CERTIFICATE OF ANALYSIS

PRODUCT

PRODUCT: Sodium Bicarbonate
BATCH NO: 4395006
BEST BEFORE END: April 2023

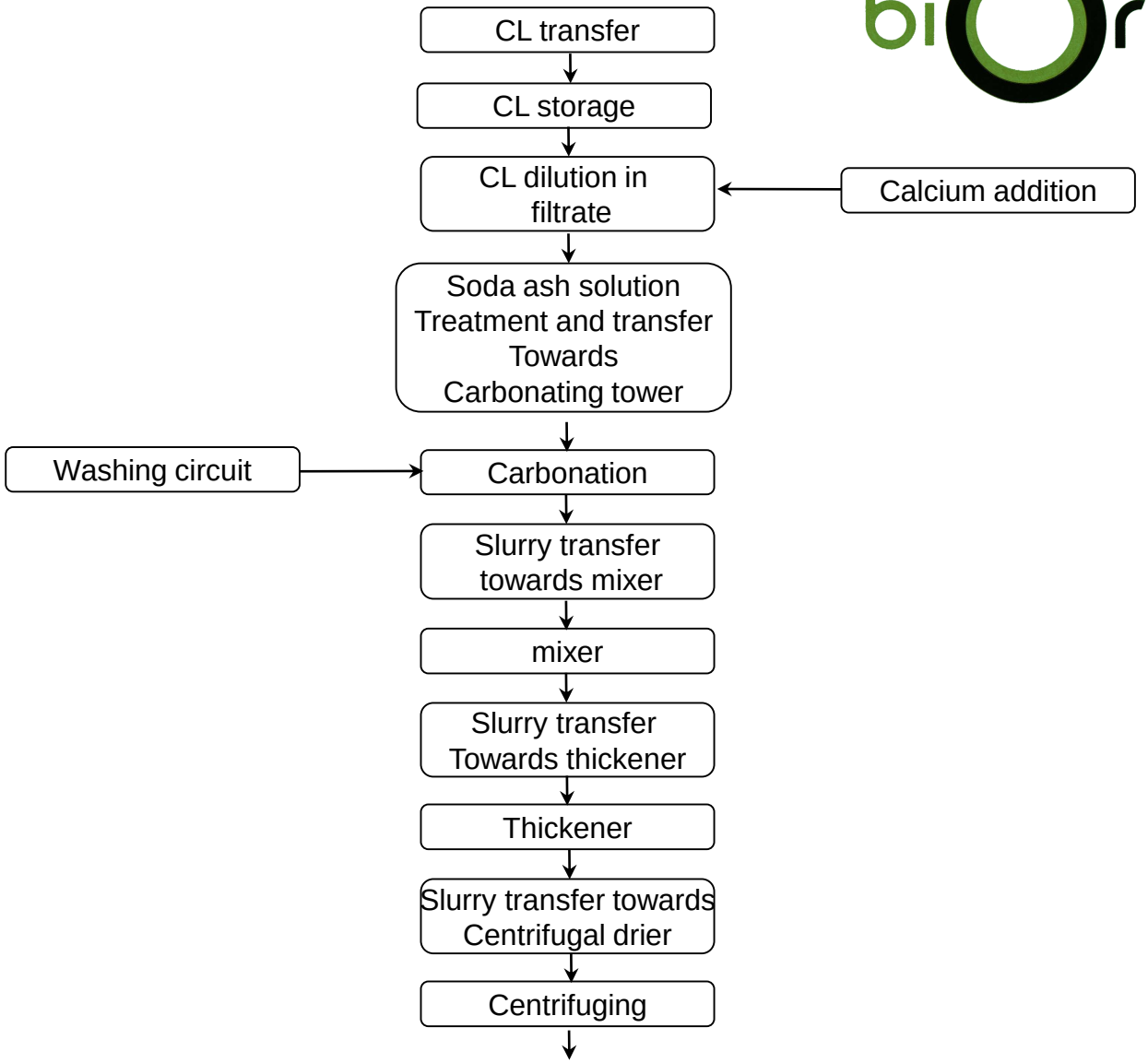
LOT

REFERENCE :

DETERMINATIONS	SPECIFICATIONS	RESULTS
Appearence	v Conforms	r Conforms
Aspect solution	v Conforms	r Conforms
Ammonium	v Conforms	r Conforms
TITRE	v 99,00 - 100,50 %	r 99,**42** %
Na2CO3	v <= 1,00 %	r 0,50 %
Humidité	v <= 0,25 %	r 0,10 %
pH solution 5 % *	v <= 8,60	r 7,**98**
Fer *		r 1 mg/kg
Arsenic *	v <= 2,000 mg/kg	r < 0,100 mg/kg
Métaux lourds *	v <= 5 mg/kg	r < 5 mg/kg
Refus cumulés à 180µm	v < 15,00 %	r 5,**40** %
Refus cumulés à 45µm	v > 30,00 %	r **43**,80 %
Masse volumique apparente *	v >= 800 kg/m3	r **1.010** kg/m3

Sodium Bicarbonate manufacturing process

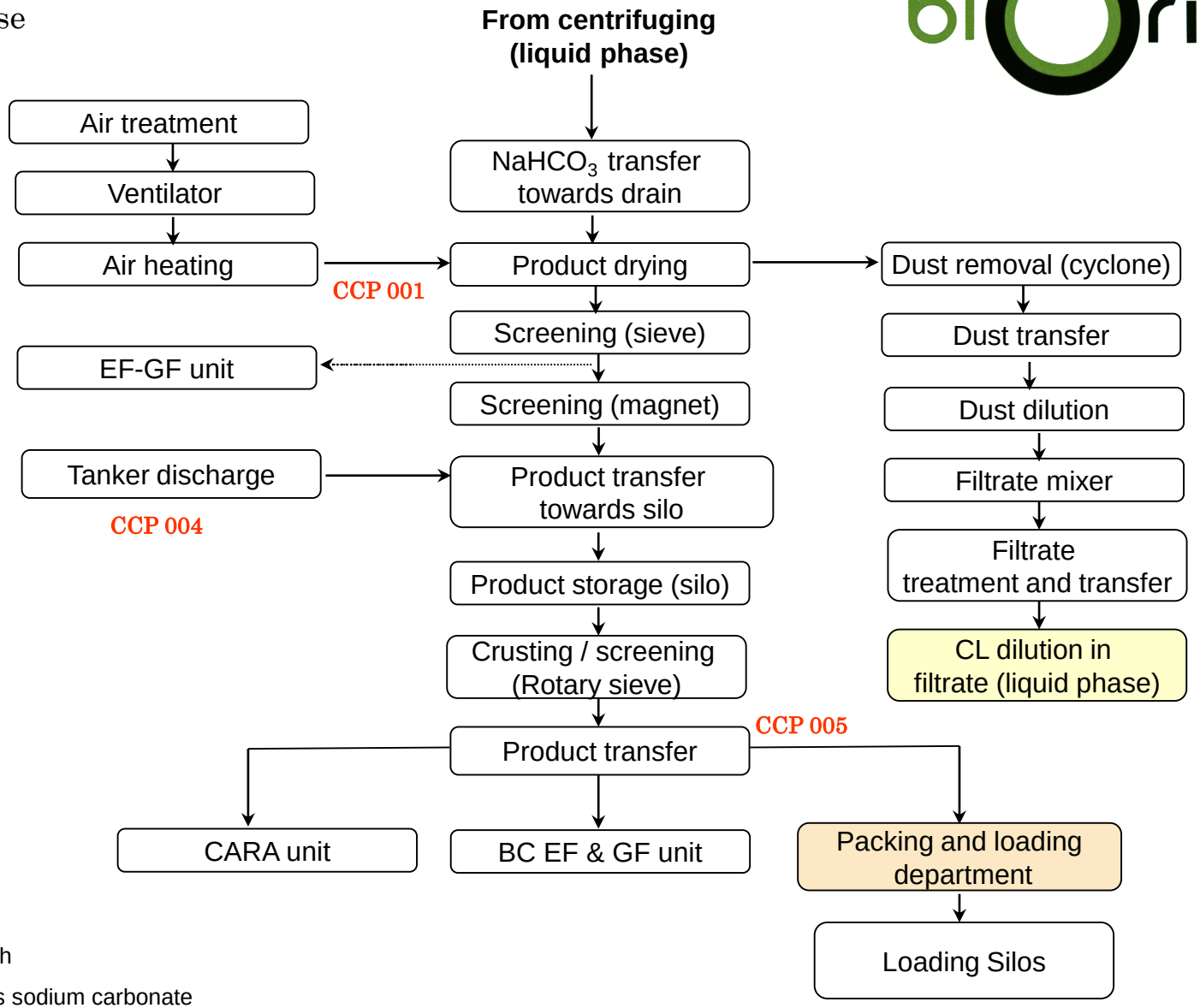
Liquid phase



CL : light soda ash

Sodium Bicarbonate manufacturing process

Solid phase



CL : light soda ash

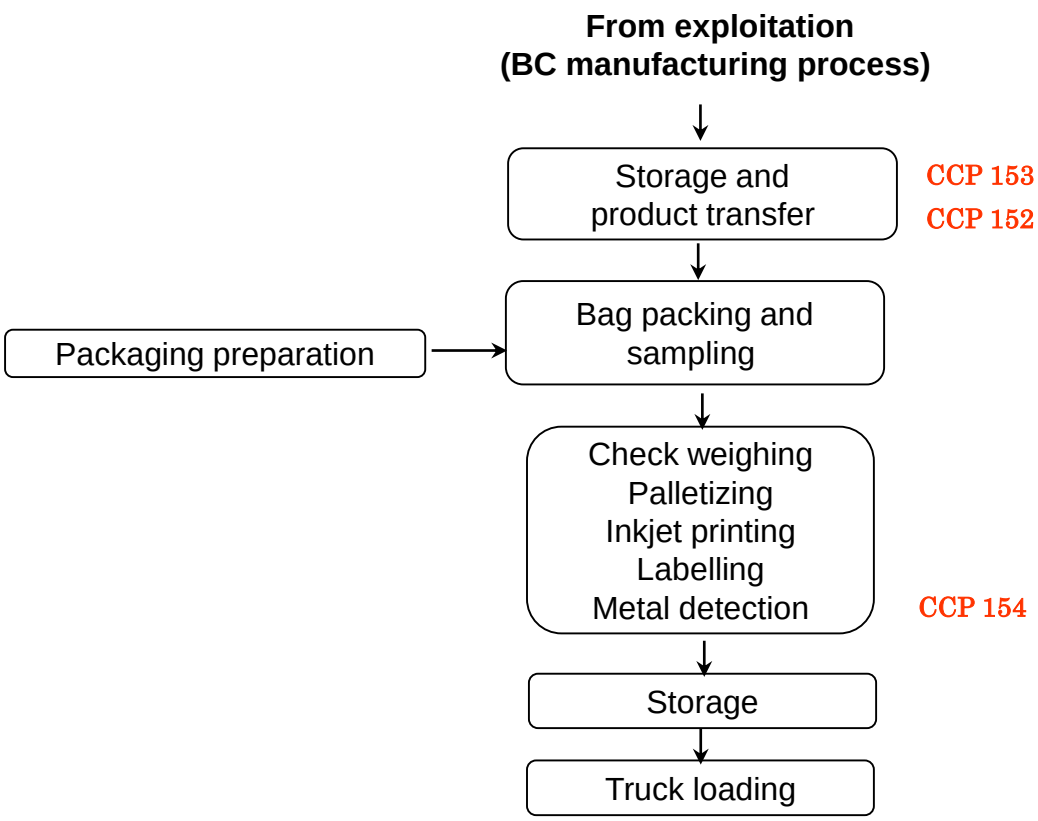
CARA : anhydrous sodium carbonate

EF : sodium bicarbonate food grade, extra fine powder

GF: sodium bicarbonate food grade, fine granular

BC bag packing

food grade or feed grade



BiOrigins, 19-20 Sandleheath Industrial Estate, Fordingbridge, Hampshire, SP6 1PA, UK
Tel: 01425 655555 Email: technical@madarcorporation.co.uk

BC : sodium bicarbonate

IDENTIFIED CCP

N°	DESCRIPTION	HAZARD	CONTROL MEASURE
SODIUM BICARBONATE PRODUCTION PROCESS			
001	Drier's temperature	microbial development in the product	Temperature is followed-up in the control room: alert threshold = 66 °C
004	Delivery of external product	To send out of specification product in our silos of end product.	• Document control before each unloading • Unloading only into silo n° 2 which is downgraded to technical grade. • Complete emptying and rinsing of the manufacturing silo before new production.
005	Precautions after maintenance work	To send out of specification product in our silos of end product.	• Complete inspection inside the devices concerned by the maintenance work in order to check that they are clean. • New production is turned away during 2 hours.

IDENTIFIED CCP

PACKING AND LOADING DEPARTMENT			
153	Screening (sifter) 4 mm* * Product is sieved at 720 microns in manufacturing process but this sieve is not a CCP for this product).	- Foreign body in the product	Scheduled maintenance: sifter inspection every 8 weeks
152	Metal separator (4300 Gauss)	- Magnetic foreign body in the product	Inspection before and after each batch
154	Metal detection (3,5 mm stainless steel ball and 3 mm steel ball)	- Magnetic foreign body in the product	Detector test before the first batch of the day (with stainless steel ball 3,5 mm).

SODIUM BICARBONATE : GMO & ALLERGEN FREE STATEMENT

We hereby certify that Sodium bicarbonate does not contain genetically modified organisms.
The manufacturing equipments used for the production do not use GMO ingredients.
Thus, there are no GMO contamination risks possible during the manufacturing process.

We also certify that Sodium bicarbonate does not contain allergen ingredients
The manufacturing equipments used for the production do not use allergen ingredients.
Thus, there are no allergen contamination risks possible during the manufacturing process.

Product	:	**SODIUM BICARBONATE**
REACH Registration Number	:	**01-2119457606-32-0012**
Issue Number	:	**02 Revision 01**
Issue Date	:	**01-04-2011**
Supercedes	:	**Issue No.02, dated 10-01-2011**

1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product Identifier

Product Name	:	SODIUM BICARBONATE
Chemical Name	:	Sodium hydrogencarbonate
Alternative Name	:	Bicarbonate of Soda, Baking Soda, Soda Bicarb.
Chemical Formula	:	$NaHCO_3$
Trade Names	:	
CAS Number	:	144-55-8
EC Number	:	205-633-8

1.2 Relevant identified uses of the substance

: Agents adsorbing and absorbing gases or liquids; flame retardants; foam(blowing) agents; food/feedstuff additives; laboratory chemicals; odour agents; pharmaceutical substance; processing aid, not otherwise listed; blasting agent; fire extinguishing agent

1.2.1 Uses advised against

: No uses advised against have been identified

1.3 Company Details

Company Name	:	MADAR Corporation Limited
Address	:	19-20 Sandleheath Industrial Estate Fordingbridge Hampshire SP6 1PA
Approved Sellers	:	Mystic Moments, New Directions, World of Moulds

1.4 Emergency Telephone

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance

2.1.1 Classification according to Regulation (EC) 1272/2008

- **Not Classified**

2.1.2 Classification according to Dangerous Substances Directive 67/548/EEC

- **Not Classified**

2.2 Labelling elements

2.2.1 Labelling according to Regulation (EC) 1272/2008

- **No labelling requirements**

2.3 Other hazards

- The substance does not meet the criteria for a PBT or vPvB substance
- No other hazards identified

biOrigins

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3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substance

Main constituent	Formula	CAS Number	EC Number	Wt. Percent
Sodium Bicarbonate	$NaHCO_3$	144-55-8	205-633-8	>98.5%w/w

Impurities
No impurities relevant for classification and labelling

4. FIRST AID MEASURES

4.1 Description of first aid measures

General advice
- No known delayed effects

Following inhalation
- Move person to fresh air and keep at rest

Following skin contact
- Wash skin with soap and water
- If irritation occurs and persists seek medical advice

Following eye contact
- Remove contact lenses if worn
- Rinse eye thoroughly with eye wash solution or clean water for at least 10 minutes
- Eyelids should be held away from the eyeball to ensure thorough rinsing
- Obtain medical attention if necessary

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

5. FIRE-FIGHTING MEASURES

5.1 Extinguishing Media

5.1.1 Suitable extinguishing media
- The product is not combustible, all extinguisher products can be used
- Use extinguishing measures that are appropriate local circumstances and the surrounding environment

5.1.2 Unsuitable extinguishing media
- None

5.2 Special hazards arising from the substance or mixture
- None

5.3 Advice for firefighters
- No special precautions required

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions

6.1.1 For non-emergency personnel
- Keep dust levels to a minimum
- Wear suitable protective equipment (see Section 8)

6.2 Environmental Precautions

- Avoid discharges into the environment (rivers, water courses, sewers etc.)
- Avoid any mixture with an acid into sewer/drains (CO_2 gas formation)

6.3 Methods for containment and clean up

- In all cases avoid dust formation
- Use vacuum suction, or shovel into bags
- store material in a suitable, correctly labelled closed container, preferably for re-use, otherwise for disposal

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

7.1.1 Protective measures

- Keep dust levels to a minimum
- Minimize dust generation
- Atmospheric levels should be controlled in compliance with the workplace exposure limit (see Section 8.1)
- Wear protective equipment (see Section 8.2)

7.1.2 Advice on general occupational hygiene

- Good personal and housekeeping practices
- No drinking, eating and smoking at the workplace

7.2 Conditions for safe storage, including any incompatibilities

- Store in a cool dry place, (preferably at a temperature below 25°c and humidity less than 65%)
- Store in original, closed and correctly labelled container
- Keep away from acids

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 Occupational Exposure Limits

- Not listed by H&SE (Guidance Note EH40) or ACGIH. However, for good hygiene practice the inert dust Workplace Exposure Limits (WEL) should be adopted
- WEL Recommended Limits: 10mg/m^3 (total dust) (8hr TWA)
  4mg/m^3 (respirable dust) (8hr TWA)

8.1.2 DNEL's/PNEC

- $DNEL_{Long\text{-}term}$ - after assessment of the physicochemical, toxicokinetic and physiological role of sodium bicarbonate, a $DNEL_{Long\text{-}term}$ derivation is considered unnecessary
- $DNEL_{Acute}$ - sodium bicarbonate is considered to be of no toxicological concern, in acute studies no local irritation was noted. A $DNEL_{acute}$ derivation is considered unnecessary
- PNEC - The lowest $L(E)C_{50}$ value is > 100 mg/l (48-h EC_{50} with *Daphnia magna* is 3,100 mg/l) and the lowest chronic value is > 0.1 mg/l (21-d NOEC with *Daphnia magna* is >576 mg/l). Therefore, sodium bicarbonate is not classified according to EU Directive 67/548/EEC or EU Classification, Regulation, Labelling and Packaging of Substances and Mixtures (CLP) Regulation (EC) No. 1272/2008.

8.2 Exposure Controls

8.2.1 Appropriate engineering controls

- if user operations generate dust, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne dust levels below recommended exposure limits

8.2.2 Personal protection

8.2.2.1 Eye/face protection

- in case of contact with the eye, wear eye/face protection rated to protect eyes against dust (EN166) eg.safety eye shields with dust protection, goggles or face visor

8.2.2.2 Hand protection

- wear suitable protective gloves for frequent or prolonged contact

8.2.2.3 Skin/body protection

- no special protective equipment required

8.2.2.4 Respiratory protection

- in the case of high dust levels wear suitable respiratory protective equipment eg.dust mask or respirator, that conform to national/international standard, EN143. Recommended filter tpe P2

8.2.3 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 crystalline powder	
Odour	: odourless	
Odour threshold	: not applicable	
pH	: 8.4	(saturated solution, study result, EU Method A.6)
Melting point	: decomposes above 50°c	(information from peer reviewed handbook)
Boiling point	: not applicable	(decomposes on heating)
Flash point	: not applicable	(inorganic substance)
Evaporation rate	: not applicable	
Flammability	: non-flammable	(study result, EU Method A.10)
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	: 2.21 – 2.23 @20°c	(study result, EU Method A.3)
Water solubility	: 93.4g/l @20°c	(study result, EU Method A.6)
Partition coefficient	: not applicable	(inorganic substance)
Auto-ignition temperature	: non-flammable	
Decomposition temperature	: starts to decompose above 50°c	
Viscosity	: not applicable	(solid)
Explosive properties	: non-explosive	(no 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)

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10. STABILITY AND REACTIVITY

10.1 Reactivity

- Decomposes slowly on exposure to water
- Reacts with acids, evolving carbon dioxide

10.2 Chemical Stability

- Stable under recommended storage and handling conditions (see Section 7)

10.3 Possibility of hazardous reactions

- None

10.4 Conditions to Avoid

- Contact with acids unless under controlled conditions
- Heating above 50°c – thermal decomposition commences
- Exposure to moisture

10.5 Incompatible materials

- Acids

10.6 Hazardous decomposition products

- None

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

(a) Acute Toxicity

- Oral LD_{50}, rat : >4000 mg/kg
- Inhalation, rat : 4.74 mg/l (low toxic potential)

Not classified according to EU Directive 67/548/EEC and CLP Regulation (EC) No. 1272/2008

(b) Skin Corrosion/Irritation

- Non-irritant

Not classified according to EU Directive 67/548/EEC and CLP Regulation (EC) No. 1272/2008

(c) Serious eye damage/irritation

- Non-irritant

Not classified according to EU Directive 67/548/EEC and CLP Regulation (EC) No. 1272/2008

(d) Respiratory or skin sensitisation

- Considered not to have any sensitising properties, based on the physiological properties of both its constituent ions and the lack of any reported issues

Not classified according to EU Directive 67/548/EEC and CLP Regulation (EC) No. 1272/2008

(e) Germ cell mutagenicity

- All test results have proven negative. Sodium bicarbonate is naturally present in cells and the structure does not indicate a genotoxic potential. Therefore sodium bicarbonate is considered not to be genotoxic

Not classified according to EU Directive 67/548/EEC and CLP Regulation (EC) No. 1272/2008

(f) Carcinogenicity

- No evidence of sodium bicarbonate having carcinogenic effects

Not classified according to EU Directive 67/548/EEC and CLP Regulation (EC) No. 1272/2008

(g) Reproductive toxicity

- No data on reproduction toxicity available. However, based on the normal physiological role of sodium and bicarbonate ions, no toxicity on mammalian or human reproduction is expected

Not classified according to EU Directive 67/548/EEC and CLP Regulation (EC) No. 1272/2008

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12. ECOLOGICAL INFORMATION

12.1 Toxicity

- Fish, Lepomis macrochirus : 96hr-LC_{50}, 7100 mg/l
- Fish, Lepomis macrochirus : 96hr-NOEC, 5200 mg/l
- Invertebrates, Daphnia magna : 48hr-LC_{50}, 4100 mg/l
- Invertebrates, Daphnia magna : 48hr-NOEC 3100 mg/l
- Invertebrates, Daphnia magna : 21day-NOEC >576 mg/l

12.2 Persistence and degradeability

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

12.3 Biocummulative potential

: Not applicable (inorganic substance)

12.4 Mobility in Soil

: Not applicable (partition coefficient measurement not required, inorganic substance)

12.5 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 spilled product is not practicable, dispose of in compliance with local or national regulations
- Dissolve in water and neutralise with an acid, under controlled conditions
- Do not dispose of directly with acids

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

Sodium bicarbonate is not classified as hazardous for transport

14.1 UN Number

- Not regulated

14.2 UN proper shipping name

- Not regulated

14.3 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

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15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations

- Water Hazard Class : WGK 1, VwVwS (Germany)
- TSCA Inventory : Listed

15.2 Chemical safety assessment

- A Chemical Safety Assessment/Report (CSA/CSR) has been undertaken on sodium bicarbonate

16. OTHER INFORMATION

16.1 Indication of changes

Section 1 – change of company name, logo and contact details

Issue No. : 02 Revision 01 Date of Issue : 01-04-2011 - supercedes Issue No. 02 Date of Issue: 10-01-2011

16.2 Abbreviations and acronyms

WEL	: Workplace exposure limit
ACGIH	: American Conference of Industrial Hygiene
TWA	: Time Weighted Average
DNEL	: Derived no effect level
NOEC	: No Observed Effect Concentration
PBT	: Persistent, Bioaccumulative, Toxic
vPvB	: very Persistent, very Bioaccumulative
PNEC	: Predicted No Effect Concentration
ADR	: European Agreement Concerning the International Carriage of Dangerous Goods by Road
RID	: International Rule for Transport of Dangerous Substances by Rail
ADN	: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterway
IMO/IMDG	: International Maritime Organization/International Maritime Dangerous Goods Code
ICAO/IATA	: International Civil Aviation Organization/International Air Transport Association
OECD	: Organisation for Economic Co-operation and Development
SIDS	: Screening Information Data Set

16.3 Key literature references and sources of data

Data is taken from the Chemical Safety Report (CSR) and/or OECD SIDS report for sodium bicarbonate

16.4 Further information

16.4.1 The substance(s) covered in this document do not legally require a Safety Data Sheet (SDS).

16.4.2 The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid.

To our best present knowledge the information given is correct and complete as of the date of this document and is given in good faith but without warranty, either expressed or implied, nor do we accept any liability in relation to this information or its use. This version of the SDS superscedes all previous versions.

sales specification

SODIUM BICARBONATE

EP/USP GRADES

PRODUCT DESCRIPTION

Sodium Bicarbonate of Pharmaceutical and Food Chemical Codex grade quality is available in a range of grades specified by their particle size.

IDENTIFICATION

Gives reactions characteristic of sodium salts and of bicarbonates.

CHEMICAL COMPOSITION

						Typical
Sodium Bicarbonate Assay	$NaHCO_3$	%	:	99.0	MIN.	
			:	100.5	MAX..	*99.87*
Carbonate	CO_3	%	:	0.23	MAX..	*0.065*
Loss on Drying	Wt. Loss	%	:	0.25	MAX..	*< 0.01*
Ammonium	NH_4	mg/kg	:	20	MAX..	*<20*
Arsenic	As	mg/kg	:	2	MAX..	*<0.1*
Calcium	Ca	mg/kg	:	100	MAX..	*75*
Chloride	Cl	mg/kg	:	150	MAX..	*65*
Heavy Metals (as Lead)	Pb	mg/kg	:	5	MAX..	*<5*
Lead	Pb	mg/kg	:	2	MAX	*<1*
Iron	Fe	mg/kg	:	20	MAX..	*2.6*
Sulphate	SO_4	mg/kg	:	150	MAX..	*40*
pH of a freshly prepared 5% Solution			:	8.6	MAX..	*8.01*
Insoluble Substances	1 g. dissolves completely in 20ml. of water to give a clear solution					

PARTICLE SIZE

Grade		Sieve Fraction (microns)	*%Max. by Weight	*Average Median Size (microns)*
Powder Fine	Retained on	125	10.0	*65*
Extra Fine	Retained on	250	0.2	*40*
	Retained on	125	2.0	
	Retained on	63	25.0	
Fine Granular	Retained on	212	1.0	*105*
	Retained on	125	28.5	
	Passing	75	15.0	
Medium Granular	Retained on	250	5.0	*140*
	Passing	63	15.0	
Coarse Granular	Retained on	250	5.0	*180*
	Passing	125	13.0	
Ultra Coarse Granular	Retained on	710	5.0	*285*
	Total Passing	250	15.0 – 60.0	
	Passing	150	15.0	

***** Limits expressed as non-cumulative values

TECHNICAL DATASHEET

SODIUM BICARBONATE BC P
FOOD

CHEMICAL FORMULA
> $NaHCO_3$
> Molecular weight: 84 g/mol

SUBSTANCE
> Sodium bicarbonate
> pH 1% aqueous solution: 8.0 - 8.6

GRADE
> N° CAS: 144-55-8
> N° EINECS: 205-633-8
> REACH: 01-2119457606-32-0011
> CLP: not classified

ASPECT
> White fine crystalline powder

SOLUBILITY
> Freely soluble in water, practically insoluble in ethanol 96%

In compliance with EU regulations 231/2012 (purity criteria for food additives) and NF EN 898 standard (water treatment). Kosher and Halal certifications. This product is free from BSE and TSE risk and does not contain GMO or allergens (certificates available on our web site).

CHEMICAL CHARACTERISTICS	SPECIFICATIONS	TYPICAL VALUES
Sodium bicarbonate ($NaHCO_3$) in %	99.0 - 100.5	≥ 99.2
Sodium carbonate (Na_2CO_3) in %	≤ 1	< 0.50
Loss on drying (H_2O) in %	≤ 0.25	≤ 0.25
Ammonium (NH_4) in mg/kg	Odorless	Conform
Arsenic (As) in mg/kg	≤ 2	≤ 2
Lead (Pb) in mg/kg	≤ 2	≤ 2
Mercury (Hg) in mg/kg	≤ 1	≤ 1
Heavy metals in mg/kg	≤ 5	≤ 5

CHEMICAL CHARACTERISTICS IN ACCORDANCE WITH NF EN 898	SPECIFICATIONS	TYPICAL VALUES
Iron (Fe) in mg/kg	≤ 5	≤ 3
Insoluble substances in mg/kg	< 200	Conform

PARTICLE SIZE	SPECIFICATIONS	TYPICAL VALUES
Cumulative fraction retained > 180 µm in %	≤ 15	5
Cumulative fraction retained > 45 µm in %	≥ 30	55
Diameter 50% in µm	-	55
Bulk density	≥ 0.8	0.98

BiOrigins, 19-20 Sandleheath Industrial Estate, Fordingbridge, Hampshire, SP6 1PA, UK
Tel: 01425 655555 Email: technical@madarcorporation.co.uk

SODIUM BICARBONATE BC P
FOOD

CERTIFICATE OF CONFORMITY AND/OR CERTIFICATE OF ANALYSIS
> On request

PACKAGING
> BB 1.2 t / BB 1.0 t / 25 kg bags / Bulk

PACKING
> BB = bulk bags in PE, with an inner liner in PE
> Bags = paper bags (3 layers + 1 inner HDPE layer), shrink-wrapped pallet

SUPPORT
> 110x110 cm or 100x120 cm, or 114x114 cm (heat treatment) pallets
> PE interlayer or cardboard sheet on the floor of the pallet

STORAGE CONDITIONS
> The stacking of pallets is not recommended
> Storage in dry and cool place (protected from the weather)
> Risk of caking if long-term storage
> Best before date: 1 year

MAIN USES
> Food additive E500ii, cosmetics, water treatment

Vegetarian & Vegan Suitability Statement

PRODUCT NAME: **Sodium Bicarbonate**

MADAR Corporation Limited can confirm that the above listed product does not contain dairy or any other animal product, by product or derivative and is therefore suitable for vegetarian and vegan use.