup> Moisten MAMBO pad before usage with de-ionized water. After AF-2. Polishing rinse with de-ionized water for 10 s.

Preparation instructions for other materials are also available.  
We will be pleased to provide these as required.

## Preparation instruction for Steel Express 2

Material: Plain steel, cast iron

Examination: Ferrit/Perlit, Graphite in cast iron, Macro view / Welding nuts, Hardness testing

Sample: Bakelit mounted sample, 40 mm Diameter

| Step                  | Medium           | Type of abrasive             | Lubricant        | Time (min) | Force (N) | Speed (rpm) | Direction head/ platen |
|-----------------------|------------------|------------------------------|------------------|------------|-----------|-------------|------------------------|
| <b>Rough Grinding</b> | <b>SQUADRO</b>   | <b>60 µm (P220)</b>          | Water            | till plane | 35        | 300         | ⇒                      |
| <b>Fine Grinding</b>  | <b>SQUADRO</b>   | <b>15 µm (P1200)</b>         | Water            | 3          | 35        | 300         | ⇒                      |
| <b>Polishing</b>      | <b>STEP-PLUS</b> | <b>POLY-TOP-DUO<br/>3 µm</b> | Lubricant Yellow | 4-5        | 25        | 150         | ↔                      |

### Notes

<sup>1</sup> Use water as coolant/lubricant LUBX20

Preparation instructions for other materials are also available.  
We will be pleased to provide these as required.

## Preparation instruction for Ti + Ti alloys

Material: Ti + Ti alloys

Examination: Structure, micro view, defects

Sample: Bakelite mounted sample 40 mm Diameter

| Step                         | Medium             | Type of abrasive             | Lubricant                 | Time (min) | Force (N) | Speed (rpm) | Direction head/ platen |
|------------------------------|--------------------|------------------------------|---------------------------|------------|-----------|-------------|------------------------|
| <b>Rough Grinding</b>        | <b>SQUADRO</b>     | <b>60 µm (P220)</b>          | Water                     | till plane | 35        | 300         | ⇒                      |
| <b>Intermediate Grinding</b> | <b>SQUADRO</b>     | <b>15 µm (P1200)</b>         | Water                     | 3          | 30        | 300         | ⇒                      |
| <b>Fine Grinding</b>         | <b>SQUADRO</b>     | <b>3 µm</b>                  | Water                     | 3          | 25        | 300         | ⇒                      |
| <b>Polishing</b>             | <b>ALUPOL-PLUS</b> | <b>POLY-TOP-DUO<br/>1 µm</b> | Lubricant Yellow          | 4-5        | 25        | 150         | ⇄                      |
| <b>Final Polishing</b>       | <b>MAMBO</b>       | <b>O.P.S.</b>                | rinse water<br>last 20 s. | 2-3        | 25        | 150         | ⇄                      |

### Notes

Step.1,2,3 Use water as coolant/lubricant LUBX20

Step.4 POLY-TOP-DUO: water-based suspension for manual or automatic dosage.  
Can be used without lubricants.

Step.5 Moisten MAMBO pad before usage with de-ionized water.  
After O.P.S. polishing rinse with de-ionized water for 10 s.

Preparation instructions for other materials are also available.  
We will be pleased to provide these as required.



## Our expertise results from continuous process improvements over three generations of the Spring-family.

Many things have changed since Rudolf Spring founded the business in 1952. Yet through three generations we have always maintained and fostered the values of an owner-managed company – quality, reliability and agility. The independence of our company promotes long-term thinking and a sustainable business strategy. In today's fast-paced, globalized world, these key values are important factors in ensuring that Microdiamant remains your reliable, professional partner.

Microdiamant's company culture incorporates a strong customer focus while paying careful attention to detail. It is crucial to first identify specific customer needs. Customer satisfaction is achieved only after all expectations have been met – in every respect and down to the smallest detail.





Our worldwide network is the key to maintaining pro-active partnerships with our customers around the globe.

Microdiamant is represented through local partners in some twenty countries in Europe, Asia and America. Please visit [www.microdiamant.com/company/contact-worldwide](http://www.microdiamant.com/company/contact-worldwide) for contact details in your country.



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