



Safety Data Sheet

according to Regulation (EC) No 1907/2006

RP-Technik GmbH

PFW413SC-P

Revision date: 15.12.2022

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

1.1. Product identifier

PFW413SC-P

Further trade names

Type: 3,2 V; 1600 mAh; 5,12 Wh

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

Use of the substance/mixture

batteries and accumulators

1.3. Details of the supplier of the safety data sheet

Company name:	RP-Technik GmbH	
Street:	Hermann-Staudinger-Str. 10-16	
Place:	D-63110 Rodgau	
Telephone:	+49 (6106) 660 28 - 0	+49 (6106) 660 28 - 40
E-mail:	info@rp-group.com	
Contact person:	Francisco Goerke	
E-mail:	product@rp-group.com	

1.4. Emergency telephone number:

+49 (6106) 660 28 - 0 (24 h.)

Further Information

This battery pack is an article according to Regulation (EC) No. 1907/2006 (REACH), Annex II, as amended by Regulation (EU) No. 453/2010, and is not subject to the REACH regulation. The information contained in this safety data sheet contains valuable and critical information for the safe and proper use of the product. This SDS should be kept and made available to employees and other users of the product.

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Regulation (EC) No 1272/2008

Acute Tox. 3; H301
Acute Tox. 3; H311
Acute Tox. 3; H331
Skin Corr. 1A; H314
Eye Dam. 1; H318
Skin Sens. 1; H317
Carc. 2; H351
STOT RE 1; H372

Full text of hazard statements: see SECTION 16.

2.2. Label elements

Additional advice on labelling

Labelling according to Regulation (EC) No. 1272/2008 [CLP]: not applicable / not relevant
The product is: article (batteries and accumulators)

2.3. Other hazards

The substances in the mixture do not meet the PBT/vPvB criteria according to REACH, annex XIII.
Risk of explosion by shock, friction, fire or other sources of ignition. (Formation of: Gases/vapours, toxic) Do not open container by force. To avoid risks to man and the environment, comply with the instructions for use.



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SECTION 3: Composition/information on ingredients

3.2. Mixtures

Chemical characterization

The product is: article (batteries and accumulators)

Relevant ingredients

CAS No	Chemical name	Quantity
15365-14-7	Lithium Iron Phosphate	25 - 30 %
—	—	—
—	Not classified as hazardous under CLP	—
7782-42-5	Graphite	8 - 12 %
231-955-3	—	—
—	Not classified as hazardous under CLP	—
7440-02-0	Nickel	0,5 - 1 %
231-111-4	028-002-00-7	—
—	Carc. 2; H351, Resp. Sens. 1; H334, Skin Sens. 1; H317, STOT RE 1; H372	—
—	High molecular polymer (binder)	3 - 5 %
—	—	—
—	Not classified as hazardous under CLP	—
7429-90-5	Aluminium	5 - 8 %
231-072-3	—	—
—	Flam. Sol. 1; H228 (powder form)	—
7440-50-8	Copper	10 - 15 %
231-159-6	—	—
—	Not classified as hazardous under CLP	—
21324-40-3	Lithium hexafluorophosphate	15 - 22 %
244-334-7	—	—
—	Acute Tox. 3; H301, Acute Tox. 3; H311, Acute Tox. 3; H331, Skin Corr. 1A; H314, Eye Dam. 1; H318, STOT RE 1; H372	—
7439-89-6	Iron	22 - 30 %
231-096-4	—	—
—	Not classified as hazardous under CLP	—

Full text of H and EUH statements: see section 16.

Specific Conc. Limits, M-factors and ATE

CAS No	EC No	Chemical name	Quantity
21324-40-3	244-334-7	Lithium hexafluorophosphate(1-)	15 - 22 %
—	Specific Conc. Limits, M-factors and ATE	—	—
—	oral: ATE = not determined	—	—



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SECTION 4: First aid measures

4.1. Description of first aid measures

General information

In all cases of doubt or when symptoms persist, seek medical attention. Never give anything by mouth to an unconscious person.

After inhalation

Remove from exposure immediately and move to fresh air. If breathing is difficult, administer oxygen if available. Seek medical attention immediately.

After contact with skin

Remove contaminated clothing and shoes immediately. Rinse skin thoroughly with plenty of water for at least 15 minutes. Seek medical attention immediately.

After contact with eyes

Flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Seek medical attention immediately.

After ingestion

Give at least 2 glasses of milk or water. Induce vomiting only if patient is conscious. Seek medical attention immediately.

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

In the event of exposure to internal cell contents: vapour/fumes may be very irritating to the eyes and skin. Inhalation may cause lung irritation. Ingestion may cause poisoning. Target organs: nerves, liver and kidneys.

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

In the event of exposure to internal battery contents, immediate medical attention is required. Moderate to severe irritation, burning and dryness of the skin may occur.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media

Water (large quantities for cooling), Carbon dioxide (CO₂).

Co-ordinate fire-fighting measures to the fire surroundings.

5.2. Special hazards arising from the substance or mixture

Cell may vent when subjected to excessive heat, exposing battery contents. Hazardous combustion products include: carbon monoxide, carbon dioxide, lithium oxide fumes. May form peroxides upon decomposition.

5.3. Advice for firefighters

Wear self-contained breathing apparatus (SCBA) and full protective clothing. Use water spray to cool fire-exposed containers and surroundings.

Additional information

Do not allow fire-fighting water to enter drains or water courses. Batteries subjected to fire or high temperatures may explode. Flash point: not applicable to article as supplied. Auto-ignition temperature: not applicable to article as supplied.



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SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General advice

If battery material is released, remove all personnel from the area until fumes dissipate. Avoid skin and eye contact and inhalation of vapours.

For non-emergency personnel

Provide maximum ventilation to clear out hazardous gases. Do not re-enter area until confirmed safe.

For emergency responders

Wear personal protection equipment (refer to section 8).

6.2. Environmental precautions

Do not allow released material to enter drains, water courses or soil. No known environmental hazards at present under normal use conditions.

6.3. Methods and material for containment and cleaning up

For containment

Place leaking battery in a plastic bag and then into a steel container. Keep the battery cool and allow vapours to dissipate.

For cleaning up

Wipe up spilled material with a cloth. Remove spilled liquid with absorbent material and incinerate in accordance with local regulations.

Other information

Use non-sparking tools. The preferred response is to leave the area, allow the battery to cool and vapours to dissipate, then provide maximum ventilation.

6.4. Reference to other sections

Safe handling: see section 7

Personal protection equipment: see section 8

Disposal: see section 13



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SECTION 7: Handling and storage

7.1. Precautions for safe handling

Advice on safe handling

Do not open, destroy or incinerate cells. Do not short circuit terminals. Do not overcharge or force over-discharge. Do not throw into fire. Do not crush or puncture the battery. Do not immerse in liquids. Avoid mechanical or electrical abuse.

Advice on protection against fire and explosion



Do not expose to heat above 70 °C. Do not incinerate. Do not disassemble. The battery may explode or cause burns if disassembled, crushed or exposed to fire or high temperatures. Do not short circuit or install with incorrect polarity.

Advice on general occupational hygiene

Avoid skin and eye contact with internal battery contents. Wash hands thoroughly after handling. Do not eat, drink or smoke in areas where batteries are handled.

Further information on handling

Do not place batteries near heating equipment. Do not expose to direct sunlight for long periods.

7.2. Conditions for safe storage, including any incompatibilities

Requirements for storage rooms and vessels

Store in a cool, dry and well-ventilated area with little temperature change. Keep away from heat sources and direct sunlight.

Hints on joint storage

Do not store together with: Oxidising agents, alkalis, water, strong oxidizers, mineral acids, strong bases, halogenated hydrocarbons.

Further information on storage conditions

Keep away from heat. (Temperature > 70 °C) Protect from direct sunlight. Protect from moisture.

7.3. Specific end use(s)

batteries and accumulators



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SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

CAS No	Substance	ppm	mg/m ³	fib/cm ³	Category	Origin
7429-90-5	Aluminium metal (Respirable Fraction)	-	1	—	TWA (8 h)	—
7440-50-8	Copper, fume	-	0.2	—	TWA (8 h)	—
-	Fluorides, inorganic	-	2.5	—	TWA (8 h)	—
7782-42-5	Graphite (all forms except fibres) (Respirable Fraction)	-	2	—	TWA (8 h)	—
-	Iron salts (as Fe)	-	1	—	TWA (8 h)	—
-	—	-	2	—	STEL (15 min)	—
7440-02-0	Nickel	-	0.5	—	TWA (8 h)	—

Biological limit values

CAS No	Substance	Parameter	Value	Test material	Sampling time
7440-02-0	Nickel	Ni	3 µg/L	Urine	After several consecutive working shifts

8.2. Exposure controls

Appropriate engineering controls

Under normal use conditions, no special engineering controls are required. In the event of battery venting, provide maximum ventilation. Avoid confined areas with venting cell cores.

Individual protection measures, such as personal protective equipment

Eye/face protection

Not necessary under normal use conditions. In the event of battery venting or handling of open cells: safety glasses with side shields.

Hand protection



Not necessary under normal use conditions. In the event of battery venting or handling of open cells: protective gloves.

Skin protection

Not necessary under normal use conditions. In the event of battery venting or handling of open cells: full protective clothing.

Respiratory protection

Not necessary under normal use conditions. In the event of battery venting: provide maximum ventilation. Use respiratory protection (SCBA) when handling venting batteries in confined spaces.

Thermal hazards

Protect against heat exposure above 70 °C. Do not expose to direct flame or incinerate.

Environmental exposure controls

Do not allow released battery contents to enter drains, water courses or soil.



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SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state:	Solid (sealed article)
Colour:	Green (approximately cylindrical housing)
Odour:	Odourless under normal conditions; ether-like/irritating if leaking
Odour threshold:	not applicable
Melting point/freezing point:	Not applicable to article as supplied
Boiling point or initial boiling point and boiling range:	Not applicable to article as supplied
Flammability:	Not applicable to article as supplied; individual electrolyte components may be flammable
Lower explosion limits:	not determined
Upper explosion limits:	not determined
Flash point:	Not applicable to article as supplied
Auto-ignition temperature:	Not applicable to article as supplied
Decomposition temperature:	Avoid temperatures above 70 °C
pH-Value:	Not applicable to article as supplied
Viscosity / kinematic:	Not applicable to article as supplied
Water solubility:	Not applicable to article as supplied
Solubility in other solvents:	not determined
Partition coefficient n-octanol/water:	not determined
Vapour pressure:	Not applicable to article as supplied
Density:	Not applicable to article as supplied
Relative vapour density:	not determined
Particle characteristics:	not determined

9.2. Other information

No information available.

SECTION 10: Stability and reactivity

10.1. Reactivity

No hazardous reaction when handled and stored according to the provisions in Section 7.

10.2. Chemical stability

Product is stable under conditions described in Section 7 (normal ambient temperatures, dry conditions, no mechanical abuse).

10.3. Possibility of hazardous reactions

Heat / In case of fire: Danger of venting and possible explosion of cell. Handle with care - avoid bumps, friction and impact. Overcharge and forced over-discharge may cause hazardous reactions.

10.4. Conditions to avoid

Heat above 70 °C, incineration, deformation, mutilation, crushing, disassembly, overcharging, short circuit, prolonged exposure to humid conditions.

10.5. Incompatible materials

Oxidising agents, alkalis, water, strong oxidizers, mineral acids, strong bases, halogenated hydrocarbons.

10.6. Hazardous decomposition products

In case of fire or venting: carbon monoxide, carbon dioxide (CO₂), lithium oxide fumes, toxic fumes, may form peroxides. If leaked, avoid contact with strong oxidizers, mineral acids, strong alkalis, halogenated hydrocarbons.



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SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

Harmful if swallowed (internal electrolyte components, e.g. lithium hexafluorophosphate). No hazard under normal use conditions as a sealed article.

ATEmix calculated

ATE (oral) not determined; ATE (dermal) not determined; ATE (inhalation vapour) not determined; ATE (inhalation dust/mist) not determined

CAS No	Chemical name				
—	Exposure route	Dose	Species	Source	Method
21324-40-3	Lithium hexafluorophosphate(1-)				
—	oral	ATE 100 mg/kg	—	—	—

Irritation and corrosivity

Internal contents (electrolyte) may cause severe skin burns and eye damage on contact. Vapour/fumes are very irritating to the eyes and skin in the event of cell rupture or venting.

Sensitising effects

May cause an allergic skin reaction (nickel content).

Carcinogenic/mutagenic/toxic effects for reproduction

Suspected of causing cancer (nickel content).

STOT-single exposure

Based on available data, the classification criteria are not met for the article as supplied under normal use conditions.

STOT-repeated exposure

Causes damage to organs through prolonged or repeated exposure (lithium hexafluorophosphate). May cause damage to organs through prolonged or repeated exposure (nickel). Target organs: nerves, liver and kidneys.

Aspiration hazard

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

Information on likely routes of exposure

Under normal use: none. In event of cell rupture/venting: skin contact, eye contact, inhalation, ingestion (of internal contents including electrolyte).

11.2. Information on other hazards

Endocrine disrupting properties

This product does not contain a substance that has endocrine disrupting properties with respect to humans as no components meets the criteria.



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SECTION 12: Ecological information

12.1. Toxicity

Based on available data, no known environmental hazards at present under normal use conditions. The product is not classified as ecotoxic.

12.2. Persistence and degradability

Slowly biodegradable. The product has not been fully tested.

12.3. Bioaccumulative potential

Slowly bio-degradable. The product has not been fully tested.

12.4. Mobility in soil

The product has not been tested.

12.5. Results of PBT and vPvB assessment

The substances in the mixture do not meet the PBT/vPvB criteria according to REACH, Annex XIII.

12.6. Endocrine disrupting properties

No information available indicating endocrine disrupting properties.

12.7. Other adverse effects

No information available.

Further information

Do not allow to enter into surface water or drains. Do not allow to enter into soil/subsoil. Dispose of in accordance with appropriate local regulations.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Disposal recommendations

Do not incinerate or subject cells to temperatures in excess of 70 °C; such abuse can result in leakage and/or cell explosion. It is recommended to fully discharge the battery before disposal to consume the lithium metal inside. Dispose of in accordance with appropriate local regulations. Do not pierce or burn, even after use. Do not allow to enter into surface water, drains or soil/subsoil.

Contaminated packaging

Dispose of packaging waste according to applicable local legislation.



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SECTION 14: Transport information

Land transport (ADR/RID)

14.1. UN number or ID number: UN 3480

14.2. UN proper shipping name: LITHIUM ION BATTERIES (including lithium polymer batteries)

14.3. Transport hazard class(es): 9

14.4. Packing group: Not Applicable



Hazard label: 9A

Classification code: M4

Special Provisions: 188 230 310 348 360 376 377 387 390 670

Limited quantity: 0

Excepted quantity: E0

Transport category: 2

Tunnel restriction code: E

Inland waterways transport (ADN)

14.1. UN number or ID number: UN 3480

14.2. UN proper shipping name: LITHIUM ION BATTERIES (including lithium polymer batteries)

14.3. Transport hazard class(es): 9

14.4. Packing group: Not Applicable



Hazard label: 9A

Classification code: M4

Special Provisions: 188 230 310 348 360 376 377 387 390 670

Limited quantity: 0

Excepted quantity: E0

Marine transport (IMDG)

14.1. UN number or ID number: UN 3480

14.2. UN proper shipping name: LITHIUM ION BATTERIES (including lithium polymer batteries)

14.3. Transport hazard class(es): 9

14.4. Packing group: Not Applicable



Hazard label: 9A

Special Provisions: 188 230 310 348 360 376 377 384 387 390

Limited quantity: 0

Excepted quantity: E0

EmS: F-A, S-I

Air transport (ICAO-TI/IATA-DGR)

14.1. UN number or ID number: UN 3480

14.2. UN proper shipping name: LITHIUM ION BATTERIES (including lithium polymer batteries)

14.3. Transport hazard class(es): 9

14.4. Packing group: Not Applicable



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Hazard label: 9A

Special Provisions: A48 A88 A99 A154 A164 A181 A185 A213 A22

Limited quantity Passenger: Forbidden

Passenger LQ: Forbidden

Excepted quantity: E0

IATA-packing instructions - Passenger: 965 Section IB

IATA-max. quantity - Passenger: Not Applicable

IATA-packing instructions - Cargo: 965 Section IB

IATA-max. quantity - Cargo: Not Applicable

14.5. Environmental hazards

ENVIRONMENTALLY HAZARDOUS: No

14.6. Special precautions for user

Lithium ion batteries must be of a type proved to meet the requirements of each test in the UN Manual of Tests and Criteria, Part III, sub-section 38.3. Cell watt-hour rating does not exceed 20 Wh (5,12 Wh). Battery watt-hour rating does not exceed 100 Wh. Compliant with IMDG CODE (Amdt. 40-20) 2020 special provision 188. May be transported as Non-restricted Good under applicable conditions. Packaging must prevent short circuit and mechanical damage. Protect against: Heat, Condensation, Humidity. Handle with care - avoid bumps, friction and impact.

14.7. Maritime transport in bulk according to IMO instruments

not applicable

SECTION 15: Regulatory information

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

EU regulatory information

Restrictions on use (REACH, annex XVII):

Entry 27, Entry 40, Entry 75

Information according to Directive 2012/18/EU (SEVESO III): Not subject to 2012/18/EU (SEVESO III)

Marketing and use of explosives precursors (Regulation (EU) 2019/1148):

This product is regulated by Regulation (EU) 2019/1148: all suspicious transactions, and significant disappearances and thefts should be reported to the relevant national contact point.

Additional information

There is no requirement for the product to be specially labelled according to EC directives or the corresponding national laws.

National regulatory information

Water hazard class (D): 2 - obviously hazardous to water

Additional information

Observe in addition any national regulations!

15.2. Chemical safety assessment

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



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SECTION 16: Other information

Abbreviations and acronyms

Water-react: Substance and mixture which, in contact with water, emits flammable gas
Flam. Sol: Flammable solid
Acute Tox: Acute toxicity
Skin Corr: Skin corrosion
Eye Dam: Eye damage
Skin Sens: Skin sensitisation
Carc: Carcinogenicity
STOT RE: Specific target organ toxicity - repeated exposure
Aquatic Acute: Acute aquatic hazard
Aquatic Chronic: Chronic aquatic hazard
CLP: Classification, labelling and Packaging
REACH: Registration, Evaluation and Authorization of Chemicals
GHS: Globally Harmonised System of Classification, Labelling and Packaging of Chemicals
UN: United Nations
CAS: Chemical Abstracts Service
M-Factor: Multiplication Factor
DNEL: Derived No Effect Level
DMEL: Derived Minimal Effect Level
PNEC: Predicted No Effect Concentration
ATE: Acute toxicity estimate
LC50: Lethal concentration, 50%
LD50: Lethal dose, 50%
LL50: Lethal loading, 50%
EL50: Effect loading, 50%
EC50: Effective Concentration 50%
ErC50: Effective Concentration 50%, growth rate
NOEC: No Observed Effect Concentration
BCF: Bio-concentration factor
PBT: persistent, bioaccumulative, toxic
vPvB: very persistent, very bioaccumulative
ADR: Accord européen sur le transport des marchandises dangereuses par Route
RID: Regulations concerning the international carriage of dangerous goods by rail
ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
IMDG: International Maritime Code for Dangerous Goods
EmS: Emergency Schedules
MFAG: Medical First Aid Guide
IATA: International Air Transport Association
ICAO: International Civil Aviation Organization
TI: Technical Instructions
DGR: Dangerous Goods Regulations
MARPOL: International Convention for the Prevention of Marine Pollution from Ships
IBC: Intermediate Bulk Container
VOC: Volatile Organic Compounds
EG or EC: European Community
IE: Industrial Emissions
SVHC: Substance of Very High Concern

Key literature references and sources for data

For abbreviations and acronyms, see: ECHA Guidance on information requirements and chemical safety assessment, chapter R.20 (Table of terms and abbreviations). (v.1.2, 2013)

Classification for mixtures and used evaluation method according to Regulation (EC) No 1272/2008 [CLP]

Classification	Classification procedure
Acute Tox. 3; H301	Calculation method



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Acute Tox. 3; H311	Calculation method
Acute Tox. 3; H331	Calculation method
Skin Corr. 1A; H314	Calculation method
Eye Dam. 1; H318	Calculation method
Skin Sens. 1; H317	Calculation method
Carc. 2; H351	Calculation method
STOT RE 1; H372	Calculation method

Relevant H and EUH statements (number and full text)

H301	Toxic if swallowed.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H318	Causes serious eye damage.
H351	Suspected of causing cancer.
H372	Causes damage to organs through prolonged or repeated exposure.
H373	May cause damage to organs through prolonged or repeated exposure.
H400	Very toxic to aquatic life.
H412	Harmful to aquatic life with long lasting effects.

Further Information

The information is based on the present level of our knowledge. It does not, however, give assurance of product properties and establishes no contract legal rights. The receiver of our product is singularly responsible for adhering to existing laws and regulations.

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