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Revision 4 Dated: 31/01/11

PRODUCT DATA SHEET: SODIUM CARBONATE GRANULAR (SOCAGR)

PRODUCT SPECIFICATION

Product Name	Sodium Carbonate Granular (Anhydrous)
Alternative Name	Soda Ash
Product Grade	
Specification Reference	SOCAGR/1 (07/07)

SALES SPECIFICATION

Chemical Composition	**Specification**	Typical Values
Total Alkalinity Na_2CO_3	99.30% min	99.7
Total Alkalinity Na_2O	58.10% min	58.3
Moisture (loss on heating)	0.30% max	0.11
Insolubles In Water @ 20°C	200 mg/kg max	100
Chloride NaCl	0.25% max	0.11
Sulphate Na_2SO_4	300 mg/kg max	100
Iron Fe_2O_3	30 mg/kg max	9
Fluoride F	15 mg/kg max	<5*
Arsenic As	1 mg/kg max	<0.1*
Cadmium Cd	1 mg/kg max	<0.5*
Chromium Cr	1 mg/kg max	<0.1*
Cobalt Co	1 mg/kg max	<0.1*
Copper Cu	1 mg/kg max	<0.1*
Lead Pb	1 mg/kg max	<0.5*
Manganese Mn	1 mg/kg max	<0.1*
Mercury Hg	1 mg/kg max	<0.1*
Nickel Ni	1 mg/kg max	<0.1*
Titanium Ti	1 mg/kg max	<0.2*
Vanadium V	1 mg/kg max	<0.1*
		*Actual level is below the limit of detection
Physical Properties		
Pouring Density kg/m^3	950 min – 1100 max	
Temperature	70°C max	

Particle Size	**% Max By Weight**	**Typical % By Weight**
Sieve Fraction (microns)		
>2800	0.5	Nil
1000 – 2800	5.0	1.9
425 – 1000		29.6
250 – 425		39.8
125 – 250		25.8
63 – 125	6.0	1.9
<63	3.0	1.0
Average Median Size (microns)		350 ± 50

NOTES

Exclusion of Liability

Information contained in this publication is accurate to the best of the knowledge and belief of Tennants.

Any information or advice obtained from Tennants otherwise than by means of this publication and whether relating to Tennants materials or other materials, is also given in good faith. However, it remains at all times the responsibility of the customer to ensure that Tennants materials are suitable for the particular purpose intended.

Tennants accepts no liability whatsoever (except as otherwise provided by law) arising out of the use of information supplied, the application, adaptation or processing of the products described herein, the use of other materials in lieu of Tennants materials or the use of Tennants materials in conjunction with such other materials.

Health and Safety

A Material Safety Data Sheet has been issued describing the health, safety and environmental properties of this product, identifying the potential hazards and giving advice on the handling precautions and emergency procedures. This must be consulted fully before handling, storage and use.

SAFETY DATA SHEET

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND COMPANY

1.1 Product Identifier

Chemical Name (EINECS)	Sodium carbonate
Product Name	SODIUM CARBONATE
Alternative Name	Disodium carbonate, soda ash
Chemical Formula	Na_2CO_3
Trade Names	
Synonyms	
CAS Number	497-19-8
EC Number	207-838-8
Index Number	011-005-00-2
REACH Registration Number	01-2119485498-19-XXXX

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

Glass production, intermediate in chemicals production, water treatment, chemicals, washing and cleaning products, other industrial, professional and consumer uses. Exposure scenarios covering uses can be found in the Annex.
Uses advised against – none identified.

1.3 Details of the supplier of the safety data sheet

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1.4 Emergency telephone number

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2. HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

2.1.1 Regulation 1272/2008 (CLP)

Eye irritant 2

2.1.2 EEC Directive 67/548/EEC & Directive 1999/45/EC

Irritating to eyes

2.2 Label elements

2.2.1 According to Regulation (EC) No. 1272/2008 (CLP).



Signal word : Warning

Hazard Statement

H319 - causes serious eye irritation

Precautionary statements.

P264 - Wash thoroughly after handling
P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection
P305 + P351 + P338 - If in eyes, rinse cautiously with water for several minutes, remove contact lenses and continue rinsing.
P337 + P313- Get medical advice/attention.



Symbol- Xi – irritant
Risk Phrases :
R36- Irritating to eyes
Safety Phrases :

S2 - Keep out of the reach of children
S22 - Do not breathe dust
S24 – Avoid contact with skin

2.3 Other hazards
The substance does not meet the criteria for a PBT or vPvB substance according to Annex XIII of the REACH Regulation EC1907/2006 (an inorganic substance)
No other hazards identified.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances Sodium Carbonate
-

CAS Number	Formula	REACH registration number	ECC Index Number	Classification according to Directive 67/548/EEC	Wt. Percent Content
497-19-8	Na_2CO_3	01-2119485498-19-XXXX	207-838-8		>99.0

Impurities
No impurities relevant for classification and labelling
See section 16 for the full text of the R, H- and EUH-phrases declared above
Occupational exposure limits, if available, are listed in section 8

4. FIRST AID MEASURES

4.1 Description of first aid measures

General Advice
No Known delayed effects

Following inhalation
Remove to fresh air and keep warm and at rest.
If symptoms persist consult medical attention.

Following skin contact
Wash skin with soap and water
Remove contaminated clothing and wash before re-use.
If symptoms persist consult medical attention.

Following eye contact
Remove contact lenses if worn
Irrigate eye thoroughly with eye wash solution or clean for at least 15 minutes, Eyelids should be held away from the eyeball to ensure thorough rinsing.
If eye irritation persists seek medical attention.

After ingestion
Do not induce vomiting.
Obtain medical advice if necessary.
Wash out mouth and give plenty of water to drink (at least 300 ml)

5. FIRE FIGHTING MEASURES

5.1 Extinguishing Media
Suitable extinguishing media:
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
None unsuitable media.

5.2 Special hazards arising from the substance or mixture
None

5.3 Advice for fire-fighters
No special precautions required

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions,
For non emergency personnel
Keep dust limits to a minimum
Wear suitable protective equipment (see section 8)

6.2 Environmental precautions
Parent uncontrolled discharges in the environment (rivers, water courses, sewers etc)
Avoid any mixture with an acid into sewer/ drains (co^2 gas formation)

6.3 Methods and material for containment and cleaning up
In all cases avoid dust formation, use vacuum suction, or shovel into bags
Collect as much as possible in a suitable clean container, preferably for re-use, otherwise for disposal (see section 13)

6.4 Reference to other sections
For more information on exposure controls/ personal protection or disposal, considerations, please see section 8 and 13

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

Keep dust limits to a minimum, minimize dust generation.
Ensure adequate ventilation
Wear protective equipment (see section 8.2). Keep away from incompatible materials.

7.1.2 Advice on general occupational hygiene
Good personal and housekeeping practises
No drinking, eating and smoking at the workplace.

7.2 Conditions for safe storage, including any incompatibilities
Requirements for storage: store in a cool dry place
Store in original, closed and correctly labelled container. Store away from incompatible materials

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters
Occupational exposure limits
Not listed by H&SE (guidance note EH40) or ACGIH.
Recommended limits : 10 mg/m^3 (total dust) (8hr TWA)
4 mg/m^3 (respirable dust) (8hr TWA)

DNEL's/PNEC

Exposure route of relevance	DNEL's (local effects) Workers Long term
Inhalation	10 mg/m^3

PNEC
The lowest L(E)C_{50} value is > 100mg/l (48-h EC_{50} is 200 mg/l in daphnids (ceriodaphnia sp)). Therefore Sodium Carbonate need not be classified according to Directive 67/548/EEC and EU classification, labelling and packaging of substances and mixtures (CLP) Regulation (EC) no. 1272/2008

8.2 Exposure controls

Appropriate engineering controls
Provide appropriate exhaust ventilation at places where dust is formed.
Apply technical measures to comply with the occupational exposure limits.

Respiratory protection
In the case of high dust levels wear suitable respiratory protective equipment e.g. Dust mask or respirator, that conform to national/ international standard, EN143. Recommended filter tpe P2

Hand protection
Wear suitable chemical resistant gloves that comply with the specification of EC Directive 89/686/EEC and the related standard EN374. Suitable materials, Neoprene or natural rubber.

Eye/ face protection
Wear eye/face protection rated to protect eyes against dust (EN166) e.g. safety eye shield with dust protection, goggles or face visor.

Environmental exposure controls
Contain any spillage
Avoid discharges to the environment
Dispose of any rinse water in accordance with local and national regulations.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance	White Powder
Colour	
Odour	Odourless
pH	>11 (Saturated solution, study result, OECD guideline105)
Melting point	851°c (published data)
Boiling point/boiling range	Not applicable (melting point >300°c)
Flash point	Not applicable (Inorganic substance)
Evaporation rate	Not applicable (melting point >300°c)
Flammability	Non-flammable (study results, EU method A.3)
Upper flammability limit	Non-flammable
Lower flammability limit	Non-flammable
Vapour pressure	Not applicable (inorganic substance, vapour pressure negligible
Vapour Density	Not applicable
Relative Density	2.52 @ 20°c (study result EU Method A.3)
Water Solubility	212.5g/l @ 20°c (study result OECD Guideline 105)

Partition coefficient	Not applicable (inorganic substance)
Auto-ignition temperature	Non-flammable
Decomposition temperature	No information available
Viscosity	Not applicable (solid)
Explosive properties	Non-explosive (void of chemical groups associated with explosive properties
Oxidising properties	Non -oxidising (based on the chemical structure of the substance and oxidation states of the constituent elements.

10. STABILITY AND REACTIVITY

10.1 Reactivity
Decomposes by reaction with strong acids to evolve carbon dioxide.

10.2 Chemical stability
Stable under recommended storage conditions (see section 7)

10.3 Possibility of hazardous reactions
None

10.4 Conditions to avoid
Contact with acids unless under controlled conditions
Exposure to moisture

10.5 Incompatible materials
Finely divided aluminium

10.6 Hazardous decomposition products
None

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects
Components:

Acute Toxicity

Oral	LD_{50} rat	2800mg/kg bw	
Dermal	LD_{50} rabbit	>2000mg/kg	Method: EPA 16 CFR 1500.40bw
Inhalation rat	LC_{50} rat	2300mg/kg	Method : based on OECD Guideline 403

Values exceed the cut off limit of 2000mg/kg established by EU Directive 67/548/EEC and EU classification, labelling and packaging of substances and mixtures (CLP) Regulation (EC) No. 1272/2008

Classification for acute toxicity: is not warranted

Skin Corrosion/Irritation

Eye irritation	irritating	Method: OECD Guideline 405
Skin irritation	not irritating	Method: OECD Guideline 404
Respiratory irritation	not irritating	Based on available data

Classification for eye irritancy	Xi, R36 (irritating to eyes) according to directive 67/548/EEC Category 2, H319 (causes serious eye irritation) According to CLP Regulation (EC) 127/2008
Classification for skin irritancy	is not warranted
Classification for Respiratory irritancy	is not warranted

Sensitisation
No data available on the sensitisation of sodium carbonate.
Sodium carbonate is considered not to have any sensitising properties, based on the physiological role of both its constituent ions and its long-term historical and wide dispersive use in individual processes and consumer products.
Classification for sensitisation: is not warranted.

Repeated dose toxicity

Oral:	Sodium carbonate dissociates into ions that are present physiologically in relatively high levels in vertebrates. Therefore, repeated dose toxicity studies are considered (Scientifically) unnecessary, in accordance with column 2 of REACH Annex VIII and IX. Furthermore, Sodium Carbonate is used as a food additive, which confirms that the substance has a low repeated dose toxicity.
Dermal :	Sodium carbonate dissociates into ions that are present physiologically in relatively high levels in vertebrates. Therefore, repeated dose toxicity studies are considered (scientifically) unnecessary, in accordance with column 2 of REACH Annex VIII and IX.

Inhalation :	Sodium carbonate dissociates into ions that are present, physiologically in relatively high levels in vertebrates. Therefore, repeated dose toxicity studies are considered (scientifically) not necessary, In accordance with column 2 of REACH Annex VIII and IX.

Classification for repeated dose toxicity : is not warranted

Mutagenicity:	In vitro- the available in vitrotests (SOS chromotest with sodium carbonate and Ames test with sodium bicarbonate) were negative. Furthermore sodium bicarbonate is naturally present in cells and both the structure of sodium bicarbonate and sodium carbonate do not indicate a genotoxic potential. Therefore, there is no reason to evaluate the potential Gentoxicity of sodium carbonate further and no genotoxic effects are expected.
Carcinogenicity:	No date available for carcinogenicity of sodium carbonate. Although the substance has a wide and varied use, there are no indications that it can induce hyperplasia, pre-neoplastic lesions or is mutagenic. Therefore a carcinogenicity study is considered unnecessary.

Classification for carcinogenicity is not warranted

Reproductive toxicity

Fertility:	No data available
Developmental Toxicity:	In accordance with section 1 of REACH Annex XI, testing does not appear Scientifically necessary, as the substance will usually not reach the foetus or the male and female reproductive organs when exposed orally, dermally or by inhalation, as it does not become available systemically. As such, it is considered not useful to perform a reproduction study.

Classification for reproductive toxicity according to Regulation (EC) 1272/2008 is not required

12. ECOLOGICAL INFORMATION

12.1 Toxicity

Acute/short term toxicity to fish

LC_{50} (96h) for freshwater fish : 300 mg/l

Chronic/long term to toxicity to fish

Study scientifically unjustified, sodium carbonate dissociates readily into sodium and carbonate ions in an aquatic environment. Both ions originally exist in nature, and their concentrations in surface water are dependent on various factors, such as geological parameters, weathering and human activities. Therefore there is a continuous source of both ions into the environment and have been measured extensively in aquatic ecosystems.

Acute/short term toxicity to aquatic invertebrates

EC_{50} (48h) for freshwater invertebrates : 200-227 mg/l

Chronic/long term toxicity to aquatic invertebrates

Study scientifically unjustified, sodium carbonate dissociates readily into sodium and carbonate ions in an aquatic environment. Both ions originally exist in nature, and their concentrations in surface water are dependent on various factors, such as geological parameters, weathering and human activities. Therefore, there is a continuous source of both ions into the environment and have been measured extensively in aquatic ecosystems.

Acute toxicity to algae and aquatic plants

Study scientifically unjustified, sodium carbonate dissociates readily into sodium carbonate ions in a aquatic environment. Both ions originally exist in nature, and their concentrations in surface water are dependent on various factors, such as geological parameters, weathering and human activities. Therefore, there is a continuous source of both ions into the environment and have been measured extensively in aquatic systems

Toxicity to soil macro-organisms

In accordance with REACH Annex XI a study is not required as in water sodium carbonate is dissociated into sodium and carbonate ions, both of which will not absorb on particulate matter. Furthermore, exposure of the soil compartment is unlikely.

Toxicity to terrestrial plants

In accordance with REACH Annex XI a study is not required as in water sodium carbonate is dissociated into sodium and carbonate ions, both of which will not absorb on particulate matter. Furthermore, exposure of the soil compartment in unlikely.

12.2 Persistence and degradability

In water	Not applicable (quickly dissociates)
In soil	Not applicable (inorganic substance)
In sediment	Not applicable (inorganic substance)

12.3 Bio accumulative potential

Not bio accumulative (inorganic substance that in water dissociates into sodium and carbonate ions, which do not accumulate in living tissues)

12.4 Mobility in soil

If sodium carbonate is emitted to soil it can escape to atmosphere as carbon dioxide, precipitate as a metal carbonate, form complexes or stay in solution.

12.5 Results of PBT and vPvB assessment
According to Annex XIII of REACH Regulation, inorganic substances do not require assessment.

12.6 Other adverse effects
No other adverse effects are identified

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
If recycling or re-use is not practicable, dispose of in compliance with local or national regulations
Neutralise with an acid, under controlled conditions
Dilute with plenty of water

Packaging:
Where possible, recycling is preferred to disposal or incineration.
Clean container with water, dispose of rinse water in accordance with local or national regulations
Must be incinerated in a registered incineration plant with permit from the local authorities.

14. TRANSPORT INFORMATION

UN Number
Not Regulated

UN proper shipping name
Not regulated

Transport Hazard Class

Land transport	ADR/RID	Not restricted
Inland waterway transport	ADN	Not regulated
Sea transport	IMO/IMDG	Not regulated
Air transport	ICAO-TI/IATA-DGR	Not regulated

15. REGULATORY INFORMATION

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

Water Hazard Class	WGK1, VwVws (Germany)
TSCA Inventory	Listed

15.2 Chemical safety assessment
A chemical safety assessment/ report (CSA/CSR) has been undertaken on sodium carbonate.

16. OTHER INFORMATION

Indication of changes
The new issue updates the safety data sheet in accordance with Annex II of the REACH Regulation (EC) 1907/2006 and also to include the classification, packaging and labelling (CLP) Regulation (EC) 127/80
Issue no: 02 Date of issue: 10-01-2011 - supercedes Issue No.1 Revision 03 date of issue: 21-10-2002
Abbreviations and acronyms
ADR: European Agreement Concerning the International carriage of Dangerous goods by Road
ADN: European Agreement concerning the International carriage of Dangerous goods by inland waterway
RID: International rule for Transport of dangerous Substances by Rail
IMDG: Internal Maritime Code for Dangerous Goods
WEL: Workplace exposure limit
TWA: Time Weighted Average
DNEL: Derived No Effect Level (REACH)
PBT: Persistent, Bio accumulative, Toxic
vPvB: Very persistent, Very Bio accumulative
PNEC: Predicted No Effect Level (REACH)
IMO/IATO: International Maritime Organisation/International Air Transport Association
ICAO/IMDG: International Maritime Organisation/International Maritime Dangerous Goods Code
LC50: Lethal Concentration, 50 percent
LD50: Lethal Dose, 50 percent
SIDS: Screening information Data Sheet.
OECD: Organisation for Economic Co-operation and Development

Source of key data used to compile the data sheet
Data is taken from the Chemical safety report (CSR) and /or OECD SIDS report for calcium chloride

Modifications from last revision
The Safety Data Sheets have been revised throughout to conform to EC Directive 1906/2007 and amendments
Date: 31/01/11

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ANNEX TO EXTENDED SAFETY DATA SHEET (eSDS):

Page 11-13 Exposure Scenario 1 (ES.l) - Soda ash - Manufacturing of sodium carbonate
Page 14-16 Exposure Scenario 2 (ES.2) - Soda ash - Glass production
Page 17-19 Exposure Scenario 3 (ES.3) - Soda ash - Formulation
Page 20-25 Exposure Scenario 4 (ES.4) - Soda ash - Other industrial and professional use
Page 26-28 Exposure Scenario 5 (ES.5) - Soda ash - Consumer use

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Exposure Scenario for communication:

ES 1: Manufacturing of sodium carbonate

0. General information

ES identifier	ES 1
Version no	01
Revision date	28.10.2010
EC #	207-838-8
CAS #	497-19-8

1. Use descriptors

Manufacturing of sodium carbonate

Market sector: SU 3 (Industrial uses)
Sector of use: SU 8 (Manufacture of bulk, large scale chemicals)

Environment: (Environmental Release Category) Manufacture of substances	ERC 1

Worker (Process Category -Phrase)

Use in closed process, no likelihood of exposure	PROC 1
Use in closed, continuous process with occasional controlled exposure	PROC2
Use in closed batch process (synthesis or formulation)	PROC 3
Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
Potentially closed processing operations with minerals/metals at elevated temperature	PROC 22

Processes, tasks, activities covered

Manufacturing, maintenance, loading, packaging, sampling and monitoring.

2. Conditions of use affecting exposure

2.0 Default Product Characteristics

Physical form of product/article	Solid
Volatility	Not relevant
Dustiness	Medium (PROCs 1, 2, 3, 4, 8a, 8b, 9) Low (PROC 22)

2.1. Control of environmental exposure:

Manufacture of substances - ERC 1

Amounts used

Annual site tonnage (tonnes/year): up to 1 500 000.

Frequency and duration of use

Continuous

Other given operational conditions affecting environmental exposure

Not applicable.

Technical and organizational conditions and measures

See section 8 of Safety data sheet.

Conditions and measures related to municipal sewage treatment plant

Wastewater streams from sodium carbonate production sites contain inorganic substances and are therefore not treated in sewage treatment plants.

Conditions and measures related to external treatment of waste

In Chapter 2.3.5 of the Reference Document on Best Available Techniques for the Manufacture of Large Volume Inorganic Chemicals - Solids and Others Industry (EC, 2007) two types of solid waste, generated during the manufacturing of sodium carbonate, are discussed. Both types of solid waste originate from raw materials and the concentration of sodium carbonate in the solid waste is negligible. For this reason specific waste related measures are not needed.

Additional good practice advice beyond the REACH CSR (Chemical Safety Report)

See sections 6 and 13 of Safety Data Sheet

2.2. Control of workers exposure

Valid for PROCs 1, 2, 3, 4, 8a, 8b, 9, 22.

Amounts used, frequency and duration of use

Amounts used	Not Relevant Parameter does not influence exposure estimations for this ES
Frequency and duration of use	Daily 8h/day

Technical and organizational conditions and measures

See section 8 of Safety Data Sheet.
Ensure workers are trained to minimize exposures.

Additional good practice advice beyond the REACH CSR (Chemical Safety Report)

See sections 7 and 8 of Safety Data Sheet

3. Exposure estimation and reference to its source

3.1 Environment exposure estimation and reference to its source

The table below gives the summary of the environment exposure estimation made in the Chemical Safety Report, referring to Document on Best Available Techniques for the Manufacture of Large Volume Inorganic Chemicals - Solids and Others Industry.

Compartments	Measured release (kg/d)	Explanation / source of measured data
Aquatic	Negligible	Reference Document on Best Available Techniques (EC, 2007)
Air (direct)	2.2-118	
Soil (direct only)	Negligible	Reference Document on Best Available Techniques (EC, 2007)

3.2 Workers exposure estimation and reference to its source

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Production of sodium carbonate: long-term exposure concentrations to workers

Routes of exposure	**Exposure concentrations (mg/m^3)**	**Explanation / source of measured data** (Characteristics, Duration, Frequency, OC and RMM described above)
Modeled exposure data		
Dermal exposure	Not relevant	No assessment for dermal exposure because of no local skin effects and no systemic availability after dermal contact.
Inhalation exposure	0.01	ECETOC TRA V2. PROC 1
	0.5	ECETOC TRA V2. PROC 2
	1	ECETOC TRA V2. PROC 3
	5	ECETOC TRA V2. PROC 4
	5	ECETOC TRA V2. PROC 8a
	5	ECETOC TRA V2. PROC 8b
	5	ECETOC TRA V2. PROC 9
	1	ECETOC TRA V2. PROC 22
Measured exposure data		
Inhalation exposure	7.9	An extensive set (in total: 698 observations) of worker exposure data from 4 sites that manufacture sodium carbonate. Measurements are representative for a workday of 8 hours.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

4.1 Environment.

Not Applicable: this scenario does not concern DU.

4.2 Health.

Not Applicable: this scenario does not concern DU.

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Substance: Sodium Carbonate ; EC : 207-838-8 ; CAS : 497-19-8

Exposure Scenario for communication:

ES 2: Glass production

0. General information

ES identifier	ES 2
Version no	01
Revision date	28.10.2010
EC #	207-838-8
CAS #	497-19-8

1. Use descriptors

Glass Production

Market sector: SU 3 (Industrial uses)
Sector of use: SU 3 (Industrial uses)

Environment: (Environmental Release Category) Industrial use resulting in manufacture of another substance (use of intermediates)	ERC 6a

Worker (Process Category -Phrase)

Use in closed process, no likelihood of exposure	PROC 1
Use in closed, continuous process with occasional controlled exposure	PROC2
Use in closed batch process (synthesis or formulation)	PROC 3
Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
Potentially closed processing operations with minerals/metals at elevated temperature	PROC 22
Open processing and transfer operations with minerals/metals at elevated temperature	PROC 23
Handling of solid inorganic substances at ambient temperature.	PROC 26

Processes, tasks, activities covered

Manufacturing, maintenance, loading, packaging, sampling and monitoring.

2. Conditions of use affecting exposure

2.0 Default Product Characteristics

Physical form of product/article	Solid
Volatility	Not relevant

Dustiness	Medium (PROCs 1, 2, 3, 4, 8a, 8b, 26) High (PROCs 22 and 23)

Mixture Article Concentration

For PROCs 1, 2, 3, 4, 8a, 8b and 26 the neat substance is taken into account, because the neat substance is transferred to the process.

Percentage of 5-25% sodium carbonate in the mixture during the melting process is assumed.

2.1. Control of environmental exposure:

Use as intermediate: industrial use resulting in manufacture of another substance.

Amounts used

Up to 200 000 tonnes/year.

Frequency and duration of use

Continuous.

Other given operational conditions affecting environmental exposure

The impact of glass manufacturing on the environment has been described extensively in the Reference Document on Best Available Techniques in the Glass Manufacturing Industry (EC, 2001). The document was established in the context of the EU Directive on Integrated Pollution Prevention and Control (Directive 96/61/EC).

Technical and organizational conditions and measures

See section 8 of Safety Data Sheet.
In case of dust formation, use filter to reduce atmospheric emissions.

Conditions and measures related to municipal sewage treatment plant

Wastewater streams of the glass industry do not contain sodium carbonate as it is stored in covered silos and not linked to internal sewage systems. For this reason an emission assessment for the sewage treatment plant is not needed for the industrial end use of sodium carbonate in the glass industry.

Conditions and measures related to external treatment of waste

No specific waste related measures are to be defined.

Additional good practice advice beyond the REACH CSA

See sections 6 and 13 of Safety Data Sheet

2.2. Control of workers exposure

Valid for PROCs 1, 2, 3, 4, 8a, 8b, 9, 22, 26.

Amounts used, frequency and duration of use

Amounts used	Not Relevant Parameter does not influence exposure estimations for this ES
Frequency and duration of use	Daily 8h/day

Technical and organisational conditions and measures

See section 8 of Safety Data Sheet

Additional good practice advice beyond the REACH CSR (Chemical Safety Report)

See sections 7 and 8 of Safety Data Sheet

3. Exposure estimation and reference to its source

3.1 Environment exposure estimation and reference to its source

The table below gives the summary of the environment exposure estimation made in the Chemical Safety Report, referring to Document on Best Available Techniques in the Glass Manufacturing Industry (EC, 2001).

Compartments	**Measured release (kg/d)**	**Explanation / source of measured data**
Aquatic	Negligible	Reference Document on Best Available Techniques (EC, 2001)
Air (direct)	Negligible	Reference Document on Best Available Techniques (EC, 2001)
Soil (direct only)	Negligible	Reference Document on Best Available Techniques (EC, 2001)

3.2 Workers exposure estimation and reference to its source

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Glass production: long-term exposure concentrations to workers

Routes of exposure	**Estimated exposure concentrations (mg/m^3)**	**Explanation / source of measured data** (Characteristics, Duration, Frequency, OC and RMM described above)
Dermal exposure	Not relevant	No assessment for dermal exposure because of no local skin effects and no systemic availability after dermal contact.
Inhalation exposure	0.01	ECETOC TRA V2. PROC 1
	0.5	ECETOC TRA V2. PROC 2
	1	ECETOC TRA V2. PROC 3
	5	ECETOC TRA V2. PROC 4
	5	ECETOC TRA V2. PROC 8a
	5	ECETOC TRA V2. PROC 8b
	1	ECETOC TRA V2. PROC 22a
	1	ECETOC TRA V2. PROC 23a

PROC26 is not foreseen in ECETOC TRA but it involves activities which are described by PROC 8a and 8b. Therefore the calculation with PROC 8a and 8b covers PROC 26.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

4.1 Environment.

Predicted exposures are not expected to exceed the DNEL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4.2 Health.

Predicted exposures are not expected to exceed the DNEL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

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Substance: Sodium Carbonate ; EC : 207-838-8 ; CAS : 497-19-8

Exposure Scenario for communication: ES 3: Formulation

0. General information

ES identifier	ES 3
Version no	
Revision date	28.10.2010
EC #	207-838-8
CAS #	497-19-8

1. Use descriptors

Formulation

Market sector: SU 3 (Industrial uses)
Sector of use: SU 10 (Formulation [mixing] of preparations and/or re-packaging (excluding alloys))

Environment: (Environmental Release Category) Formulation of preparations ERC 2

Worker (Process Category -Phrase)

Use in closed process, no likelihood of exposure	PROC 1
Use in closed, continuous process with occasional controlled exposure	PROC 2
Use in closed batch process (synthesis or formulation)	PROC 3
Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)	PROC 5
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
Production of preparations or articles by tabletting, compression, extrusion, pelletisation	PROC 14
Use as laboratory reagent	PROC 15

Processes, tasks, activities covered

storage, materials transfers, mixing, maintenance, sampling and associated laboratory activities.

2. Conditions of use affecting exposure

2.0 Default Product Characteristics

Physical form of product/article	Solid
Volatility	Not relevant
Dustiness	Medium

Mixture Article Concentration

Not relevant: for exposure estimation the neat substance is taken into account, because the neat substance is added to

the formulation process.

2.1. Control of environmental exposure:

Formulation of preparations - ERC 2
SPERC (AISE, 2010E) are also used (http://www.aise.eu/reach/exposureass_sub4.htm).

Amounts used

Up to 5 000 tonnes/year

Frequency and duration of use

Continuous

Other given operational conditions affecting environmental exposure

See sections 8 and 13 of Safety Data Sheet

Technical and organizational conditions and measures

In case of dust formation, use filter to reduce atmospheric emissions.

Conditions and measures related to municipal sewage treatment plant

Control the pH of the liquid effluent if the effluent is sent to STP.

Conditions and measures related to external treatment of waste

No specific waste related measures are to be defined.

Additional good practice advice beyond the REACH CSA

See sections 6 and 13 of Safety Data Sheet

2.2. Control of workers exposure

Valid for PROCs 1, 2, 3, 5, 4, 8a, 8b, 9,14,15.

Amounts used, frequency and duration of use

Amounts used	Not Relevant Parameter does not influence exposure estimations for this ES
Frequency and duration of use	Daily 8h/day

Technical and organisational conditions and measures

See section 8 of Safety Data Sheet

Additional good practice advice beyond the REACH CSR (Chemical Safety Report)

See sections 7 and 8 of Safety Data Sheet

3. Exposure estimation and reference to its source

3.1 Environment exposure estimation and reference to its source

The table below gives the summary of the environment exposure estimation made in the Chemical Safety Report and in Specific Environmental Release Categories (SPERC) (AISE, 2010):

Compartments	Measured release (kg/d)	Explanation / source of data
Aquatic	Negligible	
Air (direct)	2.7	Specific Environmental Release Categories (SPERC) (AISE, 2010)
Soil (direct only)	Negligible	Specific Environmental Release Categories (SPERC) (AISE, 2010)

3.2 Workers exposure estimation and reference to its source

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Formulation: long-term exposure concentrations to worker

Routes of exposure	**Estimated exposure concentrations (mg/m^3)**	**Explanation / source of measured data** (Characteristics, Duration, Frequency, OC and RMM described above)
Dermal exposure	Not relevant	No assessment for dermal exposure because of no local skin effects and no systemic availability after dermal contact.
Inhalation exposure	0.01	ECETOC TRA V2. PROC 1
	0.5	ECETOC TRA V2. PROC 2
	1	ECETOC TRA V2. PROC 3
	5	ECETOC TRA V2. PROC 4
	5	ECETOC TRA V2. PROC 5
	5	ECETOC TRA V2. PROC 8a
	5	ECETOC TRA V2. PROC 8b
	5	ECETOC TRA V2. PROC 9
	1	ECETOC TRA V2. PROC 14
	0.5	ECETOC TRA V2. PROC 15

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

4.1 Environment.

Predicted exposures are not expected to exceed the DNEL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4.2 Health.

Predicted exposures are not expected to exceed the DNEL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

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Substance: Sodium Carbonate ; EC : 207-838-8 ; CAS : 497-19-8

Exposure Scenario for communication:
ES 4: Other industrial and professional uses

0. General information

ES identifier	ES 4
Version no	01
Revision date	28.10.2010
EC #	207-838-8
CAS #	497-19-8

1. Use descriptors

1.1 Industrial end uses

Market sector: SU 3 (Industrial uses)
Sector of use: No restriction (SUs 0-20, 23, 24)

Environment: (Environmental Release Category)

Formulation of preparations	ERC 4
Industrial use resulting in inclusion into or onto a matrix	ERC 5
Industrial use resulting in manufacture of another substance (use of intermediates)	ERC 6a
Industrial use of reactive processing aids	ERC 6b
Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers	ERC 6d
Industrial use of sub-stances in closed systems	ERC 7

Worker (Process Category -Phrase)

Use in closed process, no likelihood of exposure	PROC 1
Use in closed, continuous process with occasional controlled exposure	PROC 2
Use in closed batch process (synthesis or formulation)	PROC 3
Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
Spraying in industrial settings and applications	PROC 7
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b

Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
Roller application or brushing of adhesive and other coating	PROC 10
Treatment of articles by dipping and pouring	PROC 13
Use as laboratory reagent	PROC 15
Lubrication at high energy conditions and in partly open process	PROC 17
Greasing at high energy conditions	PROC 18
Hand-mixing with intimate contact and only PPE available	PROC 19
Potentially closed processing operations with minerals/metals at elevated temperature. The process temperature is higher than the melting point (High fugacity)	PROC 22
Open processing and transfer operations with minerals/metals at elevated temperature. The process temperature is higher than the melting point (High fugacity)	PROC 23
Handling of solid inorganic substances at ambient temperature	PROC 26

Processes, tasks, activities covered:
Manufacturing, mixing, maintenance, loading, packaging, sampling and monitoring.

1.2 Professional end uses

Market sector: SU 22 (Professional uses)
Sector of use: SU 22 (Professional uses)

Environment: (Environmental Release Category)

Wide dispersive indoor use of processing aids in open systems	ERC 8a
Wide dispersive indoor use of reactive substances in open systems	ERC 8b
Wide dispersive indoor use resulting in inclusion into or onto a matrix	ERC 8c
Wide dispersive outdoor use of processing aids in open systems	ERC 8d
Wide dispersive outdoor use of reactive substances in open systems	ERC 8e
Wide dispersive outdoor use resulting in inclusion into or onto a matrix	ERC 8f
Wide dispersive indoor use of substances in closed systems	ERC 9a
Wide dispersive outdoor use of substances in closed systems	ERC 9b

Worker (Process Category -Phrase)

Use in closed process, no likelihood of exposure	PROC 1

Use in closed, continuous process with occasional controlled exposure	PROC 2
Use in batch and other process (synthesis) where opportunity for exposure arises	PROC 4
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities	PROC 8a
Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities	PROC 8b
Transfer of substance or preparation into small containers (dedicated filling line, including weighing)	PROC 9
Roller application or brushing of adhesive and other coating	PROC 10
Non industrial spraying	PROC 11
Treatment of articles by dipping and pouring	PROC 13
Use as laboratory reagent	PROC 15
Hand-mixing with intimate contact and only PPE available	PROC 19

Processes, tasks, activities covered
Manufacturing, mixing, maintenance, loading, packaging, sampling and monitoring.

2. Conditions of use affecting exposure

2.0 Default Product Characteristics

Physical form of product/article	Solid
Volatility	Not relevant
Dustiness	Medium (PROCs 1, 2, 3, 4, 8a, 8b, 9,15,19) High (PROCs 22 and 23)

2.1. Control of environmental exposure:

Industrial end uses: ERC4, ERC5, ERC 6a/6b/6d, ERC 7.
Professional end uses: ERC 8a/8b/8c/8d/8e/8f; ERC 9a/9b.

Amounts used

Industrial use up to 100 000 tonnes/year.
Professional use much lower

Frequency and duration of use

Up to continuous.

Other given operational conditions affecting environmental exposure

See sections 8 and 13 of Safety Data Sheet

Technical and organizational conditions and measures

In case of dust formation, use filter to reduce atmospheric emissions.

Conditions and measures related to municipal sewage treatment plant

Control the pH of the liquid effluent if the effluent is sent to STP.

Conditions and measures related to external treatment of waste

No specific waste related measures are to be defined.

Additional good practice advice beyond the REACH CSR (Chemical Safety Report)

See sections 6 and 13 of Safety Data Sheet

2.2. Control of workers exposure

Valid for PROC 1-4, 7, 8a, 8b, 9,10,11, 13, 15, 17, 18, 19, 22, 23, 26.

Amounts used, frequency and duration of use

Amounts used	Not Relevant Parameter does not influence exposure estimations for this ES

Frequency and duration of use (Exposure Frequency Duration)

Operational conditions related to the duration of use	**Process Category**	**Industrial (Data Field)**	**Professional (Data Field)**
Duration of exposure per day at workplace [for one worker]	PROC 1		Less than 15 min/day
	PROC 2		Less than 15 min/day
	PROC 3	> 4 hours/day (liquid mixture)	
	PROC 4		> 4 hours/day
	PROC 7	> 4 hours/day (liquid mixture)	
	PROC 8a		15 min/day to 1 hour/day
	PROC 8b		15 min/day to 1 hour/day
	PROC 9	> 4 hours/day (liquid mixture)	
	PROC10		> 4 hours/day
	PROC11		> 4 hours/day
	PROC13		15 min/day to 1 hour/day
	PROC15		15 min/day to 1 hour/day
	PROC17	> 4 hours/day (liquid mixture)	
	PROC18	> 4 hours/day (liquid mixture)	
	PROC19		15 min/day to 1 hour/day

PR0C26 is not foreseen in ECETOC TRA but it involves activities which are described by PROC 8a and 8b. Therefore the calculation with PROC 8a and 8b covers PROC 26.

Technical and organisational conditions and measures

See section 8 of Safety Data Sheet.

Additional good practice advice beyond the REACH CSR (Chemical Safety Report)

See sections 7 and 8 of Safety Data Sheet

3. Exposure estimation and reference to its source

3.1 Environment exposure estimation and reference to its source

The table below gives the summary of the environment exposure estimation made in the Chemical Safety Report:

Compartments	**Measured release (kg/d)**
Aquatic	Negligible
Air (direct)	Small releases might be possible
Soil (direct only)	Negligible in all cases except agricultural use Max application use rates of soda ash as co-formulant in plant protection products: Professional agricultural: 0.0126 kg/ ha (tier 1 default use rate: 1 kg/ha)

3.2 Workers exposure estimation and reference to its source

The ECETOC TRA tool has been used to estimate workplace exposures unless otherwise indicated.

Routes of exposure	**Explanation / source of measured data (Characteristics, Duration Frequency, OCand RMM described above)**	**Industrial estimated exposure concentrations (mg/m^3)**	**Professional estimated Exposure concentrations (mg/m^3)**
Dermal exposure	No local effects and no systemic availability after dermal contact	Not relevant	Not relevant
Inhalation exposure	PROC 1	0.01	0.0044 (liquid) 0.001 (solid)
	PROC 2	0.5 (solid)	0.044 (liquid) 0.1 (solid)
	PROC 3	1 (solid)	0.044 (liquid)
	PROC 4	5	0.044 (liquid) 5 (solid)
	PROC 7	0.022	
	PROC 8a	5	0.088 (liquid) 1 (solid)
	PROC 8b	5 (solid)	0.088 (liquid)
	PROC 9	5 (solid)	0.044 (liquid)
	PROC10		0.44 (liquid mixture only)
	PROC11		0.44 (liquid mixture only)
	PROC13		0.088 (liquid mixture only)
	PROC15	5 (solid)	0.088 (liquid mixture only)
	PROC17	0.022 (liquid mixture only)	
	PROC18	0.022 (liquid mixture)	
	PROC19	5	0.088 (liquid) 1 (solid)
	PROC22	1	
	PROC23	1	
	Professional agricultural with solid mixture, outdoor, no PPE (ECPA OWB Tier 1: default use rate)		0.142 (solid)

PROC 26 is not foreseen in ECETOC TRA but it involves activities which are described by PROC 8a and 8b. Therefore the calculation with PROC 8a and 8b covers PROC 26.

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

4.1 Environment.

Predicted exposures are not expected to exceed the DNEL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4.2 Health.

Predicted exposures are not expected to exceed the DNEL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

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Substance: Sodium Carbonate; EC : 207-838-8; CAS : 497-19-8

Exposure Scenario for communication:

ES 5: Consumer use

0. General information

ES identifier	ES 5
Version no	01
Revision date	28.10.2010
EC #	207-838-8
CAS #	497-19-8

1. Use descriptor

Consumer use

Market sector: SU 21 Consumer uses: Private households (= general public = consumers)
Sector of use: SU 21 Consumer uses: Private households (= general public = consumers)

Environment:

Environmental Release Category: ERC 8 a/b/c/d/e/f; ERC 9 a/b.

Product Category (PC): No restriction (from PC 0 to PC 40)

Process Category: Not applicable

Processes, tasks, activities covered
Cleaning activities

2. Conditions of use affecting exposure

2.0 Default Product Characteristics

Physical form of product/article	Solid or dissolved in water
Volatility	Not relevant
Dustiness	Medium for powdered detergents, low for household soda

Mixture Article Concentration
Laundry detergents and surface cleaners: 30%
Machine dish washing tablets: 45%
Household soda (pure sodium carbonate decahydrate): 37% content of sodium carbonate
Surface cleaning sprays: 10%
Air care products: 5% (PC 3)
Furniture, floor and leather care: 10% (PC 31)

2.1. Control of environmental exposure:

Consumer use - ERC 8 a/b/c/d/e/f; ERC 9 a/b.

Amounts used

Not relevant as the exposure is estimated to be negligible

Frequency and duration of use

Not relevant as the exposure is estimated to be negligible

Other given operational conditions affecting environmental exposure

See sections 8 and 13 of Safety Data Sheet

Technical and organizational conditions and measures

See section 8 of Safety Data Sheet

Conditions and measures related to municipal sewage treatment plant

See section 13 of Safety Data Sheet

Conditions and measures related to external treatment of waste

See section 13 of Safety Data Sheet

Additional good practice advice beyond the REACH CSR (Chemical Safety Report)

See sections 6 and 13 of Safety Data Sheet

2.2. Control of consumers exposure

Amounts used, frequency and duration of use

Amounts used	Household soda: 37 g/l (worst case)
Frequency and duration of use	Household soda: one time per week (frequency) and 5 min (duration) (worst case)

Technical and organisational conditions and measures

Keep out of reach of children and avoid contact with eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.

Additional good practice advice beyond the REACH CSR (Chemical Safety Report)

See sections 7 and 8 of Safety Data Sheet

3. Exposure estimation and reference to its source

3.1 Environment exposure estimation and reference to its source

The table below gives the summary of the environment exposure estimation made in the Chemical Safety Report, referring to HERA (2005a) and to Specific Environmental Release Categories (SPERC) (AISE, 2010).

Compartments	Measured release (kg/d)	Explanation / source of measured data
Aquatic	Negligible	HERA (2005a); see section 9.5.2.3.2
Air (direct)	Negligible	Specific Environmental Release Categories (SPERC) (AISE, 2010)
Soil (direct only)	Negligible	Specific Environmental Release Categories (SPERC) (AISE, 2010)

3.2 Consumers exposure estimation and reference to its source

Exposures have been calculated with the software tool REACT (Reach Exposure Assessment Consumer Tool)

Long-term dermal exposure to consumers:

Product category	Ingredient fraction by weight	Estimated uptake value (mg/kg bw per day)
Laundry regular (AISE CI, PC35), Powder	0.3	1.56E-02
Laundry regular (AISE CI, PC35), Liquid	0.3	2.29E-02

Laundry compact (AISE C2, PC35), Powder	0.3	1.60E-02
Laundry compact (AISE C2, PC35), Liquid/Gel	0.3	2.29E-02
Laundry additives (AISE C4, PC35), Liquid Bleach	0.3	2.21E-02
Hand Dishwashing (AISE C5, PC35)	0.3	3.12E-04
Surface cleaners (AISE C7, PC35), Gel	0.3	4.29E-02

The negligible inhalation has been confirmed for the laundry washing scenario reported by HERA (2005a).

4. Guidance to DU to evaluate whether he works inside the boundaries set by the ES

4.1 Environment.

Predicted exposures are not expected to exceed the DNEL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.

4.2 Health.

Predicted exposures are not expected to exceed the DNEL when the Risk Management Measures/Operational Conditions outlined in Section 2 are implemented.