

# CBI

## CLEAN BURNING IGNITOR (CBI)

### FORMULATION:

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Nitrocellulose 98.0 min.  
Diphenylamine 1.50 +/- 1.0  
Potassium Nitrate 0.1max.  
Graphite glaze 0.2 added

### SHAPE

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Single perforated flake

### COLOR

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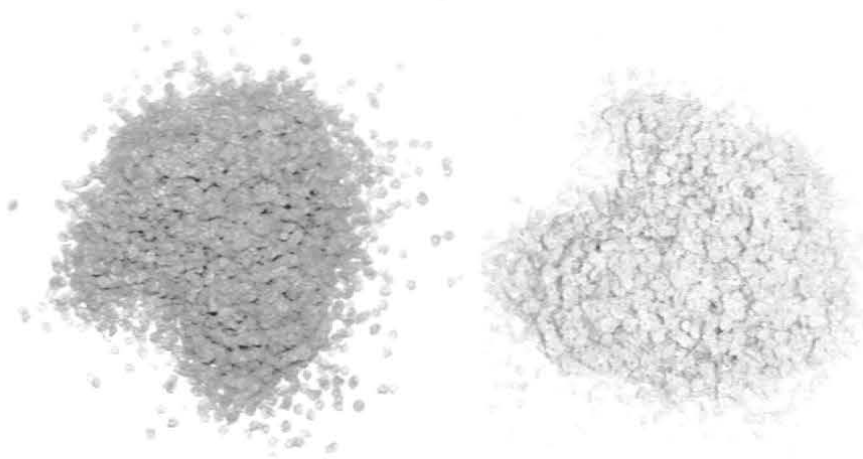
Yellow, green, blue

### DIMENSIONS

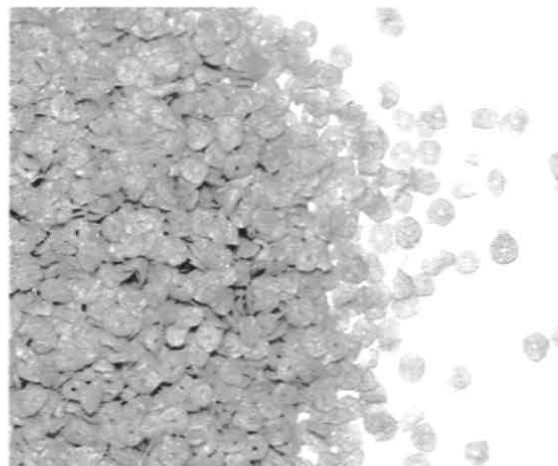
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Usage	Length (in)	Diameter (in)	Perf Diameter (in)	Inner (in)	Web Outer (in)	Average (in)	# of Perfs	Shape
155MM	0.0040	0.0800	0.0180	n/a	n/a	n/a	1	flake
Igniter Charge	0.0040	0.0550	0.0100	n/a	n/a	n/a	1	flake

*CBI Flake:*

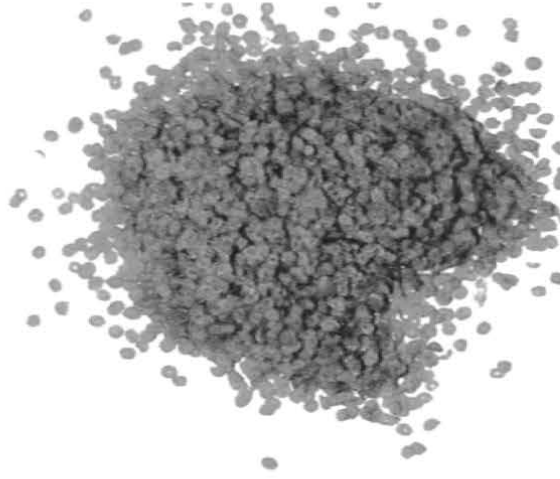


*Photos depict the color variation normally seen with CBI Flake Propellant*

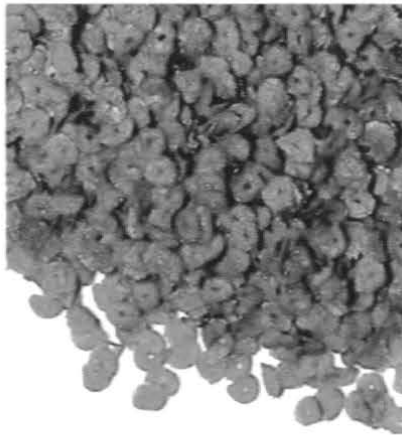


**CLOSE-UP OF CBI FLAKE**

*Blue Colored CBI Flake: A blue color change has been observed in the CBI igniter propellant in the M119A2 propelling charges stored in Southwest Asia. This phenomenon has only been seen in the M119A2 propelling charge "Y" lots. The color change has no correlation to diminished stability.*



*Actual size*



*Close-up of Blue CBI*



## MATERIAL SAFETY DATA SHEET

### PRODUCT NAME

POTASSIUM NITRATE

Product Code:

001/05-US

Date of issue:

March 2012

Supersedes: October 2008

### 1. PRODUCT AND COMPANY IDENTIFICATION

**Product identifier** Potassium nitrate / Krista K / Ultrasol K / Champion

#### Identified uses

Industrial use of potassium nitrate for formulation of preparations, intermediate use and end-use in industrial settings

Industrial end-use as energy storage salt

Professional use in formulation of fertilizer preparations and end-use as fertilizer

#### Non Recommended Uses

Food additive; Reagent in waste water treatment

#### Supplier

SQM North America  
2727 Paces Ferry Rd, Building Two, Suite 1425  
Atlanta, GA 30339

#### Company Telephone/Fax

(770) 916 9400 / (770) 916 9404

#### Emergency Telephone Number

(800) 424 9300 (CHEMTREC)

### 2. HAZARDS IDENTIFICATION

#### Emergency Overview

Crystals/Prills, white, odorless

#### WARNING

Oxidizer. Contact with combustible materials will not cause spontaneous ignition, however, sodium nitrate will enhance an existing fire.

May cause skin and eye irritation.

NFPA 704: National Fire Protection Association

Health 1  
Fire 0  
Reactivity 1  
Special Oxidizer

HMIS® III

Health 1  
Flammability 0  
Physical hazards 1

#### OSHA Regulatory Status

This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200)

#### Potential Health Effects

**Likely routes of exposure:** Eye contact, skin contact, inhalation.

In case of inhalation Irritation to respiratory tract

In case of skin contact May cause redness or irritation

In case of eye contact May cause redness or irritation

In case of ingestion Ingestion of large amounts may cause: Gastrointestinal disturbances

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance name	CAS No	EC No	Concentration
Potassium nitrate	7757-79-1	231-818-8	> 94 %
Sodium nitrate	7631-99-4	231-554-3	0.01 - 5 %
Sulphate (SO <sub>4</sub> <sup>+2</sup> )			< 1 %
Chloride (Cl <sup>-</sup> )			< 0.6 %
Magnesium (Mg <sup>+2</sup> )			< 0.5 %
Nitrite (NO <sub>2</sub> <sup>-</sup> )			< 0.02 %
Calcium (Ca <sup>+2</sup> )			< 0.2 %
Perchlorate (ClO <sub>4</sub> <sup>-</sup> )			< 0.01%
Iodate (IO <sub>3</sub> <sup>-</sup> )			0.005 - 0.01 %

For specific details on composition according to the product grade, see product data sheet

### 4. FIRST AID MEASURES

#### Description of first aid measures

##### General information

In case of persisting adverse effects consult a physician. Never give anything by mouth to an unconscious person or a person with cramps.

##### In case of inhalation

Remove to fresh air and keep at rest in a position comfortable for breathing. Get medical attention for any breathing difficulty.

##### In case of skin contact

Wash with plenty of soap and water. Remove contaminated clothing. If skin irritation occurs: Get medical advice/attention.

##### In case of eye contact

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

##### In case of ingestion

Induce vomiting. Rinse mouth immediately and drink plenty of water.



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### Most important symptoms and effects, both acute and delayed

The following symptoms may occur:

In case of inhalation	Irritation to respiratory tract
	Delayed lung effects after short term exposure to thermal degradation products
In case of skin contact	May cause redness or irritation
In case of eye contact	May cause redness or irritation
In case of ingestion	Ingestion of large amounts may cause:      Gastrointestinal disturbances

### Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

## 5. FIRE FIGHTING MEASURES

### Flammable properties

Not flammable.

### Extinguishing media

Suitable extinguishing media:      Use any suitable mean for extinguishing surrounding fire. Spray water for small fires. For large fires flood with abundant water.

Unsuitable material:      None, but attention should be paid to compatibility with chemicals surrounding.

### Protection for firefighters

#### Specific hazards arising from the chemical

Thermal decomposition can lead to the escape of toxic/corrosive gases and vapours.

#### Products of combustion

Thermal decomposition products: refer to section 10.

#### Protective equipment and precautions for firefighters

Keep upwind of fire. Wear full fire fighting turn-out gear (full Bunker gear) and respiratory protection (SCBA).

## 6. ACCIDENTAL RELEASE MEASURES

### Personal precautions

Provide adequate ventilation. Wear personal protection equipment (Section 8).

### Environmental precautions

Do not allow to enter into surface water or drains. Ensure waste is collected and contained.

### Methods for containment and cleaning up

Take up mechanically, placing in appropriate containers for disposal or recovery.

Unsuitable material for containment/taking up:      Do not absorb in saw-dust or other combustible absorbents.

### Other information

None

## 7. HANDLING AND STORAGE

### Handling

Avoid generation of dust. Provide adequate ventilation. Wear personal protective equipment. Wash hands thoroughly after handling. Do not eat, drink or smoke when using this product. Keep away from flammable, combustible and reducing substances.

### Storage

Keep/store only in original container. Store in a well-ventilated place. Keep container tightly closed.

Do not store together with:      Combustible substance, reducing agents

Perchlorate containing product - Special handling may apply. See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate) and Section 15 for more information regarding California State regulations.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Exposure Guidelines

#### Occupational exposure limits

Sodium nitrate:      No specific occupational exposure limit.

Particulates Not Otherwise Regulated (PNOR):      Inert or Nuisance Dust:

	mppcf*	mg/m <sup>3</sup>
Respirable fraction	15	5
Total dust	50	15

\*Millions of particles per cubic foot of air

#### Engineering controls

Use exhaust ventilation to keep airborne concentrations below exposure limits.

#### Personal Protective Equipment

Eye/face protection      Chemical goggles required all the time.

Skin Protection      Nitrile rubber gloves, over 0.11 mm thickness, > 480 min breakthrough time, recommended.

Respiratory Protection      Wear respiratory protection, where airborne concentrations are expected to exceed exposure limits

#### General Hygiene Considerations

Avoid contact with eyes and skin. Wash hands thoroughly after handling. Have eye-wash facilities immediately available.



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## 9. PHYSICAL AND CHEMICAL PROPERTIES

### Information on basic physical and chemical properties

Appearance	Solid, prilled or crystalline
Colour	White
Odour	Odourless
Odour Threshold	No applicable
pH value	8-10 (5% aqueous solution)
Melting point / melting range	335 °C / 635 F at 1013 hPa
Boiling temperature / boiling range	Not applicable
Flash point	Not applicable
Vapourisation rate / Evaporation rate	No data available
Flammable solids	Not flammable
Explosion limits (LEL, UEL)	Not applicable
Vapour pressure	Not applicable
Relative vapour density (air = 1)	No data available
Density	2.1 at 20°C / 68 F
Solubility	> 100 g/L at 25 °C / 77 F (water)
Partition coefficient n-octanol /water	Not applicable
Auto Ignition temperature (AIT)	Not applicable
Decomposition temperature	> 600 °C / 1112 F
Viscosity	Not applicable
Explosive properties	Not explosive
Oxidising properties	Oxidizer
<b>Other information</b>	
None	

## 10. STABILITY AND REACTIVITY

### Stability/Reactivity

Stable under normal storage and temperature conditions.

### Conditions to avoid

Keep away from flammable, combustible and reducing substances.

### Incompatible materials

Flammable, combustible and reducing substances under specific conditions. For storage and handling incompatibilities, refer to Section 7.

### Hazardous decomposition products

Thermal decomposition products (> 1112 F / 600 °C): Nitrous oxides (NO<sub>x</sub>), potassium nitrite and potassium oxide.

### Possibility of hazardous reactions

None identified

## 11. TOXICOLOGICAL INFORMATION

The following information mostly refers to the major component of the product.

### Information on toxicological effects

#### Acute toxicity

Acute oral toxicity	LD50:	> 2000 mg/kg bw	Species:	Method:
		Data obtained by analogy conclusion	Rat.	OECD Guideline 425
Acute dermal toxicity	LD50:	> 5000 mg/kg bw	Rat.	OECD Guideline 402
Acute inhalation toxicity	LC50:	> 0.527 mg/L (4-h)	Rat.	OECD Guideline 403
		(maximum achievable concentration)		

#### Irritant and corrosive effects

Irritation to the skin	Result:	Species:	
Equivalent/similar to OECD guideline 404	non-irritant.	Rabbit.	Data obtained by analogy conclusion
Primary dermal irritation index (PDII): 0 of max. 5 (mean) (Time point: 1, 24, 48, 72h)			
Irritation to eyes	Result	Species:	
OECD Guideline 437	non-irritant.	In vitro study	
OECD Guideline 405/EU B.5	non-irritant.	Rabbit.	
<b>Respiratory or skin sensitisation</b>	Result:	Species:	
OECD Guideline 429/EU B.42	not sensitising.	Mouse.	Data obtained by analogy conclusion
Respiratory sensitisation	No information available.		

#### Germ cell mutagenicity / Genotoxicity

In-vitro genotoxicity	Method:	Result:	
Gene-mutations microorganisms	bacterial reverse mutation assay	negative	(literature information)
Gene-mutations mammalian cells	OECD Guideline 476/EU B.17	negative	
Chromosome aberr. mammalian cells	According to Ishidate & Odashima (1977)	negative	(literature information)
Sister Chromatid Exchange (SCE)	Equivalent or similar to OECD 479	negative	(literature information)

#### Carcinogenicity

International Agency for Research on Cancer (IARC)	Inadequate animals and humans evidence
National Toxicology Program (NTP)	Not listed
29 CFR part 1910, subpart Z	Not listed
California Proposition 65	Not listed
WHO (2003) Nitrate in drinking water	No association between nitrate exposure in humans and the risk of cancer



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#### Reproductive toxicity

Adverse effects on sexual function and fertility/developmental toxicity

OECD guideline 422. NOAEL(C): 1500 mg/kg/d Rat.

At the highest dose tested, no effects on fertility or development were observed in this repeated dose toxicity study.

#### Specific target organ toxicity (single exposure)

Practical experience / human evidence

No relevant effect have been observed after single exposure to potassium nitrate.

#### Specific target organ toxicity (repeated exposure)

OECD guideline 422.

Effect dose: Organs affected:

NOAEL(C): 1500 mg/kg bw/day

None

#### Aspiration hazard

Physicochemical data and toxicological information does not indicate an aspiration hazard.

#### Other Toxicological Information

This product contains trace amounts of naturally-occurring perchlorate and iodate. Like other goitrogenic substances, perchlorate may affect iodine uptake by thyroid under specific conditions.

### 12. ECOLOGICAL INFORMATION

The following information mostly refers to the major component of the product.

#### Toxicity

Aquatic toxicity

96-h LC50 1378 mg/L

*Poecilia reticulata* (freshwater fish) (literature information)

48-h EC50 490 mg/L

*Daphnia magna* (fresh water flea). (literature information)

10 d EC50 > 1700 mg/L

Several algae species (literature information)

#### Persistence and degradability

In aqueous compartments, the substance will dissociate into sodium and nitrate ions. Other minor compounds are also expected to be dissociated in their corresponding ions. Sodium ions are not subject to further degradation. Under anoxic conditions, nitrate is subjected to denitrification and is ultimately converted into molecular nitrogen as part of the nitrogen cycle. Nitrate and other oxyanions impurities are likely to be found in oxic compartments.

#### Bioaccumulative potential

Potassium nitrate has a low potential for bioaccumulation based on physicochemical properties (high water solubility).

#### Mobility in soil

Nitrate has a low potential for adsorption. Portion not taken up by plants, can leach to groundwater. Potassium may be absorbed by plants and it can also participate in ion exchange processes.

#### Other adverse effects

Excess nitrate leaching may enrich waters leading to eutrophication.

### 13. DISPOSAL CONSIDERATIONS

Disposal should be in accordance with applicable regional, national and local laws and regulations.

It is the responsibility of the waste generator to determine the toxicity and physical properties of the material generated to determine the proper waste identification and disposal method in compliance with applicable regulations (eg. Resource Conservation and Recovery Act (RCRA) 40 CFR 261).

Perchlorate containing product - Special handling may apply. See [www.dtsc.ca.gov/hazardouswaste/perchlorate](http://www.dtsc.ca.gov/hazardouswaste/perchlorate) and Section 15 for more information regarding California State regulations.

### 14. TRANSPORT INFORMATION

#### US DOT (ground)

UN-No. 1486  
Proper Shipping Name POTASSIUM NITRATE  
Class(es) 5.1  
Packing group III  
Hazard label(s) 5.1 (oxidizer)  
Special marking No

#### Sea transport (IMDG)

UN-No. 1486  
Proper Shipping Name POTASSIUM NITRATE  
Class(es) 5.1  
Packing group III  
Marine pollutant No  
Hazard label(s) 5.1 (oxidizer)  
Special marking No  
Special Provision 964

#### Air transport (ICAO-TI / IATA-DGR)

UN-No. 1486  
Proper Shipping Name POTASSIUM NITRATE



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Class(es) 5.1  
Packing group III  
Hazard label(s) 5.1 (oxidizer)  
Special marking No

#### Special precautions for user

None

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not applicable

#### Remark

None

### 15. REGULATORY INFORMATION

#### US Federal

SARA Title III Rules

Section 311/312 Hazard Classes

Acute Health Hazard	No
Chronic Health Hazard	No
Fire Hazard	Yes (Oxidizer)
Release of Pressure	No
Reactive Hazard	No

Section 313 Toxic Chemicals

N511 Nitrate compounds (water dissociable; reportable only when in aqueous solution)

Section 302 Extremely Hazardous Substances (EHS)/CERCLA Hazardous Substances

Potassium nitrate is not listed

#### US State Regulations

California Proposition 65

Potassium nitrate is not listed

California Code of Regulations Title 22  
(Health & Safety Code), Chapter 33

See <http://www.dtsc.ca.gov/hazardouswaste/perchlorate/>

#### Canada

WHMIS Classification:

Class C

This product has been classified according to the hazard criteria of the 2010 Controlled Products Regulations (CPR) and the MSDS contains all the information required by the CPR.

#### European Union

Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]

Hazard classes and Hazard categories	Hazard statements
Ox. Sol. 3*	H272

\*Applicable only to the crystalline form. Granular form that passes UN Test 0.1 is not classified under GHS/CLP.

### 16. OTHER INFORMATION

This MSDS complies with 29 CFR part 1910 subpart Z, 2010 Canada Controlled Products Regulations (CPR) and ANSI Standard Z400.1-2004

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#### Indication of changes

All sections were reviewed, contents were updated and format was changed.