Formulating Polyester Resins for Use with CELOGEN® TSH-C

Metal promoters such as copper naphthenate and cobalt octoate are normally present in unsaturated polyester resins to react with the methylethylketone peroxide (MEKP) to form the radicals that initiate crosslinking or cure of the resin into a hard material from its initial liquid state. This reaction will take place spontaneously at room temperature when the MEKP is introduced into a resin containing these metal promoters.

When **CELOGEN TSH-C** is added to resin containing the above promoters with the MEKP present, a continuous redox cycle begins, also takes place at room temperature. The metal is alternately oxidized by the MEKP and reduced by the TSH-C. During the cycle, reduction of the metal promoters by TSH-C results in the release of nitrogen gas while oxidation of the promoters by the MEKP generates radicals, which initiate the crosslinking or cure. The end result is the simultaneous foaming and curing of the resin mass, yielding a uniform closed cellular structure. Put another way, the metal ions from the promoters transfer a charge between the MEKP and the TSH-C, producing gas bubbles and foam, an

influence the amount of density reduction. As cobalt is increased, the density is reduced more (more foaming).

3. For an unfilled resin, a copper naphthenate (8% active) level of 0.01 parts per hundred (pph) of resin is used as a typical starting point. Cobalt octoate (12% active) is added at 0.25 to 0.7 pph of resin.

4. With filled resins, a copper level of 0.01 pph of resin and a cobalt level of 0.5 to 1.0 pph of resin are recommended as starting points. Higher levels of cobalt are generally required in filled resins.

5. Using the above guidelines, almost any polyester resin may be formulated with metal promoters for use in foam applications. Some resin suppliers may still offer pre-promoted resins for foam. Suggested companies to contact:

   Alpha/Owens-Corning – **Alcel 965-312XP** - Collierville, TN – (901) 854-2800, Fax 7277
   Amoco Chemical - Chicago, IL - (312) 856-3200, Fax 2460
   Ashland Chemical - **Aropol S2033-08 & L-2752-02** - Columbus, OH - (614) 790-6904, Fax 6738
   The Carborundum Co. – Niagara Falls, NY - (716) 278-2000, Fax 2200
   Freeman Chemical - Port Washington, WI - (414) 284-5541
   Reichhold Chemicals Inc. - **Polylite 32-070** - Research Triangle Park, NC - (919) 990-7500, Fax 7711
   Sunrez Corporation - El Cajon, CA - (619) 442-3353, Fax 3036

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