

# INSTRUCTIONS FOR BUEHLER® RESIN AND METAL BONDED DIAMOND GRINDING DISCS

## 1. INTRODUCTION

BUEHLER® RESIN and METAL BONDED DIAMOND GRINDING DISCS are high quality diamond abrasive discs that are capable of fast and efficient material removal for many critical applications. They are particularly recommended for coarse and fine grinding of high hardness sintered materials such as tungsten carbide, ceramics, refractories, cermets, and rocks. Most softer metals and alloys should not be ground on these discs as they tend to load the disc surface, making it unusable.

METAL BONDED DISCS should be used if the material is very hard or brittle or produces an abrasive swarf.

RESIN BONDED DISCS may be used in most other applications although a shorter wheel life should be expected.

## 2. RECOMMENDED GRADES

The choice and sequence of disc grades will depend upon the material being ground and its condition at the start of work. Where rough surfaces are encountered and / or considerable material is to be removed, a coarse disc grade (165 micron) is recommended. Optimum life can be obtained by using BUEHLER® Diamond Discs in sequence, starting with the coarsest grade compatible with the work requirements and progressing through

successively finer grades until the desired finish has been achieved. A typical and frequently used sequence is 165 micron, 70 micron and 15 micron. Micron sizes available are:

- a. 300 Micron\*
- b. 165 Micron
- c. 70 Micron
- d. 45 Micron
- e. 30 Micron
- f. 15 Micron
- g. 9 Micron\*
- h. 6 Micron\*

\*Not available in Metal Bonded Discs

## 3. LUBRICATION

A lubricant must be used with these discs to obtain optimum results and a maximum disc life. The choice of lubricant depends on the material being ground. Water is usually a satisfactory choice for most applications, but water soluble oils, lapping oils, and other non-aqueous solutions may be used effectively. To obtain optimum results with 15, 9 and 6 micron discs, No. 40-6016 BUEHLER® METADI® FLUID is by far the most satisfactory lubricant. Coarser discs require a feed rate of about 10 ml per minute while a slower feed rate should be used with the finer discs (15, 9 and 6 micron).



**BUEHLER**

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#### 4. BREAK-IN

All discs will exhibit an initially high grinding rate which could, in some cases, be detrimental to the specimens. To avoid this, it is recommended that the disc be broken-in by grinding a "dummy" sample for several minutes, using water as a lubricant.

#### 5. CUTTING RATES

The cutting rate will naturally change during use. With a new disc, the rate of cut will be high; as the disc is used, the rate will become stabilized. Rate of cutting will also depend on the material being ground, the wheel speed, and the pressure applied.

#### 6. CLEANING

Because grinding residue builds up over a period of time, it is necessary to clean BUEHLER® Diamond Grinding Discs. This may be done by scrubbing with 3M Scotch Brite Pads. A wet detergent soaked pad is held against the diamond surface with medium pressure while the disc is turning at a slow speed. The cutting rate should return to near the original value. Discs that are loaded with plastics may be cleaned with acetone. Because of its high rate of evaporation, this solution should be used generously. The disc should **not** be soaked in this solution. Abrasive dressing stones should never be used with RESIN BONDED DISCS.

#### 7. GENERAL COMMENTS AND PRECAUTIONS

##### a. Range of Application:

BUEHLER® Diamond Grinding Discs may be used with almost any grinding or lapping machine having a flat, rigid lap plate.

##### b. Hand Grinding:

Discs without a center safe area are recommended for hand grinding. Medium to heavy pressure should be used on coarser discs, medium to light pressure on finer discs.

##### c. AUTOMET® Grinding:

Must be performed on the plain backed discs with 1" (2.54 cm) center hole. Recommended grinding pressure for the coarser discs is 30-40 lbs.; with finer discs (15,9 and 6 micron), lighter pressures (20-35 lbs.) should be used.

##### d. Preventing Damage

Although Diamond Grinding Discs are very durable, care must be taken to avoid unnecessary damage. Mounts containing hard specimens should be leveled before grinding is begun. The specimen should not extend beyond the surface of the mounting material.

#### 8. AVAILABLE DISC TYPES

- a. Eight-inch diameter disc with 2½" center safe area and 1" center hole for use with No. 60-1900 BUEHLER® AUTOMET® Attachment.
- b. Eight-inch diameter disc with 2½" center safe area and 10" diameter cloth bonded to back of aluminum disc for attachment with cloth clamp to No. 40-4048 BUEHLER® Bronze Wheel for hand operation.
- c. Eight-inch diameter disc with no center safe area and 10" diameter cloth bonded to back of aluminum disc for attachment with cloth clamp to No. 40-4048 BUEHLER® Bronze Wheel.
- d. Eight-inch diameter disc with 2½" center safe area with pressure sensitive adhesive back for attachment to No. 40-4048 BUEHLER® Bronze Wheel.
- e. Eight-inch diameter disc with no center safe area and pressure sensitive adhesive back for attachment to No. 40-4048 BUEHLER® Bronze Wheel.