Design No. FRD-4
October 20, 2005

(Fire Resistance Ratings)

Stability, Integrity and Insulation - 2 h

This material was extracted by 3M Fire Protection Products from the 2006 ULC Fire Resistance Directory
**Maximum Size of Duct** — 1.03 m² maximum area with no dimension exceeding 1.016 mm. For ducts penetrating combustible Floor/Ceiling assemblies, maximum area 0.62 m² with no dimension exceeding 1.22 m.

**Support Spacing** — 1.500 mm maximum.

**Duct Use Limitation** — Duct is intended for use in exhaust systems serving commercial and institutional kitchen cooking appliances.

Duct system, when constructed of the materials and in the manner described below, also meets the intent of NFPA 96, Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations. Clearance to combustible materials - 0 mm.

1. **Masonry Wall or Floor** — Minimum depth or thickness as necessary for the grade of fire separation but not less than 115 mm. Normal-density or low-density concrete. Wall can also be constructed of nominal 190 mm thick concrete block laid up with mortar.

**OR**

(a). **Wall Assembly** — The fire-rated gypsum wallboard and steel or wood stud assembly shall be constructed of the materials and in the manner described in the individual Wall or Partition design in the ULC List of Equipment and Materials, Fire Resistance Ratings.

**OR**

(b). **Floor/Ceiling Assembly** — The fire-rated combustible floor_ceiling assembly shall be constructed of the materials and in the manner described in the individual Floor_Ceiling design in the ULC List of Equipment and Materials, Fire Resistance.

2. **Grease Duct** — Duct to be constructed in accordance with the requirements of the Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations, NFPA 96. Minimum thickness of steel permitted, 1.6 mm thick carbon steel or 1.2 mm thick stainless steel; maximum size of duct 1.016 mm by 1.016 mm nominal.

3. **Grease Duct Insulation** — (Guide No. 440 E9). See ULC Heating and Ventilating Equipment and Flammable Liquids and Gases Equipment Directory. "3M FireMaster Duct Wrap" Calcium-Magnesium-Silicate (CMS) wrap, 38 mm thick, installed in accordance with the manufacturer's installation instructions and shall include the following features:

(a) Copper-coated steel insulation pins (not shown), nominal 3 mm thick, minimum 102 mm long, shall be stud welded to the bottom surface of steel duct on horizontal runs and on the widest surface on vertical runs of the steel duct at 305 mm OC maximum.

(b) The interior layer of the "3M FireMaster Duct Wrap" shall be installed around the duct with an overlap of minimum 76 mm. The second layer of blanket shall be wrapped around the first layer with overlapping joints staggered minimum 267 mm. All single and
double layer joints are to be covered with minimum 102 mm wide aluminum tape or two layers of 76 mm wide overlapped to form a width of 102 mm.

(c) The layers of blanket are locked into place over the insulation pins with 25 mm by 25 mm speed clips (not shown). Banding material (Item 6), 13 mm wide and minimum 0.3 mm thick, shall be installed with a tensioning tool and spaced a minimum 267 mm OC.

3M COMPANY

4. **Support Rod** — Steel threaded rod, nominal 13 mm minimum diameter, or for ducts not exceeding 254 mm by 406 mm (0.1 m² maximum area with no dimension exceeding 406 mm), steel threaded rod of nominal 10 mm diameter threaded through Cradle (Item 5) and mounted to concrete floor by:
   (a) Passing through pre-drilled hole and bolting with nut and washer on top of floor, or
   (b) Carbon steel or stainless steel masonry anchors, nominal 13 mm or 10 mm diameter by 50 mm long, drop-in style anchors embedded a minimum of 50 mm into concrete, or
   nominal 13 mm or 10 mm diameter stud wedge/expansion type anchors embedded a minimum of 60 mm into concrete.

5. **Cradle** — Steel angle, 50 mm by 50 mm by 5 mm, used to support wrapped duct at 1500 mm OC maximum. Hung from concrete floor with Support Rods (Item 4).

For ducts not exceeding 254 mm by 406 mm (0.1 m² maximum area with no dimension exceeding 406 mm), steel angle 38 mm by 38 mm by 4 mm can be used.

6. **Steel Band** — Nominal 13 mm wide, 0.3 mm thick, made of carbon or stainless steel for 1 h rating and stainless steel for 2 h rating, installed on wrapped duct with tensioning tool and spaced at minimum 267 mm OC.

Firestop System Installation

The duct shall be installed within the opening such that the annular space between the wrapped duct and the edges of the opening is maximum 76-mm. For installations in gypsum wallboard assemblies, the opening to accommodate the duct shall be framed on all sides using lengths of stud installed between vertical studs and secured to the vertical studs.

For installations in combustible floor/ceiling assemblies, only Option A shall be used. The maximum and minimum annular spaces shall be 82 and 22 mm respectively. The opening to accommodate the duct shall be framed on all sides using lengths of nominal 38 mm by minimum 240 mm wood joists.

Firestop System Installation through Non-Combustible Floor or Combustible or Non-Combustible Wall Opening
7(a). **Firestop Insulation** — "3M FireMaster Duct Wrap" ceramic blanket or ULC labelled mineral wool insulation with minimum 64 kg/m³ density compressed 50% minimum and installed into the opening to a minimum depth of 100 mm. Material to be recessed 6.4 mm from top surface of floor or both surfaces of wall to allow for the installation of sealant (Item 7b).

7(b). **Firestop System Component** — (Guide No. 40 U19.13). Type "3M Fire Barrier 2000 or 2000+" silicone sealant or "3M Fire Barrier CP25WB+" caulk applied over insulation (Item 7a) to a minimum depth of 6.4 mm flush with top surface of floor or symmetrically to both surfaces of wall.

Or

Type "3M Fire Barrier 1003" self-leveling silicone sealant for horizontal penetrations only applied to a minimum depth of 6.4 mm flush with the top surface of floor slab.

3M COMPANY

Option A

(Firestop System Installation Through Combustible Floor/Ceiling Opening)

8(a). **Firestop Insulation** — "3M FireMaster Duct Wrap" or ULC labelled mineral wool insulation with minimum 48 kg/m³ density compressed 50% minimum and installed into the opening to a minimum depth of 240 mm. Material to be recessed from surface of floor and of ceiling to accommodate required thickness of sealant (Item 8b).

8(b). **Firestop System Component** — (Guide No. 40 U19.13).(XHJZC) - Type "3M Fire Barrier CP-25WB+ Caulk" applied over insulation (Item 8a) to a minimum depth of 32 mm flush with top surface of floor and to a minimum depth of 16 mm, flush with surface of ceiling.

3M COMPANY