

**SECTION 235100
BREECHINGS, CHIMNEYS, AND STACKS**

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufactured breechings.
- B. Refractory lined metal stacks.
- C. Double wall metal stacks.

1.02 RELATED REQUIREMENTS

- A. Section 078400 - Firestopping.
- B. Section 230716 - HVAC Equipment Insulation.

1.03 REFERENCE STANDARDS

- A. ASTM C401 - Standard Classification of Alumina and Alumina-Silicate Castable Refractories 2012 (Reapproved 2018).
- B. NFPA 31 - Standard for the Installation of Oil Burning Equipment 2018.
- C. NFPA 54 - National Fuel Gas Code 2018.
- D. NFPA 82 - Standard on Incinerators and Waste and Linen Handling Systems and Equipment 2019.
- E. NFPA 211 - Standard for Chimneys, Fireplaces, Vents, and Solid Fuel-Burning Appliances 2019.
- F. SMACNA (DCS) - HVAC Duct Construction Standards Metal and Flexible 2005 (Revised 2009).
- G. UL 103 - Factory-Built Chimneys for Residential Type and Building Heating Appliances Current Edition, Including All Revisions.
- H. UL 959 - Medium Heat Appliance Factory Built Chimneys Current Edition, Including All Revisions.

1.04 DEFINITIONS

- A. Breeching: Vent connector.
- B. Chimney: Primarily vertical shaft enclosing at least one vent for conducting flue gases outdoors.
- C. Smoke Pipe: Round, single wall vent connector.
- D. Vent: That portion of a venting system designed to convey flue gases directly outdoors from a vent connector or from an appliance when a vent connector is not used.
- E. Vent Connector: That part of a venting system that conducts the flue gases from the flue collar of an appliance to a chimney or vent, and may include a draft control device.

1.05 SUBMITTALS

- A. See Section 013300 - Submittal Procedures, for submittal procedures.
- B. Product Data: Provide data indicating factory built chimneys, including dimensional details of components and flue caps, dimensions and weights, electrical characteristics and connection requirements.
- C. Shop Drawings: Indicate general construction, dimensions, weights, support and layout of breechings. Submit layout drawings indicating plan view and elevations where factory built units are used.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Breechings, Chimneys, and Stacks:
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1. AMPCO by Hart & Cooley, Inc; Model VSI: www.ampcostacks.com/#sle.
2. DuraVent; DuraStack Pro (DIS2): www.duravent.com/#sle.
3. Metal-Fab, Inc: www.mtlfab.com/#sle.
4. Security Chimneys International; Secure Stack Pro (CIX2): www.securitychimneys.com/#sle.

2.02 BREECHINGS, CHIMNEYS, AND STACKS - GENERAL REQUIREMENTS

- A. Regulatory Requirements:
 1. Comply with applicable codes for installation of natural gas burning appliances and equipment.
 2. Comply with NFPA 31 for installation of oil burning appliances and equipment.
 3. Factory-built vents and chimneys used for venting natural draft appliances to comply with NFPA 211 and UL listed and labeled.
 4. Products Requiring Electrical Connection: Listed and classified by Underwriters Laboratories Inc. as suitable for the purpose specified and indicated.

2.03 MANUFACTURED BREECHINGS

- A. Provide factory-built, modular connector and manifold system, tested to UL 103 with positive pressure rating.
- B. Assembly to be UL listed for use with building equipment in compliance with NFPA 211.
- C. Fabricate with 1 inch minimum air space between walls and construct inner liner of 304 stainless steel and outer jacket of 304 stainless steel.
 1. Protect aluminized steel surfaces exposed to the elements with a minimum of one base coat of primer and one finish coat of corrosion resistant paint suitable for outer jacket skin temperatures of the application.
- D. Design, fabricate, and install gas-tight preventing products of combustion leaking into the building.
 1. Securely connect inner joints and seal with factory supplied overlapping V-bands and appropriate sealant in accordance with manufacturer's instructions.
 2. System design to compensate for all flue gas induced thermal expansion.

2.04 REFRACTORY LINED METAL STACKS

- A. Fabricate jacket for size 36 inches and smaller of 24 gauge, 0.0239 inch galvanized steel with grooved seam joint, or 26 gauge, 0.0179 inch aluminized steel with riveted seams. For sizes 39 inches and larger fabricate of 11 gauge, 0.1196 inch galvanized steel with welded seam joint.
- B. Weld heavy gauge stack sections together in factory. Factory apply heat resistant paint to each stack section and accessory with primer and finish paint. Touch-up or refinish in field.
- C. Refractory lining to be a minimum 2 inch thick, proprietary material ASTM C401 Class ___ tested to UL 959 and UL listed to withstand 2000 degrees F without fusion, have maximum acid extraction of 0.2 percent, have minimum of 3200 psi cold crush strength, and be positively bonded to steel jacket, jointed with mortar.
- D. Accessories, UL Labeled:
 1. Anchor Lugs: Acid resistant coated cast iron.
 2. Clean Out Section: Welded to base of stack, with gasket, and bolt tightened inspection plate.
 3. Roof Penetration: Factory fabricated thimble, flashing and storm collar.

2.05 SINGLE WALL METAL STACKS

- A. Provide single wall metal stacks, tested to UL 103 and UL listed with positive pressure rating, for use with building heating equipment, in compliance with NFPA 211.
- B. Fabricate with AL29-4C stainless steel.

1. Protect aluminized steel surfaces exposed to the elements with a minimum of one base coat of primer and one finish coat of corrosion resistant paint suitable for outer jacket skin temperatures of the application.
- C. Accessories, UL Labeled:
 1. Ventilated Roof Thimble: Consists of roof penetration, vent flashing with spacers and storm collar.
 2. Stack Cap: Consists of conical rainshield with inverted cone for partial rain protection with low flow resistance.

2.06 DOUBLE WALL METAL STACKS

- A. Manufacturers:
 1. Z-Flex U.S. Inc; Z-VENT Double Wall: www.z-flex.com/#sle.
- B. Provide double wall metal stacks, tested to UL 103 and UL listed with positive pressure rating, for use with building heating equipment, in compliance with NFPA 211.
- C. Fabricate with 1 inch minimum air space between walls and construct inner liner of 304 stainless steel and outer jacket of AL29-4C stainless steel.
 1. Protect aluminized steel surfaces exposed to the elements with a minimum of one base coat of primer and one finish coat of corrosion resistant paint suitable for outer jacket skin temperatures of the application.
- D. Accessories, UL Labeled:
 1. Ventilated Roof Thimble: Consists of roof penetration, vent flashing with spacers and storm collar.
 2. Stack Cap: Consists of conical rainshield with inverted cone for partial rain protection with low flow resistance.

PART 3 EXECUTION

3.01 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install in accordance with NFPA 54
- C. Install breechings with minimum of joints. Align accurately at connections, with internal surfaces smooth.
- D. Support breechings from building structure, rigidly with suitable ties, braces, hangers and anchors to hold to shape and prevent buckling. Support vertical breechings, chimneys, and stacks at 12 foot spacing, to adjacent structural surfaces, or at floor penetrations. Refer to SMACNA (DCS) for equivalent duct support configuration and size.
- E. Pitch breechings with positive slope up from fuel-fired equipment to chimney or stack.
- F. Install firestopping to preserve fire resistance rating of partitions and other elements, using materials and methods specified in Section 078400.
- G. Insulate breechings in accordance with Section 230716.
- H. Assemble and install stack sections in accordance with NFPA 82, industry practices, and in compliance with UL listing. Join sections with acid-resistant joint cement. Connect base section to foundation using anchor lugs.
- I. Level and plumb chimney and stacks.
- J. Clean breechings, chimneys, and stacks during installation, removing dust and debris.

3.02 SCHEDULES

- A. Breechings, Chimneys and Stacks.
 1. Condensing Boiler: Double Wall, Manufactured Breeching, Stainless Steel, Category IV Vent.

2. Non-Condensing Boiler: Refractory Lined, Galvanized breeching, Type B vent.

END OF SECTION 235100