
USACE / NAVFAC / AFCEA / NASA

UFGS-07 92 00 (July 2006)

Preparing Activity: NAVFAC

Superseding

UFGS-07 92 00 (April 2006)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated 18 July 2006

Revised throughout - changes not indicated by CHG tags

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SECTION 07 92 00

JOINT SEALANTS

07/06

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SECTION 07 92 00

JOINT SEALANTS 07/06

NOTE: This guide specification covers the requirements for sealants for normal building construction.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

NOTE: This guide specification must be carefully modified if resealing or sealing of an addition to an existing building is required or if conditions require use of special sealing materials and designs such as high-rise curtain wall systems.

NOTE: On the drawings, show:

1. Joints in which each type of sealant will be used.

2. Typical scale or full-size details of sealant joints, indicating joint symbol or designation.

PART 1 GENERAL

1.1 REFERENCES

NOTE: Issue (date) of references included in
project specifications need not be more current than
provided by the latest guide specification. Use of
SpecsIntact automated reference checking is
recommended for projects based on older guide
specifications.

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ARCHITECTURAL MANUFACTURER'S ASSOCIATION (AAMA)

AAMA 804.1 (1992) Voluntary Specifications and Test
Methods for Sealants

ASTM INTERNATIONAL (ASTM)

ASTM C 1311 (2002) Solvent Release Sealants

ASTM C 509 (2000) Elastomeric Cellular Preformed
Gasket and Sealing Material

ASTM C 570 (2000) Oil- and Resin-Base Caulking
Compound for Building Construction

ASTM C 734 (2001) Low-Temperature Flexibility of
Latex Sealants After Artificial Weathering

ASTM C 834 (2000e1) Latex Sealants

ASTM C 919 (2002) Use of Sealants in Acoustical
Applications

ASTM C 920 (2002) Standard Specification for
Elastomeric Joint Sealants

ASTM D 1056 (2000) Standard Specification for Flexible
Cellular Materials - Sponge or Expanded
Rubber

ASTM D 1667 (1997) Flexible Cellular Materials - Vinyl
Chloride Polymers and Copolymers
(Closed-Cell Foam)

ASTM D 217 (2002) Cone Penetration of Lubricating
Grease

ASTM E 2129 (2001; R 2003) Data Collection for
Sustainability Assessment of Building
Products

ASTM E 84 (2005) Standard Test Method for Surface

Burning Characteristics of Building
Materials

BAY AREA AIR RESOURCES BOARD (BAARB)

BAARB, Reg. 8, Rule 51

(1992; R 2002) Organic Compounds, Adhesive
and Sealant Products

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS TT-S-001657

(1970) Sealing Compound - Single
Component, Butyl Rubber Based, Solvent
Release Type

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT (SCAQMD)

SCAQMD Rule #1168

(1989; R 2005) Adhesive and Sealant
Applications

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED

(2002; R 2005) Leadership in Energy and
Environmental Design(tm) Green Building
Rating System for New Construction
(LEED-NC)

1.2 SUBMITTALS

NOTE: Submittals must be limited to those necessary
for adequate quality control. The importance of an
item in the project should be one of the primary
factors in determining if a submittal for the item
should be required.

A "G" following a submittal item indicates that the
submittal requires Government approval. Some
submittals are already marked with a "G". Only
delete an existing "G" if the submittal item is not
complex and can be reviewed through the Contractor's
Quality Control system. Only add a "G" if the
submittal is sufficiently important or complex in
context of the project.

For submittals requiring Government approval on Army
projects, a code of up to three characters within
the submittal tags may be used following the "G"
designation to indicate the approving authority.
Codes for Army projects using the Resident
Management System (RMS) are: "AE" for
Architect-Engineer; "DO" for District Office
(Engineering Division or other organization in the
District Office); "AO" for Area Office; "RO" for
Resident Office; and "PO" for Project Office. Codes
following the "G" typically are not used for Navy
projects.

Submittal items not designated with a "G" are

considered as being for information only for Army
projects and for Contractor Quality Control approval
for Navy projects.

Government approval is required for submittals with a "G" designation;
submittals not having a "G" designation are [for Contractor Quality Control
approval.] [for information only. When used, a designation following the
"G" designation identifies the office that will review the submittal for
the Government.] Submit the following in accordance with Section 01 33 00
SUBMITTAL PROCEDURES:

SD-03 Product Data

[Local/Regional Materials; (LEED)

Documentation indicating distance between manufacturing facility
and the project site. Indicate distance of raw material origin
from the project site. Indicate relative dollar value of
local/regional materials to total dollar value of products
included in project.]

[Environmental Data]

Sealants; (LEED)

Primers

Bond breakers

Backstops

Manufacturer's descriptive data including storage requirements,
shelf life, curing time, instructions for mixing and application,
VOC content, and primer data (if required). Provide a copy of
the Material Safety Data Sheet for each solvent, primer or sealant
material, highlighting VOC content.

SD-07 Certificates

Sealant

Certificates of compliance stating that the materials conform to
the specified requirements.

SD-11 Closeout Submittals

[Local/Regional Materials; (LEED)

Documentation indicating distance between manufacturing facility
and the project site. Indicate distance of raw material origin
from the project site. Indicate relative dollar value of
local/regional materials to total dollar value of products
included in project. Include in LEED Documentation Notebook.]

Sealants; (LEED)

LEED documentation relative to low-emitting materials credit in
accordance with LEED Reference Guide. Include in LEED

1.3 ENVIRONMENTAL CONDITIONS AND REQUIREMENTS

NOTE: In some regions, designer shall choose the most appropriate option(s) for ventilation. For instance, high-humidity regions may generate too much condensate when using 100 percent outside air.

The ambient temperature shall be within the limits of 4 and 32 degrees C 40 and 90 degrees F when sealant is applied. Provide temporary ventilation during work of this section. Comply, at minimum, with sealant and sealant primer manufacturer recommendations for space ventilation during and after installation. Coordinate interior application of joint sealants with interior finishes schedule. Maintain one of the following ventilation conditions during the curing period, or for 72 hours after application:

- a. Supply 100 percent outside air 24 hours a day.
- b. Supply airflow at a rate of 6 air changes per hour, when outside temperatures are between 55 degrees F 13 degrees C and 85 degrees F 29 degrees C and humidity is between 30 percent and 60 percent.
- c. Supply airflow at a rate of 1.5 air changes per hour, when outside air conditions are not within the range stipulated above.

1.4 DELIVERY AND STORAGE

NOTE: Materials with a high capacity to absorb VOCs include materials which are woven, fibrous or porous in nature, such as acoustical ceilings, carpet, and textiles.

Deliver materials to the job site in unopened manufacturers' external shipping containers, with brand names, date of manufacture, [color,] and material designation clearly marked thereon. Label elastomeric sealant containers to identify type, class, grade, and use. Carefully handle and store materials to prevent inclusion of foreign materials or subjection to sustained temperatures exceeding 32 degrees C 90 degrees F or less than 4 degrees C 0 degrees F. Do not store sealants or sealant primers with materials that have a high capacity to adsorb volatile organic compound (VOC) emissions, including [_____]. Do not store sealants or sealant primers in occupied spaces.

1.5 QUALITY ASSURANCE

1.5.1 Compatibility with Substrate

Verify that each of the sealants are compatible for use with joint substrates.

1.5.2 Joint Tolerance

Provide joint tolerances in accordance with manufacturer's printed instructions.

1.5.3 Mock-Up

Project personnel is responsible for installing sealants in mock-up [prepared by other trades], using materials and techniques approved for use on the project.

1.6 SPECIAL WARRANTY

Guarantee sealant joint against failure of sealant and against water penetration through each sealed joint for [five] [_____] years.

1.7 SUSTAINABLE DESIGN REQUIREMENTS

1.7.1 Local/Regional Materials

NOTE: Using local materials can help minimize transportation impacts, including fossil fuel consumption, air pollution, and labor. Using materials harvested and manufactured within a 500 mile radius from the project site contributes to the following LEED credit: MR5. Coordinate with Section 01 33 29 LEED(tm) DOCUMENTATION. Use second option if Contractor is choosing local materials in accordance with Section 01 33 29 LEED(tm) DOCUMENTATION. Use second option for USACE projects. Army projects shall include option only if pursuing this LEED credit.

[Use materials or products extracted, harvested, or recovered, as well as manufactured, within a [500] [_____] mile [800] [_____] kilometer radius from the project site, if available from a minimum of three sources.] [See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total local material requirements. Sealant materials may be locally available.]

1.7.2 Environmental Data

NOTE: ASTM E 2129 provides for detailed documentation of the sustainability aspects of products used in the project. This level of detail may be useful to the Contractor, Government, building occupants, or the public in assessing the sustainability of these products.

[Submit Table 1 of ASTM E 2129 for the following products: [____].]

1.8 SCHEDULING

NOTE: VOCs may be emitted during the curing process. Generally, sealants continue to outgas throughout their life. Materials that adsorb VOCs include carpets, textiles, unprimed gypsum wallboard, and acoustical ceiling panels.

Allow sealant and sealant primer installations to cure prior to the installation of materials that adsorb VOCs, including [_____].

PART 2 PRODUCTS

2.1 SEALANTS

NOTE: Verify that the proper sealant is specified for the given application. Improper selection can result in reapplication, air infiltration, or water damage.

NOTE: Use Latex Sealant (ASTM C 834) for temporary, low budget construction; interior sealing of joints in wood or masonry, or in short joints between masonry, wood, or metal surfaces where maximum movement is anticipated not to exceed 15 percent of joint width.

Use elastomeric Sealants (ASTM C 920) for interior and exterior applications where maximum joint movement is anticipated to be between 25 and 50 percent of joint width.

Chemically curing sealants should not be used adjacent to or above membrane surfaces of asphaltic or bituminous materials; a sealant based on asphalt or bituminous materials similar to those in the membrane should be used.

Since all sealants meeting this specification are not suitable for all applications and substrates, specify applicable type, grade, class, and use(s) for each intended purpose:

Type S: Single-component

Type M: Multicomponent

Grade P: Pourable or self-leveling sealant for horizontal applications

Grade NS: Nonsag for vertical applications

Class 25: Withstands increase and decrease of at least 25 percent of joint width

Class 12.5: Withstands increase and decrease of at least 12.5 percent of joint width

Use T: Pedestrian and vehicular traffic areas such as walkways, plazas, decks, and parking garages

Use NT: Nontraffic areas, horizontal and vertical surfaces

Use M: Meets this specification when tested on

mortar

Use G: Meets this specification when tested on glass

Use A: Meets this specification when tested on aluminum

Use O: Meets this specification when tested on substrates other than above. Specify substrate types in project specification.

NOTE: Use lowest VOC options available with adequate competition (designer shall verify availability). Using low-VOC products contributes to the following LEED credit: EQ4. Coordinate with Section 01 33 29 LEED(tm) DOCUMENTATION. Designer must verify availability and adequate competition (including verification of bracketed VOCs included in this guide specification) before specifying product VOC requirements. Army projects shall specify bracketed LEED VOC option only if pursuing this LEED credit. Designer must edit Products section to ensure all interior use products specified meet the LEED credit requirements if pursuing this credit.

NOTE: Proper detailing, including adequate overhangs and eaves, flashing, and proper lapping of building paper and trim can minimize the use of and extend the lifetime of sealants, caulks, and adhesives.

Provide sealant that has been tested and found suitable for the substrates to which it will be applied. Comply with applicable regulations regarding toxic and hazardous materials, and as specified. [Interior adhesives, sealants, primers and sealants used as filler must meet the requirements of LEED low emitting materials credit.] [The VOC content of [interior] adhesives, sealants, and primers must be less than the current VOC content limits of SCAQMD Rule #1168, and all [interior] sealants used as filler must meet or exceed the requirements of BAARB, Reg. 8, Rule 51.] [Sealants containing asbestos, aromatic solvents, fibrous talc, formaldehyde, halogenated solvents, mercury, lead, cadmium, chromium and their compounds, are not permitted.] Sealants, primers, and cleaners required for sealant installation must also comply with all local regulations controlling VOC content.

2.1.1 Interior Sealant

NOTE: Non-wet interior areas shall use sealant as specified in the first option; wet interior areas shall use the second option.

[One-component acrylic latex water-based sealant conforming to ASTM C 834[, maximum VOC content of 42 grams/liter]] [One-part, mildew-resistant silicone rubber conforming to ASTM C 920, Type S, Grade NS, Class 25, Use NT]. Location(s) and color(s) of sealant for the following:

LOCATION	COLOR
a. Small voids between walls or partitions and adjacent lockers, casework, shelving, door frames, built-in or surface-mounted equipment and fixtures, and similar items.	[As selected] [Gray] [White] [_____]
b. Perimeter of frames at doors, windows, and access panels which adjoin exposed interior concrete and masonry surfaces.	[_____]
c. Joints of interior masonry walls and partitions which adjoin columns, pilasters, concrete walls, and exterior walls unless otherwise detailed.	[_____]
d. Joints between edge members for acoustical tile and adjoining vertical surfaces.	[_____]
e. Interior locations, not otherwise indicated or specified, where small voids exist between materials specified to be painted.	[_____]
f. Joints between bathtubs and ceramic tile; joints between shower receptors and ceramic tile; joints formed where nonplaner tile surfaces meet.	[_____]
g. Joints formed between tile floors and tile base cove; joints between tile and dissimilar materials; joints occurring where substrates change.	[_____]
h. Behind escutcheon plates at valve pipe penetrations and showerheads in showers.	[_____]
i. [_____]	[_____]

2.1.2 Exterior Sealant

For joints in vertical surfaces, provide [single-component polyurethane conforming to [ASTM C 920](#), Type S, Grade NS, Class 25, Use NT] [one-part silicon sealant[, [maximum VOC content of 15 grams/liter](#)]] [acrylic/silicon water-based sealant[, [maximum VOC content of 31 grams/liter](#)]]. For joints in horizontal surfaces, provide [ASTM C 920](#), Type M, Grade P, Class 25, Use T [, [zero-VOC](#)]. For exterior concealed joints and under thresholds, provide one-part butyl rubber caulk conforming to [FS TT-S-001657](#), Type I. For exterior concealed joints between two assembled rigid surfaces in compression, provide polyisobutylene sealant tape conforming to [AAMA 804.1](#). Provide location(s) and color(s) of sealant as follows:

LOCATION	COLOR
a. Joints and recesses formed where frames and subsills of windows, doors, louvers, and vents adjoin masonry, concrete, or metal frames. Use sealant at both exterior and interior surfaces of exterior wall penetrations.	[Match adjacent surface color] [As selected] [Gray] [White] [_____]

LOCATION	COLOR
b. Joints between new and existing exterior masonry walls.	[_____]
c. Masonry joints where shelf angles occur.	[_____]
d. Joints in wash surfaces of stonework.	[_____]
e. Expansion and control joints.	[_____]
f. Interior face of expansion joints in exterior concrete or masonry walls where metal expansion joint covers are not required.	[_____]
g. Voids where items pass through exterior walls.	[_____]
h. Metal reglets, where flashing is inserted into masonry joints, and where flashing is penetrated by coping dowels.	[_____]
i. Metal-to-metal joints where sealant is indicated or specified.	[_____]
j. Joints between ends of gravel stops, fascias, copings, and adjacent walls.	[_____]
k. [_____]	[_____]

2.1.1.3 Floor Joint Sealant

[Two-part polyurethane conforming to **ASTM C 920**, Type M, Grade P, Class 25, Use T, self-leveling[, **zero-VOC**]] [One-part polyurethane[, **maximum VOC content of 45 grams/liter**]].. Provide location(s) and color(s) of sealant as follows:

LOCATION	COLOR
a. Seats of metal thresholds for exterior doors.	[As selected] [Gray] [White] [_____]
b. Control and expansion joints in floors, slabs, ceramic tile, and walkways.	[_____]

2.1.1.4 Acoustical Sealant

NOTE: See ASTM C 919 for use of acoustical sealant.
The acoustical sealant described here is to be used
only in non-moving joints protected from abuse.
Other specified sealants may be used in acoustical
applications when appropriate.

[_____] Rubber or polymer-based acoustical sealant conforming to **ASTM C 919** must have a flame spread of 25 or less and a smoke developed rating of 50

or less when tested in accordance with **ASTM E 84**. Acoustical sealant must have a consistency of 250 to 310 when tested in accordance with **ASTM D 217**, and must remain flexible and adhesive after 500 hours of accelerated weathering as specified in **ASTM C 734**, and must be non-staining, nonskinning, nonhardening, permanently flexible, and specifically designed for sealing gypsum wallboard.

2.1.1.5 Preformed Sealant

Provide preformed sealant of polybutylene or isoprene-butylene based pressure sensitive weather resistant tape or bead sealant capable of sealing out moisture, air and dust when installed as recommended by the manufacturer. At temperatures from minus **34 to plus 71 degrees C** **30 to plus 160 degrees F**, the sealant must be non-bleeding and no loss of adhesion.

2.1.1.5.1 Tape

[_____] Tape sealant: Provide cross-section dimensions of [_____].

2.1.1.5.2 Bead

[_____] Bead sealant: Provide cross-section dimensions of [_____].

2.1.1.5.3 Foam Strip

NOTE: Untreated polyurethane foam can be used where exposed to view or where staining of adjacent surfaces is not acceptable.

Provide [_____] foam strip of polyurethane foam; with cross-section dimensions of [_____]. Provide foam strip capable of sealing out moisture, air, and dust when installed and compressed as recommended by the manufacturer. Service temperature must be **minus 40 to plus 135 degrees C** **minus 40 to plus 275 degrees F**. Furnish untreated strips with adhesive to hold them in place. Do not allow adhesive to stain or bleed into adjacent finishes. Saturate treated strips with butylene waterproofing or impregnated with asphalt.

2.2 PRIMERS

Provide a nonstaining, quick-drying type and consistency recommended by the sealant manufacturer for the particular application.

2.3 BOND BREAKERS

Provide the type and consistency recommended by the sealant manufacturer to prevent adhesion of the sealant to backing or to bottom of the joint.

2.4 BACKSTOPS

NOTE: Closed cell backer rods outgas when ruptured.
Open cell polyurethane backer rods are sponge-like and may absorb moisture.

Provide neoprene, butyl-rubber, polyethylene-jacketed polyurethane, or compressible rod-stock polyethylene foam, or other flexible, permanent, durable, nonabsorptive material free from oil or other staining elements as recommended by sealant manufacturer. Provide 25 to 33 percent oversized backing for closed cell and 40 to 50 percent oversized backing for open cell material, unless otherwise indicated. Make backstop material compatible with sealant. Do not use oakum [, [____]] and other types of absorptive materials as backstops.

2.4.1 Rubber

NOTE: Class A is adequate for most applications.
Select Class B for petroleum oil or fuel resistance.
Select Class D for temperatures of minus 75 to 175
degrees C (minus 103 to 347 degrees F) with no oil
exposure.

Specify Type 2 closed cell when moisture may migrate
to the backing.

Conform to **ASTM D 1056**, [Type 1, open cell,] [or] [Type 2, closed cell,]
Class [A] [B] [D], Grade [____], [round] [____] cross section for [____]
cellular rubber sponge backing.

2.4.2 PVC

NOTE: Do not use open cell vinyl foam in moist
areas or below grade.

Conform to **ASTM D 1667**, Grade [VO 12] [____], open-cell foam, [round]
[____] cross section for [____] Polyvinyl chloride (PVC) backing.

2.4.3 Synthetic Rubber

NOTE: Use Option I and Type I for most
applications. Select Option II only if flame
resistance is NOT required. Type II provides the
highest ozone resistance.

Conform to **ASTM C 509**, Option [I] [II], Type [I] [II] preformed [rods] [or]
[tubes] for [____] Synthetic rubber backing.

2.4.4 Neoprene

Conform to **ASTM D 1056**, [closed cell expanded neoprene cord Type 2, Class
C, Grade [2C2] [____]] [open cell neoprene sponge Type 1, Class C, Grade
[1C3] [____]] for [____] Neoprene backing.

2.4.5 Butyl Rubber Based

Provide Butyl Rubber Based Sealants of single component, solvent release,
color [as selected] [____], conforming to **ASTM C 1311**.

2.4.6 Silicon Rubber Base

Provide Silicon Rubber Based Sealants of single component, solvent release, color [as selected] [____], conforming to ASTM C 920, Non-sag, Type [____], Grade [____], Class [25] [____].

2.5 CAULKING

NOTE: The term "caulking" is limited herein to oil- and resin-based caulking which should be used only indoors and where there is little or no anticipated joint movement. Use a sealant where joints may move.

Avoid use of oil- and resin-based caulk when possible and when pursuing LEED credit EQ4. Substitute a sealant or latex or water-based caulk to eliminate or lower VOC emissions.

Conform to ASTM C 570, Type [____], for [____] Oil- and resin-based caulking.

2.6 CLEANING SOLVENTS

Provide type(s) recommended by the sealant manufacturer [except for aluminum and bronze surfaces that will be in contact with sealant].

PART 3 EXECUTION

3.1 SURFACE PREPARATION

Clean surfaces from dirt frost, moisture, grease, oil, wax, lacquer, paint, or other foreign matter that would tend to destroy or impair adhesion. Remove oil and grease with solvent. Surfaces must be wiped dry with clean cloths. When resealing an existing joint, remove existing calk or sealant prior to applying new sealant. For surface types not listed below, contact sealant manufacturer for specific recommendations.

3.1.1 Steel Surfaces

Remove loose mill scale by sandblasting or, if sandblasting is impractical or would damage finish work, scraping and wire brushing. Remove protective coatings by sandblasting or using a residue-free solvent.

3.1.2 Aluminum or Bronze Surfaces

Remove temporary protective coatings from surfaces that will be in contact with sealant. When masking tape is used as a protective coating, remove tape and any residual adhesive just prior to sealant application. For removing protective coatings and final cleaning, use nonstaining solvents recommended by the manufacturer of the item(s) containing aluminum or bronze surfaces.

3.1.3 Concrete and Masonry Surfaces

Where surfaces have been treated with curing compounds, oil, or other such materials, remove materials by sandblasting or wire brushing. Laitance, remove efflorescence and loose mortar from the joint cavity.

3.1.4 Wood Surfaces

Keep wood surfaces to be in contact with sealants free of splinters and sawdust or other loose particles.

3.2 SEALANT PREPARATION

Do not add liquids, solvents, or powders to the sealant. Mix multicomponent elastomeric sealants in accordance with manufacturer's instructions.

3.3 APPLICATION

3.3.1 Joint Width-To-Depth Ratios

a. Acceptable Ratios:

<u>JOINT WIDTH</u>	<u>JOINT DEPTH</u>	
	Minimum	Maximum
For metal, glass, or other nonporous surfaces:		
6 mm (minimum)	6 mm	6 mm
over 6 mm	1/2 of width	Equal to width
For wood, concrete, masonry, stone, or [____]:		
6 mm (minimum)	6 mm	6 mm
Over 6 mm to 13 mm	6 mm	Equal to width
Over 13 mm to 50 mm	50 mm	16 mm
Over 50 mm	(As recommended by sealant manufacturer)	

<u>JOINT WIDTH</u>	<u>JOINT DEPTH</u>	
	Minimum	Maximum
For metal, glass, or other nonporous surfaces:		
1/4 inch (minimum)	1/4 inch	1/4 inch
over 1/4 inch	1/2 of width	Equal to width
For wood, concrete, masonry, stone, or [____]:		
1/4 inch (minimum)	1/4 inch	1/4 inch
Over 1/4 inch to 1/2 inch	1/4 inch	Equal to width
Over 1/2 inch to 2 inch	1/2 inch	5/8 inch
Over 2 inch.	(As recommended by sealant manufacturer)	

- b. Unacceptable Ratios: Where joints of acceptable width-to-depth ratios have not been provided, clean out joints to acceptable depths and grind or cut to acceptable widths without damage to the adjoining work. Grinding is not required on metal surfaces.

3.3.2 Masking Tape

Place masking tape on the finish surface on one or both sides of a joint cavity to protect adjacent finish surfaces from primer or sealant smears. Remove masking tape within 10 minutes after joint has been filled and tooled.

3.3.3 Backstops

Install backstops dry and free of tears or holes. Tightly pack the back or bottom of joint cavities with backstop material to provide a joint of the depth specified. Install backstops in the following locations:

- a. Where indicated.
- b. Where backstop is not indicated but joint cavities exceed the acceptable maximum depths specified in paragraph entitled, "Joint Width-to-Depth Ratios."

3.3.4 Primer

Immediately prior to application of the sealant, clean out loose particles from joints. Where recommended by sealant manufacturer, apply primer to joints in concrete masonry units, wood, and other porous surfaces in accordance with sealant manufacturer's instructions. Do not apply primer to exposed finish surfaces.

3.3.5 Bond Breaker

Provide bond breakers to the back or bottom of joint cavities, as recommended by the sealant manufacturer for each type of joint and sealant used, to prevent sealant from adhering to these surfaces. Carefully apply the bond breaker to avoid contamination of adjoining surfaces or breaking bond with surfaces other than those covered by the bond breaker.

3.3.6 Sealants

Provide a sealant compatible with the material(s) to which it is applied. Do not use a sealant that has exceeded shelf life or has jelled and can not be discharged in a continuous flow from the gun. Apply the sealant in accordance with the manufacturer's printed instructions with a gun having a nozzle that fits the joint width. Force sealant into joints to fill the joints solidly without air pockets. Tool sealant after application to ensure adhesion. Make [sealant](#) uniformly smooth and free of wrinkles. Upon completion of sealant application, roughen partially filled or unfilled joints, apply sealant, and tool smooth as specified. Apply sealer over the sealant when and as specified by the sealant manufacturer.

3.4 PROTECTION AND CLEANING

3.4.1 Protection

Protect areas adjacent to joints from sealant smears. Masking tape may be used for this purpose if removed 5 to 10 minutes after the joint is filled.

3.4.2 Final Cleaning

Upon completion of sealant application, remove remaining smears and stains and leave the work in a clean and neat condition.

- a. Masonry and Other Porous Surfaces: Immediately scrape off fresh sealant that has been smeared on masonry and rub clean with a solvent as recommended by the sealant manufacturer. Allow excess sealant to cure for 24 hour then remove by wire brushing or sanding.
- b. Metal and Other Non-Porous Surfaces: Remove excess sealant with a solvent-moistened cloth.

3.4.3 Waste Management

**NOTE: NOTE: Designer shall verify that items are
able to be disposed of as specified.**

Close and seal tightly partly used sealant containers and store protected in well ventilated fire-safe area at moderate temperature. Place used sealant tubes and containers in areas designated for hazardous materials and dispose of properly. Return solvent and oil soaked rags for contaminant recovery and laundering or [for proper disposal][dispose of properly].

-- End of Section --