



## Fire Protection Products



**Technical Bulletin No.: 07-1004**

**Subject: ASTM E 2336 in code**

**Date: September 19<sup>th</sup>, 2007**

**Issued By: Mark Lund, P.E.**

### **TITLE: Grease Duct Listings and the Significance of ASTM E 2336 in the IMC & NFPA 96**

Significant code changes in the 2006 editions of the International Mechanical Code (IMC) and 2008 edition of NFPA 96 ‘Standard for Ventilation Control and Fire Protection of Commercial Cooking Operations’ have been made that affect field-applied grease duct enclosures. The 3M Fire Barrier products influenced by these changes are Duct Wrap 15A & 20A. Both the IMC<sup>1</sup> and NFPA 96<sup>2</sup> now adopt ASTM E 2336-04 ‘Standard Test Methods Fire Resistive Grease Duct Enclosure Systems’. This is a departure from the previous code editions, which either referenced different standards<sup>3 4</sup>, or no specific test protocol at all<sup>5</sup>. The adoption of ASTM E 2336 will mean greater clarity & simplicity for everyone involved with the submittal & approval process including: the specification author, architectural & engineering design team, plan reviewer, building inspector, distributor, general contractor, and sub-contractor.

Previously the use of field-applied grease duct wraps was allowed as either an alternative to gypsum shaft enclosures, by acceptance of an Evaluations Services (ES) report, or from third-party listings based off of ASTM E 119, ICC-ES AC 101, or UL 1978 testing. Now that ASTM E 2336 appears in the IMC and NFPA 96, the confusion surrounding what the applicable test standard for field-applied grease duct enclosures is, should be eliminated. The IMC now presents ASTM E 2336 compliant field-applied grease duct enclosures as exceptions to gypsum shafts. NFPA 96, which is referenced in the Uniform Mechanical Code (UMC)<sup>6</sup>, gives the ASTM E 2336 field-applied enclosure method consideration in a section independent of gypsum shafts<sup>7</sup>.

State building codes are often versions of a model building code with amendments made to suit a state’s particular needs. Many states adopt the International Code Council’s (ICC) entire family of codes (IBC, IMC, IPC, etc...) while other states have elected to adopt the IBC but retain the UMC as their mechanical code. In either case the model code that a particular state’s code is based off of typically lags behind the model building code publishing cycle. So though the 2006 version of the IMC and UMC have been available for some time now, many states still use an earlier edition as the basis for their mechanical code. For this reason Evaluation

Services (ES) reports still serve an important purpose in jurisdictions whose codes haven't yet adopted ASTM E 2336. 3M intends to maintain legacy ES reports<sup>8</sup> so the use of Fire Barrier Duct Wrap in jurisdictions where older model codes are still in place will have continued support.

Section 16 of ASTM E 2336-04 contains five 'Conditions of Compliance', which are described below along with a synopsis of the passage criteria:

- **16.1 Non-combustibility** (ASTM E 136) Immersion of samples into 750°C vertical tube furnace. <30s flaming & <30°C heat rise.
- **16.2 Fire resistance test** (ASTM E 119) Vertical wall panel test. Cold side average <250°F above initial, individual <325°F above initial, no passage of water through wall panel during hose stream test.
- **16.3 Durability** (ASTM C 518) 10 cycles of material at 300°F for 12 hours then ambient for 12 hours. After the temperature cycling, the increase in average thermal conductivity of the material must be less than 10%.
- **16.4 Internal Fire Test** 500°F duct soak for 4 hours, then ramp up to 2000°F for 30 minutes. Unexposed (non-fire side) surface average <250°F above initial, individual <325°F above initial.
- **16.5 Fire Engulfment** (ASTM E 119), through-penetration must pass ASTM E 814 through-penetration firestop requirements. Supports and enclosure integrity must remain intact without a through opening during fire and subsequent hose steam.

Presented below are (4) Intertek<sup>9</sup> design listings that 3M presently holds, which are fully ASTM E 2336 compliant. The fire engulfment component of the testing was conducted for a 2 hour period of time.

- GD 531 F & GD 547 F, (2-layers 20A)<sup>10</sup>
- GD 556 F & GD 557 F (2-layers 15A)

It is important that two key sections of ASTM E 2336, section 16.4 (Internal Fire Test) and 16.5 (Fire Engulfment), both appear on a grease duct enclosure design listing. Some design listings may at first glance appear to be ASTM E 2336 compliant but only conform with section 16.5 (Fire Engulfment). If a listing does not explicitly list compliance with 16.4 (Internal Fire Test), it may be based off of testing where the duct was subjected to an internal fire exposure less severe than the exposure prescribed by the ASTM E 2336 or to no internal exposure at all.

THIS BULLETIN IS BEING SENT TO:

- 3M Fire Protection Products Authorized L-1 Direct Dealers
- 3M Fire Protection Products Authorized L-2 Distributors
- 3M Sales Representatives
- 3M Manufacturer's Representatives
- 3M St. Paul Internal
- 3M International

---

<sup>1</sup> 2006 International Mechanical Code® 506.3.10, Exception 1

<sup>2</sup> NFPA® 96, 2008 Edition Section 4.3.1.2. See also NFPA® 96, 2004 Edition along with Tentative Interim Agreement (TIA) 04-2.

<sup>3</sup> 2003 Uniform Mechanical Code® Section 507.2.3

<sup>4</sup> NFPA® 96 2004 Edition Section 4.3

<sup>5</sup> 2003 International Mechanical Code® 506.3.10, Exception 1 states the duct should be continuously covered "...with a classified a labeled material, system, method of construction or product specifically evaluated for such purpose, in accordance with a nationally recognized standard for enclosure materials..."

<sup>6</sup> 2006 Uniform Mechanical Code® 507.2.3

<sup>7</sup> In addition to the UMC, NFPA 96 is also adopted by NFPA 101 – Life Safety Code, 2006 Edition Section 9.2.3 & NFPA 1 – Uniform Fire Code, 2004 Section 50.1.1

<sup>8</sup> See ESR-1255 (ICBO, UBC), 21-61 (BOCA / NBC), and 2132A (SBCCI / SBC)

<sup>9</sup> The ETL SEMKO division of Intertek Group acquired Omega Point Laboratories in April, 2005.

<sup>10</sup> In most cases GD 556 F & GD 557 F will be the contractor-preferred listings because of the material/weight savings they provide. However, the 20A listings may be helpful to bridge ASTM E 2336 with jobs that were submitted with ICC ESR-1255 as the basis for compliance.