



SOLVAY
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Improving Paint Adhesion

Ixef® PARA

Many applications in automotive, mobile electronics and consumer goods incorporate painted components made using Ixef® polyarylamide (PARA). This bulletin provides guidelines for enhancing paint adhesion as well as a list of suppliers who offer paint systems that are well-suited for Ixef®-based components.

Surface Treatment

In some instances, good adhesion to Ixef® PARA can be achieved without treating the surface. When surface treatment is required, the following methods should be used to clean the part or to enhance adhesion:

Cleaning

- Organic solvent wash
- Power wash

Chemical or Physical Treatment

- Low-pressure plasma
- Corona discharge
- Flame treatment

Paint Systems

Single-layer systems based on a sol-gel process developed by Eques Coatings are suitable for painting Ixef® PARA.

Some two-layer systems have shown good adhesion on Ixef® PARA test plates.

Three-layer systems currently used to paint Ixef® PARA consist of:

- Primer to ensure adhesion to the substrate
- Base coat with a decorative function
- Top coat (or clear coat) with functionality (UV protection, hardness, gloss, etc.)



Examples of applications where Ixef® PARA's high mechanical properties, high flowability and excellent surface appearance combine with coating technology to provide designers with a value proposition for demanding applications.

Partners in Painting

Solvay has worked closely with leading paint manufacturers worldwide to develop systems that are suitable for Ixef® PARA. Please contact a local representative from any of the following companies for detailed information:

- Akzonobel / Technicoat
- Beckers
- Berlac
- Cashew
- Eques Coatings
- PPG

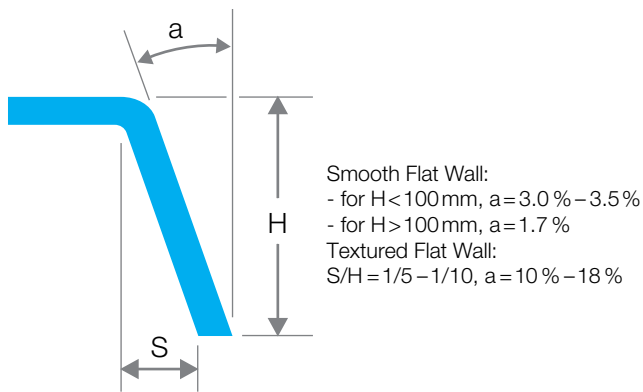
Optimizing Injection Molding

Mold Design

Aesthetics are important in painted applications and care must be taken to mold parts that are free of surface defects.

- Draft angle should be large enough to avoid surface scratches during ejection (Figure 1).
- Ensure correct gate design and efficient packing phase to avoid surface depressions created by sink marks, jetting, or weld lines.
- Be aware that some paint application systems have difficulty delivering paint into deep recesses.
- Note that paint film can form uneven thicknesses in the vicinity of sharp edges and corners due to effects of surface tension.

Figure 1: Draft angle design to process Ixef® PARA



Injection Molding

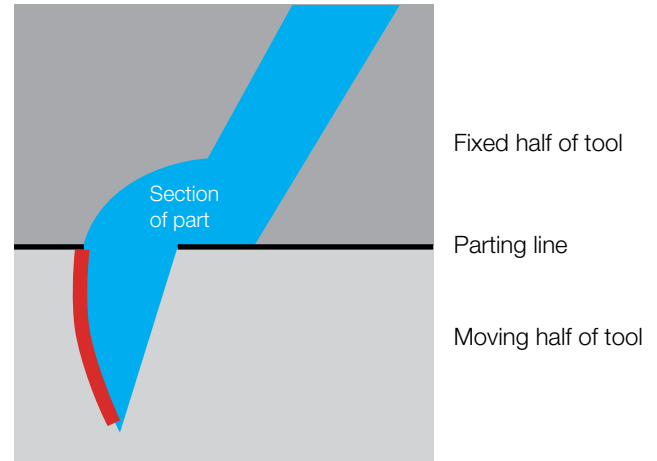
It is necessary to decrease any risk of creating a weak boundary layer as this may cause paint adhesion issues.

- For glass fiber filled Ixef® PARA grades, optimize tool temperature and injection speed to avoid glass fibers on part surface.
- Avoid the use of external mold release.
- Melt temperature and residence time must be kept as low as possible to minimize the risk of degradation.
- Vents should be sufficient and located at flow ends (Figure 2).
- Injection speed must be kept on the low side to avoid venting issues.

Handling Parts

- Minimize handling parts unless wearing gloves.
- Store parts in a clean and dry environment.

Figure 2: Example of venting issue that could cause adhesion issue



Testing Paint Adhesion

Based on our experience, testing paint adhesion on test plates does not give an accurate indication of performance in the field. Paint adhesion should be tested on fabricated parts prior to using it as a standard paint system.

Cross-Hatch Test

Solvay's technical support center is equipped to conduct ASTM D3359 and ISO 2409 testing.

- Cut a cross-hatch grid that penetrates the coating.
- Apply a tape over the grid.
- Remove the tape.
- Examine the adhesion of the coating.

Wear Test

OEMs typically conduct their own wear testing which is application specific.

Other Tests

Weathering, chemical resistance and other additional testing can be conducted as required by the application.

General Decoration

- Ixef® PARA is available in a variety of colors
- Several metallization processes are suitable for Ixef® PARA
- Ixef® PARA can be laser printed



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