SECTION 07 92 00

JOINT SEALANTS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Surface preparation and installation of sealant in joints.

B. Related Sections:
   1. Section 08 01 52 - Wood Window Repairs

1.2 REFERENCES

A. Reference Standards: Latest edition as of Specification date.
   1. ASTM International:
      a. C920: Standard Specification for Elastomeric Joint Sealants.
      b. C1193: Standard Guide for Use of Sealants
      c. C1248: Standard Test Method for Staining of Porous Substrate by Joint Sealants.
      d. C1521: Standard Practice for Evaluating Adhesion of Installed Weatherproofing Sealant Joints.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordinate Work to ensure that new materials and building interior are kept continuously dry and that continuous, watertight, new sealant installation is provided. Coordinate:
   1. With Owner's Representative.
   2. With other trades to ensure that Work done by other trades is complete and ready to receive sealant.
   3. With other trades to avoid or minimize work on, or in immediate vicinity of, installation Work in progress and completed sealant Work. Ensure that dust from other operations will not adversely affect quality of completed sealant Work.

1.4 SUBMITTALS

A. Product Data: Sealant manufacturer's literature including written instructions for evaluating, preparing, and treating substrate; technical data including tested physical and performance properties; and installation instructions.
   1. Include temperature ranges for storage and application of materials, and special cold-weather application requirements or limitations.
   2. SpecData sheet for substrate cleaner and substrate primer recommended by sealant manufacturer for specific substrate surface and conditions.

B. Samples:
   1. Sealant manufacturer's color sample card, either printed or with thin sealant beads, showing range of colors available for each product exposed to view.

C. Manufacturer's Reports and Certifications:
   1. Prior to sealant installation, submit report from sealant manufacturer with results of sealant compatibility, sealant and substrate staining, and mock-up adhesion tests.

a. Report shall state that materials which come into contact with or in close proximity to sealant have been tested.
b. Report shall include sealant manufacturer's interpretation of test results relative to material performance, potential staining of sealant and substrates, dirt accumulation of sealant, and dirt runoff from sealant.
c. Report shall include sealant manufacturer's recommendations for substrate preparation and primer needed to obtain durable adhesion**;** required cure time before penetrating sealer or elastomeric coating can be applied**;** and installation procedures successfully used in mockups and field tests.

D. Installer Qualifications:
1. Certificate signed by sealant manufacturer, certifying that Installer complies with requirements.
2. Submit evidence that Installer's *existing company* has minimum of 5 years continuous experience in application of specified materials. Submit list of at least five completed projects of similar scope and size, including:
a. Project name.
b. Owner's name.
c. Owner's Representative name, address, and telephone number.
d. Description of work.
e. Sealant used.
f. Project supervisor.
g. Total cost of sealant work and total cost of project.
h. Completion date.

E. Sample Warranty: Copy of sealant manufacturer's warranty, stating obligations, remedies, limitations, and exclusions. Submitted with bid.

F. Following completion of Work, submit sealant manufacturer's inspection report of completed sealant installation and completed warranty; submit completed Installer warranty.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Experienced firm that is approved, authorized, or licensed by sealant manufacturer to install sealant and that is eligible to receive sealant manufacturer's warranty. Must have installations of specified materials in local area in use for minimum of five years.
1. Employ foreman with minimum of 5-years experience as foreman on similar projects, to be on site at all times during Work.

B. Compatibility Tests: Include sealant and sealers or coatings that may come into contact with sealant following sealant application.

C. Mockups: Install sealant at the perimeter of one window to verify and set quality standards for materials and installation procedures, and to demonstrate aesthetic effects.
1. Include backing material, sealant, primer and other related products.
2. Mockups shall be accessible or located by Owner.
3. Notify Owner seven days in advance of date when mockups will be constructed.
4. Field-Adhesion Testing: After sealants have cured, perform field-adhesion tests according to ASTM C1521.
a. Conduct tests for each type of sealant and joint substrate, with and without primer.
b. Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Use alternate

materials or modify installation procedure, or both, for sealants that fail to adhere to substrates.

5. If Owner determines mockup does not comply with requirements, modify mockup or construct new mockup until mockup is approved.
6. Mock-ups, when approved by Owner, will become standard for Work.
7. Approved mockups may become part of completed Work if undisturbed at time of Substantial Completion.
8. Do not begin joint sealant Work until mock-up is accepted by Owner.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original packages with seals unbroken, labeled with sealant manufacturer's name, product brand name and type, date of manufacture, lot number, and directions for storing and mixing with other components.

B. Keep materials dry and do not allow materials to be exposed to moisture during transportation, storage, handling, or installation. Reject and remove from Site new materials which exhibit evidence of moisture during application or which have been exposed to moisture.

C. Store materials in original, undamaged containers in clean, dry, protected location on raised platforms with weather-protective coverings, within temperature range required by sealant manufacturer. Protect stored materials from direct sunlight. Sealant manufacturer's standard packaging and covering is ***not*** considered adequate weather protection.

D. Limit stored materials on structures to safe loading of structure at time materials are stored, and to avoid permanent deck deflection.

E. Handle materials to avoid damage.

F. Conspicuously mark wet or damaged materials and remove from site as soon as possible.

G. Remove and replace materials that cannot be applied within stated shelf life.

1.7 PROJECT CONDITIONS

A. Verify existing dimensions and details prior to installation of materials. Notify Architect/Engineer of conditions found to be different than those indicated in Contract Documents. Architect/Engineer will review situation and inform Contractor and Installer of changes.

B. Comply with Owner's limitations and restrictions for site use and accessibility.

C. Environmental Limitations: Install sealant when existing and forecast weather conditions permit sealant to be installed according to sealant manufacturer's written instructions and warranty requirements.
   1. Do not install sealant when ambient or substrate temperatures are below 40 degrees F or are expected to fall below 40 degrees F in the next 12 hours.
   2. Do not proceed with installation during inclement weather except for temporary work necessary to protect building interior and installed materials. Remove temporary work and Work that becomes moisture damaged.

1.8 CHANGES IN WORK

A. During rehabilitation work, existing conditions may be encountered which are not known or are at variance with drawings and specifications. Such conditions may interfere with Work and may consist of damage or deterioration of substrate or surrounding materials or components that could jeopardize integrity or performance of new sealant.

B. Notify Owner of conditions that may interfere with proper execution of Work or jeopardize integrity of new sealant prior to proceeding with Work.

1.9 WARRANTY

A. Manufacturer's Warranty:
   1. Written warranty, signed by sealant manufacturer, including
      a. Repair or replace sealant that does not comply with requirements; that does not remain watertight; that fails in adhesion, cohesion, or general durability; or that deteriorates in manner not clearly specified by submitted sealant manufacturer's data as inherent quality of material for application indicated.
      b. Removal and replacement with new bond breaker materials.
      c. Labor and materials to perform warranty work.
      d. Warranty does not include sealant deterioration or failure due to following.
         1) Excessive joint movement caused by structural settlement or errors attributable to design or construction, resulting in stresses in sealant exceeding sealant manufacturer's written specifications for sealant elongation or compression.
         2) Deterioration or failure of sealant due to failure of substrate prepared according to requirements.
         3) Mechanical damage caused by individuals, tools, or other outside agents.
         4) Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.
   2. Warranty Period: Four years from date of Substantial Completion.

B. Sealant Installer's Warranty:
   1. Completed warranty form at end of Section, signed by Installer.
      a. Repair or replace sealant that does not comply with requirements; that does not remain watertight; that fails in adhesion, cohesion, or general durability; or that deteriorates in manner not clearly specified by submitted sealant manufacturer's data as inherent quality of material for application indicated.
      b. Removal and replacement with new bond breaker materials.
      c. Labor and materials to perform warranty work.
      d. Warranty does not include sealant deterioration or failure due to following.
         1) Excessive joint movement caused by structural settlement or errors attributable to design or construction, resulting in stresses in sealant exceeding sealant manufacturer's written specifications for sealant elongation or compression.
         2) Deterioration or failure of sealant due to failure of substrate prepared according to requirements.
         3) Mechanical damage caused by individuals, tools, or other outside agents.
         4) Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.
   2. Warranty Period: Four years from date of Substantial Completion.

PART 2 PRODUCTS

2.1 ELASTOMERIC JOINT SEALANTS

A. General:
   1. Comply with ASTM C920 and other requirements indicated.
   2. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing on similar projects, mockups and preconstruction testing for this project, and field experience.
   3. Select products based on mockups, preconstruction testing, and sealant manufacturer's previous testing and experience.
   4. Source Limitations: Obtain each type of joint sealant through one source from single manufacturer.
   5. Colors of Exposed Joint Sealants: Selected and approved in writing by Owner, from sealant manufacturer's full range.

B. Single-Component, Non-sag, Polyurethane Sealants:
   1. Iso-Flex 830, manufactured by LymTal International, Inc.
   2. DynaTrol 1-XL, manufactured by Pecora Corporation.
   3. SikaFlex-1a, manufactured by Sika Corporation.
   4. Sonolastic NP 1, manufactured by Sonneborn.
   5. Vulkem 116, manufactured by Tremco.

2.2 AUXILIARY MATERIALS

A. General: Sealant-backer materials, primers, surface cleaners, masking tape, and other materials recommended by sealant manufacturer, that are non-staining and compatible with substrates; based on mockups, preconstruction testing, and sealant manufacturer's previous testing and experience.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions with Installer and sealant manufacturer's representative for compliance with requirements and for other conditions affecting sealant performance.
   1. Verify dimensions of sealant joints at the project site by field measurement so that all proper sealant profiles will be accurately maintained.
   2. Verify that areas and conditions under which Work is to be performed permit proper and timely completion of Work.
   3. Notify Owner in writing of conditions which may adversely affect sealant installation or performance, including joints with widths less than those allowed by sealant manufacturer for applications indicated. Do not proceed with sealant installation until these conditions have been corrected and reviewed by Architect/Engineer or Owner.
   4. Installation of sealant system indicates acceptance of surfaces and conditions.

3.2 SURFACE PREPARATION

A. Remove existing sealant and other foreign material from joints.

B. Repair damaged or deteriorated substrate surfaces according to sealant manufacturer's written instructions and as approved by Owner.

C. Clean joint substrates immediately before installing sealant, to comply with sealant manufacturer's written instructions based on mockups and preconstruction testing.
   1. Remove from substrate foreign material that could interfere with adhesion of sealant, including dirt, dust, existing sealant, oil, grease, and surface coatings.
   2. Provide dry substrate; prevent wetting of substrate prior to sealant installation.
   3. Clean porous substrates, such as concrete, masonry, stone, wood, by brushing, grinding, blast-cleaning, mechanical-abrading, or combination of methods to produce clean, sound substrate capable of developing optimum bond with sealant. Remove laitance and form-release agents from concrete. Remove loose particles remaining after cleaning operations by vacuuming or blowing out joints with oil-free, compressed air.
   4. Clean nonporous surfaces, such as metal, with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of sealant.
   5. Joints with silicone sealant and preformed sealant seals should generally be masked as subsequent cleanup of spillage and smears may be very difficult.

D. Install masking tape on adjacent surfaces to prevent permanent staining or damage due to contact with sealant or cleaning methods to remove sealant smears. Remove tape immediately after tooling sealant, without disturbing sealant.

3.3 INSTALLATION OF JOINT SEALANT

A. General: Comply with sealant manufacturer's written installation instructions for products and applications indicated, based on mockups and preconstruction testing.

B. Joint Priming: Prime joint substrates where recommended in writing by sealant manufacturer, based on mockups and preconstruction testing. Apply primer to comply with sealant manufacturer's written instructions.
   1. Confine primer to areas of sealant bond; do not allow spillage or migration onto adjoining surfaces.
   2. Limit priming to areas that will be covered with sealant in same day. Unless recommended otherwise by sealant manufacturer, reprime areas exposed for more than 24 hours.

C. Install sealant backer and position to produce cross-sectional shape and proper depth of installed sealant.
   1. Use properly-sized backer. Do not use multiple-backer units or braided-backer units to accommodate wide joints.
   2. Install backer with device that will provide consistent depth between substrate surface and outer surface of backer.
   3. Do not leave gaps between ends of sealant backers.
   4. Do not stretch, twist, puncture, or tear sealant backers.
   5. Remove wet backers and replace with dry materials.

D. Install bond-breaker tape at back of joints where the existing gap is not sufficient to fit even 1/8" backer rod.

E. Install sealant immediately after installing backer material; to produce uniform, cross-sectional shape and depth; to directly contact and fully wet joint sides and backer material; and to completely fill recesses in joint configuration.
   1. Install sealant flush with surface.
   2. Immediately after sealant application and before skinning or curing begins, tool joint with slightly concave surface, compressing sealant into joint to form smooth, uniform sealant bead; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint. Do not use tooling agent.

3.4 FIELD QUALITY CONTROL

A. At completion of project, observe installed sealant for damage or deterioration. If damage or deterioration occurs, neatly cut out and remove damaged or deteriorated sealant, prepare and prime surfaces, and install new sealant. Replace sealant immediately so new sealant is indistinguishable from original Work.

B. Field-Adhesion Testing: Testing and Inspection Agency retained by Owner will perform non-destructive and destructive field adhesion tests on sealant in accordance with ASTM C1521.
   1. Non-destructive testing:
      a. Depress center of sealant bead with probing tool to depth of 50 percent of bead width, or depress sealant bead near substrate bond-line until it appears visually that sealant is about to fail in cohesive.
      b. Record if sealant failed and, if so, if failure was adhesive or cohesive and maximum surface depression as percent of joint width.
      c. Perform test every 12 inches for first 10 linear feet of joint; if no test failure is observed, test every 24 inches thereafter.
   2. Destructive testing:
      a. Cut 6-inch-long tail of sealant loose from substrate.
      b. Mark tail 1 inch from adhesive bond.
      c. Grasp tail 1 inch from adhesive bond and pull until tail extends to two times published movement capability of sealant. If sealant has not failed, continue pulling to failure.
      d. Record elongation at failure and if failure was adhesive or cohesive.
      e. Observe sealant for complete filling of joint with absence of voids, and for joint configuration in compliance with requirements. Record observations and sealant dimensions
   3. Test reports shall include date when sealant was installed, name of person who installed sealant, test date, test location, and whether primer was used.
   4. Immediately after testing, Contractor shall replace failed sealant in test areas. Neatly cut out and remove failed sealant, prepare and prime surfaces, and install new sealant. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.
   5. Sealant not evidencing adhesive failure from testing or noncompliance with requirements will be considered satisfactory.
   6. Where Owner determines that sealant has failed adhesively from testing or does not comply with requirements, additional testing will be performed to determine extent of non-conforming sealant. Neatly cut out and remove non-conforming sealant, prepare and prime surfaces, and install new sealant. Perform field adhesion tests on new sealant. Additional testing and replacement of non-conforming sealant shall be at Contractor's expense.

3.5 CLEANING

A. Clean off excess sealant or sealant smears as Work progresses by methods and with cleaning materials approved in writing by sealant manufacturers and manufacturers of products in which joints occur. Exercise care to avoid scratching or damage to surfaces. Repair surfaces stained, marred, or otherwise damaged during roofing Work.

B. At end of each workday, clean site and work areas and place rubbish, empty cans, rags, and other discarded materials in appropriate containers.

C. At conclusion of sealant Work, clean up debris and surplus materials and remove from site.

3.6 PROTECTION

A. Protect sealant during and after curing period from contact with contaminating substances and from damage, so sealants are without deterioration or damage at time of Substantial Completion.

SEALANT INSTALLER'S WARRANTY

Delete or retain this warranty, or include another sealant Installer's warranty form if required.

WHEREAS <**Insert name**> of <**Insert address**>, herein called ***Sealant Installer***, has performed sealant and associated work, designated ***Work***, on following project:

Owner: <**Insert name of Owner.**>
Address: <**Insert address**.>
Building Name/Type: <**Insert information.**>
Address: <**Insert address**.>
Area of Work: <**Insert information**.>
Acceptance Date: <**Insert date.**>
Warranty Period: <**Insert warranty period.**>
Expiration Date: <**Insert date.**>

AND WHEREAS Sealant Installer has contracted, either directly with Owner or indirectly as subcontractor, to warrant said Work against leaks and faulty or defective materials and workmanship for designated Warranty Period,

NOW THEREFORE Sealant Installer hereby warrants, subject to terms and conditions herein set forth, that during Warranty Period it will, at its own cost and expense, make or cause to be made such repairs to or replacement of said Work as are necessary to correct faulty and defective work and as are necessary to maintain said Work in watertight condition, and warrants against following.

1. Components of sealant system that do not comply with requirements; that do not remain watertight; that fail in adhesion, cohesion, or general durability; or that deteriorate in manner not clearly specified by submitted sealant manufacturer's data as inherent quality of material for application indicated, regardless of whether Work was previously accepted by Owner.
2. Damage by exposure to foreseeable weather; and damage by intrusion of foreseeable wind-borne moisture.

Warranty is made subject to following terms and conditions:

1. Specifically excluded from Warranty are damages to Work and other parts of the building, and to building contents, caused by:
   a. lightning;

Insert required wind speed below.

   b. peak gust wind speed exceeding <**Insert wind speed**> miles per hour;
   c. fire;
   d. failure of sealant substrate, including cracking, settlement, excessive deflection, deterioration, and decomposition;
   e. activity adjacent to sealant Work by others, including construction contractors, maintenance personnel, other persons, and animals, whether authorized or unauthorized by Owner's Representative.
2. When Work has been damaged by any of foregoing causes, Warranty shall be null and void until such damage has been repaired by Sealant Installer and until cost and expense thereof have been paid by Owner or by another responsible party so designated.
3. Sealant Installer is responsible for damage to Work covered by Warranty but is not liable for consequential damages to building or building contents resulting from leaks or faults or defects of Work.
4. During Warranty Period, if Owner allows alteration of Work by anyone other than Sealant Installer, including cutting, patching, and maintenance, Warranty shall become null and void on

date of said alterations, but only to extent said alterations affect Work covered by Warranty. If Owner engages Sealant Installer to perform said alterations, Warranty shall not become null and void unless Sealant Installer, before starting said work, shall have notified Owner in writing, showing reasonable cause for claim, that said alterations would likely damage or deteriorate Work, thereby reasonably justifying limitation or termination of Warranty.

5. Owner will promptly notify Sealant Installer of observed, known, or suspected leaks, defects, or deterioration and will afford reasonable opportunity for Sealant Installer to inspect Work and to examine evidence of such leaks, defects, or deterioration. Sealant Installer shall inspect leak, defect, or deterioration within 24 hours of notification.
6. If permanent repair or replacement of warranted condition cannot be made immediately, due to weather conditions, availability of appropriate labor or materials, building occupancy, etc., Sealant Installer must make, or cause to be made, immediate temporary repairs to prevent any further damage, deterioration, or unsafe conditions. Permanent repair or replacement of warranted condition shall be scheduled as soon thereafter as practical, and with Owner's consent and approval.
7. If Owner notifies Sealant Installer of warranted condition that requires immediate attention to prevent potential injury or damage, and Sealant Installer cannot or does not promptly inspect and repair same, either permanently or temporarily, then Owner may make, or cause to be made, such temporary repairs as may be essential and Sealant Installer will reimburse Owner for cost of such repairs. Such action will not relieve Sealant Installer of its obligation to perform any necessary permanent repairs, and Warranty shall remain in full force and effect for remaining portion of its original term.
9. Sealant Installer shall provide equipment, labor, and material required to remedy warranted conditions, including repair or replacement of damage to other work resulting therefrom, and removal and replacement of other work required to access warranted condition. Additional required work will be at Sealant Installer’s sole expense for full term of Warranty. Warranty includes removal and replacement of sealant-backer material and sealant.
10. Warranty is recognized to be only Warranty of Sealant Installer on said Work and shall not operate to restrict or cut off Owner from other remedies and resources lawfully available to Owner in cases of sealant failure. Specifically, Warranty shall not operate to relieve Sealant Installer of responsibility for performance of original Work according to requirements of Contract Documents, regardless of whether Contract was directly with Owner or with Owner’s General Contractor.

IN WITNESS THEREOF, and intending to be legally bound hereby, Sealant Installer has caused this document to be executed by undersigned, duly-authorized officer.

_____ Corporate Seal:
(Sealant Installer)

By: _____
(Signature)

_____
(Name)

_____
(Date)

Subscribed and sworn to before me this ____day of _____, 20__

_____
Notary Public
My commission expires _____

END OF SECTION