

TECHNICAL BULLETIN 08/2024

Sweep Blasting

The gentle and sensitive blasting of galvanized surfaces is called Sweep Blasting or Sweeping. The chosen abrasive and the blasting parameters have to be well selected in accordance with the blasting target, in order to avoid any damage of the galvanized surfaces.

Sweep blasting of zinc coatings

Especially on Duplex coatings, composed by a galvanized surface and single or multilayers of powder coating or wet paint, sweep blasting is an established and proven process. The zinc layer can be perfectly prepared prior to a coating process. Cleaning and texturizing are done in one step.

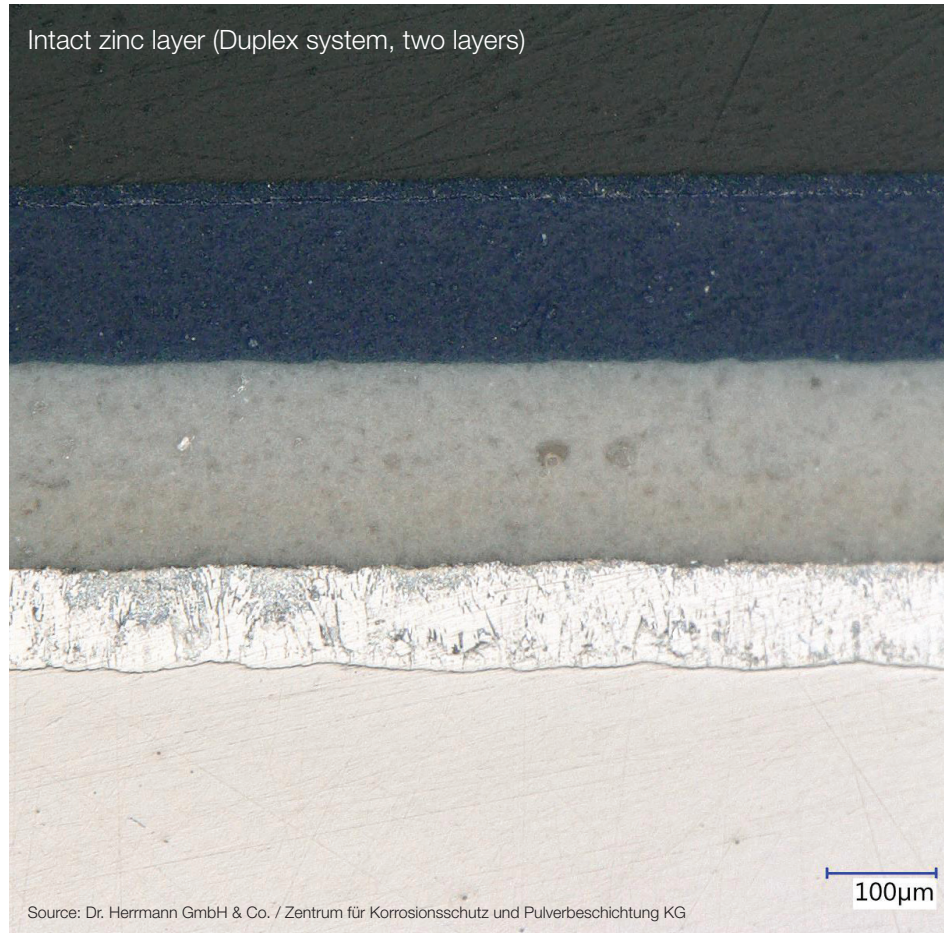
Inherent impurities of the zinc, such as white rust or other contaminations from techniques like passivation, will be removed effectively with sweep blasting.

Perfect surface profile

Galvanized surfaces usually have a very smooth surface profile. Sweep blasting will generate a controlled roughness, increasing the contact surface and improving the adherence of the coating.



Insufficient paint adhesion (surface without sweeping)



Intact zinc layer (Duplex system, two layers)

Source: Dr. Herrmann GmbH & Co. / Zentrum für Korrosionsschutz und Pulverbeschichtung KG

Powder coatings

Sweep blasting can aid the escape of possible air and hydrogen residues trapped in the zinc. That is an advantage, especially on powder coatings where higher temperatures can provoke the outgassing and can be the cause for problems with bubbles, craters or pores on the coating.

This is not only a superficial problem because it can lead to a debilitation of the protection layer of the Duplex system. An infiltration can be a consequence, causing white rust on the zinc layer, leading to a detachment of the coating.

The zinc layer

After the sweep blasting, the zinc layer must be intact. A good galvanization with a sufficient thickness is important, otherwise, the zinc layer may be

damaged even when blasted by an experienced operator.

There has to be taken into account a certain loss of the zinc layer. Hot-dip galvanization should have a layer thickness of $\geq 100 \mu\text{m}$ prior to sweeping and $\geq 85 \mu\text{m}$ afterwards. No more than $15 \mu\text{m}$ should be removed.

Surface preparation

After the sweep blasting, the zinc coating should have a homogeneous satinized appearance.

Roughness values after Sweeping:

- R_z : 25.0 – 50.0µm
- R_a : 4.0 – 6.5µm
- RPc : >40

Sweep Blasting

The angular stainless steel grit Ervin AMAGRIT is ideal for sweep blast operations.

Recommended sizes and parameters for sweep blasting:

Air blasting

- Amagrit AG 10 – AG 30 (0.10 – 0.50 mm)
- Blasting pressure: 2.0 – 3.0 bar

Wheel blasting

- Amagrit AG 30 – AG 50
- Rpm: 1.700 – 2.200

In general, sweeping is comparable with standard blasting applications, although it requires a professional execution to avoid a damage of the zinc layer.

A much lower blasting intensity has to be applied, this can be achieved by the right selection of the blasting media and the lower speed of the blast wheels or the lower blasting pressure in air blast operations.

Mineral expendable abrasives like aluminum oxide, glass beads etc. can't be used in wheel blast machines.

Ervin Amagrit is the recommended abrasive for a high performance in sweep blasting.

Work pieces with a complex geometry are usually blasted in manual air blast systems. Ervin AMAGRIT is the most economical solution in these situations.

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