SECTION 00 01 10
TABLE OF CONTENTS

END OF SECTION

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Urethane joint sealants.
3. Latex joint sealants.
4. Acoustical joint sealants.

1.2 REFERENCES

A. References, General: Versions of the [following] [cited] standards current as of the date of issue of the project apply to the Work of this Section.

B. ASTM International (ASTM): www.astm.org:

1. ASTM C 510 - Standard Test Method for Staining and Color Change of Single- or Multicomponent Joint Sealants.
2. ASTM C 661 - Standard Test Method for Indentation Hardness of Elastomeric Type Sealants by Means of a Durometer.
3. ASTM C 719 - Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).
4. ASTM C 794 - Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants
5. ASTM C 834 - Specification for Latex Sealants.
6. ASTM C 920 - Specification for Elastomeric Joint Sealants.
7. ASTM C 1087 - Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems.
8. ASTM C 1193 - Guide for Use of Joint Sealants.
9. ASTM C 1247 - Standard Test Method for Durability of Sealants Exposed to Continuous Immersion in Liquids.
10. ASTM C 1248 - Test Method for Staining of Porous Substrate by Joint Sealants.
11. ASTM C 1311 - Specification for Solvent Release Sealants.
12. ASTM C 1330 - Cylindrical Sealant Backing for Use with Cold Liquid Applied Sealants.
13. ASTM D 412 - Test Methods for Vulcanized Rubber and Thermoplastic Elastomers—Tension.
14. ASTM D 624 - Test Method for Tear Strength of Conventional Vulcanized Rubber and Thermoplastic Elastomers.
15. ASTM D 2203 - Standard Test Method for Staining from Sealants.
16. ASTM D 2240 - Test Method for Rubber Property - Durometer Hardness.

C. NSF International (NSF): www.nsf.org:

1. Standard 51 - Food Equipment Materials.

D. U. S. Environmental Protection Agency (EPA): www.epa.gov:

1. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings.

E. U.S. Food and Drug Administration (FDA): www.fda.gov:

1. 21 CFR 177.2600 - Title 21 Part 177 Indirect Food Additives: Polymers.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate installation of joint sealants with cleaning of joint sealant substrates and other operations that may impact installation or finished joint sealant work.

B. Preinstallation Conference: Conduct conference at Project Site.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of joint sealant product specified, including:

1. Preparation instructions and recommendations.
2. Standard drawings illustrating manufacturer's recommended sealant joint profiles and dimensions applicable to Project.

B. Joint Sealant Schedule: Indicate joint sealant location, joint sealant type, manufacturer and product name, and color, for each application. Utilize joint sealant designations included in this Section.

C. Samples for Color Selection: For each joint sealant type.

D. Samples for Verification: For each exterior joint sealant product, for each color selected.

E. Joint Sealant Schedule: Include application, location, drawing designation, manufacturer and product name, and selected color.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified applicator.

B. Greenguard Certificates: For each sealant and accessory product specified to meet volatile organic emissions standards of the Greenguard Children and Schools Certification.

C. Sealant, Waterproofing, and Restoration Institute (SWRI) Validation Certificate: For each sealant specified to be validated by SWRI's Sealant Validation Program.

D. Warranty: Sample of unexecuted manufacturer and installer special warranties.

E. Preconstruction Compatibility and Adhesion Test Reports: From manufacturer. Include written interpretation of reports and recommendations for primers and substrate preparation.

F. Preconstruction field-adhesion test reports.

G. Field quality control adhesion test reports.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Company with minimum of three years experience specializing in work of this section, employing applicators trained for application of joint sealants required for this project, with record of successful completion of projects of similar scope, and approved by manufacturer.

B. Single Source Responsibility: Provide exterior joint sealants by a single manufacturer responsible for testing of Project substrates to verify compatibility and adhesion of joint sealants.

C. Preconstruction Manufacturer Laboratory Compatibility, Staining, and Adhesion Testing: Submit samples of each substrate or adjacent material that will be in contact with or affect joint sealants. Current manufacturer test data of products on matching substrates will be acceptable.

1. Adhesion: Use ASTM C 719 and ASTM C 794 to determine requirements for joint preparation, including cleaning and priming.
2. Compatibility: Use ASTM C 1087 to determine materials forming joints and adjacent materials do not adversely affect sealant materials and do not affect sealant color.
3. Stain Testing: Use ASTM C 510, ASTM C 1248, or ASTM D 2203 to verify non-staining characteristics of proposed sealants on specified substrates.
4. Immersion Adhesion: Use ASTM C 1247 to determine performance of proposed immersed sealant in contact with [potable water].
5. Pre-construction manufacturer laboratory testing is not required when sealant manufacturer can furnish data acceptable to Architect based on previous testing for materials matching those of the Work.

D. Preconstruction Field-Adhesion Testing: Prior to installing joint sealants, field test adhesion to joint substrates using ASTM C 1193 Method A. Verify adhesion is adequate. Modify joint preparation recommendations for failed joints and re-test. Submit written test report.

E. Mockups: Provide joint sealant application within mockups required in other sections identical to specified joint sealants and installation methods.

1.7 DELIVERY, STORAGE AND HANDLING

A. Accept materials on site in manufacturer's unopened original packaging.

B. Store primers and sealants in dry location with ambient temperature range of 60 to 80 deg. F (15 to 27deg. C).

1.8 ENVIRONMENTAL REQUIREMENTS

A. Do not install primers or sealants when atmospheric temperatures or joint surface temperatures are less than 40 deg. F (4 deg. C).

1.9 SCHEDULING

A. Schedule work so waterproofing, water repellents and preservative finishes are installed after sealants, unless sealant manufacturer approves otherwise in writing.

B. Ensure sealants are cured before covering with other materials.

1.10 WARRANTY

A. Manufacturer's Warranty: Manufacturer's standard form in which joint sealant manufacturer agrees to furnish joint sealants to repair or replace those that demonstrate deterioration or adhesive or cohesive failure under normal use within warranty period specified.

1. Warranty Period for Silicone Sealants: [Five] years date of Substantial Completion.

B. Installer's Warranty: Original statement on Installer's letterhead in which Installer agrees to repair or replace joint sealants that demonstrate deterioration or failure within warranty period specified.

1. Warranty Period: [Two] years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Products: Provide joint sealant products manufactured by **Tremco, Inc., Commercial Sealants and Waterproofing Division, An RPM Company**, Beachwood OH; (866) 321-6357; email: techresources@tremcoinc.com; www.tremcosealants.com,

B. Substitutions: See Section 01 60 00 - Product Requirements.

2.2 SILICONE JOINT SEALANTS

A. Single-Component, Nonsag, Non-Staining, Neutral-Curing Silicone Joint Sealant: ASTM C 920, Type S, Grade NS, Class 100/50, Use NT; SWRI validated. [**SJS#**_01_]: Use at aluminum storefronts and curtain walls, metal panels, masonry, exterior expansion and control joints and window perimeters.

1. Basis of Design Product: **Tremco, Inc., Spectrem 1**.
2. Volatile Organic Compound (VOC) Content: 1 g/L maximum.
3. Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
4. Staining, ASTM C 1248: None on concrete, marble, granite, limestone, and brick.

5. Color: As selected by Architect from manufacturer's standard line of not less than 12 colors.

B. Single-Component, Nonsag, Non-Staining, Neutral-Curing Silicone Joint Sealant : ASTM C 920, Type S, Grade NS, Class 50, Use NT; SWRI validated. [SJS#_02_]: Uses include: two-sided structural glazing; perimeter and weather seals; cap, heel and toe beads; curtain wall and window joints.

1. Basis of Design Product: Tremco, Inc., Spectrem 2.
2. Volatile Organic Compound (VOC) Content: 50 g/L maximum.
3. Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
4. Staining, ASTM C 1248: None on concrete, marble, granite, limestone, and brick.
5. Color: As selected by Architect from manufacturer's standard line of not less than 10 colors.

C. Mildew-Resistant, Single-Component, Acid-Curing Silicone Joint Sealant : ASTM C 920, Type S, Grade NS, Class 25, Use NT. [SJS#_03_]: Uses include: joints at all ceramic and quarry tile. Apply at any joints with plumbing fixtures or vanities

1. Basis of Design Product: Tremco, Inc., Tremsil 200 Sanitary.
2. Volatile Organic Compound (VOC) Content: 1 g/L maximum.
3. Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
4. Color: Clear.

2.3 URETHANE JOINT SEALANTS

A. Single-Component, Nonsag, Moisture-Cure, Polyurethane Joint Sealant : ASTM C 920, Type S, Grade NS, Class 50, Use NT; Greenguard certified. [UJS#_01_]: Uses include: joints at interior doors and borrowed lights and interior sides of exterior windows.

1. Basis of Design Product: Tremco, Inc., Dymonic 100.
2. Volatile Organic Compound (VOC) Content: 40 g/L maximum.
3. Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
4. Tensile Strength ASTM D412: 350 to 450 psi
5. Percent Elongation ASTM D412: 800 to 900%
6. Modulus at 100% ASTM D412: 75 to 85 psi
7. Tear Strength ASTM D412: 65 to 75 psi
8. Smoke Development ASTM E84: 5
9. Color: As selected by Architect from manufacturer's standard line of not less than 20 colors.

B. Immersible, Single-Component, Pourable, Traffic Grade Polyurethane Joint Sealant: ASTM C 920, Type S, Grade P, Class 50, Use T and I. [UJS#_02_]: Uses include sidewalk joints and foundation/ sidewalk joints

1. Basis of Design Product: Tremco, Inc., Vulkem 45 SSL.
2. Volatile Organic Compound (VOC) Content: 110 g/L maximum.
3. Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
4. Color: As selected by Architect from manufacturer's standard line of not less than 5 colors.

C. Single-Component, Nonsag, Moisture-Cure, Polyurethane Hybrid Joint Sealant [UJS#_03_]: ASTM C 920, Type S, Grade NS, Class 35, Use NT; Greenguard certified.

1. Basis of Design Product: Tremco, Inc., Dymonic FC.
2. Extrusion Rate ASTM C1183: 93.1 mL/min
3. Weight Loss ASTM C1246: Pass
4. Tack Free Time ASTM C679: 3 to 4 hr
5. Volatile Organic Compound (VOC) Content: 10 g/L maximum.
6. Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
7. Color: As selected by Architect from manufacturer's standard line of not less than 15 colors.

2.4 LATEX JOINT SEALANTS

A. Latex Joint Sealant: Siliconized acrylic latex, ASTM C 834, Type OP, Grade NF. [LJS#_01__]: Uses: painters chalk unless otherwise noted (i.e. ceiling/wall joints)

1. Basis of Design Product: Tremco, Inc., Tremflex 834.
2. Volatile Organic Compound (VOC) Content: 35 g/L maximum.
3. Volatile Organic Emissions (VOE): Not greater than Greenguard Children & Schools Certification emissions levels.
4. Color: White, paintable.

2.5 ACOUSTICAL SEALANTS

A. Acoustical Sealant : Single-component, non-hardening, non-sag, paintable synthetic rubber-tested to reduce airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing of similar assemblies according to ASTM E 90. [AJS#_01_]: Uses at all acoustic partitions and assemblies with STC ratings

1. Basis of Design Product: Tremco, Inc., Tremco Acoustical/Curtainwall Sealant.
2. Volatile Organic Compound (VOC) Content: 160 g/L maximum.
3. Color: White, paintable.

2.6 JOINT SEALANT ACCESSORIES

A. Cylindrical Sealant Backing: ASTM C 1330, Type B non-absorbent, bi-cellular material with surface skin, or Type O open-cell polyurethane, as recommended by sealant manufacturer for application.

B. Bond Breaker Tape: Polymer tape compatible with joint sealant and adjacent materials and recommended by sealant manufacturer.

C. Joint Substrate Primers: Substrate primer recommended by sealant manufacturer for application.

D. Cleaners: Chemical cleaners acceptable to joint sealant manufacturer.

E. Masking tape: Non-staining, non-absorbent tape product compatible with joint sealants and adjacent joint surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joint profiles and surfaces to determine if work is ready to receive joint sealants. Verify joint dimensions are adequate for development of sealant movement capability. Verify joint surfaces are clean, dry, and adequately cured. Proceed with joint sealant work once conditions meet sealant manufacturer's written recommendations.

3.2 PREPARATION

A. Joint Surface Cleaning: Clean joints prior to installing joint sealants using materials and methods recommended by sealant manufacturer. Comply with ASTM C 1193.

1. Remove curing compounds, laitance, form-release agents, dust, and other contaminants.
2. Clean nonporous and porous surfaces utilizing chemical cleaners acceptable to sealant manufacturer.
3. Protect elements surrounding the Work of this section from damage or disfiguration. Apply masking tape to adjacent surfaces when required to prevent damage to finishes from sealant installation.

3.3 SEALANT APPLICATION

A. Sealant and Primer Installation Standard: Comply with ASTM C 1193 and manufacturer's written instructions.

B. Joint Backing: Select joint backing materials recommended by sealant manufacturer as compatible with sealant and adjacent materials. Install backing material at depth required to produce profile of joint sealant allowing optimal sealant movement.

1. Install joint backing to maintain the following joint ratios:

a. Joints up to 1/2 inch (13 mm) wide: 1:1 width to depth ratio.
b. Joints greater than 1/2 inch (13 mm) wide: 2:1 width to depth ratio; maximum 1/2 inch (13 mm) joint depth.

2. Install bond breaker tape over substrates when sealant backings are not used.

C. Masking: Mask adjacent surfaces to prevent staining or damage by contact with sealant or primer.

D. Joint Priming: Prime joint substrates when recommended by sealant manufacturer or when indicated by preconstruction testing or experience. Apply recommended primer using sealant manufacturer's recommended application techniques.

E. Liquid Sealant Application: Install sealants using methods recommended by sealant manufacturer, in depths recommended for application. Apply in continuous operation from bottom to top of joint vertically and horizontally in a single direction. Apply using adequate pressure to fill and seal joint width.

1. Tool sealants immediately with appropriately shaped tool to force sealants against joint backing and joint substrates, eliminating voids and ensuring full contact.
2. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.
3. Tool exposed joint surface concave using tooling agents approved by sealant manufacturer for application.

F. Cleaning: Remove excess sealant using materials and methods approved by sealant manufacturer that will not damage joint substrate materials.

1. Remove masking tape immediately after tooling joint without disturbing seal.
2. Remove excess sealant from surfaces while still uncured.

G. Installation of Acoustical Sealant: At sound-rated assemblies and elsewhere as indicated, seal construction at perimeters, behind control joints, and at openings and penetrations on both sides of assemblies with a continuous bead of acoustical sealant. Comply with ASTM C 919 and with manufacturer's written recommendations.

H. Installation of Preformed Seals: Install seals immediately after removing protective wrapping. Do not stretch or misshape material. Place seals to provide continuity at ends, turns, and intersections. Apply heat to sealant when recommended by sealant manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

A. Field-Adhesion Testing: Perform adhesion tests in accordance with manufacturer’s instructions and with ASTM C 1193, Method A.

1. Perform [5] tests for the first [1000 feet (300 m)] of joint length for each kind of sealant and joint substrate, and one test for each [1000 feet (300 m)] of joint length thereafter or 1 test per each floor per building elevation, minimum.
2. For sealant applied between dissimilar materials, test both sides of joint.

B. Remove sealants failing adhesion test, clean substrates, reapply sealants, and re-test. Test adjacent sealants to failed sealants.

C. Submit report of field adhesion testing to Architect indicating tests, locations, dates, results, and remedial actions taken.

3.5 EXTERIOR JOINT-SEALANT SCHEDULE

A. Exterior movement joints in concrete unit masonry.

1. Joint Sealant: Single-component neutral-curing non-staining silicone sealant [SJS#_01_].
2. Joint-Sealant Color: [Approved custom match to mortar at horizontal joints].

B. Exterior movement joints in brick masonry.

1. Joint Sealant: Single-component neutral-curing non-staining silicone sealant [SJS#_01_].
2. Joint-Sealant Color, Horizontal Joints: [Approved custom match to mortar at horizontal joints].

C. Exterior exposed joints in metal panel cladding systems.

1. Joint Sealant: Single-component neutral-curing non-staining silicone sealant [SJS#_01_].
2. Joint-Sealant Color: [Approved custom match to substrate sample].

D. Exterior perimeter joints at frames of doors, windows, storefront frames, curtain wall frames, and louvers.

1. Joint Sealant: Single-component neutral-curing non-staining silicone sealant [SJS#_01_].
2. Joint-Sealant Color: Approved custom match to substrate sample. Multiple colors required to match several conditions.

E. Exterior joints within aluminum storefront framing, curtain walls, and window systems:

1. Joint Sealant: Single-component neutral-curing non-staining silicone sealant [SJS#_.2_].
2. Joint-Sealant Color: Approved custom match to substrate sample.

F. Exterior horizontal traffic and traffic isolation joints[: Refer to Division 32 Section "Concrete Paving Joint Sealants"].

1. Joint Sealant: Single-component pourable urethane sealant [UJS#_02_].
2. Joint-Sealant Color: As selected by Architect from manufacturer's standard colors.

3.6 INTERIOR JOINT-SEALANT SCHEDULE

A. Interior vertical movement joints in exterior concrete and unit masonry.

1. Joint Sealant: Single-component non-sag urethane sealant[, Greenguard certified] [UJS#_01_].
2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

B. Interior movement joints in interior unit masonry.

1. Joint Sealant: Single-component non-sag urethane sealant[, Greenguard certified] [UJS#_01_].
2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

C. Interior perimeter joints of exterior aluminum and fiberglass frames.

1. Joint Sealant: Single-component non-sag urethane sealant[, Greenguard certified] [UJS#_01_].
2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

D. Interior perimeter joints of interior frames.

1. Joint Sealant: Single-component non-sag urethane sealant[, Greenguard certified] [UJS#_03_].
2. Joint-Sealant Color: As selected by Architect from manufacturer's full range for masonry/ frame joints, Paintable U.N.O.

E. Interior sanitary joints between plumbing fixtures, food preparation fixtures, and casework and adjacent walls, floors, and counters.

1. Joint Sealant: Mildew-Resistant, Single-Component, nonsag, acid-curing silicone joint sealant[, Greenguard certified] [SJS#_03_].
2. Joint-Sealant Color: clear/ paintable

F. Interior traffic joints in floor and between floor and wall construction.

1. Joint Sealant: Single-component pourable urethane sealant[, Greenguard certified] [UJS#_02_].
2. Joint-Sealant Color: As selected by Architect from manufacturer's full range.

G. Interior non-moving joints between interior painted surfaces and adjacent materials.

1. Joint Sealant: Siliconized acrylic latex[, Greenguard certified] [LJS#_01__]:
2. Joint-Sealant Color: Paintable.

H. Interior exposed and non-exposed acoustical applications:

1. Joint Sealant: Acoustical joint sealant[AJS#01].

END OF SECTION

SECTION 08 54 13
FIBERGLASS WINDOWS

A.PART 1 GENERAL

A.01 SECTION INCLUDES

A. Factory fabricated fiberglass windows with fixed and operating sash.

B. Factory glazed including infill panels.

C. Operating hardware.

D. Insect screens.

A.03 REFERENCE STANDARDS

A. American Architectural Manufacturers Association (AAMA):
   1. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for windows, doors, and skylights; 2011.

B. American Society for Testing and Materials (ASTM):
   1. ASTM C 1036 - Flat Glass.
   2. ASTM C 1048 - Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass.
   3. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by Means of a Hot Box Apparatus.
   4. ASTM D 3656 - Insect Screening and Louver Cloth Woven from Vinyl-Coated Glass Yarns.
   5. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009.
      a. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2004 (Reapproved 2012).
   6. ASTM E 330 - Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.
   7. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2009).
   8. ASTM E 547 - Water Penetration of Exterior Windows, Curtain Walls and Doors by Cyclic Static Air Pressure Differential.

C. Screen Manufacturers Association (SMA):
   1. SMA 1201 - Specifications for Insect Screens for Windows, Sliding Doors and Swinging Doors.

D. Window and Door Manufacturers Association (WDMA):
   1. ANSI/AAMA/NWWDA 101/I.S.2 - Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.
   2. ANSI/AAMA/NWWDA 101/I.S.2/NAFS-02 - Voluntary Performance Specification for Windows, Skylights and Glass Doors.
   3. AAMA/WDMA/CSA 101/I.S.2/A440-05 - Standard/Specification for Windows, Doors, and Unit Skylights.

E. National Fenestration Rating Council (NFRC):
   1. NFRC 100 - Procedure for Determining Fenestration Product u-Factors.
   2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Nominal Incidence.

A.04 PERFORMANCE REQUIREMENTS

A. Windows shall meet rating:
   1. Class CW-PG80 Type AP (Type: Awning, Performance Class: Commercial Window, Performance Grade: DP80) specification in accordance with AAMA/WDMA/CSA 101/I.S.2./A440-08

2. HS - R30 72.0" x 60.0" in. (Type: Horizontal Slider, Performance Class: Residential, Performance Grade: DP30, Maximum Size Tested) specification in accordance with AAMA/WDMA/CSA 101/I.S.2./A440-05
3. F – AW65 60.0" x 99.0" in. (Type: Awning, Performance Class: Commercial, Performance Grade: DP80, Maximum Size Tested: 60.0" x 99.0") specification in accordance with AAMA/WDMA/CSA 101/I.S.2./A440-05 for storefront.

B. Window Air Leakage, ASTM E 283: Window air leakage when tested at 1.57 psf (25 mph) shall be 0.09 scfm per square foot of frame or less for slider windows

C. Window Air Leakage, ASTM E 283: Window air leakage when tested at 6.24 psf (50 mph) shall be 0.02 scfm per square foot of frame or less. for awning windows.

D. Window Air Leakage, ASTM E 283: Window air leakage when tested at 6.24 psf (50 mph) shall be 0.06 scfm per square foot of frame or less for storefront

E. Window Water Penetration:
1. Window Water Penetration, ASTM E 547 & ASTM E 331:No water penetration through window when tested under maximum static pressure of 12.0 psf (179 mph) after 4 cycles of 5 minutes each, and 15 minutes, with water being applied at a rate of 5 gallons per hour per square foot for awnings.
2. Window Water Penetration, ASTM E 547: No water penetration through window when tested under minimum static pressure of 6.0 psf (127 mph) after 4 cycles of 5 minutes each, with water being applied at a rate of 5 gallons per hour per square foot for sliders.
3.

F. Thermal Performance- awnings, NFRC 100, NFRC 200, and ASTM 1363:
1. 1" Insulated 366 Low-E/Argon units - U Value .26, SHGC .19

G. Thermal Performance- sliders, NFRC 100, NFRC 200, and ASTM 1363:
1. 7/8" Insulated 366 Low-E/Argon units - U Value .30, SHGC .20

H. Thermal Performance,- storefront NFRC 100, NFRC 200, and ASTM 1363:
1. 1 ¼" Insulated 272 Low-E/Argon units - Overall Window R-Value (R5), SHGC .30 or Better
2. 3/16" Low E #2 x 1/8" Low-E x Air Space/Argon Gas x 3/16" Clr.

A.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component dimensions, anchors, fasteners, glass, and internal drainage details.

C. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work, installation requirements, and construction, component connections and locations, anchorage methods and locations, hardware locations, and installation details.

D. Samples: Submit full-size or partial full-size sample of window illustrating glazing system, quality of construction, and color of finish.

E. Grade Substantiation: Prior to submitting shop drawings or starting fabrication, submit one of the following showing compliance with specified grade:
1. Evidence of AAMA Certification.
2. Evidence of WDMA Certification.
3. Evidence of CSA Certification.
4. Test report(s) by independent testing agency itemizing compliance and acceptable to authorities having jurisdiction.

F. Test Reports: Prior to submitting shop drawings or starting fabrication, submit test report(s) by independent testing agency showing compliance with performance requirements in excess of those prescribed by specified grade.

A.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience. A list of 5 Window Installations in the Northeast of projects in similar size and design must be submitted 10 days before bid for Review.

B. Factory Testing: Factory test individual standard operable windows for air infiltration in accordance with ASTM E 283, to ensure compliance with this specification.

C. Mockup:
   1. Provide sample installation for field testing window performance requirements and to determine acceptability of window installation methods.
   2. Approved mockup shall represent minimum quality required for the Work.
   3. Approved mockup shall remain in place within the Work.

A.07 DELIVERY, STORAGE, AND HANDLING

A. Delivery:
   1. Deliver materials to site undamaged in manufacturers or sales branch's original, unopened containers and packaging, with labels clearly identifying manufacturer and product name. Include installation instructions.
   2. Jig, brace, and box the window frame assemblies for transport to minimize flexing of members or joints.
   3. Protect finished surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond when exposed to sunlight or weather.

B. Storage:
   1. Store materials in accordance with manufacturer's instructions.
   2. Store materials in an upright position, off ground, and under cover.
   3. Protect materials from weather, direct sunlight, and construction activities.

C. Handling: Protect materials and finish during handling and installation to prevent damage.

A.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F.

B. Maintain this minimum temperature during and after installation of sealants.

A.09 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a twenty year period after Date of Substantial Completion.

C. Submit manufacturer's standard warranty.
   1. 5 Year Window Warranty
   2. 20 Year Fiberglass Warranty
   3. 10 Year Finish Warranty. Include coverage for degradation of color finish.
   4. Provide twenty year manufacturer warranty for insulated glass units from seal failure, interpane dusting or misting, and replacement of same. Include coverage for degradation of color finish.

B.PART 2 PRODUCTS

B.01 MANUFACTURERS

A. Fiberglass Windows:
   1. Comfort Line; Fiberframe: http://www.fiberframe.com - Tom Mehrman tmehrman@comfortlineinc.com. 517-861-0159 . Basis of Design.
   2. In-Line: http://www.inlinefiberglass.com/
   3. Alpen: http://thinkalpen.com/
   4. Cascadia: http://www.cascadiawindows.com/
   5. Substitutions will be considered.

B.02 WINDOW UNITS

A. FIBERGLASS AWNING WINDOWS
   1. Fiberglass Awning Windows: Series 2100 factory-assembled fiberglass windows with outward-opening sash installed in frame.
   2. Closed Back Frame:
      a. Pultruded Fiberglass
      b. Exterior Finish: Painted
      c. Interior Finish: Painted or wood laminate.
      d. Overall Frame Depth: 3-1/4 inches (83 mm).
      e. Nominal Wall Thickness or Fiberglass Members: 0.080 to 0.090 inch.
      f. Frame Corners:
      g. Mitered
      h. Joined and sealed with PBT corner key, screws, and silicone.
   3. Sash:
      a. Pultruded Fiberglass
      b. Exterior Finish: Painted
      c. Interior Finish: Painted or wood laminate.
      d. Corners:
      e. Mitered
      f. Joined and sealed with PBT corner keys, screws, and silicone.
   4. Weather Stripping:
      a. Single foam filled weather stripping on sash.
      b. Dual foam filled weather stripping on frame.
   5. Color: Architect to select from options, selection variety and range equal to Comfort Line, Fiberframe 12 standard colors.

B. FIBERGLASS SLIDING WINDOWS
   1. Fiberglass Sliding Windows: Series 8020 factory-assembled fiberglass windows with tilt-in sash installed in frame.
   2. Frame:
      a. Pultruded Fiberglass
      b. Exterior Finish: Painted
      c. Interior Finish: Painted or wood laminate.
      d. Overall Frame Depth: 3-1/4 inches (83 mm).
      e. Nominal Wall Thickness or Fiberglass Members: 0.080 to 0.090 inch.
      f. Frame Corners:
         1) Mitered and butt-joint.
         2) Joined and sealed with ABS corner key, screws, and silicone.
   3. Sash:
      a. Pultruded Fiberglass
      b. Exterior Finish: Painted
      c. Interior Finish: Painted or wood laminate.
      d. Corners:
         1) Mitered
         2) Joined and sealed with Nylon corner keys, screws, and silicone.
   4. Weather Stripping:
      a. Wool pile and bulb seal weather stripping on sash.
      b. Wool pile weather stripping on Frame.
   5. Color: Architect to select from options, selection variety and range equal to Comfort Line, Fiberframe 12 standard colors.

C. FIBERGLASS STOREFRONT/ FIXED WINDOWS
   1. Frame:

a. Pultruded Fiberglass - No less than 60% Fiberglass shall be acceptable.
b. Exterior Finish: Painted
c. Interior Finish: Painted
d. Overall Frame Depth: Not Less than 5" inches (83 mm).
e. Nominal Wall Thickness on Fiberglass Members: 0.187 inch.
f. nterior Glazed with Square Profile-7/8" Set Back to the Glass

D. Exterior and Interior: Factory-applied two part urethane paint, complies with AAMA 623.

E. Performance Requirements: Provide products that comply with the following:
1. Grade: AAMA/WDMA/CSA 101/I.S.2/A440 requirements for specific window type:
a. Performance Class (PC): CW.
2. Deflection: Limit member deflection to 1/200 of the longer dimension with full recovery of glazing materials.
3. Water Leakage: No uncontrolled leakage on interior face when tested in accordance with ASTM E331 at differential pressure of 12.11 pounds per square foot.
4. Air Leakage: Maximum of 0.1 cu ft/min/sq ft at 6.27 pounds per square foot differential pressure, when tested in accordance with ASTM E283.

B.03 OTHER COMPONENTS

A. Insect Screens: Standard.
1. Compliance: ASTM D 3656 and SMA 1201.
2. Screen Cloth: Vinyl-coated fiberglass, 18/16 mesh.
3. Set in aluminum frame fitted to outside of window.
4. Complete with necessary hardware.
5. Screen Frame Finish: Baked enamel.
a. Color: Match window interior.

B. Fasteners: Stainless steel.

C. Installation Accessories
1. Flashing/Sealant Tape:
a. Aluminum-foil-backed butyl window and door flashing tape.
b. Maximum Total Thickness: 0.013 inch.
c. UV resistant.
d. Verify sealant compatibility with sealant manufacturer
2. Insulating-Foam Sealant: Dow Window & Door.
a. Low-pressure, polyurethane window and door insulating-foam sealant.
3. Panning: Head, Jambs and Sill - As detailed in the Architectural Drawings
4. Interior Extruded Trim Anchor: Head, Jambs and Sill - As detailed in the Architectural Drawings

B.04 GLASS AND GLAZING MATERIALS

A. Glass and Glazing Materials: As specified in Section 08 80 00 of Types described below:

B.05 HARDWARE

A. Awning Window
1. Operator:
a. Steel scissor arm operator with hardened gears.
b. Operator Base: Zinc die cast with painted E-Gard finish.
c. Operator Linkage, Hinge Slide, and Hinge Arms: Zinc die cast with E-Gard finish.
d. Exposed Fasteners: Stainless steel.
e. Hardware Salt Spray Exposure, ASTM B 117: Exceed 1,000 hours.
2. Crank Handle Finish
a. Integrated Folding Crank: Baked enamel.
3. Locking System: Multi-Point Locking System.
a. Dual Single-handle locking system.

b. Operate positive-acting arms that pull sash into locked position at bottom.
c. One or two locking points on each jamb.
d. Lock Handle Finish: Baked enamel.

B. Sliding Window
1. Sash:
a. Steel single / dual locks.
b. Zinc die cast and painted finish.
c. Exposed Fasteners: Painted.
2. Handle Finish
a. Cast: Painted.
3. Locking System:
a. Cam Locks.
b. One or Two locking points.
c. Lock Handle Finish: Painted.

B.06 FABRICATION

A. Factory glaze window units.

C.PART 3 EXECUTION

C.01 EXAMINATION

A. Verify wall openings and adjoining air and vapor seal materials are ready to receive work of this Section.

B. Examine areas to receive windows. Notify Architect of conditions that would adversely affect installation or subsequent use. Do not proceed with installation until unsatisfactory conditions are corrected.

C.02 INSTALLATION

A. Install windows in accordance with manufacturer's instructions and approved shop drawings.

B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.

D. Install windows to be weather-tight and freely operating.

E. Secure assembly to framed openings, plumb and square, without distortion.

F. Integrate window system installation with exterior water-resistant barrier using flashing/sealant tape.
1. Apply and integrate flashing/sealant tape with water-resistant barrier using watershed principles in accordance with window manufacturer's instructions.

G. Place interior seal around window perimeter to maintain continuity of building thermal and air barrier using insulating-foam sealant.

H. Seal window to exterior wall cladding with sealant and related backing materials at perimeter of assembly.

I. Leave windows closed and locked.

C.03 TOLERANCES

A. Vertical Dimensions Between High and Low Points: Plus 1/4 inch, minus 0 inch.

B. Width Dimensions: Plus 1/4 inch, minus 0 inch.

C. Building Columns or Masonry Openings: Plus or minus 1/4 inch from plumb.

D. Maximum Variation from Level or Plumb: 0.06 inches every 3 ft non-cumulative or 0.5 inches per 100 ft, whichever is less.

C.04 FIELD QUALITY CONTROL

A. Field Testing: Field-test windows in accordance with AAMA 502, Test Method A.
   1. Manufacturer's representative shall be present.
   2. If any window fails, test additional windows at Contractor's expense.

C.05 ADJUSTING

A. Adjust hardware for smooth operation and secure weathertight closure.

C.06 CLEANING

A. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.

B. Clean window frames and glass in accordance with Division 1 requirements.

C. Do not use harsh cleaning materials or methods that would damage finish.

D. Remove labels and visible markings.

C.07 PROTECTION

A. Protect installed windows to ensure that, except for normal weathering, windows will be without damage or deterioration at time of substantial completion.

D. END OF SECTION

SECTION 12 36 00
COUNTERTOPS

A.PART 1 GENERAL

A.01 SECTION INCLUDES

A. Countertops for architectural cabinet work.

B. Wall-hung counters and vanity tops.

C. Sinks molded into countertops.

D. Epoxy resin sinks.

A.03 REFERENCE STANDARDS

A. ASTM D635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; 2014.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2015a.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2014.

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards, U.S. Version 3.0; 2016.

E. IAPMO Z124 - Plastic Plumbing Fixtures; 2012.

F. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

G. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

H. PS 1 - Structural Plywood; 2009.

A.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.

C. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.

D. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.

E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

F. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

A.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience.

A.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

A.07 FIELD CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

B.PART 2 PRODUCTS

B.01 COUNTERTOPS

A. Solid Window Sills: Solid surfacing sheet or plastic resin casting over continuous substrate.
   1. Flat Sheet Thickness: 1/2 inch, minimum.
   2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; acrylic or polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
      a. Manufacturers:
         1) Dupont; _____: www.corian.com.
         2) Formica Corporation; _____: www.formica.com.
         3) Wilsonart; _____: www.wilsonart.com.
         4) Substitutions will be considered.
      b. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
      c. Color and Pattern: As selected by Architect from manufacturer's full line.
   3. Other Components Thickness: 1/2 inch, minimum.
   4. Exposed Edge Treatment: Built up to minimum 1-1/4 inch thick; square edge.
   5. Fabricate in accordance with manufacturer's standard requirements.

B.02 MATERIALS

A. Wood-Based Components:
   1. Wood fabricated from old growth timber is not permitted.

B. Plywood for Supporting Substrate: PS 1 Exterior Grade, A-C veneer grade, minimum 5-ply; minimum 3/4 inch thick; join lengths using metal splines.

C. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

D. Cove Molding for Top of Splashes: Rubber with semi-gloss finish and T-spline to fit between splash and wall; 1/2 inch by 1/2 inch.

E. Joint Sealant: Mildew-resistant silicone sealant, clear.

F. Counter Bracket Supports:
   1. Spacing: Center between sinks, 48" O.C. maximum, 6" maximum from each end of counter
   2. Manufacturer: Rakks: Vanity Brackets, Model EH-1818-LV: http://rakks.com/counter-support-brackets/

B.03 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
   1. Join lengths of tops using best method recommended by manufacturer.
   2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall.
   3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
   2. Height: 4 inches, unless otherwise indicated.

C. Solid Surfacing: Fabricate tops up to 144 inches long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

C.PART 3 EXECUTION

C.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

C.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C.03 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.

C. Attach epoxy resin countertops using compatible adhesive.

D. Seal joint between back/end splashes and vertical surfaces.
   1. Where indicated use rubber cove molding.
   2. Where applied cove molding is not indicated use specified sealant.

C.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.

B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.

C. Field Joints: 1/8 inch wide, maximum.

C.05 CLEANING

A. Clean countertops surfaces thoroughly.

C.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

D. END OF SECTION