

A close-up photograph of several metal fasteners, possibly screws or bolts, arranged in a grid-like pattern. The image is heavily blue-tinted and has a soft, out-of-focus background, creating a technical and industrial feel.

# SafeCASE Product Overview

November 2023



Thank you for safely transporting your  
batteries using KULR's SafeCASE.

# KULR – Accelerating the Transition to a Circular Electrification Economy

The **SafeCASE** technology featured in these training slides has been used by NASA since 2019 for securing batteries on the Space Station and is now accelerating a global transition to a circular electrification economy.





# Ordering Your SafeCASE

## Ready for Shipment

- When you are ready to ship batteries, you will order your SafeCASE from your OEM (original equipment manufacturer) or shipping partner.

## Defective Batteries

- When you place your order, you will need to determine if any of your batteries are DDR (damaged-defective-recalled).
  - Damaged - If the battery appears cracked, swollen, leaking, hot, or any other problems, then it is damaged.
  - Defective – If the battery has any apparent defects from its manufacturing process, then it is defective.
  - Recalled – If the OEM has issued a nationwide recall for the battery, then they have determined it has an issue requiring it be pulled from the market.
- If your battery is DDR, then let your OEM or shipping partner know, so that they can send you the proper boxes for shipping DDR.



### Remember

DDR	Damaged, defective, recalled.
Boxes and Labeling	DDR batteries require special boxes and labels for shipping, provided to you by your OEM or shipping partner.

# Why SafeCASE?

## Maximum Energy Storage

- SafeCASE is for transporting lithium-ion batteries up to 2500 watt-hours (Wh), or 2.5 kilowatt-hours (kWh). This is the maximum energy allowed under the limit of the SafeCASE.
  - You can place multiple batteries in one SafeCASE, but their total energy cannot exceed 2500 watt-hours, or 2.5 kWh.

## Example

- 4 batteries at 600 watt-hours each = 2400 watt-hours (2.4kWh)
- Only 4 batteries can ship in the SafeCASE, since the total energy is under the 2500 watt-hour (2.5 kWh) limit.

Remember	
Total Energy Permitted	Up to 2500 watt-hours (2.5 kWh)
Total Quantity Batteries Allowed	Any amount, but total energy of all batteries cannot exceed 2500 watt-hours (2.5 kWh)



# Voltage

## Calculating Voltage

- If your battery's label does not provide watt-hours(Wh) or kilowatt-hours (kWh), you can calculate as follows:
  - ***Volts x Amp-Hours = Watt-Hours***
  - \*Note, there are 1000 watt-hours in 1 kilowatt-hour.

## Example

- 40 volts x 10 amp-hours = 400 watt-hours or 0.4 kilowatt-hours

Remember	
Watt-Hours	Volts x Amp-Hours = Watt-Hours
Kilowatt-Hours	There are 1000 watt-hours (Wh) in 1 kilowatt-hour (kWh)



# Permit

- SafeCASE has 3 permits from Department of Transportation:
  - Recycling – For shipping batteries that have finished their life and ready to be retired/recycled. (DOT-SP 21139)
  - DDR – For shipping batteries that are damaged-defective-recalled. (DOT-SP 21193)
  - Prototype – For shipping prototype batteries, that are not sold in the marketplace yet. This is uncommon. (DOT-SP 21167)

## Proper Shipping Labels

- Most likely you are shipping batteries for recycling or DDR. Please communicate this with your OEM and shipping partner, and they will place the proper *permit number* on your shipping labels.
  - 49 CFR 171-185 Regulation: Governs Hazardous Material Transport

Remember	
Recycling Permit	For batteries at end-of-life.
DDR Permit	For damaged, defective, recalled batteries.
Prototype Permit	For shipping prototype batteries.

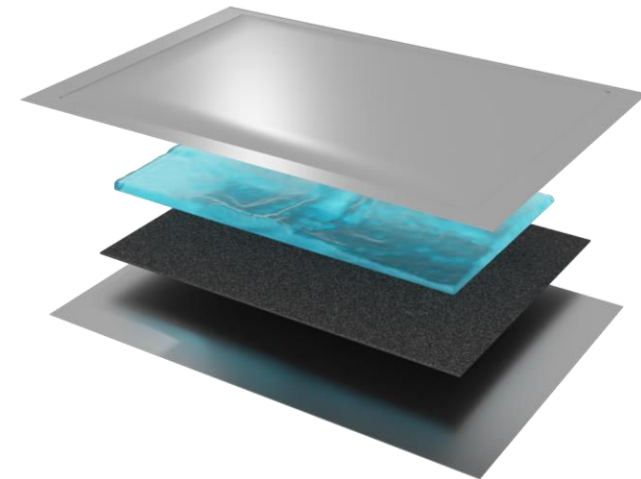


# Thermal Runaway Shield (TRS)

## Product Description

- In the walls of the SafeCASE are 6 pouches, called Thermal Runaway Shield (TRS). Within each pouch is a coolant. During a lithium-ion battery fire, a pouch will rupture, and the coolant will be released onto battery cells to stop the heat propagation.
- Always inspect all 6 TRS pouches in your SafeCASE and inspect pouches for leakage, or if the pouches are degraded. Contact your shipping partner or KULR if you need new pouches or an entire new SafeCASE. Do not ship a faulty SafeCASE.

Remember	
6 Pouches	Inspect each pouch before shipping your SafeCASE
If Leaking/Damaged	Contact KULR or your shipping partner.





# Thank You!

Thank you for safely shipping your batteries using SafeCASE. If you have additional questions, please **contact KULR**.

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