

μ -jet[®]

The Revolutionary Blasting Process from Muehlhan.

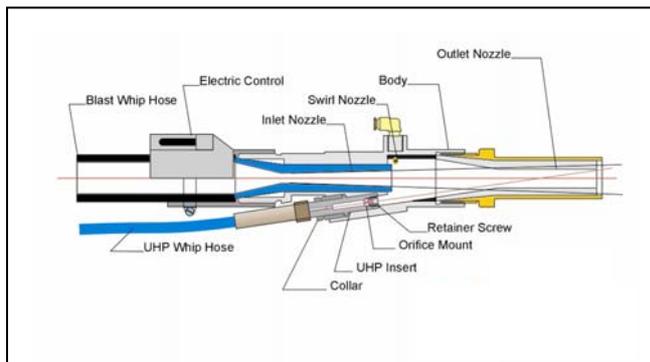


Special Technology

μ -jet[®] is the worldwide patented combination of two blasting processes: traditional dry blasting (AB), and high or ultra-high-pressure hydro-blasting (UHP). A combination of dry and liquid solvent blasting is known on the market as "slurry blasting". Albeit, this term is not to be confused with " μ -jet[®] blasting":



When slurry blasting is performed, the dry-blasting material is mixed together with a liquid on its way to the blasting nozzle or is 'de-dusted' with a concentric nozzle. With " μ -jet[®] blasting", the mixture of air/blasting material being pressed out of the dry-blasting nozzle is accelerated a second time by combining it with a jet of high/ultra-high-pressure water in a secondary chamber, which then exits from another nozzle with increased kinetic energy. If, for example, the particle flow during dry blasting has a velocity of 150 m/sec at a certain pressure and diameter, with slurry blasting this velocity is reduced depending on the volume of water injected (all other parameters remaining the same). In contrast, with " μ -jet[®] blasting", this velocity is increased considerably depending on the pressure and volume of water flow involved, e.g. up to 2,160 km/h (= 1,342 mi/h) at a pressure of 2,700 bar (= 40,000 psi) and 12 l/min (= 3,17 gal/min).



The advantages in using μ -jet[®] are obvious because, as physics dictate, kinetic energy grows by square with increasing velocity at constant mass. When the velocity is doubled, one achieves four times the kinetic energy; a threefold velocity means nine times. The logical inversion of this argument: slurry blasting is slower than dry blasting, and " μ -jet[®] blasting" much, much faster.

As a rule, " μ -jet[®]-blasting" displays the following advantages in comparison to dry blasting:

- It is between two and five times as fast.
- It does not generate any dust – other work stages can continue operations in the immediate vicinity, parallel to μ -jet[®]-blasting.
- It does not generate any hot sparks – meaning no danger of explosion by this cause.
- A surface profile of up to 150 μ m can be reached, thereby achieving optimal coating adhesion on steel.
- It saves up to 40 % abrasives – incl. disposal.
- It saves up to 40 % on energy costs.
- It cleans the surface of chlorides that sometimes considerably reduce the product life of the coating, which in extreme cases can immediately lead to blistering.
- Rain does not prevent continuation of work.





As a rule, "*μ-jet*[®] blasting" displays the following advantages in comparison to high and ultra-high-pressure hydro-blasting:

- It is up to ten times faster.
- The optimal surface profile can be specified. With UHP, the maximum one achieves is the surface profile that originally existed. So better adhesion can be reached.
- It saves up to 80 % (fresh)water.
- It saves up to 80 % energy.
- It considerably saves costs for spares and tools, as well as work disruptions.
- On horizontal surfaces, it takes longer for airborne rust to accumulate.
- The surface standards SA 2 1/2, NACE 2 or SP 10 can be complied with.
- Lower UH-pressure is possible
- Less force on the blasting worker.
- Short term dry blasting (with bounce-back effect) is possible.
- High-efficiency underwater blasting.



The systems used by Muehlhan at present are "*μ-jet*[®]102", "*μ-jet*[®]104" and "*μ-jet*[®]204". These are equipment configurations for 2 or 4 blasters respectively. Thanks to *μ-jet*[®]'s high level of efficiency, they represent an investment that amortizes itself relatively rapidly. This is true even more so when one takes into account that other work operations at a site do not have to be interrupted when blasting with *μ-jet*[®] is in progress, meaning that both personnel and all equipment are being utilized to a much fuller capacity.

Depending on the project involved, individualized decisions can be made as to whether *μ-jet*[®] blasting is to be done from a cherry-picker, scaffolding or suspended platforms. Here, too, there are considerable savings potentials to be found, depending on the system involved.



Furthermore, the Muehlhan Group in Germany and the USA has two complete *μ-jet*[®] units on container trucks: the *μ-truck*. These consist of a UHP-pump, an automatic blast hopper, a generator and a compressor with the complete peripherals and on-board workshop. Only a water connection is required – the truck is otherwise self-contained – in order to keep set-up times to a minimum.

As surfaces blasted using μ -jet[®] are better to work with, it goes without saying that all coating materials suitable for use following abrasion cleaning and washing with ultra-high-pressure hydro-blasting can be applied after μ -jet[®] blasting.

That's why μ -jet[®] is the most time and cost-efficient alternative for nearly all ultra-high-pressure hydro-blasting projects, as well as for a great number of dry-blasting projects.