Committee on NFPA 2112

M E M O R A N D U M

TO: NFPA Technical Committee on Flash Fire Protective Garments
FROM: Jeanne Moreau
DATE: April 2, 2010
SUBJECT: NFPA 2112 A11 ROP Letter Ballot Final Results

The Final Results of the NFPA 2112 ROP Letter Ballot are as follows:

19 Members Eligible to Vote
5 Ballots Not Returned (A. Duke, M. Jeffrey, C. Morin, J. Swiss and J. Womble)
5 Affirmative on All
7 Negatives on one or more proposals as noted in report
2 Abstentions on one or more proposals as noted in report

The number of affirmative votes need for the report to be published is 8.
(19 eligible to vote - 5 not returned - 2 abstentions = 12 × 0.66 = 7.92)

In all cases, an affirmative vote of at least a simple majority of the total membership eligible to vote is required.
(19 of eligible voting members ÷ 2 = 9.5 (10)

Reasons for negative votes, etc. from alternate members are not included unless the ballot from the principal member was not received.

According to the final ballot results, all ballot items received the necessary 2/3 required affirmative votes to pass ballot.

ATTACHMENT: (Final) Circulation Explanation Report
The technical committee has confused thermal exposure duration with fire event duration. It has additionally chosen to perpetuate the term "flash fire" as an incorrect generic term (for thermal exposure duration). This standard is designed to provide for a minimum performance against a thermal exposure from an industrial fire, not a specific fire type (which there are many possible in an industrial setting). As such, the committee action is inconsistent with the purpose of the standard. The term "flash fire" is therefore inappropriate and should be substituted throughout with "fire" as noted in the proposal.

The committee revision to 1.2.1 begins to get at the issues noted in the proposals noted in log #2 and log #3. An improved version of 1.2.1 that does a better job is (to be proposed in ROC):

"1.2.1 This standard shall provide minimum requirements for the design, construction, evaluation, and certification of flame-resistant garments for use by industrial personnel, with the intent of not contributing to the burn injury of the wearer, providing a degree of protection to the wearer, and reducing the severity of burn injuries resulting from short-duration thermal exposures from fire or accidental exposure to hydrocarbon flash fires."

Agree with Mr. Corrado’s comments.
Circulation Explanation Report for FLG-AAA Proposals

Friday, April 2, 2010

Document # 2112

Corrado, S.

UL does not support the proposed revision to NFPA 2112, Log #8 for the following reasons:

1. The current wording in new paragraph 4.3.X would REQUIRE a certification organization (CO) to accept component recognitions from another CO. Requiring acceptance of another CO’s certification creates undue liability concerns. If and when there is a failure of a product, the organization that made the certification decision for that product will likely be deemed liable. Without the ability of a CO to maintain control over or assess the quality of the inputs to the certification (in this case, test data or component certification), their exposure to legal risk substantially increases.

2. Further, the current wording in new paragraph 4.3.Y would require the disclosure of proprietary and confidential information, violating certification requirements and contractual obligations between the owner of the certified product and the CO. UL considers the results of an investigation as proprietary information, and for use only in UL’s Surveillance program. The Test Report is intended solely for the use of UL and the Applicant for establishment of UL certification coverage of the product under UL’s Follow-Up Service. Any use of the Report other than to indicate that the sample(s) of the product covered by the Report has been found to comply with UL’s applicable requirements is not authorized. UL shall not incur any obligation or liability for any loss, expense, or punitive damages, arising out of or in connection with the use or reliance upon the contents of the Report to anyone other than the Applicant as provided in the agreement between UL and Applicant. Any use or reference to UL’s name or certification mark(s) by anyone other than the Applicant in accordance with the agreement is prohibited without the express written approval of UL.

3. Per ISO/IEC 17007, “Conformity assessment - Guidance for drafting normative documents suitable for use for conformity assessment”, product Standards such as NFPA 2112 should focus only on the evaluation criteria or performance characteristics of the product. It should be left up to the certification organization (CO) to decide what methods and means of conformity assessment activity will be utilized, who will carry out the conformity assessment, and under what conditions. The CO requirement for data acceptance is outside of the scope and intent product standards, and conflicts with the CO’s control of their Mark and proprietary information. Just as a standard requirement cannot force manufacturers to purchase components from a specific supplier, COs cannot be required to accept the certifications of components from other COs. A product standard should not contain requirements that are business decisions on how a CO will provide its service(s).

2112-8  3.3.x Garment Composite, Insulation Material, Shell Fabric (New) and Chapter 7  (Log # 12 )

Negative

Baitinger, W.  The original language of the submitted should be accepted without modification.

Abstain

Stull, J.  This proposal was prepared with support from 3M Corporation.

2112-9  3.3.x Insulation Material, A.3.3.x, and 7.1.3 (New)  (Log # 9 )

Negative

Baitinger, W.  The original language of the submitted should be accepted without modification.

Abstain

Stull, J.  This proposal was prepared with support from 3M Corporation.

2112-12  3.3.12 Flash Fire  (Log # 4 )

Negative

Parry, R.  The technical committee has confused thermal exposure duration with fire event duration. It has additionally chosen to perpetuate the term "flash fire" as an incorrect generic term (for thermal exposure duration) but kept its definition (fire type) creating confusion. This standard is designed to provide for a minimum performance against a thermal exposure from industrial fires, not a specific fire type (which there are many possible in an industrial setting). As such, the committee action is inconsistent with the purpose of the standard. The defined term "flash fire" is therefore inappropriate and should be substituted with a definition of "fire" as noted in the proposal.

2112-19  7.1.2  (Log # 10 )

Negative
Baitinger, W.  The submitter's substantiation that a change in the char length requirement does not pose a potential hazard to the wearer is substantiated by data that was not presented at the ROP meeting and is attached. There is no direct correlation of % body burn to char length. To seek a middle ground and to offset committee comments, I propose that the language be amended to a maximum of 5 inches (125mm).

Typical results of Flammability (ASTM D6413) and Flash Fire Manikin Test (ASTM F1930).

<table>
<thead>
<tr>
<th>Fabric</th>
<th>Char Length (inches)</th>
<th>Body Burn (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5.5oz Fabric A</td>
<td>5.0</td>
<td>15.8</td>
</tr>
<tr>
<td>7oz Fabric B</td>
<td>3.5</td>
<td>13.4</td>
</tr>
<tr>
<td>9oz Fabric C</td>
<td>3.5</td>
<td>9.0</td>
</tr>
<tr>
<td>9 oz Fabric D</td>
<td>3.0</td>
<td>18.9</td>
</tr>
<tr>
<td>4.5oz Fabric E</td>
<td>2.5</td>
<td>36.6</td>
</tr>
<tr>
<td>4.5oz Fabric F</td>
<td>2.0</td>
<td>36.5</td>
</tr>
</tbody>
</table>

As the chart shows, there is no correlation between char length and protection. While the vertical flame test is very important in understanding fabric performance, it is only a basic measurement of the self-extinguishing capability. Lower char lengths do not necessarily translate into higher protective performance.

Loftin, D.  I agree with the submitter's initial substantiation that a 150 mm (6.0 inch) Char Length does not create any hazard to the wearer as the manikin test determines the extent of potential injury from a flash fire, not vertical FR testing. Requiring a 4.0 inch Char Length limits the selection of fabrics available to the market without enhancing wearer protection. Char Length only determines that a fabric is flame resistant, not its protective qualities. ASTM F 2302, Standard Performance Specification for Labeling Protective Clothing as Heat and Flame Resistant, requires a maximum of 2/0 seconds Afterflame and 6.0 inches Char Length. This should be considered the baseline standard for determining the flame resistance of a fabric.

Abstain

Dale, J.  I have no direct experience with the "vertical flame length" test. I do note however that there is a low correlation between the TPP test value and % body burn obtained on the mannequin for single layer garments. I am not surprised that there is little correlation between the "char length" and mannequin test results. All these tests are quite different in what they are quantifying.

Fithian, W.  It has been demonstrated that the final rinse cycle is not sufficient to remove all of the detergent from fabrics, prior to testing. This conclusion is based on testing that was conducted on fabrics from different manufacturers. The residual detergent acts as a contaminant, leading to a false after-flame result for the Flammability Resistance Test, as outlined in Sections 7.1.2 and 8.3 of the 2007 Edition of the NFPA 2112 Standard. It has been confirmed through additional testing, that there is residual detergent on fabrics after the specified washing and drying procedure outlined in Section 8.1.3. It has been further proven and documented that identical samples prepared and analyzed for flammability will be noncompliant or compliant, depending on the number of final rinse cycles conducted. Experimentation has proven that fabrics which are prepared and analyzed in accordance with Sections 8.1.3 and 8.3 do not meet the flammability performance criteria. However, performing two additional rinse cycles on the same pre-conditioned fabrics, followed by the flammability test, resulted in compliant test data for the fabrics. Additionally, an experiment was conducted to determine where the source of contamination may be occurring during the washing and drying procedure. Samples were randomly selected and analyzed after each step of the wash/dry procedure. The fabric testing resulted in acceptable flammability test data prior to the last Sodium silicofluoride wash cycle. Fabrics failed the flammability test after the Sodium silicofluoride procedure, but then passed the flammability test after two additional rinse cycles. It was also noted fabrics failed the flammability test after one additional rinse cycle.

It is recommended the Committee authorize, and/or conduct additional testing, to determine the precise final rinsing cycle that will be required to eliminate the high probability of a false, noncompliant flammability test result, which occurs following the current conditioning steps outlined in Section 8.1.3.

Kavalesky, P.  Same as Bill Fithian from SEI
Parry, R. The modification of A1.2.1 is a good start. However, the technical committee continues to inappropriately mix thermal exposure duration with fire event duration. The term "flash fire" continues to be used as an incorrect generic term (for thermal exposure duration) and its retained definition (fire type) creates confusion. This standard is designed to provide for a minimum performance against a thermal exposure to industrial fires, not a specific fire type (which there are many possible in an industrial setting). As such, the committee action is inconsistent with the purpose of the standard. The defined term "flash fire" is therefore inappropriate and should be substituted with a definition of "fire" as noted in the proposal and the proposed modification to A.1.2.1 should change "flash fire" to "fire".