

BONDING ON POWDER-COATED SURFACES: OPPORTUNITIES, RISKS, AND THE RIGHT APPROACH

Powder coating is a widely used and durable finish for metal surfaces. However, once bonding comes into play, the situation changes significantly. What may seem like an ideal substrate at first glance requires a well-considered and professional approach.

Why bonding on powder coating is complex

Although powder coatings vary greatly in composition, they are considered plastics from a bonding perspective. This has direct implications for adhesion.

Powder coatings contain specific additives that influence surface properties, such as:

- **Fluoropolymers** (e.g., PTFE / Teflon) that reduce surface tension
- **PE waxes** that make the surface smoother and less reactive
- **Flow-control additives** that optimize melting behavior

These components ensure a controlled finish, but they come with one major drawback: they reduce surface energy — and that is crucial for achieving a strong adhesive bond.

The result: variable and often limited adhesion

Due to this low surface energy, adhesion on powder-coated surfaces is:

- **unpredictable**
- **highly dependent on the specific coating**
- **often insufficient for structural applications**
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Therefore, a clear guideline applies:

Bonding on powder-coated surfaces is generally not recommended.

When bonding is unavoidable

In practice, there are situations where bonding to a powder-coated surface cannot be avoided. In such cases, a controlled approach is essential.

One possible solution is the use of the **TWEHA® SyntheticPrimer**, which can improve adhesion by making the surface more compatible with the adhesive.

However, keep in mind: a primer is not a guarantee — each application remains case-specific.

Always test before application

The only reliable way to ensure performance is by conducting **adhesion tests in advance**.

This means:

- testing on the **actual material**
- under **realistic conditions**
- **before** starting installation or substructure assembly

This approach helps prevent failure costs and ensures long-term reliability.

The strength of TWEHA® adhesives

TWEHA® adhesives are based on **silane-modified polymers (SMP)** and stand out due to their:

- **high surface energy**
- **excellent adhesion to polar substrates** such as glass and metal
- **durable and flexible bonds**

On substrates with higher surface energy, these adhesives perform optimally.

Caution with non-polar materials

Special attention is required when working with low surface tension (non-polar) materials, such as:

- silicone
- polyethylene (PE)
- polypropylene (PP)

These materials are inherently difficult to bond and always require additional measures or alternative solutions.

Conclusion

Bonding on powder-coated surfaces is possible — but never standard. It requires material knowledge, the right product selection, and above all: **thorough preparation and testing**. With the right expertise and support, such as that offered by TWEHA®, reliable and durable bonds can be achieved even in challenging conditions.

Not sure about your application?

Get expert advice and avoid unnecessary risks — proper preparation makes the difference between failure and success. Contact TWEHA®!

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