



BEJS SYSTEM

DO NOT OPEN ANY PACKAGES or install this material until all members of your crew have read and understand these instructions as well as all relevant SDS sheets. If you do not understand any part of these instructions CALL EMSEAL: 508-836-0280 **IMPORTANT: This product cannot perform its intended function if not properly installed.**

This document does not purport to address all of the safety concerns, if any, associated with this product's use. It is the responsibility of the user of this document to establish appropriate safety and health practices and to determine the applicability of regulatory limitations prior to use. The use of a dust mask, safety goggles and gloves is recommended. Keep out of reach of children.

NOTE: BEJS sticks are recessed 3/4" (20mm) from road surface. BEJS-Pedestrian is recessed 1/4" (6mm) from walkway surface.

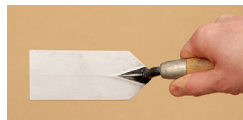
INSTALL DATA

1 Equipment & Material Storage

In addition to safety equipment required to comply with applicable federal, state and local safety regulations, equipment to prepare and repair the joint-faces, as well as normal tools of the trade, the following are required:

Equipment Checklist:

- ☐ Duct Tape (2 ½ times the length of joint)–optional–if you care about masking the joint for drips.
- ☐ Tape measure
- ☐ Heavy duty electric, plug-in, low speed - high torque drill for mixing thick epoxy
- ☐ 1 ½" diameter, paddle-type, epoxy "jiffy mixers"
- ☐ Sausage caulk guns to hold 20-oz silicone sausages
- ☐ Sausage-gun nozzles (cones)
- ☐ Long-bladed, serrated bread knife
- ☐ Spray bottle with water
- ☐ Hacksaw
- ☐ Spatula to scrape epoxy from can
- ☐ Chemical-resistant gloves
- ☐ 2-inch wide (50mm) margin trowels for applying epoxy adhesive on joint faces
- ☐ Caulk knives for tooling sealant bands
- ☐ Acetone or effective alternative solvent for cleaning joint-faces, trowels and mixer tools
- ☐ Clean lint-free, 100% cotton rags



MATERIAL STORAGE:

Cold Days: Store material, off the floor, inside at above 68°F (20°C). It will recover slower when cold and faster when warm.

Very Hot Days: Keep material out of direct sun when the temperature is greater than 80°F (27°C) until immediately prior to installation.

- **Clean Up:** Remove epoxy and silicone sealant from equipment before it cures using acetone* or alternative solvent. Solvents are not effective after the epoxy or silicone has cured. Cured material may be removed by cutting it away with sharp tools or grinding.

(*Solvents are toxic and flammable. Observe solvent manufacturer's precautions and refer to Material Safety Data Sheets as well as local and federal requirements for safe handling and use.)

2 Repair Spalled Joint Faces/Refill Old Blockouts

BEJS is only as good as the surrounding substrates. If the joint edges are badly spalled or cracked you've got to repair them.

Concrete:

- Remove loose particles and weak concrete to ensure sound concrete substrate.
- Spalls, chipped edges and uneven surfaces must be repaired using suitable patching material and proper patching geometry and techniques. Joint faces must be parallel.
- Reinforce as required per your Department's normal practice or Engineer's recommendations.



Sawcut



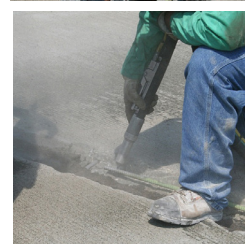
Chip



Reinforce

- Remove all contaminants by sandblasting or grinding to ensure a thoroughly clean and sound substrate for the full sealant depth.

NOTE: DO NOT use a wire wheel–this will polish the substrate and cause bond-failure.



Blast

- Use a suitable patching material (EM-SEAL's EMCRETE works great), and proper patching geometry and techniques. Joint faces must be parallel.



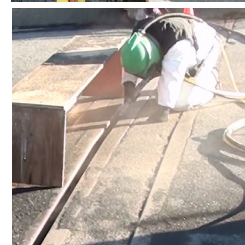
Form and Pour

Metal:

- Sandblast or grind to rough, white metal and solvent-wipe immediately prior to applying BEJS epoxy.

IMPORTANT: Ensure that no oxidation (rusting) occurs before the epoxy is applied.

Other Substrates: Contact EMSEAL.



3 Size Matters!

- Make sure you have the right size material for the joint. If you don't, it won't work.
- Measure joint width at deck surface and below to ensure joint faces are parallel.
- Material has been supplied to suit your joint widths at mean temperature based on field-measured information you provided.
- Widths of material supplied are marked on each stick of material.
- Compare width of material supplied as marked on each stick against mean joint width.
- Actual width of material measured between the hardboard packaging will be less than marked size because material is over-compressed to fit in the joint.



NOTE: If unsure of correct material selection, consult EMSEAL.

IMPORTANT: Do not remove outer plastic packaging until you have read and understand the rest of these instructions as material may expand prematurely.

4 Temperature Matters!

This step helps you plan your installation.

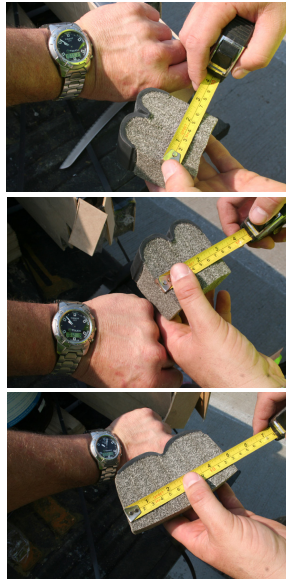
Temperature affects how fast or slow your BEJS foam expands.

This is not that lightweight, closed-cell, EVA foam—you don't have to squeeze it to get it in the joint.

BEJS is precompressed. When you take off the packaging, it will self expand.

To figure out how fast, cut a small piece off the end of one of your sticks and take off the hardboard and plastic packaging.

Measure it. Time how fast it grows to the width of the joint you just measured in Step 3.



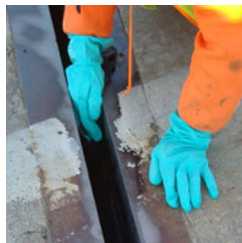
You want the material to be as big or just slightly bigger than the joint gap width when you put it in. This way it will sit snug at the right level and hold its own weight.

When it's **HOT** (above 80°F, 27°C) it moves fast. You want to store it in the shade or in an air conditioned van or cab.

When it's **COLD** (below 60°F, 15°C) you have time. Sometimes a lot of time. You want to store it in the sun or in a heated van or cab, AND you may want to open a few sticks ahead of installing the epoxy to get them moving.

5 Solvent-Wipe Joint Faces

- Wipe joint faces with solvent-dampened, lint-free rags to remove all concrete dust and contaminants.
- Dry all wet surfaces. **DO NOT** use flame to dry substrate—this will leave carbon on the substrate and cause bond-failure.



6 Start with U-90 Installation

Changes in plane, either up or down, are easily done with the use of factory-fabricated Universal-90's from EMSEAL.

If you ordered factory-fabricated transitions start with these and then move on to connecting the straight lengths. (See Pages 5 and 6 for detailed instructions).

If you are just installing straight lengths, go to Step 7).



7 Mask Deck (Optional)

- **OPTIONAL:** IF you want it to look pretty, use duct tape to mask off the deck on both sides of the joint.



8 Mix Epoxy Adhesive

Mix Epoxy

- EMSEAL epoxy adhesive may be used in the 40°F (5°C) to 95°F (35°C) temperature range.
- Using a trowel, transfer the entire contents of Part B (hardener) into the contents of Part A (base).
- Mix the material thoroughly (3 minutes) with a drill and mixing paddle. Scrape the walls and bottom of the container to ensure uniform and complete mixing.
- Ensure that a uniform gray color with no black or white streaks is obtained.

IMPORTANT: DO NOT thin the epoxy.

- **BESAFE!** Wear chemical-resistant gloves and/or barrier hand cream when handling liquid sealant or epoxy. Remove promptly from skin with a commercial hand cleaner before eating or smoking. Avoid inhaling vapors.



9 Apply Epoxy to Substrate, and...

Ensure that the mixed epoxy adhesive is applied to the substrate before the pot life has expired (10 - 30 minutes depending on the ambient temperature).

WARNING: Epoxy will harden more quickly when left in the pot. Apply it onto the joint face as soon as possible.

IMPORTANT: The epoxy must still be uncured when installing BEJS foam into the joint-gap.

If the epoxy cures before installing the BEJS foam then reapply new epoxy. If work is interrupted for more than 2 hours after initial cure then grind the old epoxy and apply new wet epoxy.

IMPORTANT: While one or more workers are applying epoxy to the joint faces, others must prepare the BEJS foam (see Step 10)



10 ... Unwrap BEJS

NOTE: Remember STEP 4? The BEJS is held in compression by shrinkwrap and hardboard. Based on what you learned in Step 4, you will either have decided to open several sticks to let them grow in cool weather, OR you will open them immediately before you need them and work quickly in hot weather.

- Slit the plastic packing by cutting on the hardboard

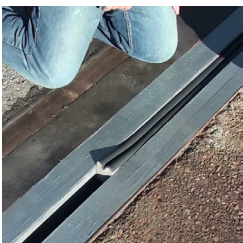
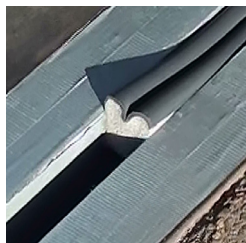
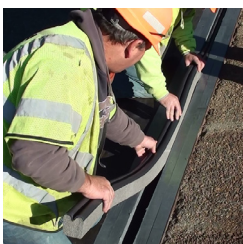
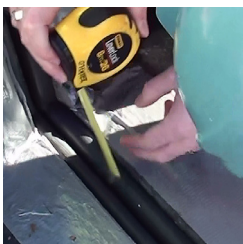
DO NOT cut along the silicone bellows face! If you do you will destroy the seal.

- Remove the shrinkwrap, hardboard, and inner release liner.



11 Install First BEJS Foam Length into Joint

- When installing the foam into the joint, ensure that the epoxy on the joint face has not cured.
- When installed, the BEJS must be recessed so that the top of the bellows is 3/4-inch (20mm) below the deck surface. *BEJS-Pedestrian is recessed 1/4" (6mm) below the sidewalk/walkway surface.*
- Note: When material is correctly expanded for a snug fit it will support its own weight in the joint.
- Feed material into joint, starting from one end. The material should fit snugly and must be eased into the joint with steady, firm pressure.
- Leave the end to be joined to the next length sticking slightly proud



12 Apply Joining Silicone to Bellows Face

- On the end of the next stick, using a sausage-gun and the sausages of silicone provided, apply the liquid silicone to the exposed face of the silicone bellows.

NOTE: Avoid spreading silicone sealant on the foam face.



13 Install Next Length

- Work in one direction towards the previously installed length or end of joint. Do not stretch the material.
- Leave the end to be joined to the previous length sticking proud of the joint—push the joining faces together.

Push, Don't Pull

- Push Hard on the stick to compress joins firmly together. Ensure there are no voids at joins.
- Once the full length is installed, push the protruding join into the joint and tool off the excess silicone.

Make the Join



Push the Join in Last

- Repeat this step for each new stick.

14 Measure, Cut and Install "Closing" Piece

- The final piece needed is your "closing" piece. It may be needed between the last full length and the end of the bridge deck, OR, it may be needed to close the gap between the last full length and a factory transition installed earlier.

NOTE: Unused BEJS can be stored for later use by keeping it compressed between the hardboard packaging using duct tape.

- Measure the length needed and add an extra 3/8-inch (10mm).

Measure



- Cut the length needed using your bread knife.

TIP: if knife is sticking, spray the blade with water from the spray bottle.

Cut

- Make sure you put your joining silicone on both joins (see Step 12).
- Install both ends first and push down working towards the middle. This will push the material outward making tight joins at each end.

Install Ends, Then Middle

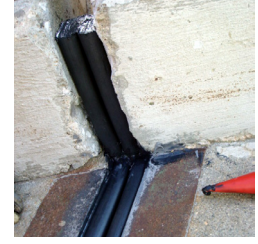


15 Wipe Silicone Facing at Joint Edge

- Using, clean, lint-free, cotton rags and solvent, thoroughly wipe the cured silicone facing and joint edge to remove excess epoxy and manufacturing release agent on silicone.



- IMPORTANT:** Any foam ends that will be exposed must be sealed with a light coating of silicone.
- You can do this before installing the piece that will be exposed or after.



16 Inject Silicone Sealant Bands at Substrates

- Before the epoxy cures, force the tip of the silicone-gun cone between the substrate and the BEJS foam. Inject a 3/4-inch (20mm) deep silicone sealant band between the foam, cured silicone facing and the joint-face.



- IF, in Step 7, you chose to mask your joint edges with Duct Tape, remove the tape now.



– INSTALLATION IS NOW COMPLETE –

Traffic can be allowed over the joints after normal cleanup of the job-site is completed and traffic diversion equipment is removed – usually within one hour of completing the installation.

17 Tool Excess Silicone into Cove-Bead

- Using a caulk knife, tool the freshly applied silicone firmly to blend with the substrates and cured bellows facing, and to ensure a proper bond and seamless appearance.



18 Remove Excess Silicone from Bellows at

- Where BEJS foam meets at butt joints, use a caulk knife to remove excess sealant from between the bellows.
- Also tool excess silicone that squeezes out from the top of the joint. Blend the sealant into the precured silicone bellows for a professional finish.



IMPORTANT: Silicone left between the wrinkles of the bellows could constrain movement – using a caulk knife, remove excess sealant and blend what remains into the bellows.

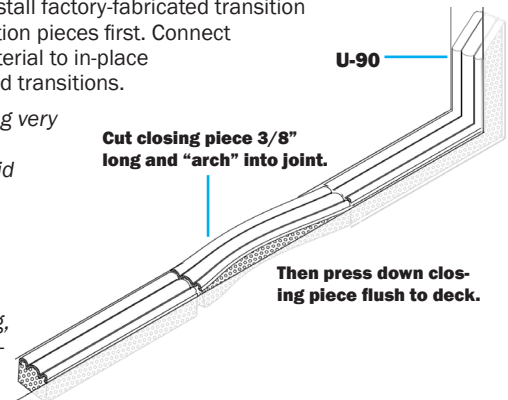
Addendum 1: Transitions, Ends, and Special Conditions

Sequencing: Install factory-fabricated transition and/or termination pieces first. Connect straight run material to in-place terminations and transitions.

Note: If installing very long runs of material, to avoid having to work at distant ends of a joint run and in order to prevent epoxy from fully curing, the final factory-fabricated Universal-90 termination can be installed as the second-to-last piece.

Cut closing piece 3/8" long and "arch" into joint.

Then press down closing piece flush to deck.

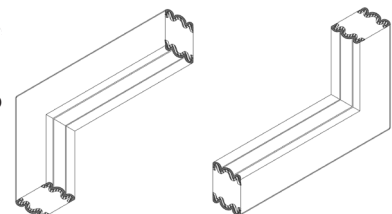


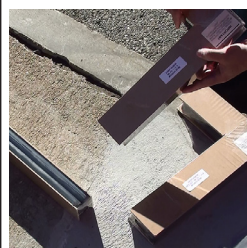
Cut closing pieces 3/8-inch (10mm) longer than the opening to be joined. Compress material longitudinally to fit.

UNIVERSAL-90 TRANSITIONS

Universal-90's are factory-made transitions that make going up and down curbs, parapets and sidewalks easy.

Unlike straight-run lengths BOTH sides of Universal-90's are silicone coated with bellows so there is no top or bottom. They can be turned over to be used either as an upturn or a downturn.





UNIVERSAL-90 Installation Sequence

Arrange your U-90's at the areas that need them.

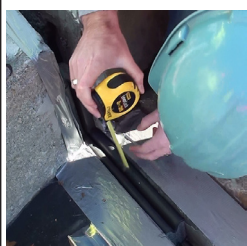
Measure the height of the curb and plan to join the lower and upper U-90 in the middle of the height of the curb.



Open and cut the vertical leg of the U-90 to a length that will bring it to the middle of the height of the curb.

REMEMBER, the top of the BEJS will be recessed 3/4-inch (20mm) from the deck/road surface. *BEJS-Pedestrian* will be recessed 1/4-inch (6mm) from the sidewalk surface.

Plan for this in your measurements.



Install the lower U-90 in accordance with the installation procedures in the rest of this instruction sheet.

Measure to make sure the top of the BEJS is recessed 3/4-inch (20mm) from the deck or road surface. *Note: BEJS-Pedestrian* will be recessed 1/4-inch (6mm) from the sidewalk or walkway surface.



Measure the distance from the top of the upturn of the installed U-90.



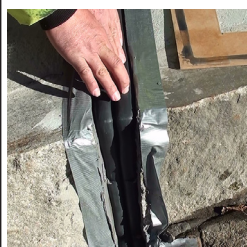
Cut the next U-90 so that it will mate firmly with the already installed U-90. Remember to allow for the BEJS recess of 3/4-inch (20mm) or the 1/4-inch (6mm) recess for *BEJS-Pedestrian*.



Apply joining silicone along the edge of the silicone bellows.



Lower the upper U-90 into the wet epoxy on the joint faces.



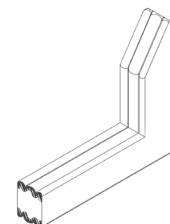
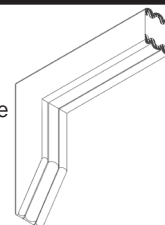
Push the upper U-90 down to join firmly with the already installed U-90 upturn below.

Tool the silicone that squeezes out of the joint to make sure that there is no silicone in the groove in the middle. Blend the extra silicone into the bellows.

Continue installation of straight lengths starting with Step 12.

UNIVERSAL-90 TERMINATIONS

If you have decided to run the expansion joint material off the end of the deck instead of sealing vertically into or over a parapet, you should terminate the installation with a downturn termination.



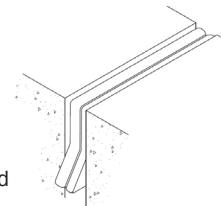
If you decide to turn the joint up into a parapet without going over the top and down the parapet, you should terminate in the face of the parapet with an upturn termination.

As with Universal-90 transitions, install factory-fabricated upturn or downturn termination pieces first.

Connect straight run material to in-place terminations and transitions (see Step 12).

KICK-OUT TERMINATION

EMSEAL's BEJS "Kick-Out Termination" is an alternative to the Universal-90 Terminations above.



The Kick-Out Termination is a factory fabricated termination piece with a built in drip-edge that directs water runoff away from the bridge structure.



The Kick-Out Termination is installed at the edge of the deck with its downturn over the side of the bridge and the drip edge sticking out beyond the face of the slab.

Water that runs off the joint is directed away from the bridge and its bearing pads, columns etc. by the silicone-coated flared end of the kick-out.

Install the Kick-Out Termination first and connect the straight lengths to it starting with Step 12.

FIELD-CUT CORNERS

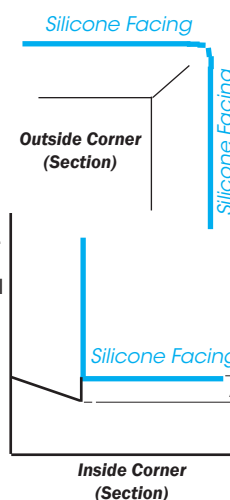
When NOT using U-90's it is possible to make corners in the field.

Outside Corners – "Notch and Bend"

- Notch the back of the foam only about 2/3 of the way through at a 40-degree angle.
- Bend the foam over keeping the silicone face intact.

Inside Corners – "Notch and Miter"

- Cut the material for the horizontal joint longer than needed by an amount equal to the depth of the material being installed.
- The inside corner must be joined by cutting a keyway in the horizontal material with a matching miter in the vertical material.
- To cut the keyway, first make a template using a piece of the hardboard packaging and a hacksaw.



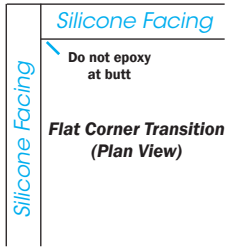
KEYWAY DIMENSIONS

Nominal Material Size	Dim. "A"
Up to 3/4-in (20mm)	1/2-in (12mm)
Over 1-in (25mm)	1-in (25mm)

- Using the template and a water-sprayed bread knife, cut each piece of foam as shown.
- Install the horizontal section ensuring that the keyway is inserted past the vertical face of the joint.
- Inject a bead of joining silicone into the face of the keyway and install the vertical miter into the wet silicone. Be sure of a tight fit with no voids. Tool excess silicone to allow bellows to move.

FLAT CORNERS:

- Work towards the corner so that the last two pieces to install will join at the corner.
- Cut each piece to be joined 3/8-inch (10 mm) longer than needed.
- Install one piece so that it runs through the intersecting joint-gap. Firmly push and compress the extra length so that a tight fit in the corner is achieved.
- Firmly butt intersecting piece(s) into side(s) of placed material.



****IMPORTANT: Be sure that there is no epoxy on the sides or faces of the foam at a butt join.**

- Using a caulk knife, remove any excess sealant and blend the liquid silicone into the bellows to preserve the bellows shape.
NOTE: The extra length will make it a tight fit—this results in a compression fit.
- Inject a bead of liquid silicone where the silicone faces join and where the silicone faces meet the substrate.

CROSSES AND TEES:

- Run one piece of material across the intersection. Coat silicone bellows end (only) of the intersecting material with silicone. Firmly butt intersecting pieces into sides of already placed material.
- Using a caulk knife, remove any excess sealant and blend the liquid silicone into the bellows to preserve the bellows shape.

Addendum2: Patching with EMCRETE Elastomeric Concrete

Step 2 on page 1 refers to EMCRETE from EMSEAL as an ideal patching material option.

EMCRETE is a highly durable, elastomeric patching material.

It is perfect for:

- fixing spalled joint edges;
- filling blockouts from old bolt-down systems;
- rebuilding joint edges
- resizing and rebuilding joint edges.



EMCRETE is shipped in a kit that contains Part A (5-gallon pail); Part B (gallon pail); Sand and Fiber Aggregate (3-gallon pail); and EMPRIME primer (quart can).

If you are using EMCRETE as part of your BEJS installation then you will have received the “EMCRETE Install Data” as part of your EMCRETE shipment.

You must read and understand and follow the complete “EMCRETE Install Data” instructions.



Learn about BEJS