Stichting Life and Building Safety Initiative

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

- Annexure 2 includes the sector of Home Textiles

Version 1.0

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Overview

This document, together with the current Vietnam LABS standards (Issue 4, November 21, 2018) and Annexure 1 includes the sector of bags and accessories (May 27, 2021), serve as the minimum requirements for RMG, footwear, bags, accessories 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 Vietnam 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 Stitching Life and Building Safety Initiative, while they may satisfy local codes, the minimum requirements of this document and existing Vietnam LABS standard shall prevail, where related to life safety.

Implementation

This document will be implemented together with existing Vietnam LABS standards (Issue 4, November 21, 2018) and Annexure 1 includes the sector of Bags and Accessories (May 27, 2021) in RMG, footwear, bag, accessory and home textiles industries in Vietnam 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 Vietnam - 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 Vietnam LABS standards (Issue 4, November 21, 2018) and Annexure 1 includes the sector of bags and accessories (May 27, 2021) in Vietnam 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 Vietnam.

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 **Vietnam National Building Code**

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

1.5.3.1 QCVN 06-2022: National Technical Regulation on Fire Safety for Buildings.

1.5.3.2 QCVN 06-2023: National Technical Regulation of Vietnam QCVN 06:2022/BXD on Fire safety of Buildings and Constructions

1.5.3.3 TCVN 3890-2023: National standard TCVN 3890:2023 for Fire protection - Fire protection equipments for building and construction - Equipment, installation.

1.5.3.4 TCVN 7568-14:2025: Fire detection and alarm systems – Part 14: Design and installation of fire alarm systems for Houses and Constructions.

1.5.3.5 TCVN 13456:2022: Fire protection – Emergency lighting and Exit sign – Design, installation requirements.

1.5.3.6 TCVN 13418:2022: Firefighting and protection – Portable foam nozzle – Technical requirements and testing methods

1.5.3.7 TCVN 7161-1:2022: Gaseous fire – extinguishing systems – Physical properties and system design – Part 1: General requirements

1.5.3.8 TCVN 12314-2:2022: Fire protection – Automatic activated fire extinguisher – Part 2: Fire suppression cylinder

1.5.3.9 TCVN 7336:2021: Fire protection – Water, foam automatic fire-extinguishing systems – Design and installation requirements

1.5.3.10 TCVN 13333:2021: Aerosol Fire-Extinguishing systems – Specifications for design, installation, inspection and maintenance

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, 2024

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, 2025

1.5.5.4 NFPA 14, Standard for the Installation of Standpipe and Hose Systems, 2024

1.5.5.5 NFPA 15: Standard for Water Spray Fixed Systems for Fire Protection, 2022

1.5.5.6 NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, 2025

1.5.5.7 NFPA 22, Water Tanks for Private Fire Protection, 2023

1.5.5.8 NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, 2020

1.5.5.9 NFPA 30, Flammable and Combustible Liquids Code, 2024

1.5.5.10 NFPA30B, Code for the Manufacture and Storage of Aerosol Products, 2019

1.5.5.11 NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, 2021

1.5.5.12 NFPA 51B, Standard for Fire Prevention During Welding, Cutting, and Other Hot Work, 2023

1.5.5.13 NFPA 58 Liquefied Petroleum Gas Code, 2020

1.5.5.14 NFPA 70 National Electrical Code®, 2023

1.5.5.15 NFPA 72, National Fire Alarm and Signaling Code, 2022

1.5.5.16 NFPA 80, Standard for Fire Doors and Other Opening Protectives, 2022

1.5.5.17 NFPA 85, Boiler and Combustion Systems Hazards Code, 2019

1.5.5.18 NFPA 87，Recommended Practice for Fluid Heaters，2018

1.5.5.19 NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, 2021

1.5.5.20 NFPA 92, Standard for Smoke Control Systems, 2021

1.5.5.21 NFPA 101, Life Safety Code®, 2024

1.5.5.22 NFPA 105 Standard for Smoke Door Assemblies and Other Opening, 2022

1.5.5.23 NFPA 110, Standard for Emergency and Standby Power Systems, 2022

1.5.5.24 NFPA 111, Standard on Stored Electrical Energy Emergency and Standby Power Systems, 2022

1.5.5.25 NFPA 204, Standard for Smoke and Heat Venting, 2024

1.5.5.26 NFPA 220 Standard on Type of Building Construction,2018

1.5.5.27 NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2022

1.5.5.28 NFPA 252, Standard Methods of Fire Tests of Door Assemblies,2022

1.5.5.29 NFPA 257, Standard on Fire Test for Window and Glass Block Assemblies, 2022

1.5.5.30 NFPA 288 Standard Methods of Fire Tests of Horizontal Fire Door Assemblies Installed in Horizontal Fire Resistance-Rated Assemblies, 2022

1.5.5.31 NFPA 400 Hazardous Materials Code,2022

1.5.5.32 NFPA 551Guide for the Evaluation of Fire Risk Assessments, 2022

1.5.5.33 NFPA 557 Determination of Fire loads for Use in Structural Fire Protection Design, 2023

1.5.5.34 NFPA 5000, Building Construction and Safety Code®, 2024

1.5.5.35 QCVN_03_2023_BCA: National Technical regulation on Fire protection equipment.

1.5.5.36 QCVN 10:2025/BCA - National technical regulation on providing and arranging fire prevention, firefighting, and rescue facilities for buildings and constructions

1.5.5.37 QCVN 01-2008-BLĐTBXH National technical regulation on safe work of steam boilers and pressure vessels**.**

1.5.5.38 TCVN 7704: 2007 Boilers - Technical requirement of design, construction, manufacture, installation, operation, maintenance

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.

FM Data Sheet 8-7, Baled Fiber Storage, April 2017.

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, November 21, 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	ANSI/SDI AISI S100-2024	North American Specification for the Design of Cold-Formed Steel Structural Members.
02	Design/ Construction	NFPA 86: 2023	Standard for Ovens and Furnaces

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 accessories manufacturers in Vietnam into practice. As a result, it is essential to adhere to the requirements in part 8 of "The existing LABS Standard (Issue 4, 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 Constructions related to the heater machine

Adding new clause for constructions related to the thermal fluid heaters as the new standard clause 8.23.4.

1. 8.23.4.1 The location and constructions related to the heaters should refer to NFPA 86, standard for ovens and Furnaces, including but not limited to:

    - Heater machine and related equipment should be located so as to protect personnel and buildings from fire or explosion hazards.
    - Heater machine should be located so as to be protected from damage by external heat, vibration, and mechanical hazards.
    - Heater machine 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 Heater machines 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 vapours.
    - Heater machine 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.
- Heater machine should be located and erected so that the building structural members are not affected adversely by the maximum anticipated temperatures or by the additional loading caused by the Heater machine.
- Structural building members should not pass through or be enclosed within a Heater machine.

2. 8.23.4.2 The heat transfer 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.

3.3.2 **Require studying, review sway and buckling resistance of portal steel frames and trusses**

Adding new clause for checking sway, buckling resistance, and overall stability of portal steel frames and trusses as the new standard clause 8.18.2.1:

Sway, buckling resistance, and overall stability of portal steel frames and trusses shall be analytically confirmed and strengthened as required.

3.3.3 **Review the available structural calculations included in the exist inspection report**

Adding new clause for "Review the available structural calculations included in the exist inspection report" as the new standard clause 8.3.1.1:

Review the available structural calculations included in the inspection report to verify that building elements meet safety requirements under standard design loads, in accordance with TCVN 2737:2023.

3.3.4 **Calculation standard for cold-form profile**

Adding new clause for calculation standard for cold-form profile as the new standard clause 8.5.5.5:

Where required, for determination of structural cold form profile, AISI S100-2024 - shall be used.

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
Vietnam National Building Code	1.5.2.1	National Technical Regulation on Fire Safety for Buildings QCVN 06:2020/BXD	Updated- replaced QCVN 06-2009; QCVN 06-2020 by QCVN 06-2022; Section update QCVN 06-2023.
Vietnam National Laws and Rules		No listed	QCVN_03_2023_BCA: National Technical regulation on Fire protection equipment.
		No listed	TCVN 6486-2008: Liquefied Petroleum Gas (LPG – Pressurized Storage- Requirement for Design and location of Installation
	1.5.3.2	TCVN 3890-2009	Updated- replace TCVN 3890-2009 by TCVN 3890-2023
	1.5.3.4	Labs standard Cl 5.9, TCVN 5738-2003	Updated- replaced by TCVN 7568-14:2025
		Not listed	Updated: TCVN 13456:2022: Fire protection – Emergency lighting and Exit sign – Design, installation requirements
		Not listed	TCVN 13418:2022: Firefighting and protection – Portable foam nozzle – Technical requirements and testing methods
		Not listed	1.5.3.7 TCVN 7161-1:2022: Gaseous fire – extinguishing systems – Physical properties and system design – Part 1: General requirements
		Not listed	1.5.3.8 TCVN 12314-2:2022: Fire protection – Automatic activated fire extinguisher – Part 2: Fire suppression cylinder
	1.5.3.3	TCVN 5307:2009 Petroleum and petroleum products terminal –	Not updated

		Design requirements	
	1.5.3.4	TCVN 5738:2001 Automatic fire alarm system. Technical requirements.	Not updated
	1.5.3.6	LABS Cl 5.3.2- TCVN 7336-2003	Updated- replace by TCVN 7336:2021: Fire protection – Water, foam automatic fire-extinguishing systems – Design and installation requirements
	1.5.3.7	TCVN 8616:2010 Liquefied natural gas (LNG) - Requirements for production, storage, and handling	Not updated
		Not listed	Updated: 13333:2021: Aerosol Fire-Extinguishing systems – Specifications for design, installation, inspection and maintenance
		Not listed	TCVN 6379_2024: Fire protection- Fire Hydrant
		Not listed	TCVN 13657 – 1: Fire protection – High Pressure mist fire extinguishing system- Part 1: Design and installation requirement
		Not listed	TCVN 13926: 2023- Fire protection- Package type fire extinguishing systems.
		Not listed	TCVN 5687: 2024- Ventilation and Air conditioning – Design Requirements.
ICC publications	1.5.4.1	IBC, International Building Code, 2021	Not updated
	1.5.4.2	IFC, International Fire Code, 2021	Not updated
	1.5.4.3	IEBC, International Existing Building Code, 2021	Not updated
NFPA publications		NFPA 1, Fire Code, 2021	Updated by NFPA 1, 2024
	1.5.5.1	NFPA 10, Standard for Portable Fire Extinguishers,2022	Not updated
	1.5.5.2	NFPA 13, Standard for the Installation of Sprinkler	NFPA 13, Standard for the Installation of Sprinkler

		Systems,2022	Systems,2025
	1.5.5.3	NFPA 14, Standard for the Installation of Standpipe and Hose Systems, 2019	NFPA 14, Standard for the Installation of Standpipe and Hose Systems, 2024
	New add	Not listed	NFPA 15: Standard for Water Spray Fixed Systems for Fire Protection, 2022
	1.5.5.4	NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, 2022	NFPA 20, Standard for the Installation of Stationary Pumps for Fire Protection, 2025
	1.5.5.5	NFPA 22, Water Tanks for Private Fire Protection,2018	Updated, NFPA 22, Water Tanks for Private Fire Protection,2023
	1.5.5.6	NFPA 25, Standard for the Inspection, Testing, and Maintenance of Water-Based Fire Protection Systems, 2020	Not updated
	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,2019	Not updated
	1.5.5.9	NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, 2021.	Updated, NFPA 37, Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines, 2023
	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
		NFPA 58, Liquefied Petroleum Gas Code, 2020	Not updated
	1.5.5.11	NFPA 70, National Electrical Code®, 2020.	Updated, 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, 2023
	1.5.5.13	NFPA 80, Standard for Fire Doors and Other Opening Protectives, 2019.	NFPA 80, Standard for Fire Doors and Other Opening Protectives, 2023

		NFPA 85, Boiler and Combustion Systems Hazards Code, 2020	Not updated
	New add	Not listed	NFPA 87，Recommended Practice for Fluid Heaters
		NFPA 88A, Standard for Parking Structures, 2019	Not updated
	1.5.5.14	NFPA 90A, Standard for the Installation of Air-Conditioning and Ventilating Systems, 2021	Not updated
	1.5.5.15	NFPA 92, Standard for Smoke Control Systems,2018.	NFPA 92, Standard for Smoke Control Systems,2022
	1.5.5.16	NFPA 101, Life Safety Code®, 2018.	NFPA 101, Life Safety Code®, 2022
	1.5.5.17	NFPA 110, Standard for Emergency and Standby Power Systems,2016.	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, 2019.	NFPA 111, Standard on Stored Electrical Energy Emergency and Standby Power Systems, 2022
		NFPA 204, Standard for Smoke and Heat Venting, 2022	Not updated
	1.5.5.19	NFPA 241, Standard for Safeguarding Construction, Alteration, and Demolition Operations, 2019.	Updated 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,2017.	Updated 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 288 Standard Methods of Fire Tests of Horizontal Fire Door Assemblies Installed in Horizontal Fire Resistance-Rated Assemblies, 2022
	New add	Not listed	NFPA 400 Hazardous Materials Code,2022
	New add	Not listed	NFPA 551Guide for the Evaluation of

			Fire Risk Assessments, 2022
	New add	Not listed	NFPA 557 Determination of Fire loads for Use in Structural Fire Protection Design, 2023
		NFPA 5000, Building Construction and Safety Code®, 2021	Updated NFPA 5000, Building Construction and Safety Code®, 2024
	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 fallowed. 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.

5.1.1 **Buildings, constructions, and fire compartments:**

The fire-related technical classification for buildings, constructions, and fire compartments serve to establish fire safety requirements for fire prevention and fire protection systems of buildings and constructions depending on their occupancies (purposes) and fire risks.

The requirement for this section will be flowed LABS standard Cl 3.12 in additional the new building is referred to QCVN 06-2022, Cl 2.5

Manufacturing facility and storage facility:

The requirement for this section will be flowed LABS standard Cl 3.12 in additional the new building is referred to QCVN 06-2022, Appendix A

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. Refer to local code QCVN 06-2022 Cl2.5

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 Vietnam QCVN 06- 2022 refers to storage occupancy as Group F5 Buildings. Storage Occupancy - Ordinary Hazard Contents will be deemed to be similar to NBC Occupancy Group F5 for the purposes of applying this Standard.

5.3 Updated requirements

5.3.1 General Fire Safety Requirements

5.3.1.1 Boiler or furnace rooms

Adding Boiler safety for LABS standard to be in line with local standard QCVN 01-2008-BLĐTBXH (Mandatory as per local regulation):

1. Existing boilers: The current boiler must adhere to the operational and maintenance standards outlined in QCVN 01-2018-BLDTBXH.

2. New Boilers: New boilers must adhere to the specifications for design, building, manufacturing, installation, operation, and maintenance as stipulated in QCVN 01-2008-BLDTBXH and TCVN 7747:2007 for technical requirements.

a. Design and Installation Requirements:

- TCVN 7704:2007 – Standards for thermal power boilers.
- QCVN 01:2018/BLĐTBXH – Vietnam's national regulation on safety for boilers and pressure vessels.
- NFPA 85:2019 – Boiler and combustion systems hazards code.

b. The installation phase must ensure compliance with the following component-specific requirements:

- Piping: All boiler piping must comply with certified pressure ratings and be compatible with working temperatures, fluids, and system pressure. Proper supports, expansion joints, and thermal insulation must be installed to prevent stress, leaks, or failures. Welded joints must be inspected and certified according to applicable standards (e.g., TCVN or ASME).
- Pressure Relief Valve: Each boiler must be fitted with at least one properly sized and certified pressure relief valve. The valve should be set to open at or below the maximum allowable working pressure (MAWP) of the boiler. It must be installed in a vertical position without isolation valves between the boiler and the relief valve. Valves shall be tested and tagged before installation and protected from corrosion and mechanical damage.
- Thermal Gauge / Temperature Indicator: A reliable temperature gauge must be fitted to display boiler water or steam temperature at all times. The gauge should be installed at

eye level and calibrated during commissioning. Red zones shall be clearly marked to indicate critical or unsafe operating temperatures.

All installation must be performed by authorized contractors, with system commissioning documented and signed off by a competent engineer.

c. Operation Requirements:

- Only certified operators may control boilers. All operators must complete a nationally recognized boiler operation training program, and annual refresher training is mandatory to maintain safety awareness and regulatory compliance.
- An up-to-date operation manual must be posted near the boiler and include start-up, shutdown, emergency procedures, safety interlock functions, and hazard responses.
- Boiler systems must undergo a full inspection at least once per year, conducted by authorized agencies in accordance with QCVN 01:2018/BLĐTBXH and AS 3873 standards. Inspection certificates must be displayed or logged for reference.

d. Maintenance and Documentation

- A preventive maintenance program must be established based on manufacturer recommendations and standards. This includes inspections of pressure parts, valves, gauges, electrical systems, and flame controls.
- All maintenance activities must be documented, including date, nature of work performed, parts replaced, test results, and personnel involved.
- Water quality must be regularly tested and treated to prevent corrosion, scaling, and overheating as required by TCVN 6007.
- Maintenance and inspection records shall be kept for a minimum of five years and made available upon request during audits or safety reviews.

5.3.1.2 **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.

4) ASME 31.3 – Process Piping.

5) ASME 31.8 – Gas Transmission and Distribution Piping System

6) QCVN 20:2023/BCT National technical regulation on safety of metallic rigid gas pipelines.

7) TCVN 7441:2004 (Liquefied Petroleum Gas (LPG) Supply System at the Point of Consumption - Design, Installation and Operation Requirements).

8) TCVN 5307:2009 Petroleum and petroleum products terminal – Design requirements

5.3.1.3 **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.

5.3.1.4 **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**

5.3.2.1 **Flame spread prevention:**

Flame spread avoidance shall be achieved by restricting the burning area, fire intensity, and fire duration. Specifically:

- Employing structural solutions and spatial arrangements to mitigate the propagation of fire hazards within a room, between rooms of varying fire risk categories based on function, across stories, within single-stair buildings, and between separate buildings.

- Mitigating fire and explosion hazards associated with technology in rooms and buildings;

- Reducing fire risk classifications of construction materials utilized on the exterior of building structures, including roofs, exterior wall finishes, rooms, and means of egress;

- Providing automatic and portable first-aid firefighting apparatus;

- Implementing fire detection systems and alarm devices.

- Regulations regarding fire separation distances between residential structures, public edifices, and industrial facilities are delineated in Appendix E of QCVN 06-2022. The separation distance between combustible liquid storage, open above-ground storage of combustible chemicals, LPG tanks, and combustible gas tanks from other structures must adhere to industry-specific laws and norms.

- The flame spread prevention requirements must adhere to LABS standards Clauses 3 and 4, as well as the local NBC – QCVN 06-2022 Clause 4.

5.3.2.2 **Fire Compartment:**

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

Existing construction: Compartmentation for existing buildings shall be done in consultation with local fire department or and 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:

Sl No.	*Use*	*Compartment-ation Area* m^2
(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.

New constructions: Compartmentation for NEW buildings following Building code QCVN 06-2022

Appendix G

5.3.2.3 **Water supply for firefighting:**

The water supply for firefighting must adhere to the LABS standard for Garment and Footwear, Clause 5.7, and/or comply with TCVN 3890 and other prevailing standards, including both indoor and outdoor water supply as stipulated in NBC-QCVN 06-2022, Clause 5.

5.3.2.4 **Fire alarm and detection system:**

Fire alarm and detection should adhere to the LABS standard for garment and footwear textiles, Clause 5.9.

The fire detection and alarm system must adhere to the local standard TCVN 3890-2023.

Installation shall adhere to TCVN 7568-14:2025 and any pertinent local codes.

5.3.3 **Means of Egress (MOE)**

5.3.3.1 **General:** Mean of egress shall be followed must adhere to the LABS standard for garment and footwear textiles, Clause 6 and refer to NBC QCVN06-2022 Cl3 and any pertinent local codes**.**

5.3.3.2 **Emergency lighting and exit sign- Design, Installation requirement:**

should adhere to the LABS standard for garment and footwear textiles, Clause 6 and local code TCVN 13456-2022.

Emergency lighting should be followed LABS standard for garment and footwear textiles, Clause 6 and TCVN 13456-2022 Cl 5.1.

Exit signages should be followed LABS standard for garment and footwear textiles, Clause 6 and TCVN 13456-2022 Cl5.2

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 mark ed 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 color 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	Updated versions	Description
01	Supplies to Life Safety Service	TCVN 7447-5-56:2011		Low voltage electrical installations - Part 5-56: Selection and installation of electrical equipment - Safety services
		TCVN 5738:2001	TCVN 7568-14:2025	Fire detection and alarm systems - Part 14: Design, installation, commissioning and service of fire detection and fire alarm systems in and around buildings
		TCVN 7336:2003	TCVN 7336:2021	Fire protection – Water, foam automatic fire-extinguishing systems – Design and installation requirements.
		QCVN 06:2020/BXD	QCVN 06:2022/BXD (with Amendment 1:2023)	National Technical Regulation on Fire Safety of Buildings and Constructions

			QCVN 10:2025/BCA	QCVN 10:2025/BCA - National technical regulation on providing and arranging fire prevention, firefighting, and rescue facilities for buildings and constructions
			QCVN01-2008-BLĐTBXH	National technical regulation on safe work of steam boilers and pressure vessels
			TCVN 7704: 2007	National Technical regulation on Fire protection equipment.
		NFPA 13:2019	NFPA 13:2025	Standard for the Installation of Sprinkler Systems
		NFPA 20:2019	NFPA 20:2025	Standard for the Installation of Stationary Pumps for Fire Protection
		NFPA 72:2019	NFPA 72:2025	National Fire Alarm and Signaling Code
		NFPA 110:2019	NFPA 110:2025	Standard for Emergency and Standby Power Systems
		NFPA 111:2019	NFPA 111:2022	Standard on Stored Electrical Energy Emergency and Standby Power Systems
		TCVN 10348-1:2014, TCVN 6613-1-2:2010, IEC 60332-1-2	IEC 60332-1-2:2025	standards for flame retardant mineral of insulated cable systems for safety services
		TCVN 9618-1:2013, TCVN 9618-2:2013, TCVN 9618-3:2013, EN 50200, BS 8434, BS 8491	EN 50200:2015	Standards for fire resistant cables for safety services
02	Earthing & Grounding	TCVN 7447-5-54:2015 (IEC 60364-5-54:2011)	IEC 60364-5-54:2011 (Amendment 1:2021)	Low voltage electrical installations - Part 5-54: Selection and erection of electrical equipment - Earthing arrangements and protective conductors
		TCVN 9358:2012		Installation of equipment earthing system for industrial projects - General requirements

		TCVN 9385:2012		Protection of structures against lightning - Guide for design, inspection and maintenance.
		TCVN 9888-1:2013 TCVN 9888-2:2013 TCVN 9888-3:2013 TCVN 9888-4:2013 (IEC 62305: 2010)	IEC 62305:2024	Lightning protection Part 1: General principles Part 2: Risk management Part 3: Physical damage to structures and danger to life Part 4: Electrical and electronic systems within structures
03	Power supply	11 TCN-20-2006 QCVN QTĐ-5:2009/BCT QCVN QTĐ-6:2009/BCT QCVN QTĐ-7:2009/BCT		Electrical equipment regulations - Part III: Distribution equipment and transformer stations National Technical Codes for Testing, Acceptance Test for Power Facility. National Technical Codes for Operating and Maintenance Power system facilities. National Technical Codes for Installation Power Network
		TCVN 9729 - 1…12:2013 (ISO 8528: 2005)		Reciprocating internal combustion engine driven alternating current generating sets
		NFPA 37:2021	NFPA 37:2024	Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines
		TCVN 6592-1: 2009 (IEC 60947-1: 2007)		Low-voltage switchgear and control devices - Part 1: General rules
		TCVN 7447-5-53:2005 (IEC 60364-5-53:2002)		Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control
		TCVN 7447-7-712:2015 (IEC 60364-7-712:2002)	TCVN 7447-7-712: 2019 (IEC 60364-7-712:2017)	Low voltage electrical installations - Part 7-712: Requirements for special

				installations or locations - Solar photovoltaic (PV) power supply systems
04	Distribution	TCVN 7447-1:2010 (IEC 60364-1)		Low-voltage electrical installations - Part 1: Fundamental principles, assessment of general characteristics, definitions
		Set of TCVN 7447-4 (IEC 60364-4): TCVN 7447-4-41:2010 (IEC 60364-4-41) TCVN 7447-4-42:2015 (IEC 60364-4-42) TCVN 7447-4-43:2010 (IEC 60364-4-43)		Low-voltage electrical installations: Safety protection Part 4-41: Protection for safety - Protection against electric shock Part 4-42: Protection for safety - Protection against thermal effects Part 4-43: Protection for safety - Protection against overcurrent
		Set of TCVN 7447-5 (IEC 60364-5): TCVN 7447-5-51:2010 (IEC 60364-5-51) TCVN 7447-5-52:2010 (IEC 60364-5-52)		Low-voltage electrical equipment: Selection and installation of Part 51: Selection and erection of electrical equipment - Common rules Part 5-52: Selection and erection of electrical equipment – Wiring systems
05	Others	NFPA 70: 2017	NFPA 70:2023	National Electrical Code
		NFPA 92:2018	NFPA 92: 2024	Standard Smoke Control Systems
		QCVN 32:2018/ BLDTBXH TCVN 6396 set		National technical regulation on safe work for home lift TCVN 6396 set - Safety rules for the construction and installation of lifts – lifts for the transport of persons and goods
		TCVN 7994-1:2009		Dielectric test requirements for electrical equipment
		TCVN 7447-5-53:2005		Electrical installations of buildings - Part 5-53: Selection and erection of electrical equipment - Isolation, switching and control

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 Vietnam 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 Vietnam." 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 follow the existing LABS standards.

7.3 Firefighting pumps:

Regarding electrical technical and safety requirements for stages from design, installation, operation, acceptance, inspection, maintenance to management of firefighting pumps should be aligned with QCVN 02:2020/BCA.

7.4 Fire detection & alarm system:

Section 5.13 Power supply of TCVN 7568-14:2025 standard refers to the backup power capacity for automatic fire alarm system.

- The standard specifies that the detection & alarm system must have two independent power sources, one of which is a backup battery. The capacity of this backup battery must ensure at least 24 hours of equipment operation in standby mode and 30 minutes in case of fire.

- Additionally, Appendix C (Reference) Power calculations provide detailed guidance on determining the backup battery capacity and charging current. This appendix includes formulas for calculating battery capacity (C20) based on static load current, static load operating time, battery capacity reduction factor, fire alarm condition current and full load operating time.

- If there is a generator used as the secondary power supply, clause 10.6.7.2 of NFPA 72 should be referred.

7.5 Lightning Protection System - Early Streamer Emission (ESE):

NF C 17-102:2011 (French standard) or UNE 21186 (Spanish Standard) should be considered the main reference standard, most widely applied for calculating protection radius, designing and installing ESE lightning rods in Vietnam.

7.6 Surge Protective Devices (SPDs) are required for critical systems, including:

- Safety circuits of industrial machinery (NFPA 70:2023 – Article 670.6)
- Critical data systems (NFPA 70:2023 – Article 645.18)
- Fire pump controllers (NFPA 70:2023 – Article 695.15)
- Emergency system electrical cabinets (NFPA 70:2023 – Article 700.8)

7.7 Rooftop solar power system: list of the most important standards, codes and regulations that the system should be aligned

1. TCVN 7447-7-712: 2019 (equivalent to IEC 60364-7-712:2017): this is the most important part of the set of standards for electrical installations, specifically regulating electrical safety requirements for solar power systems (both DC and AC sides), including protection against overcurrent, electric shock, isolation and grounding.

2. TCVN 11855-1:2017 (equivalent to IEC 62446-1:2016): specifies minimum requirements for system documentation, acceptance tests (safety tests, performance measurements) and periodic inspections after installation.

3. TCVN 12231:2018 & TCVN 12232:2018: specifies safety requirements for two core components of solar power systems: inverters and photovoltaic panels (PV modules).

4. Guidance document No. 3288/C07-P4 of the Fire Prevention and Fighting Police Department (Ministry of Public Security): specifies current requirement that need to be applied to ensure fire prevention and fighting safety for rooftop solar power systems.

7.8 National technical regulation on electrical safety QCVN 25:2025/BCT

QCVN 25:2025/BCT must be followed when performing works related to electricity, including construction, operation, business, testing/inspection, repair of power lines, electrical equipment and other work as prescribed by law. Applicable subjects are all organizations and individuals participating in performing these tasks in the territory of Vietnam.

7.9 Charging stations for electric vehicles

Sets of TCVN 13078:2020/2023 - requirements for the product (charging equipment) and TCVN 7447-7-722:2023 - requirements for the installation of those products into the electrical system should be followed for EV charging station installation and operation.

7.10 Additional Protection: Residual Current Devices (RCDs)

In accordance with TCVN 7447-5-51:2010 and TCVN 7447-7-701:2011

1. Additional protection: requires "additional protection" by means of a residual current device (RCD) with a rated residual operating current not exceeding 30mA for all circuits in areas containing bathtubs, showers, and similar wet areas.

2. Applicable areas: Areas considered wet and requiring the installation of Residual Current CBs include:

- Bathroom, toilet: All electrical outlets and equipment in this area.
- Kitchen area: especially the outlets near the sink.
- Laundry area, drying yard: place where washing machine and dryer are used.
- Swimming pools, fountains: pumps, underwater lighting.
- Outdoor areas: sockets for use in gardens and balconies where they may be exposed to rain.

7.11 LPG combustion process

To guarantee absolute electrical safety during the LPG combustion process, a comprehensive approach should be adopted:

- Hazardous area classification according to IEC 60079-10-1 or NFPA 70.
- Select electrical equipment with an explosion protection class (Ex) suitable for the classified area, in compliance with IEC 60079 series or the ATEX directive.
- Design, install, operate and maintain electrical systems and LPG supply systems according to the requirements of TCVN 7441:2004, QCVN 10:2012/BCT, and NFPA 58.
- Ensure that the grounding and lightning protection systems are properly implemented.

7.12 Safety of rotating machines:

A safe machinery system must incorporate both of the following elements:

- An effective emergency stop mechanism that enables rapid response in unexpected hazardous situations, in compliance with TCVN 6719:2008 (ISO 13850:2006).
- Robust and well-designed physical guards that prevent accidental access to dangerous components during normal operation, in accordance with TCVN 9059:2011 (ISO 14120:2002).

7.13 Isolation procedure:

An isolation procedure is a defined sequence of steps that must be followed when workers perform tasks such as inspection, maintenance, cleaning, repair, or construction. It ensures safety by controlling hazardous energy sources.

- OSHA 29 CFR 1910.147 should be applied to all types of hazardous energy, including electrical, mechanical, hydraulic, pneumatic, chemical, and thermal.
- NFPA 70E – Article 120 specifically addresses electrical energy and associated hazards such as electric shock and arc flash.

DOCUMENT VERIFICATION

<table>
<tr><td colspan="2">Document title</td><td colspan="3">Standard for Structural, Fire and Electrical Safety in the Ready-Made Garment and Footwear sector in Vietnam - Annexure 2 incl. home textile sector</td></tr>
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<tr><td rowspan="3">V1.0</td><td rowspan="3">19th November 2025</td><td>Bui Van Hai (Structural Engineer)</td><td rowspan="3">Bowen Shi</td><td rowspan="3">Gabriel Amouyal</td></tr>
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