

How to use Eastman™ CPOs as adhesion promoters

Chlorinated polyolefins serve as adhesion promoters in at least three ways:

- As a primer between the substrate and subsequent coatings.
- As a primer or tie-coat between coating layers.
- As an additive to paint or ink.

Guidelines for applying Eastman™ CPOs as primers

Eastman™ chlorinated polyolefins (CPOs) are widely used as adhesion promoters for coatings and inks on polyolefin plastics because conventional coatings do not adhere well to untreated polyethylene, polypropylene, or polypropylene/elastomer blends such as TPOs (thermoplastic olefin alloy).

The successful use of Eastman CPO as a separate primer step depends on the proper combination of substrate, CPO type, film thickness, and coating system applied over the CPO film. As noted in the following table, some CPOs are designed to promote adhesion to polyethylene, while others work well with polypropylene and other substrates. CPO is usually spray-applied as a thin mist coat having up to 5 wt% solids and allowed to flash dry thoroughly prior to application of other primers or topcoats. Thick CPO films often result in poor adhesion properties. Blending or modifying resins can be used in combination with CPOs to alter overall adhesion properties of the system. Refer to Eastman publication GN-424 for modifying resins.

Application steps

1. Clean substrate of all contamination (such as dirt, oil, grease, and mold release agents) with isopropyl alcohol or other appropriate cleaning solution. Dry thoroughly after cleaning.
2. Prepare CPO primers at 5% solids and apply 0.1–0.2 mil (dry film thickness) by spraying, wiping, or other means. Typical primer formulations are found in Eastman publication GN-424.
3. Topcoats or other primers may be applied immediately after the CPO primer coating has dried, usually within 2–3 minutes at temperatures above 21°C (70°F).
4. With coatings such as two-part urethane enamels on polypropylene, a modifying resin may be added to the CPO primer for better adhesion. Ethylene vinyl acetate (EVA) copolymers have been found to improve primer performance under these topcoats.

Substrate	Use as primer	Use as additive
Polyethylene	CP 153-2	—
Polypropylene	CP 730-1, CP 343-1, or CP 164-1	CP 343-3 or CP 515-2
TPO	CP 730-1, CP 343-1, or CP 164-1	CP 343-3 or CP 515-2
Aluminum	CP 730-1, CP 343-1, or CP 164-1	CP 343-3 or CP 515-2
Galvanized steel	CP 730-1, CP 343-1, or CP 164-1	CP 343-3 or CP 515-2

Guidelines for using Eastman™ CPOs as additives

Generally, the best overall adhesion is obtained by applying CPO directly to the substrate as a primer, followed by a color coat or other primers. However, in some cases CPOs can be used as additives to avoid an extra priming step. In other cases this may not be possible due to incompatibility with some resins and solvents in color coats and primers, especially at high CPO concentrations. The formulator must decide if the additive approach is feasible for a specific application.

The successful use of Eastman™ CPO as an additive depends on the proper combination of substrate, CPO type and level, topcoat, and system compatibility. The CPO should be tested for compatibility with the paint, coating, or ink being used. Various levels of the selected CPO should be tested in the paint, coating, or ink system since the adhesion-promoting properties of CPOs are often diluted when combined with other film formers.

Application steps

1. Clean substrate of all contamination (such as dirt, oil, grease, and mold release agents) with isopropyl alcohol or other appropriate cleaning solution. Dry thoroughly after cleaning.
2. Add 2.5% CPO solids to the unreduced paint or ink as shown in the following example and mix thoroughly.

	Wt%
CP 343-3 (25% NV)	10
Paint or ink	100

3. Test for compatibility or effect on dry film properties.
4. If adequate adhesion is not obtained with this suggested starting level, increase the amount of CPO until adhesion is obtained. Monitor any effects on other dry film properties. Refer to Eastman publication GN-424 for more details.

Guidelines for using waterborne CPOs

Waterborne CPO dispersions CP 310W, CP 347W, and CP 349W can be used as primers or additives to water-reducible paints or inks. Waterborne CPO primers may also be used with solventborne topcoats. The same guidelines for using the solventborne CPOs are true for waterborne CPOs with the following exceptions:

- Waterborne CPO primers are generally applied at 8%–10% solids.
- For spray applications, the gun pressure should be adjusted to properly atomize the waterborne CPO.
- Waterborne primers may need to be dried in an oven or by other means before subsequent coats are applied.

Additional information on formulating with CPO dispersions can be found in Eastman publications GN-411 and GN-425.



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