

SECTION 07 92 00

JOINT SEALANTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Polyurethane Sealants
- B. Tape Mastic Sealants
- C. Non-skinning Sealants
- D. Silicone Sealants
- E. Acrylic Sealants

1.2 REFERENCES

- A. American Architectural Manufacturer's Association (AAMA)
 - 1. AAMA 800-10 - Voluntary Specifications and Test Methods for Sealants
- B. ASTM International (ASTM)
 - 1. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 2. ASTM A 792 - Standard Specification for Steel Sheet, 55 % Aluminum-Zinc Alloy-Coated by the Hot-Dip Process.
 - 3. ASTM C 639 - Standard Test Method for Rheological (Flow) Properties of Elastomeric Sealants
 - 4. ASTM C 661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer
 - 5. ASTM C 681 - Standard Test Method for Volatility of Oil- and Resin-Based, Knife-Grade, Channel Glazing Compounds
 - 6. ASTM C 711 - Standard Test Method for Low-Temperature Flexibility and Tenacity of One-Part, Elastomeric, Solvent-Release Type Sealants
 - 7. ASTM C 794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
 - 8. ASTM C 908 - Standard Test Method for Yield Strength of Preformed Tape Sealants
 - 9. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants
 - 10. ASTM D 56 - Standard Test Method for Flash Point by Tag Closed Cup Tester
 - 11. ASTM D 217 - Standard Test Methods for Cone Penetration of Lubricating Grease
 - 12. ASTM D 412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension
 - 13. ASTM D 792 - Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement
 - 14. ASTM D 925 - Standard Test Methods for Rubber Property—Staining of Surfaces (Contact, Migration, and Diffusion)
 - 15. ASTM D 2452 - Standard Test Method for Extrudability of Oil- and Resin-Base Caulking Compounds
 - 16. ASTM D 2453 - Standard Test Method for Shrinkage and Tenacity of Oil- and Resin-Base Caulking Compounds
 - 17. ASTM D 1475 - Standard Test Method For Density of Liquid Coatings, Inks, and Related Products
 - 18. ASTM D 2202 - Standard Test Method for Slump of Sealants
 - 19. ASTM D 2203 - Standard Test Method for Staining from Sealants

20. ASTM G 154 - Standard Practice for Operating Fluorescent Ultraviolet (UV) Lamp Apparatus for Exposure of Nonmetallic Materials

C. Interim Federal Specifications (FS)

1. FS TT-S-00230C - Sealing Compound: Elastomeric Type, Single Component
2. FS TT-C-1796A – Caulking Compounds, Metal Seam and Wood Seam
3. FS TT-S-001543A – Sealing Compounds: Silicone Rubber Base (For Caulking, Sealing, and Glazing in Buildings and Other Structures)

D. South Coast Air Quality Management District (SCAQMD)

1. Rule 1168 – Adhesive and Sealant Applications

E. Underwriter's Laboratories

1. UL 580 - Tests for Uplift Resistance of Roof Assemblies

1.3 SUBMITTALS

A. Material Safety Data Sheets (MSDS): Provide in accordance with 29 CFR 1910.1200, Hazard Communication

B. Product Test Reports: Reports of tests required by this section performed by a qualified testing agency, indicating that the sealants comply with the requirements.

C. Buy American Compliance: Provide documentation that the products provided in this section comply with the following requirements:

1. Buy American provisions of Section 1605 of the American Recovery and Reinvestment Act of 2009 (ARRA).

D. VOC Content: Provide documentation of the Volatile Organic Content (VOC) in accordance with SCAQMD Rule 1168

E. USDA Approval: Provide documentation that the product is approved for use in meat and poultry processing areas by the USDA for the following types of sealants:

1. Polyurethane
2. Tape Mastic
3. Non-skinning Sealant

1.4 WARRANTY

A. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within 5 years of installation.

PART 2 - PRODUCTS

2.1 GENERAL MATERIAL REQUIREMENTS

A. Substrate Requirements: When testing is required on a substrate, the material used shall be either ASTM A653 G-90 or ASTM A792 AZ50 and tests shall be conducted with each of the following coatings:

1. Bare (No coating)

2. Acrylic (Galvalume Plus)
3. Polyester
4. Siliconized Polyester
5. Polyvinylidene Fluoride Resin (PVDF)

2.2 POLYURETHANE SEALANT

- A. General: Provide Sealants that meet the following specifications:
1. ASTM C 920, Type S, Grade NS, Class 25, Use: NT, A, M, G and O paintable sealant
 2. AAMA 808.3
 3. FS TT-S-00230C, Type II, Class A
- B. Color: The sealant shall be in the following colors:
1. White
 2. Gray
 3. Bronze
 4. Almond
- C. Physical Properties: The sealant shall have the following additional physical properties:
1. Peel Adhesion: All panels shall have at least a 90% cohesive failure of at least 15 lb/in when tested in accordance with ASTM C 794.
 2. Tensile Strength: Sealant shall have a tensile maximum of 300 psi and an elongation of 500-600% when tested in accordance with ASTM D 412.
 3. Sag: There shall be no sag when tested in accordance with ASTM C 639.
 4. Hardness: Shore "A" hardness on all three samples shall not exceed 40 when tested in accordance with ASTM C 661
 5. Service Temperature Range: -40 degrees Fahrenheit to 200 degrees Fahrenheit.
 6. Water Resistance: There shall be no presence of voids, cracks, separation or breakdown of the compound when tested in accordance with AAMA 800-10, Section 2.11.1.
 7. Flash Point: No less than 145 degrees Fahrenheit when tested in accordance with ASTM D 56.
 8. Shelf Life: The compound shall have a shelf life of 9 months or more when stored at or below 80 degrees.
 9. Skin Time: The compound shall have a skin time of 2-4 hours
 10. Cure Time: The compound shall have a cure time of 24-48 hours
 11. VOC Content: The Volatile Organic Compound (VOC) content shall be less than 250 g/L when calculated SCAQMD Rule 1168.

2.3 TAPE MASTIC SEALANT

- A. General: Provide Sealants that meet the following specifications:
1. AAMA 804.3
 2. AAMA 807.3
 3. FS TT-C-1796A, Type II, Class B
 4. Approved by Underwriters Laboratories for use in roof deck constructions classified under UL-518 Class 90
- B. Color: Gray
- C. Physical Properties: The sealant shall have the following additional physical properties:
1. Specific Gravity: 1.4 or higher when tested in accordance with ASTM D 792

2. Tensile Adhesive Strength: 20 psi or higher when tested in accordance with ASTM C 908
3. Elongation: 1000% or higher when tested in accordance with ASTM C 908
4. Cone Penetration: The sealant shall meet the following conditions when tested in accordance with ASTM D 217 with a 300g cone in 5 seconds:
 - a. 8.5 – 100 mm at 77 degrees Fahrenheit
 - b. 125-135 mm at 120 degrees Fahrenheit
 - c. 45-55 mm at Zero degrees Fahrenheit
5. VOC Content: The Volatile Organic Compound (VOC) content shall be less than 250 g/L when calculated SCAQMD Rule 1168.

2.4 NON-SKINNING SEALANT

- A. General: Provide sealants that meet the following specifications:
 1. AAMA 809,2
 2. FS TT-C-1796A, Type 1, Class A
- B. Color: White
- C. Physical Properties: The sealant shall have the following additional physical properties:
 1. Extrudability: The sealant shall deposit in 30 to 50 seconds through a 0.104" orifice at 50 psi pressure in accordance with ASTM D 2452
 2. Total Solids: At least 85% by weight when determined in accordance with ASTM C 681
 3. Volume Shrinkage: Less than 15% when determined in accordance with ASTM D 2453
 4. Weight per U.S. Gallon: 10.75 lbs. +/- 0.25 lbs. when determined in accordance with ASTM D 1475
 5. Vehicle Bleed out: There shall be no visible exudation of vehicle from sealant after 21 days at 158 degrees Fahrenheit on the test panel
 6. Flexibility: There shall be no loss of adhesion at -60 degrees Fahrenheit when tested in accordance with ASTM C 711
 7. Sag: 0.20 in max, full button when tested in accordance with ASTM D 2202
 8. Staining: Sealant will not stain a painted test panel when tested in accordance with ASTM D 925, Method A
 9. UV Resistance: There shall be no cracking, bleeding, or loss of elasticity after 1,000 hours of QUV exposure in accordance with ASTM G 154.
 10. Wet Flammability: No less than 110 degree Fahrenheit flash point when determined in accordance with ASTM D 56
 11. Coverage: Each gallon of sealant shall provide the following minimum coverage:
 - a. 1,500 lineal feet with 1/8 in bead
 - b. 690 lineal feet with 3/16 in bead
 - c. 390 lineal feet with 1/4 in bead.
 12. Shelf Life: 18 months minimum in unopened container when stored at or below 90 degrees Fahrenheit.
 13. Drying time: Non-skinning, remains permanently soft and tacky
 14. Engageability: Sealant will easily engage and transfer to male joint at 10 degrees Fahrenheit
 15. Service Temperature Range: -60 degrees Fahrenheit to 200 degrees Fahrenheit
 16. Application Temperature Range: 10 degrees Fahrenheit to 120 degrees Fahrenheit
 17. Non-Reactive: Will not darken, etch, or leave salt deposits on the test panel after two years
 18. VOC Content: The Volatile Organic Compound (VOC) content shall be less than 250 g/L when calculated SCAQMD Rule 1168.

2.5 SILICONE SEALANT

- A. General: Provide sealants that meet the following specifications:
1. ASTM C 920, Type S, Grade NS, Class 25
 2. AAMA 802.3, Type I and II
 3. AAMA 805.2 Group C
 4. AAMA 808.3
 5. FS TT-S-001543A, Class A
 6. FS TT-S-00230C, Class A
- B. Color: Clear
- C. Physical Properties: The sealant shall have the following additional physical properties:
1. Mechanical Properties: The sealant shall have the following mechanical properties as determined by ASTM D 412:
 - a. Tensile Strength: 150 psi minimum (Method A)
 - b. Modulus at 100% Elongation: 35 psi minimum
 - c. Elongation: 400% minimum
 - d. Recovery: 100%
 2. Hardness: Maximum Shore A hardness of 15 when determined in accordance with ASTM C 661
 3. Tack-free Time: 1/4 in dia. bead at 77 degrees Fahrenheit, 50% relative humidity, 10-15 minutes
 4. Cure Time: 1/4 in dia. bead at 77 degrees Fahrenheit, 50% relative humidity, 10-12 hours
 5. Service Temperature: -60 degrees Fahrenheit to 300 degrees Fahrenheit
 6. Shelf Life: 9 months when stored in unopened original containers at 80 degrees Fahrenheit or less
 7. VOC Content: The Volatile Organic Compound (VOC) content shall be less than 250 g/L when calculated SCAQMD Rule 1168.

2.6 ACRYLIC SEALANT

- A. Color:
1. Clear
 2. White
 3. Gray
- B. Physical Properties:
1. Percent Solids:
 - a. Colors: 75% minimum determined in accordance with ASTM D 1475
 - b. Clear: 70% minimum determined in accordance with ASTM D 1475
 2. Peel Adhesion: All panels shall have at least a 90% cohesive failure of at least 5 lb./in when tested in accordance with ASTM C 794
 3. Weight per U.S. Gallon: 8.7 lbs. +/- 0.25 lbs. when determined in accordance with ASTM D 1475
 4. Viscosity: The sealant shall meet the following conditions when tested in accordance with ASTM D 2452 with a 20g cone with a 0.104 in orifice at 60 psi at 77 degrees Fahrenheit in the indicated time:
 - a. Colors: 40-60 seconds
 - b. Clear: 35-45 seconds
 5. Elongation: 200% minimum when tested in accordance with ASTM D 412

6. Hardness: Maximum Shore A hardness of 55 when determined in accordance with ASTM C 661
7. Flash Point: No less than the following when tested in accordance with ASTM D 56
 - a. Colors: 52 degrees Fahrenheit
 - b. Clear: 40 degrees Fahrenheit
8. Slump: 0.10" maximum when tested in accordance with ASTM D 2202
9. Vehicle Migration: No vehicle migration from the sealant edge when tested in accordance with ASTM D 2203 as modified by Section 2.8.1 of AAMA 800-10
10. Paintability: Compatible with Alkyds, enamels and lacquers post-solvent release
11. Service Temperature Range: Zero degrees Fahrenheit to 180 degrees Fahrenheit
12. Shelf Life: 18 months when stored in original, unopened containers at or below 80 degrees Fahrenheit

PART 3 - EXECUTION