

# Carboguard 695 CLR

Clear Reinforced Epoxy Laminate



***For the protection of petroleum storage tank bottoms  
(Reference: API Recommended Practice 652)***

## **Protection of Tank Bottoms**

The American Petroleum Institute (API) has developed a Recommended Practice (RP 652), which provides guidelines for the “Lining of Aboveground Petroleum Tank Bottoms”. These guidelines are written to help owners of petroleum storage facilities whose tanks are ageing and may be showing signs of chemical corrosion, galvanic cell corrosion, sulfate reducing bacteria corrosion, erosion corrosion, fretting corrosion, and soil-side bottom corrosion. A well-designed and installed tank bottom lining system can provide 20-plus years of additional service, even if perforations occur in the tank bottom.



## **Lining Systems – Why Thick Film Epoxy Laminate is preferred for Older Tanks**

Both thin and thick film systems can be used for petroleum storage needs. Thin film systems (less than 20 mils) have a more difficult time protecting pitted steel and are too thin to incorporate a reinforcing mesh for higher structural/physical requirements particularly in case of bottom perforations. For these reasons they are typically only used during new construction. Thick film reinforced systems greater than 20 mils (0.020 inches) are the preferred lining system and have demonstrated proven reliability for this service for older tanks. There are potentially three types of reinforced systems to consider.

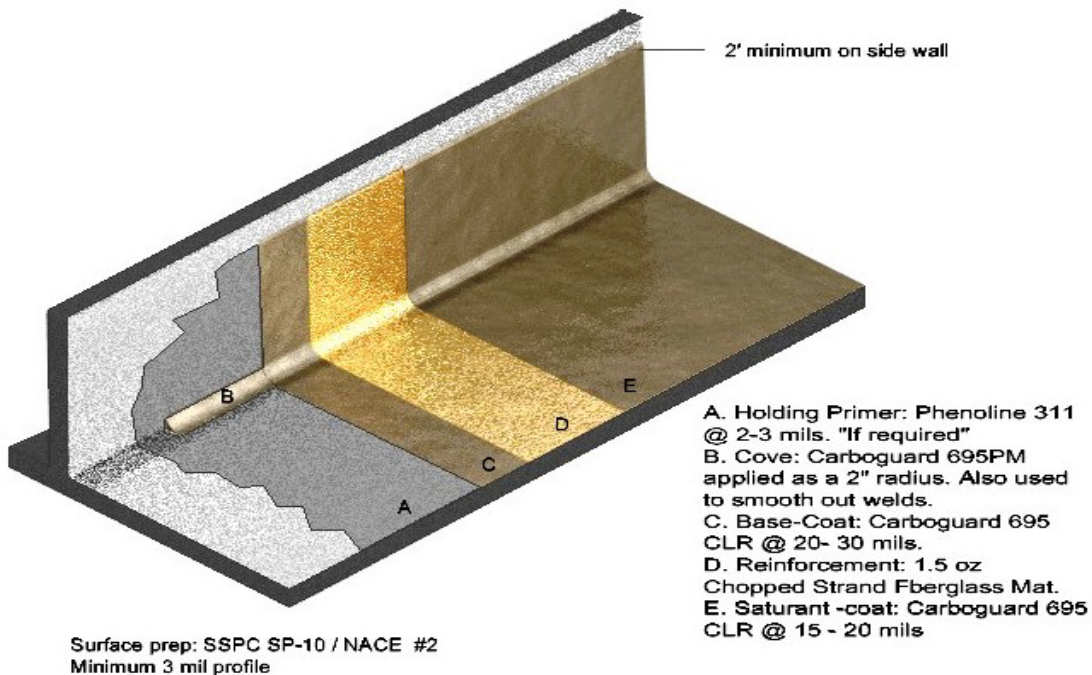
<b>Chopped Glass</b>	<b>Flake Glass Filled</b>	<b>Epoxy Laminate</b>
Requires special expertise and equipment for application. Critical levels of resin and chopped glass are required for proper strength and barrier protection. Glass fibers that protrude through the film are particularly problematic as they can “wick” petroleum products through the film. These areas must be sanded/corrected for a proper installation.	Labor advantages with a single coat lining seems appealing at first glance; but years of experience has shown that using glass mat or chopped glass (both longer glass fibers) have proven to possess the necessary hole-bridging capability (as Section 6.3 of RP652 points out). Longer fibers provide the necessary internal strength for bridging perforations over shorter flake-type fillers used in these products.	This system is more widely used and has a long history of performance. It is much more forgiving from an application standpoint. A glass mat is sandwiched between resin coats followed by a final gel coat. These systems easily bridge perforations (or future perforations); and while more labor intensive to install, no specialized equipment is necessary for their proper installation.

# Carboguard 695 CLR

## Clear Reinforced Epoxy Laminate



Carboguard 695 CLR is a glass-reinforced clear epoxy laminate utilizing a hand lay-up woven glass mat sandwiched between epoxy resin layers. This high tensile strength lining provides outstanding corrosion protection, moisture permeation resistance, and chemical resistance to a variety of petroleum products. It is ideal for older tanks whose bottoms are showing signs of corrosion pitting or even perforations.



## Advantages of Carboguard 695 CLR

Thick-film, glass-fiber reinforced linings are the material of choice for older, pitted, corroded tanks; and are very resistant to mechanical damage with high internal tensile strength. The Carboguard 695 CLR has distinct advantages:

- Easier to achieve coverage (protection) over rough, pitted floors.
- Ability to bridge future perforations (Flexural Strength 4500-12,000 psi)
- Resistant to mechanical damage.
- Easy hand lay-up (more difficult than chopper gun).
- Holiday testing results in very few pinholes.
- Excellent resistance to moisture permeation.
- History of 20 + years of service.