



U.S. Department
of Transportation

**Pipeline and Hazardous
Materials Safety
Administration**

1200 New Jersey Avenue, SE
Washington, DC 20590

May 6, 2020

Ms. Lisa Permesang
Accounting/Logistics
TerraTrike
4460 40th Street SE
Grand Rapids, MI 49512

Reference No. 19-0088

Dear Ms. Permesang:

This letter is in response to your April 22, 2019, letter, forwarded to this Office by email on July 1, 2019; your August 27 and 28, 2019, and September 19 and 25, 2019, emails that you provided to a member of my staff; and your November 15, 2019, email that you provided to Mr. Steve Hwang, Chemist, Sciences Branch, Sciences Engineering and Research Division, Pipeline and Hazardous Materials Safety Administration (PHMSA). You request clarification of the Hazardous Materials Regulations (HMR; 49 CFR Parts 171-180) applicable to hazardous materials classification. Specifically, you ask us to confirm the classifications for an electric-assist (e-assist) tricycle named “TerraTrike,[®]” manufactured by WizWheelz, Inc., that is powered by a battery classed as “UN3480, Lithium ion batteries, Class 9 (miscellaneous),” and an aftermarket e-assist kit designed to be installed on the tricycle.

You enclosed images of the battery installed in its holder and attached to the tricycle frame with a mounting bracket; the e-assist kit, which consists of the battery charger, the battery in its holder, an electric motor, and appropriate mounting equipment for attachment to the tricycle; and the e-assist kit surrounded in form-fitting foam placed in a fiberboard box labeled with a Class 9 label. You state the kit complies with § 173.185(b) of the HMR and the battery in its holder complies with the International Civil Aviation Organization (ICAO) Technical Instructions for the Safe Transport of Dangerous Goods by Air (Technical Instructions), Chapter 4, Packing Instruction 952. You expressed support for § 172.102(c)(1), Special Provision 134, which states that an electrically powered vehicle can be an example of a “mobility aid,” and clarification letter Reference No. 08-0173 (dated 08/12/08), which states that an electric bicycle that complies with § 173.185 in conformance with § 173.220(d) must be described as “UN3171, Battery powered vehicle, Class 9.”

Q1: You state WizWheelz, Inc., requests confirmation that it may classify its e-assist tricycle TerraTrike[®], powered by a “UN3480” lithium ion battery, as “UN3171, Battery powered vehicle, Class 9,” under the HMR.

- A1: When the lithium battery is installed in the tricycle, the answer is yes. Special Provision 134 of § 172.102(c)(1) requires that a battery must be installed in a vehicle to use the UN3171 proper shipping description. Also, as you noted earlier, a vehicle powered by a lithium battery must satisfy the requirements of § 173.220(d), which states that the battery design type must successfully pass each test in the United Nations Manual of Tests and Criteria, as specified in § 173.185, unless approved by PHMSA's Associate Administrator of Hazardous Materials Safety.
- Q2: You ask PHMSA to confirm whether "UN3481, Lithium ion battery contained in equipment, Class 9," or "UN3171, Battery powered vehicle, Class 9," would be the proper classification for the BOSCH Boost Kit, an aftermarket e-assist kit that is sold separately to be installed on the TerraTrike[®] tricycle.
- A2: Based on the information you provided, the e-assist kit consists of a lithium ion battery wired to a motor that is secured to and covered by its holder at the time of shipping. Therefore, it is the opinion of this Office that this battery in this kit is most appropriately described as "UN3481, Lithium ion batteries contained in equipment, 9." The HMR defines equipment as a "device or apparatus for which the lithium cells or batteries will provide electrical power for its operation." See § 173.185, introductory paragraph.

I hope this information is helpful. Please contact us if we can be of further assistance.

Sincerely,

A handwritten signature in blue ink that reads "T. Glenn Foster". The signature is fluid and cursive, with a long horizontal flourish extending to the right.

T. Glenn Foster
Chief, Regulatory Review and Reinvention Branch
Standards and Rulemaking Division

Edmondson

19-0088

Dodd, Alice (PHMSA)

From: INFOCNTR (PHMSA)
Sent: Monday, July 01, 2019 4:35 PM
To: Hazmat Interps
Subject: FW: Request for Letter of Interpretation
Attachments: Determination Request PHMSA - Sent 04.22.2019.pdf; Bosch PowerPack 400 MSDS.pdf

Hello Alice and Ikeya,

Please see the attached documents for a letter of interpretation request.

Thanks,

Lynsie, HMIC

From: Lisa Permesang [mailto:lisa@terratrike.com]
Sent: Monday, July 1, 2019 7:03 AM
To: INFOCNTR (PHMSA) <INFOCNTR.INFOCNTR@dot.gov>
Subject: Inquiry regarding Determination letter - sent 04.22.2019

Good morning, PHMSA staff –

I am not certain to whom I need to follow up with regarding a determination request we mailed to your offices in April and have yet to receive a response. I do know that this can take some time, but we are now at the 1st of July, so I just wanted to check in.

I have attached a .pdf copy of the original letter and the Safety Data Sheet I had included with my original mailing. On this MSDS, I have highlighted the exact battery pack that we are using with our product. Please advise if there is anything further I need to do or if there is a specific individual that I should be directed to. I thank you in advance for your assistance and I look forward to hearing from you.

Best Regards,



TerraTrike[®]
RIDE IN COMFORT

LISA PERMESANG
ACCOUNTING / LOGISTICS

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www.terratrike.com
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April 22, 2019

Mr. Shane Kelley
Director, Standards and Rulemaking Division
U.S. DOT/PHMSA (PHH-10)
1200 New Jersey Avenue SE East Building, 2nd Floor
Washington, DC 20590

RE: Interpretation for the Proper Classification of our E-Tricycle and our Aftermarket E-Assist kit

Dear Mr. Kelley:

I am writing for two reasons today, as stated above. The second, of which, I will have additional inquiries.

(1) WizWheelz Inc is requesting confirmation from your office that our electric-assist tricycle (TerraTrike Electric powered by a lithium ion battery can be classified and shipped as a battery powered vehicle (UN3171). Exhibit A contains a picture of this tricycle and more specifically how the battery is attached to the frame.

In 2008, your office issued a letter to Cannondale Sports Group (Ref. No. 08-0173) citing that "An electric bicycle powered by a lithium-ion battery is most appropriately described as a "Battery-powered vehicle" under the HMR. A vehicle powered by a lithium battery must satisfy the requirements of § 173.220(d), which requires the battery to be of a type that has successfully passed each test in the UN Manual of Tests and Criteria as specified in § 173.185, unless approved by the Associate Administrator." Our trike is similar and is shipped with the battery installed on the frame in order to prevent short circuiting, etc. I am including a copy of the applicable Safety Data Sheet for the lithium ion battery included with this trike. We hold the same arguments as Cannondale Sports Group in that "Therefore, we are of the opinion that the correct classification for the electric bicycle with a lithium ion battery installed is Battery powered vehicle or Battery powered equipment (UN3171). This would be consistent with the language contained in Special Provision 134 that states "*Examples of such items are electrically powered cars, lawn mowers, wheelchairs, and other mobility aids.*" (Emphasis added.) This classification also is consistent with how these types of bicycles are being packaged and offered for transport in Europe where these products are widely used."



Exhibit A

(2) Our aftermarket BOSCH Boost Kit, is an e-assist kit sold separately to be installed on a TerraTrike tricycle that was without the e-assist option at the original time of purchase. Please see the following pictures on the following page in Exhibit B. Our question here is also regarding the proper classification for this product.

Could your office confirm whether UN3481 or UN3171 would be the proper classification for this product? The kit as it is packaged below is being offered for transportation pursuant to the packaging requirements of § 173.185 (b). The battery is shipped mounted in its holder in order to prevent short circuits, and then placed in the molded foam designed specifically for the shipment of this kit in order to prevent any damage. Only one battery per kit is shipped. The final picture of Exhibit B shows our identification of this product as UN3481 Lithium Ion Battery contained in Equipment. However, Packing Instructions 952 for shipment of UN3171 requires also that the batteries must be installed and securely fastened in the battery holder of the vehicle, machine or equipment and must be protected in such a manner so as to prevent damage and short circuits. And, in fact, the battery is installed in its holder.





Exhibit B

Thank you in advance for your assistance in this clarification. If you have any further questions regarding our product, the lithium ion battery and the shipping materials, please do not hesitate to contact me using the details in my signature below. We look forward to receiving your determination.

Sincerely,

A handwritten signature in black ink, appearing to read 'Lisa Permesang'.

LISA PERMESANG
ACCOUNTING / LOGISTICS

616-455-5988 x51
lisa@terratrike.com

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SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Batterypack - Dangerous Good according to UN3480

Further trade names

Battery Pack Frame black 400Wh / 0275.007.503 / 36Vx40, 11 Ah, 400 Wh / 300*100*952,6
Battery Pack Frame white 400Wh / 0275.007.504 / 36Vx40, 11 Ah, 400 Wh / 300*100*952,6
Battery Pack Rack black 400Wh / 0275.007.505 / 36Vx40, 11 Ah, 400 Wh / 370*75*120 2,6
PowerPack 300 Active Line Frame platinum / 0275.007.509 / 36Vx30, 8,2 Ah, 300 Wh / 320*90*90 2,0
PowerPack 400 Active Line Frame platinum / 0275.007.510 / 36Vx40, 11 Ah, 400 Wh / 320*90*90 2,4
PowerPack 300 Performance Line Frame anthracite / 0275.007.511 / 36Vx30, 8,2 Ah, 300Wh / 320*90*90 2,0
PowerPack 400 Performance Line Frame anthracite / 0275.007.512 / 36Vx40, 11 Ah, 400 Wh / 320*90*90 2,4
PowerPack 400 Performance Line USA Frame anthracite / 0275.007.524 / 36Vx40, 11 Ah, 400 Wh / 320*90*90 2,4
PowerPack 400 Active Line USA Rack platinum / 0275.007.526 / 36Vx40, 11 Ah, 400 Wh / 320*90*90 2,4
PowerPack 500 Active Line Frame platinum / 0275.007.529 / 36Vx40, 13,4 Ah, 500 Wh / 320*90*90 2,6
PowerPack 500 Performance Line Frame anthracite / 0275.007.530 / 36Vx40, 13,4 Ah, 500 Wh / 320*90*90 2,6
PowerPack 300 Active Line Rack platinum / 0275.007.513 / 36Vx40, 8,2 Ah, 300Wh / 370*122*76 2,6
PowerPack 400 Active Line Rack platinum / 0275.007.514 / 36Vx40, 11 Ah, 400 Wh / 370*122*76 2,6
PowerPack 400 Performance Line Rack anthracite / 0275.007.522 / 36Vx40, 11 Ah, 400 Wh / 370*122*76 2,6
PowerPack 400 Performance Line USA Rack anthracite / 0275.007.525 / 36Vx40, 11 Ah, 400 Wh / 370*122*76 2,6
PowerPack 500 Active Line Rack platinum / 0275.007.531 / 36Vx40, 13,4 Ah, 500 Wh / 370*122*76 2,7
PowerPack 500 Performance Line Rack anthracite / 0275.007.532 / 36Vx40, 13,4 Ah, 500 Wh / 370*122*76 2,7
PowerPack 500 Active US Frame Platinum / 0275.007.533 / 36Vx40, 13,4 Ah, 500 Wh / 320*90*90 2,6
PowerPack 500 Performance US Frame Anthracite / 0275.007.534 / 36Vx40, 13,4 Ah, 500 Wh / 320*90*90 2,6
PowerPack 500 Active US Rack Type Platinum / 0275.007.535 / 36Vx40, 13,4 Ah, 500 Wh / 370*122*76 2,7
PowerPack 500 Performance US Rack Type Anthracite / 0275.007.536 / 36Vx40, 13,4 Ah, 500 Wh / 370*122*76 2,7
PowerPack 400 Active US Frame Platinum / 0275.007.538 / 36Vx40, 11 Ah, 400 Wh / 320*90*90 2,4
PowerPack 300 Active Line Frame Platinum / 0275.007.547 / 36Vx40, 8,2 Ah, 300Wh / 320*90*90 2,4
PowerPack 300 Performance Line Frame Anthracite / 0275.007.548 / 36Vx40, 8,2 Ah, 300Wh / 320*90*90 2,4
PowerPack 300 Active Line Frame Anthracite Japan / 0275.007.549 / 36Vx40, 8,2 Ah, 300Wh / 320*90*90 2,4
PowerTube 500 Horizontal Black / 0275.007.539 / 36Vx40, 13,4 Ah, 500 Wh / 360*84*652,8
PowerTube 500 Vertical Black / 0275.007.540 / 36Vx40, 13,4 Ah, 500 Wh / 360*84*65 2,8
PowerTube 500 Horizontal Black US / 0275.007.541 / 36Vx40, 13,4 Ah, 500 Wh / 360*84*65 2,8
PowerTube 500 Vertical Black US / 0275.007.542 / 36Vx40, 13,4 Ah, 500 Wh / 360*84*65 2,8

1.2. Relevant identified uses of the substance or mixture and uses advised against

Use of the substance/mixture

Not applicable.

1.3. Details of the supplier of the safety data sheet

Company name: Robert Bosch GmbH
Automotive Electronics



Street: Gerhard-Kindler-Str.3
Place: D-72770 Reutlingen
Telephone: +49 (0)7121 7666000
Responsible Department: Responsible for the safety data sheet: sds@gbk-ingelheim.de

1.4. Emergency telephone number: +49 (0) 6132 / 84463 (GBK GmbH)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Directive 67/548/EEC or 1999/45/EC

This mixture is not classified as hazardous in accordance with Directive 1999/45/EC.

Not applicable

Classification according to Regulation (EC) No. 1272/2008 [CLP]

This mixture is not classified as hazardous in accordance with Regulation (EC) No. 1272/2008.

2.2. Label elements

Additional advice on labelling

There is no hazard when the measures for handling and storage are followed.

2.3. Other hazards

In case of electrolyte leakage:

According to concentration, aqueous solution causes irritations or burns of eyes, skin and mucous membranes.

In case of cell damage, possible release of dangerous substances and a flammable gas mixture.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical characterization

Kathode:

Litium-Metall Oxide (active material)

Polyvinylidene Fluoride (Binder)

Graphite (conductive material)

Aluminium Foil

Anode:

Carbon(active material)

Polyvinylidene Fluoride (Binder)

Cooper Foil

Electrolyte:

Organic solvent (non aqueous liquid)

Silicic acid, lithium salt

Further Information

Because of the cell structure the dangerous ingredients will not be available if used properly.

SECTION 4: First aid measures

4.1. Description of first aid measures

General information

The following first aid measures are required only in case of exposure to interior battery components after damage of the external battery casing.

Undamaged, closed cells do not represent a danger to the health.

After inhalation

Ensure of fresh air.

Consult a physician.

After contact with skin

In case of contact with skin wash off immediately with soap and water.



Consult a physician.

After contact with eyes

Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes.

Seek medical treatment by eye specialist.

After ingestion

Drink plenty of water. Do not induce vomiting.

Call a physician immediately.

4.2. Most important symptoms and effects, both acute and delayed

In case of electrolyte leakage:

According to concentration, aqueous solution causes irritations or burns of eyes, skin and mucous membranes.

4.3. Indication of any immediate medical attention and special treatment needed

Treat symptoms.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

Cold water and dry powder in large amount are applicable.

Use metal fire extinction powder or dry sand if only few cells are involved.

5.2. Special hazards arising from the substance or mixture

Burning may release the following flue gases such as:

carbon monoxide and carbon dioxide

5.3. Advice for firefighters

Wear self-contained breathing apparatus and protective suit.

Additional information

If possible, remove cell(s) from fire fighting area. If heated above 125°C, cell(s) can explode/vent.

Cell is not flammable but internal organic material will burn if the cell is incinerated.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective clothing.

Avoid contact with skin, eyes and clothing.

Avoid breathing fume and gas.

6.2. Environmental precautions

Do not discharge into the drains/surface waters/ground water.

6.3. Methods and material for containment and cleaning up

Take up mechanically and send for disposal.

6.4. Reference to other sections

Information for disposal see section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Avoid short circuiting the cell. Avoid mechanical damage of the cell. Do not open or disassemble.

Follow the directions.

Advice on protection against fire and explosion

Keep away from open flames, hot surfaces and sources of ignition.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Store only in original container at cool and aired place.

Recommended storage temperature: < 40 °C

7.3. Specific end use(s)

No data available.



SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Additional advice on limit values

During normal charging and discharging there is no release of product.

8.2. Exposure controls

Protective and hygiene measures

In case of electrolyte leakage:

Provide sufficient air exchange and/or exhaust in work rooms.

Use personal protective clothing.

Avoid contact with skin, eyes and clothing.

Avoid breathing fume and gas.

Remove all sources of ignition.

Eyeface protection

In case of electrolyte leakage:

Tightly fitting goggles (EN 166).

Hand protection

In case of electrolyte leakage:

Rubber gloves

Respiratory protection

In case of electrolyte leakage:

Use protective face mask (EN 149).

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state:

Solid

Colour:

Various

Odour:

Odourless

Changes in the physical state

9.2. Other information

No data available.

SECTION 10: Stability and reactivity

10.1. Reactivity

No data available.

10.2. Chemical stability

No data available.

10.3. Possibility of hazardous reactions

Electrolyte and electrodes may react with water or moisture.

10.4. Conditions to avoid

Keep away from open flames, hot surfaces and sources of ignition.

Do not puncture, crush or incinerate.

Avoid temperatures above 60°C.

10.5. Incompatible materials

No materials to be especially mentioned.

10.6. Hazardous decomposition products

No data available.

Further information

No decomposition if stored and applied as directed.

SECTION 11: Toxicological information



11.1. Information on toxicological effects

Acute toxicity

Based on available data, the classification criteria are not met.
LD50/oral/rat: 2000 mg/kg (Electrolyte)

Irritation and corrosivity

Based on available data, the classification criteria are not met.
In case of electrolyte leakage:
According to concentration, aqueous solution causes irritations or burns of eyes, skin and mucous membranes.

Sensitising effects

Based on available data, the classification criteria are not met.
In case of electrolyte leakage:
May cause sensitization by skin contact.

STOT-single exposure

Based on available data, the classification criteria are not met.

Severe effects after repeated or prolonged exposure

Based on available data, the classification criteria are not met.

Carcinogenic/mutagenic/toxic effects for reproduction

Based on available data, the classification criteria are not met.

Aspiration hazard

Based on available data, the classification criteria are not met.

Practical experience

Other observations

If appropriately handled and if in accordance with the general hygienic rules, no damages to health have become known.

SECTION 12: Ecological information

12.1. Toxicity

No data available.

12.2. Persistence and degradability

No data available.

12.3. Bioaccumulative potential

No data available.

12.4. Mobility in soil

No data available.

12.5. Results of PBT and vPvB assessment

No data available.

12.6. Other adverse effects

No data available.

Further information

Ecological injuries are not known or expected under normal use.
Do not flush into surface water or sanitary sewer system.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste disposal number of waste from residues/unused products

160605 WASTES NOT OTHERWISE SPECIFIED IN THE LIST; batteries and accumulators; other batteries and accumulators

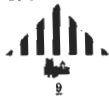
Contaminated packaging

Disposal in accordance with local regulations.

SECTION 14: Transport information

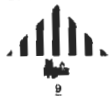
Land transport (ADR/RID)



14.1. UN number: UN 3480
14.2. UN proper shipping name: LITHIUM ION BATTERIES
14.3. Transport hazard class(es): 9
14.4. Packing group: -
Hazard label: 9A



Classification code: M4
Special Provisions: 188 230 310 348 376 377 636
Limited quantity: 0
Transport category: 2
Tunnel restriction code: E

Inland waterways transport (ADN)

14.1. UN number: UN 3480
14.2. UN proper shipping name: Lithium-ion battery
14.3. Transport hazard class(es): 9
14.4. Packing group: -
Hazard label: 9A



Classification code: M4
Special Provisions: 188 230 310 348 376 377 636
Limited quantity: 0

Marine transport (IMDG)

14.1. UN number: UN 3480
14.2. UN proper shipping name: LITHIUM ION BATTERIES
14.3. Transport hazard class(es): 9
14.4. Packing group: -
Hazard label: 9A


Special Provisions: 188, 230, 310, 348, 376, 377
Limited quantity: 0
EmS: F-A, S-I

Air transport (ICAO-TI/IATA-DGR)

14.1. UN number: UN 3480
14.2. UN proper shipping name: LITHIUM ION BATTERIES
14.3. Transport hazard class(es): 9
14.4. Packing group: -
Hazard label: 9A


Special Provisions: A88 A99 A154 A164 A183 A201 A206 A331
Limited quantity Passenger: Forbidden
IATA-packing instructions - Passenger: Forbidden
IATA-max. quantity - Passenger: Forbidden



IATA-packing instructions - Cargo: See 965
IATA-max. quantity - Cargo: See 965

14.5. Environmental hazards

ENVIRONMENTALLY HAZARDOUS: no

14.6. Special precautions for user

No specific precautions required.

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

The transport takes place only in approved and appropriate packaging.

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

National regulatory information

Additional information

Note: This product is an "article" and is not an object that is required to issue Safety Data Sheets (SDS) by regulations concerning chemical substances. This SDS voluntarily offers helpful information for your safe handling and environmental care.

15.2. Chemical safety assessment

Chemical safety assessments for substances in this mixture were not carried out.

SECTION 16: Other information

Changes

Changes in chapter: 9

Abbreviations and acronyms

ADR = Accord européen relatif au transport international des marchandises Dangereuses par Route

RID = Règlement concernant le transport international ferroviaire de marchandises dangereuses

ADN = Accord européen relatif au transport international des marchandises dangereuses par voie de navigation intérieure

IMDG = International Maritime Code for Dangerous Goods

IATA/ICAO = International Air Transport Association / International Civil Aviation Organization

MARPOL = International Convention for the Prevention of Pollution from Ships

DOT = Department of Transportation

TDG = Transport of Dangerous Goods

GHS = Globally Harmonized System of Classification and Labelling of Chemicals

REACH = Registration, Evaluation, Authorization and Restriction of Chemicals

CAS = Chemical Abstract Service

EN = European norm

ISO = International Organization for Standardization

DIN = Deutsche Industrie Norm

PBT = Persistent Bioaccumulative and Toxic

vPvB = Very Persistent and very Bio-accumulative

LD = Lethal dose

LC = Lethal concentration

EC = Effect concentration

IC = Median immobilisation concentration or median inhibitory concentration

Further Information

Data of items 4 to 8, as well as 10 to 12, do partly not refer to the use and the regular employing of the product (in this sense consult information on use and on product), but to liberation of major amounts in case of accidents and irregularities. The information describes exclusively the safety requirements for the product(s) and is based on the present level of our knowledge. This data does not constitute a guarantee for the characteristics of the product(s) as defined by the legal warranty regulations. (n.a. = not applicable; n.d. = not determined)

(The data for the hazardous ingredients were taken respectively from the last version of the sub-contractor's safety data sheet.)