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WET-BLASTING EQUIPMENT

A Comparison for Industrial Coatings Contractors

BY JON KENIMER, BLASTONE INTERNATIONAL

Wet blasting, the process of introducing water to a mixture of pressurized air and abrasive, is now a mainstream process in the surface preparation field.

While it has been referred to as other names, including dustless blasting, mist blasting, slurry blasting or vapor blasting, wet blasting uses a mixture of water and abrasive media to create a surface profile prior to coating application – making it distinct from ultra-high-pressure (UHP) waterjetting, which does not include abrasive and does not create a surface profile.

While it is true that there are other ways to reduce dust, adding water to the blast stream is often required to keep dust in check when abrasive blasting.

The "why" and "what" of wet blasting is generally well understood. Simply put, only two words are needed: "dust mitigation." While it is true that there are other ways to reduce dust ***(see sidebar)***, adding water to the blast stream is often required to keep dust in check when abrasive blasting.

Less clear, however, is the "how" of wet blasting. This article will examine and compare the various technologies and equipment currently available for these applications in the industrial coatings market.

Wet abrasive blasting was introduced over 50 years ago, so it is not a new concept. Technology is evolving however, and options now exist that offer faster production as well as lower water consumption versus older technologies.

Before we examine the various methods of wet blasting, let's look at two common scenarios where wet abrasive blasting equipment may be needed.

1. An entrepreneur is starting a field painting/abrasive blasting company and wants to be prepared to provide wet blasting services as well as dry.
2. An established industrial painting contractor wants to add wet abrasive blasting to their range of services or may want to improve their efficiency in this area.

For these purposes, there are three common types of wet blasting equipment options on the market today. Let's review and explore the pros and cons of each.

DUST MITIGATION ALTERNATIVES

Water is not always required to gain a satisfactory level of dust mitigation. Here are a few other options:

- **Use a low-dust media.** The cheapest media is generally the dustiest. The difference can be dramatic. Also, using a high-performance media often has other benefits too, including faster production, lower consumption, and/or a cleaner blasted surface.
- **Use a vacuum blaster.** Specialized blast-and-vac (BNV) systems combine a vacuum and a blast nozzle into a single workhead. Dust reduction is near total and water isn't needed. However, BNV technology is slow and is best used for spot work.
- **Use containment.** The use of containment with dust collection, although it can be expensive, allows the use of dry blasting.

Slurry Blast Equipment

This is a category of blasting equipment where water and abrasive are mixed inside the blast pot. Some versions are designed for wet blasting only, while others can blast wet or dry.

With slurry blast equipment, because the water and media are mixed in the tank, no air dryer is required. As a result, using media that has gotten wet is OK, which can be beneficial.

However, this type of equipment cannot independently control the abrasive and water ratio; this must be carefully managed manually. For example, if production needs to be increased due to a particularly thick or tough coating, the operator will increase the flow of the abrasive/water mixture. While this will increase production speed due to the higher level of abrasive, the water consumption will also increase. If production needs to be decreased due to working on a sensitive substrate such as concrete, where the underlying aggregate may become exposed, turning the abrasive down will also turn down the water possibly reducing the dust mitigating effect of the water too much. Also, slurry blast equipment produces higher water consumption rates than hybrid units. Lastly, some slurry blast configurations do not have the ability to blast dry.

Hybrid Blast Equipment

In this category, the abrasive is always dry in the blast pot. When wet blasting, water is injected at the metering valve or at the nozzle. Hybrid pots are quite versatile; they can blast dry, blast wet, blow down, or wash down. When combined with a bulk pot with multiple operators, each operator can even choose their desired function

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independently of the others. There are other considerations which will be reviewed later in this article.

Designed to do both wet and dry blasting efficiently, hybrid units are versatile, not a limited-purpose specialist machine. Overall, they have the lowest water consumption and highest productivity in this group.

On the con side, because the blast pot is dry, an air dryer is required, adding cost to the already pricy technology for companies who do not currently have one.

Nozzle-Mounted Injectors

These versions use a separate water line, which connects at the nozzle. There are two main types: a Water Induction Nozzle (WIN), which is a nozzle designed specifically for wet abrasive blasting; and a Halo (water ring), which is a device that attaches to a standard nozzle.

These smaller, compact units carry a very low upfront cost. However, nozzle-mounted injectors have limitations

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EXPERT OPINION

What else do I need to know? We asked Ben Fording, a field sales representative with over 10 years' experience at BlastOne International, to share a few points and opinions gleaned from his experience in selling wet abrasive blast equipment into many different project situations.

1. One major benefit of wet abrasive blasting is the potential of reducing or eliminating the cost of containment.
2. Water consumption is a big consideration, especially when blasting steel. It is standard practice to use a rust inhibitor in this application and that is not inexpensive. Slurry-type blasters inevitably use more rust inhibitor than the hybrid types. Even when blasting concrete and therefore not using rust inhibitor, excess water creates a mess to work in and potentially to clean up. High-quality hybrid units offer the key capability of being able to adjust water flow separately from abrasive flow. This allows the operator to adjust water flow to keep the abrasive just damp enough to mitigate the dust while still allowing the abrasive flow to be adjusted to achieve the optimal speed and consumption for the given field conditions.
3. Regardless of what may be claimed, wet abrasive blasting is always slower than dry blasting when comparing apples-to-apples. In addition and contrary to some claims, water does not do any of the blasting work—its sole function is to mitigate dust.
4. Hybrid units are unquestionably the best equipment for industrial projects. For small projects, production speed is less of a factor, and water/inhibitor consumption aren't that high anyway, so the less costly slurry and nozzle options may be viable. But without a doubt, large wet blast abrasive projects will be most economical overall when done with hybrid equipment.

TABLE 1: **Equipment Specs and Considerations for Generic Wet Blasting Equipment Types**

WHEEL MOUNTED							
MACHINE	MSRP	POT SIZE	TANK SIZE	POT TYPE	VALVE TYPE	EMPTY WT	STANDARD CONTROLS
Axxiom AmphiBlast Lite	$25,254	3.5 CF	15 gal	Dry/Hybrid	TeraValve	270 lbs	Pneumatic (option for electric)
BlastOne MistBlaster MB25000 Base Unit	$20,855	6.5 CF	Optional 50 or 275 gal	Dry/Hybrid	TeraValve	548 lbs	Dual (electric/ pneumatic)
Dustless Blasting DB500 Base Unit	$12,500	5 CF	20 gal (in pot)	Dry/Slurry	Abrasive Control Lever	368 lbs	Pneumatic
Dustless Basting DB800 Base Unit	$15,500	8 CF	30 gal (in pot)	Dry/Slurry	Abrasive Control Lever	427 lbs	Pneumatic
SKID MOUNTED							
MACHINE	MSRP	POT SIZE	TANK SIZE	POT TYPE	VALVE TYPE	EMPTY WT	STANDARD CONTROLS
Axxiom AmphiBlast Standard, Single Outlet	$31,024	4.5 CF	80 gal	Dry/Hybrid	Thompson II	850 lbs	Pneumatic (option for electric)
Axxiom AmphiBlast Standard, Double Outlet	$51,281	6.5 CF	165 gal	Dry/Hybrid	Thompson II	1350 lbs	Pneumatic (option for electric)
BlastOne MistBlaster MB20000 Base Unit	$24,970	6.5 CF	Optional 50 or 275 gal	Dry/Hybrid	TeraValve	748 lbs	Dual (electric/ pneumatic)
BlastOne MistBlaster MB40000 & MB60000, Combo Skid Series	Option Dependent	6.5 CF	50 gal	Dry/Hybrid	TeraValve	Option Dependent	Dual (electric/ pneumatic)
Clemco WetBlast Flex #2448 Base Unit	$24,580	6 CF	120 gal	Dry/Hybrid	AQV Auto Quantum	1500 lbs	Pneumatic
Greener Blaster GBT760	$30,500	7.6 CF	100 gal	Slurry	Control Panel Knob	1030 lbs	Pneumatic
Greener Blaster Dual Outlet	$53,000	12 CF	100 gal	Slurry	Control Panel Knob	1800 lbs	Pneumatic
BULK							
MACHINE	MSRP	POT SIZE	TANK SIZE	POT TYPE	VALVE TYPE	EMPTY WT	STANDARD CONTROLS
Axxiom Bulk AmphiBlast	Option Dependent	45, 120 or 160 CF	Optional 275 gal	Dry/Hybrid	Thompson II or TeraValve. 2, 3 or 4 valves	Option Dependent	Electric
BlastOne Mega MistBlaster	Option Dependent	160 CF	Optional 275 gal	Dry/Hybrid	TeraValve. 2 or 4 valves	Option Dependent	Electric, includes timers

which significantly impact their viability for industrial applications. The water-ring types use a large amount of water and the injection type negatively impacts production speed.

Technical Comparison

There are several manufacturers of wet abrasive blasting equipment and much to consider when selecting the right product for the right job. **Table 1** features equipment specs and considerations for generic wet blasting equipment types.

Final Purchase Considerations

Now that you're aware of the different types and sizes of wet blasting equipment available, let's run through a list of questions to ask to make sure you're selecting the most practical equipment setup for your wet blasting needs.

WHAT METERING VALVE DOES THE EQUIPMENT HAVE?

The metering valve is the heart of any blast machine. In the average lifespan of a blast pot, the value of the abrasive that will go through any pot can easily exceed $100,000. A valve that offers a high degree of fine metering control (allowing the operator to minimize consumption while maximizing production) may cost a few hundred dollars more up front, but can save many thousands in abrasive over the life of the pot.

Metering valves are not all created equal. Fine metering control is just one of the important aspects. Other items to consider about the metering valve include:

- How long do they last?

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- How easy are they to unclog?
- How easy are they to repair/ rebuild?
- How new is the technology in it?

These questions are nearly impossible to answer without speaking with a knowledgeable sales rep, technician, or user who has used more than one type.

WHAT IS THE EQUIPMENT'S PRESSURE EFFICIENCY?

How much pressure drop is there from the inlet of the pot to the outlet? If the metering valve is the heart of any blast machine, PSI is the heart of productivity. It is simple to test and profoundly important to understand what (if any) pressure drop is caused by the piping and valve of the blast machine. It isn't uncommon for machines to have a 10 PSI pressure drop and, in this example, the production speed will be 15% slower than one without any pressure drop. These pressure drops are insidious and difficult to identify without doing nozzle pressure checks or without

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doing timed comparisons between different equipment.

WHAT SUPPORT CAN YOU EXPECT FROM THE MANUFACTURER OR DISTRIBUTOR?

You can't just look at the manufacturer's website – you need to pick up the phone and call them. As far as the equipment is concerned, do they offer field support or just phone support? Qualified field support (both to optimize job setup as well as for equipment maintenance) can mean the difference between profit and loss on your projects. Possibly even more importantly, can they offer real-world assistance on best practices on the type of projects you want to pursue? Regardless of whether you are an old-timer in the blasting game or a greenhorn, there's always something new to learn. Look for a company who can offer suggestions on abrasive comparisons, nozzle types, hose sizes, job

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safety, how to bid projects and any other questions you may have.

HOW VERSATILE IS THE EQUIPMENT?

Does your blaster offer the ability to blast dry and if so, how well does it perform at this? Dry blasting is the preferred way to blast whenever possible and is much more commonly done. A limited purpose wet-only blaster (or one that isn't efficient at blasting dry) will tend to gather dust in your warehouse, lowering the return on your investment substantially.

CAN YOU TRY BEFORE YOU BUY?

Does the manufacturer or distributor offer field demos and/or equipment rental? This is a great way to test and find out more about your chosen equipment (and your supplier). Actually using the equipment on a demo site or out in the field for a day will help you learn more about the equipment than you could doing a week of other research on it.

DOES IT PASS THE ACID TEST?

How many machines of your selected model are available on the used market? A disproportionately high number of a given model or manufacturer is a warning sign. Compare pricing for used versus new – how much depreciation is there in your top choices?

Conclusions

While this article can help supplement your research into specific wet blasting equipment, you should also seek out advice from real-world product experts. Ask your potential supplier for referrals, especially if they have any that have "converted" from other brands. Here are five questions to ask when you connect with a referral:

1. How long have you had the equipment, and how often do you use it?
2. What are the best points about the equipment/supplier?
3. Are there any issues that haven't been resolved, or limitations/problems that may be a concern to a new user?
4. Knowing what you now know, what is the likelihood that you would buy it again?
5. Any other comments or suggestions?

As with most products marketed and sold in the U.S., a variety of good options fortunately exist because of our free market economy. A wet abrasive blast machine purchase is a major investment and what type you want or need is dependent on your specific situation. But remember this: The initial cost is far less important than the ongoing operating cost and the support available from your supplier. JPCL

ABOUT THE AUTHOR

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