

Q I am designing a parking garage that uses hot-dip galvanized steel throughout the structure. I am a big fan of the ability of HDG to protect steel from corrosion, but the coating interferes with the welding of studs to the top of beams being used for this project. Is there anything I can do to prevent the galvanized coating from forming in the sections where I plan to weld studs? Can the coating be prevented from forming on bolt threads as well?

A Yes, there are certain products called masking or stop-off material that have been used with some success to prevent the galvanized coating from forming. The masking of steel is usually done on areas that are to be welded after galvanizing, threads on bolts, mating surfaces that have fine tolerances, drilled holes, or other types of steel fabrications where the presence of a coating may interfere with its intended purpose. However, the masking products that have been used are not 100% effective. Also, there is added labor involved in applying them before galvanizing and removing them after the galvanizing process.

A few product types have shown some promise in masking areas of steel to be galvanized. High-temperature paints, greases, pastes, and adhesive tapes have all been used to mask various products. These materials are either applied before the pretreatment processes (i.e., degreasing, pickling, and fluxing) or immediately prior to dipping in the galvanizing kettle.

High temperature paints used for masking are applied to flat surfaces that require the absence of a galvanized coating. The most common application of this is when areas of the steel are to be welded after galvanizing, such as stud welding. The paints can be removed after galvanizing by grinding or brushing, depending on the size of the area that has been masked. High-temperature paints, such as those used in the automotive industry to protect exhaust systems, are capable of resisting the severe conditions in the galvanizing process. Some silicone-modified alkyd resin based paints or other epoxy/polyamide based paints have performance characteristics that should allow the paint to withstand the galvanizing process effectively mask the steel from coating.

Greases and pastes that are resistant to the conditions of the galvanizing process are typically used on internal threads or threaded holes. When pastes are moistened with a little water, they can be pressed into holes and openings; it is essential that care is taken not to trap air in

these holes. The paste hardens with the heat of galvanizing and prevents ingress of zinc. It will then be necessary to remove the residue after galvanizing by means of brushing. Dow Corning manufactures a silicone-based product, "Compound 111," that has been used successfully to mask galvanized steel.

Adhesive tapes are used on cylindrical components, such as threaded bolts or pins. The tape carburizes in the galvanizing kettle and the residue that remains prevents the galvanizing reaction from occurring. This residue must be removed after galvanizing by using a stiff bristled brush. KAPTON Polyimide Film has been documented as being used as a galvanizing stop-off material. It is exceptionally strong and thermally resistant and can be obtained with pressure-sensitive backing from tape manufactures.

Another method of masking used to prevent unwanted coating on internal threads or clearance holes is the use of "filler" bolts or pins. A bolt or pin is greased prior to insertion in the hole and removed after galvanizing. Heat may be required to remove the bolt or pin as the zinc coating may lock the bolt or pin in place.

There is one product that is manufactured specifically for masking galvanized steel and is used by many galvanizers. The product, called "Galvastop," is manufactured outside of North America, but is available through a distributor in North Carolina—Puma Chemical. AGA members and others have had problems reaching this company via telephone, but it seems the company is very reliable when contacted by fax: **828-389-4023**.

Although masking steel that is going to be galvanized is not an exact science—and rarely is 100% effective—the need for this type of material exists. The ability to mask portions of steel prior to galvanizing allows the coating to be more versatile and used in a wider range of applications.