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Technical Tip #100: Selecting and Using Carbide Burs

Burs are sometimes referred to as rotary files and come in many shapes and sizes. Typical applications are weld preparation, weld smoothing, deburring, chamfering, deflashing, and scale removal. Burs are typically chucked in air-driven die grinders and used in hand operations.

Bur Selection:
The first step in selecting the proper bur is to pick the best shape and cut style.

- Selection of shape and diameter is based on the workpiece and application.
- Burs come in 10 basic shapes: cylindrical, cylindrical ball nose, ball or round shape, egg shape, round nose tree, pointed nose tree, flame shape, included angle, pointed cone, and inverted taper.
- Burs come in fine, standard, coarse, double-cut, and aluminum cut styles.
- Double-cut burs have teeth that provide rapid stock removal in hard materials. They produce granular-type chips, reduce bounce and chatter, and offer excellent operator control.
- Selection of cut should be based on the material and finish required.
- Standard cuts produce smooth finishes on steels, cast irons, and ferrous metals.
- Fine cuts will produce better finish because of the additional flutes and lighter chiploads on harder materials.
- Coarse and aluminum cuts are recommended for soft materials that tend to load and pack in the flutes. These cuts have larger flutes for faster stock removal.

Use of Burs:

- Speed varies with the type of die grinder being used, size of the bur, and the material being removed.
- Start at lower speeds and increase speed until the desired result is achieved.
- When placing the bur into the air motor, it should be inserted into the collet as far as possible to minimize overhang.
- Burs should be feathered into the cut with even pressure to avoid digging into the material.
- Do not apply excessive pressure because it can slow the spindle and chip cutting edges. Let the bur do the cutting.
- Never encapsulate the bur in the cut.
- When using in aluminum and magnesium, consider some form of lubricant, wax, or tallow, as it will help prevent the flutes from loading or packing.
- Carbide burs, if used properly, will outperform HSS burs by 50:1.

Vendor Selection:
When selecting a vendor for burs, look for suppliers with up-to-date CNC equipment. In the past burs were hand-ground and very inconsistent in quality and performance. Today burs from top-tier manufacturers are made on CNC machines designed specifically for grinding burs. They are very high quality and consistent from lot to lot.