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**UV curing adhesive UVG-350**  
**Instructions for use**

**1 General Information**

The adhesive UVG-350 is designed for adhesion of freefilament wire strain gauges (SG) on parts made of carbon, stainless steels and heat-resistant alloys. The adhesive can be used for bonding to composite materials (after checking adhesion to the specific material).

Curing of the adhesive in the process of SG bonding is performed with the help of an ultraviolet lamp. For static measurements after the completion of curing under UV lamp, thermal treatment is recommended to stabilize the adhesive properties.

The highest operating temperature is 350°C, briefly up to 375°C.

In general, the process of SG bonding is similar to bonding with ceramic cement, but instead of hours of heat treatment of each layer for cement in the furnace, each layer of UVG-350 is polymerized with UV light for a few minutes, which significantly accelerates the bonding of SG.

**2 Precautions**

The adhesive does not contain highly toxic components, but may cause skin irritation on contact and may also cause respiratory tract irritation if concentrated adhesive vapors are inhaled.

Work with adhesive should be carried out in a ventilated room.

Conditioner SC-3 contains acid. Do not allow its contact with skin, mucous membranes and eyes. If this happens, rinse immediately with plenty of water.

Neutralizer NC-3 has an odor similar to that of ammonia. Work with it in a fume cupboard or a well-ventilated room.

When working with conditioner, neutralizer and adhesive, wear protective gloves to protect your hands and prevent the surface of the parts from being contaminated by the sweat always present on the skin, as well as safety glasses.

**3 Surface preparation**

3.1 The surface for SG bonding shall be prepared. During and after completion of surface preparation do not touch the surface with hands.

3.2 Before SG bonding clean the part surface from traces of fuel, lubricants and other contaminants with lint-free wapes moistened with alcohol or acetone.

The best way of surface preparation is sandblasting with electrocorundum or silicon carbide powder with grain size~ 50...100 microns. If sandblasting is unavailable, a good result can be obtained by scraping the surface with sandpaper P80...P120.

It is necessary to remove from the surface of the part oxide film, galvanic, paint and other coatings to the base metal.

3.3 The cleaned surface should be wiped several times with lint-free wapes moistened with acetone or alcohol until the wapes remains clean after wiping.

3.4 To improve adhesion of the glue, it is recommended to treat the surface of metal parts

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with SC-3 conditioner and NC-3 neutralizer:

- dry the surface completely after cleaning with acetone or alcohol.
- wipe the surface two or three times, each time using a new lint-free wiper or cotton swab moistened with SC-3 conditioner.
- make sure that the surface is completely wetted and the conditioner does not collect on it in individual drops. If necessary, repeat wiping with a fresh wiper (cotton swab) moistened with conditioner.
- Wipe the surface dry with a clean, dry, lint-free wiper.
- wipe the surface three times, each time using a new lint-free wiper soaked with NC-3 Neutralizer.
- air dry the surface
- if fibers from wipers or absorbent cotton remain on the surface of the part, blow them off with dry clean compressed air free of the slightest traces of oil.

3.5 Do not treat non-metallic (composite) materials with conditioner and neutralizer.

## 4 Process of SG adhesion

4.1 The tools used for working with the adhesive (spatula, brushes etc) should be thoroughly washed and completely dried.

4.2 Partial separation of the adhesive components may occur during long storage. Before use, stir the adhesive with spatula to a homogeneous mass.

It is better to apply the adhesive on the brush not by dipping it into the container with the adhesive, but with a spatula for more accurate dosing.

### 4.3 Applying the priming coat

4.3.1 UV curing of the adhesive is limited in depth, so each applied layer of adhesive shall not be too thick to avoid incomplete curing.

4.3.2 The coloration of the adhesive allows visual control of the thickness of the layer: it should appear gray...dark gray, but not black, on the metal surface. All subsequent layers of adhesive applied should have a similar thickness.

Before using glue to bonding strain gauges, it is highly recommended to practice applying a layer of glue of optimal thickness: apply several dabs of glue of different thicknesses on a free surface and allow them to polymerize. Scratch the glue and determine at what layer thickness the full polymerization takes place, and at what thickness there is liquid or soft glue under the polymerized crust. In the future, apply the adhesive in layers of the thickness at which full polymerization occurs.

4.3.3 Apply a priming coat of adhesive to the part that exceeds the dimensions of the SG by ~2 mm in each direction.

4.3.4 Polymerize the adhesive using an ultraviolet lamp. Exposure time with Sun X lamp: 4 minutes.

### 4.4 Adhesion of the SG

4.4.1 Place the SG in the project position. Roll the temporary tape frame which holding the SG to the primer coat and the part.

4.4.2 Using a thin brush apply the adhesive to the exposed spaces of the SG, taking into account information in 4.3.2, as well as on the SG leads, taking care to not to allow air



cavities to form under the adhesive layer and avoiding touching the glue with the SG temporary tape.

4.4.3 Perform polymerization of the adhesive using an ultraviolet lamp. Exposure time with the Sun X lamp: 4 minutes.

4.4.4 Repeat steps 4.4.2 and 4.4.3, if necessary, until the glue completely covers the open spaces of the sensitive grid and SG leads.

4.4.5 Carefully remove the tape frame from the SG.

4.4.6 Using a thin brush apply glue to the open spaces of the SG, and also apply a second layer of glue to the SG leads for more strong fixation.

4.4.7 Polymerize the adhesive using an ultraviolet lamp. Exposure time with Sun X lamp: 4 minutes.

4.4.8 If necessary, repeat steps 4.4.6 and 4.4.7 until the glue completely covers the open spaces of the sensitive grid and SG leads.

4.5 Weld the elongation wires to the strain gauge leads.

If necessary, apply adhesive to the welded area to secure and/or insulate. Observe the thickness of layers (clause 4.3.2), if necessary apply several thin layers with curing of each layer.

4.6 Final heat treatment

Place the parts with installed SG in the furnace and heat treat according to the next program:

- temperature rise to 300°C with a temperature increasing of no more than 4°C/minute;
- Stay for 60 min at 300°C, leave it in the furnace until it cools down completely.