

Instructions for use

SQUADRO-G

1. Intended use

SQUADRO-G is an innovative and highly efficient diamond grinding pad suitable for fine grinding of optical glass, BK7, quartz glass, glass ceramics as well as crystalline and brittle glassy materials. Thanks to the integrated high-precision micron diamond powders, there is no need to add lapping or polishing liquid. Lubrication or cooling is carried out by adding a water-soluble lubricant SQUADRO-LUB-G or using DI water.

2. Safety instructions

ATTENTION: SQUADRO-G may only be used by trained personnel.

For maximum speed parameters see point 3.5. The maximum peripheral speed of 10 m/s must not be exceeded under any circumstances. Maximum operating temperature 45° C/113° F.

Oil and chemical resistance: Only lubricants approved by Microdiamant may be used.

Lubrication/cooling: SQUADRO-LUB-G or DI water.

SQUADRO-G must not be used with defective, uneven or uncleaned carrier plates. If there is visible external damage, SQUADRO-G may no longer be used.

3. Requirements

3.1. Lubricant/coolant

Microdiamant lubricant SQUADRO-LUB-G or DI water (inflow and outflow > 10 ltr/h).

3.2. Traction rings

Traction rings are used exclusively for material guiding and should be as light as possible so as not to impair the service life of SQUADRO-G. Slotted designs made of plastic or aluminum are suitable.

3.3. Contact pressure of the workpiece

Recommended: 2-10 N/cm²; maximum: 15 N/cm²

3.4. Recommended peripheral speed

5 m/s, maximum peripheral speed 10 m/s.

3.5. Reference values for speed

Diameter (mm)	200	300	400	500	600	800	1'000
Recommended speed (RPM)	300	200	180	120	100	80	60
Max. speed (RPM)	990	630	470	380	310	240	190

4. Preparation

4.1. Carrier plate

The carrier plate must be absolutely clean, flat, dry and free of grease.

4.2. Mount with PSA, teflon, magnetic plate

SQUADRO-G must be centrally aligned and applied without bubbles.

4.3. Provide lubricant

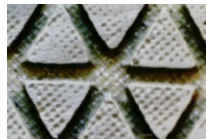
A regular lubricant supply must be ensured. The SQUADRO-G polishing pad must not run dry.

5. Dressing before first use

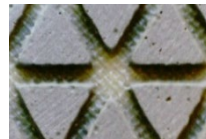
Before using the SQUADRO-G pad for the first time, it must be conditioned or dressed. This resets the surface structure caused by the manufacturing process; only then can the pad develop its full performance. For double-side machining, dressing should be carried out in order to set the plane parallelism before the first use.



Surface new



Surface opened 50%



Surface opened



Dressing stone

5.1. Wet the SQUADRO-G pad with water, then, without adding any more water, carry out dressing with a 280/400 mesh dressing stone until the pad is plane.

5.2. Machine parameters

N1 speed upper machine plate (RPM)	15	20
N2 speed lower machine plate (RPM)	-20	-15
N3 inner ring speed (RPM)	-25	25
Recommended total pressure	50 kg/30 sec.	50 kg/30 sec.

5.3. Recommended tool use

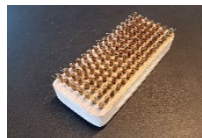
Grit sizes 6/15/30 µm	Al ₂ O ₃ stones 400 mesh
Grit sizes 60/125 µm	Al ₂ O ₃ stones 280 mesh
Recommended lubricant	SQUADRO-LUB-G or DI water

5.4. Clean with brushes

Clean the SQUADRO-G pad from the generated grinding sludge with brass brushes.



Machine brush brass



Hand brush brass

5.5. Measure

Measure the geometry of the two pads using a measuring tool. After dressing, the flatness should be 0-10 micron. If the geometry is insufficient, repeat the dressing process.

6. Parameters for production

6.1. Machine parameters

Recommended contact pressure: 0.2-0.4 kg/cm², maximum contact pressure: 1.5 kg/cm²
 Recommended peripheral speed: 2-5 m/s, maximum peripheral speed: 10 m/s

6.2. Lubricant feed

Dosage quantities for single-side machines

Pad diameter (mm)	300	500	700
Revolutions per minute (RPM)	30-130	20-80	10-50
Peripheral speed (m/s)	1-4	1-4	1-4
Initial dosage (ml)	Full surface wetting		
Lubricant dosing (l/h)	1-2	5	10

Dosage quantities for double-side machines

Pad diameter (mm)	300	500	700
Revolutions per minute (RPM)	100-160	60-100	40-70
Peripheral speed (m/s)	3-5	3-5	3-5
Initial dosage (ml)	Full surface wetting		
Lubricant dosing (l/h)	1-2	5	10

6.3. Positioning the parts

The entire surface of the SQUADRO-G pad must be used and thus used up.

This can be done in two ways:

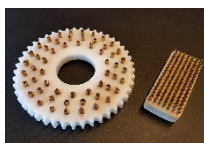
1. By overrun of the workpieces, i.e. the workpieces extend beyond the outer and inner edge or the center.
2. By overrun of the traction plates, carrier plates and conditioning rings.

7. Conditioning and cleaning

SQUADRO-G is self-sharpening. If the removal rate decreases due to chip adhesion, the pad must be conditioned with brass brushes. Furthermore, decreasing planarity can be restored by repeated dressing. Procedure see point 5. In addition, the workpieces should be positioned in such a way that the planarity is retained (overflowing workpieces).

7.1. Conditioning

Wet SQUADRO-G pads, condition with water and brass brushes.



Brass brushes



Before conditioning



After conditioning

Machine parameters

N1 upper machine plate speed (RPM)	15
N2 lower machine plate speed (RPM)	-20
N3 inner ring speed (RPM)	-25
Recommended total pressure	30 kg/45 sec.

Recommended tool use

Grit sizes 6/15/30 µm	Al ₂ O ₃ stones 400 mesh
Grit sizes 60/125 µm	Al ₂ O ₃ stones 280 mesh
Recommended lubricant	SQUADRO-LUB-G or DI water

Cleaning

Afterwards clean the SQUADRO-G pads from the generated grinding sludge with brass brushes. See point 5.4.

7.2. Cleaning with brushes

To remove workpiece abrasion, manual brushing with a brass brush (see point 5.4) and water is recommended. To do this, wet the pad and turn it according to the parameters.

Machine parameters

N1 upper machine plate speed (RPM)	15
N2 lower machine plate speed (RPM)	-20
N3 inner ring speed (RPM)	-25
Recommended total pressure	30 kg/45 sec.

8. Troubleshooting and tips

- 8.1. If the removal rate is initially too low or decreases significantly during the service life, the pad must be conditioned or sharpened. See point 5.
- 8.2. If the surface of the pad is heavily clogged with abrasion, the pad should be cleaned or conditioned. See point 5 and point 7.
- 8.3. Insufficient lubricant supply can cause interruptions in the lubrication film and damage grinding pads as well as workpieces.
- 8.4. Excessive supply of suspension ("flooding") generally leads to lower removal rates and high costs.
- 8.5. If the SQUADRO-G pad is not used for a long time, it should be cleaned, dried and protected against dirt with a clean cover.

9. Storage

Store lying flat or standing up at an angle of approx. 30 degrees to the vertical. Store at room temperature, dry and protected from direct sunlight. Clean used pads completely before storage.

10. Service life

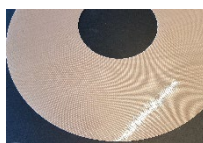
The end of the pad's service life is reached as soon as the light structure of the carrier material becomes partially visible.

11. Demounting of the pad

Pads with self-adhesive backing can only be mounted once. Teflon-coated adapters or teflon films with self-adhesive backing are available for repeated mounting. Metal carriers or magnetic foils are additionally available options.



Teflon adapter on magnet



Teflon film

12. Disposal

SQUADRO-G pads can be disposed of with normal household waste. Metal plates can be recycled. Please note the relevant local regulations.

13. Application video



An application video for SQUADRO-G is available on YouTube under the QR code on the left and under the following link: <https://youtu.be/OXG7icGhE0U>