

Stitching Life and Building Safety Initiative

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

- Annexure 2 includes the sector of Home Textiles

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 2 includes the sector of Home Textiles

Overview

This document, together with the current India LABS standards (Issue 4, August 17, 2018) and Annexure 1 includes the sector of bags and accessories (August 25, 2022), serve as the minimum requirements for RMG, footwear, bag, accessory and home textiles 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 and annexures 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 existing India LABS standard shall prevail, where related to life safety.

Implementation

This document will be implemented together with existing India LABS standards (Issue 4, August 17, 2018) and Annexure 1 includes the sector of Bags and Accessories (August 25, 2022) in RMG, footwear, bag, accessory and home textiles industries 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 2 incl. the sector of Home Textiles 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) and Annexure 1 includes the sector of bags and accessories (August 25, 2022) 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, accessories and home textiles factories in India.

1.2.3 This Standard also applies to the buildings and infrastructure of subcontractors who produce RMG, footwear, bags, accessories and home textiles 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, accessory and home textile 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 Stitching 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
- 1.5.3.17 IS 2062: Hot Rolled Medium And High Tensile Structural Steel — Specification
- 1.5.3.18 IS 4759: Hot-dip zinc coatings on structural steel and other allied products;

- 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
- 1.5.5.26 NFPA 87, Recommended Practice for Fluid Heaters, 2011

- 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.
 - 1.5.11.3 IEC 60364-7-712/ IS 16997 Requirements for special installations or locations – Solar photovoltaic (PV) power supply systems
 - 1.5.11.4 IEC 62446/ IS16960 Photovoltaic (PV) systems - Requirements for testing, documentation and maintenance
- 1.5.12 **Factories Act 1948.** Act No. 63 of 1948, Ministry of Labour and Employment, Government of India, 23 Sept 1948.
- 1.5.13 **NFC 17-102** Protection Against Lightning- Early streamer emission lightning protection systems

2 Part 2 Structure Safety Referred Codes Updates

First, the factories producing RMG, footwear, bags, accessories and home textiles must adhere to the references in Part 1.5 and Section 8 of the current LABS standard (Issue 4, August 17, 2018). 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	Design/ Construction	IS 2062:2011 IS 4759: 1996 (R2021) AA6063 T6	Hot Rolled Medium And High Tensile Structural Steel – Specification Hot-dip zinc coatings on structural steel and other allied products; Aluminum Alloy
02	Design/ Construction	NFPA 87: 2011	Recommended Practice for Fluid Heaters

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)."

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

- 1) Extent of coverage of the current standard for home textile 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 Roof top solar power plant

Adding new clause for Roof top solar power plant as the new standard clause 11.4.4.

- 1) The roof top structure shall be assessed for the load bearing capacity before installation of the roof top solar power plant based on f National Building Code of India 2016, Volumes 1 & 2 and NFPA.
- 2) The fastening of the PV panels should be checked against the wind loading conditions (As per IS 875 - III).
- 3) Module mounting structure steel shall be as per latest IS 2062:2011 and galvanization of the mounting structure shall be in compliance of latest IS 4759. MMS Aluminium shall be as per AA6063 T6. For Aluminium structures, necessary protection towards rusting need to be provided either by coating or anodization.

3.3.2 Constructions related to the thermal fluid heaters

Adding new clause for constructions related to the thermal fluid heaters as the new standard clause 8.17.4.

1. The location and constructions related to the thermal fluid heaters should refer to NFPA 87, Recommended practice for fluid heaters, including but not limited to:

- Fluid heaters and related equipment should be located so as to protect personnel and buildings from fire or explosion hazards.
 - Fluid heaters should be located so as to be protected from damage by external heat, vibration, and mechanical hazards.
 - Fluid heaters should be located so as to make maximum use of natural ventilation, to minimize restrictions to adequate explosion relief, and to provide sufficient air supply for personnel.
 - Where fluid heaters are located in basements or enclosed areas, sufficient ventilation should be supplied so as to provide required combustion air and to prevent the hazardous accumulation of vapors.
 - Fluid heaters designed for use with fuel gas having a specific gravity greater than air should be located at or above grade and should be located so as to prevent the escape of the fuel gas from accumulating in basements, pits, or other areas below the fluid heater.
 - Location of the fluid heater, piping, and related equipment should consider the minimum pumpable viscosity of the fluid.
 - Fluid heaters should be located and erected so that the building structural members are not affected adversely by the maximum anticipated temperatures (see 5.1.4.3) or by the additional loading caused by the fluid heater.
 - Structural building members should not pass through or be enclosed within a fluid heater.
2. The heat transfer fluid pipe should be considered for the stresses, reactions, and movement of the piping and connected equipment, which might result in failure of supports, leakage at flanged joints, distortion of valve bodies, and failure of in line items. The supporting structure should be designed and constructed accordingly.

4 Part 4 Fire Safety Referred Codes Updates

The RMG, Footwear, Bags, Accessories and Home-textile 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.
	1.5.9.2	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 home textiles 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.

5.3 Updated requirements

5.3.1 General Fire Safety Requirements

5.3.1.1 Flammable and Combustible Liquid

The storage and handling of flammable liquids or gases shall be in accordance with the following applicable standards:

- 1) NFPA 30, Flammable and Combustible Liquids Code.
- 2) NFPA 54, National Fuel Gas Code.
- 3) NFPA 58, Liquefied Petroleum Gas Code.

5.3.1.2 **Recirculating Heat Transfer Systems Operations**

Processing and handling of Class II and Class III liquids heated at or above their flash point shall follow the requirements for Class I liquids.

The process vessel shall be equipped with an excess temperature control set to limit excessive heating of the liquid and the subsequent release of vapors.

If a heat transfer medium is used to heat the liquid and the heat transfer fluid can heat the liquid to its boiling point on failure of the process and excess temperature heat controls, a redundant excess temperature control shall be provided.

Processing vessels and buildings containing such processing vessels shall be located so that a fire involving the vessels does not constitute an exposure hazard to other occupancies.

Processing equipment in which unstable liquids are handled shall be separated from unrelated plant facilities by either of the following:

- 1) 25 ft (7.6 m) clear spacing
- 2) A wall having a fire resistance rating of not less than 2 hours and explosion resistance consistent with the expected hazard

Drainage shall be provided at strategic low points in the heat transfer system. Drains shall be piped to a safe location that is capable of accommodating the total capacity of the system or the capacity of that part of the system that is isolated.

Automatic sprinkler protection meeting the requirements of NFPA 13, Standard for the Installation of Sprinkler Systems, for Extra Hazard (Group I) Occupancies shall be provided for building areas containing a heat transfer system heater or vaporizer.

Operators of heat transfer systems shall be trained in the hazards of improper operation of the system and leakage and shall be trained to recognize upset conditions that can lead to dangerous situations.

Safety interlocks shall be inspected, calibrated, and tested annually or at other intervals established in accordance with other applicable standards to determine that they are in proper operating condition.

5.3.1.3 **Gas Supply**

Sections 3.14.16.1 through 3.14.16.7 of existing LABS standards shall also apply to factories in Home Textiles sector.

Where gas pipes are run in buildings, the same shall be run in separate shafts exclusively for this purpose and these shall be on external walls, away from the staircases. Gas distribution pipes shall always be below the false ceiling. The length of these pipes shall be as short as possible.

There shall be an enclosure suitably ventilated for gas cylinders. It is desirable to provide medium velocity spray nozzles which can be operated by quick opening valve situated away from the enclosure.

In the case of gas cylinders, if manifold has to be installed on podium/close to podium, the same shall be away from any air intakes/ smoke exhaust openings/any windows.

The gas lines shall not be installed through any electrical shafts, escape routes, refuge areas/ refuge floors.

5.3.2 **Fire Protection Systems**

5.3.2.1 **Fire Compartment**

Fire Compartment: A space within a building that is enclosed by fire barriers on all sides, including the top and bottom.

Compartmentation for existing buildings shall be done in consultation with local fire department.

New constructions: all floors shall be compartmented/zoned with area of each compartment being not more than 750m². The maximum size of the compartment shall be as follows, in case of sprinklered basement/building:

<i>Sl No.</i>	<i>Use</i>	<i>Compartmentation Area m²</i>
(1)	(2)	(3)
i)	Basement car parking	3 000
ii)	Basements (other than car parking)	2 000
iii)	Institutional buildings: Subdivision C-1	1 800
iv)	Institutional buildings: Subdivision C-2 and C-3	1 125
v)	Mercantile and assembly buildings	2 000
vi)	Business buildings	3 000
vii)	All other buildings (Excluding low hazard and moderate hazard industrial buildings and storage buildings) ¹⁾	750

¹⁾ Compartmentation for low hazard and moderate hazard industrial buildings and storage buildings shall be done in consultation with local fire department.

In addition, there shall be requirement of a minimum of two compartments if the floor plate size is equal or less than the areas mentioned above. However, such requirement of minimum two compartments shall not be required, if the floor plate is less than 750 m².

Compartmentation shall be achieved by means of fire barriers having fire resistance rating of 120 min.

5.3.3 **Means of Egress (MOE)**

5.3.3.1 **Basements:** In no case shall there be less than 2 independent basement exits as per the NBC of India 2016 cl. 4.2.19.

5.3.3.2 **Exit Signs**

The color and design of lettering, arrows and other symbols on exit signs shall be in high contrast with their background. Words on the signs shall be at least 150mm high with a stroke of not less than 20mm.

The signs shall be on the floor-level in contrasting color showing the exit direction. The sign at the exit door shall be adjacent to the door with the closest edge of the sign within 100 mm of the door frame.

Where exit access is provided through corridors/ paths, the occupants shall be able to easily identify the way to exits. Exit signs shall be provided such that no point in an exit access is more than 30 m from a visible exit directional sign. An exit sign indicating the direction to an exit shall be provided at all changes in direction.

Exits shall be clearly visible and the route to reach the exits shall be clearly marked and signs posted to guide the occupants of the floor concerned. Signs shall be illuminated and wired to an independent electrical circuit on an alternative source of supply. The colour of the exit signs shall be green.

6 Part 6 Electrical Safety Referred Codes Updates

The factories for RMG, footwear, bags, accessories and home textiles 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
NF C 17-102			Protection Against Lightning- Early streamer emission lightning protection systems
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
		NFPA 110	Standard for Emergency and Standby Power Systems

		NFPA 37	Installation and Use of Stationary Engines
		IEC 60364-7-712/IS 16997	Requirements for special installations or locations – Solar photovoltaic (PV) power supply systems
		IEC 62446/ IS16960	Photovoltaic (PV) systems - Requirements for testing, documentation and maintenance
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)
		NBC-2016-Part 12-Section 13	Maintenance of Electrical Installations

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, accessory and home textile 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 home textile factories
- 2) new electrical installations

7.2 Terms and Definitions:

Terms and Definitions shall be taken from SP30.

7.3 ESE (Early Streamer Emission) Air-terminal

ESE (Early Streamer Emission) air-terminal is not accepted by NBC-2016-Vol 2- Part 8 Section 2 Cl 11.5. For the new constructions, ESE air-terminal is not recommended. For the existing factory facilities, if the ESE air terminal is applied, the lightning protection calculation/ installation/ testing document shall be provided based on NFC 17-102.

7.4 Roof Top Solar Power Plant

- 1) The design, installation and test of the roof top solar power plant shall be carried out in accordance with IEC 60364-7-712/ IS 16997 and IEC 62446/ IS16960.
- 2) The equipment/ components should qualify to the latest edition of IEC standards or equivalent BIS standards, i.e., IEC 61215/IS14286, IEC 61683/IS 61683, IS/IEC 60947, etc.
- 3) Operation & Maintenance manual/user manual, Engineering and Electrical Drawings shall be supplied along with the power plant.

7.5 Forklift charging station

- 1) The arrangement of the battery charging area could refer to OSHA Directives and NBC-2016 Vol 2-Part 12 section 13, including but not limited to:
 - No smoking.
 - Warning signs posted.
 - Adequate fire protection.

- Ample and readily available water supply for flushing and neutralizing spilled electrolyte.
 - An eyewash able to provide a 15-minute flow. (Figure 2) Note: For large installations, there should be a plumbed drench shower and an eyewash.
 - A phone or other means of communication in the event of an emergency.
 - Adequate ventilation to avoid the build-up of hydrogen gas during battery charging.
 - Soda ash or other neutralization materials in the immediate area.
 - Means to protect charging apparatus from damage from trucks.
- 2) The SOP should be posted at the charging station. Only trained personnel should charge and change batteries in electric forklifts. In addition to training in battery changing and charging procedures, these employees should be trained on emergency procedures in the event of an acid splash, including how to use eyewash and shower facilities.

DOCUMENT VERIFICATION

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Description				
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V1.0	18th Jan 2023	Naveen Kumar (Structural Engineer)	Bowen Shi	Gabriel Amouyal
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