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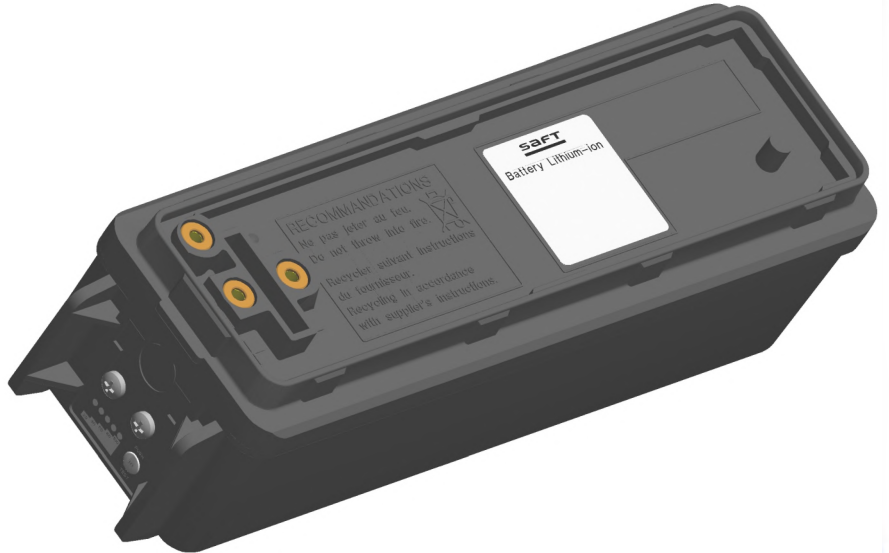
# Технические характеристики на перезаряжаемые литий-ионные аккумуляторы для космических аппаратов

# 4s2p MP176065 xlr XLSO

## Rechargeable Li-ion battery

14.6V high energy Li-ion battery with high performance and **reliability**

Saft's 4s2p MP176065 xlr XLSO battery is compatible with commercial applications requiring safety, reliability, long operating life under cycling conditions and offers excellent performance in temperature environments from -35°C to +60°C.



### Benefits

- Excellent operating lifetime in calendar and cycling with a very stable internal resistance
- Long shelf life with extremely low capacity loss in storage
- Smaller environmental footprint than other technologies

### Key features

- High energy density (133 Wh/l and 117 Wh/kg)
- Cycle life more than **1800** cycles at 100% DoD at C/2 discharge, C/ charge
- ABS black casing
- Ingress protection (IP 68)
- Operates in any orientation
- Maintenance free
- No memory effect
- **Manufactured in the EU**

### Designed to meet all major quality, safety and environmental standards

- Safety: UL 1642 and IEC 62133-2:2017
- Transport: UN 3480, UN 38.3
- Quality: ISO 9001:2009
- Environment: ISO 14001, RoHS and REACH compliant

### Typical applications

- Internet Of Things
- Security applications
- Commercial equipment
- Communications equipment

### Electrical characteristics

Typical capacity (at C/5 rate, +20°C, 2.5V cut-off) <sup>(i)</sup>	13.6 Ah	
Nominal voltage	14.6 V	
Nominal energy	198.5 Wh	
Recommended maximum discharge current <sup>(ii)</sup>	Continuous	5.0 A <sup>(iii)</sup> (+20°C)
(limited by the electronic protection circuit)		

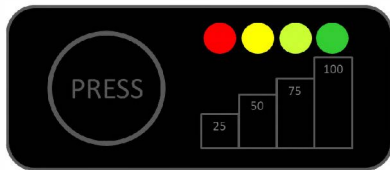
### Physical characteristics (sleeved cell)

Length (maximum)	259.0 mm	
Width (maximum)	79.0 mm	
Height (maximum including terminals)	73.0 mm	
Typical weight	1630 g	
Volume (including terminals)	1.49 l	
IEC battery designation	4INP/79/259/73-2	
Saft internal battery designation	4s2p MP176065 xlr XLSO	
Saft part number	70415N	

### Operating conditions

Typical cut-off voltage	10.0 V	
Charging method	Constant current/Constant voltage	
Charging voltage	16.8 ± 0.17V	
Maximum continuous charge current <sup>(iii)</sup>	5.0 A <sup>(iv)</sup> (~1C rate)	
Operating temperatures	Charge <sup>(iii)</sup>	-30°C to +60°C
	Discharge <sup>(iii)</sup>	-35°C to +60°C
Storage & transportation temperatures	Recommended	+10°C to +30°C
	Allowable	-40°C to +60°C

# 4s2p MP176065 xlr XLSO



## Independent five segment fuel gauge

- Asses and verify the batteries state of charge at any time.
- Verify the state of charge prior to transportation or use.
- The fuel gauge does not use battery energy while the display is inactive

## Electronic Protection Circuit

Built-in protection devices at battery and cell level ensures safe operation and user safety in case of abusive or extreme conditions. These conditions include, but are not limited to;

- Exposure to excessive heat
- Sustained exposure to direct sunlight
- External short circuit
- Overcharging the battery (resettable)
- Over discharging the battery (resettable)
- Mechanical damage

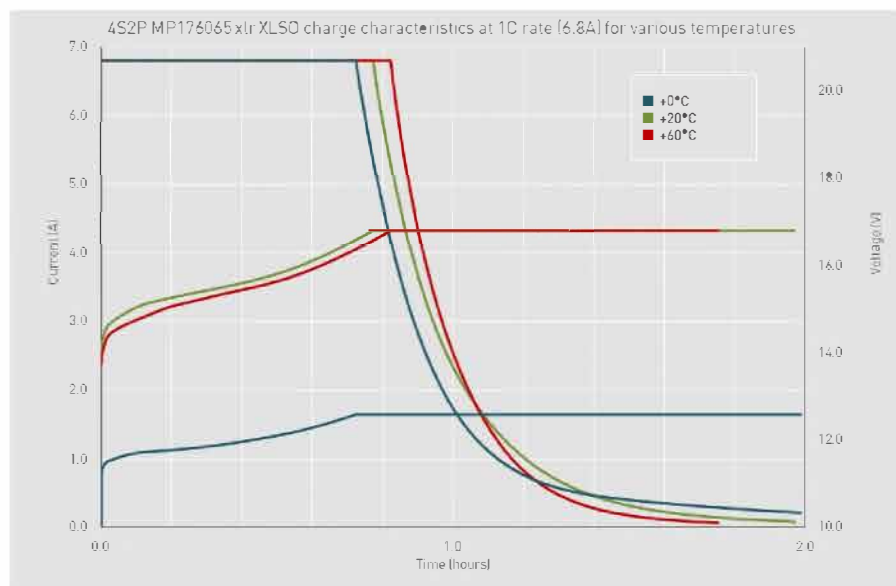
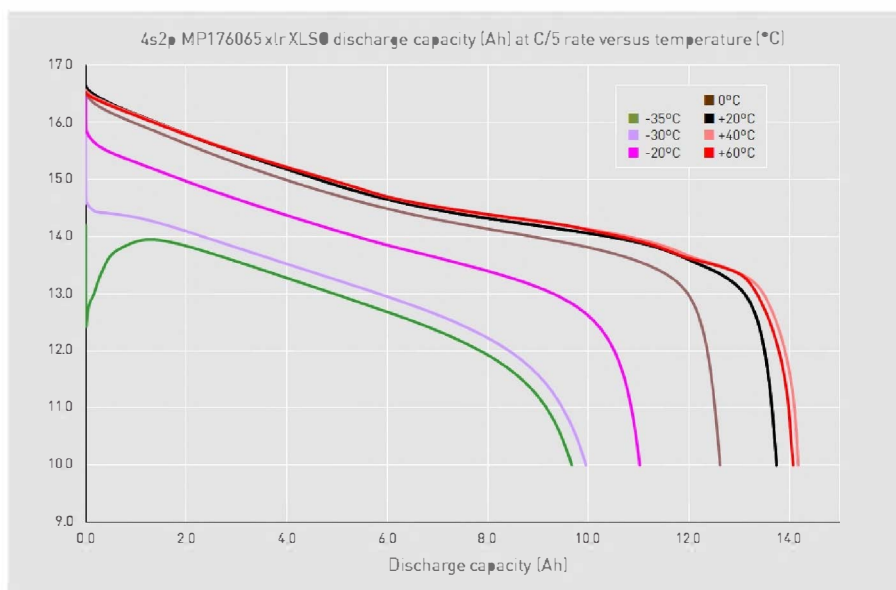
## Transport and Storage

- The storage area should be clean, cool (preferably between +10°C and +30°C), dry and ventilated
- For long-term storage, keep the battery state of charge within a 30% to 15% range.

## Warnings

- Do not crush, short-circuit, incinerate, dismantle, immerse in any liquid or heat above +85°C
- Observe charging conditions at all times
- Do not solder or weld directly to battery terminals
- Do not disassemble
- Do not disable, disconnect or modify the electronic protection circuit

Environmental requirement	Standard reference
High Temperature	810E, 501.3 (+60°C)
Low Temperature	810E, 502.3 (-20°C)
Vibration	810C, 514.2 H
Shock	810E, 516.4
Salt Fog	810E, 509.3 I
Immersion	810E, 512.3
Saft's Part Number	70415N
Saft internal battery designation	4s2p MP176065 xlr XLSO



# 1p INT 176065 isr FL

## Rechargeable Li-ion battery

3.65 V high energy Li-ion battery, high performance and **intrinsic safety**

Saft's 1p MP 175065 isr FL battery is compatible with applications requiring intrinsic safety, long operating life under cycling conditions and excellent performance in temperature environments from -30°C to +60°C.

### Benefits

- Excellent operating lifetime in calendar and cycling life with a very stable internal resistance
- High level of safety, compatible with potentially explosive atmospheres
- Long shelf life with extremely low capacity loss in storage
- Smaller environmental footprint than other technologies

### Key features

- High energy density
- Cycle life more than 2250 cycles at 100% DoD at C/2 discharge, C charge
- The battery connection area is resin encapsulated with flying leads
- Aluminium casing
- Hermetically sealed
- Operates in any orientation
- Maintenance free
- No memory effect
- **Manufactured in the EU**

### Designed to meet all major quality, safety and environmental standards

- Safety at cell level is qualified to UL 1642 and IEC 62133-2:2017
- Transport: UN 3480, UN 38.3
- IEC 60079-11 compatible component (see over for details) <sup>[v]</sup>
- Quality: ISO 9001, Saft World Class program
- Environment: ISO 14001, RoHS and REACH compliant

### Typical applications

- Backup for industrial equipment
- Medical devices
- Tracking
- Oil & Gas applications
- Internet of Things
- Wireless Sensor Networks
- Emergency lighting



### Electrical characteristics

Typical capacity (at C/5 rate, +25°C, 2.5V cut-off) <sup>[i]</sup>	5.6 Ah	
Nominal voltage	3.65 V	
Nominal energy	20.4 Wh	
Recommended maximum discharge current <sup>[ii]</sup>	Continuous	11 A (~2C rate)
	Pulse	22 A (~4C rate)

### Physical characteristics

Thickness <sup>[iii]</sup>	20.6 mm	
Width (max)	62.0 mm	
Height ( max not including cable)	74.0 mm	
Typical weight	155 g	
Volume (including terminals)	0.094 l	
IEC battery designation	1INP21/62/74	
Saft internal cell designation	MP 176065 ise	
Saft part number	70463K	
Saft model / type reference	1p INT 176065 isr FL   GP31659	

### Operating conditions

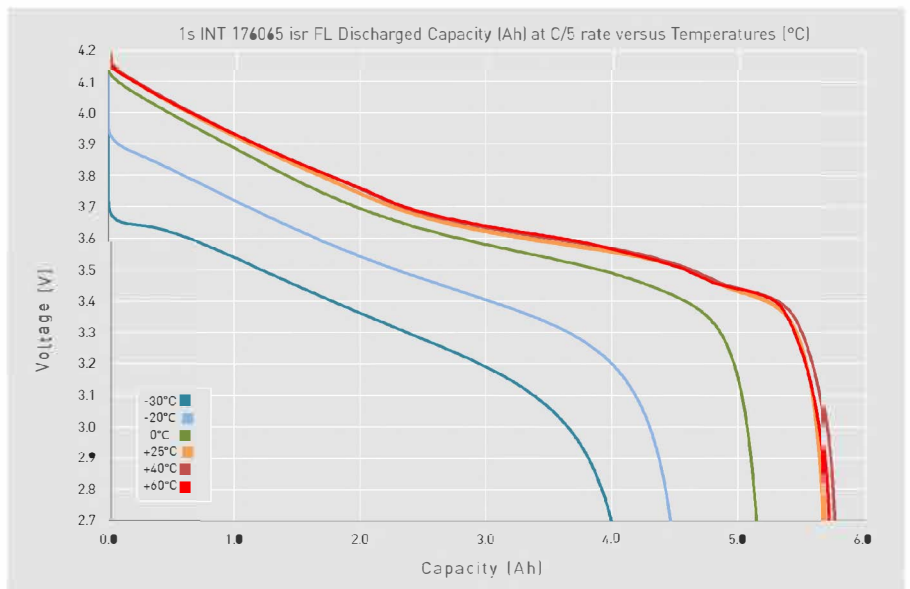
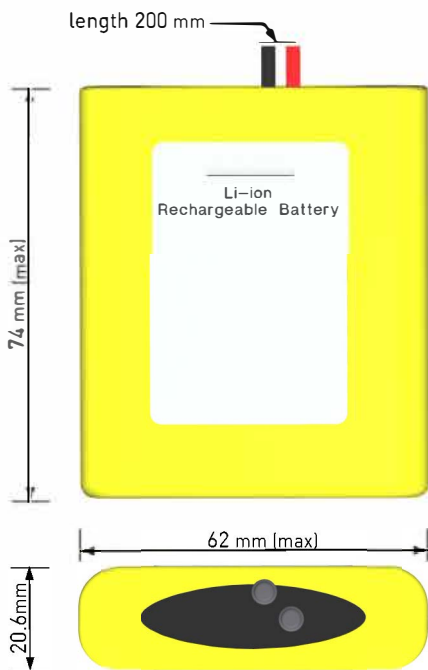
Typical cut-off voltage	2.5 V	
Charging method	Constant current/Constant voltage	
Charging voltage	4.2 ± 0.05 V	
Maximum continuous charge current <sup>[iv]</sup>	5.6 A (~1C rate)	
Operating temperatures	Charge	-30°C to +60°C
	Discharge	-30°C to +60°C
Storage & transportation temperatures	Recommended	+10°C to +30°C
	Allowable	-40°C to +60°C

[i] Can vary depending on temperature and discharge rate

[ii] Can vary depending on temperatures. Consult Saft

[iii] At beginning of life, 100% State-of-Charge. May increase with temperature and the cells' calendar life. Refer to drawing GP 31659.

[iv] Maximum continuous charge current is limited by the internal resistance of the battery. Refer to drawing GP 31659.



### Battery assembly

The battery must be mechanically and electrically integrated into a complete system. The battery must include electronic devices for performance, thermal and safety management specific to each application.

#### IEC 60079-11 Ed. 6.0:

- The battery is verified as compliant with the following parts of the above standard; 6.3.2.1, 6.3.3, 6.3.5, 6.3.6, 6.3.12, 6.6.1, 6.6.2, 10.5.1, 10.5.2 and 10.5.3

#### Battery surface temperature

- The cell can be compatible with a temperature classification of T4 at an ambient temperature of +60°C.
- The temperature classification shall be verified during the assessment of the intrinsic safety apparatus in which the battery is to be used.

#### Spark ignition

- The spark ignition risk shall be verified during the assessment of the intrinsically safe apparatus in which the battery will be used.

#### Storage

- The storage area should be clean, cool (preferably not exceeding +30°C), dry and ventilated. For long term storage keep the battery within 30±15% State of Charge.

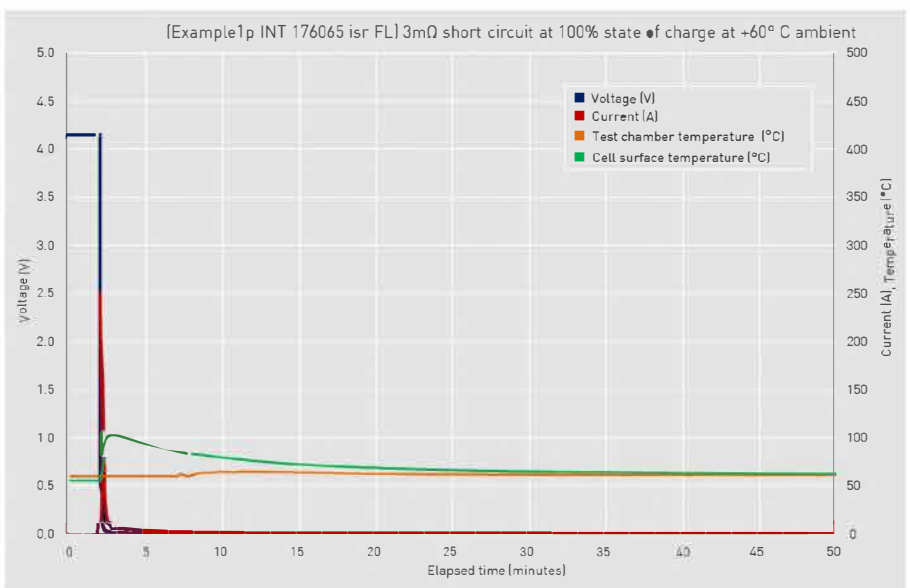
#### Warning

- Do not crush, short-circuit, incinerate, dismantle, immerse in any liquid or heat above +60°C
- Observe charging conditions at all times

Pretest conditions	Value
Test chamber temperature	60 °C
Cell state of charge	100 %
Short circuit resistance	≤ 3.0 mΩ

Test data recorded	Value (max)
Maximum current	262.6 A
Cell maximum surface temperature	113.7 °C
Temperature rise	86.4 °K

Test results	Result
Temperature >100 °C and ≤135 °C	Temperature class T4
Externally visible electrolyte ≥24 h	No visible electrolyte
Discharge current interruption	No partial discharge
IECEx ExTR Reference No.	FR/INE/ExTR19.0047/00



# 1p INT 174565 isr FL

## Rechargeable Li-ion battery

3.65 V high energy Li-ion battery, high performance and **intrinsic safety**

Saft's 1p INT 174565 isr FL battery is compatible with applications requiring intrinsic safety, a long operating life under harsh conditions and an excellent performance in temperature environments from -30°C to +60°C.

### Benefits

- Excellent operating lifetime in calendar and cycling with a very stable internal resistance
- High level of safety, compatible with potentially explosive atmospheres
- Long shelf life with extremely low capacity loss in storage
- Smaller environmental footprint than other technologies

### Key features

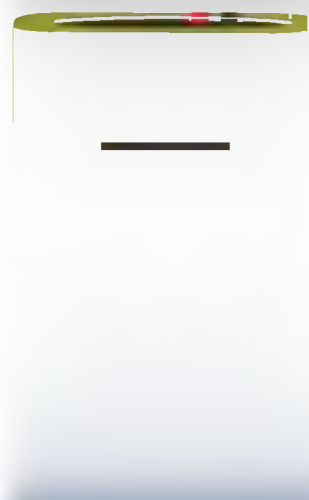
- High energy density
- Cycle life more than 2250 cycles at 100% DoD at C/2 discharge, C charge
- The battery connection area is resin encapsulated with flying leads
- Aluminium casing
- Hermetically sealed
- Operates in any orientation
- Maintenance free
- No memory effect
- **Manufactured in the EU**

### Designed to meet all major quality, safety and environmental standards

- Safety at cell level is qualified to UL 1642 and IEC 62133-2:2017
- Transport: UN 3480, UN 38.3
- IEC 60079-11 compatible component (see over for details) <sup>[v]</sup>
- Quality: ISO 9001, Saft World Class program
- Environment: ISO 14001, RoHS and REACH compliant

### Typical applications

- Backup for industrial equipment
- Medical devices
- Tracking
- Oil & Gas applications
- Internet of Things
- Wireless Sensor Networks



### Electrical characteristics

Typical capacity (at C/5 rate, +25°C, 2.5V cut-off) <sup>[i]</sup>	4.0 Ah	
Nominal voltage	3.65 V	
Nominal energy	14.6 Wh	
Recommended maximum discharge current <sup>[ii]</sup>	Continuous	8 A (~2C rate)
	Pulse	16 A (~4C rate)

### Physical characteristics

Thickness <sup>[iii]</sup>	20.65 mm	
Width	48.5 mm	
Height (not including 200mm cable)	74.0 mm	
Typical weight	97 g	
Volume	0.069 l	
IEC battery designation	1INP21/47/72	
Saft internal cell type	MP 174565 ise	
Saft battery part number	70462J	
Saft model / type reference	1p INT 174565 isr FL	

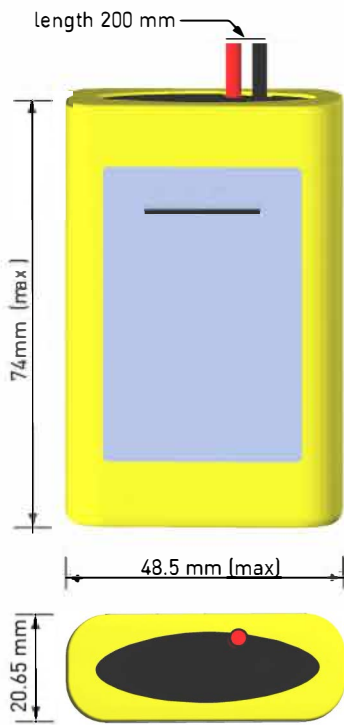
### Operating conditions

Typical cut-off voltage	2.5 V	
Charging method	Constant current/Constant voltage	
Charging voltage	4.2 ± 0.05 V	
Maximum continuous charge current <sup>[iv]</sup>	4 A (~1C rate)	
Operating temperatures	Charge	-30°C to +60°C
	Discharge	-30°C to +60°C
Storage & transportation temperatures	Recommended	+10°C to +30°C
	Allowable	-30°C to +60°C

[i] Can vary depending on temperature and discharge rate

[ii] Can vary depending on temperatures. Consult Saft

[iii] At beginning of life, 100% State-of-Charge. May increase with temperature and the



### Battery assembly

The battery must be mechanically and electrically integrated into a complete system. The battery must include electronic devices for performance, thermal and safety management, specific to each application.

#### IEC 60079-11 Ed. 6.0:

- The battery is verified as compliant with the following parts of the standard; 6.3.2.1, 6.3.3, 6.3.5, 6.3.6, 6.3.12, 6.6.1, 6.6.2, 10.5.1, 10.5.2 and 10.5.3

#### Battery surface temperature

- The battery is compatible with a temperature classification of T4 at an ambient temperature of +60°C.
- The temperature classification shall be verified during the assessment of the intrinsic safety apparatus in which the battery is to be used.

#### Spark ignition

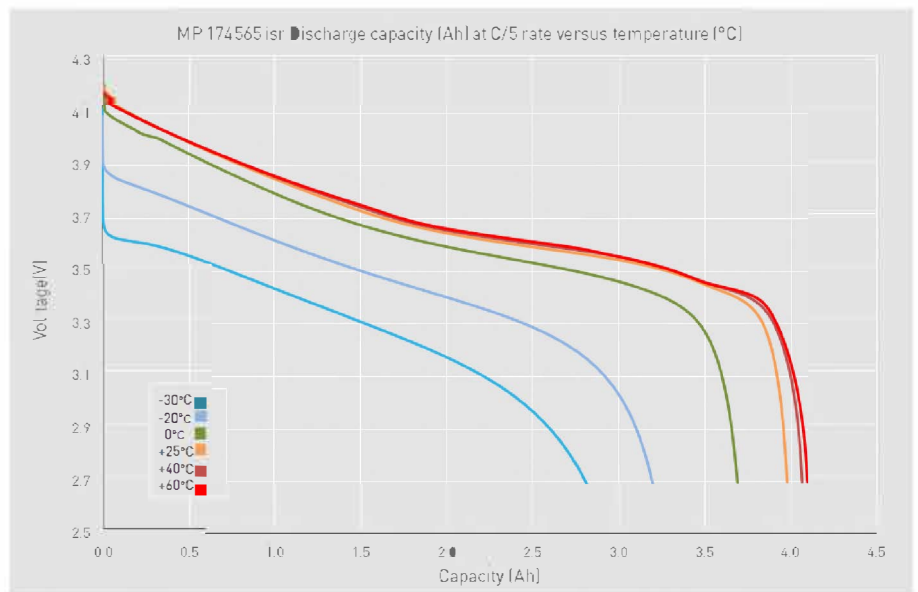
- The spark ignition risk shall be verified during the assessment of the intrinsically safe apparatus in which the battery will be used.

#### Storage

- The storage area should be clean, cool (preferably not exceeding +30°C), dry and ventilated. For long term storage keep the battery within 30±15% State of Charge.

#### Warning

- Do not crush, short-circuit, incinerate, dismantle, immerse in any liquid or heat above +60°C
- Observe charging conditions at all times



#### Pretest conditions

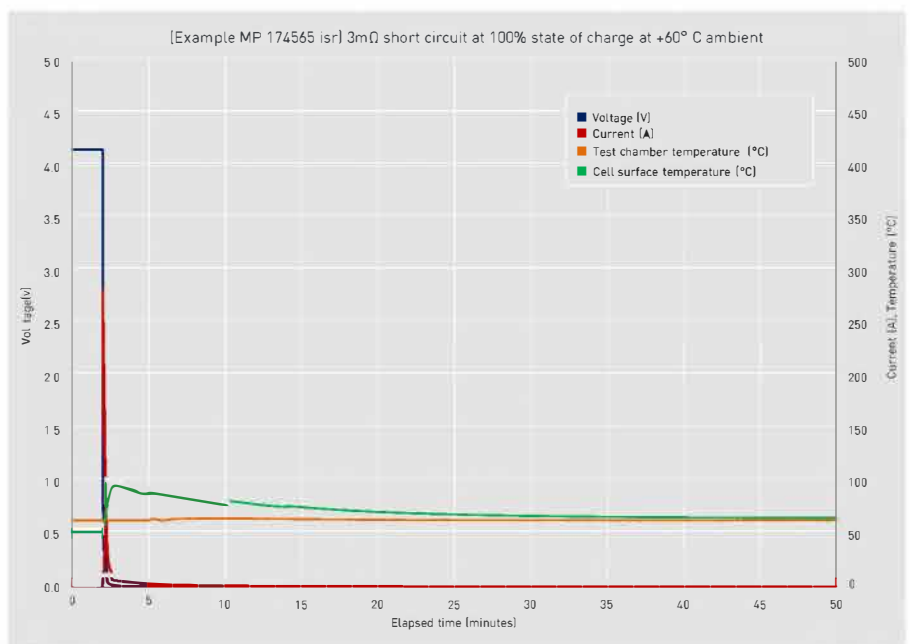
Pretest conditions	Value
Test chamber temperature	60 °C
Cell state of charge	100 %
Short circuit resistance	≤ 3.0 mΩ

#### Test data recorded

Test data recorded	Value (max)
Maximum current	263.5 A
Cell maximum temperature	111.1 °C
Temperature rise	80.2 °K

#### Test results

Test results	Result
Temperature >100 °C and ≤135 °C	Temperature class T4
Externally visible electrolyte ≥24 h	No visible electrolyte
Discharge current interruption	No partial discharge
IECEx ExTR Reference No.	FR/INE/ExTR18.0025/00



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