



EN14125 Standard Primary Pipe

EVOH Resin Offers Improved Barrier to Vapour Permeation in Semi-Rigid Fuel Pipes

As fuel piping has evolved over the years, advances in technology continue to increase protection against fuel vapour incursion into the surrounding environment. Metal piping has given way to monolayer flexible piping, which in turn has been overtaken by multilayer extruded piping. Throughout this evolution, chemical engineering technology has proffered new combinations of materials which provide continually higher levels of protection. Franklin Fueling Systems has applied the advanced properties of ethylene vinyl-alcohol (EVOH) resin to the UPP EN14125 Standard Primary Pipe, an advancement which will play a major role in the future of semi-rigid piping.

Used for years in the food packaging industry to provide a barrier against aroma leakage and to maintain freshness, EVOH

resins are also available in formulations specific to the fueling industry. Not only do these resins offer vapour resistance properties that are superior to their HDPE and nylon alternatives, but they also bolster performance. In particular, EVOH resins offer:

- Fuel barrier properties much greater than HDPE.
- Improved strength over nylon.
- Very low evaporative emissions.
- High resistance to solvents, hydrocarbons, and gasoline.
- Superior flex-crack resistance.
- Long-term thermal stability and aging resistance.

EVOH Replaces Nylon as Liner in UPP Primary Pipe

Because of its superior performance characteristics, Franklin Fueling Systems now utilises EVOH resin as the protective inner liner in EN14125 Standard-approved UPP brand primary pipe. A translucent EVOH layer replaces the long-recognised yellow nylon layer previously used in most UPP pipe, working to guard forecourts against harmful leaks. Whilst it may be tempting to tint this layer for greater recognition, introducing colour pigmentation or other additives would prevent the achievement of the T1 rating. UPP primary pipe employs EVOH resin in only its natural, unpigmented and therefore strongest form.

At the same time EVOH was added as the inner fuel contact layer, the HDPE material used in the outer structural layer of UPP primary pipe was upgraded to PE100. The ease of processing afforded by EVOH allows these layers to be coextruded, forming an integral, permanent bond the instant the pipe is manufactured. This improved combination offers superior strength and performance, allowing UPP primary pipe to successfully achieve the EN14125 Standard Class T1 temperature rating. Accordingly, the EVOH/PE100 inner/outer combination stands up to rigorous pressure, bend, impact, and puncture testing down to -40°C while remaining fully functional.

The enhanced strength of this new combination makes it possible to reduce the thickness of the outer HDPE layer to increase the pipe's inner diameter. The enlarged inner diameter provides the potential for increasing flow rates and for reducing pressure loss. (Example: in lab testing of 63mm UPP primary pipe, improvements included an increase in flow rate of 11% and a decrease in pressure loss of 18%.) This new pipe maintains the pressure rating of its nylon-lined predecessor and continues to meet the stringent permeation guidelines of EN14125 (0.2 g/m²/day).

Since it was first installed in 1981, UPP primary pipe has maintained the highest standards of safety and quality while offering superior performance. Using advances in technology such as these to facilitate the continuous improvement of its products, Franklin Fueling Systems carries forward this tradition of excellence. The improvements afforded to UPP pipe by incorporating an EVOH resin layer and a high performance design are evidence of this persistent focus.