Edlon® Custom Dual Laminate Vessels

Edlon has more than 50 years of experience providing engineered solutions in fluoropolymer materials. Our focus is on creating specialized solutions for applications requiring high purity fluid management, corrosion protection, and release. We pride ourselves as being a provider of a broad array of unique, premium products, as well as a pioneer of new technologies to the industries we serve.

Edlon’s sheet linings offer a thick, chemically inert, corrosion resistant layer between the process and the vessel, resulting in much longer lifetimes than bare fiberglass. Edlon’s custom liners provide corrosion protection at a wide range of temperatures with smooth, non-stick surfaces, low-stress designs, low permeation characteristics, and maximum bonding to the substrate surface for use in the most demanding and critical services. Dual laminate liners provide protection even in severe agitation or vacuum conditions.

Using glass or fabric backed film, Edlon’s dual laminate liners are fabricated using our proprietary fusion welding technology wherever possible, resulting in seamless welds for both body panels and nozzles – a product that is unequaled by our competition. These seams have tensile and elongation properties equal to those of the virgin fluoropolymer. Fusion welds allow for natural flex and strain, eliminating stress risers and minimizing the chance for stress cracking – one of the most common modes of failure in a fluoropolymer sheet lining. Fusion welding also reduces the chance of other common failure modes, including vapor permeation through a weak air weld. Wherever fusion welding is not applicable, we will utilize a combination of full penetration air welds and cap strips. Our engineers have expertly designed the placement of these welds to minimize creation of high stress areas.

Edlon creates the liners for all vessel heads using a thermoforming technique that allows heads to be formed in one piece, rather than in multiple pie-shaped sections. Thermoformed heads eliminates many feet of unnecessary air welds that can be found in the industry-standard dual laminate vessel head.

Dual laminate liners are fabricated using fluoropolymer sheet film which has a glass or fabric backing fused to one side. The purpose of this is to create a bondable surface that will facilitate the application of the fiberglass resin. The liner will be created first, then overlaid with a conductive carbon layer, and then overlaid by hand with Derakane 470 or equivalent resin. The vessel exterior will be sealed with a gel coat infused with a UV inhibitor.

The general procedure for fabricating a dual laminate vessel is as follows:

1. Create longitudinal fusion welds from fluoropolymer glass-backed sheet to form the vessel shape in one or more sections.
2. Thermo-form flange faces and circumferentially fusion weld to the liner. Thermo-forming the liner for the flange face allows us to A) relocate the joining weld from the
high stress flange-to-pipe interface to the lower stress area inside the column walls and
B) relieve residual stresses created by forming the shape.
3. Fusion weld each nozzle in place. Again, nozzle welds will be relocated to minimize
stresses.
4. Install mandrels into the liner to support the vessel during fiberglass overlay.
5. Hand layup carbon veil and fiberglass resin and seal exterior with gel coat. The carbon
veil layer is included to facilitate spark test of the liner.
6. Factory spark test liner at a minimum 10,000V DC to ensure pinhole free liner.
7. If necessary, circumferential weld liner sections together. Hand layup carbon veil and
fiberglass resin over seam and seal exterior with gel coat. Repeat factory spark test liner
at a minimum 10,000V DC to ensure pinhole free liner.
8. Drill bolt holes and other finishing touches.

The additional steps that we take to stress relieve each weld, heat set each flare, and fusion weld
each seam do require additional labor and costs beyond the industry-standard air welded liner.
Edlon has a proven track record utilizing this technology, resulting in easily-maintained and
worry-free operation in our vessels all over the globe. Below, please find some photos of dual
laminate vessels that we have provided to some of our customers.
5,000 & 7,000 gallon FRP/PTFM storage vessels

4,000 gallon PFA vessel before being overlaid with fiberglass resin