

Specialty Expansion Joint Systems

Bridges



Expansion Joint Systems
for Architectural,
Parking Garage and
Bridge Applications

Bridge the World with Leading Infrastructure Solutions

Solutions for the Long Term

Innovation, quality, responsiveness and productivity are integral components of the D.S. Brown mission statement. With its complete vertical integration and custom manufacturing capabilities, The D.S. Brown Company has become a leader in the transportation infrastructure construction market while expanding its customer base to include other industries. Since 1890, customers have continued to rely on the longevity and proven performance of D.S. Brown products.

Specialty Expansion Joint Systems

Table of Contents

Delastic® Preformed Compression Seals	3
J & JP-Series Sealing Systems	4-5
AF Concourse Seals.....	6
V-Seal Expansion Joint Systems.....	6
Delastic-LS® Pourable Bridge Seals Delcrete® Elastomeric Concrete	7
WAF System	8
Matrix™ 502 Asphaltic Expansion Joint.....	8

Delastic® Preformed Compression Seals

In 1960 The D.S. Brown Company began designing and extruding the first generation of Delastic® Preformed Compression Seals. Since that time continuous improvements have been made to this versatile, cost-effective joint sealing solution. To withstand the demanding requirements of bridge/highway installations, all Delastic® Preformed Compression Seals are extruded from high-quality polychloroprene (neoprene) compounds which satisfy the standard specifications (ASTM D3542 and D2628) for Preformed Elastomeric Joint Seals for Bridges and Pavements.

In addition to highway and bridge applications, Delastic® Compression Seals have also been used in spillways, dams, parking structures, stadium ramps and pedestrian overpasses. Information on additional seal designs is available.

Installation

In all installation applications, the joint width must be properly set for the specified Delastic® seal. Also, the

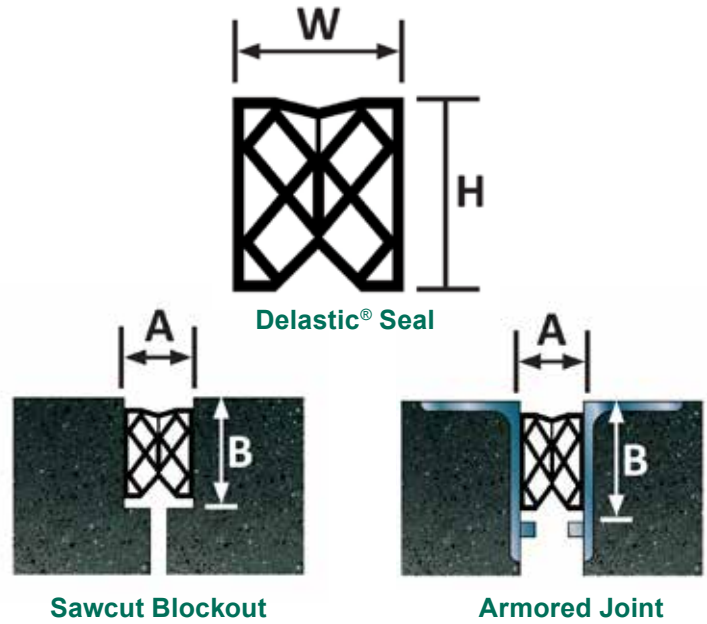
Design Data

The table below can be used to select the appropriate Delastic® Compression Seal for your project. In addition to accommodating perpendicular movements (summarized in the table), Delastic® seals are also capable of accepting approximately 15-20% lateral shear, vertical shear and rotational movements.

Delastic® Seal	Seal Characteristics			Joint Design Criteria		
	Nominal Width (W)	Nominal Height (H)	Maximum Movement	Narrowest Opening (A)	Widest Opening (A)	Minimum Depth (B)
CV-1250	1.25 (32)	1.25 (32)	0.50 (13)	0.56 (14)	1.06 (27)	2.00 (51)
CV-1625	1.63 (41)	1.88 (40)	0.66 (17)	0.72 (18)	1.38 (35)	2.50 (64)
CV-1752	1.75 (44)	1.75 (44)	0.68 (17)	0.81 (21)	1.49 (38)	2.75 (70)
CV-2000	2.00 (51)	2.00 (51)	0.82 (21)	0.88 (22)	1.70 (43)	2.95 (75)
CV-2250	2.25 (57)	2.33 (59)	0.85 (22)	1.06 (27)	1.91 (49)	3.25 (83)
CV-2502	2.50 (64)	2.50 (64)	1.00 (25)	1.13 (29)	2.13 (54)	3.50 (89)
CV-3000	3.00 (76)	3.25 (83)	1.30 (33)	1.25 (32)	2.55 (65)	4.25 (108)
CV-3500	3.50 (89)	3.50 (89)	1.60 (41)	1.38 (35)	2.98 (76)	5.25 (133)
CV-4000	4.00 (102)	4.00 (102)	1.83 (46)	1.57 (40)	3.40 (86)	5.75 (146)
CA-4500	4.50 (114)	4.50 (114)	2.27 (58)	1.56 (40)	3.83 (97)	6.25 (159)
CA-5001	5.00 (127)	5.00 (127)	2.41 (61)	1.84 (47)	4.25 (108)	6.75 (171)
CA-6000	6.00 (152)	6.00 (152)	3.10 (79)	2.00 (51)	5.10 (129)	8.50 (216)

First numbers represent inches; metric (mm) shown in parentheses. Joint opening dimensions (A) are based on minimum and maximum pressures allowed in ASTM D3542. Minimum depth dimensions (B) include a 0.25 inch (6mm) recess below the roadway surface.

Compression seals are not recommended on skewed angles over 15 degrees. Consult with a D.S. Brown [Sales Representative](#) on joint options for higher skews.



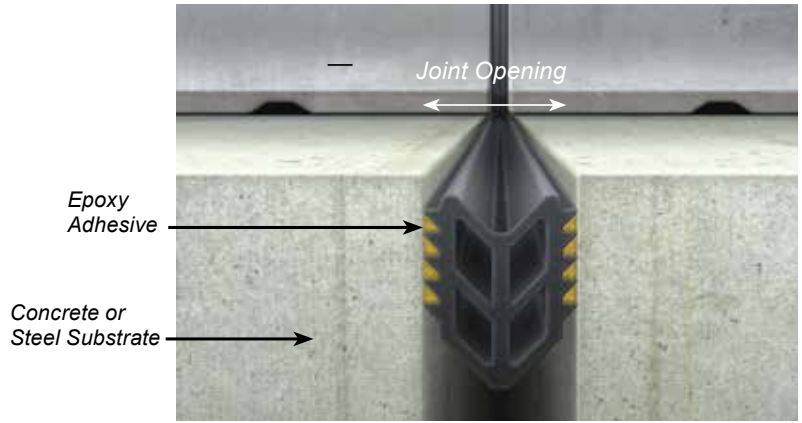
vertical faces of the joint must be clean and free of spalled concrete. For proper performance, keep the lubricant-adhesive above freezing (32°F).

Manual and automatic tools are available to facilitate installation. D.S. Brown DSB 1516 or DSB 1520 lubricant-adhesive is used primarily to lubricate the seal for installation purposes. The DSB lube products meet ASTM D2835 and D4070 standards respectively.

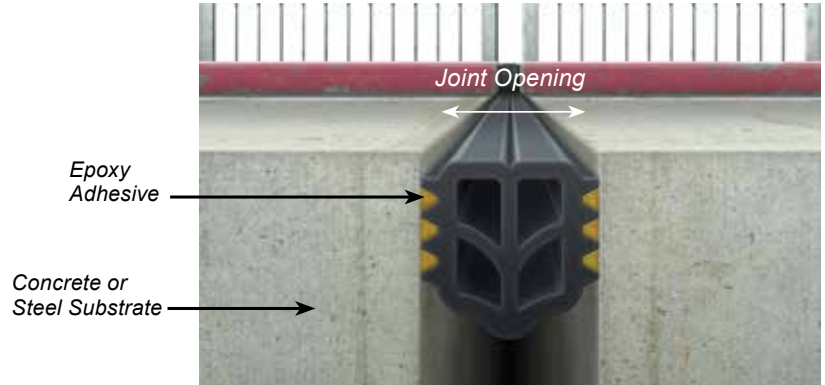
J & JP-Series Sealing Systems

The J & JP-Series Sealing Systems include an extruded elastomeric profile and a high-strength, two-part epoxy-based structural adhesive. The product, when inserted into an expansion joint in a substrate, will seal the opening from the intrusion of water and debris. This unique design allows the seal to function under compression and in tension.

The standard J-Series is used for parking garage applications, where normal and vertical movements are a design parameter. The JP-Series is designed for applications that are required to meet ADA guidelines and provide a smooth walking surface for pedestrians. In addition to architectural and parking garage projects, the J & JP-Series can also be used for bridge applications.



J-Series Profile



JP-Series Profile

Product Size and Movement

Product Name	Seal Nominal Width in (mm)	Seal Operating Range in (mm)	Total Movement in (mm)	Minimum Installation Width in (mm)	Maximum Installation Width in (mm)**	Minimum Blockout Depth in (mm)
J-100	1.00 (25)	0.50 (13) ↔ 1.50 (38)	1.00 (25)	0.50 (13)	1.00 (25)	2.00 (51)
J-150	1.50 (38)	0.75 (19) ↔ 2.38 (60)	1.63 (41)	0.75 (19)	1.50 (38)	2.63 (67)
J-200	2.00 (51)	1.00 (25) ↔ 3.00 (76)	2.00 (51)	1.00 (25)	2.00 (51)	3.25 (83)
J-250	2.50 (64)	1.25 (32) ↔ 3.88 (98)	2.63 (67)	1.25 (32)	2.50 (64)	3.75 (95)
J-300	3.00 (76)	1.50 (38) ↔ 4.50 (114)	3.00 (76)	1.50 (38)	3.00 (76)	4.75 (121)
J-350	3.50 (89)	1.75 (44) ↔ 5.00 (127)	3.25 (83)	1.75 (44)	3.50 (89)	5.38 (137)
J-400	4.00 (102)	2.00 (51) ↔ 5.88 (149)	3.88 (98)	2.00 (51)	4.00 (102)	6.00 (152)
J-500	5.00 (127)	2.50 (64) ↔ 7.26 (184)	4.76 (121)	2.50 (64)	5.00 (127)	7.50 (191)

Product Name	Seal Nominal Width in (mm)	Seal Operating Range in (mm)	Total Movement in (mm)	Minimum Installation Width in (mm)	Maximum Installation Width in (mm)**	Minimum Blockout Depth in (mm)
JP-100	1.00 (25)	0.65 (17) ↔ 1.35 (34)	0.75 (18)	0.65 (17)	1.00 (25)	1.88 (48)
JP-150	1.50 (38)	0.98 (25) ↔ 2.02 (51)	1.04 (26)	0.98 (25)	1.50 (38)	2.75 (70)
JP-200	2.00 (51)	1.30 (33) ↔ 2.70 (69)	1.40 (36)	1.30 (33)	2.00 (51)	3.25 (83)
JP-250	2.50 (64)	1.63 (41) ↔ 3.38 (86)	1.75 (45)	1.63 (41)	2.50 (64)	4.00 (102)
JP-300	3.00 (76)	1.95 (50) ↔ 4.02 (102)	2.07 (53)	1.95 (50)	3.00 (76)	5.00 (127)
JP-350	3.50 (89)	2.30 (58) ↔ 4.75 (121)	2.45 (62)	2.30 (58)	3.50 (89)	5.50 (140)
JP-400	4.00 (102)	2.60 (66) ↔ 5.40 (137)	2.80 (71)	2.60 (66)	4.00 (102)	5.88 (149)
JP-500	5.00 (127)	3.25 (83) ↔ 6.75 (172)	3.50 (89)	3.25 (83)	5.00 (127)	7.75 (197)

First numbers represent inches; metric (mm) shown in parentheses.

** The joint width at the time of installation must not exceed the nominal seal width.

** For uneven joints it is especially important to ensure that the smallest width does not exceed the nominal seal width anywhere along the full length of the joint.

Features and Benefits

- **Ease of Installation** – J & JP Seals have specially designed internal webbing to facilitate installation and do not require the use of a vacuum to collapse or inflate the seal for purpose of installation.
- **Concrete and Steel Adhesive is VOC Compliant** – The adhesive has a zero VOC rating. The material resists humidity, salt spray and extreme temperature ranges.
- **Fatigue Tested for One Million Cycles** – The profiles were cyclically opened and closed in tension and compression for one million cycles. The seals were stretched to 200% of their original width with no bond failure.
- **No Blockout Recess Required** – The J & JP-Series are a solid choice with the precast concrete industry in that no blockout recess is required. The seal profile can be installed directly between the joint interfaces.

Physical Properties

The seal profile is available in two specific designs. The profiles are extruded from high-quality polychloroprene (neoprene) material meeting ASTM D3542 with physical requirements as shown in Table 1.

The adhesive is a high-strength, two-part modified epoxy-based material. It is 100% reactive and will develop a strong bond in approximately 24 hours at room temperature. For typical physical properties, see Table 2 below.

Table 1

Physical Properties of the Neoprene Seal	ASTM Test Method	Requirement
Tensile strength, min.	D412	2000 psi
Elongation at break, min.	D412	250%
Hardness, Type A durometer	D2240	60±5
Oven aging, 70h @ 212°F	D573	
Tensile strength, max.		20% loss
Elongation, max.		20% loss
Hardness, Type A duro.		0 to +10 pts
Oil swell, ASTM Oil No. 3, 70h @ 212°F		
Weight change, max.	D471	45%
Ozone resistance, 20% strain	D1149	
70H aging, D573, 3ppm in air		No cracks

Table 2

Physical Properties of the High-Strength Adhesive
ASTM C-881, AASHTO M-235 Types I, II, IV, V Grade 3, Classes B & C
Gel Time 60 gm mass 35 minutes at 75°F (24°C)
Compressive Strength ASTM D-695:10270 psi (70.8 MPa) at 7 days
Concrete Bond Strength ASTM C-882: 2660 psi (18.34 MPa) at 2 days
4650 psi (32.06 MPa) at 14 days
Modulus of Elasticity 287,250 psi (1980.6 MPa)
Water Absorption ASTM D-570 0.10%
Mixed Color - gray

Delivery

The J & JP Seals are delivered to the jobsite in continuous lengths.

Limitations

The J & JP-Series waterproofing capabilities are dependent on the internal forces generated while the seal is under compression. For this reason, it is very important that the proper seal size be selected from the Product Size and Movement Table found in this brochure.

AF Concourse Seals

Delastic® AF preformed seals provide a level top surface that is particularly suited for pedestrian traffic. In the compressed state, the top sections are much closer together and form a level walking surface and a pleasing visual effect for exposed vertical applications. D.S. Brown concourse seals are designed for applications that are required to meet ADA guidelines. The seals are available in both polychloroprene and EPDM compounds.



AF Series

Product Size and Movement

Delastic® Seal	Seal Characteristics			Joint Design Criteria		
	Nominal Width (W)	Nominal Height (H)	Maximum Movement	Narrowest Opening (A)	Widest Opening (A)	Minimum Depth (B)
AF-200	2.00 (51)	1.50 (38)	0.80 (20)	.90 (23)	1.70 (43)	1.75 (44)
AF-225	2.25 (57)	1.50 (38)	0.90 (23)	1.00 (25)	1.90 (48)	1.75 (44)
AF-250	2.50 (64)	2.00 (51)	1.10 (28)	1.20 (30)	2.13 (54)	2.20 (56)
AF-300	3.00 (76)	2.12 (54)	1.45 (37)	1.40 (36)	2.55 (65)	2.50 (64)
AF-400	4.00 (102)	2.81 (71)	1.80 (46)	1.60 (41)	3.40 (86)	3.20 (81)
AF-500	5.00 (127)	3.25 (83)	2.30 (58)	1.95 (50)	4.25 (108)	3.70 (94)
AF-600	6.00 (152)	4.00 (102)	2.85 (72)	2.25 (57)	5.10 (130)	4.75 (121)

First numbers represent inches; metric (mm) shown in parentheses.

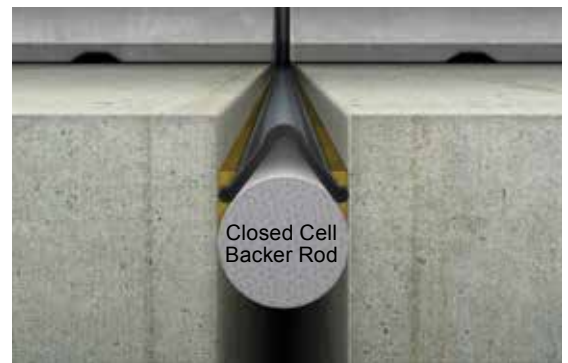
V-Seal Expansion Joint System

Product Description

V-Seal is a preformed extruded EPDM seal that can be bonded to concrete, steel or elastomeric concrete with a quick-setting V-Epoxy-R adhesive.

Basic Uses

Typical applications include: control joint and expansion joints for rehabilitation projects for bridges, highways, parking structures, stadiums, plazas, water and sewage treatment facilities and other types of concrete construction.



Advantages

- EPDM seal is weather, UV, ozone and tear-resistant
- Designed for use under extended water immersion
- V-Epoxy-R adhesive bonds in excess of 1500 PSI
- EPDM is flexible at lower temperatures.
- Easy rehabilitation of existing expansion joints
- Quick installation

V-Seal Chart

Property Name	Min. Opening		Min. Install Wd.		Max. Install Wd.		Max Opening		Min Depth
	Width	Height	Width	Height	Width	Height	Width	Height	
V-300	0.625"	2.250"	1.750"	2.125"	3.500"	1.750"	3.625"	1.500"	2.500"
V-400	1.000"	2.750"	2.250"	2.500"	4.500"	2.000"	5.000"	1.375"	3.500"
V-500	1.000"	3.375"	3.000"	3.125"	5.000"	2.750"	6.000"	1.625"	4.000"

Delastic-LS® Pourable Bridge Seals

Product Description

Delastic-LS® Sealant is a two-component, self-leveling, fast-curing, urethane sealant for use in engineered joints.

Basic Uses

Typical applications include: control joint and expansion joint systems for bridges, highways, parking structures, stadiums, plazas, water and sewage treatment facilities and other types of concrete construction. Delastic-LS® Sealant is very low in modulus and exhibits high elongation.

Delastic-LS® Sealant Technical Data from Lab Tests

Property	Test Method	Test Results
Movement capability	ASTM C719	+100% -50%
Tensile strength	ASTM D412	120 psi
Ultimate elongation	ASTM D412	1500%
Hardness (Shore A)	ASTM C661	30 ± 5
Low temperature (Flexibility @ -40°F)	ASTM D1790	Pass
Heat aging	ASTM C920	2%
Pot life	ASTM C603	20 minutes
Skin over time @ 70°F		45 minutes
Recovery	ASTM C920 - Bond Durability Test Blocked @ 50% for 48 hours	90%
Water immersion	Samples between masonry blocks will withstand water immersion while elongated 100%	

Advantages

- Cures rapidly to a soft elastomer, having exceptional elastomeric properties
- Delastic-LS® Sealant has been designed for use under extended water immersion.
- Contains no asphalt or coal tar additives, and is among the most dimensionally stable sealants available.

Delastic-LS® Installation Chart

Joint Opening (in.)	Delastic-LS® Thickness (in.)	Backer Rod Recess (in.)	Approx. Lf/per Gallon
1	1/2	7/8	32 feet
1-1/2	5/8	1-1/8	17 feet
2	3/4	1-3/8	12 feet

*Approximate estimate only, actual coverage amount can vary based on jobsite and/or installation conditions.



Delastic-LS®
Installation

Packaging

Available in one-gallon containers

Color

Gray

Delcrete® Elastomeric Concrete

Product Description

The D.S. Brown Company's line of expansion joints can be used with headers made of Delcrete® Elastomeric Concrete to create a highly durable, cost-effective and watertight expansion joint system for bridges. Delcrete® Elastomeric Concrete is a pour-in-place, free-flowing, two-part polyurethane-based elastomeric concrete. Delcrete® has been compounded to bond to a variety of surfaces including steel and concrete. Following are the design features of the industry's premier elastomeric concrete:

- Polyurethane chemistry
- Non-brittle over extreme temperature ranges
- Resistant to nearly all chemicals
- One-hour cure time
- Long-term repair solution

Although initially developed for the bridge rehabilitation market, the outstanding performance record of Delcrete® has resulted in bridge owners specifying Delcrete® for new bridge construction projects as well.



Delcrete® Elastomeric Concrete

Bridges

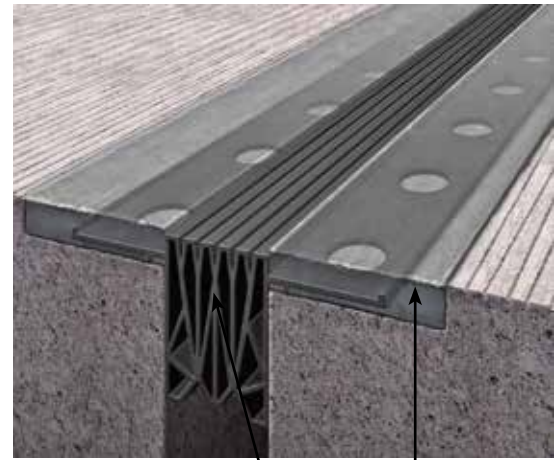
WAF System

WAF System is an excellent expansion joint for parking garages. In larger movement glands the “honeycomb” design assures a watertight walking surface. Various seal sizes are available.

Design Data

WAF System	Block Out Width*	Block Out Height	Total Movement
WAF-100	9.75"	0.75"	0.75" (19)
WAF-250	9"	0.75"	1.50" (38)
WAF-300	9.75"	0.75"	1.90" (48)
WAF-400	10.75"	0.75"	2.40" (61)

*Includes joint opening width and varies slightly depending on structure temperature. First numbers represent inches; metric (mm) shown in parentheses.



WAF System

WAF Seal

Delpatch™ Elastomeric Concrete

Features and Benefits

The WAF Seals are cast in Delpatch™ Elastomeric Concrete:

- Delpatch™ Elastomeric Concrete is a quick-setting, free-flowing material that is easily installed and can accept traffic within one hour of placement.
- The minimum installation temperature for Delpatch™ is 45°F.
- Delpatch™ is resistant to spalling and has excellent bonding characteristics.
- No external heat is necessary to cure Delpatch™ Elastomeric Concrete.



Matrix™ 502 System

Matrix™ 502 System

The Matrix™ 502 Asphaltic Expansion Joint is a hot-applied, field-molded and constructed expansion joint system that is primarily composed of a uniquely formulated polymer modified asphalt binder that is mixed with specially selected and processed aggregate.

The Matrix™ 502 Asphaltic Expansion Joint can be used for both expansion and fixed end joints at abutments or piers in many bridge types including

concrete slab, concrete beam, prestressed concrete and steel beam, either simple or multi-span, in both new construction and rehabilitation projects.

The Matrix™ 502 Asphaltic Expansion Joint provides a watertight, smooth riding joint that can accommodate up to a maximum of ± 3/4" (19 mm) of annual joint movement and can be used for expansion joint gaps up to 3" (75 mm) wide. The joint is installed in cutouts in the deck surface ranging from 2 to 6 inches deep (5 to 15 cm) and 20 to 24 inches (51 to 61 cm) wide.