

# Safety data sheet

Lithium ion based Battery storage system TS HV 70  
TS HV 70

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## Supplemental directives

### Revision history

Version	edited by	approved by	Release date	Remarks
1	Toni Krause	Ahmed Louati	2021-11-23	



*As a solid, manufactured article, exposure to hazardous ingredients is not expected with normal use. The information contained in this Safety Data Sheet (SDS) contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.*

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# 1 Identification

<b>Commercial product name</b>	TS HV 70
<b>Product category</b>	Energy storage system with 14 Lithium ion battery modules
<b>Model name</b>	Battery module 4.8-1C-HV1000 Cell CM0940R0008A (94Ah capacity)
<b>Manufacturer</b>	TESVOLT GmbH Am Heideberg 31 06886 Lutherstadt Wittenberg Germany
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## Technical data

Product type	Lithium ion based energy storage system
Model name	TS HV 70
Battery type	14S1P
Rated capacity	94 Ah
Rated energy	67 kWh
Nominal voltage	721 V
Operating voltage	627 – 814 V
Maximum current	100 A
Operating temperature range	-10 °C – 50 °C
Anode (negative electrode)	based on intercalation graphite
Cathode (positive electrode):	based on lithiated metal oxide (Cobalt, Nickel, Manganese)



*The information and recommendations set forth are made in good faith and believed to be accurate as of the date of preparation. TESVOLT makes no warranty, expressed or implied, with respect to this information and disclaims all liabilities from reliance on it.*

## 2 Hazard(s) identification

### 2.1 Hazards Identification USA

<b>Route(s) of Entry</b>	There is no hazard when the measures for handling and storage are followed.
<b>Signs and Symptoms of Exposure</b>	<p>In case of cell damage, possible release of dangerous substances and a flammable gas mixture.</p> <p>OSHA Hazard Communication: This material is not considered hazardous by the OSHA Hazard Communication Standard 29CFR 1910.1200. Carcinogenicity (OSHA): Not listed</p> <p>Carcinogenicity (NTP): Not listed</p> <p>Carcinogenicity (IARC): Not listed</p> <p>Carcinogenicity (OSHA): Not listed</p>
<b>Special hazards for human health and environment</b>	There is no hazard when the measures for handling and storage are followed. In case of cell damage, possible release of dangerous substances and a flammable gas mixture.

### 2.2 Hazards Identification USA, EU

<b>Explication of special hazards for human health and environment</b>	<p>Not classified as dangerous according to directive 1999/45/EEC</p> <p>There is no hazard when the measures for handling and storage are followed. In case of cell damage, possible release of dangerous substances and a flammable gas mixture.</p>
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### 3 Composition and information on ingredients

#### Composition/information on ingredients USA, EU

EC-No.	CAS-No.	Chemical name	Quantity	EU-Classification
215-154-6	1307-96-6	Cobalt oxide	< 30 %	Xn, N R22435053
215-202-6	1313-13-9	Manganese dioxide	< 30 %	Xn R20/22
215-215-7	1313-99-1	Nickel oxide	< 30 %	Carc. Cat. 1, T R49-43-48/23--53
231-153-3	7440-44-0	Carbon	10 - 30 %	
		Electrolyte*	10 - 20 %	
	24937-79-9	Polyvinylidene fluoride (PVdF)	< 10 %	
231-072-3	7429-90-5	Aluminium foil	2 - 10 %	
231-159-6	7440-50-8	Copper foil	2 - 10 %	
		Aluminium and inert materials	5 - 10 %	

Full text of each relevant R phrase can be found in section 16.

#### Further Information

For information purposes: (\*) Main ingredients: Lithium hexafluorophosphate, organic carbonates

Because of the cell structure the dangerous ingredients will not be available if used properly. During charge process a lithium graphite intercalation phase is formed.

Mercury content: Hg < 0.1 mg/kg

Cadmium content: Cd < 1 mg/kg

Lead content: Pb < 10 mg/kg



## 4 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 plenty of 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.

Call a physician immediately.

## 5 Firefighting measures

### 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.

### Special hazards arising from the chemical

May form hydrofluoric acid if electrolyte comes into contact with water.

In case of fire, the formation of the following flue gases cannot be excluded: Hydrogen fluoride (HF), Carbon monoxide and carbon dioxide.

### Protective equipment and precautions for firefighters

Wear self-contained breathing apparatus and protective suit.

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.

## 6 Accidental release measures

### Personal precautions

Use personal protective clothing.

Avoid contact with skin, eyes and clothing.

Avoid breathing fume and gas.

### Environmental precautions

Do not discharge into the drains/surface waters/groundwater.

Methods for cleaning up/taking up: Take up mechanically and send for disposal.

## 7 Handling and storage

### 7.1 Handling

#### Advice on safe handling

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

Advice on protection against fire and explosion: Keep away from open flames, hot surfaces and sources of ignition.

### 7.2 Storage

#### Requirements for storage rooms and vessels

Storage at room temperature (approx. 20°C) at approx. 20-50% of the nominal capacity (OCV approx. 3.5-3.7 V).

Keep in closed original container.

## 8 Exposure controls and personal protection

CAS-No.	Chemical name	ml/m <sup>3</sup>	mg/m <sup>3</sup>	F/ml	Category	Origin
7440-44-0	Graphite, respirable	-	4		TWA (8 h)	WEL
			-		STEL (15 min)	WEL

### Additional advice on limit values

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

### Occupational exposure controls

No specific precautions necessary.

### Protective and hygiene measures

When using do not eat, drink or smoke. Wash hands before breaks and after work.

### Respiratory protection

No specific precautions necessary.

### Hand protection

No specific precautions necessary.

### Eye protection

No specific precautions necessary.

### Skin protection

No specific precautions necessary.

## 9 Physical and chemical properties

### Appearance

Form: Solid

Color: Various

Odor: Odorless

### Important health, safety and environmental information

#### Test method

pH value	n.a.
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Flash point	n.a.
-------------	------

Lower explosion limits	n.a.
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Vapour pressure	n.a.
-----------------	------

Density	n.a.
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Water solubility	Insoluble
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Ignition temperature	n.a.
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## 10 Stability and reactivity

<b>Stability</b>	Stable
<b>Conditions to avoid</b>	Keep away from open flames, hot surfaces and sources of ignition. Do not puncture, crush or incinerate.
<b>Materials to avoid</b>	No materials to be especially mentioned.
<b>Hazardous decomposition products</b>	In case of open cells, there is the possibility of hydrofluoric acid and carbon monoxide release.
<b>Possibility of Hazardous Reactions</b>	Will not occur
<b>Additional information</b>	No decomposition if stored and applied as directed.

## 11 Toxicological information

### Empirical data on effects on humans

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



## 12 Ecological information

### Further information

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

## 13 Disposal considerations

**Advice on disposal** For recycling consult manufacturer.

**Contaminated packaging** For recycling consult manufacturer.

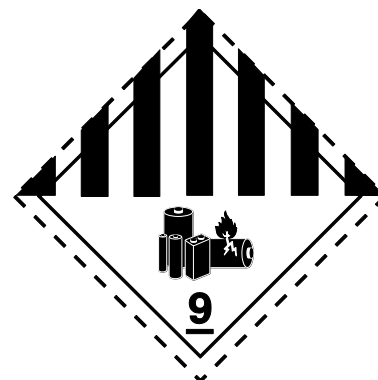
## 14 Transport information

### 14.1 US DOT 49 CFR 172.101

Proper shipping name	Lithium-ion batteries
ID Number:	UN3480
Hazard Class or Division:	9
Packing group:	II
Label:	9

### 14.2 Land transport (ADR/RID)

UN number:	3480
ADR/RID class:	9
Classification code:	M4
Hazard label:	9



ADR/RID packing group:	II
Limited quantity:	LQ 0
Tunnel restriction code:	E
Description of the goods	Lithium-ion batteries

#### Other applicable information (land)

LQ 0: No exemption under the conditions of 3.4.2.

Transport category: 2

### 14.3 Marine transport

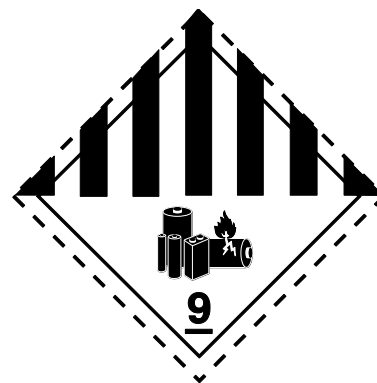
UN number:	3480
IMDG code:	9
Marine pollutant:	no
Hazard label:	9



IMDG packing group:	II
EmS:	F-A, S-I
Limited quantity:	none
Description of the goods	Lithium-ion batteries

## 14.4 Air transport

UN/ID number:	3480
ICAO/IATA-DGR:	9
Marine pollutant:	no
Hazard label:	9



ICAO packing group:	II
Limited quantity Passenger:	-
IATA-packing instructions - Passenger:	5 kg G
IATA-packing instructions - Cargo:	965
IATA-max. quantity - Cargo:	35 kg G
Description of the goods	Lithium-ion batteries

## Other applicable information

Lithium equivalent:	48.2 g
Wh-rating per cell:	345 Wh

## 15 Regulatory information

### 15.1 U.S. Regulations

#### National Inventory TSCA

The manufacturer of the cells (SAMSUNG SDI) certifies that all chemical components of the Model CM0940R0008A (94 Ah capacity) Lithium-Ion Battery are listed on the US EPA TSCA 8(b) Inventory or are exempt from listing.

#### SARA

To the best of our knowledge this product contains no toxic chemicals subject to the supplier notification requirements of Section 313 of the Superfund Amendments and Reauthorization Act (SARA/EPCRA) and the requirements of 40 CFR Part 372.

### 15.2 Regulatory information EU

#### Hazardous components which must be listed on the label

As an article the product does not need to be labeled in accordance with EC directives or respective national laws.

#### EU regulatory information

1999/13/EC (VOC): 0 %

## 16 Other relevant information

### 16.1 Other Information USA

#### Hazardous Materials Information Label (HMIS)

Health:	0
Flammability:	1
Physical Hazard:	0

#### NFPA Hazard Ratings

Health:	0
Flammability:	1
Reactivity:	0

### 16.2 Other Information EU

#### R-phrases (full text)

R10	Flammable
R20/22	Harmful by inhalation and if swallowed.
R22	Harmful if swallowed.
R34	Causes burns.
R40	Limited evidence of a carcinogenic effect.
R43	May cause sensitization by skin contact.
R48/23	Toxic: danger of serious damage to health by prolonged exposure through inhalation.
R49	May cause cancer by inhalation.
R50	Very toxic to aquatic organisms.
R53	May cause long-term adverse effects in the aquatic environment.

### 16.3 Further Information

Data of sections 4 to 8, as well as 10 to 12, do not necessarily refer to the use and the regular handling of the product (in this sense consult package leaflet and expert information), but to release 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.