

LORD® HPC-3B and HPC-3C Coatings

LORD HPC-3 Curative

Description

LORD® HPC-3B and HPC-3C coatings are two-component, room temperature curing fluoroelastomer coatings which feature robust adhesion and exceptional mechanical properties. These coatings greatly enhance fuel and fluid resistance for a wide variety of elastomeric substrates.

LORD HPC-3B coating is black; LORD HPC-3C coating is clear. Coatings are composed of a mixture of polymers, organic compounds and fillers dissolved or dispersed in an organic solvent system. LORD HPC-3 Curative is added to LORD HPC-3B and HPC-3C coating.

Features and Benefits

Excellent Adhesion – provides strong adhesion to substrate and elongation of up to 400%; properly applied coating does not crack or peel. In laboratory testing, coating has demonstrated that it will not peel or crack prior to substrate cracking.

Fluid Resistant – provides fluid resistant barrier to external surface of elastomeric part, allowing bulk of component to be made of less expensive, less fluid resistant material. Resultant system offers low cost, high mechanical properties with high fluid and environmental resistance. LORD HPC-3B and HPC-3C coatings provide excellent resistance to aggressive fuels and oils.

Convenient – applies easily by spray, brush, dip or roll coat methods; can be easily incorporated into existing production lines. Coating cures at room temperature or with the aid of hot forced air.

Application

Substrate Surface Cleaning and Preparation – Clean all surfaces of parts to be coated with LORD HPC-3 coating with methanol or other solvent capable of removing surface contaminants. Wiping is the preferred method, but dipping or spray washing may also be acceptable. A warm alkaline wash may be substituted for the methanol step.

Typical Properties*

| | HPC-3B | HPC-3C | HPC-3 Curative |
|---|--|--------------|----------------|
| Appearance | Black Liquid | Clear Liquid | Clear Liquid |
| Viscosity, cps @ 25°C (77°F) Brookfield LVT Spindle 2, 30 rpm | 75-300 | 75-300 | -- |
| Density | | | |
| kg/m ³ | 899.90 | 899.90 | 947.83 |
| (lb/gal) | (7.51) | (7.51) | (7.91) |
| Solids Content, % | | | |
| by Weight | 20 | 20 | 99.5 |
| by Volume | 10.1 | 10.1 | 99.4 |
| Flash Point (Seta), °C (°F) | 15.6 (60) | 15.6 (60) | 92.8 (199) |
| Solvents** | Methyl Isobutyl Ketone (MIBK), Methyl Ethyl Ketone (MEK) | | |

*Data is typical and not to be used for specification purposes.

**Maximum water content 500 ppm.

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The elastomer portion of the part will also require a surface treatment to obtain successful adhesion. This surface treatment varies depending on the elastomer.

- Natural Rubber

Natural rubber stocks typically require a surface treatment to ensure proper adhesion of the base elastomeric substrate to the coating. The first choice to prepare the surface is an application of Chemlok® 290 surface treatment. Chemlok 290 can be brush applied at full strength or spray applied after diluting 2:1 or 1:1, by weight, with xylene. Measurement of primer is difficult without a microscope. To ensure correct dry film thickness (0.1-0.2 mil range) has been achieved, ensure a good wet heavy coat is applied free from drips or runs. For best results, Chemlok 290 primed samples should receive a cure cycle after application for 3-5 minutes in a forced air oven set at 120-150°C (248-302°F). Top coats should be applied shortly after the Chemlok 290 drying step, ideally while surfaces are still warm from residual heat built up in the drying cycle. An alternative surface preparation is Chemlok 7701 surface treatment. Two application methods are available for Chemlok 7701, either brush/wipe or dip application may be employed. The part can be dipped as long as no metal portions come in contact with Chemlok 7701, as it is corrosive. Alternatively, Chemlok 7701 can be brushed or wiped on. Chemlok 7701 should never be sprayed or atomized. Let Chemlok 7701 flash for 10 minutes in a fume hood or oven bake up to 121°C (250°F) for a few minutes.

- Nitrile

Nitrile stocks will often require treatment with Chemlok 7701 surface treatment. However, antiozonants do not play a major role in surface contamination of nitriles. As a result, simply dipping or brushing Chemlok 7701 onto the elastomer portion of the part will be sufficient.

- EPDM

LORD HPC-5 tie coat adheres to some EPDM stocks without any surface treatment other than methanol cleaning as long as a bake cycle is employed during curing, which is described below. Alternatively, either Chemlok 7701 surface treatment or Chemlok 459X primer can be applied by brush or dip methods if a room temperature cure is desired. Chemlok 459X acts as a primer and should be baked on for 5 minutes at 121°C (250°F) prior to application of the coating.

- Butyl

Butyl rubber stocks will typically require only a bake cycle during curing in order to obtain adhesion. Bake cycles are necessary as room temperature cured samples have demonstrated poor adhesion to the coating, even with Chemlok 7701 surface treatment.

- Neoprene

The customer should evaluate adhesion to neoprene stocks using Chemlok 7701 surface treatment or an oven bake cure if necessary. Adhesion to neoprene stocks is highly variable.

- TPEs

Adhesion of the HPC coating to TPEs varies depending on the TPE. Adhesion to Arnitel and Hytrel TPEs have been successful without surface treatment provided an oven bake cure is employed.

Mixing – Mix LORD HPC-3 curative into LORD HPC-3B or HPC-3C coating while the coating is under agitation. Mix at a ratio of 2.5 parts curative to 100 parts coating, by weight.

Once mixed, the coating is used full strength for brush application. For dip application, dilute coating 25% with MIBK (maximum water content 500 ppm). For spray application, dilute coating at a ratio of 1 part coating to 1-2 parts MIBK (maximum water content 500 ppm). Start with a 1:1 dilution and increase dilution until cobwebbing is eliminated.

Applying – Apply coating by brush, dip or spray methods.

- Brushing

Apply coating using a camel hair or foam brush. The coating should be brushed onto the part in single strokes and dried for about 15 minutes at room temperature. Heat-assisted drying between coats to speed process is acceptable (and preferable). Once dried, a second brushing of the coating will be necessary to obtain a desired film thickness of 0.5-1.0 mil (12.7-25.4 micron). After the second coat is dry, it can be oven cured or cured at room temperature.

When utilizing LORD HPC-5 coating as a tie-coat, only one brushing of the LORD HPC-3 coating may be necessary after the LORD HPC-5 coating is dried to build a total film thickness of 1.0 mil (25.4 micron). Ensure that all exposed surfaces are coated with at least 1.0 mil (25.4 micron).

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- Dipping

Dip parts into the coating and remove using a hanger or some method to hang the part vertically. Two dips will typically give a film thickness of 0.8 mil (20.3 micron) and three dips will give a film thickness of 1.2 mil (30.5 micron). If utilizing LORD HPC-5 coating as a tie-coat, use LORD HPC-5 coating for the first dip, let dry, and dip twice more with LORD HPC-3 coating to obtain the same film thickness of 1.2 mil (30.5 micron). If possible, it is best to reverse the orientation of the part on each dip so that equal film thickness is obtained on the entire surface of the part. Let the coating dry for 15 minutes in between dips so that the coating thickness builds fully. Alternatively, the part may be oven dried for a few minutes at 66°C (150°F) in between dips. The part must be dry after the final dip when using an oven bake cure so that blisters do not develop from solvent trying to escape the coating barrier. Dabbing any excess run-off coating at the bottom of the part will also help to avoid blistering. Ensure that coating has been applied to the entire surface area of the part, especially where the hanger was used.

- Spraying

Air pressure on the spray gun should be kept under 30 psi. Start by closing the output valve on the gun so that a fine mist is obtained. Increase the output so that the coating can be applied sufficiently without running or cobwebbing. Oven drying at 66°C (150°F) once or twice during spraying may be necessary to build film and avoid running. Ensure that all exposed surfaces, including the sides, are covered. Film thickness should be between 0.5-1.0 mil (12.7-25.4 micron). Apply a second coat if bubbles are present after the first coat, or if coating thickness is too low. Allow coating to dry between coats, but do not wait more than 8 hours between coats. Heat-assisted drying between coats to speed process is acceptable (and preferable).

Drying/Curing – Allow coated parts to air cure at room temperature for 72 hours or longer before packaging them. Alternatively, an oven bake cure can be used to enhance adhesion and improve handling strength. An example of an oven bake is 10 minutes at 250°F (121°C) to obtain a cured coating. Wait 24 hours after oven bake before testing or packaging of parts.

Cleanup

- Within 15 minutes after application
To remove uncured LORD HPC-3 coating, use a lint-free cloth, Scotchbrite pad or non-metallic brush soaked with alcohol (ethyl, isopropyl or equivalent) or MIBK.
- Greater than 15 minutes after application
Cured HPC-3 is most easily removed from metallic surfaces by mechanical means. Alcohol or MIBK may be used to soften the coating and assist in removal.

CAUTION: Do not allow ketones to come in contact with bonded rubber surfaces or uncured LORD HPC-3 coating. Use caution to ensure cleanup procedures do not damage surfaces where the LORD HPC-3 coating is intended to remain on the final part.

Shelf Life/Storage

Shelf life is one year from date of shipment when stored at 21-27°C (70-80°F) in original, unopened container. Do not store or use near heat, sparks or open flame.

Keep the container tightly capped when not in use to prevent solvent evaporation and moisture contamination. Mixed LORD HPC-3 coating and curative has a pot life of one week. Mixtures greater than one week old should be discarded.

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Cautionary Information

Because of its highly volatile solvent base, LORD HPC-3 coating solution must not be exposed to heat, spark or flame until thoroughly dried. Proper precautions must be observed during application to avoid inhalation (refer to applicable MSDS).

LORD HPC-3 coating must be applied under/in an operating ventilating exhaust booth. Wear chemical resistant gloves and chemical splash goggles when handling this coating. Avoid contact with skin and eyes. In case of accidental contact, wash skin thoroughly with soap and water; for eyes, flush with water and obtain medical help at once. Do not smoke or eat in application/handling area.

Before using this or any LORD product, refer to the Material Safety Data Sheet (MSDS) and label for safe use and handling instructions.

For industrial/commercial use only. Must be applied by trained personnel only. Not to be used in household applications. Not for consumer use.

Values stated in this technical data sheet represent typical values as not all tests are run on each lot of material produced. For formalized product specifications for specific product end uses, contact the Customer Support Center.

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