Coatings Consultants, Inc.

www.coatingsconsultants.com
8211 Needles Drive
Palm Beach Gardens, FL 33418
561-775-7151
fax 561-775-7050

MAGIC IN A CAN!
By Bob Cusumano

When elastomeric wall coatings were first introduced to the market they were sold like magic in a can. "Solve all of your water intrusion problems. Don't paint, waterproof!" was the mantra of manufacturers' representatives and painting contractors alike as they convinced customers to "upgrade" from traditional paint to elastomeric waterproof coating. Unfortunately, when it sounds too good to be true, it usually it is. Many coatings failures can be attributed to the misuse of elastomeric coatings. In fact, at one time, most our failure analysis cases involved these products.

Fortunately, many in the coatings application industry have recognized the limitations of these products. Unfortunately, that knowledge was acquired as a result of experiencing problems. The number of elastomeric related failures has decreased dramatically over the years. However, for those who are new to the industry or who may reside in locations where elastomeric wall coatings were not originally popular, a review these coatings properties as well as problems encountered is warranted.

Elastomerics are applied at about five times to ten times the thickness of traditional acrylic paints. This higher film build has some advantages, like minimizing the appearance of surface imperfections and offering waterproofing properties, but some potential, severe disadvantages also exist. Because of its thickness and elasticity, elastomeric coatings result in a high degree of surface tension in their cured film. If the material to which it is applied has a low degree of integrity, as often happens with new, partially uncured cement plaster or old chalked or brittle paint, then the applied stress can result in delamination due to a cohesive failure of the substrate. Even though many elastomerics are said to "breathe", their high film build results in a lower vapor transmission rate than traditional acrylics and thus tend to hold moisture in the wall. Water can enter a building at the perimeter of doors, windows, through-wall penetrations, and through cracks. Although elastomerics will bridge hairline cracks if applied at their designated thickness, they are often not sufficient to satisfy the many structural or settling cracks that appear as shown in photo #1.

. Photo 1

Photo 2

While elastomeric coatings are waterproof, they will not tolerate any moisture that can get behind the coating film. Therefore, if and when any cracks do develop, large areas of delamination will result. When a stucco surface that has been coated with an acrylic develops a crack, water vapor can pass through the film and a small area of discoloration is usually the result. Water vapor does not pass readily through the thicker, tighter elastomeric and catastrophic failure may occur. Photo #2 shows "water bagging" on the wall of a building where water has entered through cracks above the raised accented stucco trim.

When applied to cementitious surfaces, like concrete, cement plaster, and concrete block, the combination of moisture and a highly alkaline condition can cause total chemical degradation of the coating system by a process called saponification, where the resin turns into soap. Photo #3 shows a concrete tilt up warehouse that has been finished with an elastomeric coating. In this instance, an alkyd primer was used. Alkyd resins are particularly susceptible to saponification. Because concrete retains a great deal of moisture and the elastomeric topcoat retards its evaporation, the moist, alkaline environment created destroyed the alkyd primer and literally "floated" the elastomeric off the wall (photo #4).

Photo 3

Photo 4

Elastomeric coatings should never be used in situations where water is likely to get behind the coating. Such areas include the underside of concrete balcony walkways where water can migrate through the slab due to gravity and cause water bagging and delamination on the underside and

below grade where hydrostatic water pressure can affect the coating from behind as shown on the face of the planter in photo #5.

Photo 5

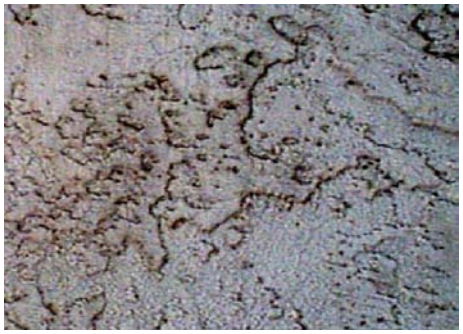

Photo 6

In repaint situations, proper surface preparation is critical. Normal pressure cleaning is usually sufficient to support the application of a traditional acrylic paint over most existing coatings. With elastomeric coatings, however, more stringent surface prep is often required. As previously applied coats of paint age, the films become brittle and the adhesion between previous coats to other coats or the substrate becomes compromised. Due to the high weight and stress attained with elastomeric coatings, their application over marginally adhered paint can result in delamination. At some point in the life of a building, all previous coatings must be removed by sandblasting, hydroblasting, or chemical stripping before additional coatings can be applied. The coating thickness at which this must be performed can vary with the exposure and the types of previous coatings applied. Because elastomeric coatings are applied at approximately five times the thickness of conventional acrylics, the point of total coating removal is reached in a lessor period of time.

As depicted in photo #6, some elastomerics have a tendency to collect dirt, often due to the migration of plasticizers to the surface. Elastomeric coatings typically have several surface pores that can also hold dirt. Elastomerics typically don't chalk. A slight amount of chalking is a desirable feature because it allows dirt to be flushed away when the surface is washed by rain. When the coating film is very soft, as is often the case with elastomeric coatings, then the dirt becomes embedded in the film and cannot be removed by pressure cleaning. Photo #7 shows a sample at 60X magnification where dirt is visible on the surface after scrubbing with soap and water.

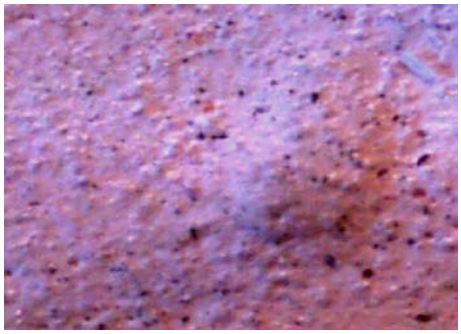

Photo 7

It is important to realize that all elastomeric coatings are not the same. Particular brands will vary in composition, percent elongation, hardness, vapor transmission and other important properties. Therefore, their susceptibility to the above mentioned problems will vary.

The four myths of elastomeric coatings are:

1. Elastomeric goes on like regular acrylic paint. Wrong. In order to achieve its desired waterproofing properties, care must be taken to apply these products at their recommended dry film thickness. This may necessitate the application of additional coats. Because of its high build, elastomeric coatings usually have a texture. Care must be taken during application to "dress down" to achieve proper appearance
2. The protection comes from the top coat of elastomeric coating; you can prime with anything. No. Often severe attack on the coating comes from the back. The primer must be able to resist alkalinity and support the stress of the cured elastomeric coating film.
3. When you use elastomeric coatings you don't have to patch. Wrong again. Elastomerics only bridge hairline cracks. Proper repair of structural and moving cracks is critical to prevent water from getting behind the coating.
4. Elastomerics are just as good for new buildings as they are as maintenance coatings. Many more failures occur on new buildings. This is due to the fact that structural cracks and high alkalinity are often initial conditions that tend to lessen as the building ages.

Never use elastomeric coatings on horizontal surfaces or below grade where water can get behind the coating. Make sure that previously applied coatings and the substrate is sound. Only use on surfaces that are severely exposed to the weather. Elastomeric coatings can provide many years of excellent service when surface preparation and application details are properly specified and conditions warrant the use of these products.