Real-Life Stories

Case Studies: Non-Woven Abrasive Discs–The RIGHT Approach

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The advantages of non-woven abrasives for right-angle grinding

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In the abrasives market, right angle grinders have traditionally been used in conjunction with grinding wheels, fiber discs, wire brushes and flap discs. When non-woven abrasive products entered the field, the technology replaced traditional coated abrasives as a faster and more cost-effective method of stripping, deburring, blending, prepping and finishing.

Non-woven abrasives are manufactured by "blending" crimped synthetic and natural fibers. During the manufacturing process, the web is impregnated with various abrasive additives, depending on the product, by either spraying or dipping the web formation in resin binders. The resulting 3-D material is pliable, conformable to the workpiece and long lasting.

Overall, non-woven abrasives have three basic components: the synthetic fiber web, the abrasives and the resin. The density of the web and the size and type of the abrasive used provides an array of combinations that give non-woven right-angle grinding products not only a great deal of versatility but also unique attributes not available in other abrasive products.

Non-woven abrasive stripping wheels are recognizable by their coarse, open web construction. They are ideal for stripping paint and coatings without affecting the base metal. The open structure resists loading, enabling it to strip even the gummiest of substances like seam sealer and adhesives.

Non-woven abrasive prepping wheels have a more open fiber web, matrix setup. This may be familiar to most users as it was the original structure of most non-woven products. It is an excellent product for surface preparation, cleaning and finishing. The prepping wheel is available in a depressed center wheel configuration with a fiberglass backup pad or, when more conformability is needed, as a disc that attaches to a rubber backup pad.

Non-woven finishing wheels have a much tighter fiber web, matrix setup, creating a firm product ideally suited for removing light welds, deburring rough metal edges, and blending and cleaning all metal surfaces.

The abrasive grain of choice for most metalworking operations using non-woven abrasive products is aluminum oxide, which is generally offered in medium and fine grit for metal removal and deburring. For light-pressure finishing operations, a very fine silicon carbide grain is generally recommended.

Latest Technology

To solve users' most aggressive stock removal and blending challenges, new extra heavy-duty non-woven discs have recently come on the scene that can do stripping, prepping and finishing. The latest technology can remove scratches, splatter and discoloration and can blend surfaces in a single step. Users will save significant labor and consumable costs by reducing application steps as compared to coated flap discs.

For example, Saint-Gobain Abrasives recently introduced Norton Rapid Prep XHD Coarse and Medium

non-woven discs. The Coarse range is good for surface blending on steels while the Medium range works well on softer metals and alloys. The discs are ideal for working with stainless steel and aluminum.

New Norton Rapid Prep XHD discs remove weld lines, weld splatter and discoloration and also blend surfaces in a single step.

The Norton Rapid Prep XHD discs offer a combination of a conformable fiber matrix and premium ceramic grain, resulting in improved cut control and surface blending compared to traditional coated flap and fiber discs. Product life is increased and shape integrity is maximized due to the Norton blended fiber web, which dissipates workpiece debris. In addition, the Norton Clean Bond resin system prevents smearing and produces a controlled wear rate.

Grade-A Test Results

To date, Norton Rapid Prep XHD discs have been widely tested, and in comparison tests, fabricators and welders, on average, see a 26 percent higher cut rate with less shedding and twice the disc life over the top competitive product using the new non-woven discs.

Here are three Norton Rapid Prep XHD disc application examples.

1. Application: Light weld blending and finishing of firetruck ladders

Material: Aluminum

Machine: 7-in. Cleco model No. 9173M (1.6 HP) rated at 12,000 RPM

Competitive product: Coarse 7-in. surface conditioning disc

SGA product: Norton Rapid Prep XHD Coarse 7-in. Hook & Loop disc

Results:

The Norton Rapid Prep XHD Coarse disc delivered a 26 percent faster cut rate and double the life versus the competitive non-woven disc.

Operators at this company have been using competitive non-woven discs for many years. The primary operator has been doing this job since 1988 and is very open about how products work. He was impressed from the start with the Norton Rapid Prep XHD disc. It did not wear down as fast as the competitive disc and operators commented about the Norton disc not leaving smear marks on the part as the disc wears away. It also held up better to edge grinding and full contact compared to the competitive product. *To read more, download a PDF of the complete* ***Case Study*** *of this company.*

2. Application: Spot weld grinding and surface finishing of IT network cabinets

Material: Carbon steel

Machine: Dynabrade air grinder model No. 50821 rated at 11,000 RPM using a competitor's hard backup pad

Competitive product: Coarse 4 ½-in. quick-change disc with TS attachment

SGA product: Norton Rapid Prep XHD Coarse 4 ½-in. quick-change disc with TS attachment

Results:

The Norton Rapid Prep XHD Coarse disc delivered twice the life of the competitor product with less shedding. The Norton disc completed 1,040 sq. in. without any surface issues versus the competitor's 480 sq. in. Operators had been using this popular competitive disc for many years.

3. Application: Locomotive cab weld grinding and surface blending before prime

Material: Carbon steel

Competitive product: Two popular grain fiber discs and one non-woven disc

SGA product: Norton Rapid Prep XHD Coarse 7-in. disc

Results:

The single Norton Rapid Prep XHD Coarse disc replaced three products and reduced a two-step operation down to a single step.

For the locomotive cab manufacturer, additional results were wide ranging. For the back of the cab, the Norton disc replaced three products. For the side of the cab, the Norton disc reduced two steps down to one. And for the front of the cab, the Norton disc produced a better finish compared to the popular competitive fiber disc.

As seen in some of the provided test examples, input was provided directly by the operators, painting a clear picture of the benefits they saw as well as the benefits that could be possible for new users. Their testimonials are powerful, considering that they had been using competitive products for multiple years.

As is true when considering any new product, due diligence is key. And part of that process involves garnering input from other users.

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