
Machining

# ‘Best of Both Worlds’: Norton’s Vortex Flap Disc Shines at Jobs from Roughing to Finishing

James Langford | Jul 05, 2023

**From roughing out mold lines on aluminum parts for electric vehicles to delivering ultra-smooth finishes for components of medical devices, Norton’s Vortex Rapid Prep flap discs can not only do the job but do it more efficiently.**

Which makes them a rare win-win for metalworkers accustomed to relying on different tools for roughing and finishing as well as trading gains in chip generation for shorter tool life.

The flap discs, part of Norton’s non-woven line, feature three-dimensional abrasive layers and the company’s proprietary Clean Bond® resin technology that guarantees smear-free finishes. Tests have shown the discs boost metal removal rates as much as 50 percent higher than previous models.

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“You get the best of both worlds,” says Michael Radaelli, senior product manager for Norton | Saint-Gobain Abrasives. “You typically will never see that with normal aluminum oxide or silicon carbide discs.”

Because the ***Vortex Rapid Prep flap disc*** “cuts like a coarse grit and finishes like a fine grit,” it often enables metalworkers to skip steps required previously, he adds. Using a Vortex flap disc, shops might be able to finish a job in two or three steps that previously required five, each using a disc of a different grit.


Vortex Rapid Prep flap discs are available in color-coded grits from coarse (brown) to medium (maroon), fine (green) and extra fine (blue). | Image courtesy of Norton

That's a game-changer for welding and fabrication shops where customers require a particular finish.

Where the finish is not critical, it might be verified with a visual inspection. Jobs with more precise specifications, meanwhile, require using a tool called a profilometer that measures the average rough (Ra), the distance between peaks and valleys in a metal's surface from a median point. That process tells metalworkers the depth of scratch and can be critical to quality control.

> **"We're able to show people a proven ability to reduce steps, function more ergonomically and deliver faster throughput from roughing operations all the way to finishing operations."**
> Michael Radaelli
> Norton | Saint-Gobain

The Vortex flap discs, made with Norton's patented agglomerated aluminum oxide grain technology, streamline metalworking tasks from light blending to stripping, edge breaking and surface prep application.

## Longer Tool Life

Multiple layers of surface conditioning material deliver longer tool life, fewer disc changes for heightened efficiency and reduced vibration, Norton says.

The toolmaker's Clean Bond® resin technology eliminates the smears that can occur when equipment is running at sufficiently high speeds or pressures to melt resin in other cutting tools.

It's a common challenge when working with malleable materials such as copper and aluminum, which can generate heat extremely quickly, one that can slow down work as operators take time to use wipes or sprays to clean away the smears.

By avoiding smears, reducing disc changes and increasing material removal rates, Norton's Vortex flap discs ultimately helps users like machine shops boost productivity, which is crucial for businesses dealing with years of disruptions in their supply chains, ***price inflation*** and a ***shortage of laborers*** that may reach 2.1 million workers by 2030.

The bottom line for developing the product, Radaelli says, was adding value.

"How do you do that? You do it by offering an engineering solution," he says. The ***Vortex Rapid Prep flap disc*** "offers a solution that others don't have. Now you can talk about skipping steps and saving money."

The Vortex Rapid Prep flap discs are ideal for products from giant milk vats used in the dairy industry, for which regulators mandate surface smoothness to prevent bacteria accumulation, to boat frames with exposed welding seams, medical devices and aerospace components, Radaelli says.

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## Less Workpiece Scrapping

In many cases, Radaelli explains, starting a job with a finer grit may be preferable to a coarser grit. The coarser the grit, he says, the easier it is to cause a scratch that can't be removed without changing the workpiece's geometry so much that it no longer meets customer specifications and has to be discarded.

"If you start with a finer product, it takes a little more time to get to where you need to be in Step No. 1, but you're reducing the risk of scrapping the part," he says. "And then, to get to the finish line, it takes much less time."

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Metalworking shops investing in automation and robotics often opt for that solution, since the equipment makes it easier to achieve precise control of pressure and speed during jobs.

Those who need help developing a process can get it from Norton's ***Abrasive Process Solutions Program***, based at the Higgins Grinding Technology Center in Northborough, Massachusetts.

Finally, Radaelli says, the Vortex Rapid Prep flap disc's three-dimensional design—saturating the entire tool with grain—gives it cutting points at all angles.

That ensures uniform finishing with a low finish value, the company says. In metalworking grades, a lower finish value indicates a shallower depth of scratches and a smoother appearance.

"We're able to show people a proven ability to reduce steps, function more ergonomically and deliver faster throughput from roughing operations all the way to finishing operations," Radaelli says.

 