

Basics of beam technology

Blasting technology is a general term for the treatment of surfaces by abrasive blasting. The adhesion and the quality of old coatings can be improved by blasting different substrates. When used as a tool, shot blasting abrasive is usually medium-sized granules. They are directed into jet/gun devices, accelerated by means of compressed air, liquids, or centrifugal wheels at high speed onto the surface to be treated (the blasting part). The result is heavily dependent on the beam method, the selected parameter settings, and the abrasive used.

Due to the risk of silicosis (pneumoconiosis), the “sandblasting” method (blasting with quartz sand) has for many years only been allowed in exceptional cases, with significant security measures. The beam system requires regular maintenance and the blasting must be controlled, depending on the type and degree of contamination on reuse and condition of the granularity.

Safety measures

Hazardous substances such as antimony, tin, arsenic, lead, and cadmium, may only be present within legally fixed limits in the abrasive grit.

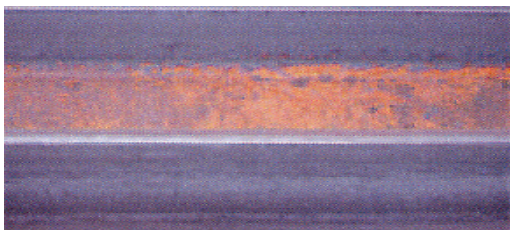
Self-contained breathing apparatus for blasting work as well as special protective clothing e.g. clothes, safety shoes and personal hearing protection should be used.

Caution: Deposited or suspended metal dust is an explosion hazard if in contact with sources of ignition. Where light metals and ferrous parts are present, this hazard can increase. The relevant statutory provisions and regulations must be observed.

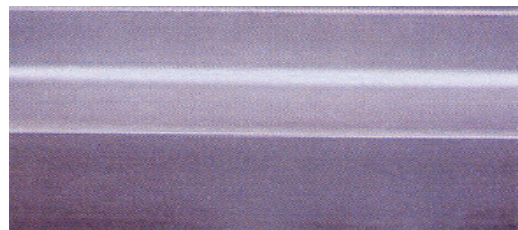


How Blasting works

Outstanding results can be achieved by using blasting technology - see the pictures below. As you will see, the process achieves de-scaling, rust removal, paint stripping, sand removal, cleaning, deburring, beam machining, and tarnish removal, as well as grinding and various surface finishes.



Steel girder - before



Steel girder - after

Blasting materials

Depending on how abrasive the substrate needs to be, various grits are used for blasting (see below). There are many different influences on the choice of blasting material: price, substrate, material thickness and the required blast profile. On thin substrates it the use of “softer” beam techniques is recommended, so as not to deform or destroy the material. On construction steel the blast profile is usually between 25-60µm; the roughness rarely goes up to 80µm.

Different blasting materials:

				
Aluminium oxide	Garnet	Steel grit	Steel shot	Plastic

Other types may include: glass beads, ceramics, dry ice, corundum, steel balls, cut wire, emery, blast furnace slag, and bronze powder.

Common methods are:

Air blasting – Dry abrasive

Dry ice blasting – CO₂-pellets, temperature at least -78°C, embrittlement of coatings by the cold to roughen the surface

Wet abrasive blasting – Moisturized blasting, dust control

Wet blasting – Abrasive with the addition of water, dust control

Slurry blasting – Water with slurry abrasive, dampened mechanical particle impact

Hot water and stream jet – Hot water or superheated stream at 50 -160 bar

Pressure liquid jets - Water using granular abrasives, pressure at 50 – 2000 bar

Centrifugal wheels dry – High speed wheels with dry abrasive medium

Centrifugal wheels wet – High speed wheels with water and dry blasting agents

Ultrasonic beams – Balls, acceleration caused by mechanical vibrations and electrical shock

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