

**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
<b>BMS Testleri / BMS Tests</b>					
1	<b>Fonksiyonel/Güvenlik</b>	<b>Düşük Gerilim Koruma Testi</b>	<b>Genel</b>	<b>BMS</b>	<b>İç</b>
	Functional/Safety	UVP Under Voltage Protection Test	General		Internal
2	<b>Fonksiyonel/Güvenlik</b>	<b>Yüksek Gerilim Koruma Testi</b>	<b>Genel</b>	<b>BMS</b>	<b>İç</b>
	Functional/Safety	OVP Over Voltage Protection Test	General		Internal
3	<b>Fonksiyonel/Güvenlik</b>	<b>Aşırı Yük Koruma Testi</b>	<b>Genel</b>	<b>BMS</b>	<b>İç</b>
	Functional/Safety	OLP Over Load Protection Test	General		Internal
4	<b>Fonksiyonel/Güvenlik</b>	<b>Aşırı Akım Koruma Testi</b>	<b>Genel</b>	<b>BMS</b>	<b>İç</b>
	Functional/Safety	OCP Over Current Protection Test	General		Internal
5	<b>Fonksiyonel/Güvenlik</b>	<b>Kısa Devre Koruma Testi</b>	<b>Genel</b>	<b>BMS</b>	<b>İç</b>
	Functional/Safety	SCP Short Circuit Protection Test	General		Internal
6	<b>Fonksiyonel/Güvenlik</b>	<b>Yüksek Sıcaklık Koruma Testi</b>	<b>Genel</b>	<b>BMS</b>	<b>İç</b>
	Functional/Safety	OTP Over Temperature Protection Test	General		Internal
7	<b>Fonksiyonel/Güvenlik</b>	<b>Düşük Sıcaklık Koruma Testi</b>	<b>Genel</b>	<b>BMS</b>	<b>İç</b>
	Functional/Safety	UTP Under Temperature Protection Test	General		Internal
8	<b>Fonksiyonel/Güvenlik</b>	<b>Hücre Dengeleme Testi</b>	<b>Genel</b>	<b>BMS</b>	<b>İç</b>
	Functional/Safety	Cell Balancing Test	General		Internal
9	<b>Fonksiyonel/Güvenlik</b>	<b>Ters Polarite Koruma Testi</b>	<b>Genel</b>	<b>BMS</b>	<b>İç</b>
	Functional/Safety	Reverse Polarity Protection Test	General		Internal
<b>Batarya Elektriksel Testler / Battery Electrical Tests</b>					
10	<b>Elektriksel/Performans</b>	<b>Şarj &amp; Deşarj Testi</b>	<b>IEC 61960-3</b>	<b>Hücre / Batarya</b>	<b>İç</b>
	Electrical/Performance	Charge & Discharge Test		Cell / Battery	Internal
11	<b>Elektriksel/Performans</b>	<b>Farklı Sıcaklıklarda Şarj &amp; Deşarj Testi</b>	<b>IEC 61960-3</b>	<b>Hücre / Batarya</b>	<b>İç</b>
	Electrical/Performance	Charge & Discharge Test at Different Temperatures		Cell / Battery	Internal

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#	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
<b>Çevre Koşul Testleri / Environmental Condition Tests</b>					
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

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

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

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**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