

Product Data



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GENERIC TYPES OF CULTURED MARBLE GEL COATS

To the cultured marble manufacturer the importance of clear cultured marble gel coat is obvious. It is the first thing that the customer sees and most often the quality of the marble or onyx is judged by the appearance of the gel-coated surface. The properties of the gel coat are largely derived from the polyester "backbone" of the gel coat (as well as the specific formulation). The polyester "backbone" is important to both the beauty of the product--which helps us to sell it--and also to the performance of the product in the field. The performance of the marble/onyx in the end user's home or business is important since the cultured marble/onyx manufacturers reputation for building a beautiful and functional product that performs in everyday use depends on it.

You may ask, "What is a gel coat and how does it affect the performance of my product?"

Polyester gel coats are specially formulated clear or pigmented polyester resin systems that are designed for use as protective and decorative coatings for molded products. The gel coat manufacturer produces gel coats that are designed to reproduce exactly the mold surface to which they are applied. Subsequent laminating or pouring of marble matrix then causes the gel coat to become an integral part of the molded product and provides a continuous clear or colored surface for the molded product with little, if any, further finishing operations.

Then you might ask, "Why is there a difference in gel coats if they are 'just' polyester resin compositions?"

You, the cultured marble/onyx manufacturer, make specific demands of the gel coat manufacturers. You demand an easy-to-use product that produces a high gloss, is non-yellowing, is stain resistant, as well as abrasion resistant and, above all, has excellent thermal shock properties. The CMI has established some basic property requirements under its certification program and the test criteria that allow the manufacturer of marble to judge the quality of the 20-25 mils of protection that he applies to his product.

In general, there are four generic types of base resins used to produce cultured marble gel coats. There are, of course, some modifications of each of these four types as well as combinations of the generic types that affect particular properties. We will not dwell on the literally infinite number of combinations that are possible, but will briefly describe some of the typical properties of the basic generic types.

1. Orthophthalic based systems. These are the oldest base polyesters used in our industry. Their benefits are generally excellent handling characteristics, i.e., "they are easy to use". They also have the distinction of having "lousy" thermo-shock properties. Orthophthalic gel coats have the advantage of being very low in cost. A thermal shock value of <100 is "normal" for this type of gel coat system.
2. Orthophthalic NPG based polyester gel coats have better properties than the straight Ortho/PG/DEG types of gel coats. They tend to be a bit tougher and less brittle and have better water resistance than the non-NPG type systems. The Orthophthalic/NPG gel coats can be expected to have better thermal shock properties than the conventional non-NPG Orthophthalic-based gel coat systems. In general they will provide thermal shock properties in the range of 550 to 650 cycles when used with a good quality matrix system. The Orthophthalic/NPG gel coats are probably the most common types of cultured marble gel coat in use today.
3. Isophthalic/Propylene Glycol systems are, and have been for many years, the workhorse of good marine gel coats and some cultured marble gel coats. They demonstrate good toughness, fair to good water resistance and good thermal shock properties. They are somewhat higher in cost than the Orthophthalic/PG systems and are slightly higher in cost than the Ortho/NPG gel coat systems. Handling properties tend to indicate that these products are a bit less easy to use than the Orthophthalic systems or the Orthophthalic/NPG systems. A typical clear cultured marble gel coat prepared from an Isophthalic-Propylene Glycol type of system will typically provide thermal shock values in the 700 to 800 cycle range.
4. NPG/Isophthalic Systems. Currently the best polyester "backbone" for both clear and pigmented gel coat systems that are used in the cultured marble industry is based on NPG/Isophthalic polyesters. While a little more sensitive, handling wise, than are the Orthos and some Isophthalic systems, the little extra effort is well worth it when properties such as chemical resistance, abrasion resistance, and water resistance are considered. Thermal shock values of 2500-8000+ are often obtained with these systems. This type of resin is the basis for HK's "G" series clear cultured marble gel coats.

By far the best properties are obtained from gel coat systems that are based on 100% NPG/Isophthalic resin systems. We are of the opinion that any gel coat system based on a resin with less than 80% NPG will perform less adequately than do the gel coats based on Isophthalic type resins with greater than 80% NPG/ Isophthalic. It is our understanding that Eastman Chemical, who manufactures "NPG", recommends that gel coat resins have a minimum of 75% NPG in order to maximize the properties.

We at HK Research feel that the manufacturer is wasting his time and money by using a polyester resin gel coat system with a NPG concentration of less than 75% - other than the sales advantage of saying that his product contains NPG.

Catalyst, both type and concentration, is important to the properties of the gel coat and appearance of the product. We highly recommend that the catalyst suggested by the gel coat manufacturer be used, as well as the correct catalyst concentration.

Now - how does the generic type of gel coat influence the properties of the cultured marble product? If you are concerned about the quality of the product that leaves your plant, we suggest that you ask your gel coat manufacturer which generic type of gel coat you are purchasing from him and have him provide this information in writing since some sales persons sometimes guess that generic type incorrectly. At least then you will have some kind of an idea what you can expect from your gel coat and-- most importantly--what to ask for when you are looking for a way to improve your product.