

Stichting Life and Building Safety Initiative

**Standard for Structural, Fire and Electrical Safety in the Ready-Made Garment
and Footwear Sector in India**

- Annexure 1 includes the sector of Bags and Accessories

Version 1.0

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Stichting Life and Building Safety Initiative

Standard for Structural, Fire and Electrical Safety in the Ready-Made Garment and Footwear sector in India - Annexure 1 includes the sector of Bags and Accessories sector

Overview

This document, together with the current India LABS standards (Issue 4, August 17, 2018), serve as the minimum requirements for RMG, footwear, bag, and accessory industries. They are intended to address the concerns that pose the greatest threat to the health and safety of the workers. They are based on global standards for structural, electrical, and fire engineering.

Compliance with this document and existing India LABS standards does not imply compliance with any other national codes, standards or statutory requirements that may prevail and it is not intended to replace those. For those factories which are part of the Stichting Life and Building Safety Initiative, while they may satisfy local codes, the minimum requirements of this document and exiting India LABS standard shall prevail, where related to life safety.

Implementation

This document will be implemented together with existing India LABS standards (Issue 4, 17th Aug 2018) in RMG, Footwear, Bags and Accessories factories in India where this life safety program is being rolled out.

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1 Part 1 Scope and Definitions

1.1 Scope

1.1.1 **Title.** Standard for Structural, Fire and Electrical Safety in the Ready-Made Garment and Footwear sector in India - Annexure 1 incl. Bags and Accessories sector developed by the LABS Initiative shall be referred to herein as "the Standard" or "this Standard."

1.2 Application

1.2.1 This Standard is the standard which shall be used together with existing India LABS standards (Issue 4, 17th Aug 2018) in India for the LABS Initiative.

1.2.2 This Standard shall apply to the construction, addition, alteration, enlargement, extension, replacement, repair, installation or movement of major equipment, use and occupancy, maintenance, removal, and demolition of all buildings or any parts of the building that are used for the RMG, Footwear, Bags and Accessories factories in India.

1.2.3 This Standard also applies to the buildings and infrastructure of subcontractors who produce RMG, footwear, bags, and accessories for LABS associated brands.

1.3 Purpose: The objective of this Standard is to create a set of minimal requirements that may be used by suppliers affiliated with LABS to assess the structural, fire, and electrical safety of new and existing RMG, footwear, bag, and accessory facilities.

1.4 Disclaimer: The technical principles and requirements of this Standard are intended to be used by professional Structural Engineers, Fire Safety Engineers or Architects, and Electrical Engineers who are competent enough to evaluate the significance and limitation of its content and who will accept the responsibility for the application of the material it contains. The developers of this Standard and the Stichting Life and Building Safety Initiative disclaim any responsibility for the stated principals and requirements and shall not be liable whether in contract or tort (including strict liability and negligence) for any loss, damage or injury of any kind and the nature resulting from the application of the principles and requirements stated in the Document.

1.5 References

1.5.1 **General:** The documents listed in this section are referenced in this Standard and the portions thereof are considered part of the requirements of this Standard to the extent of each such reference.

1.5.2 **Indian National Building Code**

Current versions of Indian National Building Code. The following is a non-exhaustive list of codes referred to in this Standard:

1.5.2.1 National Building Code of India 2016, Volumes 1 & 2

1.5.3 **Indian National Laws and Rules.** Current versions of codes published by Bureau of Indian Standards. The following is a non-exhaustive list of codes referred to in this Standard:

1.5.3.1 **IS 456: 2000 Plain and Reinforced Concrete – Code of Practice**

1.5.3.2 IS 800: 2007 General Construction Steel – Code of Practice

1.5.3.3 IS 875: 1987 Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures Part 1 Dead Loads

1. IS 875: 1987 Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures Part 2 Imposed Loads
2. IS 875: 2015 Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures Part 3 Wind Loads
3. IS 875: 1987 Code of Practice for Design Loads (Other than Earthquake) for Buildings and Structures Part 5 Special Loads and Combinations

1.5.3.4 IS 1893: 2016 Criteria for Earthquake Resistant Design of Structures Part 1 General Provisions and Buildings

1.5.3.5 IS 1641: Code of practice for fire safety of buildings (general) - General principles of fire grading and classification

1.5.3.6 IS 1642: Code of practice for fire safety of buildings (general) - DETAILS OF CONSTRUCTION CODE OF PRACTICE

1.5.3.7 IS 1643: Code of practice for fire safety of buildings (general) - Exposure hazard

1.5.3.8 IS 1644: Code of practice for fire safety of buildings (general) Exit requirements and personal hazard

1.5.3.9 IS 1646: Code of practice for fire safety of buildings (general) - Electrical installations

1.5.3.10 IS 2189: Selection, Installation and Maintenance of Automatic Fire Detection and Alarm System Code of Practice

1.5.3.11 IS 2190: Selection, Installation and Maintenance of Fire Extinguishers

1.5.3.12 IS 3844: Code of practice for installation and maintenance of internal fire hydrants and hose reels on premises

1.5.3.13 IS 9668: Code of practice for provision and maintenance of water supplies and fire fighting

1.5.3.14 IS 13039: External hydrant systems - provision and maintenance - Code of practice

- 1.5.3.15 IS 15105: Design and Installation of Fixed Automatic Sprinkler Fire Extinguishing Systems - Code of Practice
- 1.5.3.16 IS 15301: Installation and Maintenance of Fire Fighting Pumps--Code of Practice
- 1.5.4 **ICC publications.** International Code Council, 5203 Leesburg Pike, Suite 600, Falls Church, VA 22041 USA.
 - 1.5.4.1 IBC, International Building Code, 2021
 - 1.5.4.2 IFC, International Fire Code, 2021
 - 1.5.4.3 IEBC, International Existing Building Code, 2021
- 1.5.5 **NFPA publications.** National Fire Protection Association, 1 Batterymarch Park, Quincy, MA 02169 - 7471 USA.
 - 1.5.5.1 NFPA 1, Fire Code, 2021
 - 1.5.5.2 NFPA 10, Standard for Portable Fire Extinguishers, 2022
 - 1.5.5.3 NFPA 13, Standard for the Installation of Sprinkler Systems, 2022
 - 1.5.5.4 NFPA 14, Standard for the Installation of Standpipe and Hose Systems, 2019
 - 1.5.5.5 NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, 2022
 - 1.5.5.6 NFPA 22, Water Tanks for Private Fire Protection, 2018
 - 1.5.5.7 NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, 2020
 - 1.5.5.8 NFPA 30, Flammable and Combustible Liquids Code, 2021
 - 1.5.5.9 NFPA30B, Code for the Manufacture and Storage of Aerosol Products, 2019
 - 1.5.5.10 NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, 2021
 - 1.5.5.11 NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, 2019
 - 1.5.5.12 NFPA 70 National Electrical Code®, 2020
 - 1.5.5.13 NFPA 72, National Fire Alarm and Signaling Code, 2022
 - 1.5.5.14 NFPA 80, Standard for Fire Doors and Other Opening Protectives, 2022
 - 1.5.5.15 NFPA 85, Boiler and Combustion Systems Hazards Code, 2019
 - 1.5.5.16 NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, 2021
 - 1.5.5.17 NFPA 92, Standard for Smoke Control Systems, 2021
 - 1.5.5.18 NFPA 101, Life Safety Code®, 2021
 - 1.5.5.19 NFPA 110, Standard for Emergency and Standby Power Systems, 2022

- 1.5.5.20 NFPA 111, Standard on Stored Electrical Energy Emergency and Standby Power Systems, 2022
- 1.5.5.21 NFPA 204, Standard for Smoke and Heat Venting, 2021
- 1.5.5.22 NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2022
- 1.5.5.23 NFPA 252, Standard Methods of Fire Tests of Door Assemblies, 2022
- 1.5.5.24 NFPA 257, Standard on Fire Test for Window and Glass Block Assemblies, 2022
- 1.5.5.25 NFPA 5000, Building Construction and Safety Code®, 2021

- 1.5.6 **ACI publications.** American Society of Civil Engineers, 1801 Alexander Bell Drive, Reston, VA 20191 USA.
- 1.5.6.1 ASCE 41, Seismic Evaluation and Retrofit of Existing Buildings, 2013

- 1.5.7 **ASME Publications.** American Society of Mechanical Engineers, Two Park Avenue, New York, NY 10016 USA.
- 1.5.7.1 ASME A17.1 Safety Code for Elevators and Escalators, 2010

- 1.5.8 **ASTM Publications.** ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428 USA.
- 1.5.8.1 ASTM E 84, Standard Test Method for Surface Burning Characteristics of Building Materials, 2010.
- 1.5.8.2 ASTM E 119, Standard Test Methods for Fire Tests of Building Construction and Materials, 2010b.
- 1.5.8.3 ASTM E 136, Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 Degrees C, 2009b.
- 1.5.8.4 ASTM E 814, Standard Test Method for Fire Tests of Through-Penetration Fire Stops, 2010.

- 1.5.9 **FM Global publications.** FM Global, 270 Central Avenue, Johnston, RI 02919-4923 USA.
- 1.5.9.1 FM Data Sheet 7-1, Fire Protection for Textile Mills, April 2020.
- 1.5.9.2 FM Data Sheet 8-7, Baled Fiber Storage, April 2017.

- 1.5.10 **Indian Standards.** Bureau of Indian Standards, 9 Bahadur Shah Zafar Marg, New Delhi-110002, India
- 1.5.10.1 IS 732 Code of Practice of Electrical Wiring Installation
- 1.5.10.2 IS 3043 Code of Practice of Earthing

- 1.5.11 **International Electrotechnical Commission.** 3, rue de Varembé, 1st floor, P.O. Box 131, CH - 1211 Geneva 20 - Switzerland
- 1.5.11.1 IEC 60364-4-42 Low voltage electrical installations Protection for safety - Protection against thermal effects

1.5.11.2 ISO 8528 Reciprocating internal combustion engine driven alternating current generating sets.

1.5.12 **Factories Act 1948.** Act No. 63 of 1948, Ministry of Labour and Employment, Government of India, 23 Sept 1948.

2 Part 2 Structure Safety Referred Codes Updates

First, the factories producing RMG, footwear, bags, and accessories must adhere to the references in Part 1.5 and Section 8 of the current LABS standard. This standard introduced several new references and revised several of the cited codes, as shown in the table below:

No.	Group	Standard / Code	Code Descriptions
01	DEA	IS516: 2018	Part 4- Concrete Core Tests
02	DEA	IS 13311 Part 1:2004 Part 2: 2018	Method of Non-destructive testing of concrete Part 1: Ultrasonic pulse velocity; Part 2: Rebound hammer
03	DEA & Remediation	ASCE 41:2017	Seismic Evaluation and Retrofit of Existing Buildings

3 Part 3 Structure Safety Requirements

3.1 General

The primary objectives of this section are to expand and apply the updates and reviews for structural safety in the RMG, footwear, bags, and accessory manufacturers in India into practice. As a result, it is essential to adhere to the requirements in part 8 of "The existing LABS Standard (Issue 4, 17th Aug 2018, 21st Nov 2018)."

Stichting Life and Building Safety Initiative Standard new revisions have been taken into consideration based on:

- 1) Extent of coverage of the current standard for accessory factories
- 2) Practical conformity when applying the standard

3.2 Terms and Definitions:

Terms and Definitions shall follow the existing LABS standard.

3.3 Updates to Existing LABS Methodology and Standards

3.3.1 Methodology Updates

3.3.1.1 **LABS Methodology - C1 Garment Factory Loading Guidance, Storage Loads.** Adding references for new types of storage as below:

Material type	Density (kN/m ³)	Reference
Leather	8.0-10.5	Refer to product properties of leather. (Density = 0.8~1.05 g/cm ³) vegetable-tanned sole leather:0.95~1.05 g/cm ³ vegetable-tanned other than sole leather:0.8~0.9 g/cm ³
PVC sheets	16.1~17.1	Refer to product properties of PVC sheet. (Density = 1.65~1.75 g/cm ³)
Polyester webbing roll	13.5	Refer to product properties of polyester (Density = 1.38 g/cm ³)

3.3.1.2 **LABS Methodology - C1 Garment Factory Loading Guidance, Machinery and Dynamic Loads.** Adding details for Machinery and Dynamic Loads as below:

Attention should also be made to the plinths on which the equipment may be set up and the effects of vibration from the machinery, referring to NBCI Part 6.

- Dampers should be installed at the feet of the machinery to reduce dynamic load;
- Use static load instead of dynamic load on elevated floors in the FOS calculation for the columns;
- The dynamic load needs to be considered for the flooring system capacity, and fatigue checked by a qualified engineer;
- If no information provided by the machinery manufacturer, suggest using a dynamic load factor of 1.20~1.5.

Some cases as mentioned in clause NBCI Part 6 Section 1 Cl 3.6.1:

- Light machinery, shaft-or motor-driven: Dynamic Load factor of 1.2
- Reciprocating machinery or power-driven units: Dynamic Load factor of 1.5

3.3.2 **Standards Updates**

3.3.2.1 Exiting Standard 8.4.10 - New adding for structure check with **shared building**

For the shared buildings, special attention should be paid:

- The site tour should include the entire building to identify the major structure alterations, potential excessive loading, and significant stressed signs in the areas not occupied by the factory. The factory also needs to coordinate with the landlord or other tenants.
- If the access to areas is denied, the situation shall be noted in the report. Even more if the structural assessors decided that the non-accessible area is crucial for the structure safety assessment, then the assessment could be deemed as inconclusive, classified as Black- unable to complete full assessment.
- The landlord should be responsible to monitor any structure alteration and be transparent to all the tenants. Once any major structure alteration occurs, the factory should raise the notification to LABS.

3.3.2.2 Exiting Standard 8.6.14 - New adding for structure check with **dynamic load**

Floor structural members to support heavy machines such as cutting, pressing machines must confirmed the adequate capacity by designed or inspection report. The calculation should include the floor vibration and structural fatigue calculation.

The calculation should include floor vibration and structural fatigue calculation, according to NBCI Part 6 Annex M.

3.3.2.3 Exiting Standard 8.16.8 - New adding for **roof stability** check

Roof sheeting must have the capacity to resist wind load according to the standard: **IS875-3 and SP6-5**.

4 Part 4 Fire Safety Referred Codes Updates

The RMG, Footwear, Bags and Accessories factories shall comply with the latest issues of the references in Section 1.5 of existing LABS standard. This Stichting Life and Building Safety Initiative Standard updated for some of the referred codes and added several new references as listed in below table:

Group	Clause	Codes referred in LABS standard	New edition
Indian National Building Code	1.5.2.1	National Building Code of India 2016, Volumes 1 & 2	Not updated
Indian National Laws and Rules	1.5.3.8	Not listed	IS 1641: Code of practice for fire safety of buildings (general) - General principles of fire grading and classification
	1.5.3.9	Not listed	IS 1642: Code of practice for fire safety of buildings (general) - DETAILS OF CONSTRUCTION CODE OF PRACTICE
	1.5.3.10	Not listed	IS 1643: Code of practice for fire safety of buildings (general) - Exposure hazard
	1.5.3.11	Not listed	IS 1644: Code of practice for fire safety of buildings (general) Exit requirements and personal hazard
	1.5.3.12	Not listed	IS 1646: Code of practice for fire safety of buildings (general) - Electrical installations
	1.5.3.13	Not listed	IS 2189: Selection, Installation and Maintenance of Automatic Fire Detection and Alarm System Code of Practice
	1.5.3.14	Not listed	IS 2190: Selection, Installation and Maintenance of Fire Extinguishers
	1.5.3.15	Not listed	IS 3844: Code of practice for installation and maintenance of internal fire hydrants and hose reels on premises
	1.5.3.16	Not listed	IS 9668: Code of practice for provision and maintenance of water supplies and fire fighting
	1.5.3.17	Not listed	IS 13039: External hydrant systems - provision and maintenance - Code of practice

	1.5.3.18	Not listed	IS 15105: Design and Installation of Fixed Automatic Sprinkler Fire Extinguishing Systems - Code of Practice
	1.5.3.19	Not listed	IS 15301: Installation and Maintenance of Fire Fighting Pumps--Code of Practice
ICC publications	1.5.4.1	IBC, International Building Code, 2012.	IBC, International Building Code, 2021
	1.5.4.2	IFC, International Fire Code, 2012.	IFC, International Fire Code, 2021
	1.5.4.3	IEBC, International Existing Building Code, 2012.	IEBC, International Existing Building Code, 2021
NFPA publications	1.5.5.1	NFPA 10, Standard for Portable Fire Extinguishers,2013.	NFPA 10, Standard for Portable Fire Extinguishers,2022
	1.5.5.2	NFPA 13, Standard for the Installation of Sprinkler Systems,2013.	NFPA 13, Standard for the Installation of Sprinkler Systems,2022
	1.5.5.3	NFPA 14, Standard for the Installation of Standpipe and Hose Systems, 2013.	NFPA 14, Standard for the Installation of Standpipe and Hose Systems, 2019
	1.5.5.4	NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, 2013.	NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, 2022
	1.5.5.5	NFPA 22, Water Tanks for Private Fire Protection,2013.	NFPA 22, Water Tanks for Private Fire Protection,2018
	1.5.5.6	NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, 2011	NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, 2020
	1.5.5.7	NFPA 30, Flammable and Combustible Liquids Code,2012.	NFPA 30, Flammable and Combustible Liquids Code,2021
	1.5.5.8	NFPA30B, Code for the Manufacture and Storage of Aerosol Products,2011.	NFPA30B, Code for the Manufacture and Storage of Aerosol Products,2019
	1.5.5.9	NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, 2010.	NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, 2021
	1.5.5.10	NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, 2014.	NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, 2019
	1.5.5.11	NFPA 70, National Electrical Code®, 2011.	NFPA 70 National Electrical Code®, 2020

	1.5.5.12	NFPA 72, National Fire Alarm and Signaling Code, 2013.	NFPA 72, National Fire Alarm and Signaling Code, 2022
	1.5.5.13	NFPA 80, Standard for Fire Doors and Other Opening Protectives, 2013.	NFPA 80, Standard for Fire Doors and Other Opening Protectives, 2022
	New add	Not listed	NFPA 85, Boiler and Combustion Systems Hazards Code, 2019
	1.5.5.14	NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, 2012.	NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, 2021
	1.5.5.15	NFPA 92, Standard for Smoke Control Systems,2012.	NFPA 92, Standard for Smoke Control Systems,2021
	1.5.5.16	NFPA 101, Life Safety Code®, 2012.	NFPA 101, Life Safety Code®, 2021
	1.5.5.17	NFPA 110, Standard for Emergency and Standby Power Systems,2013.	NFPA 110, Standard for Emergency and Standby Power Systems,2022
	1.5.5.18	NFPA 111, Standard on Stored Electrical Energy Emergency and Standby Power Systems, 2013.	NFPA 111, Standard on Stored Electrical Energy Emergency and Standby Power Systems, 2022
	New add	Not listed	NFPA 204, Standard for Smoke and Heat Venting, 2021
	1.5.5.19	NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2013.	NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2022
	1.5.5.20	NFPA 252, Standard Methods of Fire Tests of Door Assemblies,2012.	NFPA 252, Standard Methods of Fire Tests of Door Assemblies,2022.
	1.5.5.21	NFPA 257, Standard on Fire Test for Window and Glass Block Assemblies, 2012.	NFPA 257, Standard on Fire Test for Window and Glass Block Assemblies, 2022.
	New add	Not listed	NFPA 5000, Building Construction and Safety Code®, 2021
	1.5.5.1	NFPA 10, Standard for Portable Fire Extinguishers,2013.	NFPA 10, Standard for Portable Fire Extinguishers,2022
	1.5.5.2	NFPA 13, Standard for the Installation of Sprinkler Systems,2013.	NFPA 13, Standard for the Installation of Sprinkler Systems,2022
FM Global publications	1.5.9.1	FM Data Sheet 7-1, Fire Protection for Textile Mills, January 2012.	FM Data Sheet 7-1, Fire Protection for Textile Mills, April 2020.
	1.5.92	FM Data Sheet 8-7, Baled Fiber Storage, April 2017.	Not updated

5 Part 5 Fire Safety Requirements

5.1 General

In order to ensure an adequate level of safety to the occupants in the event of fire, the requirements of Part 3 through Part 6 of existing LABS Standard shall be followed. Some of the requirements were modified in this Stichting Life and Building Safety Initiative Standard so that factories producing bags and accessories may more easily comply.

5.2 Definitions

5.2.1 General Industrial Occupancy: Refer to the current LABS standard, 3.13.4. The Industrial - General Industrial Occupancy Type includes bag and accessory manufacturing facilities.

5.2.2 Special-Purpose Industrial Occupancy: Refer to the current LABS standard, 3.13.5. The Bags and accessories factories are typically not classified as Industrial – Special-Purpose Industrial Occupancy Type.

5.2.3 High-Hazard Industrial Occupancy: Refer to the existing LABS standard 3.13.6. Industrial occupancies in which incidental high-hazard operations in low-or ordinary-hazard occupancies are protected in accordance with Section 3.14.5 in existing LABS Standard, are considered to be Separated occupancies hence are not required to be the basis for overall occupancy classification.

5.2.4 Storage Occupancy - Ordinary Hazard Contents: Refer to the existing LABS standard 3.13.15. Most of the time, factories that make bags and accessories fall within the classification of Ordinary Hazard Contents. The NBC of India 2016 refers to storage occupancy as Group H Storage Buildings. Storage Occupancy - Ordinary Hazard Contents will be deemed to be similar to NBC Occupancy Group H for the purposes of applying this Standard.

5.2.5 Boiler: A boiler is defined as a closed vessel used to heat water, produce steam, superheat steam, or any combination of these things using heat from combustible fuels in a separate or linked furnace.

5.2.6 Electric Steam Boiler: An electrical device that converts an electric current into heat to generate steam.

5.2.7 Parking Structure: A structure, building, or part of a structure that is used to park, store, or both, automobiles. Additional categories for parking structures include open, enclosed, basement, and underground. Parking structure criteria must be in accordance with the current LABS standard 3.14.12.

5.3 Updated requirements

5.3.1 General Fire Safety Requirements

5.3.1.1 **Separated Occupancies**

Where separated occupancies are provided or the shared building has more than one type of occupancies, new and existing occupancies shall be separated by fire-resisting enclosure from other occupancy types, in accordance with NFPA 5000 Section 6.2.4.

5.3.1.2 **Generators**

3.14.8.1 Generator sets shall be separated from all other occupancy areas by a minimum 2-hour construction. Fuel tanks shall be limited to a maximum 2500 L (660 gal) when located in a building with other occupancies. Exhaust shall be in accordance with NFPA 37. All exhaust systems shall discharge to the exterior of the building in a safe location. Further, the following additional aspects may be taken into account in the location of generator room:

- 1) The generator room shall be provided with its dedicated natural or mechanical ventilation system. Mechanical ventilation system for the generator room would be accepted with 60 min fire resistance rating ductwork, if it has interface with other mechanical areas. Ventilation system should not be allowed to be routed through any dedicated electrical room area or through exit corridor/exits.
- 2) The oil tank for the generator shall be provided with a dyked enclosure having a volumetric capacity of at least 10 percent more than the volume of the oil tank (if not an in-built day-tank for fuel placed under Alternator). The enclosure shall be filled with sand for a height of 300 mm.
- 3) Diesel generator set(s) shall not be installed at any floor other than ground/first basement.

5.3.1.3 **Other Hazardous Area Protection**

It is recommended that rooms used for the housing of transformers, compressors, refrigerating machinery, UPS batteries and other hazardous areas are located outside and away from the main facilities. In the case this is not possible, such rooms:

- 1) Shall not be located directly under, or directly adjacent to, exits (hence cannot be connected to exit corridors, etc. stairs by way of lobbies).
- 2) Shall be protected by a fire barrier without windows that has a 1-hour fire resistance rating and/or protected by automatic extinguishing systems, in accordance with section 8.15, 29.3.2 and 30.3.2 of NFPA 5000.

5.3.1.4 **Power Batteries and Charging room**

- 1) The EPS/UPS battery set(s) shall be located in a room(s) in accordance with the manufacturer's environmental specifications.
- 2) The location of EPS/UPS shall not be installed in the same room with the normal supply equipment, where the supply equipment is rated over 150 volts to ground and equal to or greater than 1000 amperes.
- 3) The rooms or buildings housing the EPS/UPS battery set(s) shall be located to minimize the

possibility of damage from flooding, including flooding resulting from firefighting, sewer water backup, and similar disasters or occurrences.

5.3.1.5 **Parking Structure**

Open, enclosed, basement, and underground parking structures, shall be constructed in accordance with NFPA 88A, Standard for Parking Structures.

Parking of personal motor vehicles shall not be allowed in existing buildings unless the parking area is separated by 1-hour fire-resistive rated construction or automatic sprinkler protection is provided. In addition, parking shall only be permitted if adequate provisions for carbon monoxide detection/removal are provided, and if parking areas were originally designed or subsequently approved for the parking of vehicles by appropriate legislative parties.

5.3.1.6 **Chemical Storage**

The requirements of NFPA 5000 (2015) Section 8.15 shall be incorporated. Where hazardous processes or storage e.g., chemical processing or storage is of such a character as to introduce and explosion potential, an explosion venting system or an explosion suppression system specifically designed for the hazard shall be provided subject to a risk assessment by and LABS-appointed engineer.

The requirements of IS 5571, Guide for Selection and installation of Electrical Equipment for Hazardous Areas (other than mines) and IS 5572, Classification of hazardous areas (other than mines) shall be incorporated.

5.3.1.7 **Flammable and Combustible Liquid**

Process buildings or structures used for liquid operations shall be constructed consistent with the operations being conducted and with the classes of liquids handled. They shall be constructed to minimum Type II (000) construction, as defined in NFPA 5000, Building Construction and Safety Code.

Precautions shall be taken to prevent the ignition of flammable vapors by sources such as the following:

- (1) Open flames
- (2) Lightning
- (3) Hot surfaces
- (4) Radiant heat
- (5) Smoking
- (6) Cutting and welding
- (7) Spontaneous ignition
- (8) Frictional heat or sparks
- (9) Static electricity
- (10) Electrical sparks
- (11) Stray currents
- (12) Ovens, furnaces, and heating equipment

Class I liquids shall not be handled or used in basements.

Where Class I liquids are handled or used above grade within buildings with basements or closed pits into which flammable vapors can travel, such below grade areas shall be provided with mechanical ventilation designed to prevent the accumulation of flammable vapors.

Means shall be provided to prevent liquid spills from running into basements.

5.3.2 **Fire Protection Systems**

5.3.2.1 **Automatic Sprinkler Systems**

For new industrial and storage occupancies, other than low hazard industrial/storage occupancies, shall be protected by an approved automatic sprinkler system in accordance with NFPA13 or IS 15015 in any of the following locations:

- (1) Throughout all industrial/storage occupancies three or more stories in height
- (2) Throughout all industrial/storage occupancies exceeding 12,000 ft² (1115 m²) in fire area
- (3) Where the total area of all floors, including mezzanines, exceeds 24,000 ft² (2230 m²).

Automatic sprinkler system installation requirements for **Existing Constructions** shall follow 5.3.1.2 of the existing LABS standard.

5.3.2.2 **Control Valves in Automatic Sprinkler Systems**

Each control valve shall be identified and provided with the signs that indicating the system or portion of the system that controls.

Systems that have more than one control valve that must be closed to work on a system shall have a sign on each affected valve referring to the existence and location of other valves.

Each typically open valve needs to be electrically overseen in compliance with the relevant NFPA standards, or it needs to be secured using a seal, a lock, or both.

Normally closed valves must be electrically overseen or secured with a seal in line with the relevant NFPA standard.

5.3.2.3 **Automatic Sprinkler Systems for Storage Protection**

All storage shall be maintained with a 460 mm minimum clearance from the top of storage to the sprinkler deflector.

A minimum clearance to storage of 36 in. (900 mm) shall be permitted for special sprinklers.

The clearance from the top of storage to sprinkler deflectors shall be not less than 36 in. (900 mm) where rubber tires are stored.

5.3.2.4 **Water Supply**

Types of water supply. Water supplies shall be one of the following or any combination:

- 1) A connection to an approved public waterworks system where pressure and flow rate are adequate
- 2) Automatic fire pumps connected to an approved water source in accordance with NFPA 20 or IS 15301
- 3) A connection to a water storage tank at grade or below grade installed in accordance with NFPA 22 or IS 9668 and filled from an approved source
- 4) A connection to a pressure tank installed in accordance with NFPA 22 or IS 9668
- 5) A connection to a gravity tank installed in accordance with NFPA 22 or IS 9668
- 6) A penstock, flume, river, lake, pond, or reservoir

A single automatic or semiautomatic water supply shall be permitted for Stand Pipe systems where it must be capable of supplying the system demand for the required duration. [NFPA 14 (2019): 9.1.3]

A single automatically controlled fire pump installed in accordance with NFPA 20 shall be an acceptable water supply source for sprinkler system. [NFPA 13 (2022): 5.2.3]

Ideally the pumping set should include:

- 1) Jockey
- 2) Electric Main Pumps
- 3) Diesel Driven Main Pump

5.3.2.5 **Automatic Fire Detection and Alarm System**

Where required. A fire alarm system shall be required in accordance with NFPA 72 for industrial occupancies, unless the total occupant load of the building is under 100 persons and fewer than 25 persons are above or below the level of exit discharge.

Storage occupancies shall be provided with a fire alarm system in accordance with NFPA 72, except as modified by any of the following conditions:

- 1) Storage occupancies limited to low hazard contents
- 2) Storage occupancies with ordinary hazard contents not exceeding an aggregate floor area of 100,000 ft² (9300 m²)
- 3) Storage occupancies protected throughout by an approved automatic sprinkler system, with waterflow alarms monitored in accordance with NFPA 72

5.3.3 **Means of Egress (MOE)**

5.3.3.1 **Door Swing**

Swinging-Type Door Requirement. Any door assembly in a means of egress shall be of the side-hinged or pivoted-swinging type. The door leaf shall be designed and installed so that it is capable of swinging from any position to the full required width of the opening in which it is installed,

unless otherwise specified as follows:

Where permitted in NFPA 5000, horizontal-sliding or vertical-rolling security grilles or door assemblies that are part of the required means of egress shall be permitted, provided that all of the following criteria are met:

- 1) Such grilles or door leaves shall remain secured in the fully open position during the period of occupancy by the general public.
- 2) On or adjacent to the door opening, there shall be a readily visible, durable sign in letters at least 1 in. (25 mm) high on a contrasting background that reads as follows: THIS DOOR TO REMAIN OPEN WHEN THE SPACE IS OCCUPIED.
- 3) Door leaves or grilles shall not be brought to the closed position when the space is occupied.
- 4) Door leaves or grilles shall be operable from within the space without the use of any special knowledge or effort.
- 5) Where two or more means of egress are required, not more than half of the means of egress shall be equipped with horizontal-sliding or vertical-rolling door assemblies, or horizontal-sliding or vertical-rolling grilles.

Door openings to private garages, business areas, industrial areas, and storage areas with a maximum occupant load of 10 are allowed to be vertical-rolling doors as long as the contents of the respective private garages, business area, industrial areas, and storage areas are low or ordinary hazards.

6 Part 6 Electrical Safety Referred Codes Updates

The factories for RMG, footwear, bags, and accessories must adhere to the most recent revisions of the references in parts 1.5 and 10.2 of the applicable LABS standard. The following table lists the most recent versions of the codes that were referenced in the LABS standard before the Stichting Life and Building Safety Initiative Standard was created:

No.	Group	Standard / Code	Code Descriptions
01	Supplies to Life Safety Service	IEC 60364-5-56	Low-voltage electrical installations - Part 5-56: Selection and erection of electrical equipment - Safety services
		IS1646	Code of practice for fire safety of buildings (general): electrical installations
02	Earthing & Grounding	IEC 60364-5-54	Low-voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements and protective conductor
		IEC 62305-1/2/3	Installation of equipment earthing system for industrial projects - General requirements
		IS 6235	Protection against lightning - Part 1: General principles - Part 2: Risk management - Part 3: Physical damage to structures and life hazard
		IS 3043	Code of Practice for Earthing
03	Power supply	IEC 60947-1/ IS60947-1	Low-voltage switchgear and control gear - Part 1: General rules
		IEC 60364-5-53	Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control
		ISO 8528	Generator Set
04	Distribution	IEC 60364-1	Low-voltage electrical installations - Part 1: Fundamental principles, assessment of general characteristics, definitions

		IEC 60364-4-41	Low-voltage electrical installations - Part 4-41: Protection for safety - Protection against electric shock
		IEC 60364-4-42	Electrical installations of buildings - Part 4-42: Protection for safety - Protection against thermal effects
		IEC 60364-4-43	Low-voltage electrical installations - Part 4-43: Protection for safety - Protection against overcurrent
		IEC 60364-5-52	Low-voltage of electrical installations - Part 5-52: Selection and erection of electrical equipment – Wiring systems
		NBC-2016-Part 8-Section 2	Electrical and Allied Installations
05	Others	NFPA 70	National Electrical Code
		IS1646	Code of Practice for Fire Safety of Buildings (General): Electrical Installations
		IS5571	Guide for Selection and Installation of Electrical Equipment in Hazardous Area (Other Than Mines)

7 Part 7 Electrical Safety Requirement

7.1 General

The primary objectives of this part are to expand and apply the updates/reviews for electrical safety in the RMG, footwear, bags, and accessory factories in India into practice. Therefore, it is recommended to start by adhering to the standards in section 10 of "The Standard for Structural, Fire & Electrical Safety in the Ready-Made Garment and Footwear Sector in India." Priority was given in the preparation of this section to the use of local standards and the usefulness of applying standards. Consideration has been given to any modifications to electrical safety components based on:

- 1) extent of coverage of the current standard for accessory factories
- 2) ease of understanding for critical points, which should be described in more detail
- 3) practical conformity when applying the standard

7.2 Terms and Definitions:

Terms and Definitions shall be taken from SP30.

7.3 Hazard Locations

7.3.1 A location shall be regarded as hazardous where any one or more of the following conditions exists:

- a) where flammable gases or vapours may be present in the atmosphere in sufficient quantities to produce explosive or flammable mixtures.
- b) where combustible dust is produced or handled

Note: The presence of flammable vapour in atmosphere may be deemed possible when: (flash point should be referred to the MSDS)

- 1) The flash point of the liquids is below 32.2 °C;
- 2) Or combustible/ flammable liquids having flash point above 32.2 °C but not above 93.3°C are handled (a) sprayed or (b) present in the form of mist or (c) heat to or above its flash point.

7.3.2 The hazardous locations should be in a detached building or at least fire separated from the rest by a non-combustible fire resisting wall of 2h rating.

7.3.3 The selection of electrical equipment permitted in the hazard locations shall be governed by IS5572 and IS5571 respectively. The requirement may be modified in the particular situation as per Cl.13.1 of IS1646.

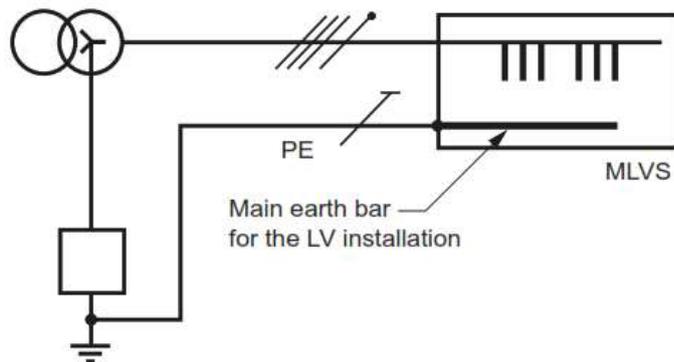
7.3.4 The factory needs to check through the MSDS if the chemical is easy to accumulate the static. If so, the flow of some flammable chemicals in the process of loading, unloading and use, is easy

to accumulate static electricity. Measures must be taken to prevent the static sparks.

7.3.5 In the hazard locations, it's important to keep good ventilation condition to prevent the concentration of the flammable chemical reaching the explosive limit.

7.4 c.s.a. of PE conductor between the MV/LV transformer and the Main Low Voltage Switchboards (MLVS)

Recommended C.S.A. of PE conductor between the MV/LV transformer and the MLVS, as a function of transformer ratings and fault-clearance times



Transformer rating in kVA (230/400 V output)	Conductor material	Bare conductors			PVC-insulated conductors			XLPE-insulated conductors		
		Copper t(s)			Aluminium t(s)			Aluminium t(s)		
		0.2	0.5	-	0.2	0.5	-	0.2	0.5	-
≤100	c.s.a. of PE conductors SPE (mm ²)	25	25	25	25	25	25	25	25	25
160		25	25	35	25	25	50	25	25	35
200		25	35	50	25	35	50	25	25	50
250		25	35	70	35	50	70	25	35	50
315		35	50	70	35	50	95	35	50	70
400		50	70	95	50	70	95	35	50	95
500		50	70	120	70	95	120	50	70	95
630		70	95	150	70	95	150	70	95	120
800		70	120	150	95	120	185	70	95	150
1000		95	120	185	95	120	185	70	120	150
1250		95	150	185	120	150	240	95	120	185

The table indicates the C.S.A. of the conductors in mm² according to:

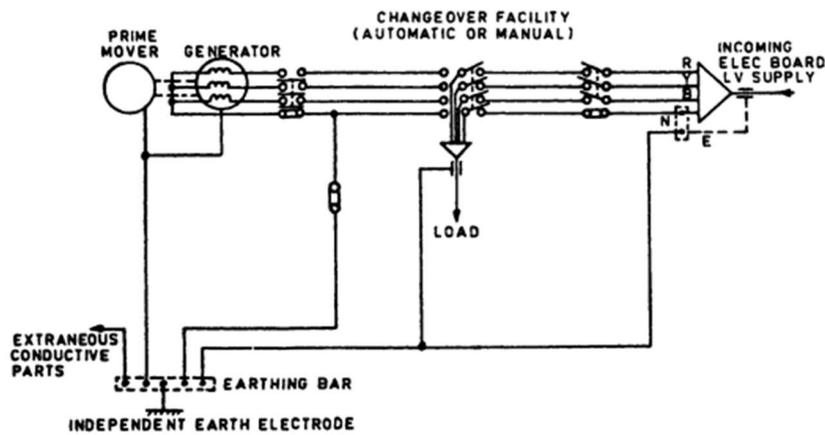
- 1) The nominal rating of the MV/LV transformer(s) in kVA
- 2) The fault-current clearance time by the MV protective devices, in seconds
- 3) The kinds of insulation and conductor materials

7.5 Transformer oil soak pit

For transformers having large oil content (more than 2000 liters), soak pits are to be provided. Soak pits shall be adequately sized to deal with the volume of oil. The details of soak pits could be referred to IS10028 Part II.

7.6 Earthing of generator

Backup generator should be earthed by two points: one for Neutral and one for Protective Earth. For the standby set, Special attentions need to be given to the change-over arrangement according to IS:3043_Clause 23.2.



NOTE 1 — Cable sheath earth of provided/shown - - - -

NOTE 2 — PNE link of provided/shown



NOTE 3 — Changeover switch could be 3-pole with linked neutral.

FIG. 24 SINGLE LOW VOLTAGE STANDBY GENERATOR (WITHOUT PARALLELING FACILITY)

7.7 Selection and Erection of Wiring Systems

7.7.1 The requirement of IEC 60364-5-52 shall be followed

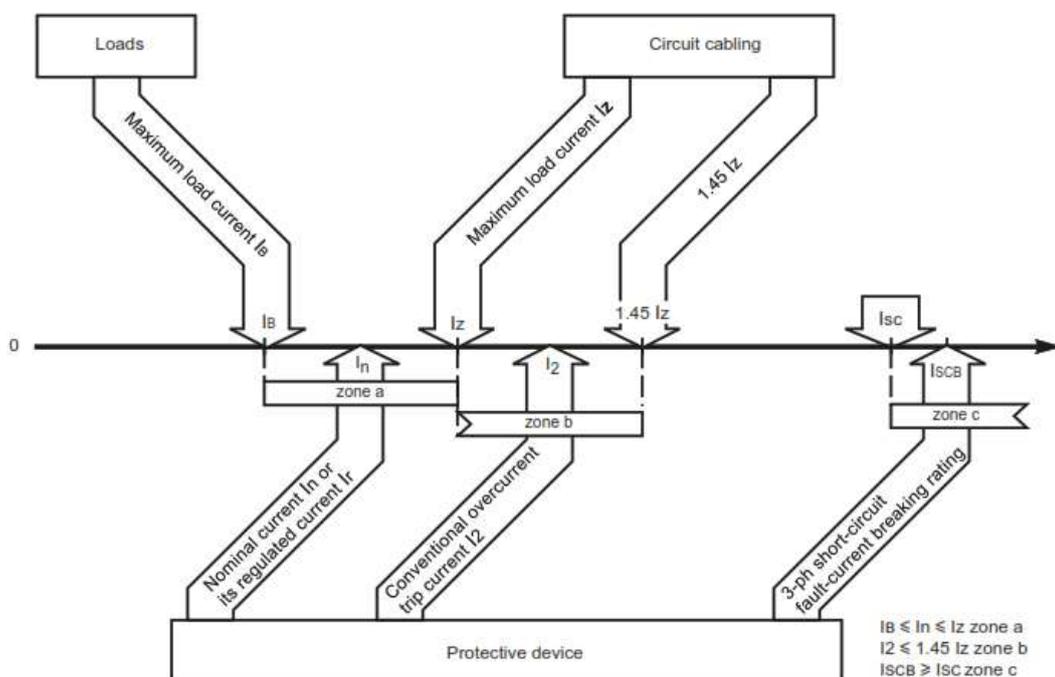
7.7.2 Maximum load current I_z should be referenced to IS3961. A simplified reference is also given here.

Nominal cross-sectional area of conductor mm ²	Installation methods of Table B.52.1						
	A1	A2	B1	B2	C	D1	D2
1	2	3	4	5	6	7	8
Cooper							
1.5	13.5	13	15.5	15	17.5	18	19
2.5	18	17.5	21	20	24	24	24
4	24	23	28	27	32	30	33
6	31	29	36	34	41	38	41
10	42	39	50	46	57	50	54
16	56	52	68	62	76	64	70
25	73	68	89	80	96	82	92
35	89	83	110	99	119	98	110
50	108	99	134	118	144	116	130
70	136	125	171	149	184	143	162
95	164	150	207	179	223	169	193
120	188	172	239	206	259	192	220
150	216	196	262	225	299	217	246
185	245	223	296	255	341	243	278
240	286	261	346	297	403	280	320
300	328	298	394	339	464	316	359

7.8 Protection against Overload Current

7.8.1 A protective device (circuit breaker or fuse) functions correctly if:

- 1) Its nominal current or its setting current is greater than the maximum load current I_B but less than the maximum permissible current I_z for the circuit, i.e. $I_B \leq I_n \leq I_z$ corresponding to zone "a".
- 2) Its tripping current I_2 "conventional" setting is less than $1.45 I_z$ which corresponds to zone "b".



7.9 Cargo/ passenger lift maintenance

7.9.1 Lifts should be inspected and maintained at least as per the Section 14 of NBCI-2016 Part 12

7.10 Electrical isolation procedure

- 7.10.1 The working permit system (such as Lock-out/Tag-out procedure) is a set of predetermined steps that should be followed when workers are required to perform tasks such as inspection, maintenance, cleaning, repair, and construction as per the Section 13 of NBCI-2016 Part 12 procedure along with work permit system must be followed and practiced.

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