



SAFETY RECOMMENDATIONS FOR THE PROPER USE OF GRINDING TOOLS

Hand this leaflet out to users!

ENG

The safety recommendations in this leaflet should be followed by all users in the interest of their own safety.

The use of damaged, improperly mounted, or incorrectly applied grinding tools is dangerous and can lead to serious injuries. This leaflet provides only a summary of the most important precautions. For further safety recommendations and guidelines, please refer to the relevant laws, regulations, safety provisions, and technical standards in different countries, as well as the FEPA guide „General Safety Principles and Safety Recommendations for the Proper Use of Grinding Tools.“

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Note: Grinding tools, as referred to in this leaflet, include all types and shapes of bonded abrasive tools intended for use on grinding machines.

SECTION 1 – GENERAL SAFETY MEASURES

Incorrect use of grinding tools is very dangerous.

- Always follow the instructions on the grinding tool and the grinding machine.
- Ensure that the grinding tool is suitable for the specific application. Inspect the grinding tool for any potential damage before each use.
- Follow the guidelines for proper handling and storage of the grinding tool.

Be aware of the potential hazards when using grinding tools and follow the recommended safety measures:

- Physical contact with the grinding tool at operating speed
- Injuries caused by the breakage of the grinding tool during use
- Grinding particles, sparks, gases, and dust generated by the grinding process
- Noise
- Vibration

Only use grinding tools that meet the highest safety standards.

The following EN standards set out the fundamental safety requirements for the respective grinding tools:

- EN 12413 for grinding tools made of bonded abrasive materials
- EN 13236 for grinding tools with diamond or cubic boron nitride (CBN)
- EN 13743 for special abrasives on backing materials (vulcanized fiber grinding wheels, flap grinding wheels, flap discs, and lamellar grinding points)

Never use a grinding machine that is not in proper working condition or contains defective components.

THIS LEAFLET CONTAINS ONLY THE KEY SAFETY RECOMMENDATIONS.

FOR MORE INFORMATION ON THE SAFE USE OF GRINDING TOOLS, YOU CAN FIND DETAILED SAFETY GUIDELINES FROM FEPA OR THE ASSOCIATION OF GERMAN ABRASIVES MANUFACTURERS:

- FEPA Safety instructions for bonded abrasives and grinding tools with diamond and CBN (Cubic Boron Nitride).
- FEPA Safety instructions for diamond and CBN grinding tools used in the construction and natural stone sectors.
- FEPA Safety instructions for abrasives on backings.

SECTION 2 – PERSONAL PROTECTIVE EQUIPMENT (PPE)

Wear eye protection, hearing protection, gloves, and a dust mask, as well as face shields, leather aprons, and safety shoes, according to the application and the material to be ground.

NOISE

- Hearing protection according to EN352 is recommended for all applications with handheld grinding machines or workpieces, regardless of the noise level.
- Ensure that the grinding tool is suitable for the specific application. An unsuitable product can generate excessive noise.

SECTION 3 – SECURING THE WORK AREA

Use the existing safety devices on grinding machines, such as protective covers, shields, or enclosures. Do not make unauthorized modifications to these devices. If there is a risk of sparks, use protective partitions.

Use air purification systems in the workplace if dust, fumes, or aerosols are present in harmful concentrations in the breathing air.

Take precautions to prevent fires or explosions if the dust, fumes, or aerosols generated during grinding operations could lead to fires or explosions.

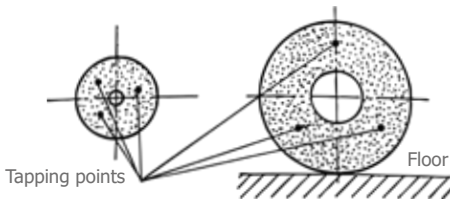
SECTION 4 – VISUAL AND SOUND INSPECTION

Before each use, visually inspect the grinding tool for any possible damage.

Perform a sound inspection on suitable grinding tools (mainly ceramic bonded grinding tools) with an outer diameter $D > 80$ mm (3.15 inches).

For this, slide light grinding tools onto a mandrel or finger, and place heavy grinding tools on a solid surface, tapping them at several points with a non-metallic object.

Example shown in the images.



An undamaged grinding tool produces a clear sound, while a damaged grinding tool produces a dull or rattling sound.

SECTION 5 – PROPER SELECTION OF THE GRINDING TOOL

Carefully read the information on the label or the grinding tool itself and ensure that:

- The grinding tool is suitable for the specific application and has the correct dimensions,
- The machine is set to a maximum speed according to the permissible rotational speed (for new wheel diameter) or peripheral speed.

Please observe the usage restrictions and other notes provided on the grinding tool itself. For example, refer to the pictograms on page 9.

COLOR STRIPE

To make the permissible maximum operating speed easier to identify, grinding tools and labels are marked with color stripes running through the center of the grinding tool or label.

The assignment of color stripes to the maximum operating speeds can be found in the table.

Color of the color stripe	Maximum operating speed in m/s
blue	50
yellow	63
red	80
green	100
blue/yellow	125

The maximum operating speed indicated by the color stripe must not be exceeded.

GRINDING WITH THE SIDE SURFACES

Side grinding may only be carried out with grinding tools that are approved for this purpose.

The side surfaces of flat grinding wheels must not be used for grinding if the width of the grinding wheel is less than 1/10 of the outer diameter.

SECTION 6 – PREPARATION FOR GRINDING

Ensure that all machine settings have been made according to the operating manual. If available, use the balancing equipment to minimize imbalance. Secure the work-piece firmly.

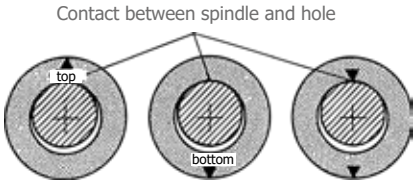
Check if the required safety cover for the grinding tool is correctly mounted, properly adjusted to the grinding tool, closed, and locked.

SECTION 7 – CLAMPING

Clamping of the grinding tool should only be performed by qualified personnel. Do not make any changes to the borehole or recesses of the grinding tool after delivery. Do not strike the grinding tool at the circumference, or punch or cut the grinding tool.

GRINDING TOOL WITH ASSEMBLY ARROW

Clamp the grinding tool with the assembly arrow in line with this marking. Examples are shown in the images.



Examples of the position of the assembly arrow

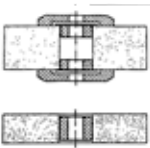
SECTION 8 – SPACERS

When fastening grinding tools using clamping flanges, spacers made of soft or elastic materials, such as plastic, cardboard, or rubber, must be used. For fine-grained coolants and longer grinding times, more elastic spacers made of plastic or rubber are recommended.

It is generally not recommended to clamp more than one grinding wheel, especially without a spacer, on the same shaft. For clamping double-sided conical grinding wheels, semi-flexible grinding wheels, straight cutting grinding wheels with a width $T \leq 1 \text{ mm}$ (0.039 inches), grinding tools on support discs, small grinding tools with an outer diameter $D \leq 20 \text{ mm}$ (0.787 inches), and honing stones, spacers are not required.

REDUCING RINGS

When loose reducing rings are used to reduce the borehole, it must be ensured that the ring-shaped contact surface of the clamping flange does not rest on the reducing rings. See the images.



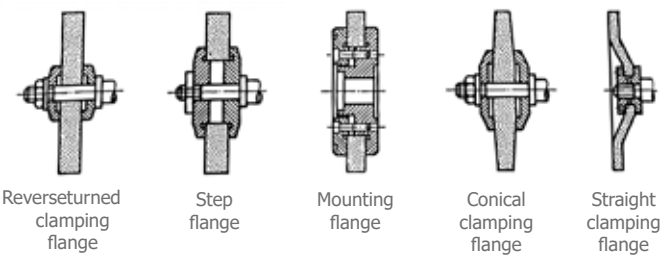
Examples of the correct use of reducing rings

SECTION 9 – CLAMPING METHODS

Depending on the type of grinding tool, it must be clamped according to one of the systems described below.

CLAMPING FLANGES FOR GRINDING WHEELS WITH CENTRAL BORE

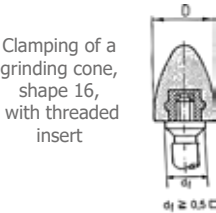
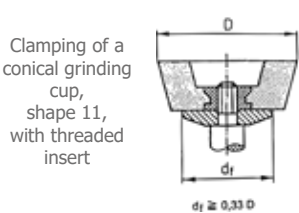
The clamping flanges must have the same outer diameter and identical contact surfaces.
The contact surfaces must be flat, clean, and free from grease, generally covering one-third of the grinding wheel diameter and featuring an appropriate recess (reverse turning) around the hole.



Push the grinding tool onto the spindle or mount without applying force and clamp it carefully. If there are multiple fastening screws on the clamping flange, tighten the screws in a crisscross pattern using a torque wrench.
Ensure that the screws and nuts are clean and in good condition.

SUPPORT FLANGES FOR GRINDING TOOLS WITH FASTENING ELEMENTS EMBEDDED IN THE AXIS OF ROTATION

These flanges must not have any reverse turning. See the images.
Spacers are not required.

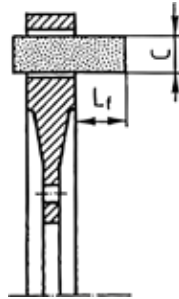


CLAMPING HEADS FOR SEGMENTS

When clamping segments without their own fastening elements, ensure that direct contact between the contact surface and the grinding segment is avoided by using elastic spacers.

The free overhanging segment length L_f must not exceed 1.5 times the segment height C .

See the illustration.



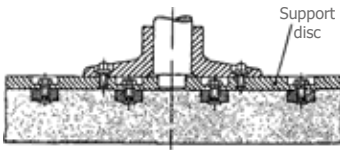
Free Segment Length
 $L_f \leq 1,5 C$

BACKING PLATES FOR GRINDING CYLINDERS AND FLAT GRINDING WHEELS FOR SIDE GRINDING

Depending on the design, the grinding tools are either glued onto the support disc or screwed onto it using the threaded inserts embedded in the grinding tool. Spacers should not be used. When gluing, ensure that the adhesive does not introduce any stresses into the grinding tool.

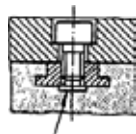
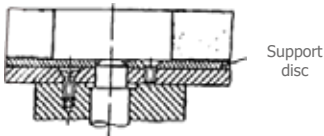
When screwing, always use all the specified fastening elements, and ensure that the screw end does not touch the bottom of the threaded hole.

See the images.



Grinding tool screwed to the support disc

Grinding tool glued to the support disc



The screw end must not touch the bottom of the grinding tool.

GRINDING MACHINE

Ensure that the machine spindle cannot be unintentionally set in motion.

Carefully inspect the mounting flanges: They must be in good mechanical condition and free from foreign objects such as residue from spacers or grinding debris.

SECTION 10 – COMMISSIONING THE GRINDING MACHINE

Subject the grinding tool to a test run on the grinding machine after each installation, using the intended processing speed, ensuring that the marked maximum operating speed of the grinding tool is not exceeded. Secure the danger area.

Conduct the test run for an appropriate amount of time.

COOLANT AND EJECTION

When wet grinding, apply the coolant only after the grinding tool has started running to avoid imbalance, which could lead to grinding tool breakage.

After completing the grinding process, turn off the coolant supply and continue running the grinding tool in idle mode until no coolant is ejected from the grinding tool.

During extended periods of machine downtime, ensure that the absorption of coolant into the grinding tool is prevented.

When wet grinding with resin-bonded grinding tools, the coolant should not exceed a pH value of 9 and a temperature of 40°C/ 104°F.

PROTECTIVE BANDS

Remove the protective bands attached to the circumference of grinding rings or grinding cups only when the wear of the grinding ring or grinding cup has reached the respective band.

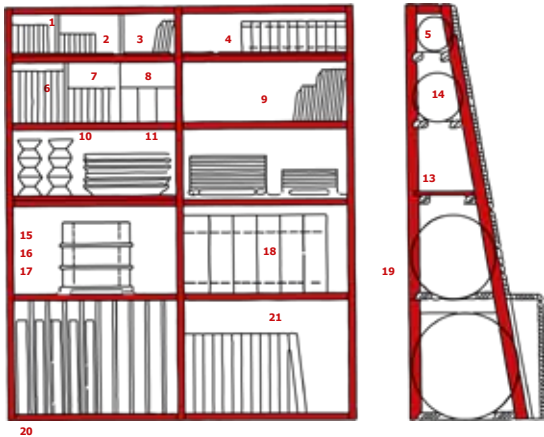
SECTION 11 – HANDLING, TRANSPORT, AND STORAGE

Carefully inspect the packaging and contents for any damage upon delivery of the grinding tools.

Always handle grinding tools with care. Do not drop, hit, or roll them on the floor without a suitable support.

Store grinding tools in a way that prevents mechanical damage and protects them from harmful influences such as moisture, frost, uneven heating or cooling, and aggressive substances. Resin-bonded grinding tools should not be stored for more than three years, as brittleness may reduce their performance characteristics over time.

For examples of proper storage of grinding tools, see the illustration.



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|--|--|
| 1 – Flat Grinding Wheels | 14 – Closed Back Wall for Protection |
| 2 – Flat Grinding Wheels | 15 – Corrugated Paper |
| 3 – Small Disc Grinding Wheels (Form 12) | 16 – Thin-walled or Soft Grinding Cylinders |
| 4 – Small Grinding Cups and Cylindrical Grinding Wheels (Grinding Rings) | 17 – Support Plate – Steel Plate or Thick Ceramic Grinding Wheel |
| 5 – Inclined Shelf for Small Grinding Bodies | 18 – Thick-walled or Hard Grinding Cylinders |
| 6-8 – Flat Grinding Wheels | 19 – The Front Face of the Wheels Should Not Extend Beyond the Shelf |
| 9 – Grinding Wheels for Saw Sharpening | 20 – Large Flat Grinding Wheels |
| 10 – Conical Grinding Cups | 21 – Medium-sized Flat Grinding Wheels |
| 11 – Large Disc Grinding Wheels | |
| 12 – Cutting-off Grinding Wheels – Flat Support, Steel Plate, etc. | |
| 13 – Flat Shelf for Cutting and Shaped Wheels | |

VIBRATION

- Ensure that your tool is in proper condition; stop the machine if excessive vibrations occur and have it inspected.
- Use high-quality grinding tools and ensure they are in good mechanical condition.
- Keep the clamping flanges and grinding discs in good mechanical condition and replace them if worn or deformed.
- Use the appropriate grinding tool, as an unsuitable product can cause excessive vibrations.

SECTION 12 – DISPOSAL OF GRINDING TOOLS

- Worn or defective grinding tools should be disposed of according to regional or national regulations.
- Please note that grinding tools may be contaminated by the process or grinding debris.

PICTOGRAMS

Pay attention to warning or safety instructions on grinding tools (labels) or their packaging:



Wear mask



Wear hand protection



Not suitable for freehand grinding



Do not use if damaged



Wear hearing protection



Wear eye protection



Not suitable for side grinding

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Only suitable for wet grinding



Follow the instructions for use



Only suitable for use with a support plate



Not suitable for wet grinding

-

Application only allowed in a closed working area



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