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Abstract

Solvent Dyes in Plastics: Performance, Processing, and Regulatory Considerations

Solvent dyes play a critical role in delivering high-transparency, high-chroma coloration in engineering and commodity plastics. Unlike pigments, solvent dyes dissolve at the molecular level within polymer matrices, enabling exceptional clarity, brilliance, and light transmission in applications such as cosmetic packaging, technical lighting, automotive interiors, and medical PVC components.

This presentation will explore the chemistry and functionality of solvent dyes and how molecular structure influences solubility, heat stability, migration resistance, and lightfastness. Processing considerations such as temperature stability, polymer compatibility (PS, SAN, PMMA, PC, PVC), and dispersion mechanisms will be discussed, along with strategies to minimize blooming, plate-out, and color shift.

Attendees will gain practical formulation insights, comparative understanding versus pigments, and guidance on selecting the appropriate dye chemistry for demanding plastic applications.