



**Tech Tips 001**

# Earth Shield® Chemical Resistant Waterstop Versus Joint Sealant

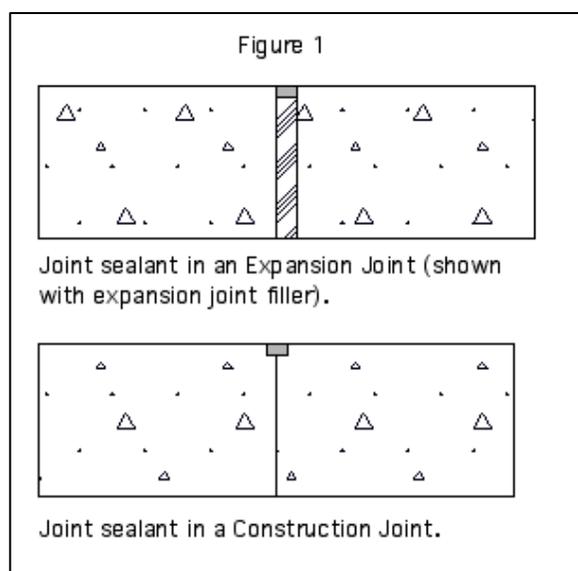
By David R. Poole, CSI

When fluid-proofing a joint it is important to consider what fluids will potentially pass through the joint; the ramifications if they do; the hydrostatic pressure applied; and the life expectancy of the joint sealing system. The answers to the aforementioned questions should ultimately determine the type of joint sealing system used.

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For example, if the primary concern is rain-water infiltrating the building envelope, a simple joint sealant or caulk will be adequate to waterproof the joint (see figure 1). A joint sealant functions by adhering to both sides of the joint.

When [sealant adhesion fails](#), so does the waterproofing function. Sealant is usually composed of silicone or urethane, and the manufacturer-listed lifecycle is usually 5 to 10 years, but because proper joint preparation procedures are often not followed, a more realistic lifecycle is 3 years.



However, if the joint is designed to prevent the passage of fluids other than water, such as fuel oils, solvent, acids, and other aggressive chemicals, only a chemical resistant waterstop such as Earth Shield® will block the fluids, resist degradation, and provide the necessary federal regulatory compliance. Earth Shield is manufactured from a fully [cross-linked](#) thermoplastic vulcanizate (TPV), which provides [broad-spectrum resistance](#) to a variety of aggressive chemicals, long life span (entire lifecycle of structure), and excellent physical properties (tensile strength, elongation, etc.).



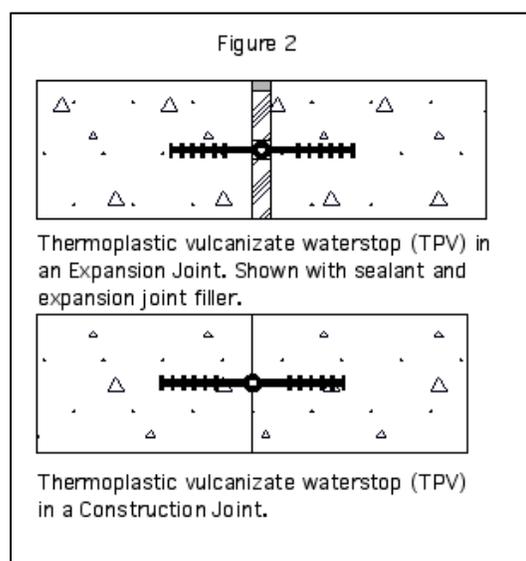
Unlike sealant, TPV waterstop does not rely on adhesion to function, but instead is installed in the center of the joint, spanning the entire length of the joint, and acts as a dam to prevent the passage of fluids (*see figure 2*). Therefore, if care is taken during installation, TPV waterstop will provide a leak-proof barrier for the life of the structure.

Additionally, Earth Shield Chemical Resistant Waterstop provides the necessary federal regulatory compliance that sealant does not. [U.S. Environmental Protection Agency \(EPA\) Title 40, CFR 265.193](#) states:

*Secondary containment for tanks must include one or more of the following devices:*

1. A liner (external to the tank);
2. A vault (constructed with chemical resistant waterstops in place at all joints);
3. A double-walled tank; or
4. An equivalent device as approved by the Regional Administrator.

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Due to aesthetics and functionality, concrete vaulting is usually the preferred method to contain hazardous chemicals. This is usually accomplished by placing the tank or process area on a concrete slab and surrounding it with short containment walls (usually 3 to 4 feet in height, [*see figure 3*]). Within the concrete joints (control, construction, and expansion), Earth Shield TPV Waterstop will span the joint preventing the passage of hazardous waste to the environment

should a catastrophic spill occur in the primary vessel or process area.

Because sealant is a maintenance item, with separation or failure occurring generally within 3 years of installation, and requiring constant maintenance throughout the life of the structure, it should not

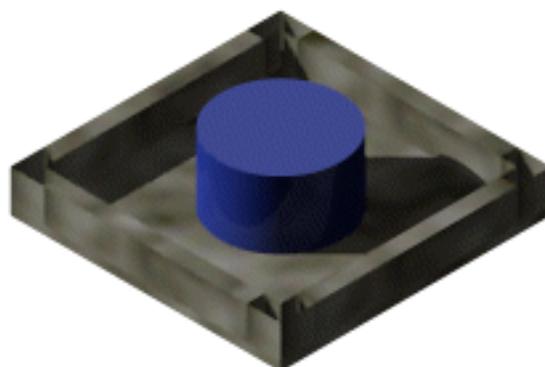


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be considered as a stand-alone barrier system when the criteria is containment of hazardous substances.

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Figure 3



Secondary Containment Vault