Fronius
SHIFTING THE LIMITS

FRONIUS SOLAR BATTERY

Information on dangerous goods

Version 1 03/2016 IM

Solar Energy

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Fronius Energy Package and Fronius Solar Battery

With the Fronius Solar Battery, Fronius is introducing a stationary battery storage to be used in photovoltaic applications.

The battery is a high-performance lithium-ion battery based on the latest iron phosphate (LiFePO4) technology and complies with the highest safety standards. Due to its high capacity, the built-in battery falls into dangerous goods class 9, which requires specific regulations and guidelines to be met.

Information regarding **packaging, transport, storage and disposal** is set out in this document. **These specifications comply with the Austrian guidelines. National regulations must be checked by your respective country organisation.**

1 PACKAGING & TRANSPORT

In view of the high capacity (nominal capacity greater than 100 Wh), the rechargeable battery pack falls into dangerous goods class 9 and must be packaged accordingly and transported in compliance with the following regulations:

/ Battery module of the Fronius Solar Battery UN 3480 Lithium-ion batteries

1.1 Packaging

The packaging of the battery modules and of the Fronius Solar Battery have to be equipped with the following stickers:

/ Dangerous goods class 9

/ UN 3480

The battery must only be transported in the packaging as it is delivered from the manufacturer.

1.2 Transport

1.2.1 Road and rail: ADR / RID 2011 (2)

If the Fronius Solar Battery is required for road transport the following applies.
The driver of the vehicle is not requested to have a special education on dangerous goods as long as the weight of the battery pack does not exceed 333 kg (734 lb.) (i.e. up to two Fronius Solar Battery 12.0 can be transported). Furthermore the vehicle needs no special equipment except a fire extinguisher.
At weights above 333 kg (734 lb.) the transport has to be treated as labelled dangerous goods transport.

In a B2B transport an ADR document is required even at storage weights below 333 kg (734 lb.). This is also valid if a Fronius Solar Battery is in transported in a company car for demonstration purposes.

When transporting the Fronius Solar Battery to the end customer (e.g. by an installation company) an ADR transport document is NOT required, as the dangerous goods transport regulations only apply within the B2B sphere (according 1.1.3.1c ADR).

An example of an ADR document including an explanation is provided by Fronius (see below).

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Transport document for transporting packages by road in accordance with ADR 5.4. 2013

Sender (according to dangerous goods legislation)	Recipient:	Collection location (if not the same as that of the sender)

Dangerous goods information:

UN Number, official name	Hazard label	PG	Tunnel code	Dangerous for the environment	Trans. cat.	Packages		Total quantity kg
						Number	Description	
UN 3480 LITHIUM-ION BATTERIES	9	II	(E)	No	2		Cardboard box	

Place and date:

Visual inspection of the vehicle and the equipment, inspection of the documents and the securing of the load

Goods and accompanying documents handed over, required equipment (fire extinguisher with at least 2 kg powder or other similar fire-extinguishing agent) on board

Signature of sender/constructor

Signature of loader

Signature of driver

☐ **Transport in accordance with paragraph 1.1.4.2.1** (differences in packaging, labelling, etc. for a road/air/sea transport chain)

Transport category 1 total quantity		x50	
Transport category 2 total quantity		x3	
Transport category 3 total quantity		x1	
Transport category 4 total quantity		(not taken into consideration for totalling)	
		Sum in accordance with 1.1.3.6.4 (<=1000)	

<=1000 points = labelling not required for transport

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NOTES FOR COMPLETION

All fields highlighted in colour and the address header must be completed in full before departure.
The document must be signed and carried on board the vehicle during transport.
In addition, a portable fire extinguisher containing at least 2 kg powder or another similar fire-extinguishing agent must be carried on board and the load must be appropriately secured.

Completion example for Fronius Solar Battery 12.0 (8 storage modules)

UN.Nummer, offizielle Benennung	Gefahr-zettel	VG	Tunnel-code	Umweltgef.	Bef. - Kat	Versandstücke Anzahl	Versandstücke Beschreibung	Gesamt-menge kg
UN 3480 LITHIUM-IONEN BATTERIEN	9	II	(E)	Nein	2	8	Karton	144

Ort und Datum: **Sattledt, 31.10.2014**

Sichtkontrolle des Fahrzeugs und der Ausrüstung, Kontrolle der Dokumente und der Ladungssicherung

Gut und Begleitpapiere übernommen, erforderliche Ausrüstung wird mitgeführt

Unterschrift des Absenders/Erstellers | Unterschrift des Verladers | Unterschrift des Fahrzeugführers

☐ **Beförderung nach Absatz 1.1.4.2.1** (Differenzen Verpackung, Bezettelung usw. Transportkette Straße/Luft/See)

Gesamtmenge Beförderungskategorie 1		x50	
Gesamtmenge Beförderungskategorie 2	144	x3	432
Gesamtmenge Beförderungskategorie 3		x1	
Gesamtmenge Beförderungskategorie 4		(bleibt für die Summenbildung unberücksichtigt)	
		Summe gemäß 1.1.3.6.4 (<=1000)	432

<= 1000 Punkte kein kennzeichnungspflichtiger Transport

Number: Number of storage modules being transported (see table)

Total quantity kg: Total quantity of storage modules multiplied by 18 kg (weight of one module)

Transport category 2 total quantity: Enter the *total quantity kg* again and then multiply by 3 (the code for dangerous goods)

Number of storage modules for each device variant

Fronius item number	Product designation	Number of storage modules	Total quantity kg	Total
4,220,110	Fronius Solar Battery 4.5	3x	54	162
4,220,111	Fronius Solar Battery 6.0	4x	72	216
4,220,112	Fronius Solar Battery 7.5	5x	90	270
4,220,113	Fronius Solar Battery 9.0	6x	108	324
4,220,114	Fronius Solar Battery 10.5	7x	126	378
4,220,115	Fronius Solar Battery 12.0	8x	144	432
43,0007,0045,Z	Fronius Battery Module 1.5 rf	1x	18	54
43,0007,0045,A	Fronius Battery Module 1.5 rep	1x	18	54

ADR document for transporting the Fronius Solar Battery

1.2.2 Sea freight: IMDG code 2011 (4)

Required stickers

/ UN 3480

/ Dangerous goods class 9

/ Lithium Ion Batteries contained in equipment

BEFÖRDERUNGSDOKUMENT FÜR GEFÄHRLICHE GÜTER
nach §8 GGVSee (IMO-ERKLÄRUNG)
TRANSPORT DOCUMENT FOR DANGEROUS GOODS
(IMO-DANGEROUS GOODS DECLARATION)

Dieses Formular entspricht SOLAS 74, Kapitel VII Regel 4; MARPOL 73/78, Anlage III, Regel 4 und dem IMDG-Code, Kapitel 5.4
This form meets the requirements of SOLAS 74, chapter VII regulation 4; MARPOL 73/78, Annex III, regulation 4 and the IMDG-Code, Chapter 5.4

Versender (Name & Anschrift) / Shipper (Name & Address) Fronius International GmbH Fronius Strasse 5 4642 Sattledt, AUSTRIA	Buchungsnummer(n) / Reference number(s)
Empfänger / Consignee C. Adolfo Casaretto S.A. Rio Negro 1580 11100 Montevideo, URUGUAY	Beförderer / Carrier
CONTAINER/FAHRZEUG-PACKZERTIFIKAT / CONTAINER/VEHICLE PACKING CERTIFICATE **ERKLÄRUNG** Es wird erklärt, dass das Packen der gefährlichen Güter in die oder auf die Beförderungseinheit gem. den Bestimmungen nach 5.4.2.1 durchgeführt wurde. **DECLARATION** It is declared that the packing of the goods into the cargo transport unit has been carried out in accordance with the provisions of 5.4.2.1. AUSFÜLLEN FÜR SENDUNGEN IN CONTAINERN ODER FAHRZEUGEN TO BE COMPLETED FOR SHIPMENTS IN CONTAINERS OR VEHICLES	Container-/Fahrzeug-Nr.: / Container-/Vehicle-Nr.: Name/Funktion, Unternehmen/Organisation des Unterzeichners / Name/status, company/organization of signatory Ort und Datum / Place and date Unterschrift für den Packer / Signature on behalf of packer
Schiffsname und Nummer der Reise / Ship's name and voyage No. — Ladehafen / Port of loading Löschhafen / Port of discharge	(Frei für Text, Anweisungen und sonstige Angaben) / (Reserved for text, instructions or other matter)

UN-Nr. / UN-No.	Inhalt (richtiger technischer Name) * / Proper Shipping Name (Correct technical name) *	Klasse/Unterklasse nach IMO / IMO-Class	Verpackungsgruppe / Packing group	Markierung der Versandstücke / Falls zutreffend, Identifikations-Nummer oder amtl. Kennzeichen / Marks & Nos, if applicable, identification or registration number(s) of the Unit	Anzahl und Verp.-Art / No. and kind of packages
UN 1950	Aerosols limited quantity	2		UN 1950 Aerosols	1 pallet overpack (consisting 20 cartons x 12 cans each)

Bruttomenge (Volumen/Masse) / Gross quantity (volume/mass) Nettomenge/Volumen/Masse / Net quantity/volume/mass Netto Explosivstoffmasse * * * Net explosive mass * * *	Merkblatt-Nr. für Unfall-Maßnahmen / EmS No.	Eigenschaften/Properties Flammpunkt/Flashpoint * * MARINE POLLUTANT * * Kontroll- und Notfalltemperatur * * Control- and emergency temperature * *	Güter angeliefert als/Goods delivered as: ☒ Stückgut/Breakbulk cargo ☐ Ladungseinheiten (Unit Loads) Unitized cargo ☐ Bulkverpackungen/Bulk packages Art der Einheit (Container, Anhänger, Tank, Fahrzeug usw.) / Type of unit (container, trailer, tank, vehicle etc.) ☐ offen/open ☐ geschlossen/closed Zutreffendes ankreuzen/Insert "X" in appropriate box (Diese Spalte kann bis auf die Überschrift freigelassen werden; in diesem Fall ist die zutreffende Beschreibung einzusetzen.) (This column may be left empty apart from the heading, in which case insert appropriate description.)
gross weight 118 kg net weight 96 kg	F-D, S-U		

* Marken- oder Handelsnamen allein sind nicht ausreichend. Falls zutreffend: (1) das Wort „ABFALL" vor den Namen setzen; (2) „LEER UNGEREINIGT" oder „RÜCKSTÄNDE – ZULETZT ENTHALTEN" hinzufügen; (3) „BEGRENZTE MENGE" hinzufügen.
* Proprietary/trade names alone are not sufficient. If applicable: (1) the word "WASTE" should precede the name; (2) "EMPTY UNCLEANED" or "RESIDUE – LAST CONTAINED" should be added; (3) "LIMITED QUANTITY" should be added.
** Falls nach Kapitel 5.4 IMDG-Code erforderlich; *** Nur bei Stoffen der Klasse 1;
** When required in chapter 5.4 of the IMDG-Code; *** Class 1 only;

1.2.3 Air freight: IATA 2016 (3)

Transporting the Fronius Solar Battery in **passenger aircrafts and freight aircrafts** is not possible due to IATA rules (2016).

1.3 Transporting "used" batteries

Mechanically defective batteries must not be transported and should be disposed of in the country of use – see "Disposal" section. Usually there is no warranty claim for mechanically defective batteries, therefore it is not necessary for the battery to be transported to the Fronius organisation.

If, in the case of a warranty claim (no mechanical defect), the battery module and/or the complete Fronius Solar Battery are sent, the shipment must be packaged and transported in accordance with the dangerous goods regulations (also see the service manual). In this case the battery has be declared as "used" on the freight document.

2 STORAGE

The latest generation of batteries is characterised by high intrinsic safety, a long service life and a low level of self discharge. Nevertheless, the rechargeable batteries present a potential risk, as poisonous vapours can be emitted in the event of a fire.
For this reason, it must be ensured that the rechargeable battery packs are stored appropriately. As a rule, the Fronius Solar Battery and its battery modules can be stored in its original packaging without any additional restrictions.

2.1 General

The storage area should be well-ventilated and free from direct sunlight and other heat sources.

- Recommended storage temperature: -40°C to 60°C (-40°F to 140°F)
- Humidity: max. 80%

The following should also be observed in terms of handling:

- Do not store the battery with other metallic objects/surfaces
- The battery should not come into contact with water
- Objects should not be introduced into the openings in the housing

2.2 Storing rechargeable battery packs

In view of fire regulations, rechargeable battery packs must be stored in an isolated area specifically designed for fire protection or by keeping a minimum safety distance (spatial separation of 5m). Mixed storage is not permitted.
The following measures are also required
/ Instructing employees about what to do in the event of a fault, First Aid measures, etc.
/ Purchasing emergency and/or protective equipment (e.g. controlled waste container)

2.2.1 Actions to be taken in the event of fire

Only Class D fire extinguishers (powder for metal fires) should be used!

2.2.2 Faults/damage

Before using the battery, the packaging and the battery itself should be examined for obvious signs of damage.

If the faults listed below occur, personal protective equipment should be worn. The defective battery must be stored in a lockable controlled waste container. Management and/or the fire safety officer must be informed if applicable.

- / Emergence of electrolytes: e.g. damp spots on the packaging
- / Mechanical damage: e.g. damaged leads, loose parts, deformation on the housing
- / Heat generation: from 60°C (140°F)
- / Smoke build-up: due to an internal short circuit

2.2.3 Required equipment

				
Close-fitting safety goggles EN 166	Protective gloves EN 420:2003	Respirator EN 405:2001	Protective work clothing	Controlled waste container

2.2.4 First Aid measures

- Inhalation
  Gases emitted can cause difficulty in breathing → ventilate the area
- Skin contact
- Skin irritations may develop → wash the affected area thoroughly with soap and water
- Contact with the eyes
- Irritations of the eye → rinse the eyes thoroughly with water for 15 minutes and seek medical attention

2.3 Duration of storage

2.3.1 Storage duration Fronius Solar Battery

Due to its very low self discharge it is possible to store the Fronius Solar Battery for up to three years after production of the modules (at Sony). If the storage duration lasts longer than that period the battery has to be recharged at Fronius International with costs. The latest point in time to bring the battery into operation is printed on the packaging. Later on this service recharging is required (see image below).

2.3.2 Storage duration Fronius Solar Battery upgrade module

Single battery modules, dedicated to extend/upgrade an existing Fronius Solar Battery, can be stored up to three months after delivery from Fronius International (date is printed as described in 2.3.1). Later a service recharging is required which can be done at Fronius International with costs.

3 DISPOSAL

A battery is special waste and must be disposed of as hazardous waste (EWC no. 1606 05 Batteries and Accumulators). It must not be disposed of with unregulated waste.

It is the responsibility of the respective country to check whether there are national legislative or notification obligations for "used rechargeable batteries". If you want to contract an external service provider for this purpose, we would suggest the company RLG, with which Fronius works in Europe.
RLG (Reverse Logistics Group) is a leading European specialist in take-back solutions.
http://www.rev-log.com

4 WHERE CAN I FIND THE RELEVANT DOCUMENTS?

The following documents are available from the Fronius Energy/net - DownloadCenter

4.1 Hazardous goods information

/ **Safety data sheet**

https://www.fronius.com/cps/rde/xchg/de_intranet/XSL/hs.xsl/-/HTML/download.htm?obj_id=543731

/ **ADR transport documents**

https://www.fronius.com/cps/rde/xchg/de_intranet/XSL/hs.xsl/-/HTML/download.htm?obj_id=442838