



GridStor Reference Codes and Standards

The typical international codes and standards used to design the containerized battery energy storage systems may include but is not limited to the following:

a. American Society of Mechanical Engineers (ASME)

BPVC	Boiler and Pressure Vessel Code
B31.1	Power Piping
B31.3	Process Piping

b. American Society for Testing and Materials (ASTM)

D412	Standard Test Method for Vulcanized Rubber and Thermoplastic Elastomers – Tension
D4169	Standard Practice for Performance Testing of Shipping Containers and Systems
E136	Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C

c. Institute of Electrical and Electronic Engineers (IEEE)

IEEE 1	General Principles for Temperature Limits in the Rating of Electric Equipment and for the Evaluation of Electrical Insulation
IEEE C2	National Electrical Safety Code
IEEE 100	Standard Dictionary of Electrical and Electronic Terms
IEEE 315	Graphic Symbols for Electrical and Electronics Diagrams.
IEEE 1106	Recommended Practice for Installation, Maintenance, Testing and Replacement of Ni-Cad Storage Batteries
IEEE 1100	Recommended Practice for Powering and Grounding
IEEE 1584	Guide for Performing Arc-Flash Calculations

d. National Fire Protection Association (NFPA)

NFPA1	Fire Code
NFPA 13	Standard for Installations of Sprinkler Systems
NFPA 15	Standard for Water Spray Fixed Systems for Fire Protection
NFPA 68	Standard on Explosion Protection by Deflagration Venting
NFPA 69	Standard on Explosion Prevention Systems
NFPA 70	National Electrical Code
NFPA70E	Electrical Safety in the workplace
NFPA 72	National Fire Alarm Code
NFPA 90A	Standard for the Installation of Air-Conditioning and Ventilating Systems
NFPA 90B	Installation of Warm Air Heating and Air-Conditioning Systems
NFPA 101	Life Safety Code
NFPA 110	Standard for Emergency and Standby Power Systems
NFPA 111	Standard on Stored Electrical Energy Emergency and Standby Power Systems
NFPA 704	Standard System for the Identification of the Hazards of Materials for Emergency Response
NFPA 750	Standard on Water Mist Fire Protection Systems
NFPA 855	Standard for the Installation of Stationary Energy Storage Systems
NFPA 2001	Standard on Clean Agent Fire Extinguishing Systems
NFPA 2010	Standard for Fixed Aerosol Fire-Extinguishing Systems

e. American National Standards Institute (ANSI) / National Electrical Manufacturers Assoc. (NEMA)

ANSI C37.2	Electrical Power System Device Numbers
ANSI Y14.15	Electrical and Electronics Diagrams



ANSI Z535.4 Product Safety Signs and Labels

NEMA Pub. No. PB-1	Panel boards
NEMA Pub. No. PB-2	Dead front Distribution Switchboards
NEMA Pub. No. ICS-1	Industrial Control and Systems - General Requirements
NEMA Pub. No. ICS-19	Industrial Control and Systems - Diagrams, Device Designations, and Symbols
NEMA Pub. No. ICS-4	Industrial Control and Systems: Terminal Blocks
NEMA Pub. No. ST-20	Dry-Type Transformers for General Applications
NEMA Pub. No. FU 1-86	Low-Voltage Cartridge Fuses
NEMA Pub. No. 250	Enclosures for Equipment

f. Underwriters Laboratories (UL)

UL 38	Manual Signaling Boxes for Fire Alarm Systems
UL44	Thermoset-insulated Wires and Cables
UL 50	Enclosures for Electrical Equipment
UL 50E	Enclosures for Electrical Equipment, Environmental Considerations
UL 67	Panel boards
UL 83	Thermoplastic - Insulated wires and cables.
UL 94	Tests for Flammability of Plastic Materials for Parts in Devices and Appliances
UL 157	Gaskets and Seals
UL 181-08	Factory Made air ducts and air connectors
UL 252	Compressed Gas Regulators
UL 263	Fire Tests of Building Construction and Materials
UL 268	Smoke Detectors for Fire Alarm Systems
UL 429	Electrically Operated Valves
UL 429A	Electrically Operated Valves for Fire Protection Service
UL 464	Audible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
UL 467	Grounding and Bonding Equipment
UL 489	Molded-Case Circuit Breakers and Circuit-Breaker Enclosures
UL 508A	Industrial Control Panels
UL 521	Heat Detectors for Fire Protective Signaling Systems
UL 746C	Polymeric Materials – Use in Electrical Equipment Evaluations
UL 840	Insulation Coordination Including Clearances and Creepage Distances For Electrical Equipment
UL 842	Valves for Flammable and Combustible Liquids
UL 864	Control Units and Accessories for Fire Alarm Systems
UL 891	Dead-Front Switchboards
UL 857	Busways
UL 924	Standard for Emergency Lighting and Power Equipment
UL 969	Marking and Labeling Systems
UL 991	Tests for Safety-Related Controls Employing Solid-State Devices
UL 1004-1	Rotating Electrical Machines – General Requirements
UL 1004-2	Impedance Protected Motors
UL 1004-3	Thermally Protected Motors
UL 1004-4	Electric Generators
UL 1004-5	Fire Pump Motors
UL 1004-6	Servo and Stepper Motors
UL 1004-7	Electronically Protected Motors
UL 1004-8	Inverter Duty Motors
UL 1004-9	Form Wound and Medium Voltage Rotating Electrical Machines
UL 1012	Power Units Other Than Class 2
UL 1564	Industrial Battery Chargers
UL 1638	Visible Signaling Devices for Fire Alarm and Signaling Systems, Including Accessories
UL 1741	Inverters, Converters, Controllers and Interconnection System Equipment for Use With Distributed Energy Resources
UL 1778	Uninterruptible Power Systems



UL 1973	Batteries for Use in Stationary, Vehicle Auxiliary Power and Light Electric Rail (LER) Applications
UL 1974	Evaluation for Repurposing Batteries
UL 1995	Heating and Cooling Equipment
UL 1998	Software in Programmable Components
UL 2075	Gas and Vapor Detectors and Sensors
UL/ULC 2166	Halocarbon Clean Agent Extinguishing System Units
UL 2200	Stationary Engine Generator Assemblies
UL 2416	Audio/Video, Information and Communication Technology Equipment Cabinet, Enclosure and Rack Systems
UL 2755	Modular Data Centers
UL 5500	Remote Software Updates
UL 9540	Energy Storage Systems and Equipment
UL 9540A	Test Method for Evaluating Thermal Runaway Fire Propagation in Battery Energy Storage Systems
UL 60079-2	Explosive Atmospheres – Part 2: Equipment Protection by Pressurized Enclosures "p"
UL 60079-29-1	Explosive Atmospheres – Part 29-1: Gas Detectors – Performance Requirements of Detectors for Flammable Gases
UL 60730-1	Automatic Electrical Controls for Household and Similar Use – Part 1: General Requirements
UL 61800-5-1	Adjustable Speed Electrical Power Drive Systems – Part 5-1: Safety Requirements – Electrical, Thermal, and Energy
UL 62109-1	Safety of Power Converters for Use in Photovoltaic Power Systems – Part 1: General Requirements
UL 62368-1	Audio/Video, Information and Communication Technology Equipment – Part 1: Safety Requirements

g. American Society of Testing and Materials (ASTM)

ASTM A36	Structural Steel
ASTM B-187B/187M	Copper, Bus Bar, Rod and Shapes and General Purpose Rod, Bar and Shapes

h. American Welding Society (AWS)

AWS D1.1	Structural Welding Code
----------	-------------------------

i. ISO standards

ISO 3744	Acoustics - Determination of sound power levels and sound energy levels of noise sources using sound pressure - Engineering methods for an essentially free field over a reflecting plane
ISO 3864	Safety Colors and Safety Signs
ISO 7010	Graphical Symbols – Safety Colors and Safety Signs – Registered Safety Signs
ISO 9614	Determination of sound power levels of noise sources using sound intensity.
ISO 1496-1	Series 1 Freight Containers – Specification and Testing – Part 1: General Cargo Containers for General Purposes
ISO 12944	(all parts) Paints and Varnishes – Corrosion Protection of Steel Structures by Protective Paint Systems
ISO 13849-1	Safety of Machinery – Safety-Related Parts of Control Systems – Part 1: General Principles for Design
ISO 13849-2	Safety of Machinery – Safety-Related Parts of Control Systems – Part 2: Validation
ISO 26262	(all parts) Road Vehicles – Functional Safety

j. International Electro technical Commission (IEC) (as applicable)

IEC 60038	IEC Standard Voltages
IEC 60059	IEC Standard Current Ratings
IEC 60364	Low Voltage Electrical Installations



IEC 60445	Identification of equipment terminals and of terminations of certain designated conductor.
IEC 60446	Identification of conductors by colors
IEC 60529	Degrees of protection provided by enclosures
IEC 60617	IEC Symbols data Base
IEC 60812	Failure Mode and Effects Analysis (FMEA and FMECA)
IEC 60947	Low voltage switchgear and control gear
IEC 61000	Series Electromagnetic compatibility (EMC)
IEC 61010	Electrical Equipment - Measurement, Control and Laboratory Use
IEC 61025	Fault Tree Analysis
IEC 62208	Empty Enclosures for LV Switchgear and Control gear assemblies
IEC 62477-1	Power Electronic Converter Systems and Equipment
IEC/TS 62933	Electrical energy storage (EES) systems

CENELEC	
EN 50110-1:2013	Operation of electrical installations. General requirements

k. IBC

IBC	International Building Code
-----	-----------------------------

l. IFC

IFC	International Fire Code
-----	-------------------------

m. ISTA

ISTA 3E	Packaged products weighing over 150 lbs.
---------	--

n. Canadian Standards Association (CSA) [for units sold for installation in Canada]

CSA C 22.2 No. 0	Canadian Electric Code
------------------	------------------------

o. Steel Structures Painting Council (SSPC)

SSPC-PA 2	Measurement of Dry Coating Thickness with Magnetic Gages
SSPC- PA 1	Shop, Field and Maintenance Painting
SSPC SP6	Commercial Blast Cleaning

p. OSHA - Occupational Safety and Health Act - Standards - U.S. Department of Labor (29CFR)

Part 1910:	Subpart D Walking - Working Surfaces
Part 1910:	Subpart E Means of Egress
Part 1910:	Subpart S Electrical

q. Local Country, Province and City Codes

Refer the Ordering Drawing / Specification, which has reference to this specification.

r. Code of Federal Regulations, Title 47, Part 15 (47 CFR 15)

Federal Communications Commission (FCC) Part 15 or Part 18, Class A minimum

s. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)

