



# ASTM Standards and Testing (Simplified)

A WHITE PAPER FROM ASSMANN

***Assmann Corporation of America manufactures our polyethylene upright storage tanks meeting and exceeding the current ASTM standards. We are an ISO 9001: 2015 certified company which requires us to track and improve upon every aspect of our process.***

We like to point out that our manufacturing process exceeds the current ASTM standards by utilizing a uniform wall thickness on our tanks. The current ASTM standards allows manufacturers to taper or stratify the wall thickness of the tank. In short, most manufacturers construct their tanks with a thick lower sidewall and then reduce the tanks thickness at the high sidewall and dome where there is less hydrostatic pressure. Assmann does not follow this practice, as our tanks are uniformly thick from the base throughout the entire vessel's sidewall and dome.

The current ASTM standards require various types of testing on polyethylene tanks. This letter is a simple outline of this testing.

- Low-Temperature Impact Testing
- O-Xylene- Insoluble Fraction Test (Gel test)
- Ultrasonic Wall Thickness Test
- Hydrostatic Water Test

***Low-Temperature Impact Testing:*** This testing requires that a sample be taken from the manufactured storage tank or piggy-back sample mold. The sample is then conditioned and impacted. The dart impact test at (-20°F) produces a value that is used as an indication of the quality of the tank. If the molding conditions were inadequate and a homogenous melt was not obtained, the impact will likely be low. Higher impact values are obtained with ideal molding conditions indicating that a quality part with good impact resistance has been molded. The impact test gives a true indication of how well the tank was molded.

***O-Xylene- Insoluble Fraction Test (Gel test):*** This test method is for determination of the Orth xylene insoluble fraction (gel) of cross-linked polyethylene. A weighed specimen of the cross-linked polyethylene sample is placed in a screen container and the total weight is taken. The container is submerged in boiling o-xylene overnight, which dissolves the uncross-linked portion of the sample. The container with the specimen is dried in an oven and weighed. The percentage gel content is calculated from the weight loss and the original specimen weight. The o-xylene insoluble portion (gel) of cross-linked polyethylene is an indication of the amount of crosslinking in the polyethylene. ASTM standards call out for a minimum of a 60% Gel. Assmann Corporation manufactures our parts in the 70-80% range. The higher gel percent represents a stronger molecular structure.

***Ultrasonic Wall Thickness Test:*** This test method is verification that the manufactured storage tank meets or exceeds the ASTM standards. Wall thickness is calculated using the Barlow Formula. This formula calculates the tank's thickness based off the hydrostatic pressure. The tank's wall thickness can be reduced as the hydrostatic pressure decreases. Assmann uses an ultrasonic measurement device to broadcast a signal through our tank wall, giving us a measurement to compare to the Barlow calculations. Assmann typically exceeds the Barlow calculation, as our tanks are manufactured with a uniform wall thickness.

*Hydrostatic Water Test:* This test method requires that each tank shall be hydrostatically tested by the manufacturer by filling the tank completely with water. Assmann performs this test on all of our storage tanks prior to shipment. We fill each tank to brim full capacity and inspect each nozzle for any signs of seepage or leaks. This ensures the customer that they will have a trouble-free installation.

We hope that you find this document useful in your understanding of Assmann Corporation's polyethylene storage tanks. We feel that by meeting and exceeding the ASTM standards we are offering our customers the best polyethylene tank available in today's market. Please feel free to contact our factory with any questions.



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