

BWR TECHNOLOGY  
 GE NUCLEAR ENERGY  
 175 Curtner Avenue  
 San Jose, CA 95125

March 10, 1994

Belzona America, Inc.  
 2000 NW 88 Court  
 Miami, FL 33172

Attn: K. McGinley

You have had the Schenectady Materials and Processes Laboratory analyze Belzona #1111, #1221, #1321, #2311, #4111 and #4911 according to our D50YP12, Rev. 2. Belzona #1221 and Belzona #4111 did meet the indicated specification.

Accordingly these materials may be regarded as Nuclear Quality providing that, when purchased by a BWR nuclear facility, they are accompanied by a copy of a certificate of analysis of a sample from that particular batch indicating that particular batch also meets D50YP12, Rev. 2.

Belzona #1221 is the material also referred to as "Super-E-Metal". Belzona #4111 is the material also referred to as "Magma-Quartz".

The functional properties must suit the required form, fit and function a particular utility requires of them. Most utilities have attempted to use Belzona materials as temporary leak sealants. Since there is no technical information concerning peel strength on these materials; it does not seem that any claim for their use as adhesives on the basis of previous experience may be made. Preservative coatings are considered to be temporary coatings for storage only and must be relatively readily removable. Thread locking materials must somehow be readily removable as well. Structural materials must be readily castable and machinable. Permanent protective coating seems to be the most reasonable use. In any case, it is up to the BWR nuclear utilities to decide what use they will make of your products.

You imply in your product instructions that #4111 is most commonly used as a protective coating on the basis of your experience with the product. Your MSDS sheets imply it is a "Diglycidyl Ether of Bisphenol A" epoxy, with titania filler, hardened with an ether-amine to give what may best be described as an epoxy amine. The filler includes quartz which may be moderately abrasive in applications where the coating might be eroded away. However as a walkway application, the quartz would have great safety value.

You similarly imply that your #1221 is also most commonly used as a protective coating. Your MSDS sheets imply that it is also a "Diglycidyl Ether of Bisphenol A" epoxy, with titania, and a diisocyanate which implies it is a prepolymerized epoxy urethane. The hardener is again an amine with a silica filler which would imply that the product is a somewhat unique urethane-modified epoxy amine.

For the benefit of nuclear plants in terms of deciding upon functional suitability of these products, and other Belzona products which might be used in other parts of the plant not requiring Nuclear Quality materials but where suitable functionality will still be very important to determine, it is recommended that some general generic category be given for each of your products, i.e., your #4111 being an epoxy amine and your #1221 being a urethane-modified epoxy amine.

With respect to these two materials (#4111 and #1221) in particular you may be interested in having them also be qualified as "Qualified Coatings" per Nuclear Regulatory Guide 1.54 and ANSI N101.4-1972, N101.2-1972 and N5.12-1974. These involve thermally-exposed and radiation-exposed coatings on defined substrate metals to verify that these materials are coatings that do not peel under the relevant conditions. If these were to pass, they would be the only coating materials that are qualified as non-peeling and which are also Nuclear Quality per our D50YP12, Rev. 2. This would mean they would be acceptable for use in nuclear containment (i.e., in torus coating).

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