

Qingdao Chenyang Electrical Technology Co.,Ltd.

TEST REPORT

Prepared For :	Qingdao Chenyang Electrical Technology Co.,Ltd.
Product Name:	LFP energy storage battery pack
Model(s):	BDW40-800/24-100-1,BDW1-1000/50-100-1,BDW40-1000/50-100-1, BDW80-1000/50-200-1,BDW160-1000/50-400-1,BDW240-1000/50-600-1, BDW320-1000/50-800-1,BDW400-1000/50-1000-1, BDW800-1000/50-2000-1,BSP40-800/24-100-1, BSP80-1000/24-300-1,BSP150-1000/24-500-1,BSP300-1000/24-800-1, BSP450-1000/24-1000-1,BSP600-1000/24-1200-1,BSP800-1000/24-1600-1, BDM20-1000/50-50-1,BDM40-1000/50-100-1,BDM80-1000/50-200-1, BDM160-1000/50-400-1,BDM320-1000/50-800-1,BDM400-1000/50-1000-1, BDM500-1000/50-1000-1,BDM600-1000/50-1200-1, BDM800-1000/50-1400-1,BD60-1000/24-200-1,BD80-1000/24-300-1, BD100-1000/24-400-1,BD120-1000/24-400-1,BD150-1000/24-500-1, BD200-1000/24-800-1,BD40-800/24-100-1,BD240-1000/24-400-1, BD300-1000/24-1000-1,BD400-1000/24-900-1,BD400-1000/24-1000-1, BD500-1000/24-1000-1,BD600-1000/24-1200-1,BD-S40-800/24-800-1, BD-S60-1000/24-200-1,BD-S80-1000/24-1200-1,BD-S80-1000/24-800-1, BD-S120-1000/24-800-1,BD-S150-1000/24-500-1,BD-S200-1000/24-800-1, BD-S300-1000/24-800-1,BD-S300-1000/24-1000-1,BD-S400-1000/24-900-1, BD-S500-1000/24-1000-1,BD-S800-1000/24-1200-1,BDEL20-1000/50-50-1, BDEL40-1000/50-100-1,BDEL80-1000/50-200-1,BDEL160-1000/50-400-1, BDEL320-1000/50-800-1,BDEL400-1000/50-1000-1, BDEL500-1000/50-1000-1,BDEL600-1000/50-1200-1, BD-40S1P-128V-168AH-1,BD-40S1P-128V-150AH-1,BD-40S1P-128V-314AH-1, BD-16S1P-51.2V-168AH-1,BD-16S1P-51.2V-314AH-1, BD-16S2P-51.2V-628AH-1,BD-52S1P-166V-314AH-1,BD-52S2P-166V-628AH-1
Prepared By :	Qingdao Chenyang Electrical Technology Co.,Ltd.
Assessment Date:	2026-08-15
Date of Report :	2026-08-21
Report No.:	MTZ20260821003LVD

TEST REPORT

Report Reference No.....:	MTZ20260821003LVD
Date of issue.....:	2026-08-21
Assessment Laboratory.....:	Qingdao Chenyang Electrical Technology Co.,Ltd.
Address..... :	No.5 Yunshui 2ndRoad,Jimo,Qingdao , China
Applicant name.....:	Qingdao Chenyang Electrical Technology Co.,Ltd.
Address..... :	No.5 Yunshui 2ndRoad,Jimo,Qingdao , China
Assessment specification:	
Standards.....:	EN IEC 62368-1: 2020 + A11: 2020; EN IEC 62619:2022;
Non-standard test method.....:	N/A
Assessment Report Form No.....:	--
Test Report Form(s) Originator.....:	
Master TRF.....:	Dated: 2020-08
This report is specially limited to the above client company and product model only. It may not be duplicated without prior written consent.	
Test item description.....:	LFP energy storage battery pack
Trade Mark.....:	N/A
Manufacturer.....:	Qingdao Chenyang Electrical Technology Co.,Ltd.
Model..... :	BDW40-800/24-100-1
Ratings.....:	N/A

Assessment procedure and location:

Assessment Laboratory.....: Qingdao Chenyang Electrical Technology Co.,Ltd.

Address.....: No.5 Yunshui 2ndRoad,Jimo,Qingdao , China

Date of Assessment.....: 2026-08-21

Assessed by (name + signature)..... : **Eric.Zhang**

Reviewed by (name + signature)..... : **Yanlei.Jia**

Approved by (name + signature).....: **Xun.Su**

EN IEC 62368-1 report

Clasuse	Requirement	Result	Verdict
4	GENERAL REQUIREMENTS		P
4.1.1	Acceptance of materials, components and subassemblies	Components which are certified to IEC and/or national standards are used correctly within their ratings. Components not covered by EN standards are tested under the conditions present in the equipment.	P
4.1.2	Use of components	See table 4.1.2	P
4.1.3	Equipment design and construction	No accessible part which could cause injury	P
4.1.15	Markings and instructions.....:	(See Annex F)	P
4.4.4	Safeguard robustness	See below	P
4.4.4.2	Steady force tests.....:	(See Annex T.4, T.5)	P
4.4.4.3	Drop tests	(See Annex T.7)	P
4.4.4.4	Impact tests		N/A
4.4.4.5	Internal accessible safeguard enclosure and barrier tests..... :	No internal enclosure.	N/A
4.4.4.6	Glass Impact tests	No such glass used.	N/A
4.4.4.74	Thermoplastic material tests	(See Annex T.8)	P
4.4.4.8	Air comprising a safeguard.....:	(See Annex T)	P
4.4.4.9	Accessibility and safeguard effectiveness	After test, all safeguard remains effective, No damaged	P
4.5	Explosion	No explosion	P
4.6	Fixing of conductors		P
4.6.1	Fix conductors not to defeat a safeguard	All conductive parts are fixed on PCB by at least two soldering points; The primary and secondary lead wire were soldered to PCB and fixed by glue.	P
4.6.2	10 N force test applied to	Applied 10 N force, no loosen	P
4.7	Equipment for direct insertion into mains socket - outlets	Complied with relative plug test details see Summary of testing in page 3.	P

4.7.2	Mains plug part complies with the relevant standard..... :		N/A
4.7.3	Torque (Nm):		N/A
4.8	Products containing coin/button cell batteries	No lithium coin/button cell battery	N/A
4.8.2	Instructional safeguard		N/A
4.8.3	Battery Compartment Construction		N/A
	Means to reduce the possibility of children removing the battery.....:		-
4.8.4	Battery Compartment Mechanical Tests:	(See Table 4.8.4)	N/A
4.8.5	Battery Accessibility		N/A
4.9	Likelihood of fire or shock due to entry of conductive object.....:	(See Annex P)	N/A
5	ELECTRICALLY-CAUSED INJURY		P
5.2.1	Electrical energy source classifications..... :	(See appended table 5.2)	P
5.2.2	ES1, ES2 and ES3limits	ES1	P
5.2.2.2	Steady-state voltage and current..... :		P
5.2.2.3	Capacitance limits:		N/A
5.2.2.4	Single pulse limits :	No such single pulses with the EUT	N/A
5.2.2.5	Limits for repetitive pulses :	No such repetitive pulses with the EUT	N/A
5.2.2.6	Ringing signals :	No such ringing signals with the EUT	N/A
5.2.2.7	Audio signals:	No such audio signals with the EUT	N/A
5.3	Protection against electrical energy sources		P
5.3.1	General Requirements for accessible parts to ordinary, instructed and skilled persons	See below.	P
5.3.2.1	Accessibility to electrical energy sources and safeguards	Only ES1 could be accessible to ordinary person.	P
5.3.2.2	Contact requirements		P
	a) Test with test probe from Annex V :	The probe could not insert into the equipment as there is no ventilation on the product.	P
	b) Electric strength test potential (V):	The probe could not insert into the equipment as there is no ventilation on the product.	N/A
	c) Air gap (mm) :	The probe could not insert into the equipment as	N/A

		there is no ventilation on the product.	
5.3.2.4	Terminals for connecting stripped wire	No such terminals intended to be used by ordinary person.	N/A
5.4	Insulation materials and requirements		P
5.4.1.2	Properties of insulating material	The choice and application have taken into account as specified in this Clause 5 and Annex T except natural rubber, hygroscopic materials or asbestos are not used as insulation.	P
5.4.1.3	Humidity conditioning	(See sub-clause 5.4.8)	P
5.4.1.4	Maximum operating temperature for insulating materials	(See appended table 5.4.1.4)	N/A
5.4.1.5	Pollution degree	Pollution degree 2	N/A
5.4.1.5.2	Test for pollution degree 1 environment and for an insulating compound	Pollution degree 2	N/A
5.4.1.5.3	Thermal cycling	Pollution degree 2	N/A
5.4.1.6	Insulation in transformers with varying dimensions		N/A
5.4.1.7	Insulation in circuits generating starting pulses		N/A
5.4.1.8	Determination of working voltage		N/A
5.4.1.9	Insulating surfaces	Considered.	N/A
5.4.1.10	Thermoplastic parts on which conductive metallic parts are directly mounted	See below	N/A
5.4.1.10.2	Vicat softening temperature..... :	(See appended table 5.4.1.10.2)	N/A
5.4.1.10.3	Ball pressure	(See appended table 5.4.1.10.3)	N/A
5.4.2	Clearances		N/A
5.4.2.2	Determining clearance using peak working voltage	(See appended table 5.4.2.2)	N/A
5.4.2.3	Determining clearance using required withstand voltage	(See appended table 5.4.2.3)	N/A
	a) a.c. mains transient voltage		-
	b) d.c. mains transient voltage		-
	c) external circuit transient voltage		-
	d) transient voltage determined by measurement :		-
5.4.2.4	Determining the adequacy of a clearance using an electric strength test	(See appended table 5.4.2.4)	N/A
5.4.2.5	Multiplication factors for clearances and test		N/A

	voltages		
5.4.3	Creepage distances	(See appended table 5.4.3)	N/A
5.4.3.1	General		N/A
5.4.3.3	Material Group	IIIb	-
5.4.4	Solid insulation		N/A
5.4.4.2	Minimum distance through insulation	(See appended table 5.4.4.2)	N/A
5.4.4.3	Insulation compound forming solid insulation		N/A
5.4.4.4	Solid insulation in semiconductor devices		N/A
5.4.4.5	Cemented joints		N/A
5.4.4.6	Thin sheet material		N/A
5.4.4.6.1	General requirements		N/A
5.4.4.6.2	Separable thin sheet material		N/A
	Number of layers (pcs)		N/A
5.4.4.6.3	Non-separable thin sheet material		N/A
5.4.4.6.4	Standard test procedure for non-separable thin sheet material.....:	(See appended Table 5.4.9)	N/A
5.4.4.6.5	Mandrel test		N/A
5.4.4.7	Solid insulation in wound components		N/A
5.4.4.9	Solid insulation at frequencies >30 kHz		N/A
5.4.5	Antenna terminal insulation		N/A
5.4.5.1	General		N/A
5.4.5.2	Voltage surge test		N/A
	Insulation resistance (M).....:		-
5.4.6	Insulation of internal wire as part of supplementary safeguard.....:	(See appended table 5.4.4.2)	N/A
5.4.7	Tests for semiconductor components and for cemented joints		N/A
5.4.8	Humidity conditioning		N/A
	Relative humidity (%).....:		-
	Temperature (°C)		-
	Duration (h)		-
5.4.9	Electric strength test.....:	(See appended table 5.4.9)	N/A
5.4.9.1	Test procedure for a solid insulation type test		N/A
5.4.9.2	Test procedure for routine tests		N/A
5.4.10	Protection against transient voltages between external circuit		N/A
5.4.10.1	Parts and circuits separated from external circuits	(See appended table 5.4.9)	N/A
5.4.10.2	Test methods		N/A
5.4.10.2.1	General		N/A

5.4.10.2.2	Impulse test	(See appended table 5.4.9)	N/A
5.4.10.2.3	Steady-state test..... :	(See appended table 5.4.9)	N/A
5.4.11	Insulation between external circuits and earthed circuitry	(See appended table 5.4.9)	N/A
5.4.11.1	Exceptions to separation between external circuits and earth		N/A
5.4.11.2	Requirements		N/A
	Rated operating voltage U_{op} (V).....:		-
	Nominal voltage U_{peak} (V).....:		-
	Max increase due to variation U_{sp}		-
	Max increase due to ageing U_{sa}		-
	$U_{op} = U_{peak} + U_{sp} + U_{sa}$		-
5.5	Components as safeguards		
5.5.1	General		P
5.5.2	Capacitors and RC units		N/A
5.5.2.1	General requirement		N/A
5.5.2.2	Safeguards against capacitor discharge after disconnection of a connector.....:	(See appended table 5.5.2.2)	N/A
5.5.3	Transformers	(See Annex G.5.3)	N/A
5.5.4	Optocouplers	(See sub-clause 5.4 or Annex G.12)	N/A
5.5.5	Relays	(See Annex G.2)	N/A
5.5.6	Resistors	(See Annex G.10)	N/A
5.5.7	SPD's	(See Annex G.8)	N/A
5.5.7.1	Use of an SPD connected to reliable earthing		N/A
5.5.7.2	Use of an SPD between mains and protective earth		N/A
5.5.8	Insulation between the mains and external circuit consisting of a coaxial cable.....:	(See Annex G.10.3)	N/A
5.6	Protective conductor		
5.6.2	Requirement for protective conductors		N/A
5.6.2.1	General requirements		N/A
5.6.2.2	Colour of insulation		N/A
5.6.3	Requirement for protective earthing conductors		N/A
	Protective earthing conductor size (mm ²)		-
5.6.4	Requirement for protective bonding conductors		N/A
5.6.4.1	Protective bonding conductors		N/A
	Protective bonding conductor size (mm ²)		-
	Protective current rating (A)		-
5.6.4.3	Current limiting and overcurrent protective devices		N/A
5.6.5	Terminals for protective conductors		N/A
5.6.5.1	Requirement		N/A

	Conductor size (mm ²), nominal thread diameter (mm) :		N/A
5.6.5.2	Corrosion		N/A
5.6.6	Resistance of the protective system		N/A
5.6.6.1	Requirements		N/A
5.6.6.2	Test Method Resistance.....:	(See appended table 5.6.6.2)	N/A
5.6.7	Reliable earthing		N/A
5.7	Prospective touch voltage, touch current and protective conductor current		N/A
5.7.2	Measuring devices and networks		N/A
5.7.2.1	Measurement of touch current		N/A
5.7.2.2	Measurement of prospective touch voltage		N/A
5.7.3	Equipment set-up, supply connections and earth connections		N/A
	System of interconnected equipment (separate connections/single connection)		-
	Multiple connections to mains (one connection at a time/simultaneous connections)		-
5.7.4	Earthed conductive accessible parts.....:	(See appended Table 5.7.4)	N/A
5.7.5	Protective conductor current		N/A
	Supply Voltage (V).....:		-
	Measured current (mA).....:		-
	Instructional Safeguard.....:	(See F.4 and F.5)	N/A
5.7.6	Prospective touch voltage and touch current due to external circuits		N/A
5.7.6.1	Touch current from coaxial cables		N/A
5.7.6.2	Prospective touch voltage and touch current from external circuits		N/A
5.7.7	Summation of touch currents from external circuits		N/A
	a) Equipment with earthed external circuits Measured current (mA).....:		N/A
	b) Equipment whose external circuits are not referenced to earth. Measured current (mA)		N/A
6	ELECTRICALLY- CAUSED FIRE		P
6.2	Classification of power sources (PS) and potential ignition sources (PIS)		N/A
6.2.2	Power source circuit classifications		N/A
6.2.2.1	General		N/A
6.2.2.2	Power measurement for worst-case load fault ... :	(See appended table 6.2.2)	N/A
6.2.2.3	Power measurement for worst-case power source fault :	(See appended table 6.2.2)	N/A
6.2.2.4	PS1	(See appended table 6.2.2)	N/A

6.2.2.5	PS2 :	(See appended table 6.2.2)	N/A
6.2.2.6	PS3 :	(See appended table 6.2.2)	N/A
6.2.3	Classification of potential ignition sources		N/A
6.2.3.1	Arcing PIS :	(See appended table 6.2.3.1)	N/A
6.2.3.2	Resistive PIS :	(See appended table 6.2.3.2)	N/A
6.3	Safeguards against fire under normal operating and abnormal operating conditions		N/A
6.3.1 (a)	No ignition and attainable temperature value less than 90 % defined by ISO 871 or less than 300 C for unknown materials :	(See appended table 5.4.1.5, 6.3.2, 9.0, B.2.6)	N/A
6.3.1 (b)	Combustible materials outside fire enclosure	No such materials used.	N/A
6.4	Safeguards against fire under single fault conditions		N/A
6.4.1	Safeguard Method	Approved fire enclosure used	N/A
6.4.2	Reduction of the likelihood of ignition under single fault conditions in PS1 circuits		N/A
6.4.3	Reduction of the likelihood of ignition under single fault conditions in PS2 and PS3 circuits		N/A
6.4.3.1	General		N/A
6.4.3.2	Supplementary Safeguards	By equipped plastic fire enclosure.	N/A
	Special conditions if conductors on printed boards are opened or peeled	No such case happened.	N/A
6.4.3.3	Single Fault Conditions :	(See appended table 6.4.3)	N/A
	Special conditions for temperature limited by fuse		N/A
6.4.4	Control of fire spread in PS1 circuits		N/A
6.4.5	Control of fire spread in PS2 circuits		N/A
6.4.5.2	Supplementary safeguards :	(See appended tables 4.1.2 and Annex G)	N/A
6.4.6	Control of fire spread in PS3 circuit		N/A
6.4.7	Separation of combustible materials from a PIS		N/A
6.4.7.1	General..... :	(See tables 6.2.3.1 and 6.2.3.2)	N/A
6.4.7.2	Separation by distance		N/A
6.4.7.3	Separation by a fire barrier		N/A
6.4.8	Fire enclosures and fire barriers		N/A
6.4.8.1	Fire enclosure and fire barrier material properties		N/A
6.4.8.2.1	Requirements for a fire barrier		N/A
6.4.8.2.2	Requirements for a fire enclosure		N/A

6.4.8.3	Constructional requirements for a fire enclosure and a fire barrier		N/A
6.4.8.3.1	Fire enclosure and fire barrier openings	No openings.	N/A
6.4.8.3.2	Fire barrier dimensions		N/A
6.4.8.3.3	Top Openings in Fire Enclosure: dimensions (mm):		N/A
	Needle Flame test		N/A
6.4.8.3.4	Bottom Openings in Fire Enclosure, condition met a), b) and/or c) dimensions (mm) :		N/A
	Flammability tests for the bottom of a fire enclosure:		N/A
6.4.8.3.5	Integrity of the fire enclosure, condition met: a), b) or c):		N/A
6.4.8.4	Separation of PIS from fire enclosure and fire barrier distance (mm) or flammability rating.....:	V-0 plastic enclosure used and no distance between PIS and enclosure	N/A
6.5	Internal and external wiring		N/A
6.5.1	Requirements		N/A
6.5.2	Cross-sectional area (mm ²):		-
6.5.3	Requirements for interconnection to building wiring:	(See Annex Q.)	N/A
6.6	Safeguards against fire due to connection to additional equipment		N/A
	External port limited to PS2 or complies with Clause Q.1		N/A
7	INJURY CAUSED BY HAZARDOUS SUBSTANCES		N/A
7.2	Reduction of exposure to hazardous substances	No hazardous chemicals within the equipment.	N/A
7.3	Ozone exposure		N/A
7.4	Use of personal safeguards (PPE)		N/A
	Personal safeguards and instructions :		-
7.5	Use of instructional safeguards and instructions		N/A
	Instructional safeguard (ISO 7010):		-
7.6	Batteries :	(See Annex M)	N/A
8	MECHANICALLY-CAUSED INJURY		P
8.1	General	See the following details.	P
8.2	Mechanical energy source classifications	Sharp edges and corners, classified as MS1 Equipment maximum mass < 7 kg, classified as MS1	P
8.3	Safeguards against mechanical energy sources		N/A
8.4	Safeguards against parts with sharp edges and corners	Accessible edges and corners of the equipment are rounded and are classified as MS1.	P
8.4.1	Safeguards		N/A

8.5	Safeguards against moving parts	No moving parts within the equipment.	N/A
8.5.1	MS2 or MS3 part required to be accessible for the function of the equipment		N/A
8.5.2	Instructional Safeguard..... :		-
8.5.4	Special categories of equipment comprising moving parts		N/A
8.5.4.1	Large data storage equipment		N/A
8.5.4.2	Equipment having electromechanical device for destruction of media		N/A
8.5.4.2.1	Safeguards and Safety Interlocks	(See Annex F.4 and Annex K)	N/A
8.5.4.2.2	Instructional safeguards against moving parts		N/A
	Instructional Safeguard..... :		-
8.5.4.2.3	Disconnection from the supply		N/A
8.5.4.2.4	Probe type and force (N)		N/A
8.5.5	High Pressure Lamps		N/A
8.5.5.1	Energy Source Classification		N/A
8.5.5.2	High Pressure Lamp Explosion Test..... :	(See appended table 8.5.5.2)	N/A
8.6	Stability		N/A
8.6.1	Product classification		N/A
	Instructional Safeguard..... :		-
8.6.2	Static stability		N/A
8.6.2.2	Static stability test		N/A
	Applied Force		-
8.6.2.3	Downward Force Test		N/A
8.6.3	Relocation stability test		N/A
	Unit configuration during 10 tilt		-
8.6.4	Glass slide test		N/A
8.6.5	Horizontal force test (Applied Force)..... :		N/A
	Position of feet or movable parts..... :		-
8.7	Equipment mounted to wall or ceiling		N/A
8.7.1	Mounting Means (Length of screws (mm) and mounting surface)		N/A
8.7.2	Direction and applied force..... :		N/A
8.8	Handles strength		N/A
8.8.1	Classification		N/A
8.8.2	Applied Force		N/A
8.9	Wheels or casters attachment requirements		N/A
8.9.1	Classification		N/A
8.9.2	Applied force		-
8.10	Carts, stands and similar carriers		N/A

8.10.1	General		N/A
8.10.2	Marking and instructions		N/A
	Instructional Safeguard..... :		-
8.10.3	Cart, stand or carrier loading test and compliance		N/A
	Applied force :		-
8.10.4	Cart, stand or carrier impact test		N/A
8.10.5	Mechanical stability		N/A
	Applied horizontal force (N):		-
8.10.6	Thermoplastic temperature stability (oC)..... :		N/A
8.11	Mounting means for rack mounted equipment		N/A
8.11.1	General		N/A
8.11.2	Product Classification		N/A
8.11.3	Mechanical strength test, variable N:		N/A
8.11.4	Mechanical strength test 250N, including end stops		N/A
8.12	Telescoping or rod antennas.....	(See Annex T)	N/A
	Button/Ball diameter (mm):		-
9	THERMAL BURN INJURY		P
9.2	Thermal energy source classifications		P
9.3	Safeguard against thermal energy sources		P
9.4	Requirements for safeguards		P
9.4.1	Equipment safeguard		N/A
9.4.2	Instructional safeguard:		N/A
10	RADIATION		N/A
10.2	Radiation energy source classification	No such radiation from the equipment.	N/A
10.2.1	General classification		N/A
10.3	Protection against laser radiation		N/A
	Laser radiation that exists equipment:		-
	Normal, abnormal, single-fault :	(See attached laser test report)	N/A
	Instructional safeguard :		-
	Tool..... :		-
10.4	Protection against visible, infrared, and UV radiation		N/A
10.4.1	General		N/A
10.4.1.a)	RS3 for Ordinary and instructed persons:		N/A
10.4.1.b)	RS3 accessible to a skilled person.....:		N/A
	Personal safeguard (PPE) instructional safeguard:		-
10.4.1.c)	Equipment visible, IR, UV does not exceed RS1 . :		N/A
10.4.1.d)	Normal, abnormal, single-fault conditions :	(See appended table B.3 & B.4)	N/A
10.4.1.e)	Enclosure material employed as safeguard is opaque:		N/A
10.4.1.f)	UV attenuation.....:		N/A
10.4.1.g)	Materials resistant to degradation UV.....:		N/A

10.4.1.h)	Enclosure containment of optical radiation.....:		N/A
10.4.1.i)	Exempt Group under normal operating conditions:		N/A
10.4.2	Instructional safeguard		N/A
10.5	Protection against x-radiation		N/A
10.5.1	X- radiation energy source that exists equipment :	(See appended table B.3 & B.4)	N/A
	Normal, abnormal, single fault conditions		N/A
	Equipment safeguards.....:		N/A
	Instructional safeguard for skilled person..... :		N/A
10.5.3	Most unfavourable supply voltage to give maximum radiation		-
	Abnormal and single-fault condition :	(See appended table B.3 & B.4)	N/A
	Maximum radiation (pA/kg)..... :		N/A
10.6	Protection against acoustic energy sources		N/A
10.6.1	General		N/A
10.6.2	Classification		N/A
	Acoustic output, dB(A)..... :		N/A
	Output voltage, unweighted r.m.s..... :		N/A
10.6.4	Protection of persons		N/A
	Instructional safeguards		N/A
	Equipment safeguard prevent ordinary person to RS2..... :		-
	Means to actively inform user of increase sound pressure..... :		-
	Equipment safeguard prevent ordinary person to RS2:		-
10.6.5	Requirements for listening devices (headphones, earphones, etc.)		N/A
10.6.5.1	Corded passive listening devices with analog input		N/A
	Input voltage with 94 dB(A) LAeq acoustic pressure output.....:		-
10.6.5.2	Corded listening devices with digital input		N/A
	Maximum dB(A).....:		-
10.6.5.3	Cordless listening device		N/A
	Maximum dB(A).....:		-
B	NORMAL OPERATING CONDITION TESTS, ABNORMAL OPERATING CONDITION TESTS AND SINGLE FAULT CONDITION TESTS		P
B.2	Normal Operating Conditions		P
B.2.1	General requirements..... :	(See Test Item Particulars and appended test tables)	P
	Audio Amplifiers and equipment with audio amplifiers:		P
B.2.3	Supply voltage and tolerances		N/A
B.2.5	Input test..... :	(See appended table	P

		B.2.5)	
B.3	Simulated abnormal operating conditions		P
B.3.1	General requirements..... :	(See appended table B.3)	P
B.3.2	Covering of ventilation openings	No ventilation openings provided.	N/A
B.3.3	D.C. mains polarity test	The EUT is not connected to a D.C. mains	N/A
B.3.4	Setting of voltage selector :	No setting of voltage selector within the EUT	N/A
B.3.5	Maximum load at output terminals:	(See appended table B.3&B.4)	P
B.3.6	Reverse battery polarity		P
B.3.7	Abnormal operating conditions as specified in Clause E.2.		N/A
B.3.8	Safeguards functional during and after abnormal operating conditions	All safeguards remained effectively.	P
B.4	Simulated single fault conditions		N/A
B.4.2	Temperature controlling device open or short- circuited:	(See appended table B.4)	N/A
B.4.3	Motor tests	No motor within the EUT	N/A
B.4.3.1	Motor blocked or rotor locked increasing the internal ambient temperature :	(See Clause G.5)	N/A
B.4.4	Short circuit of functional insulation		P
B.4.4.1	Short circuit of clearances for functional insulation		P
B.4.4.2	Short circuit of creepage distances for functional insulation		P
B.4.4.3	Short circuit of functional insulation on coated printed boards		N/A
B.4.5	Short circuit and interruption of electrodes in tubes and semiconductors		P
B.4.6	Short circuit or disconnect of passive components		P
B.4.7	Continuous operation of components		N/A
B.4.8	Class 1 and Class 2 energy sources within limits during and after single fault conditions		P
B.4.9	Battery charging under single fault conditions ... :		P
C	UV RADIATION		N/A
C.1	Protection of materials in equipment from UV radiation		N/A
C.1.2	Requirements		N/A
C.1.3	Test method		N/A
C.2	UV light conditioning test		N/A
C.2.1	Test apparatus		N/A
C.2.2	Mounting of test samples		N/A
C.2.3	Carbon-arc light-exposure apparatus		N/A
C.2.4	Xenon-arc light exposure apparatus		N/A

D	TEST GENERATORS		N/A
D.1	Impulse test generators		N/A
D.2	Antenna interface test generator		N/A
D.3	Electronic pulse generator		N/A
E	TEST CONDITIONS FOR EQUIPMENT CONTAINING AUDIO AMPLIFIERS		N/A
E.1	Audio amplifier normal operating conditions		N/A
	Audio signal voltage (V)		-
	Rated load impedance (Ω)		-
E.2	Audio amplifier abnormal operating conditions		N/A
F	EQUIPMENT MARKINGS, INSTRUCTIONS, AND INSTRUCTIONAL SAFEGUARDS		P
F.1	General requirements		P
	Instructions – Language	Evaluated the user manual in English version. The manufacturer commits to provide them in the language of the countries where the product will be distributed.	-
F.2	Letter symbols and graphical symbols		P
F.2.1	Letter symbols according to IEC60027-1		P
F.2.2	Graphic symbols IEC, ISO or manufacturer specific		P
F.3	Equipment markings		P
F.3.1	Equipment marking locations	On the product	P
F.3.2	Equipment identification markings		P
F.3.2.1	Manufacturer identification	See marking	-
F.3.2.2	Model identification	Marked	-
F.3.3	Equipment rating markings		P
F.3.3.1	Equipment with direct connection to mains	Considered	P
F.3.3.2	Equipment without direct connection to mains		N/A
F.3.3.3	Nature of supply voltage.....	See marking	-
F.3.3.4	Rated voltage	See marking	-
F.3.3.4	Rated frequency.....		-
F.3.3.6	Rated current or rated power	See marking	-
F.3.3.7	Equipment with multiple supply connections		N/A
F.3.4	Voltage setting device		N/A
F.3.5	Terminals and operating devices		N/A
F.3.5.1	Mains appliance outlet and socket-outlet markings :		N/A
F.3.5.2	Switch position identification marking		N/A
F.3.5.3	Replacement fuse identification and rating markings :		N/A
F.3.5.4	Replacement battery identification marking		N/A
F.3.5.5	Terminal marking location		N/A
F.3.6	Equipment markings related to equipment classification		N/A

F.3.6.1	Class I Equipment		N/A
F.3.6.1.1	Protective earthing conductor terminal		N/A
F.3.6.1.2	Neutral conductor terminal		N/A
F.3.6.1.3	Protective bonding conductor terminals		N/A
F.3.6.2	Class II equipment (IEC60417-5172)		P
F.3.6.2.1	Class II equipment with or without functional earth		N/A
F.3.6.2.2	Class II equipment with functional earth terminal marking		N/A
F.3.7	Equipment IP rating marking	IPX0	-
F.3.8	External power supply output marking	Marked on the label	P
F.3.9	Durability, legibility and permanence of marking	Marking plate was provided on the enclosure and it was legible, permanent and easily discernible.	P
F.3.10	Test for permanence of markings	Complied	P
F.4	Instructions		P
	a) Equipment for use in locations where children not likely to be present - marking	The accessibility of equipment was evaluated by using test probe of Figure V.2.	P
	b) Instructions given for installation or initial use	Relevant safety caution texts and installation instruction are available.	P
	c) Equipment intended to be fastened in place	See above.	P
	d) Equipment intended for use only in restricted access area	The EUT is not such type equipment	N/A
	e) Audio equipment terminals classified as ES3 and other equipment with terminals marked in accordance F.3.6.1	No such terminals provided.	N/A
	f) Protective earthing employed as safeguard	Class III equipment	N/A
	g) Protective earthing conductor current exceeding ES 2 limits	Class III equipment	N/A
	h) Symbols used on equipment	Complied	P
	i) Permanently connected equipment not provided with all-pole mains switch	The EUT is not a permanently connected equipment	N/A
	j) Replaceable components or modules providing safeguard function	No replaceable components	N/A
F.5	Instructional safeguards	No instructional safeguard is considered as necessary.	N/A
	Where "instructional safeguard" is referenced in the test	No instructional safeguard	N/A

	report it specifies the required elements, location of marking and/or instruction	required in the equipment.	
G	COMPONENTS		P
G.1	Switches		N/A
G.1.1	General requirements	No such switch as disconnect devices provided within the equipment.	N/A
G.1.2	Ratings, endurance, spacing, maximum load		N/A
G.2	Relays		N/A
G.2.1	General requirements	No such relay provided within the equipment.	N/A
G.2.2	Overload test		N/A
G.2.3	Relay controlling connectors supply power		N/A
G.2.4	Mains relay, modified as stated in G.2		N/A
G.3	Protection Devices		N/A
G.3.1	Thermal cut-offs	No thermal cut-off provided within the equipment.	N/A
G.3.1.1a) &b)	Thermal cut-outs separately approved according to IEC 60730 with conditions indicated in a) & b)		N/A
G.3.1.1c)	Thermal cut-outs tested as part of the equipment as indicated in c)		N/A
G.3.1.2	Thermal cut-off connections maintained and secure		N/A
G.3.2	Thermal links		N/A
G.3.2.1a)	Thermal links separately tested with IEC 60691		N/A
G.3.2.1b)	Thermal links tested as part of the equipment		N/A
	Aging hours (H)		-
	Single Fault Condition		-
	Test Voltage (V) and Insulation Resistance :		-
G.3.3	PTC Thermistors	No PTC thermistor provided within the equipment.	N/A
G.3.4	Overcurrent protection devices	.	N/A
G.3.5	Safeguards components not mentioned in G.3.1 to G.3.5		N/A
G.3.5.1	Non-resettable devices suitably rated and marking provided		N/A
G.3.5.2	Single faults conditions.....:	(See appended Table B.4)	N/A
G.4	Connectors		N/A
G.4.1	Spacings		N/A
G.4.2	Mains connector configuration		N/A
G.4.3	Plug is shaped that insertion into mains socket- outlets or appliance coupler is unlikely		N/A

G.5	Wound Components		N/A
G.5.1	Wire insulation in wound components.....	(See Annex J)	N/A
G.5.1.2 a)	Two wires in contact inside wound component, angle between 45° and 90°	Insulation tube used as physical separation	N/A
G.5.1.2 b)	Construction subject to routine testing		N/A
G.5.2	Endurance test on wound components		N/A
G.5.2.1	General test requirements		N/A
G.5.2.2	Heat run test		N/A
	Time (s)		-
	Temperature (oC)		-
G.5.2.3	Wound Components supplied by mains		N/A
G.5.3	Transformers		N/A
G.5.3.1	Requirements applied (IEC61204-7, IEC61558- 1/-2, and/or IEC62368-1)		N/A
	Position..... :		-
	Method of protection		-
G.5.3.2	Insulation		N/A
	Protection from displacement of windings.....:		-
G.5.3.3	Overload test..... :		N/A
G.5.3.3.1	Test conditions		N/A
G.5.3.3.2	Winding Temperatures testing in the unit		N/A
G.5.3.3.3	Winding Temperatures - Alternative test method		N/A
G.5.4	Motors		N/A
G.5.4.1	General requirements		N/A
	Position		-
G.5.4.2	Test conditions		N/A
G.5.4.3	Running overload test		N/A
G.5.4.4	Locked-rotor overload test		N/A
	Test duration (days)		-
G.5.4.5	Running overload test for d.c. motors in secondary circuits		N/A
G.5.4.5.2	Tested in the unit		N/A
	Electric strength test (V)		-
G.5.4.5.3	Tested on the Bench - Alternative test method; test time (h)		N/A
	Electric strength test (V)		-
G.5.4.6	Locked-rotor overload test for d.c. motors in secondary circuits		N/A
G.5.4.6.2	Tested in the unit		N/A
	Maximum Temperature		N/A
	Electric strength test (V)		N/A
G.5.4.6.3	Tested on the bench - Alternative test method; test time (h)		N/A

	Electric strength test (V)		N/A
G.5.4.7	Motors with capacitors		N/A
G.5.4.8	Three-phase motors		N/A
G.5.4.9	Series motors		N/A
	Operating voltage		-
G.6	Wire Insulation		N/A
G.6.1	General		N/A
G.6.2	Solvent-based enamel wiring insulation		N/A
G.7	Mains supply cords		N/A
G.7.1	General requirements		N/A
	Type.....		-
	Rated current (A).....		-
	Cross-sectional area (mm ²), (AWG)		-
G.7.2	Compliance and test method		N/A
G.7.3	Cord anchorages and strain relief for non- detachable power supply cords		N/A
G.7.3.2	Cord strain relief		N/A
G.7.3.2.1	Requirements		N/A
	Strain relief test force (N)		-
G.7.3.2.2	Strain relief mechanism failure		N/A
G.7.3.2.3	Cord sheath or jacket position, distance (mm).... :		-
G.7.3.2.4	Strain relief comprised of polymeric material		N/A
G.7.4	Cord Entry	(See appended table 5.4.11.1)	N/A
G.7.5	Non-detachable cord bend protection		N/A
G.7.5.1	Requirements		N/A
G.7.5.2	Mass (g)		-
	Diameter (m)		-
	Temperature (oC)		-
G.7.6	Supply wiring space		N/A
G.7.6.2	Stranded wire		N/A
G.7.6.2.1	Test with 8 mm strand		N/A
G.8	Varistors		N/A
G.8.1	General requirements		N/A
G.8.2	Safeguard against shock		N/A
G.8.3	Safeguard against fire		N/A
G.8.3.2	Varistor overload test	(See appended table B.3)	N/A
G.8.3.3	Temporary overvoltage	(See appended table B.3)	N/A
G.9	Integrated Circuit (IC) Current Limiters		N/A
G.9.1 a)	Manufacturer defines limit at max. 5A.		N/A
G.9.1 b)	Limiters do not have manual operator or reset		N/A
G.9.1 c)	Supply source does not exceed 250 VA		-
G.9.1 d)	IC limiter output current (max. 5A)		-

G.9.1 e)	Manufacturers' defined drift		-
G.9.2	Test Program 1		N/A
G.9.3	Test Program 2		N/A
G.9.4	Test Program 3		N/A
G.10	Resistors		N/A
G.10.1	General requirements		N/A
G.10.2	Resistor test		N/A
G.10.3	Test for resistors serving as safeguards between the mains and an external circuit consisting of a coaxial cable		N/A
G.10.3.1	General requirements		N/A
G.10.3.2	Voltage surge test		N/A
G.10.3.3	Impulse test		N/A
G.11	Capacitor and RC units		N/A
G.11.1	General requirements		N/A
G.11.2	Conditioning of capacitors and RCunits		N/A
G.11.3	Rules for selecting capacitors		N/A
G.12	Optocouplers		N/A
	Optocouplers comply with IEC 60747-5-5:2007 Spacing or Electric Strength Test (specify option and test results).....:		N/A
	Type test voltage Vini		-
	Routine test voltage, Vini,b		-
G.13	Printed boards		N/A
G.13.1	General requirements		N/A
G.13.2	Uncoated printed boards		N/A
G.13.3	Coated printed boards		N/A
G.13.4	Insulation between conductors on the same inner surface		N/A
	Compliance with cemented joint requirements (Specify construction).....:		-
G.13.5	Insulation between conductors on different surfaces		N/A
	Distance through insulation.....:	(See appended table 5.4.4.5)	N/A
	Number of insulation layers (pcs)		-
G.13.6	Tests on coated printed boards		N/A
G.13.6.1	Sample preparation and preliminary inspection		N/A
G.13.6.2a)	Thermal conditioning		N/A
G.13.6.2b)	Electric strength test		N/A
G.13.6.2c)	Abrasion resistance test		N/A
G.14	Coating on components terminals		N/A
G.14.1	Requirements	(See G.13)	N/A
G.15	Liquid filled components		N/A

G.15.1	General requirements		N/A
G.15.2	Requirements		N/A
G.15.3	Compliance and test methods		N/A
G.15.3.1	Hydrostatic pressure test		N/A
G.15.3.2	Creep resistance test		N/A
G.15.3.3	Tubing and fittings compatibility test		N/A
G.15.3.4	Vibration test		N/A
G.15.3.5	Thermal cycling test		N/A
G.15.3.6	Force test		N/A
G.15.4	Compliance		N/A
G.16	IC including capacitor discharge function(ICX)		N/A
a)	Humidity treatment in accordance with sc5.4.8 – 120 hours		N/A
b)	Impulse test using circuit 2 with $U_c =$ to transient voltage		N/A
C1)	Application of ac voltage at 110% of rated voltage for 2.5 minutes		N/A
C2)	Test voltage		-
D1)	10,000 cycles on and off using capacitor with smallest capacitance resistor with largest resistance specified by manufacturer		N/A
D2)	Capacitance		-
D3)	Resistance		-
H	CRITERIA FOR TELEPHONE RINGING SIGNALS		N/A
H.1	General		N/A
H.2	Method A		N/A
H.3	Method B		N/A
H.3.1	Ringing signal		N/A
H.3.1.1	Frequency (Hz)		-
H.3.1.2	Voltage (V)		-
H.3.1.3	Cadence; time (s) and voltage (V)		-
H.3.1.4	Single fault current(mA):.....		-
H.3.2	Tripping device and monitoring voltage		N/A
H.3.2.1	Conditions for use of a tripping device or a monitoring voltage complied with		N/A
H.3.2.2	Tripping device		N/A
H.3.2.3	Monitoring voltage (V)		-
J	INSULATED WINDING WIRES FOR USE WITHOUT INTERLEAVED INSULATION		P
	General requirements	(See separate test report)	P
K	SAFETY INTERLOCKS		N/A
K.1	General requirements		N/A
K.2	Components of safety interlock safeguard mechanism	(See Annex G)	N/A
K.3	Inadvertent change of operating mode		N/A

K.4	Interlock safeguard override		N/A
K.5	Fail-safe		N/A
	Compliance	(See appended table B.4)	N/A
K.6	Mechanically operated safety interlocks		N/A
K.6.1	Endurance requirement		N/A
K.6.2	Compliance and Test method		N/A
K.7	Interlock circuit isolation		N/A
K.7.1	Separation distance for contact gaps & interlock circuit elements (type and circuit location)		N/A
K.7.2	Overload test, Current (A).....		N/A
K.7.3	Endurance test		N/A
K.7.4	Electric strength test	(See appended table 5.4.11)	N/A
L	DISCONNECT DEVICES		N/A
L.1	General requirements		N/A
L.2	Permanently connected equipment		N/A
L.3	Parts that remain energized		N/A
L.4	Single phase equipment		N/A
L.5	Three-phase equipment		N/A
L.6	Switches as disconnect devices		N/A
L.7	Plugs as disconnect devices		N/A
L.8	Multiple power sources		N/A
M	EQUIPMENT CONTAINING BATTERIES AND THEIR PROTECTION CIRCUITS		P
M.1	General requirements		P
M.2	Safety of batteries and their cells		P
M.2.1	Requirements		P
M.2.2	Compliance and test method (identify method) .. :		P
M.3	Protection circuits		P
M.3.1	Requirements		P
M.3.2	Tests		P
	- Overcharging of a rechargeable battery		P
	- Unintentional charging of a non-rechargeable battery		N/A
	- Reverse charging of a rechargeable battery		P
	- Excessive discharging rate for any battery		P
M.3.3	Compliance	(See appended Tables and Annex M and M.4)	P
M.4	Additional safeguards for equipment containing secondary lithium battery		P
M.4.1	General		P
M.4.2	Charging safeguards		P
M.4.2.1	Charging operating limits		P
M.4.2.2a)	Charging voltage, current and temperature	(See Table M.4)	-
M.4.2.2 b)	Single faults in charging circuitry	(See Annex B.4)	-

M.4.3	Fire Enclosure		P
M.4.4	Endurance of equipment containing a secondary lithium battery		P
M.4.4.2	Preparation		P
M.4.4.3	Drop and charge/discharge function tests		P
	Drop		P
	Charge		P
	Discharge		P
M.4.4.4	Charge-discharge cycle test		P
M.4.4.5	Result of charge-discharge cycle test		P
M.5	Risk of burn due to short circuit during carrying		N/A
M.5.1	Requirement		N/A
M.5.2	Compliance and Test Method (Test of P.2.3)		N/A
M.6	Prevention of short circuits and protection from other effects of electric current		P
M.6.1	Short circuits		P
M.6.1.1	General requirements		P
M.6.1.2	Test method to simulate an internal fault		P
M.6.1.3	Compliance (Specify M.6.1.2 or alternative method) :		N/A
M.6.2	Leakage current (mA) :	0.9	P
M.7	Risk of explosion from lead acid and NiCd batteries		N/A
M.7.1	Ventilation preventing explosive gas concentration		N/A
M.7.2	Compliance and test method		N/A
M.8	Protection against internal ignition from external spark sources of lead acid batteries		N/A
M.8.1	General requirements		N/A
M.8.2	Test method		N/A
M.8.2.1	General requirements		N/A
M.8.2.2	Estimation of hypothetical volume Vz (m3/s)..... :		-
M.8.2.3	Correction factors.....:		-
M.8.2.4	Calculation of distance d (mm) :		-
M.9	Preventing electrolyte spillage		N/A
M.9.1	Protection from electrolyte spillage		N/A
M.9.2	Tray for preventing electrolyte spillage		N/A
M.10	Instructions to prevent reasonably foreseeable misuse (Determination of compliance: inspection, data review; or abnormal testing) :		N/A
N	ELECTROCHEMICAL POTENTIALS		N/A
	Metal(s) used :	Pollution degree considered	-
O	MEASUREMENT OF CREEPAGE DISTANCES AND CLEARANCES		P
	Figures O.1 to O.20 of this Annex applied :		-
P	SAFEGUARDS AGAINST ENTRY OF FOREIGN OBJECTS AND SPILLAGE OF		P

	INTERNAL LIQUIDS		
P.1	General requirements		P
P.2.2	Safeguards against entry of foreign object		P
	Location and Dimensions (mm) :	No openings	-
P.2.3	Safeguard against the consequences of entry of foreign object		N/A
P.2.3.1	Safeguards against the entry of a foreign object		N/A
	Openings in transportable equipment		P
	Transportable equipment with metalized plastic parts :		N/A
P.2.3.2	Openings in transportable equipment in relation to metallized parts of a barrier or enclosure (identification of supplementary safeguard):		N/A
P.3	Safeguards against spillage of internal liquids		N/A
P.3.1	General requirements		N/A
P.3.2	Determination of spillage consequences		N/A
P.3.3	Spillage safeguards		N/A
P.3.4	Safeguards effectiveness		N/A
P.4	Metallized coatings and adhesive securing parts		N/A
P.4.2 a)	Conditioning testing		N/A
	Tc (°C).....:		-
	Tr (°C) :		-
	Ta (°C)..... :		-
P.4.2 b)	Abrasion testing :	(See G.13.6.2)	N/A
P.4.2 c)	Mechanical strength testing:	(See Annex T)	N/A
Q	CIRCUITS INTENDED FOR INTERCONNECTION WITH BUILDING WIRING		N/A
Q.1	Limited power sources		N/A
Q.1.1 a)	Inherently limited output		N/A
Q.1.1 b)	Impedance limited output		N/A
	- Regulating network limited output under normal operating and simulated single fault condition		N/A
Q.1.1 c)	Overcurrent protective device limited output		N/A
Q.1.1 d)	IC current limiter complying with G.9		N/A
Q.1.2	Compliance and test method		N/A
Q.2	Test for external circuits – paired conductor cable		N/A
	Maximum output current (A) :		-
	Current limiting method.....:		-
R	LIMITED SHORT CIRCUIT TEST		N/A
R.1	General requirements		N/A
R.2	Determination of the overcurrent protective device and circuit		N/A
R.3	Test method Supply voltage (V) and short-circuit current (A)). :		N/A
S	TESTS FOR RESISTANCE TO HEAT AND FIRE		P

S.1	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4 000 W		N/A
	Samples, material		-
	Wall thickness (mm).....		-
	Conditioning (oC).....		-
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	- Material not consumed completely		N/A
	- Material extinguishes within 30s		N/A
	- No burning of layer or wrapping tissue		N/A
S.2	Flammability test for fire enclosure and fire barrier integrity		P
	Samples, material		-
	Wall thickness (mm).....		-
	Conditioning (oC).....		-
	Test flame according to IEC 60695-11-5 with conditions as set out		N/A
	Test specimen does not show any additional hole		N/A
S.3	Flammability test for the bottom of a fire enclosure		P
	Samples, material		-
	Wall thickness (mm).....		-
	Cheesecloth did not ignite		N/A
S.4	Flammability classification of materials		N/A
S.5	Flammability test for fire enclosures and fire barrier materials of equipment where the steady state power does not exceed 4000 W		N/A
	Samples, material		-
	Wall thickness (mm).....		-
	Conditioning (test condition), (oC)		-
	Test flame according to IEC 60695-11-20 with conditions as set out		N/A
	After every test specimen was not consumed completely		N/A
	After fifth flame application, flame extinguished within 1 min		N/A
T	MECHANICAL STRENGTH TESTS		P
T.1	General requirements		P
T.2	Steady force test, 10 N	(See appended table T2)	P
T.3	Steady force test, 30 N	(See appended table T3)	N/A
T.4	Steady force test, 100 N	(See appended table T4)	P
T.5	Steady force test, 250 N	(See appended table T5)	N/A
T.6	Enclosure impact test	(See appended table T6)	N/A

	Fall test		N/A
	Swing test		N/A
T.7	Drop test	(See appended table T7)	P
T.8	Stress relief test	(See appended table T8)	P
T.9	Impact Test (glass)		N/A
T.9.1	General requirements		N/A
T.9.2	Impact test and compliance		N/A
	Impact energy (J).....		-
	Height (m)		-
T.10	Glass fragmentation test	(See sub-clause 4.4.4.9)	N/A
T.11	Test for telescoping or rod antennas		N/A
	Torque value (Nm)		-
U	MECHANICAL STRENGTH OF CATHODE RAY TUBES (CRT) AND PROTECTION AGAINST THE EFFECTS OF IMPLOSION		N/A
U.1	General requirements		N/A
U.2	Compliance and test method for non-intrinsically protected CRTs		N/A
U.3	Protective Screen.....	(See Annex T)	N/A
V	DETERMINATION OF ACCESSIBLE PARTS (FINGERS, PROBES AND WEDGES)		P
V.1	Accessible parts of equipment		P
V.2	Accessible part criterion		P

EN IEC 62619 report			
Clause	Requirement	Result	Verdict
4	Parameter measurement tolerances		-
5	General safety considerations		P
5.1	General		P
	Cells and battery systems shall be designed and constructed so that they are safe under conditions of intended use and reasonably foreseeable misuse. It may also be expected that cells and battery systems subjected to intended use shall not only be safe but shall continue to be functional in all respects.		P
5.2	Insulation and wiring		P
	Wiring and its insulation shall be sufficient to withstand the maximum anticipated voltage, current, temperature, altitude and humidity requirements. The design of an internal wiring shall be such that adequate clearances and creepage distances are maintained between conductors and live parts at different voltages or between live parts and non-current-carrying accessible parts. Hazardous live parts of the battery system shall be protected to avoid the risk of electric shocks, including during installation. The mechanical integrity of the whole battery system (cell/module/BMS) and their connections shall be sufficient to accommodate conditions of reasonably foreseeable misuse.		P
5.3	Venting		P
	The casing of a cell, module, battery pack, and battery system shall incorporate a pressure relief function that will preclude rupture or explosion. If encapsulation is used to support cells within an outer case, the type of encapsulating material and the method of encapsulation shall neither cause the battery system to overheat during normal operation nor inhibit pressure relief.		P
5.4	Temperature/voltage/current management		P
	The design of battery systems shall be such that abnormal temperature-rise conditions are prevented. Battery systems shall be designed within voltage, current, and temperature limits specified by the cell manufacturer. Battery systems shall be provided with specifications and charging instructions for equipment manufacturers so that associated chargers are designed to maintain charging within the voltage, current and temperature limits specified.		P
5.5	Terminal contacts of the battery pack and/or battery system		P
	Terminals shall have clear polarity marking(s) on the		P

	<p>external surface of the battery pack or battery system.</p> <p>Battery packs with keyed external connectors designed for connection to specific end products need not be marked with polarity markings if the design of the external connector prevents reverse polarity connections.</p> <p>The size and shape of the terminal contacts shall ensure that they can carry the maximum anticipated current.</p> <p>External terminal contact surfaces shall be formed from conductive materials with good mechanical strength and corrosion resistance. Terminal contacts shall be arranged so as to minimize the risk of short-circuits, for example to minimize the risk of short-circuits by metal tools.</p> <p>Compliance is determined through a review of the terminal specifications.</p>		
5.6	Assembly of cells, modules, or battery packs into battery systems		P
5.6.1	General		P
	<p>The assembly of cells, modules or battery packs to constitute the battery system shall respect the following rules to support adequate mitigation of risks as regard to the battery system:</p> <ul style="list-style-type: none"> •Each battery system shall have an independent control and protection method(s). <p>NOTE For the independent control and protection method(s), see 8.2.</p> <ul style="list-style-type: none"> •The cell manufacturer shall provide recommendations about current, voltage, temperature limits and should provide mounting advice, storage conditions, maximum number of cells in series (for cell internal protection such as a current interrupt device (CID)) so that the battery system manufacturer/designer may ensure proper design and assembly. •Battery systems that are designed for the selective discharging of a portion of their series connected cells shall incorporate separate circuitry to prevent the cell reversal caused by uneven discharging. •Protective circuit components should be added as appropriate and consideration given to the end-device application. 		P
5.6.2	Battery system design		P
	The voltage control function of the battery system design shall ensure that the voltage of each cell or cell block shall		P

	<p>not exceed the upper limit charging voltage specified by the manufacturer of the cells, except in the case where the end-devices provide the voltage control function. In such a case, the end-devices are considered as part of the battery system. Refer to Note 2 and Note 3 in 3.12.</p> <p>The battery shall be designed so that the maximum charging current or the maximum discharging current of the cell are not exceeded before the maximum allowed charging or discharging current of the battery is reached.</p>		
5.7	Operating region of lithium cells and battery systems for safe use		P
	<p>The cell manufacturer shall specify the cell operating region. The battery system manufacturer shall design the battery system to comply with the cell operating region.</p> <p>Determination of the cell operating region is in accordance with Annex A.</p>		P
5.8	System lock (or system lock function)		P
	<p>The battery system shall have a non-resettable function to stop operation when one or more cells in the battery system deviates from the operating region during operation. This feature shall not be user resettable or allow for automatic reset.</p> <p>The function of the battery system may be returned after checking that the status of the battery system complies with the battery system manufacturer manual, i.e. the battery system maintenance manual shall clearly set out this procedure.</p> <p>Depending on the application, a battery system may allow a final discharge, for example to provide emergency functions. In this case, cell limits (e.g. lower limit discharge voltage or upper temperature limit) may deviate once within the range where the cell does not cause dangerous reactions.</p> <p>Therefore, the cell manufacturer shall provide the second set of limits in which the cell in the battery system may accept one discharge without dangerous reactions. The cell should not be further recharged after this last discharge.</p>		P
5.9	Quality plan		P
	<p>The battery system manufacturer shall prepare and implement a quality plan that defines procedures for the inspection of materials, components, cells, modules, battery packs, and battery systems and which covers the whole process of producing each type of cell, module, battery pack, and battery system (e.g. ISO 9001, etc.).</p> <p>Manufacturers should understand their process capabilities</p>		P

	and should institute the necessary process controls in relation to product safety.		
6	Type test conditions		P
6.1	General		P
	<p>A cell in the battery system that is used outside of its operating region may exhibit hazards resulting from the cells or battery systems. Such risks shall be taken into consideration in order to prepare a safe test plan.</p> <p>The test facility should have sufficient structural integrity and a fire suppression system to sustain the conditions of overpressure and fire that may occur as a result of testing.</p> <p>The facility should have a ventilation system to remove and capture gas which might be produced during the tests.</p> <p>Consideration should be given to high voltage hazards when applicable.</p>		P
6.2	Test items		P
7	Specific requirements and tests		P
7.1	Charging procedures for test purposes		P
	<p>Prior to charging, the cell or battery system shall be discharged in an ambient temperature of $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$, at a constant current of 0,2 It A, down to a specified final voltage.</p> <p>Unless otherwise stated in this document, cells or battery systems shall be charged in an ambient temperature of $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$, using the method specified by the manufacturer.</p>		P
7.2	Reasonably foreseeable misuse		P
7.2.1	External short-circuit test (cell or cell block)		P
	<p>a) Requirements</p> <p>Short-circuit between the positive and negative terminals shall not cause fire or explosion.</p> <p>b) Test</p> <p>Fully charged cells are stored in an ambient temperature of $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$. Each cell is then short-circuited by connecting the positive and negative terminals with a total external resistance of $30\text{ m}\Omega \pm 10\text{ m}\Omega$.</p> <p>The cells are to remain on test for 6 h or until the case temperature declines by 80 % of the maximum temperature rise, whichever is the sooner.</p> <p>c) Acceptance criteria No fire, no explosion.</p>		P
7.2.2	Impact test (cell or cell block)		P
	<p>a) Requirements</p> <p>An impact to the cell as mentioned in 7.2.2 b) shall not</p>		P

	<p>cause fire or explosion.</p> <p>b) Test</p> <p>The cell or cell block shall be discharged at a constant current of 0,2 It A, to 50 % capacity of the rated capacity.</p> <p>The cell or cell block is placed on a flat concrete or metal floor. A type 316 stainless steel bar with a diameter of 15,8 mm $\pm$ 0,1 mm and at least 60 mm in length or the longest dimension of the cell, whichever is greater, is placed across the centre of the cell or cell block. A 9,1 kg rigid mass is then dropped from a height of 610 mm $\pm$ 25 mm onto the bar placed on the sample.</p> <p>A cylindrical or prismatic cell is to be impacted with its longitudinal axis parallel to the flat concrete or metal floor and perpendicular to the longitudinal axis of the 15,8 mm diameter curved surface lying across the centre of the test sample. A prismatic cell is also to be rotated 90 degrees around its longitudinal axis so that both the wide and narrow sides will be subjected to the impact. Each sample is to be subjected to only a single impact with separate samples to be used for each impact (see Figure 1).</p> <p>In the case of a metal floor, external short circuit of the cell or cell block with the floor should be avoided by appropriate measures.</p> <p>Pouch cells are tested as prismatic cells.</p> <p>c) Acceptance criteria No fire, no explosion.</p>		
7.2.3	Drop test (cell or cell block, and battery system)		P
7.2.3.1	General		P
	The drop test is conducted on a cell or cell block, and battery system. The test method and the height of the drop are determined by the test unit weight as shown in Table 2.		P
7.2.3.2	Whole drop test (cell or cell block, and battery system)		P
	<p>This test is applied when the mass of the test unit is less than 20 kg.</p> <p>a) Requirements</p> <p>Dropping the test unit shall not cause fire or explosion.</p> <p>b) Test</p> <p>Each fully charged test unit is dropped three times from a height shown in Table 2 onto a flat concrete or metal floor. If the mass of the test unit is less than 7 kg, the test unit is dropped so as to obtain impacts in random orientations. If</p>		P

	<p>the mass of the test unit is 7 kg or more but less than 20 kg, the test shall be performed with the test unit dropped in the bottom down direction. The bottom surface of the test unit is specified by the manufacturer.</p> <p>After the test, the test units shall be put on rest for a minimum of 1 h, and then a visual inspection shall be performed.</p> <p>If the floor of the test room is metal, external short circuit of cell or cell block, and battery system with the floor should be avoided by appropriate measures.</p> <p>c) Acceptance criteria No fire, no explosion.</p>		
7.2.3.3	Edge and corner drop test (cell or cell block, and battery system)		P
	<p>This test is applied when the mass of the test unit is 20 kg or more.</p> <p>a) Requirements Dropping the test unit shall not cause fire or explosion.</p> <p>b) Test A fully charged test unit is dropped two times from a height shown in Table 2 onto a flat concrete or metal floor. The drop test conditions shall ensure, with test arrangements as shown in Figure 2, Figure 3 and Figure 4, reproducible impact points for the shortest edge drop impact and the corner impact. The two impacts, per impact type, shall be on the same corner and on the same shortest edge. For the corner and edge drops, the test unit shall be oriented in such a way that a straight line drawn through the corner/edge to be struck and the test unit geometric centre is approximately perpendicular to the impact surface. After the test, the test unit shall be put on rest for a minimum of 1 h, and then a visual inspection shall be performed.</p> <p>If the floor of the test room is metal, external short circuit of cell or cell block, and battery system with the floor should be avoided by appropriate measures.</p> <p>c) Acceptance criteria No fire, no explosion.</p>		P
7.2.4	Thermal abuse test (cell or cell block)		P
	<p>a) Requirements An elevated temperature exposure shall not cause fire or explosion.</p> <p>b) Test Each fully charged cell, stabilized in an ambient temperature of $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$, is placed in a gravity or circulating air-convection oven.</p>		P

	<p>The oven temperature is raised at a rate of 5 °C / min $\pm$ 2 °C /min to a temperature of 85 °C $\pm$ 5 °C.</p> <p>The cell remains at this temperature for 3 h before the test is discontinued.</p> <p>c) Acceptance criteria No fire, no explosion.</p>		
7.2.5	Overcharge test (cell or cell block)		P
	<p>This test shall be performed for those battery systems that are provided with only a single control or protection for the charging voltage control. For those battery systems provided with two or more independent protection(s) or control(s) for the charging voltage control, this test may be waived.</p> <p>a) Requirements</p> <p>Charging for longer periods than specified by the cell manufacturer shall not cause fire or explosion.</p> <p>b) Test</p> <p>The test shall be carried out in an ambient temperature of 25 °C $\pm$ 5 °C. Each test cell shall be discharged at a constant current of 0,2 It A to a final voltage specified by the manufacturer. Sample cells shall then be charged with a constant current equal to the maximum specified charging current of the battery system until the voltage reaches the maximum voltage value that is possible under the condition where the original charging control of the battery system does not work. Then, the charging is terminated. The voltage and temperature should be monitored during the test.</p> <p>Regarding the battery system with single cells connected in parallel, a cell charging current value, calculated by dividing the maximum charging current of the battery system by the number of parallel cells, is applied.</p> <p>The test shall be continued until the temperature of the cell surface reaches steady state conditions (less than 10 °C change in a 30-min period) or returns to ambient temperature.</p> <p>c) Acceptance criteria No fire, no explosion.</p>		P
7.2.6	Forced discharge test (cell or cell block)		P
	<p>a) Requirements</p> <p>A cell in a battery system shall withstand a forced discharge without causing fire or explosion.</p> <p>b) Test</p> <p>The test shall be carried out in an ambient temperature of</p>		P

	<p>25 °C ± 5 °C. Each test cell shall be discharged at a constant current of 0,2 It A to a final voltage specified by the manufacturer. A discharged cell is subjected to a forced discharge at a constant current of 1,0 It A for a test period of 90 min. At the end of the test period, a visual inspection shall be performed.</p> <p>If the voltage in discharge reaches the target voltage shown below within the test period, the voltage shall be kept at the target voltage by reducing the current for the remaining test period. The target voltage is determined as follows:</p> <p>i) If the battery system is provided with two or more independent protection(s) or control(s) for discharging voltage control or the battery system has only a single cell or cell block: Target voltage is minus the value of the upper limit charging voltage of the cell.</p> <p>ii) If the battery system is provided with only a single or no protection or control for the discharging voltage control: Target voltage is minus the value of (n-1) multiplied by the upper limit charging voltage of the cell, where n is the number of cells connected in series in the battery system.</p> <p>c) Acceptance criteria No fire, no explosion.</p>		
7.3	Considerations for internal short-circuit – Design evaluation		P
7.3.1	General		P
	The purpose of the test is to determine that an internal short-circuit within a cell will not result in fire of the entire battery system or fire propagating outside the battery system. This shall be demonstrated either at the cell level according to 7.3.2 internal short-circuit test or at the battery system level according to 7.3.3 propagation test.		P
7.3.2	Internal short-circuit test (cell)		P
	<p>a) Requirement A forced internal short-circuit test for cylindrical cells and prismatic cells shall not cause fire. An evaluation of a newly designed cell shall be conducted by the cell manufacturer or a third-party test house.</p> <p>b) Test The forced internal short-circuit test is performed in a chamber according to the following procedure. All the tests are carried out in an ambient temperature of 25 °C ± 5 °C.</p> <p>1) Charging procedure</p>		P

	<p>Prior to charging, the cell shall be discharged at a constant current of 0,2 It A, down to a specified final voltage.</p> <p>Then, the cell shall be charged at the upper limited charging voltage at the constant current specified by the manufacturer, continue charging at constant voltage at upper limited charge current drops to 0,05 It A.</p> <p>2) Pressing the winding core with the nickel particle</p> <p>A temperature-controlled chamber and special press equipment are needed for the test.</p> <p>The moving part of the press equipment shall be able to move at constant speed and to be stopped immediately when an internal short-circuit is detected.</p> <p>i) Preparation for the test</p> <ul style="list-style-type: none"> – The temperature of the chamber is controlled at $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$. Refer to the sample preparation guidance in Clause A.5 and Clause A.6 of IEC 62133-2:2017. Put the aluminium laminated bag with the winding core and nickel particle into the chamber for $45\text{ min} \pm 15\text{ min}$. – Remove the winding core from the sealed package and attach the terminals for voltage measurement and the thermocouple(s) for temperature measurement on the surface of the winding core. Set the winding core under the pressure equipment making sure to locate the point of placement of the nickel particle under the pressing jig. <p>To prevent evaporation of electrolyte, finish the work within 10 min from removing the winding core from the chamber for temperature conditioning to closing the chamber door where the equipment is located.</p> <ul style="list-style-type: none"> – Remove the insulating sheet and close the chamber door. <p>ii) Internal short-circuit</p> <p>The bottom surface of the moving part of the press equipment (i.e. pressing jig) is made of nitrile rubber or acrylic resin, which is put on the 10 mm × 10 mm stainless steel shaft. Details of the pressing jigs are shown in Figure 5. The nitrile rubber bottom surface is for a cylindrical cell test. For a prismatic cell test, 5 mm × 5 mm (2 mm thickness) acrylic resin is put on the nitrile rubber.</p> <p>The fixture is moved down at a speed of 0,1 mm/s monitoring the cell voltage. When a voltage drop caused by the internal short-circuit is detected, stop the descent immediately and keep the pressing jig in the position for 30 s, and then release the pressure. The voltage is monitored at a rate of more than 100 times per second. If the voltage</p>		
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	<p>drops more than 50 mV compared the initial voltage, an internal short-circuit has been determined to have occurred. If the force of the press reaches 800 N for a cylindrical cell or 400 N for a prismatic cell before the 50 mV voltage drop, stop the descent immediately.</p> <p>In the case of a prismatic cell with either a stacking type or folding type electrode element, the nickel particle should be inserted at the centre of the outer end positive and negative electrode pair, and the maximum pressing pressure is 400 N.</p> <p>The sample preparation procedure may be changed from the procedure outlined in 7.3.2 2)i), it may be performed before the charging. For example:</p> <ul style="list-style-type: none"> – the nickel particle may be inserted into a discharged electrode element and then charged, or – the nickel particle may be inserted into the electrode element before electrolyte filling and then it may be assembled, filled with electrolyte and charged. In these assemblies, a polyethylene bag and/or an aluminium-laminated bag can be used instead of the metal case for the actual cell. <p>To judge that an internal short between the positive and negative electrodes or substrate has occurred, it is acceptable to use a voltage drop of less than 50 mV if a high accuracy voltage meter with enough accuracy to detect the voltage drop is used, and the actual short- circuit location can be confirmed with an inspection of the internal short-circuit location on the sample after the test.</p> <p>The applied pressure and the voltage behaviour shall be recorded, and the appearance of the short-circuit location shall be recorded by photograph or other means.</p> <p>c) Acceptance criteria No fire.</p>		
7.3.3	Propagation test (battery system)		P
	<p>a) Requirement</p> <p>This test evaluates the ability of a battery system to withstand a single cell thermal runaway event so that a thermal runaway event does not result in the battery system fire.</p> <p>b) Test</p> <p>The battery system is fully charged and then left until the cells stabilize in an ambient temperature of $25\text{ }^{\circ}\text{C} \pm 5\text{ }^{\circ}\text{C}$. One cell in the battery system (hereafter target cell) is e.g.</p>		P

	<p>heated by laser until the cell enters into thermal runaway. After thermal runaway in the cell is initiated, the triggering source is turned off and battery system is observed for 8 h. See Annex B for an example test procedure by laser. Other methods than the laser to initiate thermal runaway in one cell are allowed. See Annex C.</p> <p>The battery system may be modified to facilitate the thermal runaway of the target cell. The modification should be minimized and it shall not affect the thermal properties of the battery system.</p> <p>The method used to initiate a thermal runaway in the target cell shall be described in the test report.</p> <p>c) Acceptance criteria</p> <p>No external fire from the battery system, no battery system case rupture.</p> <p>If the battery system has no outer covering, the manufacturer shall specify the area for fire protection.</p>		
8	Battery system safety (considering functional safety)		P
8.1	General requirements		P
	<p>Reliance on electric, electronic and software controls and battery systems for critical safety shall be subjected to analysis for functional safety.</p> <p>IEC 61508 (all parts), Annex H of IEC 60730-1:2020, ISO 13849 (all parts) or other suitable functional safety standard for the application may be used as references.</p> <p>A process hazard analysis shall be made for the cell manufacturing process as well as the battery system manufacturing process, which shall be under control with evidence documented. The manufacturer should have a way to control the manufacturing process with respect to the safety hazards of the process.</p> <p>The risk assessment and mitigation of hazards for the battery system design shall be done by the battery system manufacturers (e.g. FTA, FMEA). This process should be done in coordination with the end-use equipment manufacturer in order to fully cover the spectrum of risks.</p>		P
8.2	Battery management system (or battery management unit)		P
8.2.1	Requirements for the BMS		P
	The BMS evaluates the condition of cells and battery systems, and it maintains cells and battery systems within the specified cell operating region. The BMS shall be designed according to the safety integrity level (SIL) target defined in 8.1 c). Key factors of the cell operating region are		P

	<p>voltage, temperature and current (see Figure A.1).</p> <p>To evaluate the charge control that affects safety, the battery system manufacturers shall perform the tests mentioned in 8.2.2 to 8.2.4.</p> <p>For these tests, the battery system includes the BMS function in the application side as well, if applicable to the design.</p>		
8.2.2	Overcharge control of voltage (battery system)		P
	<p>a) Requirement</p> <p>The BMS shall control the cell voltage during charging below the upper limit charging voltage of the cells.</p> <p>b) Test</p> <p>The test shall be carried out in an ambient temperature of $25\text{ °C} \pm 5\text{ °C}$ and under normal operating conditions with the cooling system (if any) operating (main contactors are closed with the battery system controlled by the BMS). Each test battery system shall be discharged at a constant current of 0,2 It A, to a final voltage specified by the manufacturer. Sample battery systems shall then be charged at the maximum current of the recommended charger with set voltage exceeding the upper limit charging voltage by 10 % for each cell in the battery system.</p> <p>The excess voltage can be applied by an additional charger if it is difficult to do so by the original charger. Also the excess voltage can be applied to only a part of the system such as the cell(s) in the battery system if it is difficult to do so using the whole battery system. See Figure 7.</p> <p>The test shall be carried out until the BMS terminates the charging. Data acquisition/monitoring shall be continued for 1 h after charging is stopped. During the test, all functions of the battery system shall be fully operational, as designed.</p> <p>If the BMS fails to terminate the charging, the test should be stopped at the proper timing for safety reasons, for example when the cell voltage reaches 103 % of the upper limit charging voltage or 1 min after having exceeded the upper limit charging voltage, etc.</p> <p>c) Acceptance criteria</p> <p>BMS terminates charging before exceeding the upper limit charging voltage. No fire, no explosion.</p>		P
8.2.3	Overcharge control of current (battery system)		P
	<p>a) Requirement</p> <p>If the charging current of the cells in the battery system</p>		P

	<p>exceeds the maximum charging current of the cells the BMS shall interrupt the charging to protect the battery system from hazards related to charging currents above the specified maximum charging current of the cells.</p> <p>If the maximum ability of charging current of the upper system is lower than the maximum charging current for the battery system, this test may be waived.</p> <p>b) Test</p> <p>The test shall be carried out in an ambient temperature of 25 °C ± 5 °C and under normal operating conditions with the cooling system (if any) operating (main contactors closed with the battery system being controlled by the BMS). The battery system shall be discharged at a constant current of 0,2 It A, to a final voltage specified by the manufacturer. Sample battery systems shall then be charged at a current exceeding the maximum charging current by 20 %. Data acquisition and/or monitoring shall be continued for 1 h after charging is stopped. During the test, all functions of the battery system shall be fully operational as designed.</p> <p>c) Acceptance criteria</p> <p>The BMS shall detect the overcharging current and shall control the charging below the maximum charging current. No fire, no explosion.</p>		
8.2.4	Overheating control (battery system)		P
	<p>a) Requirement</p> <p>The BMS shall terminate charging when the temperature of the cells in the battery system exceeds the upper limit that is specified by the cell manufacturer.</p> <p>b) Test</p> <p>The test shall be carried out at an initial ambient temperature of 25 °C ± 5 °C and under normal operating conditions (main contactors are closed with battery system being controlled by the BMS) with the exception that the cooling system, if provided, shall be disconnected. Each test battery system shall be discharged at a constant current of 0,2 It A, to a final voltage specified by the manufacturer. Sample battery systems shall then be charged at the recommended current to a 50 % capacity of the rated capacity. The temperature of the battery system shall be increased to 5 °C above the maximum operating temperature. The charging is continued at the elevated temperature until the BMS terminates the charging. Data acquisition/monitoring shall be continued for one hour after</p>		P

	<p>the sequence is stopped (e.g. the BMS has terminated charging).</p> <p>c) Acceptance criteria</p> <p>The BMS shall detect the overheat temperature and shall terminate charging. During the test, all functions of the battery system shall be fully operational as designed.</p> <p>No fire, no explosion.</p>		
9	EMC		P
	<p>The battery system shall fulfil EMC requirements of the end-device application such as stationary, traction, railway, etc. or the specific requirements agreed between the end-device manufacturer and the battery system manufacturer. The EMC test may be conducted on the end-device, if feasible.</p>		P
10	Information for safety		P
	<p>The use, and particularly abuse, of secondary lithium cells and battery systems may result in the creation of hazards and may cause harm. The cell manufacturer shall provide information about current, voltage and temperature limits of their products. The battery system manufacturer shall provide information to equipment manufacturers regarding how to mitigate hazards and, in the case of direct sales, to end-users. For example, if the battery system needs the end device to provide protection devices and/or controls, the end device manufacturer shall provide details of these protection devices that need to be provided in the installation information for the battery system. It is the responsibility of the end-device manufacturer to inform end-users of the potential hazards arising from the use of the end-device containing the battery systems.</p>		P
11	Marking and designation		P
	Refer to Clause 5 of IEC 62620:2014.		P
12	Packaging and transport		P
	Refer to Annex D.		P

Annex

Photo of machine

/Photo/

Nameplate

LFP energy storage battery pack

Model(s):BDW40-800/24-100-1



Manufacturer: Qingdao Chenyang Electrical Technology Co.,Ltd.

Address: No.5 Yunshui 2ndRoad,Jimo,Qingdao , China

Notice

1. This evaluation report is for samples only.
2. This evaluation report has assessed the basic requirements of the sample according to relevant standards.
3. This evaluation report is invalid without authorized signature.
4. This assessment report shall not be altered or deleted,
5. This assessment report shall not be used as a forensic expertise.
6. This assessment report is internal data and does not have the ability of public disclosure.
7. Client shall put forward demurrer within 15days after received report. laboratory shall refuse disposal if exceeded the time limit.
8. The assessment results presented in this report relate only to the object assessment.