ACEO® Part Fusion

ACEO® is a registered trademark of Wacker Chemie AG.
WACKER Recommended Adhesives

ELASTOSIL® E43 N or SILPURAN® 4200

- Both adhesives can be used for food contact applications\(^1\)
- SILPURAN® 4200 can also be used for medical applications\(^1,2\)

Available at Drawin\(^1\) or your local supplier

Key Properties

- Moisture-cure silicone rubber
- One-component, self-levelling
- Primerless adhesion to most substrates
- Translucent
- Elastic, excellent mechanical properties
- Long-term stability against weathering, moisture and UV radiation
- Temperature resistance as high as 180 °C (356 °F)

\(^1\) Detailed information available at: https://www.drawin.com/drawin/de/products/productgroups/rtv_1/rtv_1.jsp
\(^2\) WACKER Healthcare policy: https://www.aceo3d.com/shop/
Recommended Operating Procedure
Four Simple Steps to Make Bigger Parts

1. Clean the Surface

- Clean and dry the surface
- DI water or Isopropanol\(^1\) can be used
- The objective is to remove grease and dust accumulated upon the manipulation of the pieces

\(^1\) Surface cleaning with a piece of cloth suffices, do not immerse in Isopropanol for a longer period of time
If the design of the piece makes impossible applying a uniform pressure over the entire surface, it is recommended to apply the adhesive on both sides of the piece to ensure a uniform distribution of it throughout the entire surface.

Four Simple Steps to Make Bigger Parts
2. Apply Adhesive

- Apply the adhesive uniformly over the surface with the help of a syringe and a spatula
- One-sided normally suffices\(^1\)
- The recommended quantity is between 30 to 60 mg per cm\(^2\)
- Increasing the adhesive quantity does not provide better results

\(^1\) If the design of the piece makes impossible applying a uniform pressure over the entire surface, it is recommended to apply the adhesive on both sides of the piece to ensure a uniform distribution of it throughout the entire surface.
Four Simple Steps to Make Bigger Parts

3. Join parts

- Join the parts
- Apply some pressure if possible

Join the parts
There appears to be no great effect of temperature on the adhesion performance, however high temperature (40°C) may help to achieve good results.

1. Cure

- Let cure for 24 hours at 65% humidity
- If it is not possible to reach 65% humidity, increasing the cure time can compensate for the lack of moisture
- High temperature (40°C) may help to achieve good results
Design for Part Fusion
Dividing Your Part into Segments

- Flat parts lead to lower printing times: minimize height

- Place the adhesion surface parallel or perpendicular to the print platform, if possible
- Use planes of symmetry
- Generated segments should allow an unambiguous positioning during gluing
Design of the Adhesive Bond – General Recommendations

- General engineering rules for adhesive bonds apply
- Large adhesion interfaces are beneficial for high adhesion forces
  - Increase adhesion interfaces
  - Lap joints are better than butt joints
- For good adhesion, avoid peel and tensile forces on the adhesive interface, shear loads should be preferred

Keep our general design guidelines / minimum feature size of 1 mm in mind!
Printed Part Surface Types

- **A**: Smooth bottom surface on build platform
- **B**: Smooth top surface from last printed layer
- **C**: Surface from contact to support material
- **D**: Side walls with layer structure
Surface Type and Orientation

Support Surface

Layers in the Z-Direction

20 ° Angle

- B: Top surface
- C: Support surface
- D: Transverse layers, Longitudinal layers
- Layered support

✓ All surface combinations have been tested and all results are good, provided recommended curing conditions are applied.
Thank You.

WACKER Chemie AG
ACEO® Campus
Gewerbepark Lindach A 12
D-84489 Burghausen

T +49 8677 83-2333
F +49 8677 886-2333
info@aceo3d.com
aceo3d.com