

Code corner

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I would like to cover two subjects in this column. The first is insurance carrier data sheets that discuss risk management solutions for laboratory safety. The second is an update from Ken Kretchman¹ regarding a code proposal from the recent ICC Public Hearing that warrants additional consideration from those who are involved in fire safety and evacuation planning.

In some of my prior columns I have talked about the factory mutual global property loss prevention data sheets and I wanted to remind readers of their existence and utility. As many of you are aware, FM Global provides comprehensive commercial and industrial property insurance and they offer many free online risk management solutions and services that are intended to address specific property risks. For those of your campuses involved with nanotechnology research and using semiconductor process tools, the FM standards can be a supplement to the information provided in Chapters 18 and 27 of the International Fire Codes. IFC Chapter 18 is the portion of the code regulating semiconductor fabrication facilities and Chapter 27 regulates hazardous materials. In the IFC 2703.8.6 Gas cabinets, the code provides information about cabinet construction, self-closing doors, and ventilation as follows:

2703.8.6 Gas cabinets. Where a gas cabinet is used to increase the maximum allowable quantity per control area or when the location of compressed gases in gas cabinets is provided to comply with the provisions of Chapter 37, the gas cabinet shall be in accordance with Sections 2703.8.6.1 through 2703.8.6.3.

2703.8.6.1 Construction. Gas cabinets shall be constructed in accordance with the following:

1. Constructed of not less than 0.097-in. (2.5 mm) (No. 12 gage) steel.
2. Be provided with self-closing limited access ports or noncombustible windows to give access to equipment controls.
3. Be provided with self-closing doors.
4. Gas cabinet interiors shall be treated, coated or constructed of materials that are compatible with the hazardous materials stored.

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Such treatment, coating or construction shall include the entire interior of the cabinet.

2703.8.6.2 Ventilation. The ventilation system for gas cabinets shall be designed to operate at a negative pressure in relation to the surrounding area. Ventilation systems used for highly toxic and toxic gases shall also comply with Items 1, 2 and 3 of Section 3704.1.2. The ventilation system shall be installed in accordance with the International Mechanical Code.

In the FM standard, Approval Standard for Tools Used in the Semiconductor Industry under Section 2.5.7.5 there are also requirements specified for gas cabinets. The FM standard contains additional requirements to those specified in the IFC Chapter 27 and anyone installing gas cabinets should certainly consider the FM standard to enhance gas process safety. The FM requirements include:

- a. Emergency shutoff valves (FSOV) shall be as close as practical to each cylinder CGA (threaded outlet on gas cylinder valve body) connection.
- b. Provision for a remote manual actuation of ACVs and ESOVs shall be provided for use outside of the gas distribution room and at the fabrication area exits.

The emergency shutoff valves shall also automatically close upon any of the following conditions:

- activation of the gas monitoring system;
- sustained (>0.15 s) power failure;
- loss of cabinet ventilation airflow;
- activation of cabinet fire detectors if provided;
- activation of an excess flow switch;
- seismic activity.

In addition to the FM Approved Standards that are online, you can go to the FM website and register to have access to the FM Global Property Loss Prevention data sheets. Some of these sheets are also extremely helpful and include information you may want to utilize in your laboratory safety program. Go to the Factory Mutual website Approval Standards at www.fmglobal.com/page.aspx?id=50030000 or register for data sheet access at www.fmglobal.com/fmglobalregistration/.

The second topic I would like to include is an update on three proposals which were



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reviewed at the recent ICC Public Hearing by the International Fire Code Committee.

The first (F164), which was approved by the IFC committee, is a proposal which requires the use of sub-atmospheric gases (SAGS) to conform to NFPA 318. This technology utilizes much smaller quantities of gas in the parent cylinder and may be of interest to those using high hazard gases in vacuum applications.

The second (F133), also approved by the IFC committee, is a proposal to require the use of carbon monoxide detectors in Group I or R occupancies (includes sleeping quarters) which contain fuel burning units in the unit or in an attached garage.

The third (F12), not approved by the IFC committee, is a proposal which requested the addition of language into the required content of fire safety plans

which stated that "Emphasis shall be given to identifying individuals with mobility and cognitive disabilities and integrating their special needs into fire safety plans". While the code proposal was not approved, it was acknowledged as an important issue that deserves due consideration from all parties involved, including the person with the impairment. In 2008, the Michael J. Minger Foundation was provided a grant from the Department of Homeland Security to review fire safety policies as related to students with disabilities at various higher educational institutions. Conclusions and recommendations from this study are contained at the Campus Firewatch website. The full report is available or an executive summary which may be found at

<http://www.campus-firewatch.com/resources/minger/execsummary.html>.

The various conclusions and recommendations included in this executive summary, among others, acknowledged the challenges in generating effective procedures, the need for awareness and attention by administrators, and the need for the students to assist the school in helping the student prepare for emergencies by self-identifying their need for assistance.

If this is a subject that has not obtained its level of deserved attention at your institution, this code proposal and the referenced website serves as a reminder to revisit this important topic.

Each of these topics, along with the hundreds of other ICC code proposals and committee actions, will be posted on the ICC website. Public comment on these proposals can be submitted and comments considered for final voting by ICC membership at the Final Action Hearings in 2010.