

BİRİKİM PİLLERİ AR-GE MERKEZİ

HEADSHIP OF BIRIKIM R&D CENTER (BARGEM)

Ar-Ge Test Takımı

R&D Test Team

20.03.2025

**BİRİKİM PİLLERİ AR-GE MERKEZİ
TEST KABİLİYETLERİ LİSTESİ**BIRIKIM PİLLERİ R&D CENTER
TEST CAPABILITIES LIST

#	Deney Kategorisi	Deney Adı	Deney Metodu	Deney Yapılan Ürün	İç / Dış Lab
	Test Category	Test Name	Test Method	Product Under test	Internal / External Lab
BMS Testleri / BMS Tests					
1	Fonksiyonel/Güvenlik	Düşük Gerilim Koruma Testi	Genel	BMS	İç
	Functional/Safety	UVP Under Voltage Protection Test	General		Internal
2	Fonksiyonel/Güvenlik	Yüksek Gerilim Koruma Testi	Genel	BMS	İç
	Functional/Safety	OVP Over Voltage Protection Test	General		Internal
3	Fonksiyonel/Güvenlik	Aşırı Yük Koruma Testi	Genel	BMS	İç
	Functional/Safety	OLP Over Load Protection Test	General		Internal
4	Fonksiyonel/Güvenlik	Aşırı Akım Koruma Testi	Genel	BMS	İç
	Functional/Safety	OCP Over Current Protection Test	General		Internal
5	Fonksiyonel/Güvenlik	Kısa Devre Koruma Testi	Genel	BMS	İç
	Functional/Safety	SCP Short Circuit Protection Test	General		Internal
6	Fonksiyonel/Güvenlik	Yüksek Sıcaklık Koruma Testi	Genel	BMS	İç
	Functional/Safety	OTP Over Temperature Protection Test	General		Internal
7	Fonksiyonel/Güvenlik	Düşük Sıcaklık Koruma Testi	Genel	BMS	İç
	Functional/Safety	UTP Under Temperature Protection Test	General		Internal
8	Fonksiyonel/Güvenlik	Hücre Dengeleme Testi	Genel	BMS	İç
	Functional/Safety	Cell Balancing Test	General		Internal
9	Fonksiyonel/Güvenlik	Ters Polarite Koruma Testi	Genel	BMS	İç
	Functional/Safety	Reverse Polarity Protection Test	General		Internal
Batarya Elektriksel Testler / Battery Electrical Tests					
10	Elektriksel/Performans	Şarj & Deşarj Testi	IEC 61960-3	Hücre / Batarya	İç
	Electrical/Performance	Charge & Discharge Test		Cell / Battery	Internal
11	Elektriksel/Performans	Farklı Sıcaklıklarda Şarj & Deşarj Testi	IEC 61960-3	Hücre / Batarya	İç
	Electrical/Performance	Charge & Discharge Test at Different Temperatures		Cell / Battery	Internal

BİRİKİM PİLLERİ AR-GE MERKEZİ

HEADSHIP OF BIRIKIM R&D CENTER (BARGEM)

Ar-Ge Test Takımı
R&D Test Team

20.03.2025

#	Deney Kategorisi	Deney Adı	Deney Metodu	Deney Yapılan Ürün	İç / Dış Lab
	Test Category	Test Name	Test Method	Product Under test	Internal / External Lab
12	Elektriksel/Performans	Kapasite Testi	Genel	Hücre / Batarya	İç
	Electrical/Performance	Capacity Test	General	Cell / Battery	Internal
13	Elektriksel/Performans	Kapasite Kaybı Testi	IEC 61960-3	Hücre / Batarya	İç
	Electrical/Performance	Capacity Loss Test		Cell / Battery	Internal
14	Elektriksel/Performans	Farklı Sıcaklıklarda Kapasite Testi	IEC 61960-3	Hücre / Batarya	İç
	Electrical/Performance	Capacity at Different Temperatures Test		Cell / Battery	Internal
15	Elektriksel/Performans	Çevrim Ömrü Testi	Genel	Hücre / Batarya	İç
	Electrical/Performance	Life Cycle Test	General	Cell / Battery	Internal
16	Elektriksel/Performans	C-Oran Testi	Genel	Hücre / Batarya	İç
	Electrical/Performance	C-Rate Test	General	Cell / Battery	Internal
17	Elektriksel/Performans	ACIR İç Direnç Testi	IEC 61960-3	Hücre / Batarya	İç
	Electrical/Performance	ACIR Internal Resistance Test		Cell / Battery	Internal
18	Elektriksel/Performans	DCIR İç Direnç Testi	IEC 61960-3	Hücre / Batarya	İç
	Electrical/Performance	DCIR Internal Resistance Test		Cell / Battery	Internal
19	Elektriksel/Performans	Sürekli ve Anlık Akım Testleri	Genel	Hücre / Batarya	İç
	Electrical/Performance	Continuous and Inrush Current Tests	General	Cell / Battery	Internal
20	Elektriksel/Performans	CF (Tepe Faktörü) Testi	Genel	Hücre / Batarya	İç
	Electrical/Performance	CF (Crest Factor) Test	General	Cell / Battery	Internal
21	Elektriksel/Güvenlik	Zorla Deşarj Testi	IEC 62133-2 UN38.3 UL1642	Hücre / Batarya	İç
	Electrical/Safety	Forced Discharge Test		Cell / Battery	Internal
22	Elektriksel/Güvenlik	Harici Kısa Devre Testi	IEC 62133-2 IEC 62619 UN38.3 UL1642	Hücre / Batarya	İç
	Electrical/Safety	External Short Circuit Test		Cell / Battery	Internal
23	Elektriksel/Güvenlik	Aşırı Şarj Testi	IEC 62133-2 IEC 62619 UN38.3 UL1642	Hücre / Batarya	İç
	Electrical/Safety	Over Charging Test		Cell / Battery	Internal
Çevre Koşul Testleri / Environmental Condition Tests					
24	Çevre Koşulu	Düşük Sıcaklık Testi	MIL-STD-810 E/F/G DO-160E	Hücre / Batarya / BMS	İç
	Environmental Condition	Low Temperature Test		Cell / Battery / BMS	Internal
25	Çevre Koşulu	Yüksek Sıcaklık Testi	MIL-STD-810 E/F/G/H DO-160E	Hücre / Batarya / BMS	İç
	Environmental Condition	High Temperature Test		Cell / Battery / BMS	Internal
26	Çevre Koşulu	Düşük Sıcaklık Depolama Testi	MIL-STD-810 E/F/G DO-160E	Hücre / Batarya / BMS	İç
	Environmental Condition	Low Temperature Storage Test		Cell / Battery / BMS	Internal

BİRİKİM PİLLERİ AR-GE MERKEZİ

HEADSHIP OF BIRIKIM R&D CENTER (BARGEM)

Ar-Ge Test Takımı
R&D Test Team

20.03.2025

#	Deney Kategorisi	Deney Adı	Deney Metodu	Deney Yapılan Ürün	İç / Dış Lab
	Test Category	Test Name	Test Method	Product Under test	Internal / External Lab
27	Çevre Koşulu	Yüksek Sıcaklık Depolama Testi	MIL-STD-810 E/F/G/H DO-160E	Hücre / Batarya	İç
	Environmental Condition	High Temperature Storage Test		Cell / Battery	Internal
28	Çevre Koşulu	Termal Şok Testi	MIL-STD-810 E/F/G DO-160E	Hücre / Batarya	İç
	Environmental Condition	Thermal Shock Test		Cell / Battery	Internal
29	Çevre Koşulu	Nem Testi	MIL-STD-810 E/F/G DO-160E	Hücre / Batarya	İç
	Environmental Condition	Humidity Test		Cell / Battery	Internal
30	Çevre Koşulu	Sızdırmazlık/Daldırma Testi (IP)	MIL-STD-810 E/F/G DO-160E	Hücre / Batarya	İç
	Environmental Condition	Immersion Test		Cell / Battery	Internal
31	Çevre Koşulu	Toz Testi	MIL-STD-810 E/F/G DO-160E	Hücre / Batarya	İç
	Environmental Condition	Dust Test		Cell / Battery	Internal
32	Çevre Koşulu	Kum Testi	MIL-STD-810 E/F/G, DO-160E	Batarya	Dış
	Environmental Condition	Sand Test		Battery	External
33	Çevre Koşulu	Tuz Spreyi Testi	MIL-STD-810 E/F/G, DO-160E	Batarya	Dış
	Environmental Condition	Salt Spray Test		Battery	External
Mekanik Testler / Mechanical Tests					
34	Mekanik	Titreşim Testi	MIL-STD-810, F/G/H, DO-160E, IEC 62133-2, UN38.3, UL1642	Hücre / Batarya	Dış
	Mechanical	Vibration Test		Cell / Battery	External
35	Mekanik	Serbest Düşme Testi	MIL-STD-810, IEC 62133-2, IEC 62619, IATA PI 96X	Hücre / Batarya	Dış
	Mechanical	Transit Drop Test		Cell / Battery	External
36	Mekanik	Mekanik Şok Testi	MIL-STD-810, E/F/G, IEC 62133-2, UN38.3, UL1642	Hücre / Batarya	Dış
	Mechanical	Mechanical Shock Test		Cell / Battery	External
37	Mekanik	Darbe Testi	IEC 62133-2, IEC 62619, UN38.3, UL1642	Hücre / Batarya	Dış
	Mechanical	Impact Test		Cell / Battery	External
38	Mekanik	Ezme Testi	IEC 62133-2 UN38.3 UL1642	Hücre / Batarya	Dış
	Mechanical	Crush Test		Cell / Battery	External
39	Mekanik	Patlatma Testi	UL1642	Hücre / Batarya	Dış
	Mechanical	Explosion Test		Cell / Battery	External
EMC Testleri / EMC Tests					
40	EMC/EMI	İşınım Yollu Bağışıklık	MIL-STD-461 IEC 61000-4-3	Batarya / Şarj Cihazı	Dış
		Radiated Immunity		Battery / Charger	External
41	EMC/EMI	İletim Yollu Bağışıklık	MIL-STD-461 IEC 61000-4-6	Şarj Cihazı	Dış
		Conducted Immunity		Charger	External

BİRİKİM PİLLERİ AR-GE MERKEZİ

HEADSHIP OF BIRIKIM R&D CENTER (BARGEM)

Ar-Ge Test Takımı
R&D Test Team

20.03.2025

#	Deney Kategorisi	Deney Adı	Deney Metodu	Deney Yapılan Ürün	İç / Dış Lab
	Test Category	Test Name	Test Method	Product Under test	Internal / External Lab
42	EMC/EMI	Elektrostatik Deşarj (ESD)	MIL-STD-461 IEC 61000-4-2	Batarya / Şarj Cihazı	Dış
		Electrostatic Discharge (ESD)		Battery / Charger	External
43	EMC/EMI	Elektriksel Hızlı Rejime / Ani Darbeye Karşı Bağışıklık (EFT/Burst)	MIL-STD-461 IEC 61000-4-4	Şarj Cihazı	Dış
		Electrical Fast Transient/Burst Immunity (EFT/Burst)		Charger	External
44	EMC/EMI	Ani Yükselmelere Karşı Bağışıklık	MIL-STD-461 IEC 61000-4-5	Şarj Cihazı	Dış
		Surge Immunity		Charger	External
45	EMC/EMI	Gerilim Çukurları, Kısa Kesintiler ve Gerilim Değişimi Testleri	MIL-STD-461 IEC 61000-4-11	Şarj Cihazı	Dış
		Voltage Dips, Short Interruptions and Voltage Variations Immunity		Charger	External
46	EMC/EMI	Işınım Yollu Emisyon	MIL-STD-461 EN55032 CISPR32	Batarya / Şarj Cihazı	Dış
		Conducted Emission		Battery / Charger	External
47	EMC/EMI	İletim Yollu Emisyon	MIL-STD-461 EN55022, CISPR22	Batarya / Şarj Cihazı	Dış
		Conducted Emission		Battery / Charger	External
48	EMC/EMI	Harmonik Akım Emisyon	MIL-STD-461 IEC 61000-3-2	Şarj Cihazı	Dış
		Harmonic Current Emission		Charger	External
Özel Testler / Specific Tests					
49	Elektriksel	Yük Analizi	Genel	Yük	İç
	Electrical	Load Analysis	General	Load	Internal
50	Elektriksel / Güvenlik / Çevresel / Mekanik	Özelleştirilmiş Performans	Genel	Hücre / Batarya / BMS / Şarj Cihazı	İç
	Electrical / Safety / Environmental / Mechanical	Specific Performance	General	Cell / Battery / BMS / Charger	Internal
51	Elektriksel / Güvenlik / Çevresel / Mekanik	Stres Testleri	Genel	Hücre / Batarya / BMS / Şarj Cihazı	İç
	Electrical / Safety / Environmental / Mechanical	Stress Tests	General	Cell / Battery / BMS / Charger	Internal

BİRİKİM PİLLERİ AR-GE MERKEZİ

HEADSHIP OF BIRIKIM R&D CENTER (BARGEM)

Ar-Ge Test Takımı
R&D Test Team

20.03.2025

**BİRİKİM PİLLERİ AR-GE MERKEZİ
STANDART OPSİYONLARI LİSTESİ**BIRIKIM PİLLERİ R&D CENTER
LIST OF STANDARD OPTIONS

#	Standart Kodu	Standart Tanımı
	Standard Code	Standard Description
1	MIL-STD-810	Military Standard: Environmental Engineering Considerations and Laboratory Tests
2	MIL-STD-461	Military Standard: Electromagnetic Interference Characteristics Requirements For Equipment
3	IEC/EN 62133-2	Secondary Cells and Batteries Containing Alkaline or Other Non-Acid Electrolytes – Safety Requirements for Portable Sealed Secondary Cells, and for Batteries Made From Them, for Use in Portable Applications – Part 2: Lithium Systems
4	IEC/EN 62619	Secondary Cells And Batteries Containing Alkaline or Other Non-Acid Electrolytes – Safety Requirements for Secondary Lithium Cells and Batteries, for Use in Industrial Applications
5	IEC/EN 62620	Secondary Cells and Batteries Containing Alkaline or Other Non-Acid Electrolytes – Secondary Lithium Cells and Batteries for Use in Industrial Applications
6	IEC/EN 61960-3	Secondary Cells and Batteries Containing Alkaline Or Other Non-Acid Electrolytes – Secondary Lithium Cells and Batteries for Portable Applications – Part 3: Prismatic and Cylindrical Lithium Secondary Cells, and Batteries Made From Them
7	IEC/EN 62281	Safety of Primary and Secondary Lithium Cells and Batteries During Transport
8	IEC/EN 63056	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 Systems
9	IEC/EN 62485-5	Safety Requirements for Secondary Batteries and Battery Installations – Part 5: Safe Operation of Stationary Lithium Ion Batteries
10	IEC/EN 50604-1	Secondary Lithium Batteries for Light EV (Electric Vehicle) Applications – Part 1: General Safety Requirements and Test Methods
11	UN38.3	Transport Of Lithium Metal, Lithium Ion and Sodium Ion Batteries
12	UL2054	Household and Commercial Batteries
13	UL2271	Batteries For Use In Light Electric Vehicle (LEV) Applications
14	UL2580	Batteries For Use In Electric Vehicles
15	UL1642	Standard For Safety Lithium Batteries
16	UL1973	Batteries for Use In Stationary and Motive Auxiliary Power Applications
17	MSDS	Material Safety Data Sheet