

SECTION 15820

DUCTWORK ACCESSORIES

This guide specification has been prepared by Hardcast, Carlisle Coatings and Waterproofing Incorporated to assist design professionals in the preparation of a specification section covering two-part tape/sealant metal duct sealant systems and insulation adhesive for metal ducts. The tape/sealant system sealant system must be field applied; refer to other Hardcast products for sealing shop-fabricated ducts.

This specification may be used as the basis for developing either a project specification or an office master specification. Since it has been prepared according to the principles established in the Manual of Practice published by The Construction Specifications Institute (CSI), this guide specification may be used in conjunction with most commercially available master specifications sections with minor editing.

The following should be noted in using this guide specification:

* Optional text requiring a selection by the user is enclosed within brackets, e.g.: "Section [01330] [_____]."

* Items requiring user input are enclosed within brackets, e.g.: "Section [_____ - _____]."

* Optional paragraphs are separated by an "OR" statement, e.g.:

[OR]

* Metric equivalents to inch-pound units follow the inch-pound units and are contained within parenthesis. Metric measurements are rationalized units based on the SI system of measurement. Delete either the inch-pound or metric units of measure depending on project requirements; do not include both units in a project specification, as conflicting requirements could result.

This guide specification is available in both hard copy and a variety of electronic formats to suit most popular word processing programs and operating platforms. Please contact Hardcast at www.Hardcast.com or at (800) 527-7092 for additional copies and for information on available electronic formats.

GENERAL

SUMMARY

Section Includes:

Mastic Dust Sealants for duct seams and joints
Tape/Sealant system for duct seams and joints.
Rolled Sealant
Adhesive for fiberglass duct insulation.

Edit the following paragraphs to coordinate with other sections of the project manual.

Related Sections:

Section [15080 - Mechanical Insulation] [_____ - _____]: Duct insulation.
Section [15810 - Ducts] [_____ - _____]: Metal ductwork.

DEFINITIONS

Duct Joint: Transverse joint between duct sections including girth joints, branch and sub-branch intersections, duct collar tap-ins, fitting subsections, louver and air terminal connections, access doors and frames, and abutments to building structure.

Duct Seam: Longitudinal joint between duct sections. Spiral lock seams in factory fabricated round or oval ducts are excluded.

REFERENCES

- American Society for Testing and Materials (ASTM)
 - E 84 - Test Method for Surface Burning Characteristics of Building Materials.
 - C-731 - Test Method for Extrudability, after Package Aging of Latex Sealants
 - D-2202 - Test Method for Slump of Sealants
- Sheet Metal and Air Conditioning Manufacturers National Association (SMACNA):
 - HVAC Air Duct Leakage Test Manual.
 - HVAC Duct Construction Standards - Metal and Flexible.
- Underwriters Laboratories, Inc. (UL):
 - 723 - Test Method for Surface Burning Characteristics of Building Materials.
 - Building Materials Directory for use with all duct configurations, systems, and connectors.

UL 181 Listed products or systems are used with Spiral and Rectangular Galvanized, Stainless, Aluminum, and PVC coated sheet metal duct and are not limited to rigid or flexible fiberglass air ducts and air connectors

- 181 B-FX - Tape Closure Systems for Use With Flexible Fiberglass Air Ducts and Air Connectors
- 181 A-M - Mastic Closure Systems for Use With Rigid Fiberglass Air Ducts, Air Connectors and Scrim
- 181 B-M - Mastic Closure Systems for Use With Flexible Fiberglass Air Ducts and Air Connectors

SUBMITTALS

Edit the following paragraph to coordinate with Division 1 statements.

Submit under provisions of Section [01330] [____].

Product Data:

In the following paragraph, retain the bracketed text where a fire-rated system is required.

Sealant System: Include product description, [surface burning characteristics,] performance characteristics, and installation instructions.

Insulation Adhesive: Include product description, performance characteristics, and installation instructions.

In the following paragraph, retain the bracketed text where a fire-rated system is required.

Test Reports - Sealant System: Indicate [surface burning characteristics,] pressure classes, and seal classes.

Certification: Manufacturer's certification that Products meet or exceed specified requirements.

QUALITY ASSURANCE

Manufacturer: Firm specializing in manufacturing the work of this Section with minimum 35 years documented experience.

Include the following paragraph when dictated by project size or special conditions; edit number of years to suit project requirements.

Installer: Firm specializing in performing the work of this Section with minimum [3] [__] years documented experience.

DELIVERY, STORAGE AND HANDLING

Store materials in protected, dry area, at a temperature within manufacturer's recommended storage range.

PROJECT CONDITIONS

Environmental Requirements: Do not apply products when ambient or surface temperature temperatures are lower or higher than those recommended by manufacturer.

PRODUCTS

MANUFACTURERS

Acceptable Manufacturer: Hardcast, Carlisle Coatings and Waterproofing Incorporated, 900 Hensley Lane, Wylie, Texas 75098, (800) 527-7092.

Edit the following paragraph to coordinate with Division 1 statements.

Substitutions: Under provisions of Section [01630] [_____].

MATERIALS - DUCT SEALANT SYSTEMS

Include the following paragraph for Two Part Sealant System for low, medium or high pressure ductwork in a UL rated tape/sealant system. This sealant should be used on interior or exterior locations.

Two Part Sealing System:

Tape: Part I

Product: DT-5300.

Description: Woven cotton fiber tape impregnated with mineral gypsum compound.

In the following paragraph, 3 inches is the standard width. Include wider tape only for wide joints

Width: [3] [4] [6] inches ([75] [100] [125] mm).

Sealant:

Product: RTA 50.

Description: Modified styrene acrylic.

Attributes:

Peel strength: 20 lb/linear inch (35 N/linear cm), tested with Instron device.

Time to test: Approximately 48 hours.

Service temperature: 0 to plus 200 degrees F (minus 17 to plus 93 degrees C).

Surface burning characteristics: Flame spread/smoke developed rating of 0/0, tested in accordance with ASTM E 84.

Seal classes: All SMACNA Classes.

Pressure classes: SMACNA 1/2, 1, 2, 3, 4, 6, and 10 inches water gage.

Include the following paragraph for low, medium or high pressure ductwork in a UL rated water based one part duct sealant system. This sealant should be used on interior or exterior locations.

One Part Sealant System:

Product: Iron-Grip 601

Description: Synthetic latex

Solvent: Water

Attributes:

Shore A Hardness: >20

Flexibility on ¼-inch mandrel: Passes

Time to test: Approximately 48 hours.

Service temperature: -20 to plus 200 degrees F (minus 29 to plus 93 degrees C).

Resistance to mold, mildew and water: Excellent

UL 181B-M: Passes

Surface burning characteristics: Flame spread/smoke developed rating of 0/0, tested in accordance with ASTM E 84.

Seal classes: All SMACNA Classes.

Pressure classes: SMACNA 1/2, 1, 2, 3, 4, 6, and 10 inches water gage.

City of Los Angeles Approval: RR# 8069

OR

Product: Versa-Grip 181

Description: Synthetic latex

Solvent: Water

Attributes:

Shore A Hardness: >20

Flexibility on ¼-inch mandrel: Passes

Time to test: Approximately 48 hours.

Service temperature: -20 to plus 200 degrees F (minus 29 to plus 93 degrees C).

Resistance to mold, mildew and water: Excellent

UL 181A-M: Passes

UL 181B-M: Passes

Surface burning characteristics: Flame spread/smoke developed rating of 25/17, tested in accordance with ASTM E 84.

Seal classes: All SMACNA Classes.

Pressure classes: SMACNA 1/2, 1, 2, 3, 4, 6, and 10 inches water gage.

City of Los Angeles Approval: Pending

OR

Product: Flex-Grip 550

Description: Synthetic latex

Solvent: Water

Attributes:

Shore A Hardness: >20

Flexibility on ¼-inch mandrel: Passes

Time to test: Approximately 48 hours.

Service temperature: -20 to plus 200 degrees F (minus 29 to plus 93 degrees C).

Resistance to mold, mildew and water: Excellent

UL 181B-M: Passes

Surface burning characteristics: Flame spread/smoke developed rating of 0/0,
tested in accordance with ASTM E 84.
Seal classes: All SMACNA Classes.
Pressure classes: SMACNA 1/2, 1, 2, 3, 4, 6, and 10 inches water gage.
City of Los Angeles Approval: RR# 8069

OR

Product: Duct-Seal 321
Description: Synthetic latex
Solvent: Water
Attributes:
Shore A Hardness: >20
Flexibility on ¼-inch mandrel: Passes
Time to test: Approximately 48 hours.
Service temperature: -20 to plus 200 degrees F (minus 29 to plus 93 degrees
C).
UL Classified Rating: UL 723
Surface burning characteristics: Flame spread/smoke developed rating of 0/0,
tested in accordance with ASTM E 84.
Resistance to mold, mildew and water: Excellent
UL 181B-M: Passes
Seal classes: All SMACNA Classes.
Pressure classes: SMACNA 1/2, 1, 2, 3, 4, 6, and 10 inches water gage.
City of Los Angeles Approval: RR# 8069

Include the following paragraph for low, medium or high pressure ductwork in a U.S.D.A. rated water based duct sealants system. This Sealant should be used on interior or exterior locations.

Sealant:

Product: Versa-Grip 102
Description: Synthetic latex
Solvent: Water
Attributes:
Shore A Hardness: >20
Flexibility on ¼-inch mandrel: Passes
Bonding time: Approximately 48 hours.
Service temperature: -20 to plus 200 degrees F (minus 29 to plus 93 degrees
C).
Resistance to mold, mildew and water: Excellent
UL 181A-M: Passes
UL 181B-M: Passes
Surface burning characteristics: Flame spread/smoke developed rating of 5/0,
tested in accordance with ASTM E 84.
Seal classes: All SMACNA Classes.
Pressure classes: SMACNA 1/2, 1, 2, 3, 4, 6, and 10 inches water gage.
City of Los Angeles Approval: RR#8069

Include the following paragraph for low, medium or high pressure ductwork in a rolled duct sealant rated tape system. This rolled sealant should be used on an interior, exterior or subgrade locations.

Rolled Sealant Tape:

Product: Aluma-Grip 701

Description: Aluminum bonded to a gray butyl adhesive

Attributes:

Thickness: 30 mils

Peel Strength: 17 lbs. per linear inch.

Tensile strength: 720 psi

Elongation: 560%

Flexibility: Excellent

Bonding time: Instant with full bond in 24 hours

Resistance to mold, mildew and water: Excellent

Weather Resistance per ASTM G-53 @ 2000 hours QUV: passes

Service temperature: -20 to plus 200 degrees F (minus 29 to plus 93 degrees C).

Surface burning characteristics: Flame spread/smoke developed rating of 25/50, tested in accordance with ASTM E 84.

VOC: 0 g/l

Seal classes: All SMACNA Classes.

Pressure classes: SMACNA 1/2, 1, 2, 3, 4, 6, and 10 inches water gage.

Include the following paragraph for low and medium pressure ductwork in a UL Classified rolled duct sealant rated tape system. This rolled sealant should be used on an interior, exterior or subgrade locations.

Product: Foil-Grip 1402

Description: Aluminum bonded to a gray butyl adhesive

Attributes:

Thickness: 17 mils

Peel Strength: 16 lbs. per linear inch.

Tensile strength: 955 psi

Elongation: 560%

Flexibility: Excellent

Bonding time: Instant with full bond in 24 hours

Resistance to mold, mildew and water: Excellent

Weather Resistance per ASTM G-53 @ 2000 hours QUV: passes

Service temperature: -20 to plus 200 degrees F (minus 29 to plus 93 degrees C).

UL Classified Rating: UL 723

Surface burning characteristics: Flame spread/smoke developed rating of 10/35, tested in accordance with ASTM E 84.

VOC: 0 g/l

Seal classes: All SMACNA Classes.

Pressure classes: SMACNA 1/2, 1, 2, 3, 4, and 6 inches water gage.

City of Los Angeles Approval: RR #8069

Include the following paragraph for low and medium pressure ductwork in a UL Listed rolled duct sealant rated tape system. This rolled sealant should be used on interior, exterior or subgrade locations.

Product: Foil-Grip 1402 181 BFX

Description: Aluminum bonded to a black elastomeric butyl adhesive

Attributes:

Thickness: 17 mils

Peel Strength: 13 lbs. per linear inch.

Tensile strength: 20 pli/1400 psi, typ.

Elongation: 200%

Flexibility: Excellent

Bonding time: Instant with full bond in 24 hours

Resistance to mold, mildew and water: Excellent

Weather Resistance per ASTM G-53 @ 2000 hours QUV: passes

UL Listed Rating: 181B-FX

Surface burning characteristics: Flame spread/smoke developed rating of 0/0, tested in accordance with ASTM E 84.

Service temperature: -20 to plus 200 degrees F (minus 29 to plus 93 degrees C).

Surface burning characteristics: Flame spread/smoke developed rating of 25/50, tested in accordance with ASTM E 84.

VOC: 0 g/l

Seal classes: All SMACNA Classes.

Pressure classes: SMACNA 1/2, 1, 2, 3, 4, and 6 inches water gage.

Include the following paragraph for low and medium pressure ductwork in a rolled duct sealant rated tape system. This rolled sealant should be used on interior locations. The cloth backing must be painted with a weatherized coating for use on exterior locations.

Product: All-Purpose 1602

Description: Sontara Fabric to a gray butyl adhesive

Attributes:

Thickness: 30 mils

Peel Strength: 17 lbs. per linear inch.

Tensile strength: 790 psi

Elongation: 560%

Flexibility: Excellent

Bonding time: Instant with full bond in 24 hours

Resistance to mold, mildew and water: Excellent

Service temperature: -20 to plus 200 degrees F (minus 29 to plus 93 degrees C).

Surface burning characteristics: Flame spread/smoke developed rating of 15/15, tested in accordance with ASTM E 84.

VOC: 0 g/l

Seal classes: All SMACNA Classes.

Pressure classes: SMACNA 1/2, 1, 2, 3, 4, and 6 inches water gage.

MATERIALS - 4 BOLT FLANGE DUCT SYSTEMS

Include the following paragraph for low, medium or high pressure 4 bolt flange ductwork in a UL rated gasket system. The extruded gasket is used with flange type connectors in non-weather exposed Locations.

Flange Gasket Sealant:

Product: Flange-Gasket 1902

Description: Extruded butyl/EPDM proprietary copolymer sealant on a siliconized release paper

Attributes:

Dimensions: 3/16 inch x 5/8 inch x 25 foot extruded roll

Peel Strength: 120 oz./Linear inch @500 g pressure at 77 F

Tensile strength: 20 to 30 psi

Flexibility: Excellent

Bonding time: Instant

Resistance to mold, mildew and water: Excellent

Service temperature: -65 to plus 200 degrees F (minus 54 to plus 93 degrees C).

Surface burning characteristics: Flame spread/smoke developed rating of 10/10, tested in accordance with ASTM E 84.

Approvals: City of LA Approval # 7736,U.S.D.A., Federal TT-C-1796A. Type II. Class B, MIL-C-18969B. Type II. Class B.

VOC: 0 g/l

Seal classes: All SMACNA Classes.

Pressure classes: SMACNA 1/2, 1, 2, 3, 4, 6, and 10 inches water gage.

MATERIALS - DUCT INSULATION ADHESIVE

Include the following paragraph for a water based adhesive for coil line, spray, brush, or roller application.

Duct Insulation Adhesive:

Product: COIL-TACK

Description: Low initial tack, high strength synthetic latex, water based, non-flammable.

Attributes:

Solids content: 36% (+/- 2%).

VOC content: 75 g/l.

Initial Bond Time: Approximately 30 min.

Dry time to touch: Approximately 45 min.

Resistance to mold, mildew and water: Excellent

Freeze/Thaw Stability: Passes 5 cycles

Service temperature: Minus 20 to plus 200 degrees F (minus 29 to plus 93 degrees C).

UL Classified Rating: UL 723

City of Los Angeles Approval: RR# 8069

Surface burning characteristics: Flame spread/smoke developed rating of 0/0, tested in accordance with ASTM E 84.

[OR]

Include the following paragraph for a medium tacking, water based adhesive for extrusion coil line, brush, roller or spray application.

Duct Insulation Adhesive:

Product: ROTO-TACK-Black

Description: A medium tacking, high strength synthetic latex, water based, non-flammable.

Attributes:

Color: Gray (wet), Black (dry)

Solids content: 48 % (+/- 2 percent).

VOC content: 80 g/L.

Initial Bond time: 20 minutes

Dry time: 30 minutes.

Resistance to mold, mildew and water: Excellent

Freeze/Thaw Stability: Passes 5 cycles

Service temperature: Minus 20 to plus 200 degrees F (minus 29 to plus 93 degrees C).

UL Classified Rating: UL 723

Surface burning characteristics: Flame spread/smoke developed rating of 0/0, tested in accordance with ASTM E 84.

City of Los Angeles Approval: Pending

[OR]

Product: ROTO-TACK-Clear

Description: A medium tacking, high strength synthetic latex, water based, non-flammable.

Attributes:

Color: White (wet), Clear (dry)

Solids content: 42 % (+/- 2 percent).

VOC content: 79 g/L.

Initial Bond time: 20 minutes

Dry time: 30 minutes.

Resistance to mold, mildew and water: Excellent

Freeze/Thaw Stability: Passes 5 cycles

Service temperature: Minus 20 to plus 200 degrees F (minus 29 to plus 93 degrees C).

UL Classified Rating: UL 723

Surface burning characteristics: Flame spread/smoke developed rating of 0/0, tested in accordance with ASTM E 84.

Include the following paragraph for a high tacking, water based adhesive for brush, roller or spray application.

Duct Insulation Adhesive:

Product: BOOTH-TACK

Description: A medium tacking, high strength synthetic latex water based, non-flammable.

Attributes:

Color: Gray (wet), Black (dry)

Solids content: 53 % (+/- 2 percent).

VOC content: 79 g/L.

Initial Bond time: 10 minutes

Dry time: 20 minutes.

Resistance to mold, mildew and water: Excellent
Freeze/Thaw Stability: Passes 5 cycles
Service temperature: Minus 20 to plus 200 degrees F (minus 29 to plus 93 degrees C).
UL Classified Rating: UL 723
Surface burning characteristics: Flame spread/smoke developed rating of 0/0, tested in accordance with ASTM E 84.

Include the following paragraph for a fast tacking, water based adhesive for brush, roller or spray application.

Product: SPEED-TACK

Description: A fast tacking, high strength synthetic latex, water based, non-flammable.

Attributes:

Color: Tan (wet and dry)

Solids content: 53 % (+/- 2 percent).

VOC content: 78 g/L.

Initial Bond time: 5 minutes

Dry time: 10 minutes.

Resistance to mold, mildew and water: Excellent

Freeze/Thaw Stability: Passes 5 cycles

Service temperature: Minus 20 to plus 200 degrees F (minus 29 to plus 93 degrees C).

Surface burning characteristics: Flame spread/smoke developed rating of 0/5, ASTM E 84.

[OR]

Include the following paragraph for a self-extinguishing, fast tacking, UL classified, solvent based adhesive for spray, brush, or roller application. Select GG-636SE for red or GG-637SE for black.

Duct Insulation Adhesive:

Product: INSTA-TACK-Red and Black

Description: Solvent based, self-extinguishing.

Attributes:

Solids content: 33 percent.

VOC content: 543 g/L.

Tack time: Immediate.

Dry Time: 15 minutes

Service temperature: Minus 20 to plus 200 degrees F (minus 29 to plus 93 degrees C).

UL Classified Rating: UL 723

Surface burning characteristics: Flame spread/smoke developed rating of 0/0, tested in accordance with ASTM E 84.

[OR]

Include the following paragraph for a self-contained, spray applied, pressure sensitive solvent based adhesive.

Duct Insulation Adhesive:

Product: TRAVEL-TACK-Standard

Description: Solvent based, non-flammable when dry.

Packaging: Aerosol can or cylinder

Attributes:

VOC content: 266 g/L.

Tack time: Immediate.
Dry Time: 10 minutes
Service temperature: Minus 40 to plus 200 degrees F (minus 40 to plus 93 degrees C).
Surface burning characteristics: Flame spread/smoke developed rating of 0/0, tested in accordance with ASTM E 84.

OR

Duct Insulation Adhesive:

Product: TRAVEL-TACK-VOC Compliant
Description: VOC compliant solvent based, non-flammable when dry.
Packaging: Aerosol can or cylinder
Attributes:
VOC content: <200 g/l.
Tack time: Immediate.
Dry Time: 5 to 10 minutes
Service temperature: Minus 40 to plus 200 degrees F (minus 40 to plus 93 degrees C).
Surface burning characteristics: Flame spread/smoke developed rating of 5/5, tested in accordance with ASTM E 84.

Adhesive Remover and Cleaner:

Product: UN-TACK
Description: Adhesive removal and cleaner for duct sealants and duct insulation adhesives.
Packaging: Aerosol can.
VOC content: >250 g/l.
Application temperature: 50 to plus 110 degrees F (10 to plus 43 degrees C).

MATERIALS - VAPOR BARRIER / INSULATION SEALANT

Include the following paragraph for insulation sealant for vapor barrier on piping insulation applications and for sealing cut ends of fibrous glass duct liner or to coat foam insulation.

Duct Insulation Sealer:

Product: SEAL-TACK
Description: Vapor barrier and lagging insulation sealant.
Attributes:
Color: White
Solids content: 50 % (+/- 2 percent).
VOC content: 128 g/L.
Dry time: 30 minutes.
Resistance to mold, mildew and water: Excellent
Freeze/Thaw Stability: Passes 5 cycles
Service temperature: Minus 20 to plus 200 degrees F (minus 29 to plus 93 degrees C).
Surface burning characteristics: Flame spread/smoke developed rating of 0/5, tested in accordance with ASTM E 84.

EXECUTION

PREPARATION

Clean surfaces of dirt, oil, grease, and loose or foreign matter that could impair adhesion, using soap and water or solvent. For maximum adhesion, rinse with a 50/50 mix of alcohol and water.

Allow surfaces to dry completely before proceeding.

INSTALLATION OF TAPE/SEALANT DUCT SYSTEM

Two Part Sealing System:

Apply two-part tape/adhesive sealant system to duct joints and seams in accordance with manufacturer's instructions.

Saturate tape with adhesive, using applicator or brush. Remove excess sealant.

Place saturated tape on duct joint or seam. Lap tape end 2 inches (50 mm) minimum.

Smooth out wrinkles, bubbles, and voids by gloved hand or brush.

Completely seal duct joints and seams with one additional brush coat.

One Part Sealant System:

General Application on Metallic Duct Systems

Apply one-part sealant system with a brush, putty knife, caulk gum or pump to duct joints, fasteners and seams in accordance with manufacturer's instructions.

Tool caulk bead with putty knife or brush.

Let dry per manufacturer data sheet

Rigid Fiberglass Air Duct or to meet code or specifications

Apply one-part sealant system with a brush or pump to duct joints, fasteners and seams in accordance with manufacturer's instructions.

Embed fabric in first course and immediately apply second layer per manufacturer's specifications.

Let dry per manufacturer data sheet

Flexible Air Duct System

Apply one-part sealant system with a brush or pump to duct joints, fasteners and seams in accordance with manufacturer's instructions.

Let dry per manufacturer data sheet

Rolled Sealant Tape:

Cut desired length, peel off release liner and by using hand pressure or squeegee apply to joint and seams. Lap tape end 2 inches (50 mm minimum). Instant adhesion requires precise positioning. Not re-positional.

INSTALLATION OF DUCT INSULATION ADHESIVE

Apply adhesive in accordance with manufacturer's instructions.

Coat duct surfaces with adhesive at minimum rate recommended by manufacturer.

Press insulation firmly into adhesive.

Fit insulation tight to adjacent pieces and to other construction without voids.

FIELD QUALITY CONTROL

Allow duct sealant system to cure minimum 48 hours before pressure testing.

Do not apply external duct insulation or coatings until ducts have been pressure tested and approved.

Test completed ductwork for leaks in accordance with SMACNA Standards.

Maximum Allowable Leakage Class:

PRESSURE CLASS /SEAL CLASS for RECTANGULAR, ROUND, OR OVAL METAL DUCTS:

1/2, 1, 2, 4, 6, and 10 inch water gauge per specification. Test and Reseal and retest joints or seams showing leakage.

END OF SECTION