INTERPLASTIC CORPORATION
Thermoset Resins Divison

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4 Tech Notes

MEKP INITIATORS

Recommendations for Gel Coats

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MEKP Initiators for Gel Coats

Background:

Methyl ethyl ketone peroxide (MEKP) initiators are used to initiate the cross linking cure reaction in unsaturated polyesters. Since the MEKP solutions are consumed during the cross linking reaction the term “catalyst” is not strictly accurate but is commonly used in the FRP industry to designate MEKP initiators.

When a gel coat cures, the peroxide initiators react with the metal salts in the gel coat to generate free radicals. These free radicals allow the crosslinking monomers such as styrene or MMA to react with the resin polymer to form a thermoset plastic.

MEKP solutions contain two different room temperature reactive organic structures, Monomeric MEKP and Dimeric MEKP, hydrogen peroxide, water, glycol, and diluents such as dimethylphthalate. The total of monomeric MEKP, Dimeric MEKP, and hydrogen peroxide constitute the active oxygen content of the initiator. The relative proportions of these reactive peroxides influence the cure cycle of gel coats.

Peroxides containing the most monomeric MEKP are more reactive having shorter gel times with less variation at different catalyst levels in bulk masses. The high dimer peroxides give slightly higher exotherms and hardness readings in 100 gram masses.

No correlations can be drawn for MEKP composition and the time required for a film cure of a thin layer of gel coat. This parameter is sensitive to initiator amount and mold temperature. The differences in MEKP composition are manifested only in larger masses but do affect the degree to which the gel coat film will cure.

References:

S. Crump. “The effect of methyl ethyl ketone peroxide composition on cure and porosity in gel coats” 40th Annual Conference, Reinforced Plastics/Composite Institute, The Society of the Plastics Industry, Inc. Jan. 28-Feb. 1, 1985.

Recommendations:

The following initiators are recommended for use with Interplastic Corporation gel coats:

Recommendations Continued:

First Choice:

Manufacturer	Initiator	Wt % Active Oxygen	Wt % Hydrogen Peroxide	Wt. % Water	Wt. % MEKP Monomer	Wt. % MEKP Dimer
Arkema	Luperox DDM-9	8.7-9.0	0.6-1.0	0.8-2.2	26.5	6
Akzo Nobel	Cadox L-50a	8.7-9.0	0.9-1.3	0.8-1.2	22	10

Second Choice:

Manufacturer	Initiator	Wt % Active Oxygen	Wt % Hydrogen Peroxide	Wt. % Water	Wt. % MEKP Monomer	Wt. % MEKP Dimer
Pergan Marshall	Hi Point-90	8.8-9.0	1.2-1.4	1.0-1.8	19.7	12.4
Arkema	Luperox DHD-9	8.7-8.9	1.3-1.8	1.9-2.5	19	13

Interplastic Corporation recommends using 1.8% MEKP initiator at 77°F. If needed, between 1.2 and 2.5% MEKP initiator can be used depending on shop temperature and working time required. At higher temperatures the level of initiator may be decreased. At lower temperature, the level of initiator may be increased. Do not attempt to use polyester gel coats at temperatures below 60°F.