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Editorial

Firefighters and fire safety: why we need them

A university professor named Fred McChesney (professor of law and economics at the University of Miami) wrote a disgusting opinion piece in the Washington Post in early September entitled "Fewer fires, so why are there far more firefighters?" (http://tinyurl.com/nz9o48r) In it he denigrates professional firefighters and urges the elimination of fire departments using professional firefighters and replacing them with volunteer firefighters. This is, in his opinion, a means to decrease spending, based on his erroneous assessment that there are not enough fires to justify paying the professional men and women who protect us from unwanted fires.

Mr. McChesney makes the following incorrect assertions (his own words): "Rapid improvements in fire safety have caused a dramatic drop in the number of blazes, according to the National Fire Protection Association. Buildings are constructed with fire-resistant materials; clothing and curtains are made of flame-retardant fabrics; and municipal laws mandate sprinkler systems and smoke detectors. The striking results: On highways, vehicle fires declined 64 percent from 1980 to 2013. Building fires fell 54 percent during that time. When they break out, sprinkler systems almost always extinguish the flames before firefighters can turn on a hose."

Some of us have spent entire careers trying to improve fire safety and can attest that the statements are incorrect.

First: we know that buildings are typically ***not*** constructed of fire resistant materials since codes only require the use of fire resistant materials in Type I and II construction, which are rare in residential construction. In the US there are some 134 million housing units, the vast majority of which are residential construction.

Second: clothing in the US needs to meet the flammability requirements of 16CFR1610 (and has had to do so since it was issued as CS 191-53 in 1953), a test that tissue paper can pass. No flame retarded fabrics are needed for such clothing (I have studied this in detail).

Third: curtains in public buildings complying with the International Fire Code or NFPA 10 are required to meet the flammability requirements of NFPA 701; does not apply to private residences.

Fourth: The International Residential Code mandates that new one and two family dwellings contain an automatic residential fire sprinkler system. However, the state of California is the only US state that has not exempted itself from that IRC requirement. Even when the requirement is in place, it does not apply to existing buildings, which are the vast majority. In 2009 4.6% of occupied homes (including multi-unit) had sprinklers.

Fifth: In 2013 fire losses were dramatically high:

- 3240 civilian fire fatalities, including 320 in vehicle fires and 2855 in structure fires.
- Fire departments responded to a fire every 25 seconds

- A structure fire was reported every 65 seconds
- A home structure fire was reported every 85 seconds
- A civilian fire injury was reported every 33 minutes
- A civilian fire death occurred every 2 hours and 42 minutes
- An outside fire was reported every 56 seconds, and
- A vehicle fire was reported every 167 seconds.

Sixth: The assertion that "sprinklers almost always extinguish the flames before firefighters can turn on a hose" is untrue. Of the reported 2007-2011 structure fires, an estimated 10% showed sprinklers present. The only occupancies where sprinklers were present in more than half the reported fires were health care properties (67%, although they are all required to have sprinklers), prisons and jails (53%), passenger terminals (51%), hotels and motels (52%), dormitories and barracks (53%), and high-rise office buildings (63%). Sprinklers are still rare in educational properties (36% of fires), stores and offices (24%), public assembly properties (23%), and especially in homes (6%), where most fire deaths occur.

Seventh: Mr. McChesney states that there wasn't a single home fire that resulted in 10 or more fire deaths in recent years. In fact, there have been 6 such home fires just since 2000, in spite of the fact that very few homes today have 10 or more people living there.

Eighth: In my August 2015 editorial I addressed the increasingly serious problem of wildland fires, which is killing more firefighters in recent years than in the past (19 firefighters died fighting one wildland fire in Yarnell, AZ, in 2013). Wildland fires are also destroying huge areas and damaging or destroying multiple properties. I want to give some examples of the damaging effects of recent wildfires, starting chronologically in 2007 (only 8 years ago!).

- Sweat Farm Road/Big Turnaround Complex Fire (Georgia, 2007): Largest recorded fire in state history.
- Florida Bugaboo Fire (Florida, 2007): Largest fire on record in state history.
- Milford Flat Fire (Utah, 2007): Largest fire on record in state history.
- Wallow Fire (Arizona and New Mexico, 2011): The largest fire in Arizona state history.
- Bastrop County Complex Fire (Texas, 2011): The worst fire in state history.
- Las Conchas Fire (New Mexico, 2011): Second largest fire in state history.
- Whitewater-Baldy Complex Fire (New Mexico, 2012): Largest wildfire in history.
- Little Bear Fire (New Mexico, 2012): Most destructive wildfire in state history.
- High Park Fire (Colorado, 2012): The second largest wildfire in state history by size.

- Waldo Canyon Fire (Colorado, 2012): The second most destructive fire in state history.
- Long Draw and Miller Homestead Fires (Oregon, 2012): State's largest fire in 150 years.
- Black Forest Fire (Colorado, 2013): The most destructive fire in state history.
- Rim Fire (California, 2013): Biggest wildfire on record in the Sierra Nevada, and third largest wildfire in state history.
- Carlton Complex Fire (Washington, 2014): The largest single wildfire in state history.
- North Star Fire (Washington, 2015): Third largest single fire in state history.
- Okanogan Complex Fire (Washington, 2015): The largest wildfire complex in state history.[1]

What the chronology above demonstrates is that the "largest" or "worst" fire in the history of many US states have occurred in this period (and the records keep getting broken). In the 10 years between 2005 and 2014 we lost 138 firefighters just in wildland fires (total firefighter fatalities in the period totaled 327, according to NFPA: http://tinyurl.com/nc6vnuk), in many cases because help was not there in time. In particular, the fact that recent years have been among the hottest in history is leading to more fires and, most likely, deadlier wildland fires.

This article is a totally unwarranted attack on the men and women who act professionally (often with little or no recognition) and protect our lives and properties. We owe them a debt of gratitude and we need to ensure that they get more financial support and not less. Volunteer firefighters do an excellent job and are also needed, but there is no way that they can replace the professionals who work day in and day out to decrease fire losses.

The codes and standards that apply to US construction (which have been improving over time, but still have a long way to go) and the efforts of our firefighters have ensured that our fire losses do not get totally out of control. This success needs to continue being managed.

I do not always agree with the political positions taken by the International Association of Fire Fighters but I am deeply committed to fire safety and its improvement. Any attempt to decrease funding for professional firefighters will inevitably lead to more fire losses and that is definitely an outcome none of us (I hope) wants.

But that's just my opinion, and I invite other opinions.

Marcelo M. Hirschler

Codes and Standards

ICC

ICC Code Hearings for 2018 Codes

The code hearings for all Group A codes were completed in Memphis, TN, on April 19-28, 2015. The relevant codes are: International Building Code (IBC) (fire safety, general and egress), International Mechanical Code (IMC), International Existing Building Code (IEBC), International Plumbing Code (IPC), International Residential Code (IRC) (mechanical and plumbing), International Property Maintenance Code, International Swimming Pool and Spa Code, International Zoning Code and International Fuel Gas Code. Note that the IBC Structural is not part of Group A codes and that the IRC Mechanical and IRC Plumbing are. The schedule and details of proposals were made available earlier and can be found at http://tinyurl.com/n4waxmr. *Subsequent to the original publication, a series of errata were published, in various stages.* Overall, there were 183 proposals on IBC Fire Safety, 237 proposals on IBC General, 10 proposals on IBC Structural (for handling by the IBC Fire Safety or IBC General committees), 169 proposals on IBC Egress, 161 proposals on IMC, 94 proposals on IEBC, 54 proposals on IRC Mechanical, 278 proposals on IPC and 19 proposals on IRC Plumbing. All actions taken by the committees were subject to public comments due July 17, via cdpAccess and the public comments are available now at http://tinyurl.com/py8srj5. The decisions will be finalized at the Public Comment Hearing (formerly Final Action Hearing), which will occur on September 30-October 5, 2015 in Long Beach, CA. The process for member voting on assembly motions has been completed and the detailed set of actions by the committees can be found at http://tinyurl.com/okxetu9, on the ICC web site, under "Report of the Committee Action Hearing". Few assembly motions were successful in the areas of interest to FSTB. Public comments were submitted to 74 proposals on IBC Fire Safety, 133 proposals on IBC General, 1 proposal on IBC Structural (fire safety related), 46 proposals on the IMC, 31 proposals on the IEBC and 15 proposals on the IRC Mechanical. Among the proposals that received comments it is worth highlighting some with major fire safety implications (with many omissions),including:FS170 and FS171 (dealing with foam plastic insulation), FS135, FS136 and FS139 (dealing with interior finish), FS147 and FS149 (dealing with NFPA 285 testing of exterior assemblies), FS178 (dealing with foam plastic in plenums), FS179 (dealing with building panels), M64 and M65 (dealing with plenum construction), M71, M75, M76, M77 and M80 (dealing with plastic pipe), M98 (dealing with coordination between IBC and IMC on plenums), G215 (dealing with awnings and canopies), G219 (dealing with trellises) and G236 (dealing with non-combustible construction).

The code change proposals for Group B of the 2018 ICC codes are due January 11, 2016. They must be done via the ICC cdpAccess process. The codes in Group B are: IBC (Structural), IECC-Commercial, IECC/IRC - Residential, IFC, IRC (Building), IWUIC and the Admin provisions of all codes. The code change proposals for Group C of the 2018 ICC codes were due January 9, 2017 but they have been cancelled. All code change

proposals and comments must be done via the ICC cdpAccess process. The full schedule can be found at http://www.iccsafe.org/cs/codes/Pages/2015-17cycle.aspx.

ICC-ES Hearings

Next meetings

Two items that were of particular interest to readers of FSTB, AC 377 and AC 456, which address spray foam insulation, have not yet been discussed but AC 377 is now on the agenda again. The last set of 2015 meetings will be held October 13-14, 2015, in Birmingham, AL. For this meeting, proposals must have been forwarded to ICC-ES staff by June 17 and staff must have posted criteria on the web site for public review by August 25 and mailed notices to the public. Public comments were due to ICC-ES by September 3 and the public comments must be web published by September 17, 2015, with rebuttal comments by proponent due at ICC-ES by September 24 and staff memos to the evaluation committee must be web-posted by October 9, 2015. The agenda for the meeting is for proposed revisions to the following acceptance criteria, modified from previous agendas:

- AC 14, Acceptance Criteria for Prefabricated Wood I Joists
- AC 230, Acceptance Criteria for Power-actuated Fasteners for Shear Wall Assemblies Constructed with Cold-formed Steel Framing and Wood Structural Panels
- AC 364, Acceptance Criteria for Mechanically Operated Flood Vent
- AC 377, Acceptance Criteria for Spray-Applied Foam Plastic Insulation
- AC 462, Acceptance Criteria for Shipping Container Building Modules
- AC 463, Acceptance Criteria for Magnetic Fastening Systems
- AC 458, Acceptance Criteria for Load Bearing Thermal Insulation Assemblies Forming a Thermal Break Between Concrete Balconies and Concrete Floors
- AC 465 Acceptance Criteria for Adhesively Attached, Cementitious Coated, Polyurethane Foam Core Roofing Tiles

International Code Council (5203 Leesburg Pike, Suite 600; Falls Church VA 22041; Tel: 888-422-7233; www.iccsafe.org)

NFPA

NFPA 70 (National Electrical Code, NEC)

All 19 code making panels (CMPs) of the National Electrical Code met in Hilton Head, SC, to develop first revisions (i.e. proposed changes) based on public inputs (i.e. proposals) to the NEC. The agendas of all CMPs can be found online at http://www.nfpa.org/codes-and-standards/document-information-pages?mode=code&code=70&tab=nextedition. The information available to date covers "proposed first revisions", as agreed to by the panels. The official results are in now but the key ones were presented in earlier editions of FSTB. The NEC correlating committee met May 12-15, 2015. Public comments are due September 25 and the panels meet again in November to discuss the comments.

NFPA Rail Committee

The committee (responsible for NFPA 130, Standard for Fixed Guideway Transit and Passenger Rail Systems) met in November 2014 and the results of the first draft meeting have just been announced. All the items

approved at the meeting passed committee ballot. The closing date for comments on this document was May 15, 2015 and the committee will meet for the comment stage on September 28-30, 2015.

NFPA Hazard and Risk Technical Committee

The technical committee on hazard and risk of contents and furnishings issued NFPA 556 (Guide on Methods for Evaluating Fire Hazard to Occupants of Passenger Road Vehicles) and NFPA 557 (Standard for Determination of Fire Loads for Use in Structural Fire Protection Design) as consent documents. The committee handled public input received for NFPA 555 (Guide on Methods for Evaluating Potential for Room Flashover) and handled comments on September 15, 2015; all three public comments were approved and the standard (if approved in the formal vote) will include a section addressing predictions for fire performance of electrical cables, based on heat release tests (cable tray tests, the cone calorimeter and the FM FPA apparatus).

NFPA Fire Tests Committee

The following fire tests are on the Fall 2016 cycle: NFPA 252 (Standard Methods of Fire Tests of Door Assemblies), NFPA 257 (Standard on Fire Test for Window and Glass Block Assemblies), NFPA 268 (Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source), NFPA 269 (Standard Test Method for Developing Toxic Potency Data for Use in Fire Hazard Modeling), NFPA 275 (Standard Method of Fire Tests for the Evaluation of Thermal Barriers), NFPA 285 (Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components), NFPA 287 (Standard Test Methods for Measurement of Flammability of Materials in Cleanrooms Using a Fire Propagation Apparatus (FPA)) and NFPA 288 (Standard Methods of Fire Tests of Horizontal Fire Door Assemblies Installed in Horizontal Fire Resistance-Rated Assemblies). Three of these tests are fire resistance (time-temperature curve) tests (NFPA 252, 257 and 288), three of them are ones used for regulation of combustibles on exterior walls in codes (including foam plastics, NFPA 268, 275 and 285), one test is used for materials used in cleanrooms (NFPA 287) and the other one is a smoke toxicity test rarely used (NFPA 269). NFPA 285 is a multi-story test for facades and attempts to change its scope to use a more severe test (FM 4880) for high rise buildings failed and a warning that the test is not severe enough for outside exposures was eliminated but the test was improved (made more severe) by "clarifying" where joints and seams need to be to ensure weak spots are tested. NFPA 287 (using the FM FPA calorimeter) added a smoke damage index, providing something that may well become an additional pass/fail criterion. Overall the changes recommended for all the tests were quite minor and unlikely to have major effects. All actions approved by the committee passed and comments are due November 16, 2015.

There was no significant progress on the new open flame test for upholstered furniture composites and components, to be designated NFPA 277 and preliminarily entitled "Standard Methods of Tests for Evaluating Fire and Ignition Resistance of Upholstered Furniture Using a Flaming Ignition Source", with a preliminary scope of "This document shall provide a test method to evaluate fire/ignition resistance of upholstered furniture

subject to a flaming ignition source." The task group stated that it is moving in the direction of adopting a test, probably one that is not small scale, while working cautiously and they do not expect to have a test imminently.

NFPA Standards Council

The latest meetings were held on August 17-20, 2015, in Quincy, MA, and the next set of meetings will be held on December 8-9, 2015, in Ashville, NC or Charleston, SC. The agenda for the August meeting can be found at www.nfpa.org/sc2015. Key agenda items were appeals on actions taken at the June 2015 annual meeting regarding NFPA 13, 24, 33, 72, 111, 520 and 1901. The decisions follow:

- NFPA 13, Standard for the Installation of Sprinkler Systems: appeal denied (dealt with reference to AWWA Guide for Steel Pipe Design and Installation)
- NFPA 24, Standard for the Installation of Private Fire Service Mains and Their Appurtenances: appeal denied(dealt with reference to AWWA Guide for Steel Pipe Design and Installation)
- NFPA 33, Standard for Spray Application Using Flammable or Combustible Materials: appeal denied (dealt with definitions and the Manual of Style)
- NFPA 72, National Fire Alarm and Signaling Code: appeal denied (dealt with light pulse durations)
- NFPA 111, Standard on Stored Electrical Energy Emergency and Standby Power Systems: appeal upheld – dealt with issuing TIA #1175: the TIA will be issued
- NFPA 520, Standard on Subterranean Spaces: appeal denied (dealt with definitions and the Manual of Style)
- NFPA 1901, Standard for Automotive Fire Apparatus: appeal denied (dealt with the size of the seating space in fire apparatus, since firefighters now require more space)

Standards Council also voted to approve the requests to change revision cycles for the following documents:

NFPA 557 (2016 edition) from Annual 2018 to Annual 2019: Permanent move: 3 to 4 year cycle

NFPA Glossary of Terminology

As a consequence of Standards Council denying the appeals on NFPA 33 and NFPA 520 (submitted by Marcelo Hirschler, chair of the NFPA Advisory Committee on the Glossary on Terminology), the committee was disbanded because council believes that the majority of its work is completed and that staff can handle further harmonization work.

TIAs

Standards Council is responsible for deciding whether to issue TIAs. Normally TIAs will be issued if they pass all ballots. At its August 2015 meeting, the NFPA Standards Council considered the issuance of several proposed Tentative Interim Amendments (TIAs). The following TIAs on NFPA 2, NFPA 13, NFPA 33, NFPA 111, NFPA 1221, NFPA 1917, and NFPA 1971 were issued.

TIAs issued on August 18, 2015 and incorporated into the NFPA Standard:

- NFPA 2, TIA 16-1, referencing 18.3.3, 2016 edition
- NFPA 13, TIA 16-1, referencing 17.2.3.5.6, A.17.2.3.5 and A.17.3.3.5, 2016 edition
- NFPA 13, TIA 16-2, referencing 2.3.1, 3.11.9, A.3.11.9, 9.3.5.12, A.9.3.5.12, A.9.3.5.12.1 and E.7, 2016 edition
- NFPA 13, TIA 16-3, referencing 5.6.3.3, Figure 5.6.3.4.2, Figure 5.6.3.3.3.2(new), 5.6.3.4, 5.6.4, A.5.6 and Table A.5.6.1.1, 2016 edition
- NFPA 13, TIA 16-4, referencing Tables A.5.6.3, A.5.6.4 and A.5.6.4.1, 2016 edition
- NFPA 13, TIA 16-5, referencing Table 9.2.6.3.1, A.9.2.6.3.1 and Table 9.2.6.5.3, 2016 edition
- NFPA 33, TIA 16-1, referencing C.2.1, 2016 edition
- NFPA 1221, TIA 16-1, referencing 3.3.X (New), 8.6 (New), and new Corresponding Annex material, 2016 edition
- NFPA 1917, TIA 16-1, referencing 2.3.6, 4.7.1, Figure 4.16.3.1, 7.6.5.1, 8.2.7, and 9.1.4, 2016 edition

TIA issued on August 19, 2015 and incorporated into the NFPA Standard:

- NFPA 111, TIA 16-1, referencing Table 4.2.2, 2016 edition

TIA issued on August 18, 2015.

- NFPA 1971, TIA 13-5, referencing 6.4.8 and A.6.4.8, 2013 edition

Latest TIAs where Standards Council is soliciting comments for:

- TIA 1187R on NFPA 59A, *Standard for the Production, Storage, and Handling of Liquefied Natural Gas (LNG) (2016 edition), by Adnan Ezzarhouni, GTT, several sections; comment closing date: October 16, 2015.*
- TIA 1191 on NFPA 80, *Standard for Fire Doors and Other Opening Protectives (2016 edition), by Mark A. Belke, Greenheck, several sections; comment closing date: October 16, 2015.*
- TIA 1192 on NFPA 105, *Standard for Smoke Door Assemblies and Other Opening Protectives (2016 edition), by Mark A. Belke, Greenheck, several sections; comment closing date: October 16, 2015.*
- TIA 1195 on NFPA 55, *Compressed Gases and Cryogenic Fluids Code (2016 edition), by J. William Degnan, NH State Fire Marshal, section 1.1.1; comment closing date: October 16, 2015.*
- TIA 1197 on NFPA 30B, *Code for the Manufacture and Storage of Aerosol Products (2015 edition), David L. Fredrickson, Fredrickson & Associates, LLC; section 3.3.2, comment closing date: October 16, 2015.*
- *TIA 1198 on NFPA 30B, Code for the Manufacture and Storage of Aerosol Products (2015 edition), David L. Fredrickson, Fredrickson & Associates, LLC; various sections, comment closing date: October 16, 2015.*

Errata

Standards Council issued no new errata.

National Fire Protection Association (1 Batterymarch Park, Quincy MA 02269; Tel: 617-770 3000; www.nfpa.org)

ASTM International

ASTM E05, Fire Standards

The committee and all its subcommittees met in Anaheim, CA, on June 15-18, 2015, and the next meeting will be in Tampa, FL, on December 7-10, 2015. Four new standards were issued: one each in subcommittee E05.11 (Guide for Evaluating the Relative Effectiveness of Building Systems to Resist the Passage of Products of Combustion Based on the Aggregation of Leakage Rates, which became ASTM E3021), E05.14 (Test Method for Resistance to Fire Penetration of Eaves, Soffits and Other Projections, which became ASTM E2957), E05.23 (Test Method for Determination of Low Levels Heat Release Rate for Materials and Products Using an Oxygen Consumption Calorimeter, which became ASTM E2965) and E05.33 (Practice for Ignition Sources, which became ASTM E3020). COS approved the actions on all the negatives and the standards are being issued. A revision to the Bylaws was issued for ballot to reduce the need for subcommittee quorum from 20% to 10%, to make meetings more efficient; negatives were addressed and it will probably be in effect in December.

It was noted that this committee has issued 26 new standards between 2005 and 2015 (before this meeting), making it 30 new standards now.

ASTM E05.11

Subcommittee ASTM E05.11 (on fire resistance). The four latest main committee ballot items were: a revision of ASTM E2226 (Practice for Application of the Hose Stream, to clarify a table, one negative), a revision of ASTM E2307 (Standard Test Method for Determining Fire Resistance of Perimeter Fire Barriers Using Intermediate-Scale, Multi-story Test Apparatus, to replace a figure, approved), a revision of ASTM E2336 (Standard Test Methods for Fire Resistive Grease Duct Enclosure Systems, for clarification, 3 negatives) and a revision to ASTM E2816 (Standard Test Methods for Fire Resistive Metallic HVAC Duct Systems, for clarification, approved). ASTM E119, ASTM E1966, ASTM E2226, ASTM E2307, ASTM E2749 and ASTM E2816 have a 2015 date.

ASTM E05.14

Subcommittee ASTM E05.14 (on exterior fire exposures). Two concurrent ballot items were issued for a revision to ASTM E2707 (Standard Test Method for Determining Fire Penetration of Exterior Wall Assemblies Using a Direct Flame Impingement Exposure), addressing sustained ignition and measurement of water content of wood specimens (one was approved and one received a negative). ASTM E2707 and ASTM E2886/E2886M (Standard Test Method for Evaluating the Ability of Exterior Vents to Resist the Entry of Embers and Flames Resulting from Wildfire) have a 2014 date and ASTM E2956 has a 2015 date.

ASTM E05.15

Subcommittee ASTM E05.15 (on furnishings and contents) has been disbanded.

ASTM E05.17

Subcommittee ASTM E05.17 (on transportation) has no update from last month. A section was written to address the issue of melting materials in

ASTM E162 (Standard Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source) and went for concurrent ballot. ASTM E2230 (Practice for Thermal Qualification of Type B Packages for Radioactive Material) has been transferred to committee C26 and subcommittee C26.13 (on Spent Nuclear Fuel and High Level Waste). A proposed update of ASTM E2061 (rail car fire hazard assessment) on the fire loss statistics is being balloted. There are no standards with a 2014 date.

ASTM E05.21

Subcommittee ASTM E05.21 (on smoke and combustion products). A concurrent ballot item was issued for a revision to ASTM E1354 (cone calorimeter) to make a clarification to the new procedure on critical flux for ignition (received one negative). The same procedure is being balloted concurrently for the mass loss cone (ASTM E2102) and it passed. Two concurrent ballot items were issued to update ASTM E1678 (smoke toxicity test; one received a negative). A subcommittee ballot item was issued on revision of ASTM E1354 (cone) to address delay time (received negatives and will be reworked). Another subcommittee ballot on an appendix to ASTM E1354 addressing modeling capabilities of cone data received multiple negatives and will be reworked and balloted concurrently. Two subcommittee ballot items have been issued for minor revisions of ASTM E662. ASTM E662, ASTM E1354 and ASTM E1740 have 2015 dates.

ASTM E05.22

Subcommittee ASTM E05.22 (on surface burning). A revision to ASTM E84 has been completed to add a reference to ASTM E2988 (fibrous insulation practice) as were several revisions to ASTM E162 (Test Method for Surface Flammability of Materials Using a Radiant Heat Energy Source). Ballots issued to get consistency between ASTM E2599 and ASTM E2231 on testing reflective insulation, when used as a pipe and duct insulation material in ASTM E84, have been completed. Ballots to eliminate the requirement that the fiber cement board in ASTM E2231 and ASTM E2404 (mounting practices) comply with the non-combustibility test (to correlate with the action above) have been completed. A ballot issued to revise ASTM E2404 (practice for wall coverings) to include a section dealing with water barriers (for code use) has been completed. Four revisions of ASTM E648 have been completed. Five revisions to ASTM D2859 (Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials, methenamine pill test) were issued at subcommittee to get consistency with the CPSC standard and moved on to main. Of the 5 items that moved to main 3 received one negative each. A proposal is being prepared to deal with vapor barriers (distinct from water barriers).

The most recent subcommittee ballot proposing a new practice (different approach) to test plastic piping materials in the ASTM E84 tunnel test was reworked to be consistent with code action (see above), went out for subcommittee ballot; it received negatives but will be reballoted concurrently. It involves water pipes up to 4 inches in diameter in pairs (not for drain, waste and vent) to be tested to UL 2846 (2 pipes in tunnel, no water, on tray similar to plenum items) and all other pipe materials and products to be tested at full width (sheets, pipes or arcs). A new ballot item proposed to add UL 2846 into ASTM E84 will be reworked and issued concurrently.

A new activity, on behalf of the American Wood Council, intends to develop an ASTM standard for testing materials in the floor of the tunnel, similar to ULC S102.2 but with an ASTM E84 tunnel (they are slightly different). There is still no activity to revise ASTM E2768, which requires some amendments.

A concurrent ballot to reapprove ASTM E2690 (Steiner Tunnel practice for caulks and sealants) received a negative. A concurrent revision has been issued to ASTM E84 to clarify full width testing (it received one negative). A revision was issued for ASTM E2688 (practice for tapes) to require full width testing and received several negatives. A concurrent ballot for revision of ASTM E162 has been issued to deal with an appendix for melting materials (it received 2 negatives). ASTM E84, ASTM E162, ASTM E2231, ASTM E2404, ASTM E2579, ASTM E2599 and ASTM E2988 have a 2015 date.

ASTM E05.23

Subcommittee ASTM E05.23 (on combustibility) now has five test methods: ASTM E136 (non-combustibility) and ASTM E2652 (non-combustibility using the ISO 1182 apparatus), ASTM E1352 and ASTM E1353 (furniture smoldering tests), ASTM E2187 (cigarette ignition potency test).A new standard was approved for a test method to use a variation of the cone calorimeter (with a much larger radiant conical heater and a larger test specimen) for measuring very low levels of heat release (expected to become ASTM E2965). An appendix will be added to address safety concerns. Two revisions to ASTM E2187 (cigarette ignition potency) have been issued concurrently, the key one being one that adds a stainless steel substrate; both received one negative each. A new revision to the appendix of ASTM E136, undertaken to look at portions that are obsolete, was reworked, eliminating mentions of limited combustible materials; it received persuasive negatives and will be reissued. Three proposed revisions to ASTM E1353 were balloted at subcommittee level and received negatives. Revisions have been issued concurrently to make mandatory the thermocouples near the specimen in ASTM E2652 (with a clarification also in ASTM E136), because this has code implications; both received 2 negatives each. A standard with 2 fire tests for Christmas trees will be issued. ASTM E2965 (Standard Test Method for Determination of Low Levels Heat Release Rate for Materials and Products Using an Oxygen Consumption Calorimeter) has a 2015 date.

ASTM E05.31

Subcommittee ASTM E05.31 (on terminology and services/functions) approved updates on non-combustible, fire protection rating and fire resistance rating in the terminology standard ASTM E176. New definitions were approved for the terms "flame retardant" (noun) and "fire retardant" (noun), which were previously described as "deprecated terms"; new discussions will be prepared for the terms. A Standard Guide for Assessment of Continued Applicability of Fire Test Reports, applying only to reaction-to-fire tests, was published as ASTM E2989, and a small revision passed. References were added to ASTM E2536 (Standard Guide for Assessment of Measurement Uncertainty in Fire Tests) and a new ballot has been issued to include more references and it passed. Two new ballots revising the definitions in on ASTM E2653 (coming from ASTM E05.15) have been issued and completed. The subcommittee now has five

standards (no test methods). Proposed definitions for "flaming droplets" and "burning droplets" were issued for ballot and received negatives and will be reworked. ASTM E176, ASTM E2536, ASTM E2653 and ASTM E2989 have 2015 dates.

ASTM E05.33

Subcommittee ASTM E05.33 (on fire safety engineering) has 5 standards: ASTM E1355 (Guide for Evaluating the Predictive Capability of Deterministic Fire Models, 2012), incorporating material from the withdrawn guides ASTM E1472 and ASTM E1895, ASTM E1591 (Guide for Obtaining Data for Fire Growth Models, 2013), ASTM E1776 (Guide for Development of Fire-Risk-Assessment Standards, 2013) and ASTM E2280 (Standard Guide for Fire Hazard Assessment of the Effect of Upholstered Seating Furniture Within Patient Rooms of Health Care Facilities, 2013). A new edition of ASTM E1546 (Fire hazard assessment guide) incorporating the concepts of the ASTM E1776, fire risk assessment guide, but referencing ASTM E1776 (which stays as a separate standard) has been completed and issued with a 2015 date. A new practice on ignition sources was issued (to become ASTM E3020) and further ignition sources will be added.

ASTM E05.91

Subcommittee ASTM E05.91 (on planning and review) completed a new long range plan for the committee and a revised set of bylaws. A document has been prepared for comparison of fire test methods between ASTM, NFPA, UL, ISO and IEC; it has been placed on the web site as a committee document and it is being revised.

ASTM D20, Plastics

The committee and all its subcommittees met in April 2015, in Anaheim, CA. Two revisions of generic interest went out for ballot: (1) a revision to the Bylaws that cleans up the document without discussing refusal of membership to applicants and (2) a revision making ASTM D4968 (Review of Test Methods and Specifications) from a Guide into a Practice, making the requirements mandatory. Both received negatives and have been reissued.

ASTM D20.20

Subcommittee ASTM D20.20 (on plastic lumber) has 9 standards, eight of them with 2013 dates, including ASTM D7568 (Specification for Structural-Grade Plastic Lumber for Outdoor Applications). ASTM D6341 (Test Method for Determination of the Linear Coefficient of Thermal Expansion of Plastic Lumber and Plastic Lumber Shapes Between –30 and 140°F (–34.4 and 60°C) has a 2014 date. Some progress occurred on repeatability statements for three test methods in this subcommittee. Ballots have been issued on repeatability statements for two of these test methods but they have received negatives. Also, a draft practice for mounting plastic composites in ASTM E84 went for ballot and received negatives and will be proposed for discussion at committee E05.

ASTM D20.30

Subcommittee ASTM D20.30 (on thermal). Work was completed on 4 changes to ASTM D1929 (Test Method for Determining Ignition Temperature of Plastics) addressing non-mandatory language; a fifth

ballot item will be issued and another one with some clarifications. ASTM D3675 (radiant panel test for plastics) now has a 2014 date. Concurrent ballots were completed on ASTM D635 (UL 94 HB) and ASTM D4804 (UL 94 V for non-rigid plastics). A ballot was issued to revise D3801 (UL 94 V). ASTM D635, ASTM D1929, ASTM D4804, ASTM D5048 (UL 94 5V) and ASTM D5207 (Practice for confirmation of small burner) now have a 2014 date.

ASTM D09 (Electrical and Electronic Insulating Materials)

Committee ASTM D09 (electrical and electronic insulating materials) completed revision of all 7 fire standards under the jurisdiction of subcommittee D09.21: ASTM D3874 (Test Method for Ignition of Materials by Hot Wire Sources, 2013), ASTM D5424 (Test Method for Smoke Obscuration of Insulating Materials Contained in Electrical or Optical Fiber Cables When Burning in a Vertical Cable Tray Configuration, 2014), ASTM D5425 (Guide for Development of Fire Hazard Assessment Standards of Electrotechnical Products, 2014), ASTM D5485 (Test Method for Determining the Corrosive Effect of Combustion Products Using the Cone Corrosimeter, 2011), ASTM D5537 (Test Method for Heat Release, Flame Spread, Smoke Obscuration, and Mass Loss Testing of Insulating Materials Contained in Electrical or Optical Fiber Cables When Burning in a Vertical Cable Tray Configuration, 2010, ballot with update), ASTM D6113 (Test Method for Using a Cone Calorimeter to Determine Fire-Test-Response Characteristics of Insulating Materials Contained in Electrical or Optical Fiber Cables, 2011) and ASTM D6194 (Test Method for Glow-Wire Ignition of Materials, 2014).allots have been completed updates of various standards, with few fire connotations. They include ASTM D2275 (corona test, which potentially involves fire issues) and ASTM D619 (Test for vulcanized fiber used as electrical insulation, which contains a fire test). A new terminology ballot was issued to revise the definition of layer insulation.

ASTM D13.52

Committee ASTM D13 (textiles, subcommittee on flammability) has 9 standards: ASTM D1230 (Test Method for Flammability of Apparel Textiles, 2010; ASTM version of 16CFR1610, regulatory test for apparel), ASTM D4151 (Test Method for Flammability of Blankets, 2010), ASTM D4723 (Classification Index of and Descriptions of Textile Flammability Test Methods, 2007; obsolete list of tests), ASTM D5238 (Test Method for Smoldering Combustion Potential of Cotton-Based Batting, 2010), ASTM D6413 (Test Method for Flame Resistance of Textiles (Vertical Test), 2015), ASTM D6545 (Test Method for Flammability of Textiles Used in Children's Sleepwear, 2010; ASTM version of 16CFR1615, regulatory test for children's sleepwear), ASTM D7016 (Test Method to Evaluate Edge Binding Components Used in Mattresses After Exposure to An Open Flame, 2014), ASTM D7140 (Test Method to Measure Heat Transfer Through Textile Thermal Barrier Materials, 2013) and ASTM D7571 (Specification for Retained Sewn Seam Strength After Exposures to Hot Air and Open Flame, 2014). A subcommittee ballot item had been issued in 2011 for ASTM D5238 (Standard Test Method for Smoldering Combustion Potential of Cotton-Based Batting) to add, as an option, the NIST SRM 1196 standard cigarette, without eliminating the alternate (commercial, reduced ignition propensity)

cigarette; it received negatives and is still being reworked. A recent ballot on ASTM D1230 received negatives and is being reworked. ASTM D6413 has a 2015 date.

Either ASTM D13.52 or ASTM F08.22 will develop a fire test method for tents (see further in the regulatory section).

ASTM D07.02

Committee ASTM D07 (wood, subcommittee on engineered products, which deals with wood/plastic composites) has issued a series of 8 main committee ballot items for revision of ASTM D7032 (Standard Specification for Establishing Performance Ratings for Wood-Plastic Composite Deck Boards and Guardrail Systems (Guards or Handrails) to change the title and incorporate the plastic lumber materials, following the joint discussions at D20.20 and D07 in April 2013. Several of the items received negatives but 4 changes were approved: (1) adding the applicability to all plastic composites to the scope, (2) adding stair treads to the scope, (3) and (4) minor scope changes. The issues dealing with title change, chemical composition of the plastic component, deletion of a note relating to plastic lumber and other issues (including fire testing) are still up for debate. The definition of plastic lumber approved by D20 and D20.20 will be changed and the one used in ASTM D7032 is different.

ASTM D07.07

Committee ASTM D07 (wood, subcommittee D07.07 on fire performance) is responsible for ASTM E69 (Standard Test Method for Combustible Properties of Treated Wood by the Fire-Tube Apparatus), an obsolete standard originally withdrawn by the fire standards committee but of interest to the fire-retardant-treated wood industry, who considers that it addresses "significant progressive combustion"; if it is not reapproved or revised this year it will be withdrawn. A series of 4 concurrent ballot items were issued to make (basically editorial) changes to ASTM E69 so it can have a new date; all received negatives. Concurrent ballot items were issued to reapprove (with editorial changes) ASTM D6305, Practice for Calculating Bending Strength Design Adjustment Factors for Fire-Retardant-Treated Plywood Roof Sheathing (it passed) and to revise ASTM D6841 Practice for Calculating Design Value Treatment Adjustment Factors for Fire-Retardant-Treated Lumber (one negative). A concurrent revision of ASTM D5516, Test Method for Evaluating the Flexural Properties of Fire-Retardant Treated Softwood Plywood Exposed to Elevated Temperatures, was issued to clean up the section on fire testing (three negatives).

Note that ASTM D4442 (Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials) has been revised, retitled and reissued with a 2015 date.

ASTM C16

Committee ASTM C16 (thermal insulation) will develop ballot action on ASTM C739 (Specification for Cellulosic Fiber Loose-Fill Thermal Insulation) requiring the use of the NIST SRM 1196 standard cigarette instead of commercial (reduced ignition propensity) cigarettes. A new concurrent ballot with fire safety implications was issued for ASTM C991, Specification for Fibrous Glass Insulation for Metal Buildings. A concurrent revision of C1126 (Specification for Faced or Unfaced Rigid Cellular Phenolic Thermal Insulation) is correcting the language regarding ASTM

E84 testing. A concurrent revision of ASTM C1497 (Specification for Cellulosic Fiber Stabilized Thermal Insulation) eliminates the discussion about the concern about settling of FR additives in loose fill insulation; it received a negative. Ballot items were issued to revise ASTM C739 to replace the commercial cigarettes by NIST SRM 1196 cigarettes and further discuss such fire testing. A concurrent ballot item was issued to develop a Specification for Insulating Covers on Accessible Lavatory Piping, which classifies such covers based on their fire test results in categories (UL 94 or ASTM E84).

ASTM F15.22

Subcommittee ASTM F15.22 (toy safety) is responsible for ASTM F963 (Standard Consumer Safety Specification for Toy Safety) a standard used for regulation of toys. A concurrent ballot item was issued addressing battery operated toys and received multiple negatives.

ASTM F15.15

Subcommittee ASTM F15.15 (wall coverings) is responsible for two standards: ASTM F793 (Standard Classification of Wall Covering by Use Characteristics) and ASTM F1141 (Standard Specification for Wallcovering). Ballots have been issued for updates, primarily dealing with fire performance issues. The subcommittee also needs to make a distinction between all wall coverings and vinyl wall coverings.

ASTM F15.10

Subcommittee ASTM F15.10 (Standards for Flammable Liquid Containers) has issued a subcommittee ballot to create a Standard Specification for Portable Gasoline Containers, 25 to 76 L (6.6 to 20 gal) Capacity, for Commercial Use.

ASTM F15.45

Subcommittee ASTM F15.45 (candles) approved ballot items to clarify that candle shapes and toppers and lanterns must comply with the same fire safety requirements as other candle accessories (ASTM F2601; with a 2013 date). The terminology document has a 2013 date (ASTM F1972) and a new ballot item was issued to revise the definition of "free standing candle", it received a negative which was handled by an administrative ballot to declare it not persuasive. Ballots were also issued to revise ASTM F2417, Standard Specification for Fire Safety for Candles. ASTM F2179 (Specification for Annealed Soda-Lime-Silicate Glass Containers That Are Produced for Use as Candle Containers) has a 2013 date, with newer standards being: ASTM F2058 (Standard Specification for Candle Fire Safety Labeling, 2014), ASTM F2179 (Standard Specification for Annealed Soda-Lime-Silicate Glass Containers That Are Produced for Use; 2014) and ASTM F2326 (Standard Test Method for Collection and Analysis of Visible Emissions from Candles as They Burn, 2015).

ASTM F23.80

This subcommittee, on Protective Clothing, Flame and Thermal, had four items on main committee ballot: ASTM F955 (retitled: Test Method for Evaluating Heat Transfer through Materials for Primary Protective Clothing Upon Contact with Molten Substances; was balloted), ASTM F1930 (Test Method for Evaluation of Flame Resistant Clothing for Protection Against Fire Simulations Using an Instrumented Manikin;

2015), ASTM F1939 (Test Method for Radiant Heat Resistance of Flame Resistant Clothing Materials with Continuous Heating, 2015) and ASTM F2702 (Test Method for Radiant Heat performance of Flame Resistant Clothing Materials with Continuous Heating; 2015). ASTM F2894 (Standard Test Method for Evaluation of Materials, Protective Clothing and Equipment for Heat Resistance Using a Hot Air Circulating Oven) is dated 2014. ASTM F955, ASTM F1002 has been revised and has a 2015 date. ASTM F2757 (Guide for Home Laundering Care and Maintenance of Flame, Thermal and Arc Resistant Clothing has been issued for reapproval. Three standards have 2008 dates and need ballot action: ASTM F1060 (Standard Test Method for Thermal Protective Performance of Materials for Protective Clothing for Hot Surface Contact), ASTM F1358 (Standard Test Method for Effects of Flame Impingement on Materials Used in Protective Clothing Not Designated Primarily for Flame Resistance; balloted 2014 with negatives) and ASTM F2302 (Standard Performance Specification for Labeling Protective Clothing as Heat and Flame Resistant).

ASTM F25.03

This subcommittee (ships, outfitting) has a standard with fire safety implications: ASTM F1085 (Standard Specification for Mattress and Box Springs for Use in Berths in Marine Vessels) with a 2014 date.

ASTM F33.05

This subcommittee (detention facilities furnishings and equipment) has standards with fire safety implications. Ballot action is expected for ASTM F1534 (Standard Test Method for Determining Changes in Fire-Test-Response Characteristics of Cushioning Materials After Water Leaching) and ASTM F1550 (Test Method for Determination of Fire-Test-Response Characteristics of Components or Composites of Mattresses or Furniture for Use in Correctional Facilities after Exposure to Vandalism, by Employing a Bench Scale Oxygen Consumption Calorimeter), both of which have 2010 dates.

ASTM F08.22

This subcommittee (camping soft goods) has a standard with a fire test for sleeping bags (ASTM F1955) which was withdrawn but was balloted for reinstatement, with revisions, and has been published.

ASTM F44.30

ASTM F44 is a new committee on General Aviation Aircraft, subcommittee on "structures". This new committee is planning to issue a document for ballot that is a specification containing "burn test methods", which are the FAA general aviation fire test methods. The committee has to date only issued specifications. The language proposed for ballot comes directly from 14 CFR Part 23 Amendment 62 Appendix A, which is the FAA regulation. The purpose of the committee is to take the regulatory language and convert it into ASTM standards since the FAA will be putting out its new rule (NPRM) in December of 2015. The committee is looking into the development of fire test methods but they are not very familiar with them as yet.

ASTM International (100 Barr Harbor Drive, PO Box C700, West Conshohocken PA, 19428-2959; Tel: 610-832-9585; www.astm.org)

ISO TC 92

ISO TC 92 is the technical committee on fire safety. It will next meet in October 2015 in Gaithersburg, MD.

Recently, ISO 5660-1 (cone calorimeter) was reissued and the following are the key changes that have occurred from the earlier edition:

- Smoke measurement (laser system) is now part of the main standard rather than a second document, now making it a mandatory item.
- Two new specimen holder optional components have been added for (a) materials that extensively distort and cannot be held by 4 wires [these are to be tested with a fine wire grid, as defined in Figure 8 of the standard] and (b) materials that require testing under compression (such as fibers) will be required to be physically restrained or compressed (so they are tested at installed densities) and they can be tested in a wire cage structure, as shown in Figure 9.
- The process for assessing the weighing device output drift has been enhanced so that the drift is now the difference between the average at the beginning and at the end of the procedure.
- When the performance of the weighing device is assessed the mass that is added to the sample holder to simulate the edge frame has changed from 250 g to 500 g (to be more representative of the actual mass of the edge frame).
- The procedure for determining the C-factor is now defined as a 1 minute (minimum) baseline phase, then a 3 minute stabilization phase, followed by a 3 minute data collection phase at 5 second intervals.
- An alternative method has been incorporated to assess the methane burner mass flow meter accuracy; in it a calibration mass flow meter can be swapped into the system, rather than putting the reference flow meter in series.
- The test end time (i.e. the time until the end of data collection) has been modified to make it clearer.
- The criteria for a required "re-test" has been modified so that the spread in the 180 s mean heat release rate is only considered if the mean value is greater than 10 kW/m^2.
- The drawings for the specimen holder pan and edge frame have been modified (Figures 3 and 4).
- The equation for calculating heat release rate (G.5) has been made more generic by replacing the constant 0.172 by a variable, since if E is not equal to 13.1 the constant in the equation is not 0.172.
- An Informative Annex has been added, entitled "Calculation of Effective Critical Heat Flux for Ignition"
- The range of heat fluxes for testing changed from 0-100 kW/m^2 to 0–75 kW/m^2 (to prolong cone heater service life
- Some construction details and the required use of the cold trap have been removed to make it more generic while maintaining the same technical requirements.

ISO TC 61 SC4

ISO TC 61 is the technical committee on plastics and subcommittee SC4 deals with fire issues. It will next meet in September 2015 in Paris, France. Among the issues to be addressed are revisions to ISO 4589 parts 1 through 3 (oxygen index and temperature index and guidance), a new standard on

fire properties of PVC and revisions to ISO 871 (Setchkin ignition) and ISO 10093 (Compilation of ignition sources).

International Organization for Standardization (1, rue de Varembé, Case postale 56, CH-1211 Geneva 20, Switzerland; Tel: 41(0) 22 749 01 11; www.iso.org)

SFPE

SFPE has recently issued a new standard: *SFPE Engineering Standard on Calculation Methods to Predict the Thermal Performance of Structural and Fire Resistive Assemblies (SFPE S.02 2015).*

The design of structural fire resistance requires three major steps: (1) determination of the thermal exposure to a structure resulting from a fire (2) determination of the temperature history within the structure, or portion thereof, and (3) determination of the structural response. This standard addresses the second step in this process.

The standard provides requirements for the development and use of methods to predict the thermal response of structures using listed fire resistive assemblies to time dependent thermal boundary conditions imposed by fires. It provides requirements for calculation methods that provide time dependent temperature field information resulting from fire exposures required for engineered structural fire design (including structural systems and fire barriers). The Annex provides precisely calculated reference temperatures from 16 verification cases that represent a variety of problems that are relevant in fire safety engineering.

This standard is a companion to the 2011 standard entitled "SFPE Standard on Calculating Fire Exposures to Structures", which provides methods for the first of these steps. It addresses fully developed fire exposures, which include fully-developed fires within an enclosure and localized fires that are not affected by an enclosure. Fires within an enclosure are considered to be spatially uniform, while local fire exposures are not. Topics covered include determining whether a fire exposure should be considered as a local fire or an enclosure fire, prediction of fire exposures within an enclosure, prediction of heat fluxes from local fires, and documentation of the analysis. An extensive commentary provides background and guidance for the requirements in the standard.

NFPA 557 (Standard for Determination of Fire Loads for Use in Structural Fire Protection Design) is another piece of this puzzle and it contains information on actual fire loads and how to predict them in a variety of occupancies. A 2016 edition has recently been approved by NFPA.

Society for Fire Protection Engineering (SFPA; 9711 Washingtonian Blvd, Suite 380, Gaithersburg, MD, 20878; Tel: 301-718-2910; https://sfpe.site-ym.com)

Financial News

Ferro Announces Raised Corporate Credit Ratings by Standard & Poor's

Ferro Corporation announced that on July 30, 2015, Standard & Poor's raised its corporate credit rating on both the Company and its issue-level debt to 'BB-' from 'B+' and maintained the outlook as "stable."

S&P based the upgrade on the Company's generation of stronger EBITDA margins as a result of acquiring higher EBITDA-generating companies, exiting more-cyclical businesses, and achieving cost savings through restructuring activities. As a result, S&P stated it expected earnings to become more stable and future performance to be forecasted with greater conviction.

Ferro Corporation (1000 Lakeside Avenue, Cleveland OH 41114; Tel: 216-641-8580; www.ferro.com)

Clariant

Clariant Again Included in Dow Jones Sustainability Index

Clariant was included in the Dow Jones Sustainability Index (DJSI) for the third consecutive time. This index, stated to be the most renowned sustainability index, listed Clariant in both the DJSI Europe and the DJSI World. The analysts at Robeco SAM stated that Clariant is among the top 4% of companies in the global chemical industry when it comes to the economic, environmental and social dimensions of sustainability. The company is said to have achieved best in class scores in the categories Innovation Management, Customer Relationship Management, Operational Eco-efficiency and Environmental Reporting.

"For Clariant, sustainability is a prerequisite for being successful in the mid to long term. It's an integral part of our corporate strategy and we will further include sustainability in our businesses, combining customer's needs with own ambitions," comments CEO Hariolf Kottmann. "Sustainability is not only our license to operate in the future; it is even more an important element in creating added value for all stakeholders."

With its Portfolio Value Program, Clariant states that it has developed a comprehensive tool to improve its sustainability performance on all levels in a continuous process, focusing also on further sustainability integration within its business and product development activities. The company states that it recently emphasized its commitment to new sustainability targets, such as sustainable sourcing of palm oil with a focus on traceability, continuous improvement of its product portfolio on all sustainability levels, improvement or replacement of product groups from the portfolio not delivering on the comprehensive sustainability aspects, value chain collaboration, and focusing on all phases of the product life-cycle. Besides its own proactive sustainability approach Clariant states that it has committed to external sustainability initiatives such as the Responsible Care Global Charter, and the United Nations Global Compact.

Regarded as one of the world's foremost sustainability indices, the DJSI is said to benchmark the sustainability performance of leading companies based on environmental, social and economic performance, including forward-looking indicators. It is said to assess various criteria, including risk and supply chain management, operational eco-efficiency, product stewardship, human capital development and occupational health and safety.

Clariant on Course for Growth in North America

Clariant states that it provided investors, analysts and journalists important details of the specific challenges and opportunities in North

America as well as unique insights into the latest market and technology trends within Clariant's Business Units Catalysis and Oil & Mining Services at Clariant´s Roundtable event in San Francisco on August 25.

The commercial relevance of the North American region in general was highlighted by Hariolf Kottmann, CEO of Clariant. He stated: "For Clariant North America is an important growth market. The US provides the single biggest revenue contribution." Currently Clariant states that it delivers sales of around US$ 1.0 billion in North America with approximate 1,800 employees, and that it has been experiencing year-on-year growth of around 4% in the region since 2011. Growth in the company's Catalysts business is said to have been even stronger, at 5%per year, while the Oil & Mining Services (OMS) business is said to have shown double digit growth per annum. Based on the strength of these businesses, Clariant sales in the first half of 2015 in North America are said to have been up by 5%. Kottmann envisions continued growth in North America, accelerated by investments in this region.

Ken Golder, Head of the region North America, described the opportunities this region offers Clariant to contribute to its growth. "As the largest specialty chemicals market in the world, we benefit from favorable pricing and availability of energy and feedstocks, and the industry in general is being revitalized as a consequence of the energy sector expansion," Golder said. He continued stating that the projected GDP growth of 2.8 % for the U.S. is among the highest of any advanced nation. Economic indicators and forecasts confirm that this strong growth will continue.

Clariant is therefore said to be investing heavily in North America. Examples are said to be the new Polypropylene Catalyst Plant in Louisville with an investment of around USD 100 million and the Houdry Catalysts Expansion with an investment of around USD 20 million.

Providing details on Clariant's Catalysis business, Stefan Heuser; head of BU Catalysts, highlighted the current annual growth rate of this business, which is said to be close to 7%. "Approximately 90% of all chemical products are manufactured with the help of catalysts," he said. "As chemical production volumes are forecasted to grow significantly, the existing technologies will double energy consumption and greenhouse gas emissions. More efficient innovative catalysts will allow chemical production to grow sustainably."

With its comprehensive catalysts portfolio, Clariant is said to be well positioned to capture the opportunities driven by new projects based on shale gas in the US. The company states it has the most extensive portfolio among major peers for shale gas driven growth in the US with leading market positions on catalysts for propane dehydrogenation, steam cracker/selective hydrogenation, methanol and ammonia production.

Clariant also states it is investing heavily in catalysts R&D, spending more than 7 % of sales. To develop the most efficient solutions, Clariant is said to be leveraging its position as an independent catalyst supplier to collaborate closely with leading process licensors as well as with customers and academic partners.

John Dunne, Head of Clariant`s Oil and Mining Services business (OMS), illustrated the importance of the oilfield chemicals market: "The global size of the oilfield chemicals market is expected to grow from USD 10 billion today to USD 12 billion by 2020. Over 50 % of the oilfield chemicals market is located in the North American Region," he added. "This is very positive for a company that is positioned such as Clariant, with today's USD 5.5 billion North American production chemicals market expected to further develop as oil and gas production increases over the mid-term." Therefore in 2014 the OMS business is said to have expanded its headquarters and North American R&D laboratories in The Woodlands, TX. The workforce in North America is said to have significantly expanded since 2014 to provide the skills and levels of service required by the customers.

Innovation is also said to be key to the success of Clariant's OMS business, which is now said to be the third largest oil production chemicals supplier in the world. OMS presented what it stated were technology developments across the oil and gas value chain. Its gas hydrate technology is said to be an excellent example of how Clariant has developed a market-leading position in deep-water flow assurance that will benefit customer operations and profitability. Clariant is also said to be active in marketing innovations that support hydraulic fracturing, by addressing challenges that competitors are unable to meet and by introducing a recently developed technology that prevents the formation of iron sulfide deposits in equipment that can shut down production.

Clariant International AG (Rothausstrasse 61, CH 4132 Muttenz 1, Switzerland; Tel: 41(0) 61 469 5111; www.clariant.com)

DSM

DSM issues long-term €500 million bond

Royal DSM, the global Life Science and Materials Sciences company, has successfully issued a €500 million 1.375% bond due 2022. The proceeds will be used for general purposes.

The terms are laid down in the €4 billion Debt Issuance Program of Royal DSM, the final terms and the supplements thereto. The re-offer price was 99.841%. Based on this price the yield is 1.399%. The bond will be listed on Euronext Amsterdam shortly.

This release does not constitute an offer or an invitation to subscribe for or purchase any securities. The notes are being offered only by means of a prospectus.

DSM among leaders in Dow Jones Sustainability World Index

Royal DSM has been named among the worldwide leaders in the Materials industry group in the Dow Jones Sustainability World Index published on Sept 10th. Since 2004, DSM has been named the leader in this sector six times and also named among the top leaders six times.

Feike Sijbesma, CEO and Chairman of the DSM Managing Board, commented: "We are proud to be once again amongst the global top leaders in the Dow Jones Sustainability World Index. We congratulate AkzoNobel on being named the leader in our industry. For Royal DSM, sustainability is not only a responsibility and a core value, but also an important business

driver. By converting crop residue into advanced green biofuels, increasing solar panel yields and reducing the weight of cars we demonstrate every day that sustainability is an integral part of our business and a key differentiator for our customers."

DSM states that it aims to create value over three dimensions simultaneously; economically, environmentally and societal, named the Triple P approach (People-Planet-Profit). DSM's business activities and results demonstrate this every day.

DSM's so called, ECO+ products, of which the environmental impact is said to be lower than that of competing mainstream products that fulfill the same function, are an increasingly important part of DSM's portfolio. The share of ECO+ products in DSM's innovation pipeline is said to be on track to achieve the 2015 aspiration of 80%. The ECO+ share in DSM's running business is today said to be almost 50%, increased from around 30% in 2010.

Examples are said to be the enzymes for the cheese, baking and beverage industries, stated to be making food products healthier whilst reducing the carbon footprint of their production. Increasingly DSM states that it contributes with its activities to the sustainability drive in China.

The so called, People+ dimension, which DSM developed with 12 European Industry leaders in 2014, is now said to be a broadly accepted methodology for assessing a product's social impact throughout its life cycle. People+ products are said to be measurably improving the lives of end-users, employees and communities across the value chain.

An example of a People+ innovation is said to be synthetic chains made of Dyneema fiber used in harbors, meaning the harbor workers are said to suffer less from back pain and injuries and to experience less noise compared to using heavy steel chains.

DSM is also said to be addressing its own environmental and carbon footprint by reducing its greenhouse gas emissions and becoming more energy efficient. DSM is said to be on track to reach its aspiration for a 20% energy efficiency improvement in 2020. DSM states that it will also achieve its aspiration of a (absolute) reduction in greenhouse gas emissions of 25% by 2020, compared to 2008. DSM states it will formulate new targets by the end of 2015.

DSM Fine Chemicals (Het Overloon 1, 6411 TE Heerlen (NL); Tel: +31 (0)45 578 8111; dsm.com)

AkzoNobel ranked top of DJSI for fourth year in a row

AkzoNobel has been ranked number one on the influential Dow Jones Sustainability Index (DJSI) for the fourth consecutive year.

The latest listing is said to place the company first out of more than 350 companies in the Materials industry group. The company states that, as well as underlining AkzoNobel's commitment to continuous improvement, the ranking would also highlight how the DJSI can play a key role in driving innovation that benefits customers and the whole value chain.

"This result reinforces our belief that sustainability should sit at the heart of our business strategy," said CEO Ton Büchner. "The DJSI is an extremely effective strategic tool for managing sustainability and

business performance, and today's ranking reflects the importance we attach to working closely with customers in order to develop more sustainable solutions."

The company states that it has now been placed in the top three for ten years in a row and aims to generate 20% of its revenue from sustainable solutions by 2020. The DJSI is said to play an important role in achieving this, as it is said to give added momentum to AkzoNobel's Planet Possible sustainability strategy.

"We've developed great products such as additives that allow asphalt to be laid at low temperatures and solar-reflective exterior paint that reduces a building's energy use up to 15%," adds Büchner. "But innovation is only part of the story. The DJSI also helps us to make advances in terms of becoming more eco-efficient, improving the safety of our products, attracting and retaining talent and improving relationships with our customers."

Said to be widely regarded as the most respected independent sustainability ranking system, the DJSI World Index is supposed to benchmark the sustainability performance of leading companies based on environmental, social and economic performance, including forward-looking indicators. It is said to assess various criteria, including supply chain management, operational eco-efficiency, product stewardship, human capital development and occupational health and safety.

Akzo Nobel (Strawinskylaan 2555, 1077 ZZ Amsterdam, The Netherlands: Tel: 31 20 502 7555: akzonobel.com)

Industry News

National Safety Apparel acquires manufacturer of fire retarded safety apparel

Cleveland-based National Safety Apparel announced it has bought TECGEN, a South Carolina manufacturer of fire retarded safety apparel.

The purchase "further increases National Safety Apparel's portfolio of premium flame resistant brands," the company said in a news release, as it seeks to build a full line of brands in the personal protective equipment market. Terms of the deal were not disclosed.

National Safety Apparel's existing brands include ArcGuard, Carbon Armour, Arc H2O and CARBONCOMFORT, which primarily are lines of fire-protection gear, rain gear or safety clothing and equipment.

Both National Safety Apparel and TECGEN are scheduled to appear, with individual booths, at the National Safety Council's 2015 Congress & Expo, which takes place in Atlanta and opens Sept. 28.

National Safety Apparel (15825 Industrial Parkway, Cleveland, OH 44135' Tel: 1-800-553-0672; www.nsamfg.com)

New FM Global Guidelines Could Reduce Warehouse Costs by Millions of Dollars

FM Global unveiled a new, more effective fire protection approach for warehouses that could reduce businesses' loss prevention costs by millions of dollars. Using current fire protection technology, the solution enables facility owners to use fewer sprinklers and lower-capacity water systems.

The development follows nearly three years of comprehensive research by FM Global consisting of extensive and advanced open-source computer fire modeling, water flow tests and large-scale fire tests at its 1,600-acre (647 hectares) Research Campus in West Glocester, RI.

"Fire is the leading cause of commercial property damage," noted Ronnie Gibson, vice president and chief engineer with FM Global. "This new in-rack sprinkler design option for warehouses can minimize our clients' costs as well as their risk and exemplifies FM Global's unparalleled risk engineering expertise and commitment to the resilience of our policyholders."

For example, in a 500,000 ft^2 (46,450 m^2) warehouse with an 80 ft. (24 m) ceiling height, the cost of installing sprinklers, pumps and water tanks could fall from approximately US$4.3 million to as little as US$2.6 million, according to contractor estimates.

In addition to cost savings, the new design also is more environmentally friendly. It would allow companies to protect their highest-hazard commodities, such as expanded plastic, using less than half the water volume previously needed. Furthermore, in the event of a fire, warehouse owners would likely sustain less water and smoke damage, because the fire would be controlled or suppressed more quickly. Businesses also may see a smaller environmental impact in smoke and water runoff.

FM Global (270 Central Avenue, Johnston RI 02919; Tel: 401-275-3000; www.fmglobal.com)

Albemarle

Albemarle to relocate its corporate headquarters to Charlotte, NC

Albemarle Corporation announced that it will relocate its corporate headquarters and its Performance Chemicals business from Baton Rouge, LA to Charlotte, NC. In addition, it will relocate Baton Rouge employees in its Refining Solutions business to its existing Clear Lake, TX office. Approximately 120 of the company's employees will be relocated to Charlotte and Clear Lake, with the majority of the relocations expected to take place in June 2016.

Albemarle continues qualification and commercialization of GreenCrest solution

Albemarle Corporation announced that it is continuing with the qualification and commercialization of its GreenCrest polymeric fire safety solution, which is based on technology licensed from Dow Global Technologies LLC, a subsidiary of The Dow Chemical Company.

Albemarle Corp. (451 Florida St., Baton Rouge LA 70801; Tel: 225-388-7402, www.albemarle.com)

PPG to Acquire Remaining Interest in Chemfil Canada Joint Venture

PPG Industries announced that it has reached a definitive agreement to acquire the remaining interest in Chemfil Canada Limited, a joint venture of PPG and Madinal Enterprises. The transaction is expected to close in the third quarter, subject to customary closing conditions. Financial terms were not disclosed.

Chemfil Canada produces pretreatment products, as well as some general industrial chemicals, for automotive original equipment manufacturers (OEMs) and industrial customers in Canada.

The acquisition will enhance PPG's pretreatment presence and capabilities in Canada, and after closing the acquired products and services will be offered under the PPG name. Also at the conclusion of the transaction, an affiliate of Madinal Enterprises will own the Windsor production facility and certain non-pretreatment business and product lines that will continue to use the Chemfil name.

"Acquiring the pretreatment business of Chemfil Canada will enable PPG to further strengthen its pretreatment offering and services in this area for global automotive OEM and industrial customers," said Cindy Niekamp, PPG senior vice president, automotive coatings. "PPG looks forward to enhancing supply capabilities for Chemfil customers and providing them with access to PPG's full portfolio of coatings products."

PPG Industries (One PPG Place, Pittsburgh PA 15272; Tel: 412-434-3131, www.ppg.com)

Murdock Webbing Announces Alexium as New Provider of FR Chemistry

Alexium International Group Limited informed that Rhode-Island based Murdock Webbing has announced it will be introducing Alexium's proprietary "environmentally friendly" fire retardant (FR) chemistry formulations into its FR webbing product lines.

Murdock Webbing is said to be a major supplier of rigid and stretch webbing for straps to end users ranging from US Military products to safety harnesses to rigid tie-downs. Murdock Webbing's US Military webbing products include: flexible stretch strapping for goggles and rigid strapping for backpacks, parachutes, field vests, duffle bags, uniform accessories, belts and tents.

Ray Clarke, VP of Sales for Murdock Webbing, said: "As collaboration with Alexium continues, we are confident with our decision to use Alexium's flame retardant products as those products continue to exceed our expectations for performance."

First Alexium FR formulation sales with Murdock Webbing are said to be in the FR Stretch Webbing market segment for use in flexible straps for goggles for the US Military.

Immediately following on from this first product line, it is anticipated Murdock will expand the use of Alexium's FR formulations on its products into the much larger FR Rigid Webbing market including military FR equipment applications for backpacks, parachutes, field vests, duffle bags, uniform accessories, belts (including seat belts) and tents.

FR Rigid Webbing is said to be essential for a variety of uses including: harnesses for high speed racing vehicles/stock cars, building industry harnesses, fall protection, transportation load strapping and hospital applications. It is intended that Alexium's FR formulations for Murdock Webbings products will also extend to this wider market. Murdock Webbings products with Alexium FR formulations are anticipated to be available to end-use customers no later than Q1 2016.

Nicholas Clark, CEO and Executive Director of Alexium, said: "As we continue to capture more of the military market, we feel Murdock Webbing, with a steadfast reputation within the military arena, was the perfect choice for collaboration on this specialist application. Beyond our efforts with Natick on 50/50 Nylon Cotton for FR Uniforms, this is the next step in our goal of supplying the military with all of its FR equipment needs."

Murdock Webbing has production facilities in Tarboro, NC, which utilizes modern-day technologies and processes to service customers in the Sling & Tie Down Industry.

Alexium International (148 Milestone Way, Greenville, SC; Tel: 864-603-1165; alexiuminternational.com)

Bayer MaterialScience changes name to Covestro ahead of float

Bayer MaterialScience is now operating under the new identity of Covestro ahead of plans to float the business on the German stock exchange by mid-2016 at the latest.

The polymer materials supplier is legally and economically independent but will remain a 100% subsidiary of Bayer AG, Covestro said in a statement.

“Independence will enable us to bring our strengths to bear in global competition more quickly, effectively and flexibly,” said CEO Patrick Thomas.

Parent company Bayer said last September that it would float the Leverkusen-headquartered division as part of a strategy to focus on its life sciences business.

Bayer MaterialScience AG (Bldg. K10, 51368 Leverkusen, Germany; Tel: 49 (0) 214-30-53823; www.bayermaterialscience.com)

LyondellBasell mulls new PE plant in Texas

LyondellBasell Industries stated it plans to build a polyethylene resin plant at one of its Texas locations.

The new plant could be in a region that includes the firm’s existing PE sites in Matagaorda and Victoria, said CEO Bob Patel.

Patel added that the site could be a combination greenfield-brownfield project. Houston-based LyondellBasell is in the midst of massive capacity expansions for ethylene feedstock. Those expansions are the result of newfound supplies of shale-based natural gas throughout North American.

LyondellBasell is said to be in the process of firing up two new cracking furnaces in Channelview, TX, that will add 250 million pounds of annual ethylene capacity there. In 2014, the firm added 800 million pounds of ethylene capacity in LaPorte, TX. Another 800 million-pound capacity expansion is said to be completed in Corpus Christi, TX, by mid-2016.

Officials state they are also reviewing a possible 550-million-pound-per-year ethylene boost in Channelview. Company officials could not be reached for comment on the new PE plant.

LyondellBasell is said to rank as North America’s largest polyolefins maker and as one of the largest in the world. In the first half of 2015, the firm stated it recorded a profit of almost $2.5 billion, up almost 18% vs. the

first half of 2014. The profit gain was realized even as sales fell 25% to $17.3 billion, mainly because of lower selling prices for its products.

LyondellBasell's Olefins & Polyolefins-Americas unit appears to have seen its PE sales volume in pounds grow almost 4% in the first half to almost 2.8 billion pounds. The unit's PP sales are said to have jumped more than 3% in the same comparison to more than 1.2 billion pounds.

LyondellBasell Industries N.V. (PO Box 2416, 3000 CK Rotterdam, The Netherlands; Tel: 31(0) 10 275 5500; www.lyondellbasell.com)

Fire Incident Reports – Int'l

China

173 People Confirmed Dead in China's Tianjin Warehouse Explosion

There was an explosion at a warehouse at the Tianjin port on August 12, where large amounts of toxic chemicals were stored, including around 700 tons of sodium cyanide. It all started with fire in the container terminal prompting a large force of firefighters rushing to the scene only to be blown off by the blasts which destroyed several residential building in the neighborhood besides about 10,000 imported cars of various companies lined up for delivery. It is still not known what caused the fire and the ferocity of the explosions which shook the city.

Chinese authorities put the final death toll at 173 in the country's worst industrial disaster at Tianjin port, as officials ended the search for the

remaining eight missing exactly a month after the incident following a complete clean-up of the place.

Tianjin city government announced in a micro-blog that there was no hope of finding the eight persons, and the court will now start issuing death certificates. The massive twin blasts that rocked the chemical warehouse at the port city were also disastrous for the country's firefighting unit as 104 firefighters were killed besides 11 police officers and 55 civilians. The eight persons who remained unaccounted for included five firefighters. Over 700 people were injured and many of them are still undergoing treatment in hospitals.

Meanwhile, amid fears of chemical contamination of air and water, officials managed to clear thousands of burnt cars and containers by deploying a large force of nuclear and biological warfare experts. Official media has carried photos of empty sites, except for puddles of water, stating that the place has been cleaned up. Amid speculation about corruption, 12 people including the chairman, vice-chairman and three deputy general managers of the company owning the warehouse where the explosions took place were arrested.

Also an ugly row has broken out over payment of compensation for 104 firemen killed in the blasts as relatives of the firefighters on contracts complained of discrimination. Family members of some of the dead firefighters, employed as contract staff by the company managing the port, said the government had failed to honor and compensate equally with firemen on regular government employment.

Residents affected by the explosions said they are not satisfied with a local government offer to either repair their homes or ask private companies to purchase their houses and demanded higher compensation to buy new residential flats.

It is unclear at this stage if the warehouse was storing materials in compliance with local requirements (including separation distances) or whether the codes were being ignored.

France

8 Dead, Including 2 Children, in France Apartment Fire

Eight people died in an apartment fire on Sept 2nd in Paris, officials said, and police were investigating whether the fire was started intentionally.

Interior Ministry spokesman Pierre-Henry Brandet said the dead included two children. Four survivors were hospitalized.

Brandet said the firefighters extinguished a small paper fire around 00.23 GMT in the building, located at the foot of Paris' famed Montmartre hill. They were called back two hours later for a new fire that began in a ground floor stairwell and quickly engulfed the building's upper stories.

More than 100 firefighters were required to extinguish the blaze.

Some victims died leaping from the burning building's windows, Brandet said. A witness said that she'd seen building inhabitants screaming "Save us!" from windows while the fire raged.

Paris Mayor Anne Hidalgo said the building had not had any previous problems and had been in good condition.

It was one of the deadliest fires in Paris since the 2005 fire in a hotel housing African immigrants that left 24 people dead including 11 children.

Indonesia

Indonesia Declares Emergency as Brush-fire Smoke Chokes Region

Indonesia declared a state of emergency on Sept 14th in a province choked with thick smoke from brush fires, as the pall continued to spread to other parts of Southeast Asia and fears mounted that worsening air quality could affect the international Grand Prix race set for Sept 20th in neighboring Singapore.

The emergency announcement in Indonesia's Riau province on Sumatra Island came as aircraft were deployed to water-bomb the raging blazes and to seed clouds with chemicals in attempt to induce rain.

Indonesia had said on Sept 11th it would send more than 1,000 troops to fight fires in southern Sumatra, with smoke sickening thousands of people and pushing air quality to unhealthy levels across the narrow straits in Singapore and Malaysia.

Indonesia has vowed in previous years to end the seasonal fires, but has failed each time to stop the so-called "haze" caused by slash-and-burn land clearing on the islands of Sumatra and Borneo, where large areas of forest and brush concessions are held by palm oil and pulp-and-paper companies. The problem has been occurring during the region's annual dry season for the past two decades.

Indonesian troops will be sent to the provinces of South Sumatra and Jambi, two of the main hotspots, Indonesia's National Disaster Mitigation Agency (BNPB) said.

If necessary, the agency will also send in additional helicopters to help water-bomb fires.

"We have mobilized national resources to put out the fires," newly appointed BNPB Chief Willem Rampangilei said in a news release.

South Sumatra, one of the main centers of the fires, has alone reported 22,585 cases of acute respiratory tract infections since Friday.

Singapore has passed legislation allowing authorities to fine companies that cause or contribute to haze, regardless of whether they have an office in the city-state. But Indonesia has previously faced criticism for failing to hand over information about the suspected culprits.

On Sept 11th, Singapore's Pollutants Standard Index rose to 248, which categorizes the air as "very unhealthy," at one level below the index's highest air pollution category of "hazardous."

The organizers of the Singapore Grand Prix were also keeping a close watch on the situation. The F1 race, to be held Sept 20th, has taken place in Singapore since 2008 and draws hordes of tourists and racing enthusiasts from the region and beyond.

"In the event that the haze caused visibility, public health or operational issues, Singapore GP would work closely with the relevant agencies before making any collective decisions regarding the event," the Singapore GP said in a statement.

However, a decision on whether it will be safe to race will be made by FIA Race Director Charlie Whiting after consulting with drivers and teams.

The race has always been held at this time of year, and while there has been some haze in past years, it has never prevented the race from going ahead.

Singapore advised citizens against strenuous outdoor exercise.

Saudi Arabia

Fire at Saudi oil workers' compound kills 10, many injured

Fire swept through an oil workers' residential compound in Saudi Arabia on August 30th, killing 10 people, the Civil Defense agency said.

Saudi national oil company Saudi Aramco did not identify the nationalities of those killed from the fire at the compound in the town of Khobar, some distance from its oil and gas production areas.

However, the Civil Defense agency said in a new statement that three Canadians from Asian origins, one Pakistani and one Nigerian woman were among the 10 killed.

The Civil Defense said 259 people were injured while 80 people from various nationalities remain hospitalized for treatment.

A fire was reported in the basement of the Radium residential compound in Al Khobar which is leased by Saudi Aramco for its employees," Aramco said in a statement.

Witnesses said the fire burned for almost six hours.

Based on initial findings, one of the cameras showed that the cause of the fire was an electric mass in a transformer in the basement where the fire burned 70 parked vehicles and sent smoke to the upper floors of the complex.

According to Aramco's website, the Radium Residential Complex consists of eight six-story buildings and comprises 486 units.

Aramco, which has more than 61,000 employees, many of them expatriates, runs several private gated communities.

Saudi Arabia is the world's largest oil exporter and Aramco produces roughly one in eight barrels of the world's oil supply.

Fire Incident Reports – US

California

California Gov. Declares State Of Emergency As Wildfires Grow

California Gov. Jerry Brown declared a state of emergency in parts of the state on Sept 13th as wildfires destroyed hundreds of homes and forced thousands to evacuate.

More than 100,000 acres have been scorched near Sacramento by both the rapidly growing Valley Fire, which began Sept 12th, and the Butte Fire.

At least 1,000 firefighters have been dispatched to the Valley Fire to fight the encroaching flames, four of whom were hospitalized on Sept 12th. Some 3,800 firefighters are battling the Butte Fire, which was only 20% contained as of Sept 13th.

Brown's declaration will help expedite recovery services and waive fees for residents to replace essential documents lost in the fire.

Early Sept 14th, the California Department of Forestry and Fire Protection confirmed one fatality in the wildfire in Middletown, which lies about 20 miles north of the famed Napa Valley. At least 400 homes, two apartment complexes and 10 businesses were also destroyed by the flames, department spokeswoman Lynn Valentine said.

An elderly, disabled woman who was unable to flee her home in Middletown as flames bore down died as her home burned to the ground. Also, four firefighters suffered burns while fighting the fire.

Wildfires have become increasingly common throughout California spurred by dry conditions and the ongoing drought. Firefighters have responded to nearly 6,800 individual fires since January, more than 1,500 above average.

Brown warned wildfires have become the "new normal" in California last month as rising temperatures and drought provide the perfect fuel for intense blazes.

"The fires are changing. The drought over the last several years has made everything drier," Brown said at the time. "It's a new normal. We're going to get ready. We have resources, we'll need more, but you can be sure that the

California firefighting personnel and all their different departments are ready and we're going to do everything we possibly can."

Nevada

NTSB to investigate airplane fire on Las Vegas tarmac that injured 27

The National Transportation Safety Board is looking into what caused a British Airways plane to catch fire on takeoff from Las Vegas, sending flames and smoke billowing from the tarmac area and injuring 27 on Sept 8th.

The agency said on Twitter it was sending three investigators to the scene to begin its inquiry.

The plane was bound for London and had been cleared for takeoff when its left engine caught fire according to the Federal Aviation Administration and McCarran Airport officials.

The pilots immediately aborted takeoff and evacuated the passengers using emergency slides, according to FAA spokesman Ian Gregor. Airport officials said there were 159 passengers on board; in a statement, British Airways put the count at 157. There were also 13 crew members on board the 275-seat Boeing 777.

"Mayday, Mayday ... we have a fire, I repeat, we are evacuating," the pilot can be heard saying in a hurried back-and-forth with the airport tower, according to audio made public Sept 9th on a website that archives air traffic control recordings.

Firefighters were able to put out the flames within minutes, according to the airport.

A total of 27 people were taken to Sunrise Hospital in Las Vegas and treated for minor injuries, according to Sylvia Song, a hospital spokeswoman. All had been released by the same evening, British Airways said in a statement.

The airline said remaining passengers were taken to hotels.

The runway where the plane caught fire was closed for about eight hours, reopening shortly after midnight Sept 9th.

A Boeing spokesman said the company is providing "technical assistance" to the NTSB in its investigation into the fire.

New York

Triple manhole explosions rock Manhattan & send metal covers flying 15 ft.

New Yorkers ran for cover as manhole covers rained down on a busy city street on Aug 14th at lunch time when three manholes exploded into a fiery flame, just feet from each other.

The explosions all rocked the corner of 45th and 9th Avenue on Manhattan's West Side around noon.

A passer-by managed to take video with her cell phone just as one manhole cover burst into a jet of fire, and a still from the video is shown below.

A second explosion blew out a fifth floor window in the building and the third manhole blowout sent a metal cover over 15 ft. into the air, where it then fell and knocked out part of a fire hydrant.

No one was hurt during the triple manhole cover explosion. 'It's a miracle no one got hurt. It could have been a lot worse,' said someone working nearby when he heard the deafening explosions.

Con Ed officials think underground electrical problems sparked the manhole blasts, possibly from the heavy volume of electricity being used during an August heatwave.

But manhole cover explosions are actually fairly common in the city - several manhole explosions rocked West 35th Street and Eighth Avenue only four months ago.

Washington

Three Firefighters Killed in Washington as Wildfires Spread Across West

Three firefighters were killed and four others injured in central Washington on Aug 19th battling one of the more than 100 wildfires burning across at least 1.1 million acres in the West, authorities said.

The fatalities occurred when winds shifted unexpectedly near the towns of Twisp and Winthrop and turned back on crews fighting a small new fire, Okanogan County Sheriff Frank Rogers said.

"It was a hellstorm up here," Rogers said. "The fire was racing and the winds were blowing in every direction."

All residents of both towns — almost 1,000 people — were ordered to evacuate immediately.

"We are devastated by the tragic loss of three of our Forest Service firefighters," said Mike Williams, forest supervisor on the Okanogan-Wenatchee National Forest. "Our hearts and prayers go out to the families and fellow crewmembers of these brave firefighters."

Gov. Jay Inslee said in a prepared statement: "They gave their lives to protect others. It was their calling, but the loss for their families is immense and I know the community will come together to support them."

White House spokesman Eric Schultz said President Barack Obama had been briefed on the situation. "On behalf of a grateful nation, the president's thoughts and prayers are with the families of these brave Americans," he said.

The 50-acre fire began eight miles west of Twisp, a town of about 900 people, and quickly grew to 1,500 acres, the state Department of Natural Resources said. It's separate from the Okanogan Complex in Okanogan County, all of which was under a general evacuation advisory, with the 200 or so residents of Conconully previously ordered to leave. That fire was at almost 31,000 acres with only 20% containment.

Winds were expected to increase substantially over the next 48 hours, and Okanagon County Emergency Management officials warned residents to monitor local radio and weather reports for updates.

Wildland Fires in the Western US

Updates on Multiple Fires

Another five-fire Washington blaze called the Chelan Complex had reached almost 70,000 acres on the eastern edge of Okanogan-Wenatchee National Forest and was only about 50% contained, commanders said late Aug 19th.

More than 70 structures have already been destroyed in the Chelan Complex, which had reached almost 70,000 acres and was only about 50% contained, commanders said.

"We're really concerned about that weather," Kale Casey, a spokesman for the joint incident team at the scene, told NBC station KING of Seattle.

"We've had no break in the hot, dry weather," Casey said. "We're going to see probably some impressive fire behavior in the next couple days."

Three separate multi-fire complexes were scorching more than 163,000 acres in and around Shasta-Trinity National Forest in Northern California, the state and federal joint incident command said Wednesday on the third straight day of 100-degree-plus temperatures and very low humidity.

The 45,477-acre River Complex near Denny in Trinity County remained only 18% contained as of Aug 19th, commanders said. The towns of Daily Ranch, Bell Flat, Hoboken and Quinby, in addition to Denny, were under mandatory evacuation orders.

The Mad River Complex — formed this week by the merger of two other multi-fire complexes in Trinity and Humboldt counties — was churning through 60,424 acres and was reported to be 37% to 65% contained depending on the location. Mandatory evacuations were in effect for about two dozen homes in the Forest Glen area.

The six-fire, 22,367-acre South Complex in Trinity County, meanwhile, was reported 40% contained. All national forestlands within the fire areas were closed, the National Forest System said.

The incident command agency said efforts to contain the fires were being seriously hampered by daily temperature inversions — in which thick hot smoke soars into the sky as cool morning air burns off. The towering plumes of smoke have grounded all aerial assets except for one plane that's being sent up with an infrared camera to see through the smoke and send information to commanders on the ground.

A Smokey Bear sign keeps watch over the charred landscape left by the 283,000-acre Soda fire in Idaho. Joint Incident Information System

Oregon's biggest problem was the 48,201-acre Canyon Creek Complex of fires in Grant County, which was burning out of control Aug 19th. So far, 36 homes and 50 other structures have been destroyed or damaged, and at least 500 other structures are threatened.

For the first time, state officials banned all burning on state-run land across Oregon — including candles.

The Defense Department said Tuesday that it will mobilize 200 active-duty service members to help fight the fires, the first time it has taken that step in nearly a decade.

The biggest is the Soda fire, which has eaten up 283,686 acres straddling the eastern Oregon and western Idaho borders. But it's now 95 percent contained, with crews turning to mop-up duty, incident commanders said. Of more concern are the dozens of smaller but still sizable fires burning through hundreds of thousands of acres of California, Oregon, Washington, Idaho and Montana. Among the most serious:

Oregon

The Cornet-Windy Ridge fire, south of Baker City, was at 103,540 acres and 45% containment. The County Line 2 fire, on Warm Springs Indian Reservation, was at 62,696 acres and 43% containment. Commanders said a red flag warning for hot, dry air could create what they called "critical fire behavior."

The Stouts Creek fire, south of Milo, was at 25,324 acres and 74% containment. The fire, which was caused by someone illegally mowing during prohibited hours on July 30, has forced the closing of all public lands in Douglas County administered by the federal Bureau of Land Management.

Washington

The North Star fire 25 miles north of Coulee Dam, at 45,632 acres and burning out of control. Mandatory evacuations were ordered for residents north of the town of Nespelem, from Gold Lake Road to Stepstone Road.

The Wolverine fire, three miles northwest of Lucerne, was at 40,357 acres and 30% containment. The villages of Holden, Stehekin and 25-Mile were described as under threat.

The four-fire Kettle Complex, in northern Ferry County, was at 39,570 acres with no report of containment. Parts of Colville National Forest Area are closed and Washington National Guard troops are on the scene, where hot, dry weather is expected fuel the fire into Aug 20th.

California

The Rough fire, 2½ miles southwest of Spanish Mountain in Fresno County, was at 30,901 Acres and only 3% containment. US Forest Service and Kings Canyon National Park campgrounds and trailheads were closed, and 2,500 campers, hikers, employees and residents have been evacuated from the Hume Lake area. Commanders said heavy smoke had forced them to use infrared imagery to even estimate the fire's size.

Idaho

The Clearwater Complex, near Kamiah, was at 64,150 acres and 25% containment. Forty-two homes have been destroyed so far, commanders said

Patent Applications

Developed by Ed Weil: eweil@nyu.edu, http://www.edweil.com

Building Products

Intumescent caulking compositions and methods

US Pat. Appl. 20150218403 (published Aug. 7. 2015) by Lu, Yi (MN) ; Pyun, Eumi (TX) ; Fisher, Carl E. (TX); Baran, Jr., Jimmie R. (WI); Gestner, Robert E. (MN) and Smith, Terrance P. (MN), assigned to 3M Innovative Properties.

The invention is an intumescent caulking composition comprising: a nitrogen phosphorus component; an expandable graphite; the composition exhibiting: a char expansion ratio of at least 8; a char strength of at least 8 N; and a caulk rate of greater than 100 gm/min after 1 day.

The preferred nitrogen-phosphorus compound is ethylenediamine phosphate, and may be supplemented by expandable graphite.

Electrical and Electronics

Flame retarded polymers containing renewable content

US Pat. Appl. 20150225510 (published Aug. 13, 2015) by Boday, Dylan J. (AZ); Kuczynski, Joseph (FL) and Mauldin, Timothy C. (AZ), assigned to International Business Machines Corporation.
The invention is a flame retarded polymer, comprising: a polycondensation reaction product of a biobased diol and a phosphorus-

containing monomer, wherein at least 50% of the mass of the biobased diol is obtained directly from a biological product. It is intended for printed circuit boards.

In an exemplary synthetic method, a bio-derived flame retarded polymer is prepared by a polycondensation reaction of isosorbide and the phosphorus-containing monomer (reactant) is phenylphosphonic dichloride.

Flame retarded polymers containing renewable content

US Pat. Appl. 20150225511 (published Aug. 13, 2015) by Boday, Dylan J. (AZ); Kuczynski, Joseph (FL) and Mauldin, Timothy C. (AZ), assigned to International Business Machines Corporation.
As in the preceding application but claiming the article of manufacture exemplified by an electronic circuit board, a connector, or an electronic device plastic enclosure panel.

Epoxy resin compound, prepreg and copper-clad laminate

US Pat. Appl. 20150240055 (published Aug. 27, 2015) by Zeng, Xianping and Ren, Nana (both China) assigned to Shengyi Technology Co., Ltd.

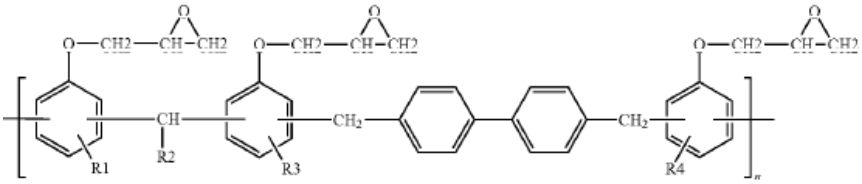
The invention is an epoxy resin composition comprising components as follows: an epoxy resin containing 3 or more epoxy groups and nitrogen in the molecular chain, a phosphate salt compound and an active ester hardener; the amount of the epoxy resin containing 3 or more epoxy groups and nitrogen in the molecular chain is 100 parts by weight, the amount of the phosphate salt compound is 5.about.50 parts by weight, the equivalent ratio of the amount of the active ester hardener, based on the ratio between epoxy equivalent and active ester equivalent, is 0.85.about.1.2.

The exemplified phosphate salt is the aluminum salt of a phosphate with 23% P content (Clariant OP935).

Self-extinguishing epoxy resin for epoxy molding compound

US Pat. Appl. 20150232658 (published Aug. 20, 2015) by Lee, Si-Chang, Park, Kyung-Ho, Shin, Tae-Kyoo, Lee, Jin-Soo, Hwang, Hyun-Ju and Woo, Hyun-Yoo (all Korea), assigned to Kukdo Chemical Co.

The invention is a so-called self-extinguishing epoxy resin for an epoxy molding compound (EMC) represented by the following formula:



In a representative example, the epoxy resin is made from the acid-catalyzed condensation product of 4-phenylbenzaldehyde, 4,4'-bis(methoxy-methyl biphenyl) and phenol. The improvement in fire performance of the cured epoxy is achieved without halogen or phosphorus. A UL 94 flammability rating of V0 is achieved.

Engineering Plastics

Polyester-polycarbonate composition and article

US Pat. Appl. 20150240074 (published Aug. 27, 2015) by Chen, Lin; Guan, Bing; Wang, Huanbing; Xing, Dongbo; Wan, Shun and Shen, Dake (all China), assigned to SABIC

The invention is a composition comprising, based on the total weight of the composition: 5-50 wt% of an aromatic polycarbonate; 10-40 wt% of a block polycarbonate-polysiloxane; 5-35 wt% of a poly(alkylene terephthalate); 5-50 wt% of a block polyester carbonate comprising a polyester block comprising resorcinol ester repeat units and a polycarbonate block comprising carbonate repeat units wherein at least 60 % of the total number of the linking groups are aromatic; and 4-20 wt% of an organophosphate ester.

The exemplified organophosphate is bisphenol A bis(diphenyl phosphate) from Daihachi supplemented by $ZnHPO_4$ from Budenheim Iberica.

Polymeric blends containing photoactive additive

US Pat. Appl. 20150232614 (published Aug. 20, 2015) by Morizur, Jean-Francois; Sybert, Paul Dean; Johnson, Peter; Evans, Thomas L.; Hoover, James Franklin and Flores, Amanda Marie (all IN), assigned to SABIC

The invention is a polymeric blend having improved fire performance properties and good ductility at low temperatures. The blend is formed from (A) a photoactive additive containing a photoactive group derived from a monofunctional benzophenone; and (B) a polymer resin which is different from the photoactive additive. The additive can be a compound, oligomer, or polymer. When exposed to ultraviolet light, cross-linking will occur between the photoactive additive and the polymer resin, enhancing the chemical resistance and flame retardance while maintaining ductility.

In this lengthy (50 pp.) application a very wide variety of systems are exemplified.

Thermally conductive blended polymer compositions with improved fire performance

US Pat. Appl. 20150232664 (published Aug. 20, 2015) by Guo, Mingcheng (China) and Mercx, Frans (The Netherlands), assigned to SABIC

The invention is a thermally conductive polymer composition comprising: (a) from about 20 wt% to about 60 wt% of an organic polymer comprising polyamide, polyester, or polyolefin; (b) from about 30 wt% to about 70 wt% of a thermal conductive additive comprising magnesium hydroxide or aluminum oxide hydroxide; and (c) from about 1 wt% to about 10 wt% of a polyarylene sulfide; wherein all weight percent values are based on the total weight of the composition; and wherein the composition exhibits a fire performance better than that of an otherwise identical composition without the polyarylene sulfide.

In a working example, 43% PA-6, 40% magnesium hydroxide, 10% glass fiber, 0.5% pentaerythritol tetrastearate, 0.4% antioxidants and 6% polyphenylene sulfide (Fortran)205 B$) gave a UL 94 flammability rating of V0 whereas, without the PPS, it only achieved a V2.

Polymeric products with improved flammability

US Pat. Appl. 20150232644 (published Aug. 20, 2015) by Ahlborn, Udo (Germany); Horn, Klaus (Germany); Piermatteo, Ciro (Italy) and Rothe, Matthias (Germany), assigned to Bayer.

The invention is a process to produce a molding which passes the Italian vertical flame test in UNI 9177, with a class 1 requirement, and/or the requirement of the Swiss BKZ rating 5.3. The invention comprises compounding a composition comprising: A) 96.00 wt% to 99.98 wt% of at least one polycarbonate, B) 0.01 wt% to 1.00 wt% of one or more mold release agents, C) 0.01 wt% to 1.00 wt% of one or more heat stabilizers and/or processing stabilizers, D) 0.00 wt% to 2.00 wt% of at least one or more UV absorbers, E) 0.00000 wt% to 5.00000 wt% of one or more colorants selected from the group of organic and inorganic colorants and carbon black, based on the total amount of the sum of components A-D, F) 0.0 wt% to 5.0 wt% of one or more further additives, different from components B)-E), based on the total amount of the sum of components A-D, the components A-D adding up to 100 wt%, and where the composition is free from phosphorus-based flame retardants, from alkali metal and alkaline earth metal salts of aliphatic and aromatic sulfonic acid, sulfonamide and sulfonimide derivatives, sodium or potassium pentachlorobenzoate, sodium or potassium 2,4-dichlorobenzoate, sodium or potassium 2,4,6-trichlorobenzoate, trisodium or tripotassium hexafluoroaluminate, disodium or dipotassium hexafluorotitanate, disodium or dipotassium hexafluorosilicate, disodium or dipotassium hexafluorozirconate, sodium or potassium tetrafluoroborate.

The preferred polycarbonate has an average molecular weight of 29 000 to 32 000 g/mol. The exemplified flame retardant is Bayowet C4, a potassium nonafluoro-1-butanesulfonate from Lanxess AG. The molding is particularly suited for seating applications.

Copolyester elastomer & alpha-olefin vinyl acetate copolymer

US Pat. Appl. 20150218365 (published Aug. 7. 2015) by Zhang, Bin (KY); Kaushik, Mukul (KY) and Zierer, Dirk Ronald (DE), assigned to Ticona

The invention is a polymer composition comprising: a thermoplastic polyester elastomer; a second polymer; at least one non-halogen flame retardant, the at least one non-halogen flame retardant comprising a metal phosphinate, an ammonium polyphosphate or a nitrogen-based compound; a char promoter; and wherein the polymer composition has a UL 94 flammability rating of V1 or V0.

The exemplified non-halogen flame retardant is 26.7% aluminum diethylphosphinate and 13.3% melamine cyanurate.

Polyamide molding compounds with improved both fire performance & long term aging

US Pat. Appl. 20150218374 (published Aug. 7. 2015) by Thomas, Oliver; Lamberts, Nikolai; Hofmann, Botho and Beschiasvili, Georgi (all CH), assigned to EMS-Patent AG

The invention is a polyamide molding compound consisting of: a) 22-99.99 wt% of a polyamide mixture, consisting of (A1) at least one partially aromatic, partially crystalline polyamide with a melting point in the range

of 255 to 330°C and (A2) at least one caprolactam-containing polyamide which differs from the at least one partially aromatic, partially crystalline polyamide (A1) and has a content of caprolactam of at least 50 wt%, the total caprolactam content of the caprolactam contained in polyamide (A1) and polyamide (A2), relative to the polyamide mixture, being 3 to 35 wt%, b) 0 to 25 wt% of at least one flame retardant, c) 0.01 to 3.0 wt% of at least one organic heat stabilizer based on sterically hindered phenols and d) 0 to 50 wt% of at least one additive, components a) to d) adding up to 100 wt%, wherein the polyamide molding compound is free of metal salts and/or metal oxides of a transition metal of group VB, VIB, VIIB or VIIIB of the periodic table.

The flame retardant is preferably non-halogen and a very wide range is recited. The exemplified flame retardant is Clariant's Exolit OP 1230.

Polycarbonate resin composition and resin molded object

US Pat. Appl. 20150218370 (published Aug. 7, 2015) by Ueda, Kenji; Inagaki, Yasuhito, Ohe, Takahiro and Yamada, Atsushi (all JP), assigned to Sony Corp.

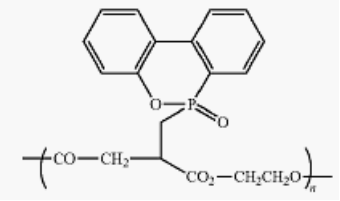
The invention is a resin composition comprising: a component A being a polycarbonate resin; a component B being talc having an average median diameter of 4.6 μm or more and 6.0 μm or less, the content of the component B being 5% or more and 20% or less by weight; a component C being an organic sulfonic acid or an organic sulfonic acid metal salt, the content of the component C being 0.05% or more and 2.0% or less by weight; and a component D being a drip inhibitor, the content of the component D being 0.05% or more and 1.0% or less by weight and the average median diameter being 4.6 μm or more and 6.0 μm or less,

The drip inhibitor is a polytetrafluoroethylene having fibril-forming abilities. The sulfonic acid metal salt is exemplified by a product in which sulfonic acid potassium salt was introduced to the surface of polystyrene (PSS-K: produced by Sony Chemical & Information Device Corporation) or potassium per[fluoro]butanesulfonate (Chemguard-411: produced by Sun Chemical Corporation).

Flame retarded polyester resin compositions

US Pat. Appl. 20150218366 (published Aug. 7. 2015) by Taketani, Shuji and Suzuki, Noriyuki (both JP), assigned to Kaneka Corp.

The invention is a flame retarded polyester-based resin composition comprising: 100 parts by weight of a thermoplastic polyester-based resin (A); 5 to 80 parts by weight of an organophosphorus-based flame retardant (B) represented by the following general formula



and 1 to 20 parts by weight of at least one amorphous thermoplastic resin (C) selected from the group consisting of a polyetherimide resin, a polysulfone-based resin, and a polyarylate resin.

The preferred polyester is an alkylene terephthalate, PET exemplified. In an example, 15 phr of the above structure, 20 phr melamine cyanurate, and 90 phr glass fibers gave a UL 94 flammability rating of V0.

Flame retarded thermoplastic polyester resin composition and molded article

US Pat. Appl. 20150225564 (published Aug. 13, 2015) by Togawa, Kentaro; Sato, Daisuke and Kumazawa, Sadanori (all Japan), assigned to Toray Industries Inc.

The invention is a flame retarded thermoplastic polyester resin composition comprising 100 parts by weight in total of (A) 50 to 95 parts by weight of a thermoplastic polyester resin, and (B) 5 to 50 parts by weight of a methacrylate resin; 1 to 70 parts by weight of (C) phosphorus-containing flame retardants which are at least 2 members selected from the group consisting of (C-1) a condensed phosphate ester, (C-2) a phosphazene compound, and (C-3) an organic metal phosphinate salt in relation to 100 parts by weight of the total of (A) and (B); and 1 to 90 parts by weight of (D) a nitrogen-containing flame retardant in relation to 100 parts by weight of the total of (A) and (B).

In a representative example of many, 80 parts PET, 20 parts methacrylate resin, 13 parts 1,3-phenylene bis(di-2,6-xylenyl) phosphate, 26 parts Clariant OP-1240, 10 parts melamine cyanurate, and 64 parts glass fiber gave a UL 94 flammability rating of V0.

Flame retarded engineering polymer compositions

US Pat. Appl. 20150210848 (published July 30, 2015) by Freitag, Dieter (DE); Stahl, Gad (IL) and Lebel, Marc-Andre (MA), assigned to FRX Polymers.

A polymer composition comprising: an engineering plastic; melamine or a derivative or salt thereof; and a linear or branched polyphosphonate or copolyphosphonate or combination thereof having a weight average molecular weight (Mw) of at least about 20,000.

The preferred melamine additive is melamine cyanurate. The polyphosphonate is a bisphenol A methylphosphonate. A wide range of engineering polymers is recited but poly(ethylene terephthalate), poly(butylene terephthalate), poly(naphthylene terephthalate) or mixtures, and copolymers thereof are preferred.

Flame retarded polymer compositions with calcium hypophosphite

US Pat. Appl. 20150218347 (published Aug. 7. 2015) by Zheng; Hao; (Shanghai, CN) ; Li; Junli; (Shanghai, CN) ; Gao, Yajuan; Yang, Yong and Xing, Qiang (all CN), assigned to Rhodia Operations.

The invention is a polymer composition comprising a calcium hypophosphite, an aluminium inorganic salt and an additive improving the flame retardant properties of the composition other than the hypophosphite salts.

In the working example, polymer is PBT, the aluminum salt is the hypophosphite, and the additional flame retardant is melamine cyanurate. Most of the disclosure deals with means for avoiding phosphine.

FR Systems

Hydrolytically stable functionalized polyphosphonate flame retardant

US Pat. Appl. 20150240080 (published Aug. 27, 2015) by Zhou, Chongfu and Avakian, Roger W. (both OH), assigned to PolyOne Corporation.

The invention is a flame retardant comprising: (a) polyphosphonate, (b) functional additive and (c) optionally, antioxidant, wherein the functional additive is selected from the group consisting of epoxy-functional styrene-acrylic oligomer, aromatic carbodiimide, and combinations thereof, wherein the flame retardant has improved hydrolytic stability, represented by decreased conductivity of 10% or more compared to the flame retardant without the functional additive

The exemplified polyphosphonate is FRX-100, a polymeric aromatic methylphosphonate. The principal application for the invention is in polylactic acid.

Phosphorus-containing aluminum carboxylate salt flame retardants

US Pat. Appl. 20150225546 (published Aug. 13, 2015) by Shankar, Ravi B.; Yonkey, Matthew M.; Bunker, Shana P. and Morgan, Ted A. (all MI), assigned to Dow Global Technologies.

The invention is an aluminum carboxylate salt having the following formula: $Al[OCO(CH_2)_nP(O)(OR1)(OR2)]_3$ where R1 and R2 are hydrocarbyl groups that can optionally be joined and n is independently an integer between 1 and 4. It is preferred that n is one in each occurrence and R1 and R2 are ethyl groups.

In an example, polymethyl methacrylate-co-polyethyl acrylate copolymer is compounded with 19.7% aluminum tris(3-[diethoxyphosphoryl]propanoate) and gives an LOI of 25.5.

Textiles, Foams and Coatings

Articles of ignition resistant cotton fibers

US Pat. Appl. 20150233022 (published Aug. 20, 2015) by McCullough, Francis P. (TX) and Hall, David M. (AL), assigned to Carbtex Technology, Inc.

The invention is a bi-regional fiber with a cellulosic core and a wax outer sheath. The sheath can comprise high melting temperature wax. The fiber may be produced by processing the natural fiber at temperatures less than 70C. The fiber can be processed in a standard manner.

The preferred wax has a melting point temperature of about 70°C, more preferably 90°C or greater. Candelilla wax is exemplified. The flammability test is non-standard.

Combinatorial materials: architecture and process for textiles and related applications

US Pat. Appl. 20150210865 (published July 30, 2015) by Kalita, Parash (AR), no assignee stated.

A composite material architecture for treating a substrate, the composite material architecture comprising: a. a complex of crystals comprising one or both of releasable phosphorus or nitrogen; and b. a plurality of metallic deposits on the complex of crystals.

The metals claimed are copper, silver, aluminum, nickel, chromium, or cobalt, preferably copper and silver. The phosphorus and nitrogen rich material is one or more of ammonium polyphosphate-long chain, ammonium polyphosphate-short chain, melamine polyphosphate, and melamine pyrophosphate. The examples show deposition of the solids on already flame-retarded nylon or cotton tent fabric.

Transportation

Plastic part for a railway vehicle

U. S. Pat. Appl. 20150218346 (published Aug. 7. 2015) by Zhang, Rui and Krijgsman, Josien (both NL), assigned to DSM IP Assets BV.

The invention is a railway vehicle comprising an electrical or electronic system comprising a plastic part, characterized in that the plastic part is made from a halogen free flame retardant polymer composition comprising a thermoplastic polymer, glass fibers and melam.

In the example, 39.5 parts of a blend of PA46 and PA6, 25 parts of melam, 5 parts of Clariant Exolit OP 1230 and 30 parts of glass fiber gave a V0 rating

Others

Fire and smoke suppressing surface for substrates.

US Pat. Appl. 20150240412 (published Aug. 27, 2015) by Rowen, John B. (MA), assigned to Avtec Industries, Inc.

The invention is a supporting medium that contains and transports fire retarding materials. These transport media deliver fire retarding and smoke suppressing constituents to the surface of fiber reinforced polymer (FRP) composite substrates during a manufacturing process. Upon exposure to open flame or radiant heat, the resultant manufactured product has much lower surface flammability and smoke development characteristics than would otherwise be achieved by the substrate material alone.

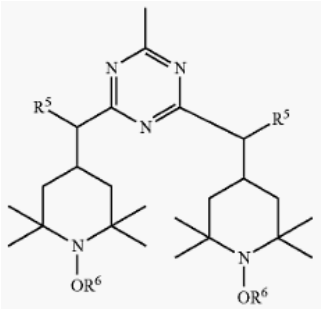
The flame retardant at the surface may comprise an acid former such as a phosphorus compound which decomposes to form phosphoric acida, a char former, and gas forming constituent, typically a carbon-nitrogen compound which produces fire snuffing gases. No compositional detail is given.

Polyolefin-based pre-expanded particles

US Pat. Appl. 20150210815 (published July 30, 2015) by Itoi, Akihiro (JP), assigned to Kaneka Corp.

The invention is a method for producing polypropylene-based resin pre-expanded particles comprising: dispersing polypropylene-based resin particles into an aqueous dispersion medium with a dispersing agent in a presence of a blowing agent; heating the dispersion at a temperature in a range of (a melting point of the polypropylene-based resin particles -

25°C) to (the melting point of the polypropylene-based resin particles +25°C) under pressure; and releasing the dispersion into a low pressure region, wherein the polypropylene-based resin particles are used in an amount of 20 to 100 parts by weight per 100 parts by weight of the aqueous dispersion medium, the polypropylene-based resin particles comprising a polypropylene-based resin composition including: a polypropylene-based resin; a sterically hindered amine ether flame retardant expressed by the following general formula (1): $RNHCH_2CH_2NR2CH_2CH_2NR3CH_2CH_2CH_2NHR4$ (1) (where R1, R2 and one of R3 and R4 are a s-triazine moiety T expressed by the following general formula



the other of R3 and R4 is a hydrogen atom, and in the general formula (2), R5 is an alkyl group having 1 to 12 carbon atoms and R6 is a methyl group, a cyclohexyl group, or an octyl group); and a phosphoric ester.

The preferred phosphoric ester is an aryl phosphate. Daihachi PX-200 is exemplified. The sterically hindered flame retardant is Ciba's NOR-116.

Intumescent battery housing

US Pat. Appl. 20150221914 (published Aug. 7. 2015) by Page, John B.; and Luo, Xiaoxiong (both CA), assigned to Pyrophobic Systems.

The invention is a battery housing comprising: a body; and a lid mateable with said body; said body and said lid, when mated, providing: a chamber dimensioned to hold at least one battery; and a venting passageway from said chamber; at least a portion of at least one of said body and said lid comprising an intumescent flame retarded material with an expansion ratio sufficient to drive gas from said chamber through said venting passageway and to seal said chamber, when said material intumesces in the event of thermal runaway of a battery housed in said chamber.

The intumescent is a powder referenced in US 6,645,278 and also may be supplemented by expandable graphite.

People News

ICC-ES President Moinian Appointed Chair of PMI Allied Member Committee

ICC Evaluation Service (ICC-ES) President Shahin Moinian has been named chair of the new Plumbing Manufacturers International (PMI) Allied Member Committee. Committee members are non-manufacturing organizations involved with the plumbing manufacturing industry such as certification bodies, raw materials suppliers and organizations that

provide statistical data. The selection is based on leadership and demonstrated commitment to PMI

"This activity will help make the allied member involvement in PMI's objectives more effective," said Moinian. "I am honored to have been chosen to serve as chair."

Moinian will serve in an advisory role and seek to understand and represent the collective interests of the Allied Membership to the PMI Board of Directors.

The scope of the Allied Member Committee is to:

- Participate with the Board and PMI membership with regard to legislative-related efforts as well as general outreach activities.
- Collaborate with members in regard to code changes submitted to code developing bodies.
- When possible or applicable, support PMI's position with City Jurisdiction (conformity assessment issues, product marking issues, etc.)

PMI President Fernando Fernandez appointed Moinian to a one-year term serving with Allied Member Committee Board Liaison Scott McDonald. Fernandez selected Moinian based on leadership, demonstrated commitment to PMI, and attendance at PMI meetings and forums.

FPRF announces winners of 2015 William M. Carey and Ronald K. Mengel Awards

The Fire Protection Research Foundation (FPRF), an affiliate of NFPA, announced winners of the 2015 William M. Carey and Ronald K. Mengel awards. The award winners were selected by participants at the Foundation's 2015 Suppression, Detection and Signaling Research and Applications Symposium (SUPDET). Recipients will receive their awards at the 2016 SUPDET Symposium.

Elyse Gottuk won the 2015 Ronald K. Mengel Award for outstanding detection paper for her report entitled "The Effect of Ceiling Fans on Smoke Alarm Performance." Gottuk recently completed eighth grade at Burleigh Manor Middle School in Maryland. Her presentation, which centered on work she conducted for a science fair project, also won the Chesapeake Chapter of Systems Engineering Award for best project.

The late Mengel had a long and distinguished career in fire protection, and served for many years as the vice president of industry affairs for the system sensor division of Honeywell Corporation. He was instrumental in Honeywell's industry-sponsored research and training efforts. Mengel contributed to a number of FPRF projects and served on FPRF's Fire Detection and Alarm Research Advisory Council.

The 2015 William M. Carey Award for best suppression paper was awarded to Daniel R. Steppan for "Protection of Rack Stored Exposed Expanded Group A Plastics with ESFR Sprinklers and Vertical Barriers. " Steppan began his career at UL in 1993 after working in the aerospace industry for four years in component and system design engineering. He currently holds the position of staff engineer at the Northbrook, IL, UL fire test facility, working primarily in Large Scale Fire Research. He has been involved in large scale fire research programs since 1996.

Carey was a senior staff engineer at UL and participated in many FPRF fire suppression projects, including the first The National Quick Response Sprinkler Project. Throughout his career, he was regarded as "the bridge" between research and the application of new fire safety knowledge.

DuPont Announces Senior Leadership Changes in Management Board

DuPont recently announced that it has named John L. Chrosniak, President, DuPont Sustainable Solutions effective Sept. 1, succeeding James R. (Jim) Weigand, who has been appointed Chairman & CEO of the DuPont Teijin Films joint venture.

Chrosniak will report to Marc Doyle, senior vice president, DuPont Safety & Protection, while Weigand will report to Patrick E. Lindner, president, DuPont Performance Polymers.

"We thank Jim for his many years of leadership expanding the Sustainable Solutions business at DuPont," said Doyle. "John brings global business experience with a proven record of success in setting strategy and direction and creating top line growth, and will make an outstanding leader at an important time for Sustainable Solutions."

Weigand joined DuPont in 1981 and has served in several leadership positions in corporate finance and planning. In 2003, Weigand was named global business director for Advanced Fibers Systems, where he had global business leadership responsibilities for products under the DuPont Kevlar and Nomex brands sold into a variety of markets including military, government, automotive, aerospace and oil and gas. In September 2007 he was named vice president and general manager of DuPont Safety Resources. In October 2009, he was appointed president of DuPont Safety Resources, which is now part of DuPont Sustainable Solutions, an integrated business that also includes segments of DuPont Clean Technologies and Coastal Training Technologies.

Chrosniak joined DuPont in 2005 and has served in leadership positions in a number of businesses, most recently in Electronics & Communications, where he served as global business director of DuPont Packaging Graphics.

McGarry takes over PPG executive role

Mr. McGarry took over as CEO from Charles Bunch, who remains executive chairman. Mr. McGarry is keeping the title of president that he has held since March.

PPG Industries' new chief executive, Michael McGarry has held 22 different jobs with PPG, rising through its management ranks on the chemicals side before jumping to coatings, where he helped engineer and execute some of the largest acquisitions in the Downtown-based company's history.

As he takes the reins of a company that generated sales of $15.4 billion last year and employs more than 46,000 worldwide, Mr. McGarry said his vision is for PPG to continue to grow its dominance in coatings.

That business now accounts for 95% of PPG's portfolio and includes consumer paints and coatings for automobiles, industrial and aerospace

equipment. The balance of revenues is mainly glass — a nod to its historical roots when it was founded in 1883 as Pittsburgh Plate Glass.

"It's been an evolution; not a revolution. I don't think it's going to change," Mr. McGarry said during an interview this week on the 40th floor of the iconic glass tower near Market Square where PPG maintains its corporate headquarters.

Following a series of huge acquisitions over the past decade that helped define PPG as a global coatings leader — including Dutch paints maker SigmaKalon in 2008, the North American architectural coatings unit of Dutch company AkzoNobel in 2013, and Mexican paints giant Consorcio Comex last year — Mr. McGarry said his biggest concern for the company going forward is complacency.

"We've been very successful. Now is the time to widen the gap between where we are and where the competition is," he said.

That means PPG plans to scoop up more paints and coatings companies "because it's still not a consolidated market," he said. "There's more opportunity out there."

Eco Building Products, Inc. Appoints Buzz Nielsen as Director of Sales

Buzz Nielsen is a seasoned and accomplished lumber marketing and sales professional with established lumber dealer and distributor contacts throughout North America. In his 30-year career, Buzz Nielsen held tenure with key players in the industry, including: Georgia Pacific, Hayward Lumber, SierraPine, Sealaska and International Forest products. While with Georgia Pacific, he was the Branch Manager of their Seattle Distribution Center, and he has deep existing relationships throughout the Pacific Northwest, which will no doubt serve the Eco Products' Tacoma facility well.

He knows first-hand how to bring value-added products to industry customers, and has successfully marketed commodity lumber, plywood and Oriented Strand Board (OSB), and engineered wood products as well as the very high-end tropical hardwood, Ipe imported from Brazil.

Product News

Idaho-made Aerial Fire Retardant to Adopt Hot Pink Color

A fire retardant company in Coeur d'Alene, ID, is said to be offering a tool to protect homes from wildland fires.

In 2014, ICL is said to have introduced its new high visibility Phos-Chek MVP-Fx. The Fx line of products is said to use a fugitive (disappearing) fluorescent color that is said to be extremely vivid both coming out of the airplane, and on the ground, and to disappear after a few weeks in the sun. Feedback from the aviation community is said to have been uniformly positive. The fire retardant is said to be highly visible on the ground, allowing pilots to effectively tag-on to previous retardant drops.

ICL is said to expect to have both its Phos-Chek LC95A Liquid Concentrate product and Phos-Chek 259 Fixed Tank Helicopter qualified product, approved with the Fx color in time for the 2016 fire season.

Phos-Chek Home Retardant is said to be able to be used to pre-treat homes before a fire or after a fire has attacked the home. The product is said to be new to the Spokane, WA, area and to be available in places like Boise, ID and California.

Homeowners who have been involved in the fire service and live in rural areas are said to consider that the new fire retardant is a useful tool to protect the home.

One retired firefighter stated: "This doesn't have the red dye in it, you can spray your plants and it doesn't hurt anything. If you spray it on your house it could leave a film on your windows so you will want to wash those off".

ICL Performance Products (10667 Jersey Blvd, Rancho Cucamonga, CA; Tel: (909) 983-0772; Phos-chek.com)

ICL Supplying Specialty Polymeric Flame Retardant to EPS/XPS Markets

ICL Industrial Products ("ICL IP"), a segment of ICL has stated that its manufacturing plants in the Netherlands and Israel are fully operational and supplying commercial quantities of FR-122P, a new polymeric flame retardant. The company is said to have also developed and to be producing in its Netherlands plant two specialty grades of compacted FR-122P - one suitable for the EPS market and the other for the XPS market.

The ICL IP plant in the Netherlands is said to be producing FR-122P in powder and compacted form at full capacity of 2,400 metric tonnes per annum. ICL IP's FR-122P plant in Israel, which is said to be a scale-up of the Netherlands facility and to produce the same high quality material, is said to have also ramped up its production of FR-122P in powder form. The Israeli plant is said to have a production capacity of 10,000 metric tonnes per annum. Following requests from the market, compacted material for both EPS and XPS markets is said to be available from the Israeli facility in 2016. Both specialty grades of the compacted polymeric FR products were said to have been developed in accordance with applications requirements to optimize their performance and flame retardant needs. ICL IP is said to have received very positive feedback from EPS/XPS manufacturers following their extensive testing of the new formulations.

ICL-IP believes that there is sufficient commercial availability of the new polymeric products to meet demand by the EPS/XPS industry, and, therefore, that a smooth transition to these new polymeric products can occur without the need to extend the phase out of HBCD any longer. ICL IP had previously announced that it is ceasing production and phasing out sales of its HBCD product, FR-1206, excluding sales based on existing commitments to customers, and in line with the phase out dates of REACH and POP legislation.

ICL's FR-122P product is said to be derived from a licensing agreement that Bromine Compounds Limited (a business unit of ICL IP) entered into with Dow Global Technologies LLC for the manufacture of FR-122P.

ICL - Israel Chemicals, Ltd. (Millenium Tower, 23 Aranha St., Tel-Aviv 61070, Israel; Tel: 972 (0) 3 6844401; www.icl-group.com)

Multiwall Carbon Nanotubes for Flame Retarded Halogen-Free Products

The project DEROCA which stands for "Development of safe and eco-friendly materials based on CNT-co-additives for commodity polymers" is a collaborative project coordinated by Nanocyl SA and supported by DG RTD of the European Commission. The project DEROCA is said to have demonstrated that industrial multiwall carbon nanotubes NC7000 are an effective synergist with other common flame retardants additives to produce flame retardant halogen-free multifunctional products.

Halogenated flame retardant additives are said to be commonly used because of their low impact on other material properties and the low loading levels necessary to meet the required flame-retardancy; however, claims regarding potential side-effects on human health and environment have raised concerns about their risk-benefit balance. The chemical regulations being developed are said to be stimulating research for alternatives. DEROCA is said to aim to develop one of those alternatives.

The objectives of DEROCA are said to be:

- Develop and introduce new flame retardants expected to be safer and more eco-friendly through exploiting the synergistic effect of carbon nanotubes (improved fire performance promoter) with phosphorus based FRs and other current or new promising organic or inorganic additives in intumescent or carbon crust formation systems by identification and optimization of the most efficient/cost competitive solutions;
- Develop small scale test methods and numerical models to predict full end product standard scale test results suitable for rapid materials development and screening;
- Assess the safe use and toxicity of the new FR materials in production, use and fire situations;
- Develop products to support industries to (i) switch from halogenated FRs into halogen free products and maintain their market share or to (ii) increase their market share by improving their halogen-free FR materials.

DEROCA is said to focus on the development of specific FR applications for five final products which represent large volumes of commodity polymers, i.e. wires & cables, insulation foams, HVAC, corrugated pipes and consumer goods.

Nanocyl s.a. (Rue de l'Essor, 4, B-5060 Sambreville, BELGIUM; Tel: + 32 71 750 380; www.nanocyl.com)

Fire Retarded Flexible Hoses

Flexaust is said to offer a broad line of standard flexible, "self-extinguishing" hoses developed for a wide range of commercial and industrial applications where worker safety is critical.

Flexaust hoses are said to be rated UL94 V0 and to 15 standard products which are made from neoprene polyester, PVC polyester, acrylic polyester, PVC, polyurethane, and thermoplastic rubber for a wide range of applications where worker safety is critical. The hoses are said to feature a choice of highly flexible and abrasion-resistant constructions, and the extruded hoses are said to be available in various wall thicknesses and the fabric hoses are said to come in single- and double-plies and several weights.

Said to be offered in sizes from 1" to 48", depending upon type, in lengths to 50 ft., Flexaust UL94V-0 Rated Hoses are said to be able to be provided with various end finishes. They are said to be ideally suited for dust collection and fume extraction applications in the agricultural, automotive, chemical, coatings, industrial, metal-working, shipbuilding, utility, and woodworking industries.

Flexaust UL94V-0 Rated Hoses are said to be priced according to material, size, and quantity. Pricing and evaluation samples are available upon request.

Flexaust Inc. (1510 Armstrong Rd. Warsaw, IN; Tel: (800) 343 – 0428; flexaust.com)

New 160 Watt Integrated Led Light Fixture from Larson Electronics

Larson Electronics announced the release of a new 160 watt integrated LED light fixture approved for Class 1 Division 2 areas and said to be ideal for hazardous locations where flammable chemical and petrochemical vapors may be encountered.

The HAL-48-2L-ITG-LED-BMSW from Larson Electronics is said to be a 4 ft., two lamp integrated LED light fixture that is said to be ideal for operators who seek a top quality, explosion-proof light that reduces operating costs, improves lighting quality, and reduces down-time from incurred frequent servicing intervals. This fixture is said to be equipped with a specially designed integrated LED array which produces 19,200 lumens of bright light in a 160Â° wide flood beam spread. The LED array is said to be protected by a powder coated aluminum frame and a shatter and heat resistant clear acrylic lens secured with ten steel draw latches. The integrated heat sink is said to allow for efficient heat dissipation, preventing the LEDs from overheating and keeping the overall temperature of the fixture relatively low. This fixture is said to carry a T4A temperature rating and is said to comply with UL 595 and UL 1598A marine type for use in marine environments. This new fixture is said to be weatherproof and to provide operators in hazardous locations with a highly efficient, reliable, and affordable lighting solution for open areas where flammable chemicals and vapors may be present. This new LED light fixture is said to be surface mounted via two adjustable swivel brackets cinched to the mounting pegs on each side of the light. The angle of the bracket is said to be set by tightening two bolts on either side of the bracket. Once the brackets are mounted to a surface, the light fixture is said to be able to be pivoted by loosening the bolts which allows for 45Â° of pivot from the 90Â° point. This class 1 division 2 fixture is said to be universal voltage and to operate on any voltage ranging from 90 to 305 volts AC or 127 to 431 volts DC.

This new integrated LED fixture is said to provide operators with top of the line output in a compact form factor that is said to outperform standard fluorescent fixtures most people use in hazardous locations, according to Rob Bresnahan with Larsonelectronics.com. The solid state LED technology offered by this fixture is said to provide operators with a more reliable, durable, and energy efficient lighting solution.

Larson Electronics states that it carries an extensive line of LED light towers, portable power distributions, explosion proof lights for hazardous locations, portable work lights and industrial grade LED area lights.

Publications

Temperature distribution of steel columns protected by sprayed fire retardant coatings with three sides exposed to fire is the title of a study by Peijun Wang, Jinhuan Xia and Qiudi Du (Department of Civil Engineering, Shandong University, Jinan, Shandong, China) published in Fire and Materials (August/September, Vol. 39, Issue 5, pp. 487–506).

Temperature gradient will occur when the steel framed column is heated from three sides in a fire. Current design codes provide the design equations to calculate the temperature elevation of the steel column unevenly heated in a fire. However, the design equation is based on the assumption that the temperature is uniformly distributed across the section. The temperature field of a steel column protected by sprayed fire retardant coating with three sided exposed to fire is analyzed using a verified finite element model. Parameters that affect the temperature distribution across the section are investigated, which include the section height, the web thickness, and the fire protection thickness. The coded equations based on the element factor approach are modified according to the finite element simulation results. Different temperature distribution profiles are proposed through using the heated flange temperature, the web temperature, and the protected flange temperature.

Fire behavior of regular and latent heat storage gypsum boards is the title of a study by D. A. Kontogeorgos, I. D. Mandilaras and M. A. Founti (National Technical University of Athens, School of Mechanical Engineering, Laboratory of Heterogeneous Mixtures and Combustion Systems, Athens, Greece) published in Fire and Materials (August/September, Vol. 39, Issue 5, pp. 507–517).

This paper investigates the fire behavior of a regular and an energy storage gypsum board with latent heat storage characteristics when exposed to fire temperatures. Gypsum board samples, with and without a microencapsulated paraffin mixture phase change material, are studied at material and board level. At the material level, measurements of the physical properties, that is, mass and effective thermal conductivity, as a function of temperature, as well as differential scanning calorimetry experiments, in inert and oxidized environments, are performed. At the board level, specimens are inserted into a preheated oven, and the temperature evolution at preselected board locations is recorded. Both experimental procedures reveal significant information concerning the evolution of the various thermochemical processes taking place inside the gypsum boards during their heating. Results indicated the different fire behavior of the samples at different temperature ranges. At temperatures up to 300°C, the materials act as a fire retardant because of the dehydration of the free and chemically bound water contained in the gypsum boards. On the other hand, at temperatures higher than 300°C, the temperature rise within the samples is enhanced and accelerated because of the oxidation of the phase change material and their external finishing.

Synthesis of a phosphorus and sulfur-containing aromatic diamine curing agent and its application in flame retarded epoxy resins is the title of a study by Wei Zhao, Kun Yang, Li Lin (Heilongjiang Key Laboratory of Molecular Design and Preparation of Flame Retarded Materials, College of Science, Northeast Forestry University, Harbin, China) Miaojun Xu, Bin Li (Heilongjiang Key Laboratory of Molecular Design and Preparation of Flame Retarded Materials, College of Science, Northeast Forestry University, Harbin, China) (Post-doctoral Mobile Research Station of Forestry Engineering, Northeast Forestry University, Harbin, China) published in Fire and Materials (August/September, Vol. 39, Issue 5, pp. 518–532)

A novel curing agent of epoxy resins (EPO), bis(3-amino-2-thienyl) phenylphosphine oxide (ABTPPO), was synthesized and characterized by Fourier transform infrared spectroscopy, 1H nuclear magnetic resonance (NMR), 13C NMR, and 31P NMR. ABTPPO was used as a flame retardant curing agent, and a novel halogen-free flame retardant EPO composite was prepared. The flame retardant properties of ABTPPO-cured EPO were evaluated in terms of limiting oxygen index and vertical burning test (UL 94), while the combustion and thermal degradation behaviors were investigated by cone calorimeter test (CONE) and thermogravimetric analysis, respectively. The cured EPO composite passed the UL 94 V1 and V2 rating when the sample thickness is 3.0 and 1.6 mm, respectively, and the limiting oxygen index value reached 38.3%. The morphological structures of char residue tested by scanning electron microscopy demonstrated that ABTPPO benefited to the formation of a more compact and homogeneous char layer on the materials' surface during burning, which protected the underlying matrix from decomposition and enhanced the flame retardancy of materials. The cured EPO showed excellent fire performance after the water resistance test because of the low water uptake (0.6 wt%), which demonstrated that the flame retarded EPO composite possessed excellent water resistance property.

Numerical experiments in fire science: a study of ceiling jets is the title of a study by Nils Johansson, Jonathan Wahlqvist and Patrick van Hees (Department of Fire Safety Engineering, Lund University, Lund, Sweden) published in Fire and Materials (August/September, Vol. 39, Issue 5, pp. 533–544).

In this paper, a numerical experiment, consisting of 90 simulations in Fire Dynamics Simulator (FDS), is conducted for two different purposes. Firstly, numerical experiments are explored as a research method in fire science, and it is demonstrated that numerical experiments could be used as a complement to traditional fire experiments in fire science research. Secondly, an evaluation of previously derived correlations for ceiling jet excess temperatures and velocities is performed with the help of the results from the numerical experiment. The procedure used in this evaluation constitutes an outline for how a numerical experiment can be conducted in fire science. The evaluation indicates that the existing correlations will give a good estimate of the average temperature in a ceiling jet calculated by FDS. However, the correlations do not give a good estimate of the maximum

excess temperature. A new correlation to estimate the maximum temperature has therefore been developed and is presented in the paper.

The effect of various fire-exposed surface dimensions on the spalling of concrete specimens is the title of a study by Steve Werner and Andreas Rogge (BAM Federal Institute for Materials Research and Testing, Safety of Structures, Berlin, Germany) published in Fire and Materials (August/September, Vol. 39, Issue 5, pp. 545–556).

Concrete spalling due to fire exposure is often defined as the sudden detachment of fragments from a concrete surface. It can be quantified by various parameters of which weight loss and spalling depth are the most common ones. The risk of spalling is influenced by many factors such as concrete composition, heating rate and applied testing methods. A reduced scale testing method should be developed to analyze the spalling behavior and to understand its effectiveness in more detail. As a subsection of this development, this study aimed to analyze the effect of different-sized, circular heated areas in semi full-scale fire tests. Therefore, vermiculite slabs with varying cut-outs in their center were placed between a specimen made of a spalling-sensitive concrete and the combustion chamber. The combustion chamber was heated following a standard fire curve. The experimental results show that the thermal expansion inside of equal-sized specimens is strongly dependent on the size of the heated area. In addition, this area also affects thermal stresses. They decrease as a result of lower temperature gradients for tests with smaller unheated boundary areas. Apart from this, the analysis of fragments shows no correlation between their relative volume distribution and the heated area.

Characterization of compatibilized blends of nylon 66/poly(2,6-dimethyl-1,4-phenylene ether)/high-impact polystyrene filled with phosphinate-based flame retardants: Mechanical property, rheological behavior, and flame retardancy is the title of a study by Do Kyun Kim, Kwang Ho Song (Department of Chemical and Biological Engineering, Korea University, Seoul, Republic of Korea), Chong Min Koo, Soon Man Hong (Center for Materials Architecturing, Korea Institute of Science and Technology, Seoul, Republic of Korea), and Dong Wook Chae (Department of Textile Engineering, Kyungpook National University, Sangju, Republic of Korea) published in Journal of Fire Sciences (Sept. 2015, Vol. 33, Issue 5, pp. 339-357).

The optimum weight ratio of each component in the compatibilized blends of nylon 66/poly(2,6-dimethyl-1,4-phenylene ether)/high-impact polystyrene with polystyrene-co-maleic anhydride and styrene–ethylene–butylene–styrene block copolymer grafted with maleic anhydride was determined in terms of exhibiting balanced mechanical properties. The mechanical strength of the blends was deteriorated with increasing phosphinate-based flame retardant content while the tensile modulus increased. For the UL 94V test, the addition of ~10 wt% phosphinate did not have a significant effect on the fire performance, showing a V2 grade, while further addition gave rise to char formation resulting in a V0 grade. Limiting oxygen index values increased greatly by ca. 34% at 5 wt% phosphinate, followed by mild increase by further addition. Heat release rate peaks of the blends were reduced and broadened with increasing phosphinate content showing little difference from 15 wt%. The complex

viscosity increased with phosphinate content, but its increasing extent decreased at a high frequency. In the Cole–Cole plot, the presence of the phosphinate shifted the plot from unfilled blends without showing a single master curve depending on its loading level.

Experimental study on fire risk of buildings' U-shaped exterior wall on flame propagation of insulation material on plain and plateau is the title of a study by Lin Jiang, Jinhua Sun (State Key Laboratory of Fire Science, University of Science and Technology of China, Hefei, China) Weigang Yan, Weiguang An (State Key Laboratory of Fire Science, University of Science and Technology of China, Hefei, China)(USTC—CityU Joint Advanced Research Centre, Suzhou, China) Yang Shen (Rudong Coastal Development Zone of Jiangsu, Rudong, China) published in Journal of Fire Sciences (Sept. 2015, Vol. 33, Issue 5, pp. 358 – 373).

This study provides an understanding of the fire risk of a building's exterior wall geometry design at different altitudes. The influences of the U-shaped exterior wall geometry on upward flame spread over insulation material on plain and plateau were studied through laboratory-scale experiments. A hypothesis of pseudo chimney effect is provided. Results show that in both plain and plateau, the flame spread rate and the mass loss rate increase as the U-shaped geometry becomes deeper. The time for flame to propagate a certain distance follows an exponential decreasing trend, while it could be concluded that the upper and lower boundaries indicate the time for that of flat and enclosure geometry, respectively. Moreover, the flame spread rate is much higher in plain than in plateau. The key parameter is the upward flow induced by the air entrainment from bottom and front sides of the geometry which enhances the heat feedback.

Regulatory

New activity on regulation of tent flammability

The Industrial Fabrics Association (INDA) has been maintaining CPAI 84 for many years. An activity, initiated in Canada by Health Canada, to update the requirement is continuing at ASTM, which has been granted permission by INDA. INDA requires tent materials to meet the CPAI 84 test, also required by some jurisdictions. CPSC and Health Canada are participating in this activity (see ASTM F08) but are not necessarily developing flammability requirements.

It is important to note that seven US states (and the International Fire Code) regulate the flammability of tents, in different ways. CPAI 84 (issued by the Industrial Fabrics Association and not updated in many years) contains two fire tests: one that is similar to the methenamine pill test in ASTM D2859 (for the tent floor material) and one that is similar to the old (withdrawn) "NFPA 701 small scale test" for the wall and roofs of tents. The requirements in the states that regulate tent flammability are not consistent with one another:

- California requires tent material to be "flame retardant" without properly defining it, although it appears to use a test similar to the old NFPA 701 small scale test. The requirement applies to "all tents manufactured for sale in" the state.

- Louisiana requires tents to comply with CPAI 84. The requirement applies to "small-scale tents".
- Massachusetts requires tent material to be "flame retardant" and it states that it must comply with NFPA 701; as no date for the standard is indicated, the requirements in NFPA 701 discuss that tent materials need to meet test # 2. The requirement applies to "any mobile or temporary shelter designed to protect persons from all elements, all or a portion of the covering of which is made of fabric or other pliable materials
- Michigan requires tents to comply with NFPA 701-1969, which means the old "NFPA 701 small scale test" but all new camping tentage manufactured after October 1, 1975 must comply with CPAI 84 or with "another nationally recognized standard that is acceptable to the director". The requirement applies to tents which may be occupied or furnished for public assembly by 50 or more people, to tents in which animals are stabled for public exhibition or sale, to tents located within a building used by the public, to all tarpaulins and decorative material used in connection with any of the above.
- Minnesota requires tents to be "flame resistant" without any further detail, as issued in 1975. This has typically meant compliance with NFPA 701 and the flame test at the time would probably correspond to the old "NFPA 701 small scale test". The requirement applies to tents for "circus, side show, carnival, tent show, theater, skating rink, dance hall, or a similar exhibition, production, engagement or offering or other place of assemblage in or under which ten or more persons may gather for any lawful purpose in any tent, awning or other fabric enclosure".
- New Jersey requires tent materials to meet CS 191-53 (now 16 CFR 1610), the regulatory test for wearing apparel. It applies to small-scale tents for less than 10 persons.
- New York requires tent material to comply with NFPA 701; as no date for the standard is indicated, the requirements in NFPA 701 discuss that tent materials need to meet test # 2. The requirement applies to "all tents, canopies or membrane structures both temporary and permanent".
- The IFC requires tents and membrane structures, temporary or permanent, to comply with Test 1 or Test 2, as appropriate, of NFPA 701 (which says it needs to be Test 2). The requirement applies to temporary and permanent tents (A structure, enclosure or shelter, with or without sidewalls or drops, constructed of fabric or pliable material supported by any manner except by air or the contents that it protects) and membrane structures (An air-inflated, air-supported, cable or frame-covered structure).

European Court of Justice rules on SVHCs in articles

In a landmark ruling, the European Court of Justice (ECJ) has said the 0.1% threshold for notifying Substances of Very High Concern (SVHCs) in articles applies to "each of the articles incorporated as a component of a complex product" rather than to the entire article.

The court's decision contradicts the view adopted by the European Commission and the guidance from the European Chemicals Agency (ECHA) on requirements for substances in articles, and backs the view taken by five EU member states and Norway.

The case relates to two Articles of the REACH Regulation. Article 7(2) says "producers and importers" of articles must notify ECHA if an SVHC is present, totaling over one tonne per producer or importer per year, in a

concentration higher than 0.1% by weight. Article 33 requires "suppliers" of articles containing an SVHC above this threshold to inform the recipient of the article, and to provide similar information in response to consumer enquiries within 45 days.

The court said the REACH Regulation's definition of an "article", taken together with the lack of any provisions specifically addressing the situation of a complex product containing several articles, means "there is no need to draw a distinction between the situation of articles incorporated as a component of a complex product and that of articles present in an isolated manner."

Thus, "each of the articles, incorporated as a component of a complex product, is covered by the relevant duties to notify and provide information, when they contain an SVHC in a concentration above 0.1% of their mass."

The producer's duty to notify, says the court, covers only those articles which the producer itself has "made or assembled", but does not apply to articles made by a third party. Nonetheless, the third party is also subject to the duty to notify articles, which it makes or assembles.

Similarly, it says, the importer of a product, comprising one or more of the objects defined as articles, must also be considered to be the importer of those articles. "The fact that it can be difficult for importers to obtain the required information from their suppliers established in non-EU countries," said the court, "does not alter their duty to notify."

The duty for "suppliers" to provide information to recipients and consumers is not restricted to producers and importers, said the court, "but applies to all operators along the supply chain, when that person supplies an article to a third party."

It is, therefore, for the person supplying a product, with one or more constituent articles containing an SVHC above the threshold, "to fulfil his duty to provide information and provide the recipient and the consumer … as a minimum, with the name of the substance in question."

The ruling broadly follows an Opinion from an ECJ advocate general earlier this year (18 February 2015).

ECHA said some elements of its guidance will need to be revised and that it will "commence the process".

FTA Seeks Input on Safety of Buses

The Federal Transit Administration (FTA) issued an NPRM (Notice of Proposed Rulemaking) for regulation of safety of buses on June 23, 2015 (Federal Register Vol. 80, No.120, page 36112). It was entitled "Bus Testing: Establishment of Performance Standards, a Bus Model Scoring System, a Pass/Fail Standard and other Program Updates - 49 CFR Part 665 - Docket No. FTA–2015–0019 - RIN 2132–AB11). This has happened shortly before (but almost simultaneously with) a preliminary report from NTSB (National Transportation Safety Board) regarding the crash and fire April 2014 in California of a FEDEX truck and a bus. In the recommendations NTSB says that fire safety of

materials in buses must be improved and they suggest that the rules for rail or aircraft be applied.

The "recommended guidelines" for fire safety that the FTA applies for bus interior materials were never made a requirement. They are very similar to the requirements for rail cars that the Federal Railroad Administration (FRA) uses and also to the rules in the NFPA 130 standard (for trains and undergrounds). The reason for that is that they were developed in the 1970s by the same people (primarily Irving Litant and William Hathaway, at the Department of Transportation).

The closing date for comments to the FTA NPRM was August 24, 2015.

In order to comment, they had to be submitted referencing "Federal Transit Administration DOT Docket ID Number FTA–2015–0019 or RIN 2132–AB11" by only one of the following methods:

- *Electronic:* Go to the Federal eRulemaking Portal at *www.regulations.gov* and follow the online instructions for submitting comments.
- *Mail:* Docket Management Facility: U.S. Department of Transportation, 1200 New Jersey Avenue SE., West Building Ground Floor, Room W12–140, Washington, DC 20590–0001.
- *Hand Delivery or Courier:* West Building Ground Floor, Room W12–140, 1200 New Jersey Avenue SE, between 9 a.m. and 5 p.m. ET, Monday through Friday, except Federal holidays.
- *Fax:* 202–493–2251

It is expected that comments were submitted recommending that fire safety requirements for buses be added to the FTA general bus safety requirements.

EPA is Seeking Your Input

EPA is announcing the availability and opening of a 60-day public comment period for TSCA Work Plan Chemical problem formulation and initial assessment documents for three flame retardant clusters. EPA is also making available and opening a 120-day public comment period for the TSCA Work Plan Chemical data needs assessment document for the Brominated Phthalates flame retardant cluster. Based on experience in conducting TSCA Work Plan Chemical assessments and public input, starting in 2015 EPA will publish a problem formulation and initial assessment, or a data needs assessment, for each TSCA Work Plan assessment as a stand-alone document to facilitate public input prior to conducting further risk analysis. EPA believes publishing problem formulation and initial assessment documents for TSCA Work Plan assessments will increase transparency about EPA's thinking and analysis process, provide opportunity for the public to comment on EPA's approach, and give EPA the opportunity to receive additional information/data prior to EPA conducting detailed risk analysis and risk characterization. There are three clusters of flame retardant on the TSCA Work Plan for which there are "problem" formulation and initial assessment documents: Brominated Bisphenol A, Chlorinated Phosphate Esters, and Cyclic Aliphatic Bromides. In addition, there is a data needs assessment document for the Brominated Phthalates flame retardant cluster. There is a separate docket assigned to each TSCA Work Plan Chemical flame retardant cluster.

Comments on the three "problem" formulation and initial assessment documents (Brominated Bisphenol A (TBBPA), Chlorinated Phosphate Esters (CPE), and Cyclic Aliphatic Bromides (HBCD)) must be received on or before 60 days after the date of publication in the Federal Register. Comments on the data needs assessment document for Brominated Phthalates (TBB & TBPH) must be received on or before 120 days after the date of publication in the Federal Register.

Comments must be submitted, as identified by docket identification (ID) number for the corresponding TSCA Work Plan chemicals as identified in this document, by one of the following methods:

• Federal eRulemaking Portal: http://www.regulations.gov. Follow the online instructions for submitting comments. Do not submit electronically any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute.

• Document Control Office (7407M), Office of Pollution Prevention and Toxics (OPPT), Environmental Protection Agency, 1200 Pennsylvania Ave., NW., Washington, DC 20460-0001.

• Hand Delivery: To make special arrangements for hand delivery or delivery of boxed information, please follow the instructions at http://www.epa.gov/dockets/contacts.html.

Completed Problem Formulation and Initial Assessments

To date, EPA has released Problem Formulation and Initial Assessments for the TSCA Work Plan Chemicals listed below.

Chlorinated Phosphate Esters Cluster (chemical in bold is on EPA's TSCA Work Plan)

On August 13, 2015, EPA released a problem formulation for Chlorinated Phosphate Esters used as flame retardants in furniture foams and textiles. The goal of this problem formulation was to identify scenarios where further risk analysis may be necessary. The conclusion of this problem formulation is that EPA will assess risks to consumers, the general population and aquatic organisms exposed as a result of manufacture, processing and use of chlorinated phosphate esters cluster members.

- Cluster chemicals
  - **Ethanol, 2-chloro-, phosphate (3:1) (TCEP,** CASRN: 115-96-8)
  - 2-Propanol, 1-chloro-, 2,2',2"-phosphate (TCPP, CASRN: 13674-84-5)
  - 2-Propanol, 1,3-dichloro-, phosphate (3:1) (TDCPP, CASRN: 13674-87-8)
- Initiated: 2014
- Problem Formulation and Initial Assessment (72 pp, 924 kb, About PDF)(Docket: EPA-HQ-OPPT-2015-0068)

Cyclic Aliphatic Bromides Cluster (chemical in bold is on EPA's TSCA Work Plan)

On August 13, 2015, EPA released a problem formulation for the Cyclic Aliphatic Bromides used as a flame retardant in extruded and expanded polystyrene foams (EPS/XPS), polystyrene (PS) products. The goal of this

problem formulation was to identify scenarios where further risk analysis may be necessary. The conclusion of this problem formulation is that EPA will assess risks to workers, consumers, the general population and aquatic, terrestrial and avian wildlife exposed as a result of manufacture, processing and use of HBCD.

- Cluster chemicals
  - **Hexabromocyclododecane (HBCD,** CASRN: 25637-99-4)
  - 1,2,5,6,9,10-Hexabromocyclododecane (CASRN: 3194-55-6)
  - 1,2,5,6-Tetrabromocyclooctane (CASRN: 3194-57-8)
- Initiated: 2014
- Problem Formulation and Initial Assessment (97 pp, 1.0 mb, About PDF)(Docket: EPA–HQ–OPPT-2015-0081)

Tetrabromobisphenol A and Related Chemicals Cluster (chemical in bold is on EPA's TSCA Work Plan)

On August 13, 2015, EPA released a problem formulation for TBBPA and related chemicals used as flame retardants in plastics/printed circuit boards for electronics. The goal of this problem formulation was to identify scenarios where further risk analysis may be necessary. The conclusion of this problem formulation is that EPA will assess risks to workers, consumers, the general population and aquatic, sediment- and soil-dwelling organisms exposed due to the manufacture, processing and use of TBBPA.

- Cluster chemicals
  - **Tetrabromobisphenol A (TBBPA,** CASRN: 79-94-7)
  - TBBPA-bis(dibromopropyl ether) (CASRN: 21850-44-2)
  - TBBPA-bis(ally ether) (CASRN: 25327-89-3)
  - TBBPA-bis(methyl ether) (CASRN: 37853-61-5)
- Initiated: 2014
- Problem Formulation and Initial Assessment (135 pp, 1.13 mb, About PDF) (Docket: EPA-HQ-OPPT-2014-0730)
  - Supplemental File 1 TBBPA Biomonitoring (14 pp, 231 kb, About PDF)
  - Supplemental File 2 TBBPA Environmental Monitoring (59 pp, 773 kb, About PDF)
  - Supplemental File 3 TBBPA Residential Monitoring (16 pp, 260 kb, About PDF)
  - Supplemental File 4 Cancer Assessment Review Committee Report (15 pp, 314 kb, About PDF)

Brominated Phthalate Cluster (chemical in bold is on EPA's TSCA Work Plan)

On August 13, 2015, EPA released a data needs assessment for the Brominated Phthalate Cluster used as flame retardants in polyurethane foams. During problem formulation, EPA/OPPT reviewed previous assessments and identified critical gaps in toxicity, exposure, and

commercial mixtures data. The data needs assessment is intended to guide the collection of additional data and information.

- Cluster chemicals

- **1,2-Benzenedicarboxylic acid, 3,4,5,6-tetrabromo-, 1,2-bis(2-ethylhexyl) esters (TBPH,** CASRN: 26040-51-7)

- **Benzoic acid, 2,3,4,5-tetrabromo-, 2-ethylhexyl esters (TBB,** CASRN: 183658-27-7)

- 2-(2-Hydroxyethoxy)ethyl 2-hydroxypropyl 3,4,5,6-tetrabromobenzenedicaroxylate (CASRN: 77098-07-8)

- 3,4,5,6-Tetrabromo-1,2-benzenedicarboxylic acid, mixed esters with diethylene glycol and propylene glycol (CASRN: 20566-35-2)

- 1,2- (2,3-dibromopropyl) benzenedicarboxylate (CASRN: 7415-86-3)

- Chemical A – Chemical Identity claimed confidential by manufacturer

- Chemical B – Chemical Identity claimed confidential by manufacturer

- Initiated: 2013

- Data Needs Assessment (EPA–HQ–OPPT– 2014-0491) (40 pp, 897 kb, About PDF)

- BPC Data Needs Assessment Technical Supplement: P Chem and Fate (17 pp, 212 kb, About PDF)

- BPC Data Needs Assessment Technical Supplement: Use and Exposure (17 pp, 217 kb, About PDF)

- BPC Data Needs Assessment Technical Supplement: Hazard (23 pp, 389 kb, About PDF)

1,4-Dioxane

This problem formulation and initial assessment examined likely 1,4-Dioxane exposure and hazard scenarios to workers and consumers based on current production, use, and fate information. The goal of this problem formulation and initial assessment was to identify scenarios where further risk analysis may be necessary. On April 20, 2015, EPA released a problem formulation and initial assessment. The conclusions are: a) there are no risks to the general population through exposure to air emissions; b) an assessment of risk from drinking water is not needed at this time because 1,4-Dioxane is currently being monitored and EPA will determine whether or not regulatory action is needed as part of its Regulatory Determination Process; c) EPA/OPPT will further assess risks to workers and consumers exposed to 1,4-Dioxane through certain uses. EPA plans to review and evaluate the results of previous exposure assessments and health benchmarks for this chemical. As a result, EPA/OPPT will develop margins of exposure and cancer risk estimates to evaluate the potential risks from worker and consumer exposure to 1,4-Dioxane.

- CASRN: 123-91-1

- Initiated: 2014

- Problem Formulation and Initial Assessment (Docket: EPA-HQ-OPPT-2015-0078)

Ongoing Chemical Assessments

To date, EPA has initiated assessments for the TSCA Work Plan Chemicals listed below.

1-Bromopropane (1-BP) This assessment addresses occupational uses of 1-BP in dry-cleaning and foam gluing operations, consumer uses in aerosol solvent cleaners and spray adhesives, and its effects on human health.

- CASRN: 106-94-5
- Initiated: 2013
- Peer Review Plan (PDF) (5 pp, 79 kb, About PDF)

Long-chained Chlorinated Paraffins (LCCPs; C $_{18-20}$): This assessment addresses the use of LCCPs as metal working and compounding agents and its effects on ecological receptors.

- Initiated: 2012

Medium-chained Chlorinated Paraffins (MCCPs; C $_{14-17}$) This assessment addresses the use of MCCPs as metal working and compounding agents and its effects on ecological receptors.

- Initiated: 2012

Octamethylcyclotetrasiloxane (D4) This assessment addresses down the drain releases of D4 and its effects on ecological receptors.

- CASRN: 556-67-2
- Initiated: 2012
- On April 2, 2014, EPA signed an Enforceable Consent Agreement with five manufacturers of D4. The testing program will be conducted over a one year period. The information gathered by the ECA will be used in conjunction with other available data to assess exposures and risks due to environmental releases from D4. (Docket: EPA-HQ-OPPT-2012-0209-0068)

New York code council ruling against home fire sprinklers angers safety advocates

Tempers flared following a recent vote by the New York Fire Prevention and Building Code Council to adopt the 2015 International Residential Code but remove its requirement to sprinkler all new, one- and two-family homes. Instead, the council opted to continue using the current code, which requires sprinklers only in wood frame residences exceeding two stories.

"You guys messed up," Jeff Wilkinson, president of the New York State Fire Marshals and Inspectors Association, told the council. "You guys should be ashamed of yourselves."

Also not mincing words was the New York State Association of Fire Chiefs (NYSAFC), an active member of the New York Sprinkler Initiative, which has been advocating for the sprinkler requirement for months. The group has been stressing the loss of two-year-old Nora Lamirande, who died in May 2015 from a fire in a New York home built in 2013. "I am deeply disappointed that in voting to remove residential sprinklers from the

statewide building code, members of the Code Council have chosen to put profit ahead of safety," said Jerry DeLuca, the association's executive director and CEO.

China releases Hazchem guidance and mandatory classifications

China's State Administration of Work Safety (SAWS) issued guidance on its hazardous chemicals catalogue, together with mandatory classifications for all chemicals listed, on September 2, 2015. The new documents affect registration, safety data sheets (SDS) and labeling. They were issued under the title of: "China, Substance registration & inventories, Priority substances".

The guidance explains how to find out if a mixture, or "product", is listed in the catalogue and whether firms producing or handling listed chemicals require licenses or hazardous chemical registrations.

If at least 70%, by weight or volume, of the ingredients in a mixture are listed, it is deemed as listed in the catalogue, and may need administrative licenses.

A hazardous chemical registration is required if the mixture itself is listed – unless it has already been officially classified as not hazardous.

If a mixture is listed in the catalogue, companies that handle it may be subject to administrative license requirements, such as production, operation or safe use licenses.

Mandatory GHS classifications

The guidance also requires companies to use the mandatory classifications for all 2,828 chemicals listed in the catalogue. These are in a "classification information sheet" set out as an annex to the guidance. Each entry, for each chemical, must include the chemical's:

- Chinese and English name;
- CAS number; and
- Hazard category.

Companies must prepare or update safety data sheets and labels in accordance with these.

Together, the catalogue, guidance and annex will help businesses that produce, import, distribute or use listed chemicals, comply with the safe management of hazardous chemicals regulations (Decree 591). Along with Order 53, the decree requires manufacturers and importers to register hazardous chemicals with the National Registration Centre of Chemicals (NRCC).

Research and Development

An FPRF report by J. Dinaburg and D. Gottuk on "Smoke Alarm Nuisance Source Characterization: Experimental Results: Final Report" was published in August 2015 and can be found on the NFPA website at: http://tinyurl.com/okdln75.

This work analyzed physical measurements and alarm response characteristics for several simulated cooking and water mist nuisance alarm sources and several real fires. The obscuration, Measuring

Ionization Chamber (MIC) response, particle density, mass concentration, temperature increases, CO, and CO_2 concentrations were measured to compare nuisances and real fires. In addition, photoelectric and ionization smoke alarms and detectors were installed at multiple distances to determine the response to these sources and how various measured quantities affect existing smoke detection technologies.

The nuisance alarm tests were conducted in a large space designed to simulate the standard ANSI/UL 217/268 fire test enclosure. This room was larger and not necessarily representative of a real kitchen application. Despite the larger room, nuisance alarm activations were produced for all cooking scenarios tested. Toasting bread, broiling hamburgers, and frying hamburgers produced nuisance responses in ionization smoke alarms/detectors. Frying hamburgers produced the only photoelectric nuisance alarm responses measured. This result was generally in agreement with the pre-test expectation that photoelectric devices will respond more strongly to larger particulate, and that toast would produce small particles, broiling would produce medium particles, and frying would produce the largest particles proposed by NIST. Previous NIST testing produced nuisance responses in photoelectric devices for both broiling and frying testing. It is believed that the larger test space in this test series limited the concentrations of broiling particulate and reduced the occurrences of nuisance alarms. The nature of the broiling particulate was larger than that of toast, and could have likely produced photoelectric nuisance alarms in concentrations comparable to those obtained in the NIST test room.

Peak obscuration levels during nuisance cooking were measured during gas and electric frying tests. Obscuration during normal cooking reached levels of 1.5-2.0 %/ft. (4.8-6.4 %/m) at 6 ft. (1.8 m), 1.2-1.5 %/ft. (3.9-4.8 5/m) at 10 ft. (3.0 m), and 0.7-1.0 %/ft. (2.3-3.2 %/m) at 20 ft. (6.1 m). Peak MIC levels were also measured during the gas frying nuisance testing up to 43.3 pA at the 10 ft. (3.0 m) distance. The gas frying test was conducted at a high temperature and produced the most nuisance alarms, activating both photoelectric and ionization devices.

After transitioning to hazards (food began to burn) the obscuration levels for toast and frying tests began to increase rapidly, without greatly increasing the MIC response. The same effects were observed for limited increases in the particle densities with large increases in mass concentrations after hazardous transitions for these sources. These shifts both indicate the average size of the particles being produced after the food begins to burn increase rapidly. Similar effects were not observed for electric or gas broiling, however. All hazardous cooking scenarios more than doubled the peak obscuration levels of normal cooking, except for the electric and gas broiling. Electric broiling only reached an obscuration of 1.2-1.4 %/ft. (3.9-4.5 %/m) at the 6 ft. (1.8 m) distance, and gas broiling did not produce any measureable obscuration. The average particle sizes remained relatively constant after the food began to burn in the broilers, with only the total concentration continuing to increase.

It was observed that increasing the amount of food cooked did not increase the likelihood of nuisance alarm responses. Initial estimates presumed that more food would produce more particulate, increasing the likelihood of nuisance alarms. The opposite effect was observed, however. Increased

and earlier nuisance responses with less food present is believed to be the result of reduced cooking temperatures resulting from using the same total heat input to cook more food. In contrast to the normal cooking, when food began to burn more total particulate was produced for tests with more food quantity. In this sense, more food is easier to detect as a hazard, and easier to ignore as a nuisance. In general, the most challenging nuisance/detection scenario is one with high temperature/ power input cooking and low food quantities.

Gas concentrations measured during cooking tests include the CO and CO_2 concentrations. No measureable CO concentrations above the 5 ppm resolution of the analyzer were measured for any nuisance cooking, or for any hazardous cooking other than burning toast, where levels up to 85 ppm were measured. During normal cooking, no discernable CO_2 was measured except for when cooking with a natural gas range. When using the gas range, CO_2 levels increased over ambient by as much as 0.105 %. When continuing into hazardous cooking, CO_2 increased over ambient by as much as 0.129 %, but did not increase rapidly, but rather continuing the linear trend observed during normal cooking. When bread in a toaster began to burn, some measureable CO_2 was produced, which spiked if a flaming ignition occurred, reaching levels as high as 0.102 % above ambient. Although significant, this level was less than produced during normal cooking with a gas range.

In addition to cooking, nuisance alarm responses were also evaluated by the release of hot water mist from a bathroom after running a shower. Only photoelectric devices responded to this type of nuisance, with no ionization alarms recorded. It was observed that peak obscuration levels and alarm activations increased by ending the shower after only 2.5 minutes compared to 10 minute showers. The peak obscuration levels in the bathroom were observed to decay beyond this time, and resulted in reduced obscuring mist released from the bathroom door to expose the alarms. Peak obscuration levels of 2.6-3.5%/ft. (8.3-11.0 %/m) at the 3-7 ft. (0.9-2.1 m) distance, and up to 0.7 %/ft. (2.3 %/m) at the 14 ft. (4.3 m) distance were measured. Photoelectric alarms and detectors responded out to the 7 ft. (2.1 m) distance within 15-45 seconds of opening the door. In general, these alarms were fairly short lived, only sustained for several alarm cycles.

Fire tests were conducted in order to compare nuisance test data to real fire data. The fires conducted included the standard ANSI/UL 217/268 fires including flaming paper, flaming wood, flaming liquid, and smoldering wood. Additional testing conducted at UL included the proposed flaming and smoldering PU foam tests. Limited data was available from these tests, including the obscuration, MIC, particle density, and mass concentrations were measured at the standard 17.7 ft. (5.4 m) distance.

Comparisons were made between the particulate, temperatures and gases produced from the nuisance cooking sources and the real fire tests. In general, the fire sources tested tracked reasonably well with the standard fire curves. Some shifts in timing of flaming breakthroughs or smoke buildup rates were observed. In addition, a general trend appeared that the obscuration levels were slightly low compared to the MIC levels when compared to the standard results. It

was determined that the tests adequately represented the standard fire curves for the purposes of this analysis. For the purposes of this analysis, exact compliance was not achieved, but meaningful conclusions and comparisons can still be made for a more robust analysis. Alarms/detectors designed for nuisance resistance by differentiating nuisance sources from only a handful of select standard fires will not be as effective as ones designed to address a broader range of fires in the field, which is partly achieved by variations from the standard test profiles.

When comparing the peak levels for temperature, smoke, particles, and gases, however, the size of the nuisance test space must be considered. By testing in a space larger than a typical kitchen, it should be anticipated that the measured quantities and resulting nuisance alarm activations would be increased when installed in a real kitchen application.

The highest temperature increases among cooking nuisances occurred at a distance of 6 ft. (1.8 m) when gas frying, increasing ambient temperatures by up to 6.0°C (10.8°F). At a distance of 20 ft. (6.1 m), however, the broiling tests resulting in higher temperature increases than all other nuisance cooking, increasing above ambient temperature by 3.5°C (6.3°F). The nuisance cooking temperatures measured were the same or higher than the temperature increases measured during the flaming paper and smoldering wood fire tests. The flaming wood and liquid tests produced higher temperature increases than all other tests. When the temperature increases are limited to the time of alarm activations, however, the fire test temperatures are reduced to equal to or less than those measured during normal cooking. This is because the real fires produce more smoke per watt of heat compared to the nuisance sources. Temperature increases do not provide a good distinction between the nuisance and real fire scenarios.

Obscuration levels measured for the fire tests are generally significantly higher than those measured by the nuisance sources tested. Peak obscuration levels of 2.0 %/ft. (6.4 %/m) and 3.4 %/ft. (10.7 %/m) were measured for cooking and water mist nuisances, respectively. Higher levels may be produced when cooking in a smaller, confined space, however. The fire tests are designed to produce much higher levels of obscuration, potentially reaching levels of 37 %/ft. (78 %/m), 17%/ft. (45.7 %/m), 13 %/ft. (36.7 %/m), and 10 %/ft. (29.2 %m) for the flaming paper, flaming wood, flaming liquid, and smoldering wood tests, respectively. The obscuration limits for the flaming and smoldering foam tests are still up for debate, but have been proposed at 5 %/ft. (15.5 %/m) and 12 %/ft. (34.3 %/m), respectively.

Although the fire obscuration levels are higher than the nuisances tested, it should be understood that alarms and detectors do not measure obscuration, and will respond differently to each of these sources. Both ionization and photoelectric devices tested generally alarmed to the cooking sources at obscuration levels below the smoke box tested sensitivities, while generally alarming to the real fires at obscuration levels above the listed sensitivities. In other words, the devices tested appear less sensitive to obscuration from fire sources than from the smoke box wick source and more sensitive to cooking particulate. Some of the higher obscuration responses are due to the relatively rapid rate of obscuration rise during the fires or when burning toast. During the slow growing smoldering wood fires, for example, the photoelectric devices tested occasionally responded before the

listed sensitivity. The ionization devices tested responded at 2 to 3 times the listed obscuration to smoldering wood, however.

When comparing the MIC levels measured during normal cooking and real fires, there is less distinction than for obscuration. Peak MIC levels measured during normal cooking reached as low as 43.3 pA for gas frying. Other cooking sources produced MIC responses in the range of 75-59 pA. These levels are generally equal to or greater than the MIC levels designed to initiate alarm responses for ionization devices. MIC levels for the fire tests measured at the latest allowable alarm response time do not exceed 40 pA for the smoldering wood or flaming foam tests. Even at the minimum allowable sensitivity, it would be difficult for an ionization alarm to distinguish between these sources and normal cooking. The smoldering foam test does not produce an MIC response level less than 82.2 pA at the minimum alarm response at 12 %/ft. (34.3 %/m). This level is already above the alarm response level for most ionization devices, and could not be distinguished from any cooking source tested.

The particle densities measured produced similar response to the MIC current levels. This is in agreement with general MIC theory, that the response if proportional to the number of particles. The highest particle densities during normal cooking were produced by gas frying, reaching 5.95 million particles/cm^3. The least particles were measured during electric broiling, but still exceeded 2.33 million particles/cm^3. When limited by the minimum alarm response times, the smoldering wood and flaming foam produced fewer than 2.33 million particles per cm^3, less than the lowest cooking source. The smoldering foam source produced no more than 0.25 million particles per cm^3, a full order of magnitude less than the lowest normal cooking source. Particle density, like MIC response, provides little distinction between cooking and fire sources.

The mass concentration results show excellent agreement with the obscuration results. This is also in agreement with the light scattering theory. Mass concentrations measured during normal cooking were generally low, with some electric frying reaching as high as 43 mg/m^3, but toasting and gas frying producing almost no measureable particle mass. With the exception of gas broiling, the mass concentrations increased rapidly after food began to burn, increasing to over 400 mg/m^3 for toast, and over 100 mg/m° for all other sources. With the exception of the flaming PU foam, all fire sources measured over 116 mg/m^3 prior to reaching the maximum alarm response time. The flaming foam tests only measured mass concentrations of 40-57 mg/m° when reaching the 5 %/ft. (15.5 %/m) alarm threshold, however. Based purely on mass, this source would be very hard to distinguish from the normal cooking scenarios tested.

The increased measurements of obscuration and mass concentration compared to MIC and particle densities for the fire sources indicate that the real fire sources produce an average larger particle size than the nuisance sources. The relative ratios of these quantities also indicate that the nuisance sources tested provide a good general range of particle sizes for analysis. Although the relative order of size varied for various metrics, in general the toast produced very small particles, and the various types of broiling and frying produced much larger particles. The fire sources

were also found to vary by particle size, with the flaming foam producing the smallest particles and the smoldering foam producing the largest.

With regard to gas concentrations, all the flaming fires except for the flaming liquid produced much higher concentrations of CO than the nuisance sources. No nuisance sources produced CO in greater concentrations than the 5 ppm uncertainty of the sensor. The flaming paper, flaming wood, and smoldering wood all produced CO levels greater than 47 ppm before the maximum allowable alarm time. The flaming liquid source did not produce any measured CO above the uncertainty levels. On this basis, CO measurement would likely provide excellent distinction between the nuisances and most of the fire sources. CO_2 levels measured during fire tests, however, did not exceed the levels produced during normal cooking on the gas range. CO_2 does not provide sufficient distinction between the nuisances and fire scenarios to be further considered.

The particulate produced during normal cooking and showering causes existing smoke detection technologies to go into alarm. The methods and procedures used in these tests provided challenging conditions for nuisance rejection. Depending on the cooking method, temperatures, and food quantities, the responses of the tested detection technologies were varied. In general, all types of cooking caused nuisance alarm responses in ionization devices tested out to the maximum tested distance of 20 ft. (6.1 m). Cooking at higher temperatures that produced more total particles and cooking that produced larger particles, such as pan frying, caused nuisance alarms to occur in photoelectric devices located within 10 ft. (3.0 m) of the source. Hot water mist spilling from a bathroom caused alarms in photoelectric devices only out to distances of 7 ft. (2.1 m). The responses of the alarms/detectors measured in this analysis are likely conservative, based on the large size of the test space. Real nuisance alarms would be more likely to occur when the particulate is held in higher concentrations by smaller kitchen spaces.

This work was intended to verify the expectations that the cooking sources selected provided a range of real cooking nuisance particulate. Work conducted by NIST indicated that the tested sources should produce a range of cooking particles sizes (toast – small, electric broiling – medium, electric frying – large). These test results confirmed that the toasting produced small particles while electric frying produced large particles. Particle size estimates for electric broiling were variable, indicating medium to large particles. In general, the NIST relative particles sizes were verified.

Various particle analysis metrics indicated that the range of particle sizes produced by the selected sources and cooking methods did vary greatly. Toasting bread and cooking burgers in a gas broiler produced very small particles with very little mass or light obscuration. These particles were measureable by condensation particle counter (CPC) and MIC and caused nuisance alarm responses in ionization type devices. The electric broiling, gas frying, and electric frying all produced larger particles, with the order somewhat variable depending on the metric used for comparison. The gas frying, which was conducted at the highest temperatures, produced the most total particulate with the highest obscuration, and resulted in nuisance alarms in both ionization and photoelectric devices. An electric

broiling test produced the highest mass concentrations with the fewest total particles during normal cooking, and may be considered the largest particle by this metric. Despite producing a relatively larger particle, the lower total concentrations compared to gas frying resulted in no photoelectric nuisance alarm responses.

All cooking tests produced uniquely different particulate. There was general agreement between the original NIST tests and these tests that ionization alarms would respond to all three types of cooking, while photoelectric alarms responded to frying. These tests did not produce alarms in photoelectric to broiling, while the NIST tests did, however. This difference is believed to result from reduced concentrations in the larger test space, rather than a fundamental difference in particle size. Comparing the times to alarm between these and the NIST tests is of no consequence, due to the change in location and test space., but cooking at the highest representative input power and rate is recommended. In addition to increasing the cooking input power, a more challenging test may actually be conducted by reducing the food quantity to a single burger, which would heat up more quickly and produce more particulate during normal cooking.

Because the real fire sources produced relatively larger particulate than the cooking sources, the largest cooking particle source likely represents the most challenging particulate for nuisance rejection. The highest ratio of mass concentration to particle number density among all cooking sources was measured in one of the electric broiling tests. Although broiling produced lower particle concentrations and fewer alarm responses than the frying tests conducted, the nature of the broiling particulate may make it suitable for a nuisance rejection test that is challenging to all alarm types.

In order to produce a challenging yet realistic broiling test, higher particle concentrations than those obtained in these tests would be necessary. This could be done either by reducing the size of the test space or increasing the total heat output of the broiler. Another option to consider may be continuing to cook burgers beyond normal cooking and into the hazardous portion of the tests. Particle analysis metrics used in these tests indicated that the fundamental nature did not change when burning food in the broiler, but rather only the total particle concentrations were increased. This resulted in the activation of photoelectric alarms during hazardous cooking testing. Although alarms/detectors may be desired to respond to hazardous broiling, the nature of the particle is not changed and more of the nuisance-like particulate could be produced for testing in a larger than normal kitchen space.

Observations to consider for development of standard cooking tests:

• The most particles produced in these tests resulted from gas frying hamburgers. Gas frying was conducted at the highest temperature setting on the range. Increasing cooking temperature and rate increase the particle production. Decreasing the food quantity also increases the cooking rate and temperatures.

• Particles produced from cooking were smaller than the real fire sources. Even the largest cooking particles were sufficiently small to challenge ionization type alarms/detectors, while also challenging photoelectric

type detectors. Testing using the source with the smallest particles is not necessary to challenge ionization type alarms/detectors.

• The largest relative particles measured during cooking were obtained from one of the electric broiling tests. The broiling methods tested did not produce sufficient particle concentrations to challenge all alarms, but may have if the process specifics were altered to produce more particulate (e.g. increased broiler power, reduced room size).

• The test space used was not representative of a real kitchen. A smaller test space would increase particulate concentrations and growth rates, increasing the likelihood of nuisance responses.

• In general, advanced particle metrics (number density, mass concentration) were well reflected by standard measurements of MIC and obscuration. Additional instrumentation for test characterization beyond that in UL 217/268 is likely not necessary for smoke particles.

• CO gas measurements did provide distinction between nuisances and real fires, and should be measured as part of a nuisance cooking protocol.

Water mist produced particles different in nature from cooking particulate that resulted in real nuisance alarm activations. This type of test should be included in a standard nuisance rejection test protocol. Several similarities and differences were observed between the nuisance sources and the real fire sources. The MIC response alone could not distinguish between cooking and fire particulate. MIC responses to nuisances exceeded levels measured in 3 of 6 fire test scenarios. Nuisance MIC currents dropped as low as 40 pA, but a valid test conducted for the smoldering foam, smoldering wood, or flaming paper sources need not produce currents below 95, 52, or 45 pA, respectively. It was also observed that the response of the MIC and ionization devices to total aerosol particle densities also followed this general trend. Measurement of the particle density does not provide additional information to distinguish between the nuisance and fire particulate.

The total obscuration levels measured between normal cooking and hazardous cooking and real fires did show measureable levels of distinction. This effect was also observed for mass concentration, a result in agreement with general obscuration and light scattering theory. In general, the normal cooking scenarios produced lower levels of obscuration than the hazards tested. This was true for all cooking sources except for gas broiling, which produced almost no obscuration even when burning the food. Nuisance cooking sources produced obscuration levels up to 2 %/ft. (6.4 %/m) at the 6 ft. (1.8 m) distance. This level would be expected to increase for a smaller kitchen space.

A major issue to consider with regard to obscuration levels is that they are not directly representative of the operation of smoke alarms. This consideration greatly complicates the development of nuisance test threshold criteria. Obscuration levels are representative of the hazard within the test space, as reflected in loss of visibility and increased difficulty to achieve egress.

Ionization devices operate using a measurement unrelated to optical light obscuration. Light scattering (photoelectric) devices operate by measuring a small percentage of the obscured light that is scattered at a

specific angle. This effect does not account for different angles or for absorbed light. The response of light scattering devices to the same levels of obscuration can be very different depending on the type of smoke being measured. In general, both ionization and photoelectric devices tested produced alarms to cooking particulate at lower obscuration levels than for real fire scenarios and the listed smoke box tested sensitivities. All alarms/detectors tested alarmed at very different obscuration levels for each different source tested.

CO levels measured were distinguishable between the nuisances and real fire sources tested. No CO levels above 5 ppm were measured for any nuisance cooking scenario. CO was not measured for water mist testing. CO concentrations for the flaming paper, flaming wood and smoldering wood all exceeded levels of 47 ppm. The flaming liquid did not produce measured CO levels above the uncertainty of the analyzer (±5 ppm). When normal cooking transitioned to hazards, only the burning toast produced measureable CO (max of 85 ppm). Burning food in the broilers or frying pans did not produce distinguishable CO levels. The CO levels were measured but not provided for this analysis during the PU foam tests conducted at UL.

Safety News

DHS Grant to UL to Improve Fire Service Knowledge with Hands-on Training

UL announced that its Firefighter Safety Research Institute (FSRI) received a $1.5 million Assistance to Firefighters Grant from the US Department of Homeland Security (DHS) for the 10th consecutive year. UL states that the funding will help support FSRI's mission to increase firefighter knowledge and reduce injuries and deaths in the fire service and the communities it serves.

UL's FSRI has received $11 million in grants over the past 10 years. These grants are part of the Fire Prevention and Safety Grants intended to support projects that enhance safety of the public and firefighters from fire and related hazards. The primary goal of the grants is to reduce injury and prevent deaths in the fire service and the communities which they serve.

Over the past 30 years, despite advances in technology, the rate of firefighter deaths inside structures has continually risen. While firefighting techniques have been passed down through generations, science is vital to keep pace with new hazards and save lives, as the modern fire environment responds less effectively to certain tactics.

In particular, current firefighting training lacks visual, hands-on components that enable new recruits to experience how their tactics can affect fire behavior in a structure. The newly-awarded grant will allow FSRI to build upon the past 10 years of research to help bridge the gap between fire dynamics in training environments and actual emergencies.

"DHS-funded studies have helped save the lives of firefighters," said Steve Kerber, director of FSRI. "As building and product materials change, the hazards change, making firefighting even more complex. The work FSRI will conduct through this new grant will enhance the

hands-on training opportunities that firefighters can receive, leading to better decision-making on the fire ground, and more effective and efficient firefighting."

UL states that it plans to expand upon previous research studies that examined fire dynamics, fire service tactics and hands-on firefighter training, including:

Underwriters Laboratories Inc. (333 Pfingsten Road, Northbrook IL 60062; Tel: 847-272-8800; www.ul.com)

CPSC Recalls

CPSC announced a series of recalls in cooperation with the firms named below.

Crib Mattresses

About 38,400 (VYSSA SPELEVINK crib mattresses were previously recalled in January 2015 and again in May 2015 for entrapment hazards.) units manufactured in China and imported by IKEA North America were recalled because the crib mattresses fail to meet the federal open flame standard for mattresses, posing a fire hazard. No injuries have been reported.

The mattresses were sold at IKEA stores nationwide and online at www.ikea-usa.com from October 2000 through May 2014 for about $100.

Consumers should immediately stop using the recalled crib mattresses and return them to any IKEA store for a full refund. For more information please see: http://www.cpsc.gov/en/Recalls/2015/IKEA-Recalls-Crib-Mattresses-Fire-Hazard/

Lawn Mowers

About 4,400 units manufactured in the US were recalled because the gas tank can leak, posing a fire hazard. Scag Power Equipment has received five reports of gas tank leaks on the mowers. No injuries have been reported.

The mowers were sold at Scag Power Equipment authorized dealers nationwide from October 2014 through May 2015 for about $4,500.

Consumers should immediately stop using these recalled lawn mowers and contact Scag Power Equipment or an authorized dealer for a free repair. For more information please see: http://www.cpsc.gov/en/Recalls/2015/Scag-Power-Equipment-Recalls-Lawn-Mowers/

LED Tubes

About 46,300 units in the US and about 8,700 units in Canada manufactured in South Korea and imported by Osram Sylvania were recalled because the lamps can overheat and melt, posing a burn hazard. Osram Sylvania Inc. received 34 reports of overheating and melting. No injuries have been reported. *(See also Health Canada below)*

The tubes were sold at Osram Sylvania industrial/commercial distributors between December 2014 and May 2015.

Consumers should immediately stop using the lamps, remove them from the fixture and immediately contact Osram Sylvania for a free replacement. For more information please see: http://www.cpsc.gov/en/Recalls/2015/Osram-Sylvania-Recalls-T8-LED-Tubes/

Dremel Rotary Tools

About 93,000 units in the US and about 2,750 units in Canada manufactured in Mexico and imported by Robert Bosch Tool Corp. were recalled because the tool's circuit board can overheat and melt the tool's enclosure. If the tool is being held while overheating, it could present a risk of burn. Additionally, some tools may lose their speed control changing to high speed in use, turn on by themselves, or may not turn off, posing a personal injury hazard. Bosch Tool has received six reports from consumers of tools overheating. There are no reports of injuries. *(See also Health Canada below)*

The tools were sold at Ace Hardware, Home Depot, Lowe's, Menards and other home improvement, hardware and major retailers nationwide and online including www.acehardware.com, www.amazon.com, www.homedepot.com, www.lowes.com and www.menards.com from July 2014 through May 2015 for about $90.

Consumers should immediately contact Robert Bosch Tool for information on a free repair. For more information please see: http://www.cpsc.gov/en/Recalls/2015/Robert-Bosch-Tool-Recalls-Dremel-Rotary-Tool/

Plug-in Wall Chargers for iphones

About 3,200 units manufactured in China and imported by MiWorld Accessories were recalled because the chargers can overheat and catch fire while in use, posing a fire hazard. There has been one report of the charger catching on fire. No injuries have been reported.

The chargers were sold at Charlotte Russe stores nationwide during October 2014 for about $13.

Consumers should immediately stop using recalled chargers and contact MiWorld for a full refund. For more information please see: http://www.cpsc.gov/en/Recalls/2015/MiWorld-Accessories-Recalls-Plug-in-Wall-Chargers-for-iPhones/

Water Dispensers

About 190 units manufactured in China and imported by MTN Products were recalled because the screws holding the heat band in the dispensers can break or detach and cause the unit to overheat, posing a fire hazard. No injuries have been reported.

The water dispensers were sold at the water dispensers were distributed to businesses and residential customers in Florida, Massachusetts and New York as part of a water delivery contract.

Consumers should immediately stop using the recalled water dispensers, unplug the units and contact Nestlé for a free pickup of the recalled unit and delivery of a free replacement water dispenser. For

more information please see: http://www.cpsc.gov/en/Recalls/Recall-Alerts/2015/Nestle-Waters-North-America-Recalls-Water-Dispensers/

Wireless Smoke Alarms

About 950 units manufactured in China and imported by Bosch Security Systems were recalled because the alarms can fail to alert consumers to a fire, posing a fire hazard. Bosch has received two reports that alarms failed to sound during installation testing.

The alarms were sold at Security system dealers nationwide from November 2013 through October 2014 for about $125.

Consumers should immediately contact their dealer/installer for a free replacement alarm. For more information please see: http://www.cpsc.gov/en/Recalls/Recall-Alerts/2015/Bosch-Security-Systems-Recalls-Wireless-Smoke-Alarms/

Touchless Kitchen Faucets

About 4,500 units manufactured in China and imported by Lota were recalled because the battery box used to power the faucet's sensor can short circuit, overheat and/or melt, posing fire and burn hazards to consumers. The firm has received six reports of the faucet's battery box overheating, melting and/or smoking, including one report of a fire in the box and one report of a burn to a consumer's thumb.

The faucets were sold at The Home Depot stores nationwide and online at www.homedepot.com from March 2015 through May 2015 for about $225.

Consumers should immediately unplug and remove batteries from the faucet's battery box and contact Lota USA for a replacement battery box for the faucet. For more information please see: http://www.cpsc.gov/en/Recalls/2015/Touchless-Kitchen-Faucets-Recalled-by-Lota/

Halogen Lamp Bulbs

About 370,000 units manufactured in China and imported by Philips Lighting were recalled because the lens of the bulb can shatter in the lamp or the lens can fall and shatter, posing a laceration and burn hazard. Philips has received 13 reports of the lens of the bulb shattering, including five reports of property damage totaling about $700 and two laceration injuries.

The bulbs were sold at Home Depot stores and professional distributors nationwide and online at www.Amazon.com from November 2013 through March 2015 for about $10.

Consumers should immediately stop using these recalled bulbs, remove them from any fixtures and contact Philips to request packaging materials and instructions for returning the recalled bulbs at no cost. Philips will provide free replacement bulbs. For more information please see: http://www.cpsc.gov/en/Recalls/2015/Philips-Recalls-Halogen-Bulbs/

Health Canada Recalls

Health Canada announced a series of recalls in cooperation with the firms named below.

Sasha Striped Scarves

About 263 units manufactured in India and imported by Ten Thousand Villages were recalled because the Health Canada's sampling and evaluation program has determined that the scarf does not meet the requirements for textile flammability under the Canada Consumer Product Safety Act. Neither Ten Thousand Villages Canada nor Health Canada has received any reports of consumer incidents or injuries to Canadians related to the use of this product.

The scarves were sold exclusively at Ten Thousand Villages stores across Canada from Sept 2012 to Aug 2015.

Consumers should stop using this recalled scarf and return it to Ten Thousand Villages Canada for a refund. For more information please see: http://healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2015/54912r-eng.php

Kidde Smoke Alarms and Combination Smoke/CO Alarms

About 148,000 units in Canada and about 670,000 units in the US manufactured in China and imported by Kidde Canada were recalled because should a power outage occur at the same second that the device is performing a once-per-minute sensor health check, the device may go into a "latched" mode, causing it not to alarm in the presence of smoke and/or carbon monoxide. An affected device will sound if it receives a signal from an alarm in the same interconnected system. Once power is restored, a latched device will sound an alarm regardless of the presence of smoke and/or carbon monoxide. Health Canada and Kidde received one report of a consumer incident related to the use of this product. Neither Kidde nor Health Canada have received any reports of consumer injuries related to the use of these products.

The September 11, 2014 recall involves Kidde branded AC/DC powered residential smoke alarms and combination smoke/CO alarms, models KN-COSM-IBACA, i12010S-CO-CA and i12010S-CA. This recall has been expanded to include one additional date code of model i12010S-CO-CA alarm.

Model KN-COSM-IBACA was sold between January 2, 2014 and May 13, 2014. Model i12010SCA alarms with date codes from March 11, 2014 to May 13, 2014 were sold between April 17, 2014 and May 13, 2014. Model i12010S-CO-CA alarms with date codes from March 14, 2014 to May 13, 2014 were sold from April 17, 2014 through May 13, 2014. Model i12010S-CO-CA alarms with date code June 6, 2014 were sold since June 22, 2014.

Customers should immediately check the model number and date code on their smoke alarms or combination smoke and carbon monoxide alarms to determine if any of their devices are included in the recall. For more information please see: http://healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2015/54652r-eng.php

Dremel Rotary Tools

About 2,750 units in Canada and about 93,000 units in the US manufactured in Mexico and imported by Robert Bosch Tool Corp. were recalled because the tool's circuit board can overheat and melt the tool's enclosure. If the tool is being held while overheating, it could present a risk

of burn. Additionally, some tools may lose their speed control changing to high speed in use, turn on by themselves, or may not turn off, posing a personal injury hazard. Health Canada has not received any reports of consumer incidents or injuries related to the use of this product. Robert Bosch Tool has received six reports from consumers of tools overheating. There are no reports of injuries. *(See also CPSC above)*

The tools were sold at Ace Hardware, Home Depot, Lowe's, Menards and other home improvement, hardware and major retailers nationwide and online including www.acehardware.com, www.amazon.com, www.homedepot.com, www.lowes.com and www.menards.com from July 2014 through May 2015 for about $90.

Consumers should immediately contact Robert Bosch Tool for information on a free repair. For more information please see: http://healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2015/54734r-eng.php

Weather Radios

About 10 units manufactured in China and imported by Ambient Weather were recalled because the weather radio's AC power adapter can overheat, posing a fire hazard. Neither Health Canada nor Ambient weather has received any reports of consumer incidents or injuries related to the use of these products in Canada.

Consumers should immediately stop using the product and contact Ambient Weather to arrange to receive a free replacement adaptor. For more information please see: http://healthycanadians.gc.ca/recall-alert-rappel-avis/hc-sc/2015/54804r-eng.php

LED Tubes

About 46,300 units in Canada and about 8,700 units in the US manufactured in South Korea and imported by Osram Sylvania were recalled because the lamps can overheat and melt, posing a burn hazard. Osram Sylvania Inc. received 34 reports of overheating and melting. No injuries have been reported. *(See also CPSC above)*

The tubes were sold at Osram Sylvania industrial/commercial distributors between December 2014 and May 2015.

Consumers should immediately stop using the lamps, remove them from the fixture and immediately contact Osram Sylvania for a free replacement. For more information please see: http://www.cpsc.gov/en/Recalls/2015/Osram-Sylvania-Recalls-T8-LED-Tubes/

Notes

City Councilman Wants Answers on Firehouse Sex Ad Photos

Ivory Lee Young Jr. said scantily clad females used public resources in the wrong way. That much the city councilman said he can determine immediately just by looking at the photographs which appeared in a sexually oriented advertisement on the firehouse web site.

The public resources the councilman makes reference to is fire equipment housed inside the Jonesboro Road fire station in Atlanta, GA.

In one photo, a female in high heels somehow climbed or may have been lifted all the way to the top of a truck to take her pose.

Fire commanders attended an Atlanta City Hall meeting Sept 15th. It was their first opportunity to talk publicly what they have learned about exactly how the photo shoot took place.

It is not uncommon for permission to be granted to individuals who may want to snap a photo at a firehouse. Usually those request come from parents and school groups.

City officials have launched an internal investigation after photos of a woman posing inside an Atlanta Fire station surfaced.

The photos were part of an online ad appearing to offer escort services. The racy photos show a woman posing in a suggestive manner around fire engines, firefighters' gear, and other equipment. Markings suggest the photos were taken inside of Atlanta Fire Station 2.

"The Atlanta Fire Rescue Department will launch an internal investigation into the matter, and will take decisive action based on the outcome of the investigation," read a statement from an Atlanta Fire Department spokesperson.

The woman in the photos has not yet been identified and no criminal charges have been filed.

Orange Co. Fire hosts 3rd Hero Challenge

More than 100 people from across Central Florida competed for a great cause Saturday. Orange County Fire Rescue kicked off its third annual Hero Challenge. The charitable event helped raise money for firefighters dealing with cancer, while honoring first responders who lost their lives on September 11.

The hero who saved 13 girls from fire

Though he saved 13 girls from a fire on August 23rd, Thabang Moruti is haunted by the memory of the three girls he couldn't help.

The 21-year-old matriculation pupil at the North West Secondary School for the Deaf in Leeudoringstad (South Africa) has emerged as the hero of a fire that claimed the lives of three of his friends.

Wearing nothing but a pair of shorts and with his ripped, wet T-shirt tied around his face, Thabang climbed a tree and used a crowbar to force open a window to the hostel's first floor. He went from room to room and bed to bed, getting the girls up and out of the raging inferno.

After he had rescued 13 of them, he came across the bodies of three fellow female pupils, aged 16, 18 and 22 years old.

"I saw the two bodies in the bathrooms. One of the girls was lying face up on the floor with her arms crossed over her chest while the other one was badly burnt," he said.

"I loved them. I knew them and they were also my friends. I went outside and all the deaf pupils were crying. I cried a lot."

On Aug. 23rd, Thabang was asleep in his bed when he smelt smoke. He went outside to investigate and saw that the floor above his dormitory – where 50 deaf girls were sleeping – was on fire.

He could not see any of them from where he was standing, looking up. He ran up the stairs but the door was locked.

He ran outside again, tore his T-shirt, dipped it in water and wrapped it around his mouth and nose to keep the smoke at bay. He climbed a tree dressed only in his shorts.

"I got up there and, with an iron rod, broke the window and slipped through it into the girls' rooms. There was not much movement and only a few were up. The others were still sleeping," he said.

"There was lots of smoke and it was dark. I walked towards the door and used the same iron rod to force it open."

With the exit now cleared, some girls ran out, leaving Thabang behind to search for others. He reached for the first girl he stumbled on and dragged her out. From there, he rushed up and down the stairs, in and out of the building, dragging girls out of the fire.

"Some were still sleeping and I went from room to room in the dark searching with my hands for the girls.

"I woke up those who were sleeping and others were too confused and made it hard for me to get them out of the building because they were pulling out of my grip," he said.

"At one point I found two girls, grabbed them both, using one arm for each of them, and rushed out. Once outside, other boys helped to pour water on them, as they were coughing and struggling to breathe."

One of the teachers was also there and rescued one girl, he said.

"Another boy was also helping me search for more girls and take them out of the building. It was hot in there and the smoke was not making it easy for us, but we continued searching while other boys with water buckets were trying to put out the flames," he said.

"When most of the girls were already out, I walked into the bathrooms. Before I entered, part of the burning roof collapsed in front of me. I am not sure if it was the geyser or burst pipes, but there was a lot of water coming from the roof. But I was too late to save the three girls."

The rescued girls had lost their clothing and most of their belongings in the fire and all were still wearing their pajamas. Moruti stepped in again.

"It was about 1am and too cold, especially for those who had had water poured over them. They were freezing and I went to the boys' rooms and brought some of my clothes and gave to those I could … I was sad I could not help all of them," he said.

Thabang couldn't think of his own fear as he rescued the girls from the fire.

"I was only thinking of the girls who were trapped in their rooms. I was not scared at all. All I wanted was to save lives."

Thabang now knows what he wants to do with his life.

"I have always dreamt of being a fireman and saving lives, but now I am sure this is what I want. I am very sad that the firemen arrived too late and the police could also not help much," he said.

"If I could, I would have a fire station in each and every town and village, and not some distance away. Lives could have been saved had a fire station been close by."

Calendar

Codes and Standards

NFPA 555 (Hazard and Risk) Committee Second Draft Meeting – September 15, 2015 – www.nfpa.org

ISO TC61 SC4 (Plastics and Combustion) – September 21-23, 2015, Paris, France – www.iso.org

NFPA 70 (NEC) Public Comment Closing Date – September 25, 2015 – www.nfpa.org

NFPA 130 (Rail) Committee Second Draft Meeting – September 28-30, 2015 – San Diego, CA – www.nfpa.org

ICC Code Hearings Public Comments ICC 2018 Group A Codes – Sept. 30 – October 5, 2015 – Long Beach, CA – www.iccsafe.org

NFPA 1 (Fire Code) – October 8-9, 2015 – San Diego, CA – www.nfpa.org

NFPA 90A/90B (Air Conditioning) Committee First Draft Meeting – October 15, 2015 – Quincy, MA – www.nfpa.org

ISO TC92 (Fire Safety) – October 19-23, 2015 – Gaithersburg, MD (NIST) – www.iso.org

NFPA 502 (Tunnels) Committee Second Draft Meeting – October 19-22, 2015 – Dallas, TX – www.nfpa.org

ASTM C16 (Thermal Insulation) Committee – October 25-28, 2015 – Tampa, FL – www.astm.org

ASTM E60 (Sustainability) Committee – October 27-29, 2015 – Tampa, FL – www.astm.org

ASTM D7 (Wood) Committee – October 29-30, 2015 – Tampa, FL – www.astm.org

NFPA 70 (NEC) – Second Draft Meetings – November 2-14, 2015 – San Diego, CA **–** www.nfpa.org

ASTM D20 (Plastics) Committee – November 15-18, 2015 – Tampa, FL – www.astm.org

ASTM D9 (Electrical Insulation) Committee – November 2015 - canceled – www.astm.org

ASTM F25 (Ships) Committee – December 8-10, 2015 – Tampa, FL – www.astm.org

ASTM E05 (Fire Standards) Committee – December 7-10, 2015 – Tampa, FL – www.astm.org

NFPA 99/99B (Health Care Facilities) Committee First Draft Meeting – December 15, 2015 – Orlando, FL – www.nfpa.org

ICC Group B Codes Public Proposal Closing Date – January 11, 2016 – www.iccsafe.org

ASTM D13 (Textiles) Committee – January 24-27, 2016 — San Antonio, TX – www.astm.org

ASTM F23 (Protective Clothing) Committee – January 25-28, 2015 — San Antonio, TX – www.astm.org

NFPA 70 (NEC) Correlating Committee – Second Draft Meetings – February 23-26, 2016 – Biloxi, MS **–** www.nfpa.org

ASTM C16 (Thermal Insulation) Committee – April 10-13, 2016 – San Antonio, TX – www.astm.org

ASTM D20 (Plastics) Committee – April 10-13 2016 – San Antonio, TX – www.astm.org

ASTM D7 (Wood) Committee – April 12-14 2016 – San Antonio, TX – www.astm.org

ASTM E60 (Sustainability) Committee – April 12-14 2016 – San Antonio, TX – www.astm.org

ASTM D9 (Electrical Insulation) Committee – April 13-14 2016 – San Antonio, TX – www.astm.org

ICC Group B Committee Proposal Hearings – April 17-27, 2016 – Louisville, KY – www.iccsafe.org

NFPA 70 (NEC) NITMAM Closing Date – April 29, 2016 – www.nfpa.org

ASTM F25 (Ships) Committee – May 3-5, 2016 – San Antonio, TX – www.astm.org

NFPA Annual Mtg, June 15-16, 2016 – Las Vegas, NV – www.nfpa.org

ASTM D13 (Textiles) Committee – June 26-29, 2016 — San Antonio, TX – www.astm.org

ASTM E05 (Fire Standards) Committee – June 27-30, 2016 – Chicago, IL – www.astm.org

ASTM F23 (Protective Clothing) Committee – May 3-4, 2106, www.astm.org

ICC Group B Codes Public Comment Closing Date – Jul 22, 2016 – www.iccsafe.org

ICC Group B Comment Hearings – October 19-25, 2016 – Kansas City, MO – www.iccsafe.org

ICC Group C Codes Public Proposal Closing Date – January 2017 – cancelled – www.iccsafe.org

Fire Safety & Technology Conferences

Human Behaviour in Fire 2015 Int. Conference – Sept. 28-30, 2015 – Cambridge, UK – www.intersciencecomms.co.uk

Fire India – Oct. 5-7, 2015, New Delhi, India - http://www.fire-india.com/

10th AOSFST Asia-Oceania Symposium on Fire Science and Technology – Oct. 5-7, 2015 – Tsukuba, Japan – http://www.iafss.org/10th-aosfst/

ISO TC92 Cone Calorimeter Workshop – October 18, 2015, Gaithersburg, MD – www.iso.org

Backyards & Beyond: Wildland Fire Education Conf. – October 22-24, 2015, Myrtle Beach, SC – www.nfpa.org

15th International Water Mist Conference – Oct. 28-29, 2015 – Amsterdam, Netherlands - https://de.amiando.com/SFJLWVE.html

SFPE North America Conf.: Freedom to Design – Nov. 8-15, 2015 – Philadelphia, PA – www.sfpe.org

NFPA Annual Conference – June 13-16, 2016 – Las Vegas, NV – www.nfpa.org

Interflam 2016 Conference – July 4-6, 2016 – Windsor, UK – www.intersciencecomms.co.uk

4th International Conference on Fires in Vehicles, FIVE 2016 – Oct. 4-6, 2016 – Baltimore, MD – www.firesinvehicles.com

6th International Fire Ecology & Management Congress – November 16-20, 2015 - San Antonio, TX - http://afefirecongress.org

2nd International Conference on Performance-based and Lifecycle Structural Engineering (PLSE 2015) – December 9-11, 2015 - Brisbane (Australia) - http://plse2015.org

Mar 16-18 7th International Symposium on Tunnel Safety and Security (ISTSS) – March 16-18, 2016 - Montréal (Canada) - http://istss.se/EN/Sidor/

5th Fire Behavior and Fuels Conference – held concurrently in Portland, Oregon (USA) and Melbourne (Australia) – April 11-15, 2016 http://www.iawfonline.org/conferences.php

Fire Retardants in Plastics – May 3-4, 2016 – Pittsburgh, PA – www.amiplastics-na.com

BCC Flame Retardancy Conf. – May 23-26, 2016 – Stamford, CT - www.bccresearch.com

12th International Symposium on Fire Safety Science - June 12-16, 2017, Lund, Sweden – www.iafss.org

Interflam 2016 – July 4-6, 2016 – Royal Holloway College, Windsor, UK – www.intersciencecomms.co.uk

Courses and Workshops

Performance Based Fire Protection Engineering in New Zealand – Triumphs and Challenges – Member-Only Webinar – http://tinyurl.com/olugyux

The general principles of smoke control CPD webinar – http://tinyurl.com/lwyak6w

The Firewise Landscaping course – Free Course – http://tinyurl.com/bhns76v

Homeowners/Civic Leaders/Firefighters Course: Community Assessment– Free Course – http://tinyurl.com/bhns76v

Firefighters Course: Safety– Free Course – http://tinyurl.com/bhns76v

Other Conferences

2nd Workshop on Complex Events and Information Modelling (CEIM\'15) – September 13-16, 2015 – Lodz (Poland) - https://fedcsis.org/2015/ceim/

Living Product Expo – September 16-18, 2015 – Pittsburgh, PA - www.livingproductexpo.org

MEIA 2015 (2015 International Conf. Materials Engineering and Industrial Applications) Sept. 20-21, 2015, Hong Kong, China - http://www.meia2015.org/

Amer. Soc. Composites 30th Technical Conf. – Sep. 28-30, 2015, East Lansing, MI - http://www.asc-composites.org/

CPI Polyurethanes Conference 2015 – October 5-7, 2015, Orlando, FL – www.polyurethane.americanchemistry.com

ATEM'15: International Conference on Advanced Technology in Experimental Mechanics 2015 – October 4-8, 2015 - Toyohashi (Japan) - http://solid.me.tut.ac.jp/atem15/

Greenbuild 2015 – November 18-20, 2015 – Washington, DC - www.greenbuildexpo.com

NIBS 4th Annual Conf. – January 11-15, 2016, Washington, DC – www.nibs.org

Polymer Foam US 2016 – April 5-6, 2016, Newark, NJ – www.amiplastics-na.com

PVC Formulation 2016 – April 5-7, 2016, Cologne, Germany – www.amiplastics.com

FS&TB Abbreviations List

Regulations, Codes and Standards

CPD.....European Commission Construction Products Directive
EN.....Euro Norm (European Standard)
FFA.....Flammable Fabrics Act (US)
IBC.....International Building Code (US)
IFC.....International Fire Code (US)
IMC.....International Mechanical Code (US)
LPS.....Loss Prevention Standard (UK)
NEC.....National Electrical Code (US)
RoHS.....EC Directive on Restriction of Hazardous Substances
SBI.....Single Burning Item (European Norm EN 13823)
SOLAS.....International Convention for the Safety of Life at Sea (from IMO)
SRM.....Standard Reference Material
UFC.....Uniform Fire Code (also known as NFPA 1)
UMC.....Uniform Mechanical Code
WEEE.....EC Directive on Waste Electrical and Electronic Equipment

Organizations

ASTM.....American Society for Testing and Materials (now ASTM International)
BRE.....Building Research Establishment (UK)
BSEF.....Bromine Science and Environmental Forum
BSI.....British Standards Institution
CEN.....European Committee for Standardization
CPSC.....Consumer Product Safety Commission (US)
CSA.....Canadian Standards Association
EBFRIP.....European Brominated Flame Retardant Industry Panel
EC.....European Commission
EPA.....Environmental Protection Agency (US)
EU.....European Union
FAA.....Federal Aviation Administration (US)
FSC.....Coalition for Fire Safe Cigarettes
IAFC.....International Association of Fire Chiefs
IAPMO.....International Association of Plumbing and Mechanical Officials (US)
IEC.....International Electrotechnical Commission
IMO.....International Maritime Organization
ISO.....International Organization for Standardization
ISPA.....International Sleep Products Association (US)
LPCB.....Loss Prevention Control Board (UK)
NASFM.....National Association of State Fire Marshals (US)
NEMA.....National Electrical Manufacturers Association (US)
NFPA.....National Fire Protection Association
NIST.....National Institute of Standards and Technology (US)
ODPM.....Office of the Deputy Prime Minister (UK)
SFPE.....Society of Fire Protection Engineers (US)
SP.....Swedish National Testing and Research Institute
UL.....Underwriters Laboratories
UKAS.....United Kingdom Accreditation Service
USFA.....United States Fire Administration
VECAP.....Voluntary Emissions Reduction and Control Action Programme (EBFRIP)

Polymers and Other Chemicals

ABS.....acrylonitrile-butadiene-styrene copolymer
APP.....ammonium polyphosphate
ATH.....alumina trihydrate
BPA.....bisphenol A
deca-BDE.....decabromodiphenyl ether
EPDM.....ethylene propylene diene monomer (rubber)
EPS.....expanded polystyrene
EVA.....ethylene-vinyl acetate copolymer
FR.....flame retardant additive
HBCD.....hexabromocyclododecane
HDPE.....high density polyethylene
HIPS.....high impact polystyrene

LDPE .....low density polyethylene
MDI.....methylene diphenyl diisocyanate
MMA.....methyl methacrylate
PAN .....polyacrylonitrile
PBB.....polybrominated biphenyl
PBDD.....polybrominated dibenzodioxin
PBDE.....polybrominated diphenyl ether
PBDF .....polybrominated dibenzofuran
PBT.....poly(butylene terephthalate)
PCB.....polychlorinated biphenyl
PCDD.....polychlorinated dibenzodioxin
PCDF .....polychlorinated dibenzofuran
PE .....polyethylene
PET.....poly(ethylene terephthalate)
PFOA.....perfluorooctanoic acid
PMMA.....poly(methyl methacrylate)
POM.....polyoxymethylene
PP.....polypropylene
PPS .....polyphenylene sulfide
PS.....polystyrene
PTFE.....polytetrafluorethylene
PU .....polyurethane
PVC.....poly(vinyl chloride)
PVDF .....poly(vinylidene fluoride)
SAN.....styrene acrylonitrile
TBBPA.....tetrabromobisphenol A
TCDD.....2,3,7,8-tetrachlorodibenzo-p-dioxin
TCPP.....tris(1-chloro-2-propyl)phosphate
TDI.....toluene diisocyanate
TPE .....thermoplastic elastomer
TPU.....thermoplastic polyurethane

Fire Test Properties

CFD.....computational fluid dynamics
DTA.....differential thermal analysis
HRR .....heat release rate
FTIR.....Fourier transformation infrared spectra
LOI.....limiting oxygen index
SEM .....scanning electron microscopy
TGA.....thermogravimetric analysis