
1. PURPOSE

- 1.1 The purpose of this document is to establish typical guidelines for installation of Willseal® WJS with Willcrete. The techniques involved may require modifications to adjust to jobsite conditions. Consult your local Willseal or Tremco Sales Representative or Tremco Technical Services for specific design requirements.
- 1.2 The Willseal Wing Joint System is used to seal expansion joints exposed to higher volume, low speed wheel and/or pedestrian traffic in parking structures, stadiums, plaza decks, and other concrete structures.

2. SCOPE

- 2.1 This document will provide the necessary instructions for installation of Willseal® WJS to qualify for a manufacturer's warranty.

3. POSSIBLE SYSTEM COMPONENTS

- 3.1 Willcrete – Nosing Kit
 - a. Willcrete Part A – Binder
 - b. Willcrete Part B – Activator
 - c. Willcrete Part C – Aggregate
- 3.2 Willseal WJS – Gland Kit
 - a. Willcrete Part D – Catalyst
 - b. Willcrete Part E – Gland
 - c. WJS Part F – Splice Kit
 - i. Loctite® SF 770™
 - ii. Loctite 401
- 3.3 Tremco Accessories
 - a. TREMGrip™ – Single-Component, Quick Tack Adhesive

4. AVAILABILITY

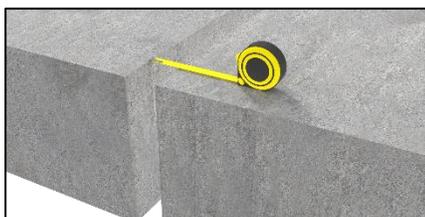
- 4.1 Willseal WJS is available in 2, 3, and 4 inch (5, 7.6, and 10 cm) wide in coils, your authorized Tremco or Willseal Sales Representative, Tremco or Willseal distributor or warehouse.
- 4.2 Willcrete is available from your authorized Tremco or Willseal Sales Representative, Tremco or Willseal distributor or warehouse in ready-to-use kits. Willcrete consists of 3 parts provided as a kit: Willcrete Part A – Binder, Willcrete Part B – Activator, and Willcrete Part C – Aggregate.
- 4.3 For more information contact Customer Service by phone at 800-274-2813 or email custserv@willseal.com.

5. STORAGE

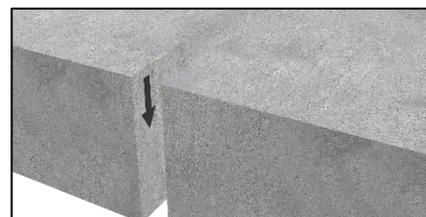
- 5.1 Store materials in a cool, dry location at 60 to 80 °F (15 to 27 °C).

6. MATERIAL SIZING

- 6.1 Joints must be sized every 5 to 7 ft (1.5 to 2.1 m) to ensure gap opening is uniform. See Ref 1.
- 6.2 Allow sufficient depth to recess the foam material a minimum 1/2 to 3/4 inch (12.7 to 19.0 mm) into the joint. See Ref 2.



Ref 1 – Measure gap opening every 5 to 7 ft (1.5 to 2.1 m).



Ref 2 – Ensure depth for 1/2 to 3/4 in. foam recess minimum.

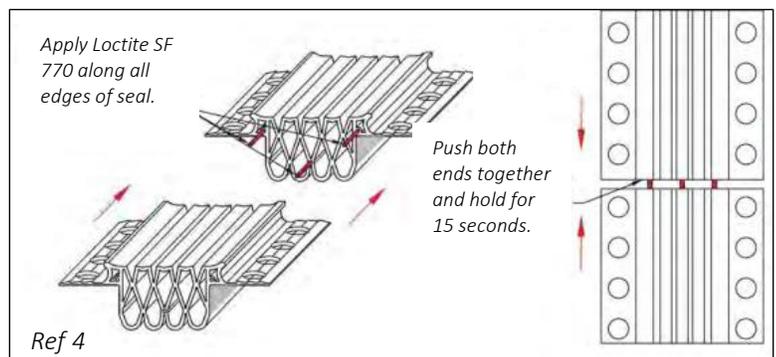
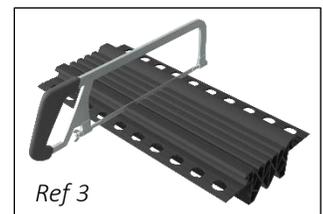
7. SUBSTRATE PREPARATION

- 7.1 The contractor shall provide properly formed concrete blockouts and expansion joint openings constructed to the exact dimensions and elevations as indicated herein or as shown on the contract drawings. Notify the engineer of record of any deviations from these dimensions. DO NOT begin installation until written consent is received.
- 7.2 The concrete must be completely dry and fully cured (28 days where the concrete has a moisture content that is below 4%) prior to placement of the expansion joint system. Joint openings requiring the use of structural repair material must be cured for 72 hours prior to joint system placement.
- 7.3 Surface areas two feet on each side of the expansion joint opening shall be finish graded perpendicular to joint opening creating flush slab-to-slab transition. Elevations on each side shall be identical. Concrete at the two-foot expansion joint transition area shall have elevations above those of the finished deck ensuring a downward slope.
- 7.4 The base of the recess must be formed level and at the same elevation across the joint. The joint sidewall interfaces must be parallel, straight, plumb and continuously equidistant from each other. They are to be perpendicular to the base surfaces of the blockout – making the corner a perfect 90° angle.
- 7.5 Grind a slight beveled edge on the corners of the concrete to reduce the effects of erosion, cracking, or spalling of the edge due to impact loads from vehicles.
- 7.6 Abrasive blast the recessed surfaces to remove all laitance. Blow out blockout area using compressed air. Make sure that compressor lines are blown prior to cleaning to ensure that any oils or moisture in lines are not present. The surface must be clean and dry prior to installation of Willcrete nosing.
- 7.7 Minimum blockout dimensions are 3/4" deep by 3-1/2" wide. Sound concrete is required. If edges of joint opening are uneven or exhibit rough edges or voids, then repair by grinding; saw cutting or utilizing a pre-approved structural repair product. All areas adjacent to the expansion joint opening and cracks must also be repaired.
- 7.8 Actual field dimensions of expansion joint blockouts may be deeper and wider than the required sizes as detailed on the contract drawings. When blockout size is smaller it shall be made larger by saw cutting. When existing blockout is larger it is recommended that additional elastomeric concrete be used to fill the blockout. DO NOT use an unapproved patching material to reduce the size of the blockout. If blockout exceeds 1-1/2" in depth, contact Tremco/ Willseal Technical Services.

8. MATERIAL PREPARATION, SPLICING, TERMINATIONS

- 8.1 Splices and terminations should be made prior to mixing of Willcrete.
- 8.2 Uncoil the WJS gland and allow it to relax to relieve any temporary kinking from shipment packaging. Expose to direct sunlight if possible. The seal must be cut to the correct length without pulling or exerting excess tension.
- 8.3 Field Splicing

- a. To join the ends of two lengths of seals together, first square off the ends to be joined with a knife blade saw. Use denatured alcohol to lubricate the blade. Clean both ends of the seal with denatured alcohol and let dry. See Ref 3.
- b. Apply Loctite SF 770 to both ends of the seal. Apply Loctite 401 to only one of the ends of the seals to be joined. Attach the two ends together and hold in place for approximately 15 seconds. See Ref 4.
- c. Cut 2" splice strips. Remove the protection liner from the splice strip (no cleaning required).
- d. Apply Loctite SF 770 to the entire seal and splice strip contact area. Apply Loctite 401 only to the seal surface, one inch at a time. Apply splice strip to seal.



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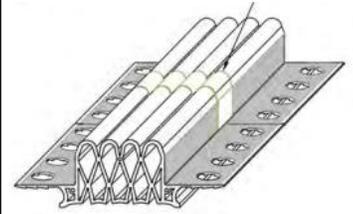
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Use margin trowel to hold the splice strip in place for 15 seconds. Continue one inch at a time until the entire strip is bonded to the seal. See Ref 5.

- e. For terminations, trace WJS profile onto splice strip patch and cut out patch. Follow the steps for splice strip application using the cut out patch to terminate the ends of the WJS gland.
- 8.4 For terminations, trace the WJS gland profile onto a splice strip patch and cut it out. Apply Loctite SF 770 to the entire seal and splice strip contact area. Apply Loctite 401 only to the seal surface, one inch at a time. Apply splice strip patch to seal the end of the WJS gland. Use margin trowel to hold the splice strip in place for 15 seconds. Continue one inch at a time until the entire patch is bonded to the seal.

Apply splice strip at each splice location.



Ref 5

9. WJS GLAND INSTALLATION

- 9.1 **IMPORTANT!** Apply a 3/16" bead of TREMGrip adhesive to the base of the blockout setback 1/16" in from the edge of the joint. Ensure that the TREMGrip does not cover holes on wing of seal.
- 9.2 Install WJS gland by squeezing it while at the same time pushing it into the joint opening. Walk on the seal to ensure it is completely seated. Use steel rollers to embed the flap of the seal into the adhesive.
- 9.3 To ease the installation, the WJS gland can be installed with the assistance of a vacuum pump using the following procedure.
 - a. Prior to termination of one end, use a standard hole punch to punch a hole at the face of the WJS gland, and through each of the internal sections of the web walls. This will allow air to be vacuumed through the webs. The exterior walls of the webs should not be punctured. Keep the punched plug from the WJS gland face for repair.
 - b. Follow steps (above) to terminate the final end of the WJS gland.
 - c. Using a vacuum pump with a male snap-in fitting, typically 1/4", insert the snap-in fitting into the punched hole opening and pull vacuum through the entire WJS Gland. This will test the air-tight seal of any seams and terminations. If all seams and terminations are air-tight, the body of the WJS gland will contract for easier placement in the joint. The WJS gland wings should prevent the material from falling completely into the joint.
 - i. If the body of the WJS gland does not contract upon vacuum, a leakage of air is occurring at a seam or termination. This must be identified and repaired before vacuum can be applied.
 - d. Once the WJS gland has been placed into the joint, the vacuum can be removed and the WJS gland will expand to completely fill the opening.
 - e. The punched hole in the exposed face must be repaired using the original plug, Loctite SF 770, and Loctite 401. Apply Loctite SF 770 to both the punched hole opening and the plug. Apply Loctite 401 to the plug only. Insert plug with the Loctite 770 still wet (typically 5 to 10 minutes).

10. WILLCRETE NOSING MIXING AND APPLICATION PROCEDURE

- 10.1 DO NOT mix Willcrete nosing material until gland has had final placement within joint. Mix all components as directed. Do not alter mix ratios as this may cause product failure. Do not attempt partial mix. Only mix entire units. Do not preemptively open buckets.
- 10.2 Follow steps below to **Mix Willcrete** and prepare for application:
 - a. Each unit of Willcrete consists of one 5-gallon bucket containing the following: one (1) gallon can of black resin (Part A), one (1) quart can of clear resin (Part B), and 30 pounds of a specialty sand/aggregate blend (Part C). Please note that the cans are short filled to achieve exact mixing ratios.
 - b. Each unit yields approximately 550 cubic inches of blended A, B, and C components. This is enough material to fill a 3/4" x 3-1/2" blockout on both sides of the expansion joint for ten (10) feet.
 - c. Premix Part A (black) for 1 minute with small jiffy-paddle type mixer.
 - d. Add entire contents of Part B Activator into Part A can and mix for 1 minute with jiffy-paddle mixer.
 - e. Pour entire contents of premixed Parts A & B into a clean 5-gallon bucket.
 - f. Scrape down sides of the can to ensure you empty out all premixed Part A & B liquids. A suggestion, use a HYDE Paint Mixer or plastic baker's spatula to scrape down the sides.

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- g. Immediately and gradually add Specialty Aggregate Part C and blend with Auger Style Mixing Paddle for 5 minutes minimum or until all components are thoroughly blended. To reduce entrapment of air during mixing, avoid lifting the paddle with an up and down motion.
- 10.3 Follow steps below to **Apply Willcrete** and complete the Wing Joint System installation:
- a. Mask off and protect area around the joint with duct tape and heavy-duty paper or plastic. Avoid roofing felt (tar paper) as this can stain the concrete if chemicals come in contact with it.
 - b. Mask off the face of the WJS gland with duct tape to avoid coverage with the nosing material.
 - c. Generously brush-apply Willcrete Primer (Part D) onto side of bulkhead and top of wing (flap) and into the Bulkhead Anchoring Cavity.
 - d. Using margin trowels place Willcrete nosing so that it is even with the top of the deck surface. Occasionally clean trowels to ensure ease of installation – wiping the trowel with a white cotton cloth soaked with Xylene is essential for creating a smooth finish and avoiding a buildup of Willcrete on the trowel. Do not dip the trowel in Xylene. Always wipe off excess Xylene from the trowel. **IMPORTANT!** Use a trowel to force the Willcrete nosing material into the top and bottom of the Bulkhead Anchoring Cavity. Ensure that the entire cavity is filled with Willcrete.
 - e. Finish trowel the Willcrete towards the center of the WJS gland. This pushes the nosing tight up against the bulkhead of the gland.

11. CLEAN UP

- 11.1 As soon as placement of Willcrete is complete, remove all paper and duct tape. The hardening of the elastomeric concrete will make the removal of these items difficult if allowed to sit.
- 11.2 After all work is complete, clean all tools with Xylene.
- 11.3 Clean exposed surfaces with a suitable cleaner that will not harm or attack the concrete finish.

12. CONSIDERATIONS

- 12.1 Preinstallation Inspection: The General Contractor, Engineer, Architect, Manufacturer's Representative, and Certified Contractor, will conduct a pre-installation project site inspection. The Certified Contractor shall provide a field report that summarizes the project conditions and any remedial action necessary to correct field conditions (substrate, joint size, vertical offsets, etc.) that may affect expansion joint system performance.
- 12.2 Seal Size Selection: The Project Engineer shall provide anticipated movement of the expansion joint opening. The maximum and minimum joint opening size must be known to determine the appropriate seal size. Expansion joints shall not be installed until the structure has undergone its anticipated short-term shortening and creep.
- 12.3 Weather Conditions: Temperatures must be 40°F and rising during installation. This also applies to the concrete deck temperature. Cease installation of expansion joints under adverse weather conditions
- 12.4 The temperature should be rising, and the joint closing, during the cure period. If temperatures drop during the initial cure period, causing the joint to open, bond failure could occur.
- 12.5 It is recommended to allow the elastomeric concrete to cure for a minimum of 24 hours. Premature exposure to vehicular traffic can cause stress on the bond line due to vertical slab deflection. For best results wait 72 hours before allowing vehicular traffic to drive over the system.

13. LIMITATIONS

- 13.1 If a fire barrier is required, please contact your Tremco or Willseal Sales Representative for fire-rated options.
- 13.2 Protect the system and its components during construction. Heavy construction vehicles should not be permitted to cross the expansion joint. Subsequent damage to the expansion joint system will be repaired at the general contractor's expense.
- 13.3 The concrete blockout and structural joint opening must be clean of foreign matter, sound, dry, and free of any laitance or curing agents. Prepare all surfaces, including metal surfaces by abrasive blasting to ensure they are free from foreign material and clean.
- 13.4 Installation temperature must be 40 °F (4.4 °C) and rising and at least 5 °F above the dew point. Willseal WJS has been engineered for automobile traffic traveling at speeds less than 15 mph (24 km/h).

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13.5 The maximum allowable concrete moisture content is 5% for application of Willcrete. Do not install in latex modified mortar or concrete. Always use Willcrete Primer when bonding to rubber.

14. MAINTENANCE

14.1 Follow Recommended Maintenance Procedures document for horizontal applications on tremcosealants.com.

WWJS-AI/0224

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