



**BUILDING TRUST** 

# PRODUCT DATA SHEET BEJS-DS System

### Dual-Sided Watertight Expansion Joint System for Bridges, Roadways, and Tunnels

# **Product Description**

The **BEJS-DS System** (Bridge Expansion Joint Systems-Double Sided) by Sika Emseal is a dual-sided expansion joint designed for primary use in sealing bridges, roadways and tunnels where upper surface and lower exposure requires a dual-sided seal. It is often used when positive-side installation is attainable demanding a watertight seal, but the negative side calls for a vapor or moisture barrier.

The System is comprised of: 1) Precompressed, silicone-andimpregnated-foam hybrid installed into 2) field-applied epoxy adhesive on the joint faces; with the dual-faced silicone bellows locked to the joint faces with 3) a silicone sealant band on the watertight side (see Figure 1).

The BEJS-DS System features an innovation in sealant technology in the form of a microsphere-modified, 100% acrylic impregnation infused into the cellular foam base material.

The material is odorless, clean handling, UV stable, non-staining, and features low temperature flexibility not previously available in asphalt, wax, or isobutylene-based predecessors or competitors.

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 jointface adhered installations on bridge decks, wing walls, abutments, jersey barriers, precast panels, etc.

Suitability is further extended to 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 slightly recessed from the top/outer surface of the substrate. The addition of a final silicone band between the substrate and the bellows ensures watertightness to that particular face.

**Non-Invasive Anchoring** – there are no hard metal-to-concrete connections with the BEJS-DS 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 backpressure of the foam; the epoxy adhesive, and 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. "Custom Transitions" are factory fabricated transition pieces from Emseal that can be installed at inside corners and outside corners as needed and are warranted by Emseal to be watertight through the entire movement capability of the product. Alternatively, details for field-fabricated transitions from deck to wall, ceiling to wall, at curbs, sidewalks, and parapets are available from Emseal.



**Movement Capability –** +60% and -60% (Total 120%) of nominal material size.

**Aesthetics & Versatility** – Standard color is black. Uniform bellows appearance, fuel resistance, and an enhanced ability to handle variations in joint size are among other System features

# **Uses and Applications**

- In bridges, roadways, and tunnels where a dual-sided watertight seal is required.
- Ideal for new construction and retrofit bridge and tunnel preservation of old or failed joint Systems in concrete or rebuilt joint edges. Use in embedded metal angles where demolition or removal of the metal angles is not feasible and where existing joint opening is suited to the movement capability of BEJS.

## Performance

- Substrates must be parallel, plumb and capable of resisting approx. 2.5 psi backpressure from the foam.
- Standard sizes from 1 1/2" (40mm) to 4" (100mm). 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 silicone material will normally occur, but it will return to its original shape upon evaporation of the fuel.

#### **BEJS-DS Typical Concrete**





#### **BEJS-DS in Metal Angles**



#### **BEJS-DS in Negative-side Installation**





## **Composition**

- BEJS-DS is produced by coating an impregnated cellular foam with highway-grade silicone on both sides of the joint.
- 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.
- BEJS System 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 "BEJS 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.
- Properly prepare substrates.
- 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 BEJS foam
- Apply a thin layer of epoxy to both sides of the joint face.
- Remove shrink-wrap packaging, hardboard. If necessary, heat using torch to expand material to a snug fit in the joint.
- Insert material into joint with a 3/4" (20mm) recess. For reels recess 1/2" (12mm).
- Join lengths by pushing silicone coated ends firmly together.
- Wipe silicone facing using clean, lint-free rag 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.

# **CAD & Guide Specs**

Guide specifications and CAD details re available online at Emseal.com or by contacting Emseal.

#### Warranty

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

## **Availability & Price**

BEJS-DS System is available for shipment internationally. Prices are available from local representatives and/or directly from the manufacturer. Sika Emseal reserves the right to modify or withdraw any product without prior notice.





Table 1: Typical Physical Properties of BEJS Foam				
Property	Value	Test Method		
Base Material	Cellular, high density, polyurethane foam	N/A		
Impregnation	Proprietary, modified, water-based, acrylic	N/A		
Temperature Service range High Low	185°F (85°C) -40°F (-40°C)	ASTM C711		
UV resistance	No Changes – 2000 hours	ASTM G155-00A		
(Accelerated Weatherometer) resistance to aging	No Changes – 2000 hours	ASTM G155-00A		
Bleeding: -40°F to 180°F (-40°C to 85°C)	No bleeding when compressed to minimum of claimed movement i.e. -50% of nominal size and when simultaneously heated to 180°F (85°C) for 3 hours			
Compression set	Material recovers to +50% of nominal size within 24 hours of compression to -50% and simultaneous heating to $180^{\circ}$ F (85°C) for 3 hours			

Table 2: Typical Physical Properties of Silicone Coating			
Property	Value		
Color	Black		
Percent Solids (minimum)	96		
Specific Gravity	1.26 – 1.34		
Following tests conducted on Sealant Cured after 21 days at 25°C (77°F) and 50% RH:			
Elongation percent minimum	1400		
Joint Modulus at 50 percent Elongation, psi (kPa) maximum	7(48)		
Joint Modulus at 100 percent Elongation, psi (kPa) maximum	8(55)		
Joint Modulus at 150 percent Elongation, psi (kPa) maximum	9(62)		
Adhesion to Concrete, minimum percent Elongation	+600		
Adhesion to Asphalt, minimum percent Elongation	+600		
Joint Movement Capability, +100/-50 percent, 10 cycles	No Failure		
Weatherability	Unaffected by climatic extremes		
Flexibility	Cured sealant stays rubbery from -45 to 149°C (-50 to 300°F)		

#### Table 3: Approximate Volume Change of Silcone Coating After Exposure to Fluids

Percent Volume Swell - Visual		
<u>Fluid</u>	Silicone Joint Sealant	
JP-4	5 – 20%	
Skydrol B	None	
50/50 Glycol/H2O	None	
Hydraulic Fluid	None	After drying, all samples passed +100/-50% movement testing.

#### EMSEAL JOINT SYSTEMS, LTD

25 Bridle Lane Westborough, MA 01581 USA Phone: 508.836.0280 Fax: 508.836.0281 www.emseal.com/bridge

#### EMSEAL, LLC

111 Royal Group Crescent Woodbridge, ON L4H 1X9 Canada Phone: +1-416-740-2090 Fax: +1-416-740-0233 www.emseal.com

#### SIKA CORPORATION

201 Polito Avenue Lyndhurst, NJ 07071 USA Phone: +1-800-933-7452 Fax: +1-2019336225 www.usa.sika.com **Product Data Sheet** Emseal BEJS-DS May 2022 Version SE-1.1



**Jika**®