

ICC-ES Evaluation Report**ESR-2627****Issued July 1, 2008 Reissued July 1, 2010**This report is subject to re-examination in two years.*www.icc-es.org | (800) 423-6587 | (562) 699-0543

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DIVISION: 15—MECHANICAL
Section: 15810—Ducts**REPORT HOLDER:****METAL-FAB, INC.**
POST OFFICE BOX 1138
WICHITA, KS 67201
www.mtlfab.com**EVALUATION SUBJECT:****METAL-FAB MODELS IPIC-4G AND IPIC-3G NO-CHASE
GREASE DUCT SYSTEMS****1.0 EVALUATION SCOPE****Compliance with the following codes:**

- 2006 *International Mechanical Code*® (IMC)
- 2006 *IAPMO Uniform Mechanical Code* (IAPMO UMC)

Properties evaluated:

- Durability
- Fire resistance
- Noncombustibility
- Surface burning characteristics

2.0 USES**2.1 General:**

The Metal-Fab Model IPIC-4G and IPIC-3G No-Chase grease duct systems are self-enclosed, factory-fabricated grease duct systems serving Type I kitchen hoods used in buildings required to be of one- or two-hour fire-resistance-rated construction. When installed in accordance with this report, each system is an alternate to the grease ducts described in Section 506.3 of the IMC and section 510.4 of the IAPMO UMC; and complies with the grease duct enclosure requirements of 506.3.10 of the IMC and Section 507.2.3 of the IAPMO UMC. These systems can be used to penetrate fire-resistance-rated concrete floor-ceiling or wall assemblies when installed in accordance with Section 4.2 of this report.

3.0 DESCRIPTION**3.1 Grease Duct System:**

The Model IPIC-4G No-Chase grease duct system is of double-wall-type construction, with a 4-inch (102 mm) annular space between the inner wall (flue) and the outer casing. The flue is manufactured from 0.035-inch-thick (0.889 mm), Type 304, 316 or Type 430 stainless steel.

The outer casing is manufactured from 0.024-inch-thick (0.610 mm), Type 304, Type 316 or Type 430 stainless steel, or 0.024-inch-thick (0.610 mm) aluminized steel. The annular space is filled with 4-inch-thick (102 mm), minimum 6-pcf (96 kg/m³), noncombustible ceramic fiber.

The Model IPIC-3G No-Chase grease duct system is of double-wall-type construction, with a 3-inch (76 mm) annular space between the inner wall (flue) and the outer casing. The flue is manufactured from 0.035-inch-thick (0.889 mm), Type 304, 316 or Type 430 stainless steel.

The outer casing is manufactured from 0.024-inch-thick (0.610 mm), Type 304, Type 316 or Type 430 stainless steel, or 0.024-inch-thick (0.610 mm) aluminized steel. The annular space is filled with 3-inch-thick (76 mm), minimum 8.5 pcf (136 kg/m³), noncombustible ceramic fiber.

The Model IPIC-4G duct system is available with inside diameters of 6 inches (152 mm) through 36 inches (914 mm), in 2-inch (51 mm) increments. The Model IPIC-3G duct system is available with inside diameters of 6 inches (152 mm) through 24 inches (610 mm), in 2-inch (51 mm) increments. Each system comes in standard duct lengths of 9, 18, 30 or 42 inches (229, 457, 762 or 1067 mm). Other components include duct supports, expansion joints, grease manifold tees, access covers and tee caps. See Figure 1 for typical components.

3.2 Expansion Joints:

Expansion joints, which are used to accommodate thermal expansion and for making up odd lengths, are made of materials identical to those of the grease duct system. The joint is comprised of a 5 1/4-inch-long (133 mm) collar, a 30-inch-long (762 mm) flanged tube with a diameter equal to the inner diameter of the installed duct system, and a 36-inch-long (914 mm) outer jacket. For Model IPIC-4G, insulation between the inner and outer jackets is 4-inch-thick (102 mm), minimum 6 pcf density (96 kg/m³), noncombustible ceramic fiber. For Model IPIC-3G, insulation between the inner and outer jackets is 3-inch-thick (76 mm), minimum 8.5 pcf density (136 kg/m³), noncombustible ceramic fiber.

***Revised June 2009**

3.3 Ceramic Insulation:

Ceramic insulation is supplied by Metal-Fab, Inc., and is installed at the jobsite for duct joints and through-penetration firestops. For duct joints, insulation is a minimum 6 pcf (96 kg/m³) density for Model IPIC-4G and a minimum 8.5-pcf (136 kg/m³) density for Model IPIC-3G and is of the same materials as used for the grease duct components.

3.4 Sealant:

Type P080 Sealant is used for joining duct sections and is supplied by Metal-Fab, Inc.

4.0 INSTALLATION

4.1 General:

Duct sections are connected by mechanical joints, consisting of integral flanges on adjoining inner wall sections, held together with a 0.024-inch-thick (0.610 mm) stainless steel flange band and sealed with Type P080 sealant. For Model IPIC-4G, a 6-inch-wide-by-4-inch-thick (152 mm by 102 mm) strip of minimum 6 pcf (96 kg/m³), noncombustible, ceramic fiber insulation is placed around the joint of the inner wall sections. For Model IPIC-3G, a 6-inch-wide-by-3-inch-thick (152 mm by 76 mm) strip of the same type is used and the insulation is minimum 8.5 pcf (136 kg/m³), noncombustible ceramic fiber. The outer casing sections are then joined with a closure band. See Figure 2 for typical connection details.

Expansion joints are assembled in accordance with the manufacturer's installation instructions. Expansion joints are located between fixed supports to allow for thermal expansion. The expansion joint must not be used to correct misalignment.

Access to the interior of the duct must be provided at the duct entry or discharge and at each floor level in accordance with NFPA 96. A grease manifold tee is provided at each floor level, and is capped by the following typical connection details and using a tee cap with a closure band (identified as part TCN or TAP; see Figure 4).

Each system may be installed with zero clearance between the outer casing and combustible construction. The ducts are supported with support mechanisms provided by the manufacturer, as illustrated in Figure 1. Maximum unsupported spacing is 13 feet (3962 mm) vertically and 9 feet (2743 mm) horizontally.

4.2 Through-penetration Fire-stop System:

Penetrations by the duct through minimum 4¹/₂-inch-thick (114 mm) concrete floor-ceiling assemblies complying with IBC Table 720.1(3), or minimum 4¹/₂-inch-thick (114 mm) wall assemblies complying with IBC Table 720.1(2), must be protected as follows: The maximum 1-inch (24.5 mm) annular space is filled with bulk ceramic insulation with a minimum 6 pcf (136 kg/m³) density, to within ¹/₂ inch (12.7 mm) of the upper and lower surfaces. The remaining space

is filled with 3M CP25WB caulk supplied by Metal-Fab, Inc., which is sloped to a height of 1-1/8 inches (28.6 mm) against the duct. On the upper surface of the assembly, a two-piece, 0.035-inch-thick (0.889 mm), Type 304 stainless steel plate, cut to the appropriate duct size, is placed around the duct and mechanically attached to the floor. One-inch-thick-by-12-inch-wide (25.4 mm by 305 mm) ceramic fiber insulation, minimum 6 pcf (136 kg/m³) density, is then wrapped around the duct and secured with an outer layer of 0.035-inch-thick (0.889 mm), Type 304 stainless steel. The floor-ceiling assembly, as described, has F- and T-ratings of three hours. The wall assembly as described has a fire-resistance rating of 3 hours. See Figure 3.

5.0 CONDITIONS OF USE

The Metal-Fab Model IPIC-4G and Model IPIC-3G No-Chase grease duct systems described in this report comply with, or are suitable alternatives to what is specified in those codes listed in Section 1.0 of this report, subject to the following conditions:

- 5.1 The system is manufactured, identified and installed in accordance with this report and the manufacturer's instructions. In the event of a conflict between the manufacturer's instructions and this report, this report governs.
- 5.2 Clearances to combustible construction must be as noted in Section 4.1 of this report.
- 5.3 Penetrations of fire-resistance-rated concrete floor-ceiling or wall assemblies must be protected as described in Section 4.2 of this report.
- 5.4 Installations requiring factory-installed taps for installation of fire-extinguishing systems are beyond the scope of this report.
- 5.5 The duct systems are manufactured in Wichita, Kansas, under a quality control program with inspections by Underwriters Laboratories Inc. (AA-668).

6.0 EVIDENCE SUBMITTED

- 6.1 Data in accordance with UL2221.
- 6.2 Quality documentation
- 6.3 Data in accordance with the ICC-ES Acceptance Criteria for Grease Duct Systems, Self-enclosed (AC121), dated April 1997. (Model IPIC-4G only.)

7.0 IDENTIFICATION

Each Model IPIC-4G and Model IPIC-3G component bears a label with the Metal-Fab Inc. name and address, the product name, clearances to combustibles, the name of the inspection agency (Underwriters Laboratories Inc.), and the evaluation report number (ESR-2627).

Packaging for Type P080 sealant bears the Metal-Fab Inc. name and address and the product name.

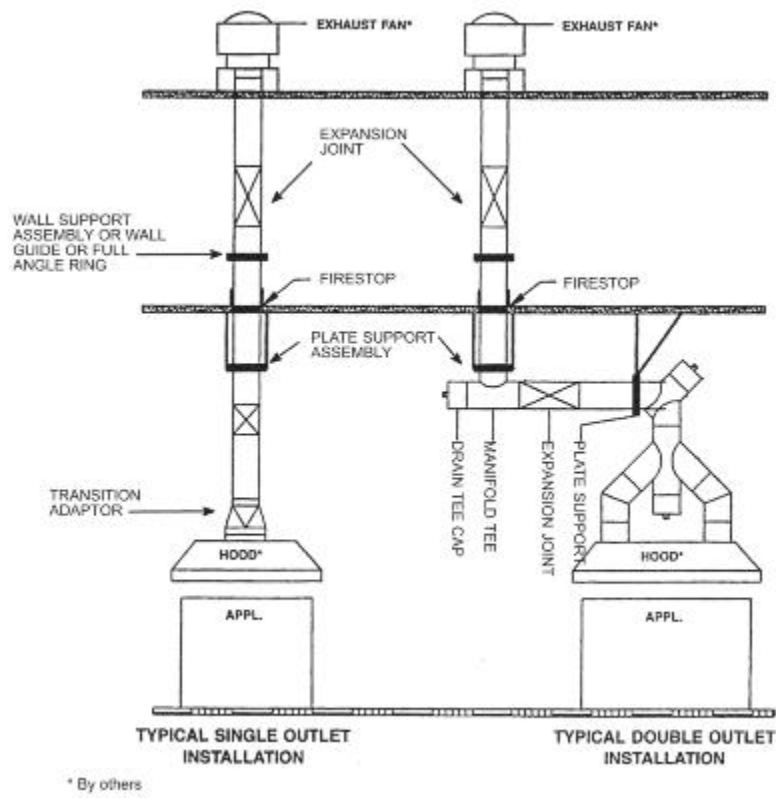


FIGURE 1—TYPICAL INSTALLATION DETAILS

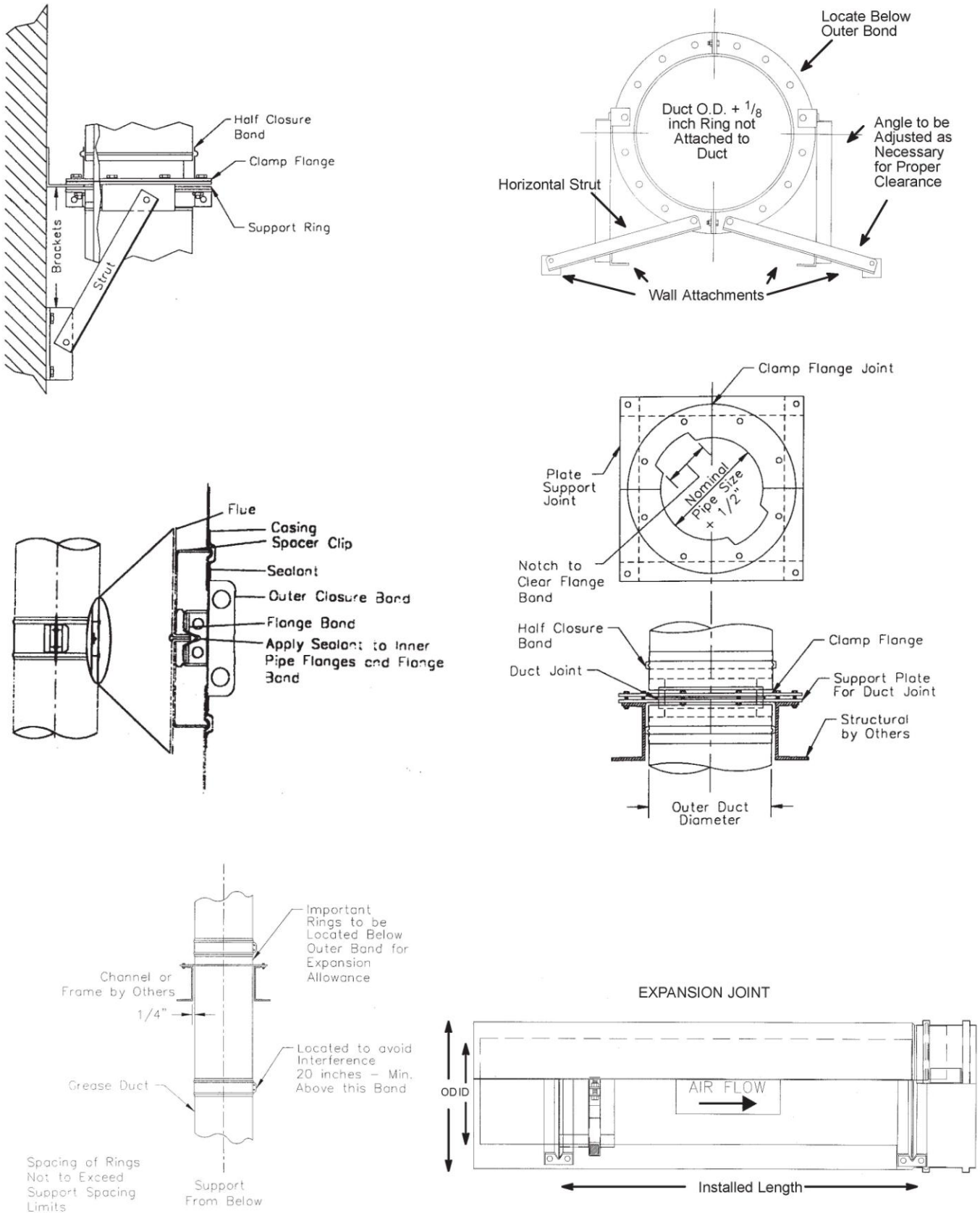


FIGURE 1—TYPICAL INSTALLATION DETAILS (Continued)

Spacing of Rings
Not to Exceed
Support Spacing
Limits

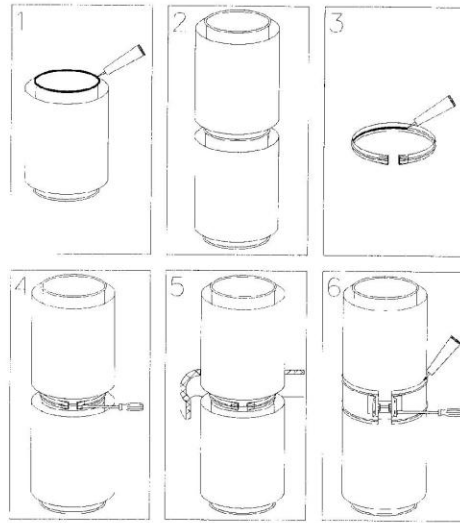


FIGURE 2—TYPICAL DUCT CONNECTION

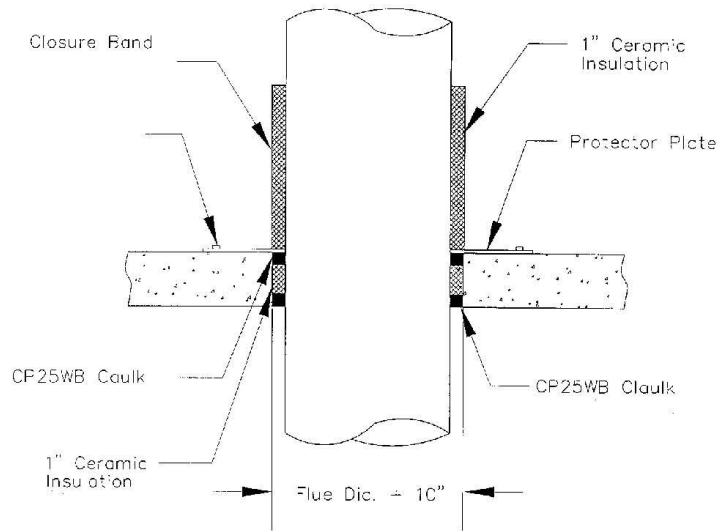


FIGURE 3—THROUGH-PENETRATION FIRE STOP

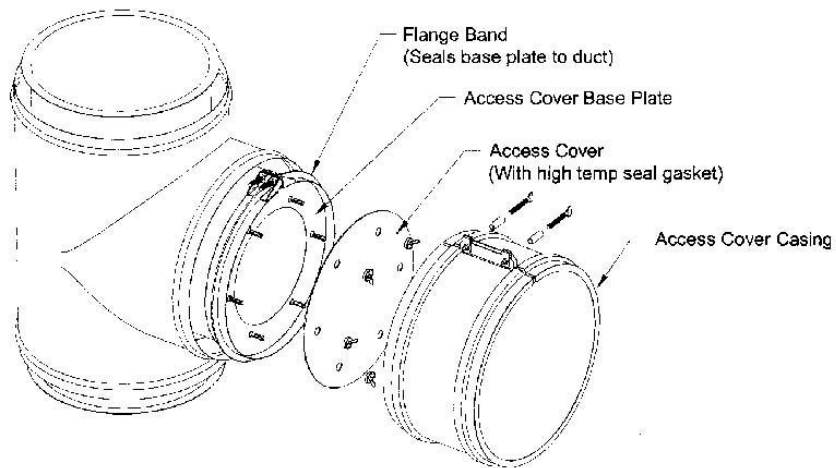


FIGURE 4—ACCESS COVER