Tech Tips 026

Waterstops for Ultra-low Temps and LNG Containment

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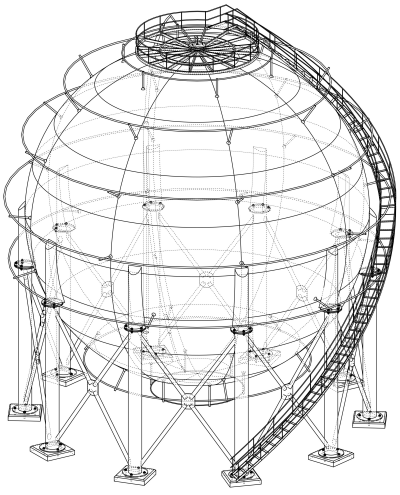
LNG stands for liquefied natural gas, a highly flammable and volatile substance typically stored and transported at extremely low temperatures. The storage and handling of LNG are critical to ensuring its safety and integrity.

LNG is stored below -256°F in specially designed tanks with double-walled insulation and a vacuum-sealed reinforced inner container. The storage tanks must maintain the LNG at this ultra-low temperature to prevent it from reverting to its natural gaseous state or boiling off.



An LNG Storage Tank

The storage tanks must also be able to withstand the extreme temperature swings that can occur when the tank is emptied or filled, as the liquid rapidly expands and contracts. Temperatures inside the tank must be continuously monitored and controlled using sophisticated cooling systems that rely on refrigeration technology to keep the LNG at the proper temperature.

Because of LNG's volatile nature, handling it with extreme care is essential, and special precautions must be taken to prevent leaks or

spills. Explosions and fires can occur when LNG is exposed to air or ignition sources, making safety procedures and training of personnel essential when dealing with LNG.

Plastic waterstops can become brittle and more prone to cracking or breaking when they get too cold. Low temperatures can cause the chains of polymer molecules in plastic to become stiff and more rigid, reducing their flexibility. In extreme cases, some plastic waterstops may even shatter when subjected to very low temperatures. Installing plastic waterstops within their factory-certified temperature range is crucial to avoid damage.

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When rubber waterstop gets too cold, it can become stiff and lose its elastomeric properties, turning more rigid and brittle, making it more susceptible to structural cracking, tearing, and failing. Rubber contains a variety of molecules with spring-like properties that allow it to bend, stretch, and recover when exposed to deformation. However, when exposed to extremely low temperatures, these molecules can become more rigid and inflexible, reducing the material's capacity for expansion and contraction. As a result, rubber waterstops should be installed within their recommended temperature range to maintain their elasticity and performance.

- **Earth Shield® PVC (polyvinyl chloride) waterstops are suitable for low temperatures below -35°F.**
- **Earth Shield® TPV (thermoplastic vulcanizate) waterstops are suitable for low temperatures below -78°F.**
- **Earth Shield® SS (stainless steel) waterstops are suitable for low temperatures below -320°F.**

STAINLESS STEEL WATERSTOP

Earth Shield® Stainless Steel Waterstop can stop even the most corrosive fluids in their tracks, even at severely elevated temperatures. A variety of metals, grades, and gauges are available. Earth Shield® utilizes 20 gauge 316 low carbon as our standard alloy, which offers broad-spectrum corrosion resistance to most aggressive media, and is virtually untouched by the deleterious effects of ozone, making it an ideal choice for ozone contactor structures used in modern water treatment plants.

Earth Shield® Stainless Steel Waterstop is available in many standard shapes and sizes, including new construction and retrofit profiles. All change-of-direction fabrications can be pre-manufactured, leaving only straight butt welding for the field.

Learn more about Earth Shield® stainless steel waterstops at the links below.

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1. stainless steel waterstop product literature (PDF)
2. stainless steel waterstop specification (PDF)
3. stainless steel waterstop specification (MS Word)
4. stainless steel waterstop submittal package (PDF)
5. stainless steel retrofit waterstop installation guides
6. stainless steel waterstop CAD details (PDF and DWG)
7. stainless steel waterstop chemical resistance chart

JP Specialties, Inc. / Earth Shield® Waterstop

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