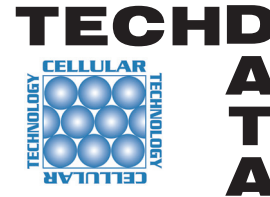




## DSM SYSTEM Watertight Joint System for Decks



### Product Description

The DSM SYSTEM builds on a track record of over 30 years of sealing horizontal plane joints with impregnated foam sealants and is an evolution of EMSEAL's DSH SYSTEM.

The system is comprised of:

- 1) Precompressed, silicone-and-impregnated-foam hybrid installed into
- 2) field-applied epoxy adhesive on the joint faces; with the silicone bellows locked to the joint faces with
- 3) a silicone sealant band (see Figure 1).

The DSM SYSTEM features an innovation in sealant technology in the form of a patent-pending acrylic adhesive infused into the cellular foam base material. This new chemistry incorporates a hydrophobic microsphere component never before available in a sealant formulation.

The material features sealing performance significantly greater than any acrylic impregnated predecessor. In addition, it is **odorless, clean handling, UV stable, non-staining, and features low temperature flexibility** not previously available in asphalt, wax, or isobutylene-based predecessors.

The result is extension of the usability of the product to applications where asphalt and wax-based predecessors did not work well under conditions of thermal shock (rapid opening and closing of joints during large temperature swings). These applications include joint-face adhered installations on top decks as well as intermediate decks.

Suitability is further extended to horizontal-plane joint applications in colder geographical regions to which asphalt and wax-based predecessors have not previously been recommended.

### Features

**Watertight**—the tensionless silicone bellows are installed just below the deck surface. This ensures watertightness is achieved at the deck surface.

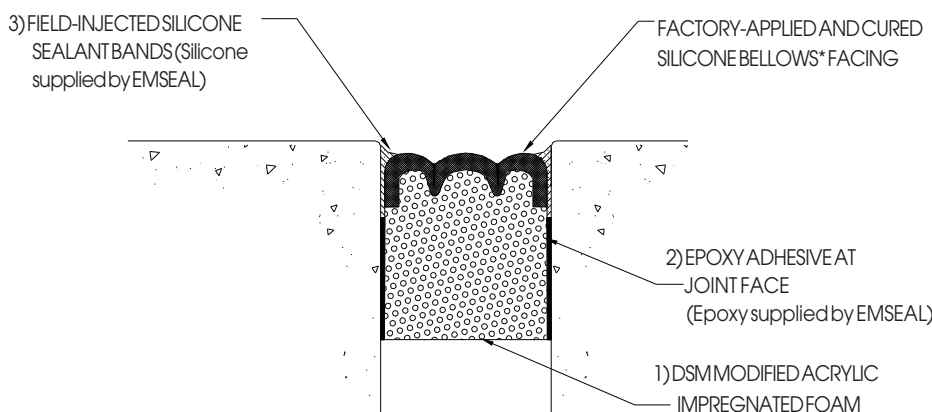
**Non-Invasive Anchoring**—there are no hard metal-to-concrete connections with the DSM SYSTEM. This includes embedded pins, anchors, screws, bolts or tracks, trays or rails. The system is locked to the joint faces by means of the 1) backpressure of the foam; 2) the epoxy adhesive, and 3) the injected

### Uses

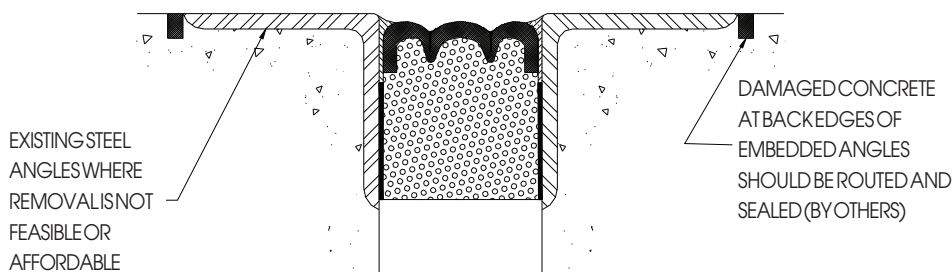
- Ideal for new construction and retrofit of old or failed joint systems in embedded metal angles where demolition and removal of the metal angles is not feasible or affordable.
- Ideal for lasting replacement of tee-to-tee caulk joints in precast parking decks and stadiums or where pedestrian or vehicular traffic is expected.

- |                 |                  |                          |
|-----------------|------------------|--------------------------|
| • decks         | • runways        | • stadiums               |
| • parking decks | • airport aprons | • arenas                 |
| • roadways      | • sidewalks      | • mall bridge connectors |
| • ice-floors    | • stair towers   | • perimeter joints       |

**Figure 1: DSM SYSTEM in Typical Installation--New or Retrofit**



**Figure 2: DSM SYSTEM in Existing Steel Angles--Retrofit**



**Note: For joint sizes less than 1" (25mm) a smooth, convex, single bellows is supplied.**

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. Details for watertight, field-fabricated transitions from deck to wall, at curbs, sidewalks, parapets, tees, and crosses are available from EMSEAL.

**Movement Capability**  
+30% and -25% (Total 55%) of nominal material size (see "Performance").

**Aesthetics & Versatility**—Standard color is gray (other colors available),

uniform bellows appearance, double sealing, fuel resistance, and an enhanced ability to handle variations in joint size are among other system features.

### Performance

- Capable, as a dual seal, of movements of +30%, -25% (55% total) of nominal material size. DSM will remain watertight up through movements of +50% of nominal material size with the silicone bellows providing the waterproofing, but at these levels of extension use should be limited to where no direct traffic is possible—as in deck-to-wall conditions or where the DSM SYSTEM is protected by a coverplate.

- Substrates must be parallel, plumb and capable of resisting approx. 2.5 psi backpressure from the foam.
- Standard sizes from 1/2" (12mm) to 6" (150mm). Other sizes available subject to review of application: consult EMSEAL.
- Fuel Resistance: Silicone sealant is not degraded by contact with fuel. Some swelling of the material will normally occur, but it will return to its original shape upon evaporation of the fuel.

**Composition**

- DSM is produced by coating an impregnated cellular foam with highway-grade silicone.
- The silicone external facing is factory applied to the foam at a width greater than maximum joint 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 reasonable transient point loads (see Performance).
- DSM SYSTEM is supplied in 6.56 LF (2m) shrink-wrapped lengths (sticks). It 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.

**Installation**

**IMPORTANT:** The following instructions are a summary. Refer to "DSM SYSTEM Install Data" and job-specific instructions of an EMSEAL technician for complete procedures.

- Store indoors at room temperature. Expansion is quicker when warm, slower when cold.
- Ensure material nominal size matches joint size.
- Mix epoxy and trowel a thin layer onto the joint faces to at least the depth of the DSM foam
- Apply a thin layer of epoxy to both sides of the joint face.

- Remove shrink-wrap packaging, hardboard. Heat using torch to expand material to a snug fit in the joint.
- Insert material into joint with at least a 1/4" (6mm) recess.
- Join lengths by pushing silicone coated ends firmly together.
- Wipe silicone facing using clean, lint-free rag made damp with solvent.
- Before the epoxy cures, force the tip of the sealant tube between the foam and the substrate and inject a silicone sealant band. Tool overflow sealant into a cove bead between the top of the silicone bellows and the substrate. Tool silicone between joined lengths so that bellows is not restrained by excess silicone.

**Warranty**

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

**CAD Details & Guide Specs**

Guide specifications and CAD details are available at [www.emseal.com](http://www.emseal.com).

**Availability & Price**

DSM SYSTEM is available for shipment internationally. Prices are available from local representatives and/or directly from the manufacturer. EMSEAL® reserves the right to modify or withdraw any product without prior notice.

Property	Value	Test Method
BASE MATERIAL <b>Impregnation</b>	CELLULAR, HIGH DENSITY, POLYURETHANE FOAM <b>Proprietary, modified, water-based, acrylic</b>	N/A N/A
TENSILE STRENGTH <b>Elongation - ultimate</b>	22.3 PSI MIN (153 kPa) <b>157% min</b>	ASTMD3574 E ASTM D3574 E ASTMC711
TEMPERATURE SERVICE RANGE HIGH LOW	185°F (85°C) -40°F (-40°C)	
<b>UV RESISTANCE</b> (Accelerated Weatherometer) RESISTANCE TO AGING	<b>No CHANGES--2000 HOURS</b>  No CHANGES--2000 HOURS	<b>ASTM G155-00A</b>  ASTM G155-00A
<b>Bleeding:</b> -40°F to 180°F (-40°C to 85°C)	<b>No bleeding when compressed to minimum of claimed movement i.e. -25% of nominal size and when simulateously heated to 180°F (85°C) FOR 3 HOURS</b>	
COMPRESSION SET	MATERIAL RECOVERS TO +30% OF NOMINAL SIZE WITHIN 24 HOURS OF COMPRESSION TO -25% AND SIMULTANEOUS HEATING TO 180°F (85°C) FOR 3 HOURS	

Property	Value
COLOR	DARK GRAY
<b>Percent Solids (minimum)</b>	<b>96</b>
SPECIFIC GRAVITY	1.26 - 1.34
<b>Following tests conducted on Sealant Cured after 21 days at 25°C (77°F) and 50% RH:</b>	
ELONGATION PERCENT MINIMUM	1400
<b>Joint Modulus at 50 percent Elongation, psi (kPa) maximum</b>	<b>7(48)</b>
JOINT MODULUS AT 100 PERCENT ELONGATION, PSI (KPa) MAXIMUM	8(55)
<b>Joint Modulus at 150 percent Elongation, psi (kPa) maximum</b>	<b>9(62)</b>
ADHESION TO CONCRETE, MINIMUM PERCENT ELONGATION	+600
<b>Adhesion to Asphalt, minimum percent Elongation</b>	<b>+600</b>
JOINT MOVEMENT CAPABILITY, +100/-50 PERCENT, 10 CYCLES	NO FAILURE
<b>Weatherability</b>	<b>Unaffected by climatic extremes</b>
FLEXIBILITY	CURED SEALANT STAYS RUBBERY FROM -45 TO 149°C (-50 TO 300°F)

Percent Volume Swell - Visual	
Fluid	Silicone Joint Sealant
JP-4	5-20 PERCENT
<b>Skydrol B</b>	<b>None</b>
50/50 GLYCOL/H2O	NONE
<b>Hydraulic Fluid</b>	<b>None</b>

AFTER DRYING, ALL SAMPLES PASSED +100/-50% MOVEMENT TESTING.

Nominal Material Size (Joint Size at Mean T°F)	Depth of Seal	Min. Joint (closes to)	Max. Joint (opens to)
1/2" (12mm)	1 1/2" (40mm)	3/8" (10mm)	5/8" (16mm)
3/4" (20mm)	1-1/2" (40mm)	9/16" (14mm)	15/16" (24mm)
1" (25mm)	2" (50mm)	3/4" (20mm)	1-1/4" (30mm)
1-1/4" (30mm)	2" (50mm)	7/8" (22mm)	1-5/8" (42mm)
1-1/2" (40mm)	2 1/2" (65mm)	1-1/8" (28mm)	2" (50mm)
1-3/4" (45mm)	2-1/2" (65mm)	1-1/4" (30mm)	2-1/4" (55mm)
2" (50mm)	2-1/2" (65mm)	1-1/2" (40mm)	2-5/8" (67mm)
2-1/4" (55mm)	2-1/2" (65mm)	1-5/8" (42mm)	2-7/8" (73mm)
2-1/2" (65mm)	2-3/4" (70mm)	1-7/8" (47mm)	3-1/4" (85mm)
2-3/4" (70mm)	2-3/4" (70mm)	2" (50mm)	3-1/2" (90mm)
3" (75mm)	2-3/4" (70mm)	2-1/4" (55mm)	3-7/8" (98mm)
3-1/4" (85mm)	3-1/2" (90mm)	2-1/2" (65mm)	4-1/4" (110mm)
3-1/2" (90mm)	3-1/2" (90mm)	2-5/8" (67mm)	4-1/2" (115mm)
3-3/4" (95mm)	3-1/2" (90mm)	2-3/4" (70mm)	4-7/8" (120mm)
4" (100mm)	3-1/2" (90mm)	3" (75mm)	5-1/4" (135mm)
5" (125mm)	5-1/2" (140mm)	3-3/4" (95mm)	6-1/2" (165mm)
6" (150mm)	6" (150mm)	4.5" (115mm)	7-1/8" (180mm)

- Sizes in excess of 4" must be covered by a coverplate when the joint will experience pedestrian or vehicular traffic.
- For sizes not shown consult EMSEAL.
- Select nominal material size to correspond to joint-gap size at mean temperature.
- Material supplied in shrink-wrapped sticks of 6.56 ft. (2 M).