**BUREAU OF INDIAN STANDARDS**

 **(New Delhi)**

**MINUTES**

**Textiles Protective Clothing Sectional Committee, TXD 32 21st Meeting**

|  |  |  |
| --- | --- | --- |
| **Date/Day** | **Time** | **Venue** |
| 23 August 2024(Friday) | 1100 h | Through Video Conferencing |

**ATTENDEES :**

|  |  |  |
| --- | --- | --- |
|  | **Dr. Arindam Basu (Chairman)**  | **Northern India Textile Research Association, Ghaziabad** |
|  | Shri Sandeep Hora  | Aeronav Industrial Safety Appliances, Noida |
|  | Ms Palak Kakar | Arvind Limited, Ahmedabad |
|  | Shri Harsh Wardhan Sharma | Avient Protective Materials Limited, Pune |
|  | Shri Sanjay Kumar Singh | CRPF, New Delhi  |
|  | Shri Mahipal Meena | CFEES, Delhi |
|  | Shri Sunak Banarjee  | CII, New Delhi |
|  | Dr. Madhusudan Pal  | Defence Research and Development Organization, Defence Institute of Physiology and Allied Science, New Delhi |
|  | Dr. S K Tomar | Department of Delhi Fire Services, Govt of NCT of Delhi, Delhi |
|  | Shri K I Singh | Directorate General of Quality Assurance, New Delhi |
|  | Shri Amiya Kumar Mallick | -do- |
|  | Dr. Swapan Kumar ghosh | Department of Jute and Fibre Technology, University of Kolkata, Kolkata |
|  | Shri Manoj Jhaver | E.I. Dupont India Pvt Ltd., Gurgaon |
|  | Shri Vinay Khanna | Foremost Technico Pvt. Ltd., New Delhi |
|  | Prof. Abhijit Majumdar | IIT, New Delhi |
|  | Prof. Bipin Kumar | -do- |
|  | Shri Sanjay Sathe  | Indian Technical Textiles Association, Mumbai |
|  | Shri Munendra Singh | Kusumgar Corporates Private Limited, Vapi |
|  | Shri S. G .Khandelwal | National Forensic Sciences University, Gandhinagar |
|  | Shri Manu Lochab | National Security Guard, New Delhi |
|  | Dr. M. S. Parmar | NITRA, Ghaziabad |
|  | Dr. Shweta Saxena | -do- |
|  | Shri V Mathivanan | Ordinance Clothing Factory, Shajahanpur |
|  | Shri Shanmugam. B | -do- |
|  | Shri N K Singh | Office of the Textile Commissioner, Mumbai |
|  | Smt Manisha Mathur | SASMIRA, Mumbai |
|  | Dr. Kartikeyan K | SGS India Pvt. Ltd., Chennai |
|  | Smt Anitha Jeyaraj | -do- |
|  | Shri Ashish Kansal | SMPP, New Delhi |
|  | Shri Gaurav | -do- |
|  | Shri Vikramjeet Singh Mann | -do- |
|  | Shri Naveen Gupta | Star Safety Hub, Faridabad |
|  | Shri Pawan Kumar Gupta | -do- |
|  | Shri Sudhir Takker  | System 5 S Private Limited, Chennai |
|  | Dr. Preeti Jain | TBRL, DRDO, Chandigarh |
|  | Shri Ravi Kumar | Teijin, Gurugram |
|  | Shri Sanjay Aggarwal | Tex Corporation Limited, Gurugram |

**BIS DIRECTORATE GENERAL:**

01. Shri J K Gupta Head, Textiles

02. Shri Mayur Katiyar Scientist B & Member Secretary

**Item 0 WELCOME AND INTRODUCTORY REMARKS BY THE CHAIRMAN**

* 1. Shri J K Gupta, Head, Textiles, welcomed all the members and requested for their precise inputs on agenda item. He informed them that there is a strong emphasis from the management for focusing on international standardization work and requested them for their active participation in international standardization also.
	2. Dr. Arindam Basu, Chairman, welcomed all the members present in the meeting and encouraged them for active participation in the committee's work. He also appreciated the committee members for having a strong track record of active participation and for engaging in thorough and in-depth discussions.

**Item 1 CONFIRMATION OF THE MINUTES OF THE PREVIOUS MEETING**

**1.1** In view of no comments,the committee confirmed the minutes of the 20th meeting of TXD 32 held on 08 July 2024 and circulated to members vide BIS DG letter No. TXD 32/A2.20 dated 16 July 2024.

**Item 2 COMPOSITION OF TXD 32**

**2.1** The committee scrutinized the present scope and composition of TXD 32 as given in **Annex 1** to the agenda. After detailed deliberations, the committee decided as follows:

1. The committee decided that Shri Munendra Singh shall represent Kusumgar Corporates Private Limited, Vapi as an alternate member in place of Dr. M K Talukdar.
2. The committee decided to modify the name of E.I. Dupont India Pvt Ltd., Gurugram to Dupont Specialty Products India Pvt Ltd, Gurugram.
3. The committee noted that Shri Narinder Thapa has left Arvind Ltd., Ahmedabad. In view of the above, the committee decided that Shri Pabitra Sahoo shall represent Arvind Ltd, Ahmedabad as principal member and Ms Palak Kakkar as an alternate member.

**2.2** The committee noted that as directed by DG, BIS the memberships of the following organizations which did not attend last two sectional committee meetings were terminated:

1. Fire Retardant Association of India, Mumbai
2. JCT, Phagwara
3. Ministry of Textiles, New Delhi
4. MKU Limited, Kanpur
5. NBC Equipment Wing, Ministry of Defence (DGQA), Pune
6. Reliance Industries Limited
7. TUV Rhineland (India) Private Limited, Mumbai

However, the committee considered the representation received from the following organizations to reconsider their termination of the membership as given in **Annex 2** to the agenda.

* + 1. MKU Limited, Kanpur
		2. NBC Equipment Wing, Ministry of Defence (DGQA), Pune
		3. TUV Rhineland (India) Private Limited, Mumbai

After detailed deliberations the committee decided to recommend to TXDC to condone the absence of the above-mentioned organizations.

**2.3** The committee scrutinized the co-option request received from the following organizations as given in **Annex 3** to the agenda.

1. M/s Star Wire (India) Limited, Faridabad,
2. Smt Shahi Garg
3. Sri Gopal Suryavanshi

After detailed deliberation, the committee decided not to accept the requests of the above-mentioned organizations as the committee is adequately represented by all the stakeholders. However, the committee decided to include the above stakeholders on the BIS mailing list for circulation of draft documents for their comments.

The committee also scrutinized the co-option request received from ATIRA, Ahmedabad vide mail dated 22 August 2024, as placed during the meeting. After detailed deliberation, the committee decided to accept the co-option request by ATIRA, Ahmedabad. Smt. Deepali Plawat and Shri Jigar Dave shall represent ATIRA, Ahmedabad as Principal & Alternate members respectively.

**Item 3 ISSUES ARISING OUT OF THE PREVIOUS MEETINGS**

**3.1** The committee noted the summary of actions taken on the various decisions of the 20th meeting as given in **Annex 4** of the agenda.

**Item 4 DRAFT STANDARD FOR FINALISATION**

**4.1** The committee scrutinized the following draft Indian Standards which were issued under wide circulation for eliciting comments as given in **Annex 5** to the agenda.

1. **[Doc : TXD/32/25492]** IS 12722 : 1989 Textile **—** Floor Coverings Determination of Flame Resistance by Tablet Test
2. **[Doc : TXD/32/25486]** IS 10054 : 1996 Textiles **—** High Density Polyethylene (HDPE) Monofilament Mosquito Netting Round Mesh **—** Specification (*first revision*)
3. **[Doc : TXD/32/25487]** IS 13501 : 1992 Textiles **—** Determination of Flammability by Oxygen Index
4. **[Doc : TXD/32/25852]** IS 16890 : 2018 Textiles **—** Protective Clothing for Firefighters **—** Specification (*first revision*)
5. **[Doc : TXD/32/25824]** Textiles **—** Fire resistant fabric made of Cotton Man-made fibres, filaments and their blends **—** General and Performance Requirements

The committee also scrutinized the comments received from Shri Manoj Jhaver, Dupont Specialty Products India Pvt Ltd., Mumbai on **Doc: TXD/32/25824** as given **Annex 6** to the agenda. The committee also scrutinized the comments received from Manak Manthan on **Doc: TXD/32/25824**, organized by Ahmedabad Branch Office, on 22nd August 2024, as placed by the member secretary during the meeting. After detailed deliberations, the committee decided as follows:

1. **Regarding the drafts at Sl No. (i), (ii), (iii)**

The committee decided to finalize the above-mentioned drafts as given in **Annex 5** to the agenda for publication. BIS may carry out editorial changes, if any.

1. **Regarding the drafts at Sl No. (iv) for [Doc : TXD/32/25852] IS 16890 : 2018 ‘Textiles — Protective Clothing for Firefighters — Specification (first revision)’.**

The committee decided to finalize the draft for publication, after incorporating the following changes:

1. (*Clause* 1, Scope) — Substitute the following for existing:

“ **1 SCOPE**

This standard specifies test methods and minimum requirements for protective clothing for two categories (category 1 and category 2) of protective clothing for firefighters to be worn during firefighting and associated activities where there is a risk of heat and/or flame and covers the general clothing design, the minimum performance levels of the materials used, and the methods of test for determining these performance levels.

The category 1 of protective clothing is recommended for work associated with outdoor firefighting as well as support activities. While category 2 of protective clothing is recommended to be worn during intense structural firefighting, close firefighting operations and associated activities like rescue operations. Category 2 addresses protection requirements for increased risk of convective and radiant heat and/or flame exposures as compared to Category 1 protection requirements. Also, Category 2 covers higher mechanical performance test requirements in terms of tensile strength and tear strength so that the protective clothing can be deployed for more intense firefighting and rescue applications. To facilitate flexibility and comfort for firefighting and rescue applications, the Category 2 protective clothing also stipulates lighter garment assembly compared to Category 1 garment using lower weight of fabric layer assembly without lowering the performance requirements related to protection against convective and radiant heat.

This standard does not cover special clothing for use in other high risk situations such as specialized firefighting (fire entry application), or clothing for use in long term firefighting operations in high ambient temperature, for example brush, wildland, or forest firefighting. It does not cover protection for the head, hands and feet or protection against other hazards, for example biological, radiation and electrical hazards. These aspects may be dealt with in other standards.

NOTES

**1** Additional personal protective equipment to protect the head, hands, and feet should be worn with clothing specified in this standard and in majority of situations breathing apparatus is also required to be worn. Firefighters should be trained in the use and care of protective clothing covered by this standard including an understanding of its limitations and of the other items of personal protective equipment that may be required depending on the risks encountered.

**2** The protective clothing for firefighters under this standard is commonly referred to as Fire proximity suits, firefighters’ suits and turn out gears

**3** ISO 23616:2022 may be referred for guidance regarding the cleaning, inspection and repair of this Protective clothing.”

1. (*Clause* 7.6) — Substitute the following for existing:

“**7.6 Residual Strength of Material when Exposed to Radiant Heat**

One machine and one cross machine specimen of the outer material shall be tested in accordance with IS 1969 (Part 1) before and after pre-treatment of the complete assembly by method A of IS 15758 (Part 2) at a heat flux density of 10 kW/m2. Each specimen of Category 1 shall have a tensile strength ≥ 450 N. Each specimen of Category 2 shall have a tensile strength ≥ 600 N.”

BIS may carry out editorial changes, if any.

1. **Regarding the drafts at Sl No. (v) for [Doc : TXD/32/25824] ‘Textiles — Fire resistant fabric made of Cotton Man-made fibres, filaments and their blends — General and Performance Requirements’.**

The committee decided as follows:

1. Regarding the comments received from Manak Manthan on **Doc: TXD/32/25824**, organized by Ahmedabad Branch Office, the committee decided as follows:

|  |  |  |  |
| --- | --- | --- | --- |
| **Sl No.** | **Clause Number** | **Proposed Change** | **Decision of Committee** |
|  | Clause 3.1.1 | Addition of drying temperature (65 ± 5°C) | Accepted |
|  | Clause 3.1.4.2. | Fabric shall not shrink by more than 7% at 260 ± 5°C; 10% is too high. | The committee did not accept the proposed change because the shrinkage is measured at a significantly higher temperature of 260°C. Additionally, the committee noted that the existing requirement aligns with IS 15748, which is on similar products. |
|  | Clause 3.1.4.3 | Addition of edge test (limited flame spread) as per ISO 15025 | Accepted |
|  | Clause 3.1.4.3 (Table 1) | For dark coloured fabrics, the afterglow is visible only in dark rooms – so this needs to be mentioned in the methodology. | The committee decided to add the following note after the clause: Note — For dark coloured fabric specimen, the samples may be tested in dark rooms for easy visibility of afterglow.  |
|  | Clause 3.1.4.3 (Table 1) | Clarity as to whether the hole formation should be observed while the sample is on the frame or after the sample is removed and kept on a surface? Because many times holes are seen only when the samples are removed | The committee noted that there is no mention of removing the specimen from the frame in clause 9.2.1.3 (h) of ISO 15025 which specifies the method for observation of hole formation in the specimen. In view of the above, the committee decided not to accept the comment.  |
|  | Clause 3.1.4.3 (Table 1) | The below Afterglow point has ambiguity and needs to be reworded or removed - “A glowing inside the charred area is defined in ISO 15025 as afterglow without combustion and for the purpose of this clause is not regarded as afterglow” | The committee decided to rephrase the given paragraph as follows: “Afterglow is a continuation of combustion with the evolution of heat and light but withoutflame. Some materials absorb heat during the flame application and continue to emit this absorbed heat insidethe charred area after removal of the igniting flame. This glowing inside the charred area without combustionshall not be recorded as afterglow.” |
|  | Clause 3.1.4.3 (Table 1) | Addition of Char Length or Burning area as acceptance criteria to be included. | The committee did not accept the comment, as the acceptance criteria of after-flame time as <2s is appropriate and internationally accepted. |
|  | Clause 3.1.4.4.1 (Table 2) | Max heat transfer factor as per EN469 for multilayer is 13secs. Hence performance levels B2 & B3 will be difficult to achieve for single layer fabrics | The committee did not accept the comment, as requirement aligns with IS 15748, which is on similar product. |
|  | Clause 3.1.4.4.2 (Table 3) | Heat Transfer Factor for Radiant Heat – Level C3 & C4 difficult to achieve. | The committee did not accept the comment, as requirement aligns with IS 15748, which is on similar product. |
|  | Clause 3.1.4.4.2 | Residual strength should be tested at 10Kw/m2. No loss of strength should be observed. | The committee did not accept the comments as the requirement is relevant for areas with the risk of intense fire which can lead to strength loss.  |
|  | Clause 3.1.4.4.3 & 3.1.4.4.4 | As per ISO 9185 Clause 9.5, test specimen must be examined 30secs after completion of pouring. Due to adherence examination cannot be done after 30 secs. Min 10-15 mins required. | The committee noted that as per clause 8 of ISO 9185, the operator shall wear protective equipment meeting the requirements of ISO and CEN standards in order to protect against the hazard of accidental splashes of molten metal. The committee decided to not change the requirements of molten metal splash. |
|  | Clause 3.1.4.4.3 & 3.1.4.4.4 | If metal adheres, acceptance criteria should be – no damage to skin. This should be included as a statement in the evaluation. | The committee noted that if the molten metal adheres to the fabric, the risk of burn injuries increases significantly. In view of the above, the committee decided to insert the following note under the clause:NOTE — The sample shall be considered failed if the molten metal adheres to the fabric test specimen. |
|  | Clause 3.1.4.5 | Minimum tensile strength to be changed as 250N for 100% cotton-based fabrics especially having GSM of around 150-200. 300N would be difficult to achieve for these weights of fabric. | Accepted |
|  | No clause | Consider adding pH, pilling/abrasion and colour fastness tests (wherever applicable) in performance requirements of standard. | The committed decided to incorporate only the requirement of pH in the standard. |
|  | No clause | Also adding toxicity and smoke density can be considered as a performance test. | The committee did not accept the comment, as the requirement for toxicity and smoke density is only required for textile products like curtains, drapes, upholstery fabric, etc being used in confined spaces  |
|  | No clause | Discrepancy in the conditioning of the samples with respect to RH and temperature for electrical resistance test in 3.2.12 vs. 3.2.3. Needs to be kept as per 3.2.3 | Accepted |

1. After the detailed deliberation, the committee decided to finalize the above-mentioned draft standard for publication after incorporating the following changes:

(*Foreword, Paragraph* 2) — Substitute the following for existing:

‘**i)** **By chemical treatments**

Chemical treatments are employed to impart flame retardant properties to fabrics. FR chemical finishes utilize compounds like brominated, phosphorus, and nitrogen compounds to impart fire resistance to the fabric. These treatments enhance fabric safety in fire-prone environments.’

(*Clause* **3.1.1,** *Note*) —Substitute the following for existing:

‘NOTES

**1** Manufacturer’s instructions typically indicate one or several of the various methods and processes of ISO 6330, ISO 15797, ISO 3175-2, or equivalent as standardized processes for cleaning.

**2** The drying temperature may be 65 ± 5°C.’

(*Table* 1*, Row* 5)—Substitute following for existing:

|  |  |
| --- | --- |
| ‘Afterglow | Afterglow time shall be ≤ 2 s. Afterglow is a continuation of combustion with the evolution of heat and light but without flame. Some materials absorb heat during the flame application and continue to emit this absorbed heat inside the charred area after removal of the igniting flame. This glowing inside the charred area without combustion shall not be recorded as afterglow.’ |

(*Clause* **3.1.4.3)** — Substitute the following for existing:

‘**3.1.4.3** *Limited flame spread*

Testing of fabric for limited flame spread shall take place in accordance with ISO 15025, to procedure A (Code letter A1) and procedure B (Code letter A2). This test shall be carried out both before and after pre-treatment specified in **3.1.1**.

NOTE — For dark coloured fabric specimen, the samples may be tested in dark rooms for easy visibility of afterglow.

(*Clause* **3.1.4.3.1)** —Insert the following new clause after the existing clause

**‘3.1.4.3.2** *Tested in accordance with ISO 15025, Procedure B (code letter A2)*

When tested in accordance with ISO 15025, Procedure B, specimens from fabric shall meet the following requirements (*see* Table 2):

**Table 2 — Limited flame spread performance requirements, ISO 15025, Procedure B**

**(code letter A2)**

(*Clause* 3.1.4.3.2)

|  |  |
| --- | --- |
| **Properties** | **Requirement** |
| Flame spread  | No specimen shall permit any part of the lowest boundary of any flame to reach the upper or either vertical edge. |
| Flaming debris | No specimen shall give flaming or molten debris. |
| Afterglow | Afterglow time shall be ≤ 2 s. Afterglow is a continuation of combustion with the evolution of heat and light but without flame. Some materials absorb heat during the flame application and continue to emit this absorbed heat inside the charred area after removal of the igniting flame. This glowing inside the charred area without combustion shall not be recorded as afterglow. |
| After flame | After flame time shall be ≤ 2 s.’ |

*(Clause* **3.1.4.4.3)** —Insert the following note under the clause:

NOTE — The sample shall be considered failed if the molten metal adheres to the fabric test specimen.

*(Clause* **3.1.4.4.4)** —Insert the following note under the clause:

NOTE — The sample shall be considered failed if the molten metal adheres to the fabric test specimen.

*(Clause* **3.1.4.5)** —Insert the following note under the clause:

‘**NOTE** — For 100 % cotton woven fabric the tensile strength shall be 250 N, *Min* in both the machine and cross directions.’

(*Clause* **3.1.4.8**) —Insert the following new clause after existing clause:

**‘3.1.4.9** *p*H *Evaluation*

When tested in accordance with the IS 1390, the fabric shall have the pH from 6.0 to 8.0’

(*Clause* **3.2.1,** *Note*) —Substitute the following for existing:

‘NOTES

**1** Manufacturer’s instructions typically indicate one or several of the various methods and processes of ISO 6330, ISO 15797, ISO 3175-2, or equivalent as standardized processes for cleaning.

**2** The drying temperature may be 65 ± 5°C.’

(*Clause* **3.2.3** *Line* 1, *Line* 3, *Line* 6) —Substitute ‘(27 ± 2) °C’ *for* ‘(20 ± 2) °C’

(*clause* **3.2.9**) **—** Substitute the following for existing:

**‘3.2.9** *Limited flame spread*

Testing of fabric for limited flame spread shall take place in accordance with ISO 15025, to procedure A (Code letter A1) and procedure B (Code letter A2). This test shall be carried out both before and after pre-treatment specified in **3.2.1**.

NOTE — For dark coloured fabric specimen, the samples may be tested in dark rooms.

**3.2.9.1** *Testing in accordance with ISO 15025, Procedure A (code letter A1)*

When tested in accordance with ISO 15025, Procedure A, specimens from fabric shall meet the following requirements (*see* Table 8):

**Table 8 — Limited flame spread performance requirements, ISO 15025, Procedure A**

**(code letter A1)**

(*Clause* 3.2.9.1)

|  |  |
| --- | --- |
| **Properties** | **Requirement** |
| Flame spread  | No specimen shall permit any part of the lowest boundary of any flame to reach the upper or either vertical edge. |
| Flaming debris | No specimen shall give flaming or molten debris. |
| Hole formation | No specimen shall give hole formation of 5 mm or greater in any direction, except for an interlining that is used for specific protection other than heat and flame protection. |
| Afterglow | Afterglow time shall be ≤ 2 s. Afterglow is a continuation of combustion with the evolution of heat and light but without flame. Some materials absorb heat during the flame application and continue to emit this absorbed heat inside the charred area after removal of the igniting flame. This glowing inside the charred area without combustion shall not be recorded as afterglow. |
| After flame | After flame time shall be ≤ 2 s. |

**3.2.9.2** *Tested in accordance with ISO 15025, Procedure B (code letter A2)*

When tested in accordance with ISO 15025, Procedure B, specimens from fabric shall meet the following requirements (*see* Table 9):

**Table 9 — Limited flame spread performance requirements, ISO 15025, Procedure B**

**(code letter A2)**

(*Clause* 3.2.9.2)

|  |  |
| --- | --- |
| **Properties** | **Requirement** |
| Flame spread  | No specimen shall permit any part of the lowest boundary of any flame to reach the upper or either vertical edge. |
| Flaming debris | No specimen shall give flaming or molten debris. |
| Afterglow | Afterglow time shall be ≤ 2 s. Afterglow is a continuation of combustion with the evolution of heat and light but without flame. Some materials absorb heat during the flame application and continue to emit this absorbed heat inside the charred area after removal of the igniting flame. This glowing inside the charred area without combustion shall not be recorded as afterglow. |
| After flame | After flame time shall be ≤ 2 s.’ |

(*Clause* **3.2.12,** *line* 2**) —** Substitute ‘(85 ± 5) %’ *for* ‘(65 ± 5) %’

(*Clause* **3.2.12**) **—** Insert the following new clause after existing clause:

**‘3.2.13** *p*H *Evaluation*

When tested in accordance with the IS 1390, the fabric shall have the pH from 6.0 to 8.0’

(*Clause* **3.3.1,** *Note*) —Substitute the following for existing:

‘NOTES

**1** Manufacturer’s instructions typically indicate one or several of the various methods and processes of ISO 6330, ISO 15797, ISO 3175-2, or equivalent as standardized processes for cleaning.

**2** The drying temperature may be 65 ± 5°C.’

*Clause* **3.3.4.3)** —Substitute the following for existing:

**3.3.4.3** *Limited flame spread*

Testing of fabric for limited flame spread shall take place in accordance with ISO 15025, to procedure A (Code letter A1) and procedure B (Code letter A2). This test shall be carried out both before and after pre-treatment specified in **3.3.1**.

NOTE — For dark coloured fabric specimen, the samples may be tested in dark rooms.

**3.3.4.3.1** *Testing in accordance with ISO 15025, Procedure A (code letter A1)*

When tested in accordance with ISO 15025, Procedure A, specimens from fabric shall meet the following requirements (*see* Table 10):

**Table 10 — Limited flame spread performance requirements, ISO 15025, Procedure A**

**(code letter A1)**

(*Clause* 3.3.4.3.1)

|  |  |
| --- | --- |
| **Properties** | **Requirement** |
| Flame spread  | No specimen shall permit any part of the lowest boundary of any flame to reach the upper or either vertical edge. |
| Flaming debris | No specimen shall give flaming or molten debris. |
| Hole formation | No specimen shall give hole formation of 5 mm or greater in any direction, except for an interlining that is used for specific protection other than heat and flame protection. |
| Afterglow | Afterglow time shall be ≤ 2 s. Afterglow is a continuation of combustion with the evolution of heat and light but without flame. Some materials absorb heat during the flame application and continue to emit this absorbed heat inside the charred area after removal of the igniting flame. This glowing inside the charred area without combustion shall not be recorded as afterglow. |
| After flame | After flame time shall be ≤ 2 s. |

**3.3.4.3.2** *Tested in accordance with ISO 15025, Procedure B (code letter A2)*

When tested in accordance with ISO 15025, Procedure B, specimens from fabric shall meet the following requirements (*see* Table 11):

**Table 11 — Limited flame spread performance requirements, ISO 15025, Procedure B**

**(code letter A2)**

(*Clause* 3.3.4.3.2)

|  |  |
| --- | --- |
| **Properties** | **Requirement** |
| Flame spread  | No specimen shall permit any part of the lowest boundary of any flame to reach the upper or either vertical edge. |
| Flaming debris | No specimen shall give flaming or molten debris. |
| Afterglow | Afterglow time shall be ≤ 2 s. Afterglow is a continuation of combustion with the evolution of heat and light but without flame. Some materials absorb heat during the flame application and continue to emit this absorbed heat inside the charred area after removal of the igniting flame. This glowing inside the charred area without combustion shall not be recorded as afterglow. |
| After flame | After flame time shall be ≤ 2 s.’ |

*(Clause* **3.3.4.4,** *Note***)** —Insert the following note 2 under the clause and renumber the existing note as note 1:

‘NOTE — For 100 % cotton woven fabric, the tensile strength shall be 250 N, *Min* in both the machine and cross directions.’

(*Clause* **3.3.4.6**) **—** Insert the following new clause after existing clause:

**‘3.3.4.7** *p*H *Evaluation*

When tested in accordance with the IS 1390, the fabric shall have the pH from 6.0 to 8.0’

(*Annex*A) — Insert the following standard reference at appropriate place:

‘IS 1390 : 2022 Textiles — Determination of pH of Aqueous Extract (*third revision*)’

Since some additional tables have been incorporated, all the tables shall be renumbered accordingly.

BIS may carry out editorial changes, if any.

**Item 5 DRAFTS FOR WIDE CIRCULATION**

**5.1** The committee scrutinized the draft minutes of the working group constituted under the convenorship of Dr M S Parmar, NITRA for discussion on IS 15741 for curtains and drapes and revision of IS 15768, as given in **Annex 7** to the agenda. After detailed deliberations, the committee decided/noted as follows:

1. **Regarding discussion on IS 15741 for curtains and drapes:**

The committee noted that the testing procedure (like size of sample, type of material, etc) for testing of Blinds will be different from curtains and drapes. The committee also noted that the Blinds can not only be made from textiles material but also be made of non-textile materials like bamboo, plastics, etc. In view of the above, the committee decided that the blinds do not fall under the scope of IS 15741. However, considering the role of Blinds in fire safety of both residential and public occupancies, the committee decided that a separate new standard shall be formulated for Blinds.

1. **Regarding revision of IS 15768**

The committee decided to wide circulate the draft revision of IS 15768 for a period of 1 month for eliciting comments as given in the minutes of the above-mentioned working group. BIS may carry out editorial changes if, any.

**Item 6 COMMENTS ON PUBLISHED STANDARD**

**6.1** The committee scrutinized the query pertaining to the ambiguity in the scope of the IS 15742 as received from Central Marks Department, BIS as given in **Annex 8** to the agenda. The committee noted the present scope of IS 15742. The committee also scrutinized the proposal of BIS that the standard is applicable to the entire protective clothing and not only to the textile materials and material assemblies used in protective clothing. The committee further scrutinized the comments received on the above-mentioned proposal as circulated to the committee members vide mail dated 29 July 2024 as given in **Annex 9** to the agenda. After detailed deliberations, the committee decided to incorporate the following changes in IS 15742:

1. (Scope) — Substitute the following for existing:

‘**1 SCOPE**

**1.1** This standard specifies the performance requirements for the limited flame spread properties of textile protective clothing where protection against limited flame spread due to accidental contact with small igniting flames is required in circumstances where there is no significant heat or fire hazard such as clothing used in kitchens of commercial organizations such as office canteens, guest houses, restaurants, hotels, motels, inns, hospitals, etc.’

1. The committee also decided to replace Textile material/ Textile assemblies with textiles protective clothing wherever mentioned in the standard
2. The committee decided to remove the requirement for limited flame spread index 1.
3. The committee also decided to incorporate the requirement for pretreatment as follows appropriately in the standard:

‘**PRE-TREATMENT BY CLEANING**

All the tests shall be carried out both before the pre-treatment and after the pre-treatment, if cleaning is allowed. If the manufacturer’s instructions indicate that cleaning is not allowed, i.e. single-use garments, then testing shall be carried out on new material. The cleaning shall be in line with the manufacturer’s instructions, on the basis of standardized processes. If the number of cleaning cycles is not specified, the tests shall be carried out after five cleaning cycles (a cleaning cycle is one wash and one dry cycle). This shall be reflected in the information supplied by the manufacturer. If the garment can be washed and dry-cleaned, it shall only be washed. If only dry-cleaning is allowed, the garment shall be dry-cleaned in accordance with the manufacturer’s instructions.

NOTE — Manufacturer’s instructions typically indicate one or several of the various methods and processes of ISO 6330, ISO 15797, ISO 3175-2, or equivalent as standardized processes for cleaning.’

1. The committee also decided to incorporate the requirement for dimensional change as follows appropriately in the standard:

**‘DIMENSIONAL CHANGE OF TEXTILE PROTECTIVE CLOTHING**

The Dimensional change shall be measured before and after the samples have undergone five cleaning cycles according to pre-treatment as mentioned above.

The change in dimensions of woven, and non-woven clothing shall not exceed ± 3 % in either length or width direction when measured in accordance with ISO 5077. The change of dimensions of knitted materials shall not exceed ±5 % when measured in accordance with ISO 5077.

The Dimensional change shall be measured after the specimen has been uncreased and flattened on a plane surface. Dimensional change does not apply to single-use garments.’

1. The committee also decided to incorporate the requirement for sewing threads as follows appropriately in the standard:

‘For testing of seams of the textiles protective clothing, three specimens containing seam shall be tested in accordance with ISO 15025, Procedure A. Specimens shall be oriented with the seam running up the centreline of the outer surface of the test specimen so that the burner flame impinges directly upon the seam. Seams shall not separate.’

1. Delete the definitions for Textiles material, Textiles Assemblies and durability index under clause 3 and insert the definition of Textiles Protective clothing appropriately as follows:

‘**Textiles Protective clothing** — Clothing which covers or replaces personal clothing and which is designed to provide protection for the wearer’s upper and lower torso, neck, arms, and legs against small igniting flames.’

1. [*Clause* 8.1 (d)] — Delete.

The committee decided that BIS shall prepare a draft revision after incorporating the above-mentioned changes and the same shall be wide circulated for a period of 1 month for eliciting technical comments. BIS may carry out editorial changes, if any.

**6.2** The committee scrutinized the comments received on IS 15809 : 2017 from M/s NITRA, Ghaziabad as given in **Annex 10** to the agenda. The committee also scrutinized the comments received from M/s Starsafety Pvt Ltd., as placed during the meeting. After detailed deliberations, the committee decided to finalize the following amendment:

(*Page* 9, *Annex* C, **C-3.1**) — Insert the following at the end of last paragraph:

‘Average value of 5 readings shall be reported, and the difference between any two individual values shall not be more than 15%.’

(*Page* 9, *Annex* C, **C-3.2.1**) — Insert the following note under the clause:

‘NOTE — A black plate may be used as backing material.’

 [*Page* 5, *clause* **6.1.1**, *Note* 2*,* (*see Amendment* 1)] — Delete.

(*Page* 5, *clause* **6.1.1**) — Insert the following clause after the existing clause and renumber the subsequent clauses:

‘**6.1.2** *Marking of Buyer brand/logo* — The buyer brand name/brand logo or departmental identification/logo may be applied on the garment by heat transfer or sublimation or screen printing or embroidery or by stitching a reflective patch. The size and the position of the same shall be as agreed between buyer and the seller.

NOTE — The marking of buyer brand/logo is for the identification of the wearer of high visibility clothing and may not be reflective in nature.’

The Committee also DECIDED to waive off the wide circulation of the above amendment as per provisions laid down under Rule 22 (4) of BIS Rules 2018 notified vide GSR 584(E) dated 25 June 2018, as the matter is non-controversial. BIS may carry out editorial changes, if any.

**Item 7 NEW WORK ITEM PROPOSAL**

**7.1** The committee scrutinized the P-Draft on ‘Jute based cloth for workers working in foundry and other fire accident prone workplaces’ as received from M/s NITRA, Ghaziabad and as given in **Annex 11** to the agenda. After detailed deliberations, the committee requested M/s NITRA, Ghaziabad to provide the details of manufacturers and consumers, test repots of the product, and user feedbacks for the above mentioned NWIP and the same shall be placed before the committee for discussion and decision.

**Item 8 REVIEW OF R&D PROJECT**

**8.1** The committee scrutinized the progress report of the R&D project on fire hoods for firefighters as received from Smt Shweta Saxena, NITRA, Ghaziabad (Project leader) and as given in **Annex 12** to the agenda. The committee also noted the ToR of the above-mentioned project as given in **Annex 13** to the agenda. The project leader informed the committee that despite the timely communication with the manufacturers, project leader has not yet received the required samples and the necessary permissions to proceed with the factory survey. This delay has significantly impacted her ability to complete the project within the stipulated timeframe. In view of the above, the project leader requested to extend the duration of the project for a period of 2 months without any additional cost. After detailed deliberations, the committee noted/decided as follows:

1. The committee noted that the literature review for fire hoods of fire fighters has been completed satisfactorily.
2. The committee also noted that the following 3 manufacturers have been visited for collecting samples and information regarding fire hoods for firefighters:
3. Sparakarm Pvt. Ltd., Chennai
4. System 5s, Chennai
5. Starsafety hub, Faridabad
6. The committee also noted that as of now no large manufacturers have been visited for collecting samples. However, the project leader in in process for approaching the following organizations for visit to their manufacturing facilities:
7. Arvind Ltd, Ahmedabad
8. Loyal Textiles, Chennai
9. 4S Industries, Chhattisgarh
10. Shree Deepak Exports, Mumbai
11. Vasa Industries (Safety) LLP, Mumbai
12. The committee noted that 2 small, 2 medium and 2 large manufacturers shall be visited for collecting information pertaining to fire hoods for firefighters as per the approved Terms of Reference. The committee also requested the project leader to inform whether the above-mentioned manufacturers which are visited for sample collection are small, medium, or large manufacturers.
13. The committee noted that the start date of the project is 07 June 2024 instead of 11 June 2024 as mentioned in the progress report.
14. The committee noted that despite timely communication with the manufacturers, project leader has not yet received the required samples and the necessary permissions to proceed with the factory survey. In view of the above, the committee decided to extend the timeline of the R&D project by a period of 2 months.
15. The Committee informed the project leader to submit the following documents:
16. Revised progress report as per Annex E of BIS R&D guidelines **Doc no. SCMD/R&D Guidelines/20240522** (hosted on BIS website),
17. Utilization certificate as per Form GFR 12-A of GFR 2017.
18. Statement of expenditure as per BIS R&D guidelines **Doc no. SCMD/R&D Guidelines/20240522** (hosted on BIS website).
19. Report on utilization of the 75 percent of the fund,

The committee DECIDED to circulate all the received document/reports to all committee members for 7 days for their inputs/comments.

**Item 9 ANY OTHER BUSINESS**

**9.1** The committee scrutinized the following ballots from ISO which were circulated to the committee members through IRD portal of BIS as placed during the meeting by the Member Secretary:

| **BALLOT TYPE** | **REFERENCE NUMBER** | **TITLE** |
| --- | --- | --- |
| CIB | ISO 6941 | CIB request for the approval of the revision of ISO 6941:2003 Textile fabrics — Burning behaviour— Measurement of flame spread properties of vertically oriented specimens |
| CIB | ISO 6940 | CIB request for the approval of the revision of ISO 6940:2004 Textile fabrics — Burning behaviour — Determination of ease of ignition of vertically oriented specimens |
| CIB | ISO 10047 | CIB request for the approval of the revision of ISO 10047:1993 Textiles — Determination of surface burning time of fabrics |
| CIB | ISO 16602 Parts 1-5 (N2234) | DRAFT Resolution 745-2024 (JWG 1) - Restart of cancelled projects ISO 16602-series |
| FDIS | ISO/FDIS 13997 (Ed 3) | Protective clothing — Mechanical properties — Determination of resistance to cutting by sharp objects |
| SR | ISO 18889 : 2019 | Protective gloves for pesticide operators and re-entry workers — Performance requirements |
| NP | ISO/NP 22615 | Protective clothing — Performance requirements and test methods for protective clothing against infective agents |
| NP | ISO/NP 16602-6 | Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 6: Guidance for Selection, Use, Care and Maintenance |

After detailed deliberations, the committee decided as follows:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **BALLOT TYPE** | **REFERENCE NUMBER** | **TITLE** | **QUESTIONS** | **DECISION OF THE COMMITTEE** | **Level of interest** |
| CIB | ISO 6941 | CIB request for the approval of the revision of ISO 6941:2003 Textile fabrics — Burning behaviour— Measurement of flame spread properties of vertically oriented specimens | 1 Do you approve with the revision of ISO 6941 as proposed? YesNo \*Abstain2 Call for the experts when this project is approved for revision. Please give the experts name and email address in the ISO commenting template. Yes \*NoAbstain | 1 Do you approve with the revision of ISO 6941 as proposed? **Yes**2 Call for the experts when this project is approved for revision. Please give the experts name and email address in the ISO commenting template. **Yes \*****Dr M S Parmar, NITRA, Ghaziabad nominated as expert from BIS to represent India** | High |
| CIB | ISO 6940 | CIB request for the approval of the revision of ISO 6940:2004 Textile fabrics — Burning behavior — Determination of ease of ignition of vertically oriented specimens | 1 Do you approve with the revision of ISO 6940 as proposed? YesNo \*Abstain2 Call for the experts when this project is approved for revision. Please give the experts name and email address in the ISO commenting template. Yes \*NoAbstain | 1 Do you approve with the revision of ISO 6940 as proposed? Yes2 Call for the experts when this project is approved for revision. Please give the experts name and email address in the ISO commenting template. Yes \***Dr M S Parmar, NITRA, Ghaziabad nominated as expert from BIS to represent India** | High |
| CIB | ISO 10047 | CIB request for the approval of the revision of ISO 10047:1993 Textiles — Determination of surface burning time of fabrics | 1 Do you approve with the revision of ISO 10047 as proposed? YesNo \*Abstain2 Call for the experts when this project is approved for revision. Please give the experts name and email address in the ISO commenting template. Yes \*NoAbstain | 1 Do you approve with the revision of ISO 10047 as proposed? Yes2 Call for the experts when this project is approved for revision. Please give the experts name and email address in the ISO commenting template. Yes \***Dr M S Parmar, NITRA, Ghaziabad nominated as expert from BIS to represent India** | High |
| CIB | ISO 16602 Parts 1-5 (N2234) | DRAFT Resolution 745-2024 (JWG 1) - Restart of cancelled projects ISO 16602-series | Do you approve DRAFT resolution 745/2024 as seen in document N2234? YesNo \*Abstain | Do you approve DRAFT resolution 745/2024 as seen in document N2234? **Yes** | High |
| FDIS | ISO/FDIS 13997 (Ed 3) | Protective clothing — Mechanical properties — Determination of resistance to cutting by sharp objects | 1 Do you approve the technical content of the final draft? ApprovalApproval with corrections \*Disapproval \*Abstention | 1 Do you approve the technical content of the final draft? **Approval** | High |
| SR | ISO 18889 : 2019 | Protective gloves for pesticide operators and re-entry workers — Performance requirements | 1 Recommended action Withdraw \*Revise/Amend \*ConfirmAbstain due to lack of consensusAbstain due to lack of national expert input2 Has this International Standard been adopted or is it intended to be adopted in the future as a national standard or other publication? Yes \*No \*3 Is the national publication identical to the International Standard or was it modified? IdenticalModified \*4 If this International Standard has not been nationally adopted, is it applied or used in your country without national adoption or are products/processes/services used in your country based on this standard? Yes \*No5 Is this International Standard, or its national adoption, referenced in regulations in your country? Yes \*No6 If the committee decides to revise or amend, do you propose an expert and/or project leader for the development of that project? Yes (name(s) and proposed role(s): expert or project leader) \*No | 1 Recommended action **Confirm**2 Has this International Standard been adopted or is it intended to be adopted in the future as a national standard or other publication? **Yes \*****This standard has been adopted as Indian Standard**3 Is the national publication identical to the International Standard or was it modified? **Identical**4 If this International Standard has not been nationally adopted, is it applied or used in your country without national adoption or are products/processes/services used in your country based on this standard? **No**5 Is this International Standard, or its national adoption, referenced in regulations in your country? **No**6 If the committee decides to revise or amend, do you propose an expert and/or project leader for the development of that project? **No** | High |
| NP | ISO/NP 22615 | Protective clothing — Performance requirements and test methods for protective clothing against infective agents | **1 1a. Do you approve, disapprove or abstain on this NWIP?** * Approve
* Disapprove \*
* Abstain due to lack of consensus
* Abstain due to lack of national expert input

**2 Please also select from one of the following options (note that if no option is selected, the default will be the first option):** * Draft document can be registered as a Working Draft (WD - stage 20.00)
* Draft document can be registered as a Committee Draft (CD - stage 30.00)
* Draft document can be registered as a Draft International Standard (DIS - stage 40.00)

**3 In case of disapproval, do you believe that further study and consultations are needed first among committee members on this proposal as a preliminary work item before this proposal can be formally accepted?** * Yes
* No

**4 1b. Did you consult with the range of relevant stakeholders identified in the proposal in the development of this voting position and related comments?** * Yes
* No

**5 2. Standard(s), regulation(s), and other relevant documentation existing in our country, with any remarks concerning their application if necessary and consequences for global relevance, as well as copyright information on these documents, are attached:** * Yes (references provided below) \*
* No

**6 3. Do you wish to add any additional comments?** * Yes \*
* No

**7 4. We are committed to participating actively in the development of the project, at least by commenting on working drafts (P-members voting "Disapprove" in Qu. 1a may nevertheless nominate experts):** * Yes (and we nominate an expert below) \*
* No
 | **1 1a. Do you approve, disapprove or abstain on this NWIP?** * Approve

**2 Please also select from one of the following options (note that if no option is selected, the default will be the first option):** * Draft document can be registered as a Working Draft (WD - stage 20.00)

**3 In case of disapproval, do you believe that further study and consultations are needed first among committee members on this proposal as a preliminary work item before this proposal can be formally accepted?** * No

**4 1b. Did you consult with the range of relevant stakeholders identified in the proposal in the development of this voting position and related comments?** * Yes

**5 2. Standard(s), regulation(s), and other relevant documentation existing in our country, with any remarks concerning their application if necessary and consequences for global relevance, as well as copyright information on these documents, are attached:** * No

**6 3. Do you wish to add any additional comments?** * No

**7 4. We are committed to participating actively in the development of the project, at least by commenting on working drafts (P-members voting "Disapprove" in Qu. 1a may nevertheless nominate experts):** * Yes (and we nominate an expert below) \*

**Dr M S Parmar, NITRA, Ghaziabad nominated as expert from BIS to represent India** | High |
| NP | ISO/NP 16602-6 | Protective clothing for protection against chemicals — Classification, labelling and performance requirements — Part 6: Guidance for Selection, Use, Care and Maintenance | **1 1a. Do you approve, disapprove or abstain on this NWIP?** * Approve
* Disapprove \*
* Abstain due to lack of consensus
* Abstain due to lack of national expert input

**2 Please also select from one of the following options (note that if no option is selected, the default will be the first option):** * Draft document can be registered as a Working Draft (WD - stage 20.00)
* Draft document can be registered as a Committee Draft (CD - stage 30.00)
* Draft document can be registered as a Draft International Standard (DIS - stage 40.00)

**3 In case of disapproval, do you believe that further study and consultations are needed first among committee members on this proposal as a preliminary work item before this proposal can be formally accepted?** * Yes
* No

**4 1b. Did you consult with the range of relevant stakeholders identified in the proposal in the development of this voting position and related comments?** * Yes
* No

**5 2. Standard(s), regulation(s), and other relevant documentation existing in our country, with any remarks concerning their application if necessary and consequences for global relevance, as well as copyright information on these documents, are attached:** * Yes (references provided below) \*
* No

**6 3. Do you wish to add any additional comments?** * Yes \*
* No

**7 4. We are committed to participating actively in the development of the project, at least by commenting on working drafts (P-members voting "Disapprove" in Qu. 1a may nevertheless nominate experts):** * Yes (and we nominate an expert below) \*
* No
 | **1 1a. Do you approve, disapprove or abstain on this NWIP?** * Approve

**2 Please also select from one of the following options (note that if no option is selected, the default will be the first option):** * Draft document can be registered as a Working Draft (WD - stage 20.00)

**3 In case of disapproval, do you believe that further study and consultations are needed first among committee members on this proposal as a preliminary work item before this proposal can be formally accepted?** * No

**4 1b. Did you consult with the range of relevant stakeholders identified in the proposal in the development of this voting position and related comments?** * Yes

**5 2. Standard(s), regulation(s), and other relevant documentation existing in our country, with any remarks concerning their application if necessary and consequences for global relevance, as well as copyright information on these documents, are attached:** No**6 3. Do you wish to add any additional comments?** * No

**7 4. We are committed to participating actively in the development of the project, at least by commenting on working drafts (P-members voting "Disapprove" in Qu. 1a may nevertheless nominate experts):** * Yes (and we nominate an expert below) \*

Shri Sudhir Takkar, System 5s, Chennai | High |

**9.2** It was observed that clause 4.2.2 of IS 15748 contains an ambiguity regarding whether the requirements for both one-piece and two-piece garments must be met simultaneously, or if they can be fulfilled separately. To remove this ambiguity and after detailed deliberations, the committee decided to finalize the following amendment:

[*National Foreword, Third cover page, Para* 5, (*see* *also* Amendment 1 *and* 2)] — Insert the following new para after para 5:

‘Clause **4.2.2** has been modified for better clarity and the modified clause is given in National Annex C.’

[*Page* 22, *National Annex* B, (*see also* Amendment 2)] — Insert the following National Annex C after National Annex B:

**‘ANNEX C**

(*National Foreword*)

**4.2.2** Protective clothing

Heat and flame protective suits shall completely cover the upper and lower torso, neck, arms to the

wrist, and legs to the ankle. Suits shall consist of one of the following:

a) a single garment, e.g. a coverall or boiler suit;

b) a two-piece garment, consisting of a jacket and a pair of trousers;

For two-piece garment, trouser bottoms shall overlap the top of the footwear and this overlap should be maintained while walking and crawling.

Also, quick-release fastenings shall be provided to enable rapid removal of the garments in the event of an emergency.

Where protection to the requirements of this International Standard is provided by an outer two-piece suit, it shall be determined that, when correctly sized for the wearer, an overlap between the jacket and trousers remains when one standing wearer firstly fully extends both arms above the head and then bends over until the fingertips touch the ground.

Conformity shall be checked by visual inspection including an assessment of fit and physical measuring when the appropriate size of clothing is donned by a wearer.

In addition, the wrists, lower arms, and ankles shall also remain covered in an upright position; this

shall also apply to one-piece suits.’

The Committee also DECIDED to waive off the wide circulation of the above amendment as per provisions laid down under Rule 22 (4) of BIS Rules 2018 notified vide GSR 584(E) dated 25 June 2018, as the matter is editorial. BIS may carry out editorial changes, if any.

**9.3** Regarding IS 15741 for Curtains and Drapes, the committee noted that the standard is under QCO. The member secretary informed the committee that the standard may need modifications for better clarity and facilitate smoother implementation. After detailed deliberations, the committee decided to incorporate the following changes in the standard:

1. (*Clause* 1.1) — Substitute the following for existing:

‘**1.1** This standard specifies requirements for the resistance to ignition of fire-retardant textile curtains or drapes or their fabrics.

NOTE — The levels of ignition resistance have been set after careful consideration of the fire risk of the particular end-use environment involved. These levels do not necessarily reflect the behaviour of curtains and drapes in a fully developed fire.’

1. (*Clause* 3.1) — Insert the following clause before clause 3.1 and renumber the existing clauses:

‘**3.1 Curtains or drapes** — Curtains/drapes refers to the textile coverings used to block light, dust, wind etc from windows, doors, screens etc.’

1. (*Annex* B)— Substitute the following for existing:

‘**ANNEX B**

(*Clause* 4.1 *and* *Table* 1)

**BROAD CLASSIFICATION OF VARIOUS**

**OCCUPANCIES INTO DIFFERENT DEGREE OF HAZARD**

**B-1 LOW HAZARD OCCUPANCIES**

1. Analytical, Inspection and/or Q.C. Laboratories;
2. Assembly buildings (small) – Institutional / Office Seminar or Meeting halls;
3. Clubs;
4. Day Centres;
5. Dwellings, lodges, dormitories, etc;
6. Educational and Research Institutions;
7. Office premises;
8. Places of worship; and
9. Residential buildings (except hotels);
10. Museums, archives and record rooms

**B-2 MODERATE HAZARD OCCUPANCIES**

1. Airport and other transportation terminal buildings;
2. Assembly buildings (large): Places of Public Entertainment or Gatherings
3. Casinos;
4. Computer Installations (like data centres, server rooms, etc);
5. Hospitals including ‘X’ ray and other diagnostic clinics;
6. Mercantile occupancies (departmental stores, shopping complex, shopping malls, etc);
7. Museums, archives, record rooms;
8. Places of public entertainment (exhibitions, marriage pandals, theatres, cinema halls, etc.);
9. Public Halls;
10. Public houses and bars; and
11. Residential apartments, hotels, cafes, restaurants

**B-3 HIGH HAZARD OCCUPANCIES**

1. Hazardous occupancy buildings;
2. Offshore installations;
3. Prison cells;
4. Sleeping accommodation in certain hospital wards; and
5. Underground shopping complexes and underground shopping malls.’

The committee decided that BIS shall prepare a draft revision after incorporating the above-mentioned changes and the same shall be circulated to the committee members for 15 days for comments.

**9.4** The meeting ended with a hearty vote of thanks to and from the chair.