



## RE: Cross linked Polyethylene vs. Linear Polyethylene

Assmann Corporation utilizes two types of resin, crosslinked polyethylene (XLHDPE) and linear polyethylene (LMDPE). Crosslinked polyethylene by far is the more reliable of the two resins because of higher impact resistance, greater environmental stress cracking resistance (ESCR), able to hold higher maintenance temperatures, and due to the molecular structure less likely to experience catastrophic failure. Of the two resins used in our process, crosslinked polyethylene would account for over 70% of the total resin usage. Linear polyethylene is generally used for FDA applications, secondary containment, smaller units such as feed-stations, and water services. Linear polyethylene carries NSF approval for potable water applications. Assmann has also received NSF certification for our Crosslink polyethylene in chemical storage applications. Other manufacturers Crosslink polyethylene does not carry the NSF certification without the use of expensive linear than run a high risk of delaminating.

The environmental stress crack resistance of the crosslink resin used in our manufacturing process exceeds ASTM recommendations. You will find that both crosslinked and linear polyethylene resins show an ESCR value greater than 1000 hours, these results are based on using a 100% solution of Igepal. The more severe test uses a 10% solution of Igepal. In this case the linear polyethylene values are around 150 hours, where as the crosslinked polyethylene values are still over 1000 hours. These results prove that crosslinked polyethylene does have a significant advantage over linear polyethylene in services like sodium hypochlorite, sodium hydroxide, and other know oxidizers or stress cracking agents.

Another advantage that crosslinked tanks have over linear tanks in any service is their overall toughness and lower notch sensitivity. While the lower notch sensitivity reduces the possibility of catastrophic failure, the toughness allows the tank to withstand abuse without failure. Assmann Corporation supplies tanks for the nuclear industry. The units we supply are put through a battery of drop tests. First the unit is filled with sand and water. The unit is then dropped on its flat bottom, top, and top & bottom radiuses from 25 ft. Linear polyethylene may hold up to the first drop, but will fail on the second attempt. This test demonstrated that crosslinked tanks have superior toughness and the ability to withstand significantly more abuse than linear, because the resin is less notch sensitive than linear. In service, any deep scratch, gouge or small crack will act as a notch. Even cracks generated by weather or a slight chemical attack could behave as a notch.

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