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Common Questions About Composites

What is the difference between "pre-impregnated", "wet-layup", and "pre-cured"?

Pre-impregnated fabrics have the resin applied to them under factory controlled conditions. The resin/glass ratio is able to be watched closely and be kept within tolerances. Pre-impregnated fabrics are generally easier to use in the field, as the installer does not have to mix resins and apply that to the fabric in the field. Wet-layup systems are just that, applying wet resin to the composite reinforcement fabric out on the jobsite. This can be done by hand or by using an impregnating machine. Although time consuming, in some cases this process can be beneficial. Where difficult applications are encountered, the installer can pre-cut and position the dry fabric to make sure it will fit where it needs to go. Using a fabric that is already wetted out can make doing this difficult. Pre-cured systems are impregnated and cured solid at the factory. They are not easily modified in the field and their rigidness can make for a difficult installation.

Can composites be used to repair internal piping defects?

Yes, in certain cases. Epoxies are more likely to seal, on their own, as opposed to a polyurethane system. If there is an existing leak, it is best to shut down the system and plug the hole with an epoxy putty, and then install the composite. If there is an active leak and the line cannot be shut down, more advanced leak repair methods must be used. Composites should not be installed over an active leak. The product inside the pipe can have adverse effects on the resin during the cure, which can have a detrimental effect on its properties. For lines that are not leaking, but are expected to hole through during the lifetime of the repair, special precautions need to be observed. Is the matrix compatible with the product? How many layers do I need for leak retention? How long does it need to last? If you have a special application, please contact our technical support staff.

How long do composites last?

Composites can last one year, or last fifty years, depending on the application. Just like any other material, they will degrade over time. Steel will rust, concrete will crack, paint will peel, and composites will lose their strength. Our long-term tests show that Aquawrap® will retain better than 50% of its strength over fifty years. Epoxy systems have a high initial strength, but weaken more over the long term. Both types of material have been in use in various applications for decades.

How should I prepare the surface?

For steel substrates, we recommend cleaning to at least a NACE II or SSPC-10 level (see below). The better the cleaning and preparation, the better the bond will be. In some cases, bond has a significant effect on the performance. For concrete surfaces, above and below the water line, all loose debris, coatings, marine growth, etc. must be removed. This can be done with high pressure water blasting or sand blasting. All surfaces need to be wiped clean prior to installation of the composite system chosen.

SSPC-SP10 or NACE #2 Definition:

In this method, all oil, grease, dirt, mill scale, rust, corrosion products, oxides, paint or other foreign matter have been completely removed from the surface by abrasive blasting, except for very light shadows, very slight streaks or slight discolorations caused by rust stain, mill scale oxides or slight, tight residues of paint or coating. At least 95% of each square inch of surface area shall be free of all visible residues, and the remainder shall be limited to the light discolorations mentioned above. From a practical standpoint, this is probably the best quality surface preparation that can be expected to today for existing plant facility maintenance work.

Can solutions be designed for internal corrosion/erosion situations?

Absolutely. We frequently design solutions for internal defects. These must address both product and pressure containment in anticipation of future through wall conditions. This requires a proper assessment of the compatibility of the composite material to be used and the product contained in the line. The impermeability and high adhesion level of our 100% solids epoxy resin creates the containment barrier. Depending upon the calculations, additional layers of either the PowerSleeve® or the Aquawrap® would provide the needed pressure reinforcement to complete the repair.