



Overview of 2006 IFC & IBC Requirements for Group H5 Occupancies

Scott A. Stookey
Senior Technical Staff – Business & Product
Development
International Code Council, Austin Texas

Introduction

- The 2006 editions of the *International Fire Code* (IFC) and *International Building Code* (IBC) contain requirements for the design, construction and operation of Group H-5 occupancies.
- This seminar will update EHS professionals on the significant changes to the 2006 IFC that affect the semiconductor industry and Section 415 of the 2006 IBC.

IBC Section 415

- The requirements in IBC section 415.8.3 govern HPM piping above corridors or concealed spaces of other occupancies.
- The requirements for separation have been revised to clarify that separation of corridors and concealed spaces must be accomplished using a fire barrier.
- The separation is only required when HPM piping and tubing are located in a corridor not classified as a Group H-5 occupancy.

IFC Chapter 18

- IFC Chapter 18 regulates the storage, use, handling of hazardous production materials (HPMs) in Group H-5 occupancies.
- Three significant code changes were approved by the ICC membership:
 - Requirements for when gas detection is requirements are based on the physiological warning threshold level
 - New requirements for organometallic HPMs
 - Increased HPM quantities at work stations.

Physiological Warning Threshold Level

- IFC section 3702 defines PWTL as:
 - A concentration of air-borne contaminants, normally expressed in parts per million (ppm) or milligrams per cubic meter (mg/m^3), that represents the concentration at which persons can sense the presence of the contaminant due to odor, irritation or other quick-acting physiological responses. When used in conjunction with the permissible exposure limit (PEL), the physiological warning threshold levels are those consistent with the classification system used to establish the PEL. See the definition of “Permissible exposure limit (PEL)” in Section 2702.

Physiological Warning Threshold Level

- For toxic and toxic gases, IFC section 1803.13 now requires continuous gas detection systems when the PWTL is greater than the permissible exposure limit.
- One source for PWTL data is the American Conference of Governmental and Industrial Hygienists document, *Documentation of the Threshold Limit Values and Biological Exposure Indices*.

New Requirements for Organometallics

- Organometallics are used as a component of atomic vapor deposition during metal deposition.
- Organometallics generally fall into the chemical family known as Grignard reagents.
- Grignard reagents exhibit the following hazards:
 - Pyrophoric liquid or solid
 - Class 3 Water Reactive liquid or solid

Requirements for Organometallics

- Section 1805.2.3.5 is a new section that specifies the fire protection & chemical safety requirements for organometallics (OMs).
- These requirements were approved because of the loss history for OMs.
 - Factory Mutual Global, an HPR insurer, has never paid a claim for OMs at semiconductor fabrication facilities.

IFC Section 1805.2.3.5

- The referenced section specifies requirements for Pyrophoric & Class 3 Water Reactive liquids used for vapor deposition. The requirements are:
 - Containers are limited to 0.5 to 5.3 gallons
 - Containers are stored in fire-resistant cabinets
 - Cabinets shall be equipped with mechanical ventilation
 - Cabinets require an automatic fire detection system
 - Loss of ventilation, activation of spill detection system or activation of the cabinet fire detection system will cause tool shutdown and closing of supply valves at the OM container and notify the emergency control station.

MAQ Tool Increase

- To accommodate 300 mm wafers, SIA gained approval of a change to Table 1805.2.2. This table establishes quantity limits for HPMs at work stations.
- Quantities for oxidizers, pyrophorics and toxics have been increased and quantity limits are now based on the situation of the material.
 - E.g., use-open versus use-closed for solids and liquids

Questions?

Scott Stookey

Senior Technical Staff

International Code Council

807 Sweetwater River Drive

(South) Austin, Texas 78748

1-888-422-7233 X 3473 (Fire)