

Invision® Enhanced Polyolefin Resin

General Painting Guidelines

Invision® resins are based on enhanced polyolefin compositions that have been specifically designed to provide high melt strength for sheet extrusion and thermoforming applications. *Invision* resins can be categorized within the thermoplastic polyolefin (TPO) family of polymers. As such, they can be painted using the same materials and procedures commonly associated with painting TPO.

Major paint suppliers who supply paint systems as well as general painting guidelines for TPO are provided.

Suppliers:

- PPG: (248) 641-2000
- DuPont: (248) 583-8000
- BASF: (248) 304-5700
- Rohm and Haas: (800) 323-3224
- Red Spot: (734) 454-9200
- Sherwin Williams: (248) 588-3500

TPO Paint Systems

The typical paint system for TPO consists of the surface preparation cleaner, adhesion promoter, basecoat and clearcoat. Waterborne and solventborne painting systems are available for use in painting TPO. They are generally spray applied through non-electrostatic or electrostatic means by hand or robotics spray control. In place of waterborne or solventborne adhesion promoters, methods such as plasma, corona, or flame treatment have been very successful in raising the surface energy of TPO to accept paint coatings and adhesives through oxidation of the TPO surface. Such equipment is available through sources such as Enercon Industries Corp. (262-255-6070). Another well established and widely practiced method is through the use of air atomized adhesion promoters. These adhesion promoters are normally formulated with chlorinated polyolefin (CPO) as well as conductive resins.

TPO Paint Procedure

- 1) All painted parts must be fully supported through the paint process to safeguard against part warpage, which can occur through the multiple bake steps required in the paint process. Low bake paint systems (180 °F/ 82 °C) have less effect on dimensional changes and part warpage than high bake systems (250 °F / 121 °C). The required bake temperature is dependant on the paint system used. Rigid wire mesh or full metal support fixtures are typically used to support parts through the painting process.
- 2) Powerwash with the proper cleaning solution and rinse with neutral pH deionized water. The recommended cleaning solution can be purchased through the paint supplier. Five or more stages of wash and rinse are typical in clean and preparation procedures. After the wash stages are complete, parts are to be dried according to your paint suppliers recommendation for time and temperature, such as 20 minutes at 160 °F (71 °C). Note: Cleaning and preparation of the surface prior to painting is critical to the adhesion performance of the paint coating. Be sure to follow your paint suppliers recommended procedures.
- 3) Allow panels to cool to room temperature prior to processing.
- 4) Apply the adhesion promoter system to the TPO panels. Spray applied promoters are generally recommended to achieve 0.2 - 0.4 mils (5-10 microns) dry film thickness. Waterborne systems generally require the part to be baked for a specific time and temperature, such 30 minutes at 160 °F (71 °C), prior to the basecoat application. The chosen adhesion promotion system; waterborne, solventborne, atomized adhesive spray, plasma, corona, flame each have specific application requirements. Consult your paint supplier to determine which is most suitable for your application and capabilities and follow their recommendations closely.
- 5) Allow parts to cool prior to basecoat application.
- 6) Apply the basecoat to achieve the targeted dry film thickness. Film thickness requirements will vary by color, but are generally 0.8 – 1.6 mils (20-40 microns) thick. Parts may require a flash bake of five minutes at 160 °F (71°C) prior to application of the clearcoat. Reference your specific paint supplier procedure.
- 7) Apply the clearcoat over the part to achieve the targeted dry film thickness, which is typically 1.6 – 1.8 mils (40-46 microns) thick.
- 8) Parts are then final baked according to your paint supplier recommendations for time and temperature, such as 30 minutes @ 250 °F (121 °C).