

60 Liter Metal Drum Approved for Lithium Batteries

Packaging type: 1A2 – open-head steel drum, 60 liters

Type: Removable lid drum

Steel: UNI EN 10130 (Fe P01)

Nominal capacity: 60 L (62 L actual)

Maximum gross mass: 100 kg

Body thickness: 0.6 mm

Lid thickness: 0.5 mm

Bottom thickness: 0.6 mm

Weight: 4.9 kg

Internal diameter: 378 mm

External height: 610 mm

Closure: Galvanized steel ring with locking lever

Gasket: Acid-resistant rubber

Construction: Longitudinal welded shell

Seaming type: Triple seam with mastic interposition

Shell type: Two expansion-formed ribs (Ø 392)

Handles: Two lateral metal handles

External finish: Oven-baked enamel, custom RAL above 1000 units

Internal lining: Textile material subjected to thermal treatment

Approval: UN 1A2/Y100/S/... with vented plug on lid

Packing groups: II, III

Transport regulations: ADR – RID – IMDG – ICAO

Equipment: 2" brass vented plug



The drums will be supplied with the required UN 3480 labeling in compliance with applicable legal regulations.



Brass Vented Plug

GENERAL INFORMATION

- 2" drum venting device, suitable for use with $\frac{3}{4}$ " taps.
- Brass vent plug complete with sealing gaskets.
- The vent opening may be left open when required.

• Weight: 1.5 kg

Pressure rating:

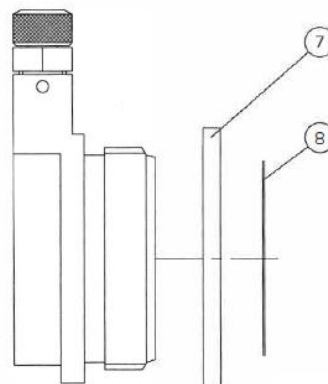
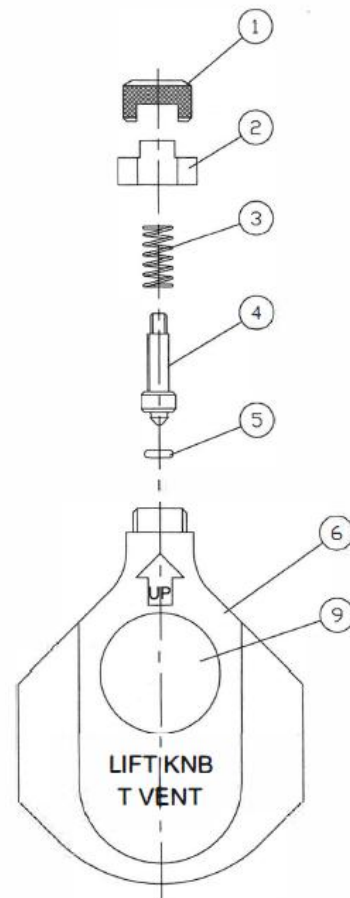
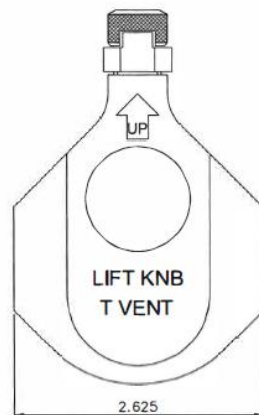
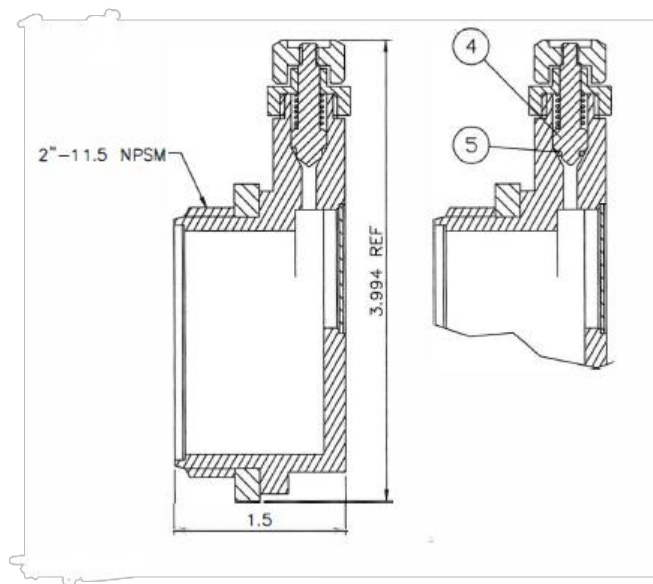
- Pressure < 5 psi: the vent remains closed
- Pressure between 5 and 8 psi: the vent may activate
- Pressure > 8 psi: the vent opens automatically



The vented plug is installed on the lid of the 60-liter steel drum.



2"NPS END BUNG DRUM VENT Part				
Part No.	Name	Material	Quantity	Remark
1	VALVE STEM KNOB	BRASS	1	
2	RETAINER	BRASS	1	
3	VALVE SPRING	STAINLESS STEEL	1	
4	RELIEF VALVE STEM	BRASS	1	
5	O-RING	NBR	1	2.9x1.78
6	DRUM VENT BODY	BRASS	1	
7	GASKET	NBR	1	
8	FLAME ARRESTOR	BRASS	1	
9	BLOW PLUG	COPPER	1	ø28.3x0.8T
10				

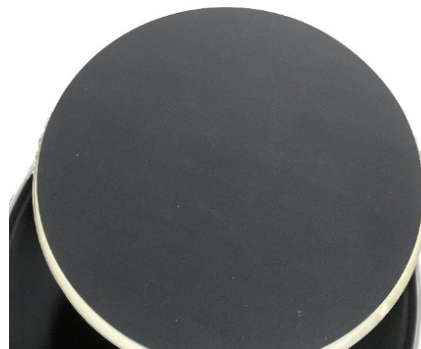


Thermally Treated Textile Lining

The internal drum lining is made of a textile material subjected to a specific thermal treatment process. The treated felt material contains no chemical flame retardant additives and provides high resistance and non-flammability, offering protection against heat generated by direct flame contact.

The lining shows excellent fire resistance and insulation properties. It does not burn or melt when exposed to fire, but undergoes a very slow carbonization process. When tested with direct oxy-acetylene flame at approximately 15 cm distance and temperatures between 500–700°C, flame penetration occurs only after about 10 minutes, without producing toxic fumes.

Heat transfer on the opposite side remains negligible and can be tolerated even with bare hands.



Characteristics:

Weight: 100 g/m²

Thickness: 1.5 mm

Processing: carding

Tensile strength (100 g/m²): longitudinal > 2.79 kg – transversal > 2.09 kg

Color: black

Certified according to Italian standards UNI 8456 and UNI 9174 – Fire Reaction Class 1.

Technical Analysis on the Effectiveness of the Drum for the Collection and Transport of Lithium Batteries

The 60-liter UN 1A2 approved steel drum represents a **unique solution on the market** for the safe collection, storage, and transport of lithium batteries, particularly in scenarios involving damaged, end-of-life, or potentially unstable cells.

Lithium batteries are known to present **high thermal and fire risks**, especially during transport, due to the possibility of thermal runaway, internal short circuits, or external mechanical damage. Conventional packaging solutions are primarily designed for containment and mechanical protection, but **do not provide effective resistance against extreme temperatures** generated during battery failure events.

Exceptional Thermal Resistance up to 700°C

The distinctive feature of this drum lies in its **internally integrated thermally treated textile lining**, specifically engineered to withstand **direct flame exposure at temperatures between 500°C and 700°C**.

Independent testing demonstrates that:

- The lining does **not ignite, melt, or drip**
- It undergoes a **slow and controlled carbonization process**
- Direct oxy-acetylene flame penetration occurs **only after approximately 10 minutes**
- No toxic fumes are generated during exposure
- Heat transfer to the external surface remains **negligible and safely tolerable**

This level of thermal resistance is **exceptional and uncommon** in lithium battery transport packaging, positioning this drum well above standard steel containers that lack internal fire-protective barriers.

Integrated Elastomeric Layer – Impact Mitigation and Thermal Delay Function

In addition to the textile lining, the system incorporates an *internal elastomeric (rubber-based) layer*, specifically selected for its *combined mechanical damping and thermal resistance properties*.

The elastomeric layer provides the following functional contributions:

- *Impact energy absorption*: reduction of peak mechanical loads during handling, transport, and accidental drops, thereby minimizing the risk of cell rupture or internal damage.
- *Thermal resistance*: inherent fire-resistant properties that prevent rapid degradation under elevated temperatures
- *Thermal diffusion delay*: increased thermal inertia of the system, contributing to a measurable reduction in heat transfer rate from the internal environment to the external drum surface. The synergistic interaction between the textile lining and the elastomeric layer results in a *multi-layer passive protection system*, capable of *extending the time-to-critical temperature transfer* and improving overall containment reliability under fire exposure scenarios.

This combined approach enhances both *thermal containment performance* and *mechanical robustness*, representing a substantial advancement over standard single-layer packaging systems for lithium battery transport.

Controlled Pressure Management and Risk Mitigation

The drum is equipped with a **2" brass vented plug**, calibrated to activate automatically at defined pressure thresholds.

This system plays a critical role in **preventing over-pressurization**, a known risk during thermal runaway events, by allowing controlled gas release while maintaining structural integrity.

Combined with:

- triple-seam construction
- acid-resistant gasket
- reinforced steel body
- UN performance certification (Y100)

the drum provides a **balanced containment and pressure-relief system**, reducing the risk of explosion or catastrophic rupture.

Regulatory Compliance and Market Uniqueness

The drum is fully compliant with:

- ADR
- RID
- IMDG
- ICAO

and is supplied with the required **UN 3480 labeling**, ensuring legal conformity for international transport of lithium batteries.

What makes this solution **unique on the market** is not only its UN approval, but the **integration of certified fire-resistant internal insulation capable of resisting temperatures up to 700°C**, a feature rarely available in standard lithium battery transport drums.

Conclusion

This drum is not merely a container, but a **passive safety system** designed to:

- delay fire propagation
- mitigate thermal runaway effects
- protect operators, transport assets, and surrounding environments

Its ability to withstand extreme temperatures makes it **one of the safest and most advanced solutions currently available** for the collection and transport of lithium batteries.