



Machining

Consider These 3 Abrasive Options to Improve Performance

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“Always choose the right product for the job” is good advice in any grinding, finishing and cutting application. Selecting the best product for the material type and thickness and the desired surface finish can greatly impact productivity, costs and the end results.

While it may seem faster and more convenient to use whatever tool is handy, when a product isn't well-suited for the task it can damage the workpiece, lead to costly rework and reduce product life.

Some abrasive products are less commonly used, yet they are good alternatives for grinding, finishing and cutting, especially on thinner materials. Plus, they can deliver significant results to improve productivity and performance.

Getting Results

When it comes to abrasives, there are some key ways to save time and money that also help companies get the best results.

- **Product choice:** To choose the best product for the grinding and finishing application, it's important to consider the desired outcomes. Rather than using what's already in the tool cupboard, an operation may need to invest in a product that works best for the material type and thickness, operating conditions and surface finish requirements. There are many options available to help get the job done efficiently and abrasive technology continues to evolve.
- **Grit choice:** Most abrasive products are available in a wide range of grit sizes. The right size for the job depends on several factors, including metal thickness and finish requirements. For example, coarse, aggressive grits typically aren't used on thinner materials because they can damage the workpiece or remove too much material.
- **Proper use:** Following the recommended approach angle to the workpiece when using any abrasive product is important. Using an improper angle can greatly affect performance and product wear, resulting in additional downtime for product changeover or rework of the part.

Proper education and training helps operators become familiar with the best practices for each product.

After considering these common best practices that can help improve results, get to know some of the lesser-known products that can provide benefits in the right application.

Circular Flared End Brush

These ball-shaped wire brushes are a good option for finishing applications on broad, flat and slightly contoured surfaces. The crimped wire ends are “pre-flared” to match the working angle of the brush at operating speed.

Circular flared end brushes used on a die grinder can replace manual finishing work in some applications, especially on aluminum. Because of the round shape, these products provide the same point of contact to the workpiece no matter the angle of approach for greater operator flexibility. When finishing parts by hand, operators may avoid changing their hand position or tool orientation to work around obstacles for fear of damaging the part. The circular flared end brush allows operators to manipulate their access angle while still maintaining the same point of contact to the workpiece — for a consistent finish in significantly less time than manual finishing.

When MIG welding aluminum, a smoky haze is often left on the part after welding. Using a circular flared end brush in a fine stainless steel filament — such as .006 or .008 wire — will remove the haze and leave a nice finish. A thinner gauge wire brush is well-suited for cleaning and finishing thinner metal, but these brushes also are available in larger gauges like .020.

With any wire brush, it’s important to let the wire tips do the work. Applying too much pressure causes the wires to bend and can lead to wire breakage and premature brush wear. If it seems the brush isn’t doing its job, the operator usually has a tendency to push harder. However, it may be an issue of needing a different brush. Using a coarser wire can provide more aggression, and changing the brush trim length is another option. Brushes with a shorter trim length provide a greater ability to remove more aggressive materials, while longer trim lengths can improve operator comfort and perform better on irregular surfaces.

Mini Flap Disc

When working with thinner materials, flap discs are often a good choice because they offer reliable grinding action, while also allowing for more delicate blending and finishing work. Mini flap discs, which provide the same benefits as standard flap discs, are ideal for getting into tight spaces due to their smaller size. Mini flap discs are available in 2-inch and 3-inch diameters, with grit sizes ranging from 36 to 120.

Mini flap discs are designed to blend, grind and finish in one product, improving efficiency and productivity. They are a good option for grinding, blending, deburring, chamfering, edge chamfering and finishing on steel or stainless steel. Because of their smaller size, these discs aren’t an efficient option for working on large surface areas.

In some applications, mini flap discs can replace the use of small blending discs. These flap discs shed cloth and expose new grains to deliver a consistent, aggressive cut rate. They can remove three times more material over the life of the disc compared to a blending disc, and flap discs outlast blending discs by a significant margin. These features save time and money by minimizing product changeover.

Angle and pressure are key considerations for using a mini flap disc. A Type 27 flap disc has a flatter profile and is best for finishing and applications that require lighter pressure and lower grinding angles ranging from 5 to 15 degrees. A Type 29 flap disc is designed with an angle and is best for more aggressive, higher-angle grinding between 15 and 35 degrees. The workpiece, angle of approach, and

desired finish or result dictates which type of disc to choose.

Regarding pressure, it's again important to let the tool do the work. Avoid putting too much pressure on the disc, and always use lighter pressure when surface finish is a priority. If the sound of the tool audibly drops, the operator is likely using too much pressure.

When using mini flap discs, it's also important to avoid dwelling too long in one spot. Keep the product moving to avoid gouging or damaging the workpiece, which results in added rework and expense. Dwelling also causes heat to build up faster, which can adversely affect the finish, weld strength and mechanical properties — especially on thinner materials.

1-Millimeter Cutoff Wheel

A standard .045-inch cutoff wheel is commonly used in cutting applications, but a 1-millimeter version is often a better option when working with thin-gauge materials. The smaller wheel thickness reduces surface contact with the workpiece to minimize burr formation as well as heat buildup and discoloration throughout the cut.

On thinner materials especially, friction and heat are the enemies, and imperfections on the workpiece become more obvious. Using a standard-sized cutting wheel on thin materials can result in heat discoloration and burrs down the cut line, which requires secondary operations for cleanup before the process can continue. That extra time and money spent on secondary cleanup can be minimized or eliminated with a 1-millimeter cutoff wheel.

On sheet metal, thin wall tubing, small rods, and similar materials, 1-millimeter cutoff wheels provide a precise, fast cut. Because of the thinness of the wheel, these products aren't well-suited to cutting thick materials.

Proper technique also helps minimize heat and friction when using a 1-millimeter cutoff wheel. Just as with other abrasive products, using too much pressure is a common misstep. Use light pressure and consistent movement with a cutting wheel for a cleaner cut and extended wheel life. Also, avoid dwelling in one spot too long to minimize heat buildup.

Making The Choice

Whether the application involves tubing, stainless steel or thin carbon steel, proper tool selection and use can have a significant impact on productivity and performance — and therefore downtime and costs.

To choose the right product for the job, it's important to first consider the desired end results. Especially with thin-gauge materials, it's recommended to select the finest grit or lightest grain product possible to still get the job done. This increases productivity and reduces the need for secondary finishing operations.

There are many options available for cutting, grinding and finishing applications, and some of these products are underutilized. Consult a distributor or product manufacturer for help in making a choice that will maximize results.

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