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ARMEX™ Versus Crushed Glass: Seeing the Bigger Picture

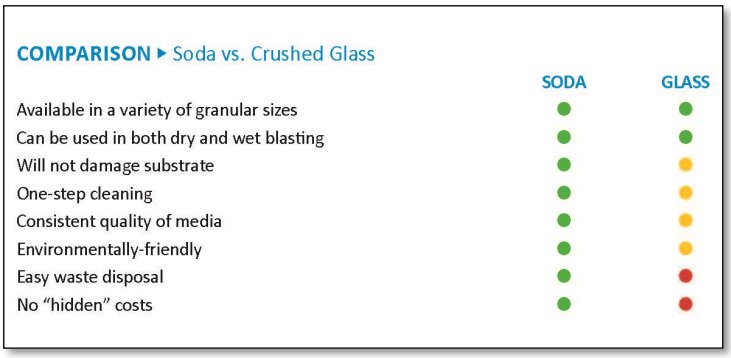
How do you choose the best blasting technology to get the job done right? What are all the factors that need to be considered? Companies looking for the most cost-effective blasting abrasive often choose crushed glass, which offers a lower up-front cost. However, there are several hidden costs that are easy to overlook. It's important to see the bigger picture and here are some of the key factors to consider.

Substrate Preservation

One of the most important differences between blasting with sodium bicarbonate (baking soda) versus blasting with any other abrasive medias are that baking soda's attributes allow it to remove contaminants without damaging the underlying substrate. Baking soda is all about surface preservation.

How does baking soda not damage substrates? In most cases baking soda is harder than the contaminants you are trying to remove, be it grease, oil, paint, environmental soil, etc.—but softer than the substrate. This is how baking soda can clean without damaging the underlying surface. By comparison, when a hard-abrasive particle impacts the surface, the energy of the impact is transferred into the substrate, fracturing it and blowing surface materials off along with the contaminate you are trying to remove. When baking soda impacts the surface, the impact energy is transferred back into the baking soda crystal itself, which gets fractured and blown apart removing just the surface contaminants all while leaving the substrate unchanged. The substrate is an important cost consideration if the project specification is to preserve substrate materials.

Surface preservation is critical when dealing in markets like remanufacturing, where surface materials cannot be removed from parts. At a minimum, the potential for substrate damage will add another layer to the quality check process — although this may be just the tip of the iceberg. When metal parts are profiled, tolerances and specifications change. Glass can also damage threads in softer metals such as aluminum, necessitating re-threading, a Heli-Coil, or even rejection of the part altogether. Another market in which surface preservation is critical is the marine/boating industry. After time, buildup of antifouling paint on boat hulls needs to be removed. Year after year of adding multiple coats of antifouling paint adds weight and resistance to boat hulls, which can decrease fuel efficiency and cause stability issues. Abrasive blasting with glass can damage gelcoat. Baking soda will not damage gelcoat. The use of glass in restoration of fire damage, cleaning of stone and masonry products, and paint removal all have the potential to damage substrate materials. Baking soda will preserve substrates.



Liability Costs

Not only can hard abrasive media such as glass cause obvious substrate damage, but particles left behind after blasting can pack into small passageways and make it difficult to detect substrate cracks. These particles can also work their way into the nooks and crannies of complex systems such as a vehicle engines and transmissions. The potential for system failures from entrapped hard abrasives is a clear liability to consider. This potential is eliminated altogether when using soda. Any small particles of soda left behind are easily dissolved by water and by the liquids that normally circulate through engines and transmissions, such as engine oil, antifreeze or transmission fluid.

Preparation Costs

Adding steps to the blasting process such as pre-cleaning, pre-soaking or masking of delicate areas can be essential when hard abrasives are used. Whereas soda is often said to "love grease and oil" because of the way that its alkaline environment naturally draws contaminants away from the substrate, other types of media can push contaminants further into the surface if extra cleaning steps — involving additional labor costs — are not performed prior to blasting.

Even after blasting with media such as glass, an oil or grease film can remain on the surface of the cleaned part. If the part is to be painted, it may require yet another additional cleaning step to become paint-ready. Contaminants lifted away with soda, by contrast, can be removed with a freshwater rinse. Delicate areas must also be protected from hard abrasives; crushed glass, for instance, will frost window glass. This is an especially important consideration to those working in restoration. For some thin or ornamental surfaces, soda blasting may be the only viable choice.

Quality and Quantity Concerns

Because glass media is frequently made from post-consumer recycled glass, it is often said to be an environmentally friendly media. But the quality of that recycled glass can be highly variable, depending on the source and the method of processing. Using a lower-quality glass can have undesirable results, including the need to use more of it, requiring additional time and producing excess waste. This dynamic also influences the media's capacity for reuse. While glass beads can be re-used for blasting, the particles get smaller with each application and eventually lose their ability to clean. This is a prime example of the "principle of diminishing returns." As a natural, non-toxic product, baking soda is consistent regardless of source and is inherently environmentally friendly.

Disposal Procedures

Disposal can be a challenge with media such as glass. To prevent environmental impact during blasting projects, the blast area must be contained and spent media must be collected at the end of the project. Contaminants get mixed in with the spent media and the ratio of hazardous contaminants contained in that mixture increases with each re-use — making it likely that a hazardous landfill will be the ultimate destination. Each of these factors also adds labor and materials costs to the overall process. The disposal of spent ARMEX™ is less costly and complex than waste disposal for other abrasive media. On its own, ARMEX™ blast media is water-soluble, non-toxic and environmentally friendly — and is the only type of abrasive media that can be disposed within a traditional waste stream. It is important to note, however, that the waste contaminants removed by the media may be hazardous. The surface being blasted and the type of contaminants being removed will play a role in this, and determining the level of hazardous contaminants in the spent media sets the stage for everything to follow.

That's where a company such as Clean Harbors/Safety-Kleen comes in. Along with cleanup and waste removal services, Safety-Kleen offers analysis and consultation services to classify your waste and guide your disposal procedures. The contaminant ratio within the spent media byproduct is key to determining whether it can be disposed within a traditional waste stream. Of course, customers should always check state and municipal guidelines for disposal, as well; regulations may vary considerably, depending on locality.

Costs are always a top priority to consider in all projects and cleaning processes. However, there are more to costs than just the abrasive media. As outlined in this article, potential for damage, material and labor costs and the complexity of disposal need to be factored into project and cleaning process costs. There is indeed a bigger picture to consider and abrasive blasting with sodium bicarbonate (baking soda) just may be worth another look; this is especially true when surface preservation is a must.

"HIDDEN" COSTS ▸ Soda vs. Crushed Glass

	SODA	GLASS
Up-front costs	$$$	$
Potential for substrate damage		$
Potential liability costs		$
Pre-cleaning for heavy contamination		$
Pre-cleaning to be "paint-ready"		$
Pre-blast masking of delicate surfaces		$
Quantity of time spent and media used		$
Complex disposal procedures		$

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