

Flocking with CPH5/CPR5 Epoxy

Epoxy resins are high-performance adhesives noted for their versatility (ability to bond just about all materials), durability (at all temperatures), high resistance to chemicals and general toughness. Epoxy is an exceptional adhesive for metal, wood, glass, stone and some plastics. It is unmatched, amongst common adhesives, in its resistance to heat and chemicals. Epoxy CPR5 is a copolymer; that is, it is formed from two different chemicals. These are referred to as the "resin" and the "hardener". The resin, in this case, is produced from a reaction between epichlorohydrin and bisphenol-A and the hardener consists of polyamine monomers, Triethylenetetramine (TETA). When these compounds are mixed together, the amine groups react with the epoxide groups to form a covalent bond, so that the resulting polymer is heavily cross-linked, and is thus rigid and strong. The process of polymerization is called "curing".

Materials Epoxy CPH5/CPR5 is suitable for

- Car dashboards
- Metal
- Glass
- Wood
- Stone
- Some plastics

Epoxy CPH5/CPR5 is **not** recommended for use of fabrics due to its rigidity when cured.

Preparation of the substrate

The substrate must be clean and dry before the adhesive is applied, acetone can be used to prepare the substrate and flocking equipment. It is important that the adhesive coating does not get absorbed by the surface of the substrate therefore, with porous substrates (e.g. wood, chipboard, etc) a primer (such as a water-based polyurethane or thinned epoxy) may have to be used prior to the adhesive. A thick layer of adhesive must be applied (approximately 1/10 of the length of the flock fibre), so that the flock can adhere adequately to the substrate.

How to mix the Epoxy Resin CPH5/CPR5

1. Wear latex gloves and a respirator, as Epoxy can be an irritant.
2. Dispense the epoxy into a clean plastic, metal or wax-free paper container. Don't use glass or foam containers because of the potential danger from exothermic heat build-up. Mix the resin and the hardener in the ratio 50:50. Measure carefully! Most problems related to the curing of Epoxy can be traced to the incorrect ratio of resin to hardener.
3. It is extremely important that the two components are mixed thoroughly – a mixing time of two minutes is recommended. To assure thorough mixing, scrape the sides and bottom of the pot as you mix. Use the flat end of the mixing stick to reach the inside corner of the pot. Curing epoxy generates heat. For this reason do not use foam or glass mixing containers.
4. If you use slightly less hardener (CPH5) working time and cure time will be extended.

There is about 40 minutes working time before the adhesive will start to set/skin.

The mixture can be heated to reduce its viscosity, although, this will shorten the working time.

Solvent for Epoxy CPH5/CPR5

The solvent for CPR5/CPH5 is acetone, this can be used to thin the mixture down. By thinning down the epoxy, you increase the range of possible uses. For example, thinned Epoxy CPH5/CPR5 can be used for the following

- Prime substrate
- Spray application
- A more fluid application
- Increased flexibility of cured product

To thin down Epoxy CPH5/CPR5 use acetone (this can be supplied by DCA). The Epoxy can be thinned down to a maximum of 25%.

Note: If acetone is added to the mix, then the working time will be slightly increased and the epoxy will remain slightly flexible (plastic) once cured

Using Pigments

Pigments are available to colour the epoxy so that it can be used as a primer prior to flocking, in order to achieve a seamless finish where the substrate is a markedly different colour to the flock being used. In addition, if the substrate comprises more than one colour, adding pigment to the adhesive will prime the substrate, giving a uniform appearance. The adhesive is matched to the flock in colour. This compensates for areas with a slightly lower flock density (e.g. in interior corners).

The pigment is suspended in epoxy resin and can be pre-mixed with CPR5 if desired. Otherwise pigment is mixed in with the mixture of CPR5 and CPH5.

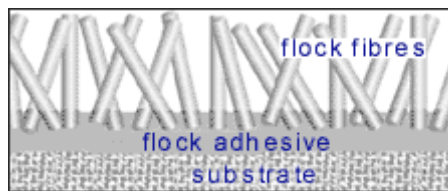
The volume of pigment required will depend on the colour being used (e.g. it will require more light coloured pigment to cover a darker substrate than you would need for a dark coloured pigment to cover a light substrate). Add sufficient pigment to get the required colour.

Be careful not to putting the stirring tool used for the epoxy mixture into the pigment pot, as this will cause the pigment to harden.

Method of Application

There are various ways to apply the adhesive depending on what it is that you are flocking. Generally speaking, anyway that you can apply paint to a surface, you can also apply adhesive to the surface. Any of the following methods can be used (although some will be more successful after the epoxy has been thinned down).

- Paint Brush
- Paint Roller
- Spray Gun



Adhesive should cover at least 10% of flock fibre length

The adhesive must be viscous enough to support the flock fibres during the cure.



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Curing Times

The length of time it will take to cure (dry) the epoxy will depend on the temperature that it is setting in. The warmer the surrounding air, the less time it will take to cure.

Air Temperature	Curing Time	
	Working Cure	Full Cure
15°C	18hrs	48hrs
20°C	12hrs	24hrs
70°C	2hrs	3hrs

The cure process stops if the temperature falls below 8°C

Storage

The epoxy should be stored between 10°C and 25°C.

Do not store the epoxy below 10°C, as waxing or crystallisation is likely to occur. In the event that waxing or crystallisation does occur, the epoxy should be heated to 45°C and shaken or stirred in order to reverse the process (e.g. dissolve the crystals back into the epoxy).

The epoxy has a storage life of up to 12 months when stored in an unopened container in dry conditions at a temperature between 10°C and 25°C.

Clean-up

Vinegar is an effective and safe solvent for cleaning tools, brushes and most surfaces contaminated with epoxy resin or hardener. Vinegar is particularly recommended for cleaning any residue off human skin, rather than acetone; both liquids will dissolve the resin, but the resin/acetone solution can easily pass through the skin and enter the bloodstream, unlike vinegar. Citrus-based, waterless hand-cleaners will help to remove fresh resin from the skin. One should always follow the initial removal of epoxy from the skin with washing with soap and water.

White vinegar can even clean up epoxy resin that is beginning to harden/cure. Once the epoxy has cured it will be necessary to use acetone to remove any unwanted residue. DME (dimethoxyethane) is also a good solvent for removing epoxy resin and hardener that gives off very little vapour.

Health & Safety

- Epoxy CPR5/CPH5 should always be used in a well ventilated space.
- Latex gloves should always be worn.
- Avoid contact with skin. If contact does occur, wash immediately and thoroughly.
- Eye protection should be worn when mixing, using or cleaning epoxy. In the event of contact with the eye(s), rinse immediately with plenty of clean water and seek medical advice.
- Respiratory masks of protection class FFP3 should be worn in the event of prolonged or frequent exposure.
- If swallowed, do not induce vomiting. Seek medical advice immediately.

The primary risk associated with epoxy use is sensitisation to the hardener, which, over time, can induce an allergic reaction. It is a main source of occupational asthma among users of plastics.

Bisphenol-A, which is used in Epoxy CPH5/CPR5, is a known endocrine disruptor.

Full health and safety data are given in the Product Safety Data sheet.

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