

Surface Preparation

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1 Blasting

There are basically two different methods of blasting. Wet blasting and dry blasting. Shot-blasting, sand-blasting and grit-blasting employ different types of blasting material, but are essentially the same. In this manual we will use the word blasting.

1.1. Dry Blasting

Dry blasting is the most common kind of blasting. Blasting is not only used for cleaning metal surfaces, but is also used widely for cleaning before painting houses, steel constructions etc. Blasting offers the best physical adherence, prior to application with Wencon products and is the most efficient way of cleaning the parts. We recommend to use blasting prior to an application. If blasting is impossible, other ways of surface preparation must be adopted. Machine parts that have been in use, for instance in sea water, will have quite an amount of water and salt penetration into the metal structure. This penetration should be removed before application, meaning; sufficient salt and water should be removed, to ensure salt and water do not enter the surface of the substrate, before Wencon compound has cured. If the surface of a machine part shortly after blasting, turns black or very dark, it may be a sign of salts sweating from the substrate. A way of accelerating the sweating out of the salts, is by heating up the part or leaving it in a warm place for at least 12 hours. The most efficient way of removing water from the substrate is by using dehumidification units. (See Wet Blasting) In most cases it may be a good idea to use written specifications.

Specification for Dry Blasting

1. Blast the machine part to SA 2 ½ using sharp-edged blasting media, to a roughness of min. 75 microns.
2. Leave the part for sweating out salts in a warm place for at least 12 hours or heat it up to 30 - 40 °C (86-104 °F) using gas torches.
3. Blast again to SA 2 ½ immediately prior to the application.
4. For parts containing lots of water and salt it may be necessary to repeat 2. and 3. until the surface remains light grey for at least 2 hours after blasting. Most companies will understand a specification like this, but it may be necessary to check the blasting prior to application. If there are any signs of salts sweating out, the parts must be blasted again.

1.2 Wet Blasting

Some applications do not allow dry blasting, due to dust coming from the process. For instance on site, with motors, pumps, valves etc. in close proximity. The reason being that dust will enter roller bearings, etc. even inside the motors. In such conditions, the solution might be wet blasting. Wet blasting is carried out in almost the same manner as dry, but using water in union with air and grit. We use the same standards as for the dry blasting (SA 2.5, SA 3 etc.). There are two challenges that might follow wet blasting. The first being that the technique leaves the substrate wet, the other being the fact that a wet surface will oxidize before getting dry.

Dehumidification. Prior to application on a surface that has been wet blasted, a dehumidification must take place. Dehumidification units can be hired from a relevant supplier. Make sure you are instructed, to choose the correct type and size for the application. After dehumidification a light dry blasting may be necessary. It may be done using equipment, that retrieves the blasting material and dust by means of vacuum suction.

2. Rotating Blasting

Using a Rotating Blaster is like blasting, but without sand. Rotating Blaster is a rubber disc with hard steel spikes mounted on the perifericke. Rotating Blaster can be mounted in a normal drilling machine, and the result is a surface close to a blasted surface - clean and rough with sharp edges. Rotating Blaster discs can be ordered at Wencon and at all Wencon distributors.

3. Grinding

Grinding is for small repair jobs, with too many objections for blasting. Wheel grinding may be an solution, in cases where it is possible to grind the entire surface, mostly when repairing mechanical damages. Corroded areas are often in a state where a wheel grinder will only be able to cover part of the surface, and is therefore not advisable. When grinding use a coarse stone. Use Wencon Bio Cleaner before and after grinding. Grinding with sandpaper or emery cloth is only advisable when, for example, carrying out shaft-repair on a lathe.

4. Needle Gunning

Needle gunning is mainly used for very rough cleaning or removal of rust. Needle gunning takes time and should be closely supervised. It is essential, that the marks from the sharp needles cover the entire surface, so that none of the original surface remains. It is recommendable to steam clean the surface before needle gunning. (see steam cleaning)

5. Machining

When carrying out mechanical repair jobs, using a lathe mill for turning is often the best and easiest way of preparing the surface. By repairing, for instance a worn shaft damaged by a loose roller bearing, using a lathe to a rough standard should be done prior to degreasing and application.

6. Steam cleaning
- An effective method of removing salt and oil remaining in the substrate is to use steam cleaning. Steam cleaners are available from most plant hire firms. Use steam temperature of approx. 95 °C and repeat the process three times, leaving the substrate to dry for some 15 minutes between each cleaning. Steam cleaning is not sufficient in itself. It must be followed by blasting or one of the other surface preparation methods.
7. Dehumidification
- A very simple and effective method of removing moisture, whether it be moisture in the metal or from wet shot-blasting, is dehumidifying. Even parts which appear to be completely dry, can contain large quantities of moisture. When coating tanks, or other totally or partly enclosed parts - large pumps, pipes, etc. - dehumidification is recommended, as humidity emanating may condense on the part and reduce the physical adherence. Dehumidification units (DU) in different types and capacity units can be rented in most places. Position the DU close to the substrate to be treated, and insert the tube carrying dry air into the tank or part. If the parts to be treated are numerous and small, make a tent of plastic sheets and feed the tent. A few hours of dehumidification is enough to obtain a dry and good surface ready for the application. A quality requirement of dehumidification, is that during the coating process there must be a temperature of minimum 3°C. above the point of condensation. The point of condensation temperature is the highest the part must have, when moisture from the surroundings falls on the part and condenses. The point of condensation is thus dependent upon the temperature of the part, the ambient temperature, and the relative humidity of the air. Instruments exist for measuring these values, and where the repair of large parts is concerned, conditions should be laid down regarding this, if the application is to be done by subcontractor or customer.
8. Steel brushing
- Cleaning by using a steel brush (by hand or on a machine) is not recommended. A steel brush leaves a polished surface, which will reduce the adhesion of Wencon or other products - paint etc.