This table covers test standards for Li-ion batteries. It is made in the European projects eCaiman, Spicy and Naiades.











Legend:

Battery level: CL: Cell level ML: Module level SL: System level

Topic:	
Performance	
Ageing	
Safety / Abuse	
Type approval / Certification	

Application:								
transport	traction							
general	stationary							
(hybrid) electric vehicles	industrial							
light electric vehicles	portable							
road vohicles, not for propulsion	commercial							

Idea of Con-	Auguliantiau	T	Title 0 Tealer		Leve		.		Table o	coverage	
Identifier	Application	Test	Title & Topics	CL	ML	SL	Туре	Perf.	Ageing	Safety short	Safety det.
UN38.3: 2015	transport		Recommendations on the Transport of Dangerous Goods - Manual							x	x
		T.1	of Tests and Criteria - section 38.3 Lithium batteries. Altitude simulation	х	x	х	Safety / Abuse-Environmental				
		T.2	Thermal test	х	х		Safety / Abuse-Thermal				
		T.3	Vibration	х	х		Safety / Abuse-Mechanical				
		T.4 T.5	Shock External short circuit	x x	x x		Safety / Abuse-Mechanical Safety / Abuse-Electrical				
		T.6	Impact / Crush	x			Safety / Abuse-Electrical Safety / Abuse-Mechanical				
		T.7	Overcharge	х	х	х	Safety / Abuse-Electrical				
		T.8	Forced discharge	х			Safety / Abuse-Electrical				
IEC 62281:2016 RLV	transport		Safety of primary and secondary lithium cells and batteries during transport.							x	x
		T.1	Altitude simulation	х	х	х	Safety / Abuse-Environmental				
		T.2	Thermal cycling	х	х		Safety / Abuse-Thermal				
		T.3 T.4	Vibration Shock	x x	X X		Safety / Abuse-Mechanical Safety / Abuse-Mechanical				
		T.5	External short circuit	х	х		Safety / Abuse-Electrical				
		T.6	Impact / Crush	х	х		Safety / Abuse-Mechanical				
		T.7 T.8	Overcharge Forced discharge	x x	×		Safety / Abuse-Electrical Safety / Abuse-Electrical				
UL1642:2013	general		Safety of Lithium-Ion Batteries – Testing.				,			х	
		10	Short-Circuit Test			х	Safety / Abuse-Electrical				
		11 12	Abnormal Charging Test				Safety / Abuse-Electrical Safety / Abuse-Electrical				
		13	Forced Discharge Test Crush Test				Safety / Abuse-Electrical Safety / Abuse-Mechanical				
		14	Impact Test			х	Safety / Abuse-Mechanical				
		15 16	Shock Test			X	Safety / Abuse-Mechanical				
		16 17	Vibration Test Heating Test				Safety / Abuse-Mechanical Safety / Abuse-Environmental				
		18	Temperature Cycling Test			х	Safety / Abuse-Environmental				
		19	Low Pressure (Altitude Simulation)Test				Safety / Abuse-Environmental				
	light electric	20	Projectile Test Manual for evaluation of energy systems for Light Electric Vehicle			Х	Safety / Abuse-Mechanical				
BATSO 01	vehicles		(LEV)- Secondary Lithium Batteries								
		5.1.1	Overcharge	1	x		Safety / Abuse-Electrical	<u> </u>			
		5.1.2 5.1.3	External short circuit Vibration		x x		Safety / Abuse-Electrical Safety / Abuse-Mechanical				
		5.1.4	Partial short circuit		x		Safety / Abuse-Electrical				
		5.2.1	Crush		х		Safety / Abuse-Mechanical				
		5.2.2 5.2.3	Shock Drop		x x		Safety / Abuse-Mechanical Safety / Abuse-Mechanical				
		5.3.1	Altitude simulation		x		Safety / Abuse-Mechanical				
		5.3.2	Temperature test		х	Х	Safety / Abuse-Thermal				
<u>UL 2271</u>	light electric	5.3.2	Temperature test Batteries for use in light electric vehicle (LEV) applications		х	х	Safety / Abuse-Thermal				
<u>UL 2271</u>	light electric vehicles	5.3.2			x	X	Safety / Abuse-Thermal Safety / Abuse-Electrical				
<u>UL 2271</u>		23 24	Batteries for use in light electric vehicle (LEV) applications		x						
<u>UL 2271</u>		23 24 25	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test		x		Safety / Abuse-Electrical Safety / Abuse-Electrical Safety / Abuse-Electrical				
<u>UL 2271</u>		23 24 25 26	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test		X		Safety / Abuse-Electrical Safety / Abuse-Electrical Safety / Abuse-Electrical Safety / Abuse-Electrical				
<u>UL 2271</u>		23 24 25	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test		x		Safety / Abuse-Electrical Safety / Abuse-Electrical Safety / Abuse-Electrical				
<u>UL 2271</u>		23 24 25 26 27 28 29	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test		x		Safety / Abuse-Electrical				
<u>UL 2271</u>		23 24 25 26 27 28 29 30	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test		x		Safety / Abuse-Electrical				
UL 2271		23 24 25 26 27 28 29 30 31	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test		x		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Mechanical				
<u>UL 2271</u>		23 24 25 26 27 28 29 30	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test		x		Safety / Abuse-Electrical				
<u>UL 2271</u>		23 24 25 26 27 28 29 30 31 32 33 34	Batteries for use in light electric vehicle (LEV) applications Overdange Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test Crush Test Drop Test Mold Stress Relief Test		x		Safety / Abuse-Electrical Safety / Abuse-Mechanical				
<u>UL 2271</u>		23 24 25 26 27 28 29 30 31 32 33 34 35	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test Crush Test Drop Test Mold Stress Relief Test Handle Loading Test		x		Safety / Abuse-Electrical Safety / Abuse-Mechanical				
<u>UL 2271</u>		23 24 25 26 27 28 29 30 31 32 33 34	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Wibration Endurance Test Shock Test Crush Test Drop Test Mold Stress Relief Test Handle Loading Test Roll Over Test		x		Safety / Abuse-Electrical Safety / Abuse-Mechanical				
UL 2271		23 24 25 26 27 28 29 30 31 32 33 34 35 36	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test Crush Test Drop Test Mold Stress Relief Test Handle Loading Test		x		Safety / Abuse-Electrical Safety / Abuse-Mechanical				
<u>UL 2271</u>		23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test Crush Test Drop Test Mold Stress Relief Test Handle Loading Test Roll Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating)		x		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental				
<u>UL 2271</u>		23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test Crush Test Drop Test Mold Stress Relief Test Handle Loading Test Roll Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test		x		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
<u>UL 2271</u>		23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test Crush Test Drop Test Mold Stress Relief Test Handle Loading Test Roll Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test		x		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental				
	vehicles	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test Circuit Test Overdischarge Test Uibration Endurance Test Shock Test Circuit Test Over Test Molid Stress Relief Test Handle Loading Test Roll Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid		x		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
UL 2271	vehicles	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test Crush Test Drop Test Mold Stress Relief Test Handle Loading Test Roll Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test		x		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
	vehicles	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Sibolation Resistance Test Sibolation Resistance Test Sibolation Resistance Test Sibolation Resistance Test Wibration Endurance Test Sibolation Resistance Test Sibolation Resistance Test Mold Stress Relief Test Handle Loading Test Handle Loading Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries for use in road vehicles not for the propulsion		x		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
	road vehicles, not for propulsion	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overdischarge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test Crush Test Drop Test Mold Stress Relief Test Handle Loading Test Strian Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries		×		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
	road vehicles, not for propulsion	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Wibration Endurance Test Shock Test Circuit Test Overdischarge Test Uibration Endurance Test Wibration Endurance Test Shock Test Circuit Test Over Test Moid Stress Relief Test Handle Loading Test Roll Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries for use in road vehicles not for the propulsion Under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium batteries for use in road vehicles not		×		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
IEC 63057 NWP	road vehicles, not for propulsion	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Shock Test Crush Test Drop Test Mold Stress Relief Test Handle Loading Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries for use in road vehicles not for the propulsion under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Sacendary lithium batteries for use in road vehicles not for the propulsion		×		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
IEC 63057 NWP	road vehicles, not for propulsion	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Shock Test Circuit Test Overdischarge Test Indial Stress Relief Test Handle Loading Test Boil Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries for use in road vehicles not for the propulsion Under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium batteries for use in road vehicles not for the propulsion Under development		×		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
IEC 63057 NWP	road vehicles, not for propulsion	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test Crush Test Drop Test Mold Stress Relief Test Handle Loading Test Boll Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries for use in road vehicles not for the propulsion under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium batteries for use in road vehicles not for the propulsion under development Safety requirements for secondary batteries and battery		×		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
IEC 63057 NWP	road vehicles, not for propulsion road vehicles, not for propulsion	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Shock Test Crush Test Drop Test Mold Stress Relief Test Handle Loading Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries for use in road vehicles not for the propulsion under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium batteries for use in road vehicles not for the propulsion under development Safety requirements for secondary batteries and battery installations - Part - 6: Lithium-ion batteries for traction applications		×		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
IEC 63057 NWP	road vehicles, not for propulsion road vehicles, not for propulsion	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test Crush Test Drop Test Mold Stress Relief Test Handle Loading Test Boll Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries for use in road vehicles not for the propulsion under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium batteries for use in road vehicles not for the propulsion under development Safety requirements for secondary batteries and battery		×		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
IEC 63057 NWP IEC 63118 NWP	road vehicles, not for propulsion traction	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test Crush Test Over Test Strain Relief Test Handle Loading Test Build Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries for use in road vehicles not for the propulsion under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium batteries for use in road vehicles not for the propulsion under development Sefety requirements for secondary batteries and battery installations - Part - 6: Lithium-ion batteries for traction applications under development Secondary cells and batteries containing alkaline or other non-acid		×		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
IEC 63057 NWP	road vehicles, not for propulsion road vehicles, not for propulsion	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test mibalanced Charging Test Dielectric Voltage Withstand Test isolation Resistance Test Wibration Endurance Test Shock Test Crush Test Orop Test Mold Stress Relief Test Handle Loading Test Roll Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries for use in road vehicles not for the propulsion under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium batteries for use in road vehicles not for the propulsion under development Safety requirements for secondary batteries and battery installations - Part - 6: Lithium-ion batteries for traction applications under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and		×		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
IEC 63057 NWP IEC 63118 NWP	road vehicles, not for propulsion traction	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test mibalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Vibration Endurance Test Shock Test Crush Test Over Test Strain Relief Test (Lord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries for use in road vehicles not for the propulsion under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium batteries for use in road vehicles not for the propulsion under development Safety requirements for secondary batteries and battery installations - Part - 6: Lithium-ion batteries for traction applications under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries for use in electrical energy storage system		×		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
IEC 63057 NWP IEC 63118 NWP	road vehicles, not for propulsion traction	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Wibration Endurance Test Shock Test Crush Test Orop Test Mold Stress Relief Test Handle Loading Test Boil Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries for use in road vehicles not for the propulsion Under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium batteries for use in road vehicles not for the propulsion under development Safety requirements for secondary batteries and battery installations - Part - 6: Lithium-ion batteries for traction applications under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries for use in electrical energy storage system Under development		×		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
IEC 63057 NWP IEC 63118 NWP IEC 62485-6 NWP	road vehicles, not for propulsion road vehicles, not for propulsion traction stationary	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Wibration Endurance Test Shock Test Crush Test Drop Test Mold Stress Relief Test Handle Loading Test Roll Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries for use in road vehicles not for the propulsion Under development Safety requirements for secondary latteries not for the propulsion under development Safety requirements for secondary batteries and battery installations - Part - 6: Lithium-ion batteries for traction applications under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary batteries and battery installations - Part - 6: Lithium-ion batteries for traction applications under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries for use in electrical energy storage system Under development Safety requirements for secondary batteries and battery				Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				
IEC 63057 NWP IEC 63118 NWP	road vehicles, not for propulsion traction	23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40	Batteries for use in light electric vehicle (LEV) applications Overcharge Test Short Circuit Test Overdischarge Test Temperature Test Imbalanced Charging Test Dielectric Voltage Withstand Test Isolation Resistance Test Wibration Endurance Test Shock Test Crush Test Orop Test Mold Stress Relief Test Handle Loading Test Boil Over Test Strain Relief Tests (Cord Anchorages) Immersion Test Water Exposure Test (IP Code Rating) Thermal Cycling Test Label Permanence Test Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium batteries for use in road vehicles not for the propulsion Under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Secondary lithium batteries for use in road vehicles not for the propulsion under development Safety requirements for secondary batteries and battery installations - Part - 6: Lithium-ion batteries for traction applications under development Secondary cells and batteries containing alkaline or other non-acid electrolytes - Safety requirements for secondary lithium cells and batteries for use in electrical energy storage system Under development		×		Safety / Abuse-Electrical Safety / Abuse-Mechanical Safety / Abuse-Environmental Safety / Abuse-Environmental Safety / Abuse-Environmental				

UL 1973	stationary		Batteries for Use in Light Electric Rail (LER) Applications and							
		13	Stationary Applications Overcharge Test	H	-	х	Safety / Abuse-Electrical			
		14	Short Circuit Test			х	Safety / Abuse-Electrical			
		15	Overdischarge Protection Test		ŀ		Safety / Abuse-Electrical			
		16 17	Temperature and Operating Limits Check Test Imbalanced Charging Test				Safety / Abuse-Electrical Safety / Abuse-Electrical			
		18	Dielectric Voltage Withstand Test		ŀ	х	Safety / Abuse-Electrical			
		19 20	Continuity Test Failure of Cooling/Thermal Stability System		ŀ		Safety / Abuse-Electrical Safety / Abuse-Electrical			
		21	Working Voltage Measurements				Safety / Abuse-Electrical			
		22	Tests on Electrical Components			x	Safety / Abuse-Electrical			
		23 24	Vibration Test (LER Motive Applications)		ŀ		Safety / Abuse-Mechanical			
		25	Shock Test (LER Motive Applications) Crush Test (LER Motive Applications)		ľ		Safety / Abuse-Mechanical Safety / Abuse-Mechanical			
		26	Static Force Test			x	Safety / Abuse-Mechanical			
		27	Impact Test			х	Safety / Abuse-Mechanical			
		28 29	Drop Impact Test Wall Mount Fixture/Handle Test		ŀ	X	Safety / Abuse-Mechanical Safety / Abuse-Mechanical			
		30	Mold Stress Test			x	Safety / Abuse-Mechanical			
		31	Pressure Release Test			х	Safety / Abuse-Mechanical			
		32 33	Start-To-Discharge Test		ľ	X	Safety / Abuse-Mechanical Safety / Abuse-Thermal			
		34	Thermal Cycling Test (LER Motive Applications) Resistance to Moisture Test			x	Safety / Abuse-Invironmental			
		35	Salt Fog Test			х	Safety / Abuse-Environmental			
		36 37	External Fire Exposure Test Internal Fire Exposure Test		ŀ	X	Safety / Abuse-Thermal Safety / Abuse-Thermal			
BATSO 02		37	Manual for Evaluation of Energy Systems – Secondary Lithium				Safety / Abuse-Thermal			
		test 1	Batteries Part 2: Stationary Batteries Fire	H		х	Safety / Abuse-Thermal			
		test 2	Earthquake			x	Safety / Abuse-Mechanical			
		test 3 test 4	Flooding Dust				Safety / Abuse-Mechanical Safety / Abuse-Mechanical			
		test 4 test 5	Vibration during transport				Safety / Abuse-Mechanical			
		test 6	Misuse		Į.	x	Safety / Abuse-Thermal			
		test 7 2.1.2	Internal fire Batteries under offshore conditions		ŀ	x	Safety / Abuse-Thermal			
		2.1.2	Batteries under offshore conditions Batteries under agricultural conditions			x	Safety / Abuse-Environmental Safety / Abuse-Environmental			
		3	Conformity and certification			х				
Telcordia GR-3150- CORE	stationary		Generic Requirements for Secondary Non-Aqueous Lithium Batteries							
		4.4.1	Fire Propagation and Projectile Hazard Characterization	П	T		Safety / Abuse-Thermal			
		4.4.2 4.4.3	Simulated Brush Fire Simulated Telecom Environmental Cycles				Safety / Abuse-Thermal Safety / Abuse-Environmental			
		4.4.4	Operating Altitude				Safety / Abuse-Mechanical			
		4.4.5	Immersion (Flooded Conditions)				Safety / Abuse-Environmental			
		4.5.1 4.5.2.1	Overcharge External Short Circuit				Safety / Abuse-Electrical Safety / Abuse-Electrical			
		4.5.2.1	Internal Short Circuit				Safety / Abuse-Electrical			
		4.5.3	Reverse Polarity				Safety / Abuse-Electrical			
		4.5.4 4.5.5	Overdischarge High-String Voltage				Safety / Abuse-Electrical Safety / Abuse-Electrical			
		4.5.6	Electromagnetic Compatibility Criteria				Safety / Abuse-Electrical			
		4.5.6.1	System-Level ESD				Safety / Abuse-Electrical			
		4.5.6.2	System-Level Electrical Fast Transients (EFTs)				Safety / Abuse-Electrical			
		4.5.6.3 4.5.6.4	Electromagnetic Interference (EMI) Lightning and AC Power Fault				Safety / Abuse-Electrical Safety / Abuse-Electrical			
		4.6.1	Handling Resistance Criteria				Safety / Abuse-Mechanical			
		4.6.1.1	Packaged Shock Criterion				Safety / Abuse-Mechanical			
		4.6.1.2 4.6.2	Unpackaged Shock Criteria Crush				Safety / Abuse-Mechanical Safety / Abuse-Mechanical			
		4.6.3.1	Earthquake				Safety / Abuse-Mechanical			
		4.6.3.2	Transportation Vibration				Safety / Abuse-Mechanical			
		4.6.3.3 5.1.1	Low-Level Vibration Resistance Float Voltage and Capacity				Safety / Abuse-Mechanical Performance-Electrical			
		5.1.1.1	Float Voltage				Performance-Electrical			
]	5.1.1.2	Capacity				Performance-Electrical			
		5.1.2 5.1.3	Recharge Time End of Discharge (EOD) Voltage	1			Performance-Electrical Performance-Electrical			
		5.1.4	Cycling				Ageing-Electrical			
]	5.1.5	Shelf Life and Charge Retention				Ageing-Electrical			
]	5.1.5.1 5.1.5.2	Shelf Life Charge Retention				Ageing-Electrical Ageing-Electrical			
		5.1.5.2	Extended Outages	[Ageing-Electrical			
		5.2.1	Temperature and Humidity Shock During Transportation and Storage				Safety / Abuse-Environmental			
		5.2.2	Particulate Contamination and Corrosive Gas Resistance				Safety / Abuse-Environmental			
		5.2.3	Salt Fog Exposure				Safety / Abuse-Environmental			
		5.2.4	Cold Temperature Start Secondary cells and batteries containing alkaling or other non-acid.	H			Performance-Thermal			
<u>IEC 62619</u>	industrial		Secondary cells and batteries containing alkaline or other non-acid electrolytes – Safety requirements for secondary lithium cells and						х	
		7.2.1	batteries, for use in industrial applications External short-circuit test (cell or cell block)	х			Safety / Abuse-Electrical			
		7.2.2	Impact test (cell or cell block)	х	- [Safety / Abuse-Mechanical			
]	7.2.3	Drop test (cell or cell block, and battery system) Thormal abuse test (cell or cell block)	x x	ŀ	х	Safety / Abuse-Mechanical			
		7.2.4 7.2.5	Thermal abuse test (cell or cell block) Overcharge test (cell or cell block)	x x			Safety / Abuse-Thermal Safety / Abuse-Electrical			
		7.2.6	Forced discharge test (cell or cell block)	x			Safety / Abuse-Electrical			
		7.3.2	Internal short-circuit test (cell)	x			Safety / Abuse-Electrical			
		7.3.3 8.2.2	Propagation test (battery system) Overcharge control of voltage (battery system)		ľ		Safety / Abuse-Thermal Safety / Abuse-Electrical			
		8.2.3	Overcharge control of current (battery system)		ŀ	x	Safety / Abuse-Electrical			
		8.2.4	Overheating control (battery system) Secondary cells and batteries containing alkaline or other non-acid			X	Safety / Abuse-Thermal			
<u>IEC 62620</u>	industrial		electrolytes – Secondary lithium cells and batteries for use in industrial applications					х		
		6.3.1	Discharge performance at +25°C (rated capacity)	х		X	Performance-Electrical			
		6.3.2 6.3.3	Discharge performance at low temperature High rate permissible current	x x		x	Performance-Electrical Performance-Electrical			
]	6.4	Charge (capacity) retention and recovery	х		x	Ageing-Electrical			
]	6.5.2	Measurement of the internal a.c. resistance	х		x	Performance-Electrical			
		6.5.3 6.6.1	Measurement of the internal d.c. resistance Endurance in cycles	x x	ľ	x x	Performance-Electrical Ageing-Electrical			
				Ü						
		6.6.2	Endurance in storage at constant voltage (permanent charge life)	<u> </u>	ľ	^	Ageing-Electrical			
ı	I	7.3.3	Conditional type approval	Х	1	х	l			

		1	T						ı	
			Secondary cells and batteries containing alkaline or other non-acid							
IEC 62133-2:2017	portable		electrolytes - Safety requirements for portable sealed secondary							¥
120 02100 2:2017	portable		cells, and for batteries made from them, for use in portable							
			applications.							
		7.2.1	Continuous low-rate charging	х			Safety / Abuse-Electrical			
		7.2.2	Case stress at high ambient temperature	х			Safety / Abuse-Mechanical			
		7.3.1	External short circuit (cell)	х			Safety / Abuse-Electrical			
		7.3.2	External short circuit (battery)		х	х	Safety / Abuse-Electrical			
		7.3.3	Free fall	х			Safety / Abuse-Mechanical			
		7.3.4	Thermal abuse	x			Safety / Abuse-Thermal			
		7.3.5	Crushing of cells	х			Safety / Abuse-Mechanical			
		7.3.6	Over-charging of battery		x	×	Safety / Abuse-Electrical			
		7.3.7	Forced discharge	х	^	^	Safety / Abuse-Electrical			
		7.3.8.1	Vibration	x			Safety / Abuse-Electrical Safety / Abuse-Mechanical			
		7.3.8.2	Mechanical shock	x			Safety / Abuse-Mechanical			
		7.3.8.2		^			Safety / Abuse-Mechanical			
			Secondary cells and batteries containing alkaline or other non-acid							
IEC 61960-3 : 2017	portable		electrolytes - Secondary lithium cells and batteries for portable					x		
	•		applications - Part 3: Prismatic and cylindrical lithium secondary cells							
			and batteries made from them							
		7.3.1	Discharge Performance at 20°C (rated capacity)	х	х	х	Performance-Electrical			
		7.3.2	Discharge Performance at -20°C	х	х	х	Performance-Electrical			
		7.3.3	High rate discharge performance at 20°C	х	х	х	Performance-Electrical			
		7.4	Charge (capacity) retention and recovery	х	х	х	Ageing-Electrical			
		7.5	Charge (capacity) recovery after long term storage	x	x		Ageing-Electrical			
		7.6.2	Endurance in cycles at a rate of 0,2 I _t A	х	x		Ageing-Electrical			
		7.0.2	Endurance in cycles at a race of 6/2 if 7	^	^	^	Ageing Electrical			
		7.6.3	Endurance in cycles at a rate of 0,5 I _t A (accelerated test procedure)	x	x	х	Ageing-Electrical			
		7.7.2	Measurement of the internal AC resistance	х	×	х	Performance-Electrical			
		7.7.3	Measurement of the internal DC resistance	x	x		Performance-Electrical			
		7.8	Electrostatic discharge (ESD)	^	x		Performance-Electrical			
		8	Test protocol and conditions for type approval	x	x		Performance-Electrical			
		0	rest protocor and conditions for type approval	^	^	^	Periorilance-Electrical			
<u>UL2054:2004</u>	commercial		Standard for safety-Household and Commercial Batteries.							
		9	Short-Circuit Test			х	Safety / Abuse-Electrical			
		10	Abnormal Charging Test			х	Safety / Abuse-Electrical	l	ĺ	
		11	Abusive Overcharge Test			х	Safety / Abuse-Electrical	Ī	l	
		12	Forced-Discharge Test			х	Safety / Abuse-Electrical		ĺ	
		13	Limited Power Source Test			х	Safety / Abuse-Electrical	l	ĺ	
		13A	Battery Pack Component Temperature Test			x	Safety / Abuse-Electrical	l	ĺ	
		13B	Battery Pack Surface Temperature Test			x	Safety / Abuse-Electrical	l	ĺ	
		14	Crush Test			x	Safety / Abuse-Mechanical			
		15	Impact Test			x	Safety / Abuse-Mechanical	l	ĺ	
		16	Shock Test						ĺ	
		17				x	Safety / Abuse-Mechanical	l	ĺ	
			Vibration Test			х	Safety / Abuse-Mechanical	l	ĺ	
		19	250 N Steady Force Test (Battery Enclosure Test)			х	Safety / Abuse-Mechanical		ĺ	
		20	Mold Stress Relief Test (Battery Enclosure Test)			Х	Safety / Abuse-Mechanical	l	ĺ	
		21	Drop Impact Test (Battery Enclosure Test)			х	Safety / Abuse-Mechanical	l	ĺ	
		22	Projectile Test			х	Safety / Abuse-Mechanical	l	ĺ	
		23	Heating Test			х	Safety / Abuse-Environmental	l	ĺ	
		24	Temperature Cycling Test			х	Safety / Abuse-Environmental	<u> </u>		

Despite our care we do not claim to cover all standards and that all test topics have been given here. The organisations that categorised the available test standards cannot be kept responsible for your decisions.

The involved institutes of the survey are:









