



TECH DATA Chemseal

Chemical-Resistant Watertight Joint System

Product Description

Featuring a chemical-resistant silicone sealing surface and backed by an integral, pressure-resisting impregnated foam backing, **Chemseal** provides a lasting solution to joint sealing applications where exposure to chemicals or solvents is expected in volumes up to 5-feet of liquid head pressure.

Chemseal has been tested to continuously resist water pressure of a with head pressure of up to 5-feet. For depths up to 30-feet EMSEAL, or where the expansion seal will be continuously emersed, EMSEAL recommends Submerseal.

Chemseal builds on a track record of over 30 years of sealing structural expansion joints with impregnated foam sealants and is an evolution of EMSEAL's DSM System.

The system is comprised of (see Figure 1) precompressed, silicone-and-impregnated-foam hybrid installed into field-applied epoxy adhesive on the joint faces with the silicone bellows locked to the joint faces with a silicone sealant band. A polysulfide option is also available in place of silicone, however this will change installation parameters with a longer cure time (consult EMSEAL).

Chemseal features EMSEAL's microsphere-modified acrylic adhesive infused into the cellular foam base material.

The silicone coating is NSF compliant which also allows it to be installed in areas which are sensitive to food contamination.

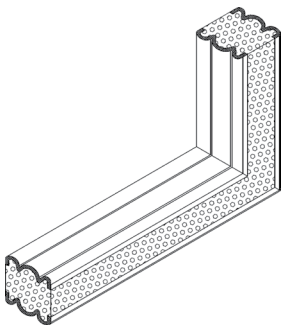
Features

Watertight – Chemseal is installed with the tensionless silicone bellows facing the liquid ensuring that watertightness is achieved.

Non-Invasive Anchoring – there are no hard metal-to-substrate connections with Chemseal. This includes embedded pins, anchors, screws, bolts or tracks, trays or rails. The system is locked to the joint faces by means of the 1) backpressure of the foam; 2) the epoxy adhesive, and 3) the injected silicone sealant band at the joint face to foam-and-silicone-bellows interface.

Continuity of Seal — as in all EMSEAL expansion joint systems, continuity of seal through changes in plane and direction is an essential performance differentiator. Chemseal is manufactured in straight-run sticks which are joined in the field with EMSEAL's exclusive "Universal-90's" which are factory-fabricated single-piece 90-degree units. In addition to guaranteeing watertightness,

EMSEAL's "Universal-90's" allow for much faster and secure installation by eliminating field cutting at angles. And because they are coated on both sides they can easily be installed at inside and outside corners as needed. (See Figure 3. Page 2)



EMSEAL's Factory-fabricated Universal-90

US Patent No. 9,200,437 Patent Pending

Uses and Applications

Manufactured to resist the harsh conditions found when expansion joint systems contact non-purified water or liquid-suspended chemicals. Some examples are:

- Waste Water Tanks
- Food Processing
- Industrial Testing Tanks
- Cooling Towers
- Chlorinated Water
- NSF-Compliance
- Petrochemical Plants
- HazMat Storage

Figure 1: Chemseal System in Typical Installation (Single-sided)

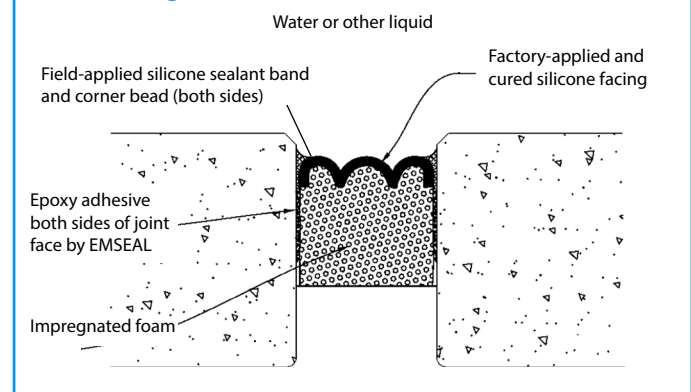


Figure 2: Chemseal System in Installation Where Contamination from Both Sides is Possible (Double-sided)

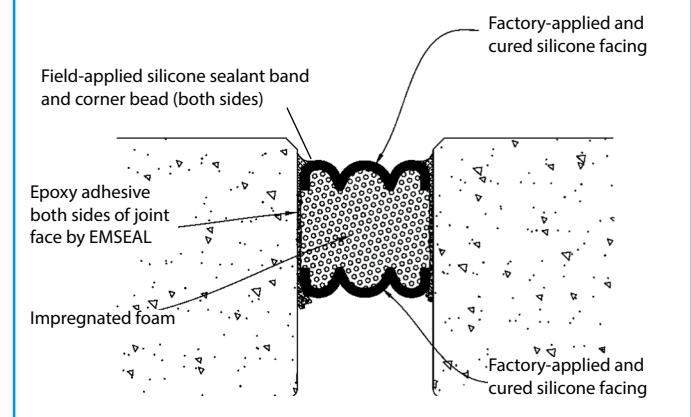
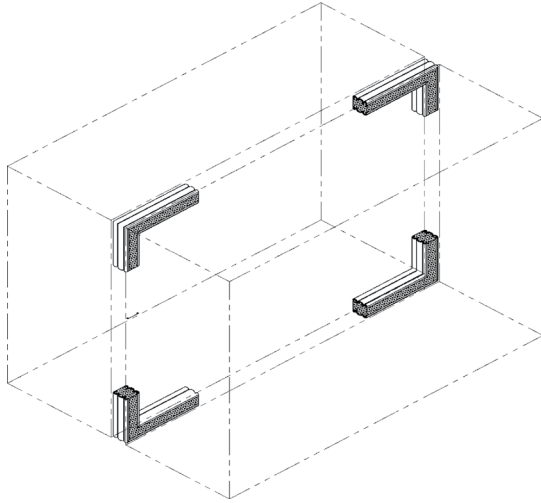


Figure 3: EMSEAL's warranted-watertight, factory-fabricated Universal-90's at inside and outside corners ensure continuity of seal while eliminating field execution of directional changes.



Double-Sided Straight-Run Option – Chemseal is also available with double-sided protection manufactured with the chemical-resistant bellows on both sides of straight lengths for use in applications where contamination from two sides is possible. (See Figure 2)

Movement Capability – +25% and -25% (50% total) of nominal material size. (See "Performance")

Versatility – The standard Chemseal silicone color is white. Uniform bellows appearance, chemical resistance, and ability to handle variations in joint size through size-switching are among other system features.

Performance

Capable of movements of +25%, -25% (50% total) of nominal material size.

Chemseal will maintain its watertight capabilities and shape under a constant submerged depth (headwater pressure) of up to 5 feet. For greater depths consider EMSEAL's Submerseal (up to 30 feet) — see page 3.

Standard sizes from 1/2" (12mm) to 4" (100mm).

Substrates must be solid, parallel, plumb and capable of resisting approximately 2.5 psi backpressure from the foam.

Chemical Resistance – Chemseal's silicone coating offers a chemical resistance surface. In the unique situation where a more extensive list of contact chemicals requires a greater degree of resistance, Chemseal is available with a polysulfide sealant in place of silicone. Consult EMSEAL as to chemical resistance and property characteristics of polysulfide.

Composition

- Chemseal is produced by coating an impregnated cellular foam with a chemical-resistant silicone liquid sealant.
- The silicone external facing is factory-applied to the foam at a width greater than the maximum offered extension and is cured before final compression.
- Silicone application and curing takes place in a factory-controlled environment. In contrast to field-applied liquid sealant and backer rod installations, no movement takes place during curing that can cause deformation or stresses in the material.
- When compressed, a bellows is created in the coating. As joint movement occurs the bellows simply folds and unfolds free of tension on the bondline, and virtually free of tensile stresses in the silicone material.
- The foam provides a resilient backing to the silicone coating, making the system capable of resisting head pressure and reasonable transient point loads.
- Chemseal is supplied in 6.56 LF (2m) shrink-wrapped lengths (sticks). "Universal-90" factory-fabricated corners with a standard length of 6-inches (one leg) and 12-inches (other leg) are also available. Chemseal is precompressed to less than the joint size for easy insertion. After removal from the shrink-wrap and hard board restraining packaging, it expands gradually.

Table 1: Typical Physical Properties of Chemseal Impregnated Foam

Property	Value	Test Method
Base Material	Cellular, high density, polyurethane foam	N/A
Impregnation	Proprietary, modified, water-based, acrylic	N/A
Temp. Service Range		ASTM C711
High	185°F (85°C)	
Low	-40°F (-40°C)	
UV Resistance*	No Changes – 2000 hours	ASTM G155-00A
Resistance to Aging*	No Changes – 2000 hours	ASTM G155-00A
Bleeding:	No bleeding when compressed to minimum of claimed movement, i.e. -25% of nominal size and when simultaneously heated to 185°F (85°C) for 3 hours	
-40°F to 180°F (-40°C to 85°C)		
Compression Set	Material recovers to +25% of nominal size within 24 hours after compression to -25% and simultaneous heating to 180°F (85°C) for 3 hours	

(*Accelerated Weatherometer)

Table 2: Typical Physical Properties of Silicone Coating

Property	Value	Test Method
Specific Gravity, 77°F (25°C)	1.33	ASTM D70
Peel Strength	25%	
Hardness (Shore A)	35	ASTM D2240
Tack Free	30 minutes	
Elongation	350%	ASTM D412
Tensile Strength	275 psi	ASTM D412

Installation

IMPORTANT: The following instructions are a summary. Refer to "Chemseal Install Data" and job-specific instructions of an EMSEAL technician for complete procedures. **FOR PROFESSIONAL USE ONLY. KEEP OUT OF REACH OF CHILDREN.**

- Store indoors at room temperature. Expansion is quicker when warm, slower when cold. Substrate temperature must range between 40°F (5°C) and 110°F (43°C). Shelf Life: One year in original unopened packaging stored at temperatures not to exceed 80°F (26°C).
- **Precautions** – Wear chemical-resistant gloves and/or barrier hand cream when handling liquid silicone sealant or epoxy. Remove promptly from skin with a commercial hand cleaner before eating or smoking. Avoid inhaling vapors.
- **Sequencing** – Install factory-fabricated transition and/or termination pieces first. Connect straight run material to in-place terminations and transitions. Cut closing pieces 3/8-inch (10mm) longer than the opening to be joined. Compress material longitudinally to fit.
- Ensure nominal material size matches joint size.
- Mix epoxy and trowel a thin layer onto the joint faces to at least the depth of the Chemseal foam.
- Remove shrink-wrap packaging and hardboard.
- Wipe silicone facing using clean lint-free rag made damp with solvent.
- Insert material into joint to determined depth below the substrate surface.
- The silicone liquid sealant is shipped in 10 oz. tubes (as used in standard caulking gun).
- Inject a band of liquid silicone between mating bellows' faces.
- Join lengths by pushing silicone-coated ends firmly together.
- Before the epoxy or the mixed silicone cures, force the tip of the bulk-gun cone between the foam and the substrate and inject a silicone sealant band. Tool the overflow sealant into a cover bead between the top of the silicone bellows and the substrate.
- Tool the silicone between joined lengths so that the bellows are not restrained by excess silicone. *NOTE: It is critical that any exposed foam ends or any other foam exposed during installation*

be field coated with the liquid silicone sealant supplied. The resilient foam backing is not resistant to chemical exposure.

- **Clean Up** – Remove silicone sealant from equipment before it cures using Acetone or other solvents. These solvents are not effective after the silicone has cured. Cured material may be removed by cutting it away with sharp tools, sandpapering or softening with chlorinated solvents*.
*(Observe solvent manufacturer's precautions and refer to Material Safety Data Sheets as well as local and federal requirements for same handling and use).

IMPORTANT: When final environment will be one of continued immersion allow silicone to attain a complete cure before filling area with liquid (7 days minimum).

- **Maintenance** – If the silicone bellows or sealant bands are damaged but remain intact, cut out the damaged area and recaulk. No primer is required. If the bond has been affected or the foam backing of the Chemseal is compromised, remove the damaged area, clean and prepare the substrates in accordance with instructions and reinstall new material.

CAD & Guide Specs

Guide specifications and CAD details are available online at emseal.com or by contacting EMSEAL.

Warranty

Standard or project-specific warranties are available from EMSEAL on request.

Availability & Price

Chemseal is available for shipment internationally. Prices are available from local representatives and/or directly from the manufacturer. The product range is continually being updated, and accordingly EMSEAL® reserves the right to modify or withdraw any product without prior notice.

EMSEAL's Submerseal Alternative

Submerseal is recommended for use in most submerged applications. Its single bellows construction and increased silicone thickness makes it ideally suited to accommodate the significant head-pressure of continuous submersion for depths up to 30-feet. When not limited or prohibited by contact with extraordinary chemical composition, EMSEAL recommends considering Submerseal for all applications requiring continuous immersion in chlorinated water and other liquids.

Table 3: Chemseal Sizing

Nominal Material Size at Mean T		Minimum (close to)		Maximum (opens to)		Total Movement		Depth of Seal	
1/2 in	(13mm)	3/8 in	(10mm)	5/8 in	(16mm)	1/4 in	(6mm)	1 5/8 in	(42mm)
5/8	(16)	15/32	(12)	25/32	(20)	5/16	(8)	1 5/8	(42)
3/4	(19)	9/16	(14)	15/16	(24)	3/8	(10)	1 5/8	(42)
1	(25)	3/4	(19)	1 1/4	(30)	1/2	(13)	2	(50)
1 1/4	(30)	7/8	(22)	1 5/8	(42)	3/4	(19)	2	(50)
1 1/2	(40)	1 1/8	(28)	2	(50)	7/8	(22)	2 3/8	(58)
1 3/4	(45)	1 1/4	(30)	2 1/4	(55)	1	(25)	2 3/8	(58)
2	(50)	1 1/2	(40)	2 5/8	(67)	1 1/8	(28)	2 1/2	(65)
2 1/4	(55)	1 5/8	(42)	2 7/8	(73)	1 1/4	(30)	2 1/2	(65)
2 1/2	(65)	1 7/8	(47)	3 1/4	(85)	1 3/8	(35)	2 3/4	(70)
2 3/4	(70)	2	(50)	3 1/2	(90)	1 1/2	(40)	2 3/4	(70)
3	(75)	2 1/4	(55)	3 7/8	(98)	1 5/8	(42)	2 3/4	(70)
3 1/4	(85)	2 1/2	(65)	4 1/4	(110)	1 3/4	(45)	3 3/8	(87)
3 1/2	(90)	2 5/8	(67)	4 1/2	(115)	1 7/8	(47)	3 1/2	(90)
3 3/4	(95)	2 3/4	(70)	4 7/8	(123)	2 1/8	(53)	3 1/2	(90)
4	(100)	3	(75)	5 1/4	(135)	2 1/4	(55)	3 1/2	(90)