

# WHAT IS VAPOR ABRASIVE BLASTING?

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**Vapor abrasive blasting (also known as wet abrasive blasting) removes coatings, contaminants, corrosion and residues from hard surfaces.** It's similar to dry blasting, except that **the blast media is moistened prior to impacting the surface.**

The main advantage of vapor abrasive blasting over dry blasting is that it **reduces dust**, allowing for operators to work in a wide range of environments with **minimal setup and cleanup costs**. It results in a cleaner, more consistent finished, ready to coat, with no embedded particles or clinging dust.

Vapor abrasive blasting is alternatively referred to as **wet blasting, wet abrasive blasting, vapor blasting, slurry blasting, wet sandblasting** and **dustless blasting**.

## ▼ METHODS

### VAPOR ABRASIVE/WET ABRASIVE BLASTING METHODS

#### WIN and Halo Nozzles

Nozzles are extensions for sandblasters that provide some dust suppression.

*Water Injection Nozzles (WIN).* Jets of water dampen abrasive as it leaves the nozzle.

*Halo (water ring) nozzles.* A curtain of water surrounds the abrasive blast, dampening dust after impact.

Pros: Relatively inexpensive. Suppresses 50-85% of dust.

Cons: High water consumption.

#### Cabinets and blast rooms

Water and media are mixed and sprayed inside an enclosure. An efficient way to blast parts.

Pros: Allows for media recycling, built-in containment.

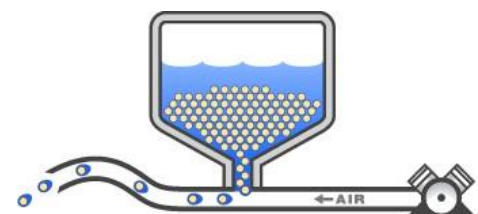
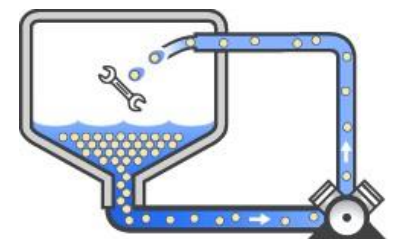
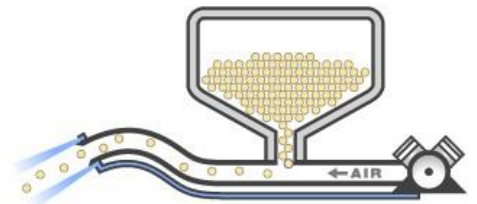
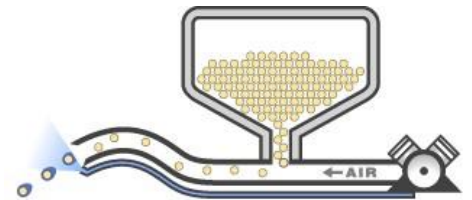
Cons: Stationary. Blasting limited to objects that can fit in the enclosure.

#### Modified Sandblasters

Water and abrasive is stored in a pot under air pressure. The mixture is drawn into the airflow using the venturi effect.

Pros: Effective dust suppression.

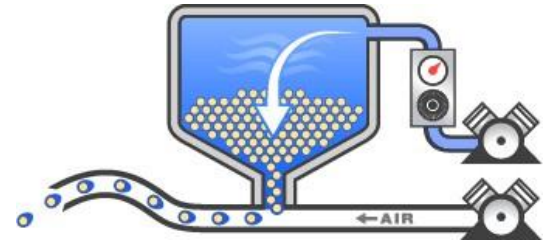
Cons: Limited flow control. High abrasive and water consumption.



## Vapor Abrasive Blasters

Water and abrasive are combined in a pot under water pressure, then injected into the airflow.

Pros: up to 95% dust suppression. Affords fine control over the air pressure and water/abrasive mixture, allowing for blasting of a wider range of surfaces and reducing the amount of media and water expended.



## WHAT HAPPENS ON IMPACT

When abrasive impacts a hard surface, the particle often breaks or shatters, propelling finer particles into the air as **dust**, in addition to dust already present in the dry media. This impact can also cause dry sparks charged with static electricity.

**When wet abrasive impacts a surface, fine particles are sequestered in water droplets.** The additional water weighs the particles down, **preventing dust**.

The presence of water also confers more mass on the particle at impact. As the water droplet disperses, **the hydrostatic force blasts away surface coating**, leaving a feathered edge around the perimeter for seamless recoatings.

## MATERIALS

A variety of materials are suitable for vapor abrasive blasting.

### Abrasives



Abrasives include any blast material that creates a surface profile (or anchor pattern) upon impact. Surface coatings adhere more strongly to profiled surfaces.

Left to right: Garnet, crushed glass, staurolite, coal slag.

Not shown: special types of soda.

### Media



Media refers to materials that do not create a surface profile upon impact. These include both inorganic and organic materials.

Left to right: Glass beads, plastic beads, crushed walnut.

## APPLICATIONS

Wet abrasive blasting can substitute for sandblasting for virtually any application, but there are surfaces, conditions and environments for which wet blasting is especially advantageous.



**Alongside other workers.** Dust from dry blasting presents not only an inhalation health hazard, but severely limits visibility. Whereas dry blasting operations must be sequestered from normal operations, **wet blasters can work in close proximity with other workers with minimal precautionary measures.**



**Outdoor/urban environments.** Dry blasting requires substantial containment/tenting to maintain airborne dust levels within legal limits. In outdoor and urban environments, such containment is not practical or cost-effective. Due to inherent dust suppression, **vapor abrasive blasting operations require minimal containment.**



**Delicate surfaces.** Wet blasters can operate effectively at lower PSI, **removing coatings without damaging the underlying substrate.** Vapor abrasive blasting is a preferred method for blasting antique, fragile surfaces and soft surfaces (including wood). In addition, the presence of lubricating water reduces heat due to friction that can warp metal surfaces.

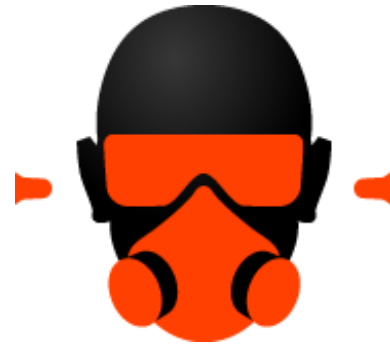


**Industrial settings.** Dry blasting can cast dry sparks charged with static electricity which can lead to explosions in the presence of flammable gases. Wet blasting does not completely eliminate sparks, but when sparks occur they are cold sparks (without static electricity), minimizing the explosive potential.

## SAFETY

Full blasting helmets are a requirement for dry blasting operations which restricts visibility, reducing productivity and heightening accidental risk.

**Vapor abrasive blasting requires only a respirator, eye and ear protection.**



## HISTORY

In 1950, sandblasting was banned in Britain due to concerns over silicosis, an occupational hazard associated with inhalation of silica dust. Shortly after, Norman Ashworth invented the first vapor abrasive blaster there.

In 1966, several European nations followed suit and banned sandblasting, leading to innovation of new wet blasting technologies, notably in Germany, where the first mobile wet blaster was invented, designed explicitly to compete with sandblasters.

### *Adoption in North America*

Wet blasters were imported to North America from Germany in the 90s and Britain in the 00s. In 2009, the first domestically- manufactured vapor abrasive blasters – Ecoquip and GeoBlaster – entered the market. In 2013 and 2014 respectively, Ecoquip and GeoBlaster were acquired by Graco Inc., a worldwide leader in fluid handling.

With industry-standard parts that can be sourced locally and improved efficiency due to technological innovations, vapor abrasive blasters are experiencing widespread adoption in the surface preparation industry