Safety Data Sheet

According to 1907/2006 article 31 as amended

Calcium carbide

Version number: GHS 2.1 Revision: 2020-01-07

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

1.1 Product identifier

Identification of the substance	**Calcium carbide – Norm vial – Carbide vial**
Registration number (REACH)	01-2119494719-18-0000
EC number	200-848-3
Index number in CLP Annex VI	006-004-00-9
CAS number	75-20-7
Product-ID:	120010, 120011, 120012 and 120020

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

Relevant identified uses	Laboratory and analytical use – Moisture measurement using the Carbide Method

1.3 Details of the supplier of the safety data sheet

Dr. Radtke CPM Chemical-Physical Measuring techniques Ltd.
Laettichstreet 4a
6340 Baar / Schweiz

National contact	+41 41 710 00 32 This number is only available during the following office hours. Mo - Fri 08:00 AM - 4:00 PM e-mail: info@cpm-radtke.com

1.4 Emergency telephone number

Poison centre

Country	Name	Postal code/city	Telephone
United Kingdom	Guy's & St Thomas' Poisons Unit	London	0870 243 2241
United Kingdom	National Poisons Information Service (Belfast Centre)	Belfast	0870 600 6266 (UK only)
United Kingdom	National Poisons Information Service (Cardiff Centre)	Cardiff	0870 600 6266 (UK only)
United Kingdom	Scottish Poisons Information Bureau	Edinburgh	0870 600 6266 (UK only)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

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

Section	Hazard class	Cat-egory	Hazard class and category	Hazard state-ment
2.12	substance and mixture which, in contact with water, emits flammable gas	2	Water-react. 2	H260
3.2	skin corrosion/irritation	2	Skin Irrit. 2	H315
3.3	serious eye damage/eye irritation	1	Eye Dam. 1	H318
3.8R	specific target organ toxicity - single exposure (respiratory tract irritation)	3	STOT SE 3	H335

For full text of abbreviations: see SECTION 16.

The most important adverse physicochemical, human health and environmental effects:
In contact with water releases flammable gases which may ignite spontaneously.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 (CLP)

- Signal word **danger**
- Pictograms

GHS02, GHS05, GHS07

- Hazard statements

H260	In contact with water releases flammable gases which may ignite spontaneously.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H335	May cause respiratory irritation.

- Precautionary statements

P223	Do not allow contact with water.
P231+P232	Handle and store contents under inert gas/.... Protect from moisture.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P302+P352	IF ON SKIN: Wash with plenty of water.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P370+P378	In case of fire: Use powder extinguisher to extinguish.
P402+P404	Store in a dry place. Store in a closed container.
P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

2.3 Other hazards

Results of PBT and vPvB assessment

According to the results of its assessment, this substance is not a PBT or a vPvB.

SECTION 3: Composition/information on ingredients

3.1 Substances

Name of substance	Calcium carbide – Norm vial – Carbide vial
Identifiers	
REACH Reg. No	01-2119494719-18-0000
CAS No	75-20-7
EC No	200-848-3
Index No	006-004-00-9

SECTION 4: First aid measures

4.1 Description of first aid measures

General notes

Do not leave affected person unattended. Remove victim out of the danger area. Keep affected person warm, still and covered. Take off immediately all contaminated clothing. In all cases of doubt, or when symptoms persist, seek medical advice. In case of unconsciousness place person in the recovery position. Never give anything by mouth.

Following inhalation

Provide fresh air. In all cases of doubt, or when symptoms persist, seek medical advice. If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions. In case of respiratory tract irritation, consult a physician.

Following skin contact

Brush off loose particles from skin. Rinse skin with water/shower. Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice/attention.

Following eye contact

Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart. Remove contact lenses, if present and easy to do. Continue rinsing. Call a physician immediately.

Following ingestion

Do NOT induce vomiting. Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms and effects are not known to date.

4.3 Indication of any immediate medical attention and special treatment needed

After inhalation check for liquid in the lung.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media

D-Powder, Dry sand

Unsuitable extinguishing media

Water jet, Foam, Carbon dioxide (CO2)

5.2 Special hazards arising from the substance or mixture

On contact with water highly flammable and explosive acetylene is generated.

Hazardous combustion products

Carbon monoxide (CO), Carbon dioxide (CO2)

5.1 Advice for firefighters

In case of fire and/or explosion do not breathe fumes. Co-ordinate firefighting measures to the fire surroundings. Do not allow firefighting water to enter drains or water courses. Collect contaminated firefighting water separately.
Fight fire with normal precautions from a reasonable distance.

Special protective equipment for firefighters

Chemical protective clothing, Wear self-contained breathing apparatus

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Remove persons to safety. Provision of sufficient ventilation. Wearing of suitable protective equipment (including personal protective equipment referred to under Section 8 of the safety data sheet) to prevent any contamination of skin, eyes and personal clothing. Removal of ignition sources.

For emergency responders

Wear breathing apparatus if exposed to vapours/dust/spray/gases.

6.2 Environmental precautions

Keep away from drains, surface and ground water. Retain contaminated washing water and dispose of it.

6.3 Methods and material for containment and cleaning up

Advices on how to contain a spill

Covering of drains, Take up mechanically

Advices on how to clean up a spill

Take up mechanically.

Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materi- als: see section 10. Disposal considerations: see section 13.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Recommendations

- Measures to prevent fire as well as aerosol and dust generation

Keep container tightly closed. Use local and general ventilation. Take precautionary measures against static dis- charge. Use only in well-ventilated areas.

- Specific notes/details

Dust deposits may accumulate on all deposition surfaces in a technical room.

Handling of incompatible substances or mixtures

- Keep away from

Acids, Water, Store separately from oxidising and spontaneously flammable substances.

Advice on general occupational hygiene

Take off immediately all contaminated clothing. Wash hands after use. Do not eat, drink and smoke in work areas. Remove contaminated clothing and protective equipment before entering eating areas. Never keep food or drink in the vicinity of chemicals. Never place chemicals in containers that are normally used for food or drink. Keep away from food, drink and animal feedingstuffs. Do not breathe gas/vapour/spray. Avoid contact with skin and eyes.

7.2 Conditions for safe storage, including any incompatibilities

Managing of associated risks

- Explosive atmospheres
  Removal of dust deposits.
- Incompatible substances or mixtures
  Do not allow contact with water.
- Do not mix with
  Acids, Caustic solutions, Alcohols, Water
- Evaporative conditions
  Keep container tightly closed and in a well-ventilated place.

Control of effects

Protect against external exposure, such as
Humidity

- Ventilation requirements
  Use local and general ventilation.
- Packaging compatibilities
  Only packagings which are approved (e.g. acc. to ADR) may be used.

7.3 Specific end use(s)

See section 16 for a general overview.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limit values (Workplace Exposure Limits)

Country	Name of agent	CAS No	Identifier	TWA [ppm]	TWA [mg/m³]	STEL [ppm]	STEL [mg/m³]	Source
GB	dust		WEL		10			EH40/2005
GB	dust		WEL		4			EH40/2005

Notation

STEL	short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period (unless otherwise specified)
TWA	time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hour's time-weighted average (unless otherwise specified)

8.2 Exposure controls

Appropriate engineering controls
General ventilation.

Individual protection measures (personal protective equipment)

Eye/face protection
Use safety goggle with side protection.

Skin protection

- Hand protection
  Chemical protection gloves are suitable, which are tested according to EN 374. Check leak-tightness/impermeability prior to use. In the case of wanting to use the gloves again, clean them before taking off and air them well. For special purposes, it

is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

- Type of material

NBR: acrylonitrile-butadiene rubber

- Other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended. Wash hands thoroughly after handling.

Respiratory protection

In case of dust formation: respiratory protection. Particulate filter device (EN 143).

Environmental exposure controls

Use appropriate container to avoid environmental contamination. Keep away from drains, surface and ground water.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties Appearance

Physical state	solid
Colour	dark grey
Odour	characteristic

Other safety parameters

pH (value)	not applicable
Melting point/freezing point	2,160 °C
Initial boiling point and boiling range	2,300 °C
Flash point	not applicable
Evaporation rate	not determined
Flammability (solid, gas)	substance which, in contact with water, emits flammable gases (in accordance with GHS criter- ia)
Explosion limits of dust clouds	not determined
Vapour pressure	not determined
Density	2.22 $^{g}/_{cm^3}$
Vapour density	this information is not available
Solubility(ies)	not determined
- Water solubility	material hydrolyses (half-life < 12 hours)

Partition coefficient

- n-octanol/water (log KOW)	this information is not available
Auto-ignition temperature	not determined
Viscosity	not relevant (solid matter)
Explosive properties	none
Oxidising properties	none

9.2 Other Information

There is no additional information

SECTION 10: Stability and reactivity

10.1 Reactivity

Concerning incompatibility: see below "Conditions to avoid" and "Incompatible materials". It's a reactive substance. The mixture contains reactive substance(s). Reactivity with water.

10.2 Chemical stability

See below "Conditions to avoid".

10.3 Possibility of hazardous reactions

On contact with water highly flammable and explosive acetylene is generated.

10.4 Conditions to avoid

Protect from moisture. Store separately from oxidising and spontaneously flammable substances.

10.5 Incompatible materials

Water, Acids, Bases, Oxidisers, Silver, Copper

Release of flammable materials with water

10.6 Hazardous decomposition products

Reasonably anticipated hazardous decomposition products produced as a result of use, storage, spill and heating are not known. Hazardous combustion products: see section 5.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Classification according to GHS (1272/2008/EC, CLP)

Acute toxicity

Shall not be classified as acutely toxic.

GHS of the United Nations, annex 4: May be harmful if swallowed or in contact with skin.

Acute toxicity

Exposure route	Endpoint	Value	Species	Notes
oral	LD50	>2,000 $^{mg}/_{kg}$	rat	
dermal	LD50	>2,500 $^{mg}/_{kg}$	rabbit	

Skin corrosion/irritation

Causes skin irritation.

Serious eye damage/eye irritation

Causes serious eye damage.

Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

Germ cell mutagenicity

Shall not be classified as germ cell mutagenic.

Carcinogenicity

Shall not be classified as carcinogenic.

Reproductive toxicity

Shall not be classified as a reproductive toxicant.

Specific target organ toxicity - single exposure

May cause respiratory irritation.

Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

Aspiration hazard

Shall not be classified as presenting an aspiration hazard.

SECTION 12: Ecological information

12.1 Toxicity

Shall not be classified as hazardous to the aquatic environment.

Aquatic toxicity (acute)

Endpoint	Value	Species	Exposure time
LC50	>50 mg/l	fish	96 h
EC50	4.62 mg/l	aquatic invertebrates	48 h
ErC50	46 mg/l	algae	72 h
LOEC	>50 mg/l	fish	96 h
NOEC	50 mg/l	fish	96 h
growth rate (ErCx) 10%	12 mg/l	algae	72 h
growth (EbCx) 10%	2.7 mg/l	algae	72 h

12.1 Persistence and degradability

Data are not available.

12.2 Bioaccumulative potential

Data are not available.

12.3 Mobility in soil

Data are not available.

12.4 Results of PBT and vPvB assessment

Data are not available.

12.5 Other adverse effects

Endocrine disrupting potential

Not listed.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

This material and its container must be disposed of as hazardous waste.

Waste treatment-relevant information

Recycling/reclamation of other inorganic materials.

Sewage disposal-relevant information

Do not empty into drains. Avoid release to the environment. Refer to special instructions/safety data sheets.

Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used. Completely emptied packages can be recycled. Handle contaminated packages in the same way as the substance itself.

Relevant provisions relating to waste

List of wastes

Disposal code numbers according to the European Waste Catalogue are defined according to origin of the waste. As this product is used in several branches of industry, no disposal code number can be specified by the manufacturer. The waste code number must be determined in consultation with the disposal company or the competent authority.

Remarks

Please consider the relevant national or regional provisions. Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities.

SECTION 14: Transport information

14.1	**UN number**	1402
14.2	**UN proper shipping name**	CALCIUM CARBIDE
14.3	**Transport hazard class(es)**	
	Class	4.3 (substances which, in contact with water, emit flammable gases)
14.4	**Packing group**	II (substance presenting danger)
14.5	**Environmental hazards**	non-environmentally hazardous acc. to the dangerous goods regulations

14.6 Special precautions for user

Provisions for dangerous goods (ADR) should be complied within the premises.

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

The cargo is not intended to be carried in bulk.

Information for each of the UN Model Regulations

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN)

UN number	1402
Proper shipping name	CALCIUM CARBIDE
- Particulars in the transport document	UN1402, CALCIUM CARBIDE, 4.3, II,
(B/E) Class	4.3
Classification code	W2
Packing group	II
Danger label(s)	4.3

Excepted quantities (EQ)	E2
Limited quantities (LQ)	500gr/30kg
Transport category (TC)	2
Tunnel restriction code (TRC)	B/E
Hazard identification No	X423

International Maritime Dangerous Goods Code (IMDG)

UN number	1402
Proper shipping name	CALCIUM CARBIDE
- Particulars in the shipper's declaration	UN1402, CALCIUM CARBIDE, 4.3, II
Class	4.3
Marine pollutant	-
Packing group	II
Danger label(s)	4.3

Special provisions (SP)	951
Excepted quantities (EQ)	E2
Limited quantities (LQ)	500gr/30kg
EmS	F-G, S-N
Stowage category	B

International Civil Aviation Organization (ICAO-IATA/DGR)

UN number	1402
Proper shipping name	Calcium carbide
- Particulars in the shipper's declaration	UN1402, Calcium carbide, 4.3, II
Class	4.3
Packing group	II
Danger label(s)	4.3

Excepted quantities (EQ)	E2

SECTION 15: Regulatory information

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

Relevant provisions of the European Union (EU)

Restrictions according to REACH, Annex XVII

Dangerous substances with restrictions (REACH, Annex XVII)

Name of substance	Name acc. to inventory	Restriction	No
Calcium carbide	this product meets the criteria for classification in accordance with Regulation No 1272/2008/EC	R3	3
Calcium carbide	flammable / pyrophoric	R40	40

Legend

R3 1. Shall not be used in:
- ornamental articles intended to produce light or colour effects by means of different phases, for example in ornamental lamps and ashtrays,
- tricks and jokes,
- games for one or more participants, or any article intended to be used as such, even with ornamental aspects,

2. Articles not complying with paragraph 1 shall not be placed on the market.

3. Shall not be placed on the market if they contain a colouring agent, unless required for fiscal reasons, or perfume, or both, if they:
- can be used as fuel in decorative oil lamps for supply to the general public, and,
- present an aspiration hazard and are labelled with R65 or H304,

4. Decorative oil lamps for supply to the general public shall not be placed on the market unless they conform to the European Standard on Decorative oil lamps (EN 14059) adopted by the European Committee for Standardisation (CEN).

5. Without prejudice to the implementation of other Community provisions relating to the classification, packaging and labelling of dangerous substances and mixtures, suppliers shall ensure, before the placing on the market, that the following requirements are met:

(a) lamp oils, labelled with R65 or H304, intended for supply to the general public are visibly, legibly and indelibly marked as follows: 'Keep lamps filled with this liquid out of the reach of children'; and, by 1 December 2010, 'Just a sip of lamp oil - or even sucking the wick of lamps - may lead to life-threatening lung damage';

(b) grill lighter fluids, labelled with R65 or H304, intended for supply to the general public are legibly and indelibly marked by 1 December 2010 as follows: 'Just a sip of grill lighter may lead to life threatening lung damage';

(c) lamp oils and grill lighters, labelled with R65 or H304, intended for supply to the general public are packaged in black opaque containers not exceeding 1 litre by 1 December 2010.

6. No later than 1 June 2014, the Commission shall request the European Chance with Article 69 of the present Regulation with a view to ban, if appropriate, grill lighter fluids and fuel for decorative lamps, labelled R65 or H304, intended for supply to the general public.

7. Natural or legal persons placing on the market for the first time lamp oils and grill lighter fluids, labelled with R65 or H304, shall by 1 December 2011, and annually thereafter, provide data on alternatives to lamp oils and grill lighter fluids labelled R65 or H304 to the competent authority in the Member State concerned. Member States shall make those data available to the Commission.

Legend

R40 1. Shall not be used,
as substance or as mixtures in aerosol dispensers where these aerosol dispensers are intended for supply to the general public for entertainment and decorative purposes such as the following:
- metallic glitter intended mainly for decoration,
- artificial snow and frost,'whoopee' cushions,
- silly string aerosols,
- imitation excrement,
- horns for parties,
- decorative flakes and foams,
- artificial cobwebs,
- stink bombs.

2. Without prejudice to the application of other Community provisions on the classification, packaging and labelling of substances, suppliers shall ensure before the placing on the market that the packaging of aerosol dispensers referred to above is marked visibly, legibly and indelibly with:
'For professional users only'.

3. By way of derogation, paragraphs 1 and 2 shall not apply to the aerosol dispensers referred to Article 8 (1a) of Council Directive 75/324/EEC (2).

4. The aerosol dispensers referred to in paragraphs 1 and 2 shall not be placed on the market unless they conform to the requirements indicated.

List of substances subject to authorisation (REACH, Annex XIV) / SVHC - candidate list

not listed

Seveso Directive

2012/18/EU (Seveso III)

No	Dangerous substance/hazard categories	Qualifying quantity (tonnes) for the application of lower and upper-tier requirements		Notes
O2	other hazards (Water-react., cat. 1)	100	500	59)

Notation

59) substances and mixtures which in contact with water emit flammable gases, category 1

Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) - Annex II

not listed

Regulation 166/2006/EC concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)

not listed

Directive 2000/60/EC establishing a framework for Community action in the field of water policy (WFD)

not listed

Regulation 98/2013/EU on the marketing and use of explosives precursors

not listed

Regulation 111/2005/EC laying down rules for the monitoring of trade between the Community and third countries in drug precursors

not listed

Country	Inventory	Status
EU	REACH Reg.	substance is listed
AU	AICS	substance is listed
CA	DSL	substance is listed
CN	IECSC	substance is listed
EU	ECSI	substance is listed
JP	CSCL-ENCS	substance is listed
KR	KECI	substance is listed
MX	INSQ	substance is listed
NZ	NZIoC	substance is listed
PH	PICCS	substance is listed
TR	CICR	substance is listed
TW	TCSI	substance is listed
US	TSCA	substance is listed

Legend

AICS	Australian Inventory of Chemical Substances
CICR	Chemical Inventory and Control Regulation
CSCL-ENCS	List of Existing and New Chemical Substances (CSCL-ENCS)
DSL	Domestic Substances List (DSL)
ECSI	EC Substance Inventory (EINECS, ELINCS, NLP)
IECSC	Inventory of Existing Chemical Substances Produced or Imported in China
INSQ	National Inventory of Chemical Substances
KECI	Korea Existing Chemicals Inventory
NZIoC	New Zealand Inventory of Chemicals
PICCS	Philippine Inventory of Chemicals and Chemical Substances
REACH Reg.	REACH registered substances
TCSI	Taiwan Chemical Substance Inventory
TSCA	Toxic Substance Control Act

15.2 Chemical Safety Assessment

For this substance a chemical safety assessment has been carried out.

SECTION 16: Other information

Indication of changes (revised safety data sheet)

Section	Former entry (text/value)	Actual entry (text/value)	Safety - relev- ant
1.1	Alternative name(s): Calcium acetylide		yes
5.2	Special hazards arising from the substance or mixture: Product may release hydrogen gas. Increased storage temperatures will accelerate this pro- cess. On contact with water highly flammable and explosive acetylene is generated.	Special hazards arising from the substance or mixture: On contact with water highly flammable and ex- plosive acetylene is generated.	yes

Abbreviations and acronyms

Abbr.	Descriptions of used abbreviations
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)
ADR	Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
DGR	Dangerous Goods Regulations (see IATA/DGR)
EC No	The EC Inventory (EINECS, ELINCS and the NLP-list) is the source for the seven-digit EC number, an identifier of substances commercially available within the EU (European Union)
EH40/2005	EH40/2005 Workplace exposure limits (http://www.nationalarchives.gov.uk/doc/open-government-li- cence/)
EINECS	European Inventory of Existing Commercial Chemical Substances
ELINCS	European List of Notified Chemical Substances
EmS	Emergency Schedule
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations
IATA	International Air Transport Association
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)
ICAO	International Civil Aviation Organization
IMDG	International Maritime Dangerous Goods Code
index No	The Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No1272/2008
MARPOL	International Convention for the Prevention of Pollution from Ships (abbr. of "Marine Pollutant")
NLP	No-Longer Polymer
PBT	Persistent, Bioaccumulative and Toxic
ppm	Parts per million
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)
STEL	Short-term exposure limit
SVHC	Substance of Very High Concern

Abbr.	Descriptions of used abbreviations
TWA	Time-weighted average
vPvB	Very Persistent and very Bioaccumulative
WEL	Workplace exposure limit

Key literature references and sources for data

Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures. Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU.

Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN). International Maritime Dangerous Goods Code (IMDG). Dangerous Goods Regulations (DGR) for the air transport (IATA).

List of relevant phrases (code and full text as stated in chapter 2 and 3)

Code	Text
H260	In contact with water releases flammable gases which may ignite spontaneously.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H335	May cause respiratory irritation.

Disclaimer

This information is based upon the present state of our knowledge. This SDS has been compiled and is solely intended for this product.

9 EXPOSURE ASSESSMENT

Exposure scenarios are presented for the production of calcium carbide and the two identified uses described in Section 2:

A) Use of calcium carbide in the production of acetylene and calcium cyanide.

B) Use of calcium carbide in metallurgy.

Any tonnages discussed in this document are generic and should not be taken as relating to any specific site. The scenarios and releases described in this chapter are written in accordance with the REACH Guidance and are taken mainly from or based on the following sources:

- Reference Document on Best Available Techniques (BAT) for the Manufacture of Large Volume Inorganic Chemicals.
- Information provided by calcium carbide consortium members.
- Site visits to a calcium carbide production plant and industries making use of calcium carbide.

The uses and relevant descriptor codes for each identified exposure scenario are summarised in Table 9.1.

Exposure Scenario 1 describes the production of calcium carbide.
Exposure Scenario 2 describes the milling/formulation of calcium carbide products.
Exposure Scenario 3 describes the industrial use of calcium carbide as a process material or intermediate in the production of acetylene and calcium cyanide.
Exposure Scenario 4 describes use of calcium carbide in metallurgy (use as a blast furnace hot metal desulfuriser, use as a foundry iron desulfuriser and use during steelmaking).
Exposure Scenario 5 describes use of calcium carbide in Carbide Lamps.
Exposure Scenario 6 describes use of calcium carbide in Carbide welding.
Exposure Scenario 7 describes use of calcium carbide in humidity analyzers.

It should be noted that all concentrations in the soil compartment are upper limits; the significance of this is discussed in Section 10.7.3

No calculation of regional releases is required, for reasons explained in Section 9.8.

Table 9.1, Exposure scenario and coverage of substance life cycle

ES- number	Volume (tonnes)	Manufacture	Identified uses			Resulting life cycle		Linked to Identified Use	Sector of Use (SU)	Preparation Category (PC)	Process category	Article category
			Formulation	End user	Consumer	Service life (articles)	Waste sta					
ES 7	Confidential			X				Calcium carbide in humidity analyzers	SU 24, 19	PC 19	PROC 3	N/A

9.7 Calcium carbide in humidity analyzers (ES7)

9.7.1 Exposure scenario

This exposure scenario is valid for professionals.

9.7.1.1 Description of activities and processes covered in the exposure scenario

Granules of Ca-carbide, welded in a glass tube, are put into a container of the analyzer. The article to be analysed is added together with steal balls. The container is closed and the content is mixed. The humidity of the article reacts with Ca-carbide and generates acetylene, which increases the pressure inside the container. The pressure is a measure of the humidity of the article.

9.7.1.2 Operational conditions related to frequency, duration and amount of use

Duration, frequency and amount

Information type	Data field	Explanation
Used amount of substance (as such) per worker per day	ca. 0.07 kg/d	Typical data.
Duration of exposure per day	<1 h/day	Duration of the filling procedure, afterwards the container in the device is closed. Ca-carbide is welded in glass tubes.
Frequency of exposure	10 /day	
Annual amount used per site	ca. 0.7 kg/y	
Emission days per site	ca. 100 d/y	

9.7.1.3 Operational conditions and risk management measures related to product characteristics

Characteristics of the substance

Information type	Data field	Explanation
Physical state	solids	
For solids: Categorisation of dust grades	Low	Granules of 0.3 to 1 mm diameters are used.
Concentration of substance in preparation	-	Substance is used as such.
Concentration after dilution for use (if relevant)	-	Substance is used as such.
Risk management measures related to the design of product		Granules of 0.3 to 1 mm diameters are used.

9.7.1.4 Operational conditions related to available dilution capacity and characteristics of exposed humans

Default data as in CHESAR are used.

9.7.1.5 Other operational conditions of use

Technical fate of substance and losses from process, waste water and air

Information type	Data field	Explanation
Fraction consumed in process/use	100 %	

9.7.1.6 Risk management measures

Risk management measures for wide dispersive use

Information type	Data field	Explanation
Personal protective equipment (PPE)		
Gloves	-	Gloves are recommended but, based on experience, are not required.

9.7.1.7 Waste related measures

Fractions of substance in waste and waste management measures

Information type	Data field	Explanation
Amount of substances in waste resulting from identified uses covered in the exposure scenario	0 kg/y	The substance is consumed during the process. Residual amounts are reacted with water.

9.7.2 Exposure estimation

9.7.2.1 Workers exposure

9.7.2.1.1 Acute/Short term exposure

Acute exposure concentrations to workers

Routes of exposure	Estimated Exposure Concentrations		Measured exposure concentrations		Explanation / source of measured data
	value	unit	Value	unit	
Dermal exposure	0.1	mg/cm^2	-		Data estimated by TRA for workers, based on dust, which is not present, as the substance is used in granular form and welded in glass tubes.
	-	-	-		
Inhalation exposure	0.06	mg/m^3	-		Data estimated by TRA for workers, based on dust, which is not present, as the substance is used in granular form and welded in glass tubes.
	-	-	-		

Summary of acute exposure concentrations to workers

Routes of exposure	Concentrations	Justification
Dermal local exposure (in mg/cm2)	< 0.1mg/cm^2	Granules of 0.3 to 1 mm particle size are used, therefore no exposure to dust will occur. Only an accidentally dermal exposure, during the filling of the container, could occur. From experience it can be stated that no irritating effects were reported in the past when handling the devices by professionals or consumers.
Dermal systemic exposure (in mg/kg bw/d)	not relevant	No systemic but only local effects, if any, are expected due to the reactivity of Ca-carbide with water.
Inhalation exposure (in mg/m3)	< 0.06 mg/m^3	Granules of 0.3 to 1 mm particle size are used, therefore no exposure to dust will occur. The vapour pressure of Ca-carbide is extremely low, not leading to a relevant concentration in air.

9.7.2.1.2 Long-term exposure

The same data as for acute exposure are applied, as the relevant toxic effects are the local irritating effects.

9.7.2.2 Consumer exposure

The same data as for workers are applied as there are no different uses or operational conditions for consumers, compared to workers.
An oral exposure is not relevant, except in casualties.

9.7.2.3 Indirect exposure of humans via the environment (oral)

An indirect exposure of man via the environment can be excluded, as the substance rapidly decays in contact with water or humidity.

9.7.2.4 Environmental exposure

9.7.2.4.1 Environmental releases

Releases to the environment

Compartments	Predicted releases (kg/d)	Measured release (kg/d)	Explanation / source of measured data
Aquatic (without STP)	0	-	The substance decays within the device. No release is possible. Accidental spillage during filling the device is not relevant as the substance rapidly decays at the first contact with water.
		-	
Aquatic (after STP)	0	-	The substance decays within the device. No release is possible. Accidental spillage during filling the device is not relevant as the substance rapidly decays at the first contact with water.
Air (direct + STP)	0	-	The substance has an extremely low vapour pressure and no dust is produced in the device.
Soil (direct only)	0	-	The substance decays within the device. No release is possible. Accidental spillage during filling the device is not relevant as the substance rapidly decays at the first contact with water.

Summary of the releases to the environment

Compartments	Release from point source (kg/d) (local exposure estimation)	Total release for regional exposure estimation (kg/d)	Justification
Aquatic (without STP)	0	0	see above
Aquatic (after STP)	0	0	see above
Air (direct + STP)	0	0	see above
Soil (direct releases only)	0	0	see above

9.7.2.4.2 Exposure concentration in sewage treatment plants (STP) Not relevant, see above.

9.7.2.4.3 Exposure concentration in aquatic pelagic compartment

Not relevant, see above.

9.7.2.4.4 Exposure concentration in sediments

Not relevant, see above.

9.7.2.4.5 Exposure concentrations in soil and groundwater

Not relevant, see above.

9.7.2.4.6 Atmospheric compartment Not

relevant, see above.

9.7.2.4.7 Exposure concentration relevant for the food chain (Secondary poisoning)

Not relevant, see above.

9.8 Regional exposure concentrations

Regional concentrations cannot be added to the exposure scenario because there is no realistic way to assess regional exposure for inorganic substances. The standard models, e.g. EUSES 2.1.1 are parameterised for organic substances.
Furthermore, the ultimate degradation products in the environment are inorganic species already present in the environment at high concentration.

It is concluded that regional exposure assessment need not be performed.

10 RISK CHARACTERISATION

It should be noted that no combined assessment of exposure from the different scenarios is necessary.

10.7 Calcium carbide in humidity analyzers ES 7

10.7.1 Human health

10.7.1.1 Workers

Quantitative risk characterisation for workers

	Route	ES 5- exposure concentrations (EC)	Leading toxic end point / Critical effect	DN(M)EL	Risk characterisation ratio
Acute - systemic effects	Dermal	not required	N/A	Not relevant	-
	Inhalation	not required	N/A	Not relevant	-
Acute - local effects	Dermal	qualitative	irritation	Not quantifiable	-
	Inhalation	qualitative	irritation	10 mg/m3	-
	Combined routes	qualitative	irritation	Not quantifiable	-
Long-term - systemic effects	Dermal	0.343 mg/kg bw	N/A	Not relevant	-
	Inhalation	qualitative	N/A	Not relevant	-
	Combined routes	qualitative	N/A	Not relevant	-
Long-term – local effects	Dermal	0.1 mg/cm2	irritation	Not quantifiable	-
	Inhalation	0.06 mg/m3	irritation	10 mg/m3	0.006

Qualitative risk characterisation for workers

	Route	ES 5- exposure concentrations (EC)	Leading toxic end point / Critical effect	Qualitative risk characterisation
Acute - systemic effects	Dermal	not required	N/A	No systemic but only local effects, if any, are expected due to the reactivity of Ca-carbide with water.
	Inhalation	not required	N/A	No systemic but only local effects, if any, are expected due to the reactivity of Ca-carbide with water.

Acute - local effects	Dermal	qualitative	irritation	Granules of 0.3 to 1 mm particle size are used, therefore no exposure to dust will occur. The filling of the devices occur only in intervals, from estimated once daily to once monthly. Only accidentally a short contact with skin could occur during the filling of the device. Afterwards the device is closed. From experience it can be stated that no irritating effects were reported in the past when handling the devices by professionals or consumers. No additional measures to prevent release or exposure are required, but gloves are recommended during the filling procedure.
	Inhalation	qualitative	irritation	Granules of 0.3 to 1 mm particle size are used, therefore no exposure to dust will occur. The vapour pressure of Ca-carbide is extremely low, not leading to a relevant concentration in air. The risk is low and acceptable.
	Combined routes	qualitative	irritation	See the 2 lines above.
Long-term - systemic effects	Dermal	0.343 mg/kg bw	N/A	No systemic but only local effects, if any, are expected due to the reactivity of Ca-carbide with water.
	Inhalation	qualitative	N/A	No systemic but only local effects, if any, are expected due to the reactivity of Ca-carbide with water.
	Combined routes	qualitative	N/A	No systemic but only local effects, if any, are expected due to the reactivity of Ca-carbide with water.
Long-term – local effects	Dermal	0.1 mg/cm2	irritation	Granules of 0.3 to 1 mm particle size are used, therefore no exposure to dust will occur. The filling of the devices occur only in intervals, from estimated once daily to once monthly. Only accidentally a short contact with skin could occur during the filling of the device. Afterwards the device is closed. From experience it can be stated that no irritating effects were reported in the past when handling the devices by professionals or consumers. No additional measures to prevent release or exposure are required, but gloves are recommended during the filling procedure.
	Inhalation	0.06 mg/m3	Irritation	Quantitative, see above.

10.7.1.2 Consumers

The same risks as for workers, see previous chapter, are assumed, as there are no different uses or operational conditions for consumers, compared to workers.

An oral exposure is not relevant, except in casualties.

10.7.2 Indirect exposure of humans via the environment

An indirect exposure and a risk for man via the environment can be excluded, as the substance rapidly decays in contact with water or humidity.

10.7.3 Environment

10.7.3.1 Aquatic compartment (including sediment and secondary poisoning)

Risk characterisation for the aquatic compartment

Compartments	PEC	PNEC	PEC/PNEC	Discussion
Freshwater	not required	toxicity is unlikely	-	Calcium carbide is unlikely to have direct toxic effects on aquatic organisms. No exposure is expected because of the rapid decay of Ca-carbide when coming in contact with water.
Marine water	not required	toxicity is unlikely	-	Calcium carbide is unlikely to have direct toxic effects on aquatic organisms. No exposure is expected because of the rapid decay of Ca-carbide when coming in contact with water.
Sediment	qualitative	toxicity is unlikely	-	Calcium carbide is unlikely to have direct toxic effects on aquatic organisms. No exposure is expected because of the rapid decay of Ca-carbide when coming in contact with water.
Aquatic freshwater food chain	not required	toxicity is unlikely	-	Calcium carbide does not have potential to bioaccumulate.
Aquatic marine water food chain	not required	toxicity is unlikely	-	Calcium carbide does not have potential to bioaccumulate.

10.7.3.2 Terrestrial compartment (including secondary poisoning)

Risk characterisation for the terrestrial compartment

Compartments	PEC	PNEC	PEC/PNEC	Discussion
Agricultural soil	qualitative	toxicity is unlikely	-	It is unlikely that Ca-carbide could have toxic effects to terrestrial organisms. No exposure is expected because of the rapid decay of Ca-carbide when coming in contact with water or humidity.
Grassland	qualitative	toxicity is unlikely	-	It is unlikely that Ca-carbide could have toxic effects to terrestrial organisms. No exposure is expected because of the rapid decay of Ca-carbide when coming in contact with water or humidity.
Terrestrial food chain	not required	toxicity is unlikely	-	Calcium carbide does not have potential to bioaccumulate, and, therefore, secondary poisoning is not relevant.

10.7.3.3 Atmospheric compartment

It is unlikely that Ca-carbide could have toxic effects on birds. Ca-carbide is not volatile. No exposure is expected from dust because of the rapid decay of Ca-carbide when coming in contact with humidity.

10.7.3.4 Microbiological activity in sewage treatment systems

Compartments	PEC	PNEC	PEC/PNEC	Discussion
STP	not required	toxicity is unlikely	-	No exposure is expected because of the rapid decay of Ca-carbide when coming in contact with water.

10.8 Overall exposure (combined for all relevant emission/release sources)

It is unlikely that the 2 or 3 of the exposure scenarios take place at one site and/or are performed by the same person.