Article Release

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Re: Reduce Finishing Cost in a Global Recession

The economic downturn of 2008 through 2009 shifted corporate focus from mass production to downsizing. With less material and personnel, companies had to quickly learn to be more efficient in order to maintain a profitable business. We need to think outside the box to make our companies more profitable. We need to manufacture better products that enable us to compete globally.

How can we do more with less?

Reach out to your suppliers. Each of us is a buyer and seller of products. We should be looking for good partners to strengthen our business. Who has the technology and knowledge to help me reach my goal?

In the forge and casting process, most products require finishing steps that use abrasives. Saint-Gobain Abrasives has a team of Application and Product Engineers to help customers improve their process. The tools available to them, like the Field Instrumentation System (FIS), are highly sophisticated and help customers optimize their process and ensure the best product is chosen. And, sometimes we find that a more economical product is better for a particular application. Use of the FIS and other analytical tools leads to an understanding of the grinding process based on real data. This shifts the focus away from trial and error and more towards viewing the grinding process as a whole – as a “system.” Hence, in many cases, using FIS, our Application Engineers have been able to help our customers solve their problems originating from machine tools, cycle designs, work holding, etc. vs. the abrasive products.

Case study of how FIS improved the process:

As the belt nears end of life, frequent infeed compensation is required to hold size. Monitoring with the FIS enabled prediction of when size and surface finish compensation became necessary. This improved belt life, lowered cost of production, improved quality, and reduced waste.
There are four main types of abrasive minerals commonly used today in coated abrasive products. Each mineral also has a certain cost associated with it. The ceramic alumina mineral is the most expensive initially. Therefore, it is important to make sure that you are using the most cost-effective coated abrasive product.

- Metalite® (aluminum oxide) – a utility grade mineral that provides a good cut and consistent finish on metals such as carbon steel, bronze and wood
- Durite® (silicon carbide) – a hard, sharp and brittle mineral that provides a consistent finish on stainless steel and titanium
- NorZon® (zirconia alumina) – a mineral that is tougher than aluminum oxide or silicon carbide and typically used on aluminum and stainless steels
- Ceramic Alumina – a mineral with the greatest toughness and hardness, generally used on super-alloy metals such as aerospace alloys, nickel-based alloys, and some stainless steels

Saint-Gobain Abrasives has developed two new products called under their Norton brand: Norton SG BLAZE® Plus (ceramic) and NorZon BlueFire™ (zirconia). NorZon BlueFire has a unique self-sharpening characteristic which provides long life on roughed stock removal operations. Because controlled fracturing of the grain continuously produces sharp new abrading surfaces, NorZon BlueFire is well suited for aluminum, titanium, stainless steels and even wood.

Coated abrasive products are made up of three basic components: backing, abrasive minerals (grains), and adhesive that bonds the other two components together. Selecting the proper abrasive size (e.g. 50 grit) is also very important to achieve the optimal cut rate and desired surface finish. (See Table 1.)

<table>
<thead>
<tr>
<th>Operation</th>
<th>Grit Size Range</th>
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</thead>
<tbody>
<tr>
<td>Heavy Stock Removal</td>
<td>24-80</td>
</tr>
<tr>
<td>Medium Stock Removal</td>
<td>100-180</td>
</tr>
<tr>
<td>Light Stock Removal</td>
<td>220-320</td>
</tr>
<tr>
<td>Finishing</td>
<td>400-600</td>
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The backing on a coated abrasive belt must be strong enough to withstand grinding pressures, and flexible enough to conform to contours of the work piece and the grinding machine. Two main backings are polyester and cotton. Polyester backing offers better tear and puncture resistance than cotton. Cotton is lighter and able to conform to work piece shapes.

Will it be cost-effective? The best product for cleaning/finishing can be determined by the actual cost/part including labor and overhead. Add the cost of the abrasive belt to the cost of labor and overhead for the time the abrasive belt was used. Divide that amount by the number of parts ground. This will give the cost/part of the grinding operation.

Remember, ceramic belts come at a premium initial price. They can cut faster and last longer but you need to ensure your operation has the correct specification and you are fully optimizing your process to get maximum benefit. Talk to your Saint-Gobain Abrasives representative to determine if using an alternate grain type like NorZon BlueFire or Norton SG BLAZE Plus will have a lower abrasive belt cost per part.

About Norton
Norton is a brand of Saint-Gobain Abrasives, a division of Saint-Gobain. Saint-Gobain (Paris, France) is a leading producer of construction products (building materials, gypsum products, insulation and pipe), Innovative Materials (abrasives, ceramics, high-performance plastics, flat glass, and technical fabrics) and glass containers. The company is also a leading distributor of building products. One of the top 100 industrial companies in the world, Saint-Gobain's 2009 sales approximated $53 billion. In the United States and Canada, Saint-Gobain employs about 20,000 people and has approximately 330 locations. Saint-Gobain's web site is [www.saint-gobain.com](http://www.saint-gobain.com).

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