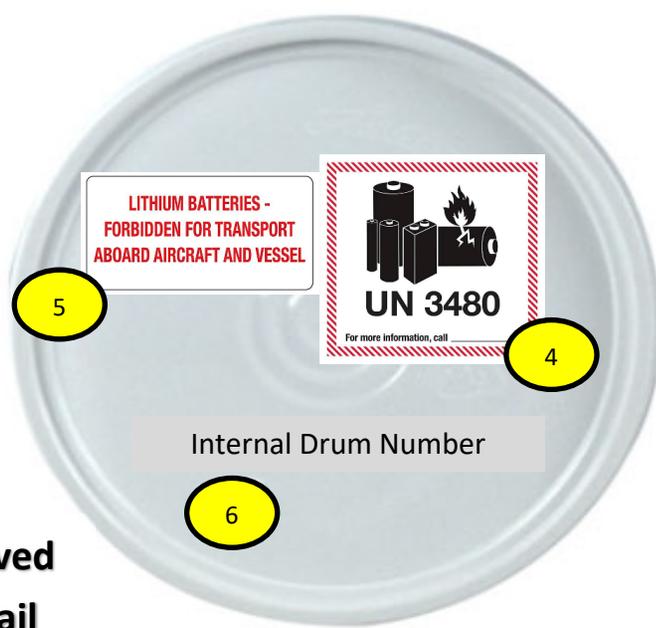


Lithium Ion Batteries

(Preparing Lithium Ion Packaging)

**UN/DOT Approved
DF 12 Gallon Pail**



****Gross Weight Not to Exceed 66 pounds****

1

'Universal Waste - Used Batteries' Label

Regulatory Citing: NR 673

Must Include:

- the words 'Universal Waste: Used Batteries'
- an Accumulation Start Date

2

Non-Hazardous Waste Label

Regulatory Citing: 49 cfr 172.2

Must Include:

- Shipper Name
- Shipper Address
- Contents: Use the following shipping name:
UN3480 Waste Lithium Ion Batteries, 9, II

4

Lithium Battery & Cell Marking

Regulatory Citing: 49 cfr 173.185(c)(3)

Must Include:

- Appropriate UN number (UN3480)
- Telephone number for additional information

5

Air/Vessel Forbidden

Regulatory Citing: 49 cfr 173.185(c)(1)(iv)

Must Include:

- Required Verbiage: **"LITHIUM BATTERIES - FORBIDDEN FOR TRANSPORT ABOARD AIRCRAFT AND VESSEL"**

6

HMR Internal Drum Number

Regulatory Citing: NA

Must Include:

- drum number

BATTERIES INDIVIDUALLY BAGGED OR TERMINALS TAPED; NO DAMAGED BATTERIES

Lithium Ion Batteries

Preparing Lithium Ion Batteries

1. Separate Lithium Ion batteries. Look for key word:
 - lithium ion
 - Li-Ion
 - INR, ICR, or similar
 - Battery dimensions: ex. '18650'
2. Batteries must be rated < 300 watt-hours*
3. Batteries must be individually bagged; terminals taped; or terminals coated with non-conductive material.
4. Batteries will be placed in a DOT/UN approved plastic **twelve** gallon pail.
5. Net weight of container and batteries can be no greater than 66 pound.



420 watt-hours!

Ego Battery, 7.5 Ah,
Li-Ion, 56V DC...



* **Batteries need to be less than 300 watt-hours for a lithium ion battery and 60 watt-hours for a lithium ion cell. Watt-hours = (amps)(watts)**

Lithium metal batteries must contain up to 25 grams lithium.

- 49 CFR 173.21 – Forbidden materials and packages
 - “Unless otherwise provided in this subchapter, the offering for transportation or transportation of the following is forbidden:”
 - 49 CFR 173.21(c)
 - Electrical devices, such as batteries and battery-powered devices which are likely to create sparks or generate a dangerous evolution of heat, unless packaged in a manner which precludes such an occurrence.

Lithium Metal Batteries

(Preparing Lithium Metal Packaging)

**UN/DOT Approved
DF 5 Gallon Pail**



1

'Universal Waste - Used Batteries' Label

Regulatory Citing: NR 673

Must Include:

- the words 'Universal Waste: Used Batteries'
- an Accumulation Start Date

2

Non-Hazardous Waste Label

Regulatory Citing: 49 cfr 172.2

Must Include:

- Shipper Name
- Shipper Address
- Contents: Use the following shipping name:
UN3090 Waste Lithium Metal Batteries, 9, II

4

Lithium Battery & Cell Marking

Regulatory Citing: 49 cfr 173.185(c)(3)

Must Include:

- Appropriate UN number (UN3090)
- Telephone number for additional information

5

Air/Vessel Forbidden

Regulatory Citing: 49 cfr 173.185(c)(1)(iv)

Must Include:

- Required Verbiage: **"LITHIUM BATTERIES - FORBIDDEN FOR TRANSPORT ABOARD AIRCRAFT AND VESSEL"**

6

HMR Internal Drum Number

Regulatory Citing: NA

Must Include:

- drum number

BATTERIES INDIVIDUALLY BAGGED OR TERMINALS TAPED; NO DAMAGED BATTERIES

Lithium Metal Batteries

Preparing Lithium Metal Batteries

1. Separate Lithium Ion batteries. Look for key word:
 - Lithium
 - Ultimate Lithium
 - Button batteries
2. Batteries must contain < 25 grams of lithium*
3. Batteries must be individually bagged; terminals taped; or terminals coated with non-conductive material.
4. Batteries will be placed in a DOT/UN approved plastic **five** gallon pail.
5. Net weight of container and batteries can be no greater than 66 pound.



*Batteries need to be less than 300 watt-hours for a lithium ion battery and 60 watt-hours for a lithium ion cell. Watt-hours = (amps)(watts)

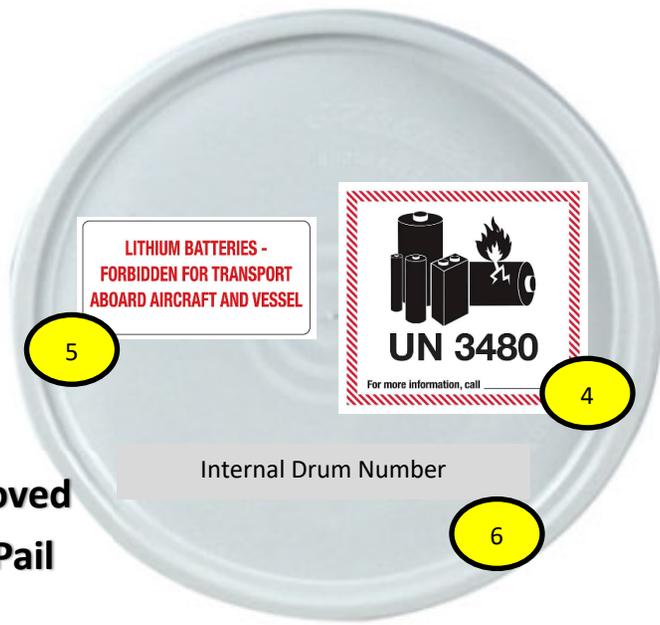
Lithium metal batteries can contain up to 25 grams lithium.

- 49 CFR 173.21 – Forbidden materials and packages
 - “Unless otherwise provided in this subchapter, the offering for transportation or transportation of the following is forbidden:”
 - 49 CFR 173.21(c)
 - Electrical devices, such as batteries and battery-powered devices which are likely to create sparks or generate a dangerous evolution of heat, unless packaged in a manner which precludes such an occurrence.

Lithium Polymer Batteries

(Preparing Lithium Polymer Packaging)

**UN/DOT Approved
DF 12 Gallon Pail**



1

'Universal Waste - Used Batteries' Label

Regulatory Citing: NR 673

Must Include:

- the words 'Universal Waste: Used Batteries'
- an Accumulation Start Date

2

Non-Hazardous Waste Label

Regulatory Citing: 49 cfr 172.2

Must Include:

- Shipper Name
- Shipper Address
- Contents: Use the following shipping name:
UN3480 Waste Lithium Ion Batteries, 9, II

4

Lithium Battery & Cell Marking

Regulatory Citing: 49 cfr 173.185(c)(3)

Must Include:

- Appropriate UN number (UN3480)
- Telephone number for additional information

5

Air/Vessel Forbidden

Regulatory Citing: 49 cfr 173.185(c)(1)(iv)

Must Include:

- Required Verbiage: "LITHIUM BATTERIES - FORBIDDEN FOR TRANSPORT ABOARD AIRCRAFT AND VESSEL"

6

HMR Internal Drum Number

Regulatory Citing: NA

Must Include:

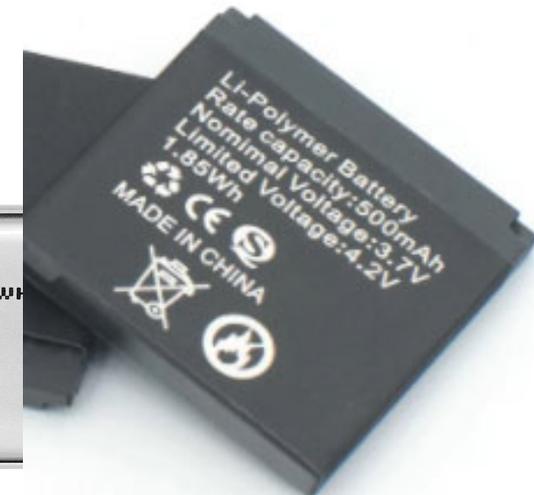
- drum number

BATTERIES INDIVIDUALLY BAGGED OR TERMINALS TAPED; NO DAMAGED BATTERIES

Lithium Polymer Batteries

Preparing Lithium Polymer Batteries

1. Separate Lithium Polymer batteries. Look for key word:
 - Lithium Ion Polymer
 - Li-Polymer
 - LiPo
2. Batteries must be rated < 300 watt-hours*
3. Batteries must be individually bagged; terminals taped; or terminals coated with non-conductive material.
4. Batteries will be placed in a DOT/UN approved plastic **twelve** gallon pail.
5. Net weight of container and batteries can be no greater than 66 pound.
6. Lithium polymer batteries that appear swollen or 'puffy' are damaged and require special handling & packaging.



*Batteries need to be less than 300 watt-hours for a lithium ion battery and 60 watt-hours for a lithium ion cell. Watt-hours = (amps)(watts)

Lithium metal batteries can contain up to 25 grams lithium.

- 49 CFR 173.21 – Forbidden materials and packages
 - “Unless otherwise provided in this subchapter, the offering for transportation or transportation of the following is forbidden:”
- 49 CFR 173.21(c)
 - Electrical devices, such as batteries and battery-powered devices which are likely to create sparks or generate a dangerous evolution of heat, unless packaged in a manner which precludes such an occurrence.

Damaged Lithium Polymer

(Preparing Damaged Battery Packaging)

Damaged, defective, or recalled cells or batteries:

49 CFR 173.185(f)



Call2Recycle has a DOT special permit to allow for shipping of DDR batteries.

Use Call2Recycle ‘Damage, Defected, & Recalled’ (DDR) shipping/disposal kit. Follow instructions that come with kit.

Directional highlights include:

- 1.) Place inner plastic liner in container
- 2.) Pour 2” of a vermiculite base.
- 3.) Each DDR battery to be placed in separate BAG (*taping terminals not adequate in this situation*).

One battery per bag.

- 4.) Fill container with layer of DDR batteries with vermiculite surrounding each bag.

Batteries need to be less than 300 watt-hours for a lithium ion battery and 60 watt-hours for a lithium ion cell.

Watt-hours = (amps)(watts)

Lithium metal batteries must contain up to 25 grams lithium.

Damaged Lithium Polymer and other Rechargeable Batteries

Bring SEVERELY damaged batteries to management's attention!!!

Preparing Damaged Batteries

1. Refer to Call2Recycles Damaged, Defective & Recalled (DDR) kit for packaging instructions.



* Batteries need to be less than 300 watt-hours for a lithium ion battery and 60 watt-hours for a lithium ion cell. $\text{Watt-hours} = (\text{amps})(\text{watts})$

Lithium metal batteries must contain up to 25 grams lithium.

- 49 CFR 173.21 – Forbidden materials and packages
 - “Unless otherwise provided in this subchapter, the offering for transportation or transportation of the following is forbidden:”
 - 49 CFR 173.21(c)
 - Electrical devices, such as batteries and battery-powered devices which are likely to create sparks or generate a dangerous evolution of heat, unless packaged in a manner which precludes such an occurrence.

Nickel Metal Hydride & Nickel Cadmium Batteries

(Preparing NiMH & NiCd Battery Packaging)



1

'Universal Waste - Used Batteries' Label

Regulatory Citing: NR 673

Must Include:

- the words 'Universal Waste: Used Batteries'
- an Accumulation Start Date

2

Non-Hazardous Waste Label

Regulatory Citing: 49 cfr 172.2

Must Include:

- Shipper Name
- Shipper Address
- Contents: Use the following shipping name:
Waste Batteries, dry, sealed, n.o.s (used NiCd & NiMH)

3

HMR Internal Drum Number

Regulatory Citing: NA

Must Include:

- drum number

BATTERIES INDIVIDUALLY BAGGED OR TERMINALS TAPED; NO DAMAGED BATTERIES

Nickel Metal Hydride & Nickel Cadmium Batteries

Preparing Nickel Metal Hydride (NiMH) & Nickel Cadmium (NiCd) Batteries

1. Nickel Metal Hydride and Nickel Cadmium batteries can be shipped together
2. Batteries must be individually bagged; terminals taped; or terminals coated with non-conductive material.
3. Batteries will be placed in a DOT/UN approved plastic 30 gallon drum.



***Bring 'wet cell' nickel cadmium batteries to manager's attention!**

Nickel Cadmium



Nickel Metal Hydride



- 49 CFR 173.21 – Forbidden materials and packages
 - “Unless otherwise provided in this subchapter, the offering for transportation or transportation of the following is forbidden:”
- 49 CFR 173.21(c)
 - Electrical devices, such as batteries and battery-powered devices which are likely to create sparks or generate a dangerous evolution of heat, unless packaged in a manner which precludes such an occurrence.

Alkaline Batteries

(Packaging & Shipping)



UN/DOT Approved
DF 30 Gallon Drum

Gross Weight not to exceed
390 lbs.

1

'Universal Waste - Used Batteries' Label

Regulatory Citing: NR 673

Must Include:

- the words 'Universal Waste: Used Batteries'
- an Accumulation Start Date

2

Non-Hazardous Waste Label

Regulatory Citing: 49 cfr 172.2

Must Include:

- Shipper Name
- Shipper Address
- Contents: Use the following shipping name:
Waste Batteries, dry, sealed n.o.s. (used alkaline)

3

HMR Internal Drum Number

Regulatory Citing: NA

Must Include:

- drum number

**BATTERIES OVER 9V NEED TO BE
INDIVIDUALLY BAGGED OR
TERMINALS TAPED.**

Alkaline Batteries

Preparing Alkaline Batteries

1. Alkaline batteries 9 volts and under have been demonstrated being UNLIKELY to 'create sparks or generate a dangerous evolution of heat' and do not need terminals covered. However.....
2. ...Batteries exceeding 9 volts must be individually bagged; have terminals taped; or terminals coated with non-conductive material.
3. Batteries will be placed in a DOT/UN approved plastic 30 gallon drum.



- 49 CFR 173.21 – Forbidden materials and packages
 - “Unless otherwise provided in this subchapter, the offering for transportation or transportation of the following is forbidden:”
- 49 CFR 173.21(c)
 - Electrical devices, such as batteries and battery-powered devices which are likely to create sparks or generate a dangerous evolution of heat, unless packaged in a manner which precludes such an occurrence.

Battery (lithium) Containing Devices

(Packaging & Shipping)



1 'Universal Waste - Used Batteries' Label

Regulatory Citing: NR 673

Must Include:

- the words 'Universal Waste: Used Batteries'
- an Accumulation Start Date

2 Air/Vessel Forbidden

Regulatory Citing: 49 cfr 173.185(c)(1)(iv)

Must Include:

- Required Verbiage: **"LITHIUM BATTERIES - FORBIDDEN FOR TRANSPORT ABOARD AIRCRAFT AND VESSEL"**

3 Lithium Battery & Cell Marking

Regulatory Citing: 49 cfr 173.185(c)(3)

Must Include:

- Appropriate UN number (UN3480)
- Telephone number for additional information

Note:

Brown County deemed best management practice.

UNIVERSAL WASTE	
Accumulation Start Date: <input type="text"/>	Contents: Battery Containing Devices
Generator: Brown County HMR 2561 S. Broadway Green Bay, WI 54304	
1 USED BATTERIES	

LITHIUM ION BATTERIES - FORBIDDEN FOR TRANSPORT ABOARD PASSENGER AIRCRAFT	2
--	----------

