

TECHNICAL DATA SHEET

FORMULATION and APPLICATION TIPS FOR RETROREFLECTIVE

COATINGS & INKS

POROUS SUBSTRATES

PAPER & CARD STOCK:

These substrates tend to absorb the resin portion of the coating or ink. The result can be “starving” of the reflective beads, resulting in poor bonding.

Application of a clear sealer coat is suggested. For screen process printing, a prime coat of clear process ink works well. Bead concentration for most formulations will be 45 to 55% by weight. Resin solids, for solvent or water-thinned inks & coatings should be 20 to 25% by weight.

FABRICS

Here, the formulation should be designed to permit controlled penetration of the fabric by the resin system, while retaining sufficient resin to give good bead surface bonding. Adhesion promoters such as silanes, titanates and co-solvents are necessary for many fabrics. Rheology should be close to Newtonian. Bead content can be as low as 30% to 40% by weight.

There are several plastisol and latex systems that perform well, within this beads concentration level.

WOOD

Wooden surfaces that will have retro reflective beads applied to them via aerosol or spray applications should be clean and free of debris. A primer coat is NOT NECESSARY in all applications, but may be necessary where the wood is exceedingly dry and aged, or porous.

NON-POROUS SUBSTRATES

UNPRIMED METAL AND PLASTICS

Whether solvent or latex base formulas, use low resin solids (20 -25% by weight) and a thixotropic formulation with *60 to 65% by volume of Beads, based on total solids volume*.

Bead separation and settling can be avoided, using the appropriate thixotropes.

ADHESION PROMOTERS

Specific to some plastics, may be needed. Coupling agents for beads to the resin may also be required, because you are purposely formulating at over the Critical Pigment Volume Concentration (C.P.V.C)

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Av. Fagundes Filho, 145, 14ª andar – Ed. Austin – São Paulo – SP – CEP 04304-010

Tel.: 11 5585 3671 – Fax: 11 5071 2693 – Site: www.braschemical.com.br

BEAD PROTRUSION

Beads **MUST** protrude from the film surface. An air/bead interface is essential for retro-reflectivity. Clear overcoating is not practical. coated microbeads, aim for a dry film thickness of 50-60 microns (2 to 2.5 mil). Additional film thickness will not reflect more light and beads are a very expensive filler!

COLORS

SHADING COLORS

The natural color of the beads is a medium gray. Very attractive reflective colors including Charcoal Gray, Red, Orange, Brown, Green, Blue and Violet can be made using transparent, permanent colors at levels of 1 to 2 % pigment paste by weight and now under developing products ready for use .

Bright, clean colors such as white, traffic yellow, safety orange and bright fluorescents hardly be achieved due to the gray cast of the beads but it would be achieved soon.

WATER-THINNED COATINGS AND INKS

pH CONTROL

The pH of any system containing aluminized glass beads is very important. pH that is too high or too low will degrade the aluminum, causing a loss of retroreflectivity and possible generation of unwanted gasses in the coating or ink. Avoid primary amines. Use AMP-95 or ethanolamines for pH control. pH should be between 6-7 for most systems

100% SOLIDS POWDER & U.V. CURED COATINGS & INKS:

POWDER COATINGS

Use low viscosity / high shrinkage systems, to allow beads to protrude from surface.

Powder coatings - Only dry blend is possible. Adhesion promoter and bead/resin coupling agents improve the coating integrity. Silane treated silica partitioning agent will help maintain the bead / polymer ratio during spraying. Thin resin bonding to the beads is also effective.

size 50 micron beads work well, but the preferred beads for powder coatings are size 80 micron.

SCREEN PRINTING INKS:

PRINTING PROCESS

Use Monofilament screens, 80 to 150 mesh. Print off-contact. Flood screen/print/flood.

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APPLICATION METHODS, COATINGS:

Conventional air, HVLP air, airless, aerosol, knife & gravure coater, curtain coater, reverse roll.
Beads may be applied to a wet adhesive by scattering or fluidized bed.

This information provided is believed to be accurate and reliable. Specifications are tentative and subject to revision without notice.