

# MATERIAL SAFETY DATA SHEET

SECTION 1 - PRODUCT AND COMPANY IDENTIFICATION						
<b>PRODUCT NAME:</b> <b>RockCracker™</b> (Primary Filler Charge*) (ALL Propellant)		<b>DATE:</b> 8/15/2008				
<b>PRODUCT NUMBERS:</b> 27.5/20E&S, 27.5/40E&S, 27.5/100E,S&B, 42/100E,S&B						
<b>TRADE NAME:</b> RockCracker™ Cartridges <b>GENERAL USE:</b> Rock fracturing propellant. <b>CHEMICAL FAMILY:</b> NG,NC explosives ,oxidizers & metals blend. <b>PRODUCT DESCRIPTION:</b> Odorless plastic casting with attached plastic tubing.						
<b>MANUFACTURER</b> <b>Global Pyrotechnic Solutions, Inc.(d/b/a:GPS,Inc.)</b>		<b>DISTRIBUTOR</b> <b>RockTek USA Ltd.</b>				
<b>ADDRESS (NUMBER, STREET, P.O. BOX)</b> 10476 Sunset Drive		<b>ADDRESS (NUMBER, STREET, P.O. BOX)</b> 10476 Sunset Drive				
<b>(CITY, STATE AND ZIP CODE)</b> COUNTRY Dittmer, MO 63023 USA		<b>(CITY, STATE AND ZIP CODE)</b> COUNTRY Dittmer, MO 63023 USA				
<b>TELEPHONE NUMBER FOR INFORMATION / Customer Service</b> 813-248-0573		<b>TELEPHONE NUMBER FOR INFORMATION / Customer Service</b> 813-248-0573				
		<b>CHEMTEL 24-HOUR EMERGENCY TELEPHONE NUMBER</b>				
North America Toll Free		<b>1-800-255-3924</b>				
International		<b>813-248-0585</b>				
SECTION 2 - HAZARDOUS INGREDIENTS						
Hazardous Components	% (by Weight)	CAS #	EINECS #		Hazard Symbol	RISK PHRASES (Full Text Section 15)
Nitrocellulose (13.05-13.2% N)	40-70	9004-70-0	NR	(+E),(+F)		R1,R2,R5,R11
Dinitrotoluene	1 max.	606-20-2	210-106-0	(+T),(+N)	R23/24/25,R45, R48/22, R62,R68	R51/53
Potassium nitrate	.1-1.5	7757-79-1	231-818-8	(+O)		R9
Graphite	.4 max.	7782-42-5	231-955-3	None		None
Diphenylamine Stabilizer	.75-1.5	122-39-4	204-539-4	(+T),(+N)		R23/24/25, R33, R50/53
Nitroglycerin	12-16	55-63-0	200-240-8	(+E),(+T), (+N)		R3,R26/27/28,R33, R51/53
Calcium Carbonate	1 max	1317-65-3	215-279-6	None		None
Dinitrobenzene	5.5-9.5	25154-54-5	246-673-6	(+T),(+N)		R26/27/28,R33,R50/53
Rosin	1.2 max	9/78050	232-475-7	XI		R 43
Sodium Sulfate	0.5 max	7757-82-6	231-820-9	None		None
Stannic Oxide	0.65-1.5	1332-29-2	215-569-2	None		None
Deterrent	4-8	NR	NR	NR		NR
TV	2 max	NR	NR	NR		NR
NOTES: * This MSDS describes the composition of the Primary filler charge only, the igniters and booster charge are not part of the primary filler charge and are the subject of other MSDS's. Materials in this product are subject to the reporting requirements of S.A.R.A. Title III, Section 313 as follows: Nitroglycerin, Dinitrotoluene,Diphenylamine,Dinitrobenzene.						
<b>Warning: Product has limited shelf life. Manufacturer's recommendation is a 2 year shelf life. DO NOT USE EXPIRED OR DETERIORATED PRODUCT!!</b>						
SECTION 3 - HAZARDS IDENTIFICATION						
<b>EMERGENCY OVERVIEW: Product is highly explosive and flammable!!</b>						
No exposure to chemical hazards is expected with normal handling of the packaged articles. Post firing fumes may cause discomfort in some individuals. <b>HAZARDOUS DECOMPOSITION PRODUCTS:</b> Nitrous Oxides (NOx) at low temperatures, Nitrogen (N2).Carbon Monoxide (CO). Ammonia (NH4). Carbon dioxide (CO2). Anemia and cardiovascular disease are aggravated by prolonged exposure. Workers should be in generally good health.						
<b>THIS SECTION APPLIES TO BOTH OPENED CARTRIDGES and IGNITED MATERIALS:</b>						
<b>PREVENTION OF ACCIDENTS IN THE USE OF EXPLOSIVES:</b>						
The prevention of accidents in the use of explosives is a result of careful planning and observance of the best known practices. The explosives user must remember that he is dealing with a powerful force and that various devices and methods have been developed to assist him in directing this force. He should realize that this force, if misdirected, may either kill or injure both him and his fellow workers.						
<b>WARNING</b>						
All explosives are dangerous and must be carefully transported, handled, stored, and used following proper safety procedures either by or under the direction of competent, experienced persons in accordance with all applicable federal, state and local laws, regulations, or ordinances.						
<b>ALWAYS lock up explosive materials and keep away from children and unauthorized persons.</b> If you have any questions or doubts as to how to use any explosive product, DO NOT USE IT before consulting with your supervisor, or the manufacturer, if you do not have a supervisor. If your supervisor has any questions or doubts, he should consult the manufacturer before use.						
<b>Smokeless powder is a deflagrating explosive.</b> It is very sensitive to flame and spark and can also be ignited by friction and impact. When ignited unconfined, it burns with explosive violence and will explode if ignited under even slight confinement.						
<b>Smokeless powder is a powerful explosive,</b> and ignition may cause severe physical injury, including death. All explosives are dangerous and must be handled carefully and used following approved safety procedures under the direction of competent, experienced persons in accordance with all applicable federal, state and local laws, regulation and ordinances.						

# MATERIAL SAFETY DATA SHEET

**PRODUCT NAME:** RocCracker™ (Primary Filler Charge\*) (ALL Propellant)  
**PRODUCT NUMBERS:** 27.5/20E&S, 27.5/40E&S, 27.5/100E,S&B, 42/100E,S&B **DATE:** 8/15/2008

### SECTION 3 - HAZARDS IDENTIFICATION Continued

#### POTENTIAL HEALTH EFFECTS

**INHALATION:**

Irritation to nose, throat, lungs. Dilation of blood vessels with drop in blood pressure and headache may result from the combustion of nitroglycerin.

**SKIN:**

Dilation of blood vessels with drop in blood pressure and headache may result from skin absorption of nitroglycerin. Irritation to skin is possible. Allergic contact dermatitis can occur secondary to topical exposure to nitroglycerin.

**EYES:**

Unlikely given the physical form of this products' packaging but can produce irritation if direct eye contact occurs.

**INGESTION:**

Gastrointestinal irritation, cardiovascular symptoms, aggravation of preexisting anemia. Dilation of blood vessels with drop in blood pressure and headache may result from the ingestion of nitroglycerin and nitrates present in this product..

**CARCINOGENICITY:**

NTP? None	IARC MONOGRAPHS? Group2b CAS 606-20-2	OSHA REGULATED? No
CALIFORNIA, Prop.65?	CAS 606-20-2	ESIS: CAS 606-20-2

### SECTION 4 - FIRST AID MEASURES

**INHALATION:**

Remove to fresh air. Administer artificial respiration and /or oxygen if unconscious. Obtain medical help if breathing remains difficult.

**EYES:**

Flush with water for 15minutes, get medical attention.

**SKIN:**

Wash skin with soap and water.

**INGESTION:**

Give 1 or 2 glasses of water to dilute substance. Get medical attention immediately.

### SECTION 5 - FIRE FIGHTING MEASURES

**GENERAL HAZARDS:**

FLASH POINT: >75° C. If confined, individual cartridges may deflagrate rapidly upon exposure to excessive heat, friction, initiation, impact or other flames. Will not mass explode if multiple devices are involved. Burning material may produce toxic vapors.

**EXTINGUISHING MEDIA:**

Water flood, Dry chemical, Foam

**FIRE FIGHTING PROCEDURES:**

Fight fires from a safe distance with hose apparatus by flooding packaging with water. Evacuate personnel to predetermined safe distance. Firemen may require breathing apparatus as vapor and fume levels generated (oxides of nitrogen) from thermal decomposition may be toxic.

**UNUSUAL FIRE AND EXPLOSION HAZARDS:**

If confined, individual cartridges may deflagrate rapidly upon exposure to excessive heat, friction, initiation, impact or other flames. Will not mass explode if multiple devices are involved. Burning material may produce toxic vapors.

**HAZARDOUS COMBUSTION PRODUCTS:**

Nitrous Oxides (NOx) at low temperatures, Nitrogen (N2). Carbon Monoxide (CO). Ammonia (NH4). Carbon dioxide (CO2).

### SECTION 6 - ACCIDENTAL RELEASE MEASURES

**STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED:**

Avoid any and all situations that could initiate the material such as flame, friction, heat or electrostatic discharge. Wet down with water first and then sweep up spilt contents with a soft bristle brush and non-metallic pan or shovel. Place material in a properly labeled storage container and store wet in an approved magazine for further disposition.

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## SECTION 7 - HANDLING AND STORAGE

**PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE:**

Handle with care. Store in an authorized magazine with compatible material. Store in a cool dry place. Fire resistant and heat insulated enclosure is recommended.

## SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

HAZARDOUS COMPONENTS	NIOSH				ACGIH		OSHA	
	TWA ppm	TWA mg/m3	STEL ppm	STEL mg/m3	TLV/TWA ppm	TWA mg/m3	PEL ppm	PEL mg/m3
Nitrocellulose (13.05-13.2% N)	NE		NE		NE		NE	
Dinitrotoluene		1.5				0.2		1.5
Potassium nitrate	NE		NE		NE		NE	
Graphite		2.5				2	NE	
Diphenylamine Stabilizer		10				10		15
Nitroglycerin			0.1		0.05	0.46	0.2	2
Calcium Carbonate		10			NE		15	
Dinitrobenzene		1	NE	50 IDLH		0.15		1
Rosin	NE		NE		Sensitizer		NE	
Sodium Sulfate	NE		NE		NE		NE	
Stannic Oxide		2				2		2
Deterrant	NR		NR		NR		NR	
TV	NR		NR		NR		NR	

### PERSONAL PROTECTION

**RESPIRATORY PROTECTION:**

None required for normal handling.

**PROTECTIVE GLOVES:**

Wear suitable gloves when initiating and handling post ignition residuals.

**EYE PROTECTION:**

Safety glasses and a blast shield when initiating .

**OTHER PROTECTIVE CLOTHING OR EQUIPMENT:**

None required for normal handling. Protective clothing recommended when handling post ignition residuals.

**WORK / HYGIENIC PRACTICES:**

Avoid breathing fumes from initiation. Do not use radios or cellular phones while handling product. Ground all handling and transferring operations. Use non-static utensils and tools while working with product, especially in dry conditions. Do not expose to heat, open flames, sparks or severe shock. Do not smoke while handling product. Do not eat or drink while handling product. Wash hands with soap and water after handling product.

## SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE AND ODOR	VAPOR PRESSURE
Odorless plastic casting with attached plastic tubing.	NA
pH	SPECIFIC GRAVITY (WATER = 1)
NE	0.85 to 0.95
BOILING POINT / BOILING RANGE	SOLUBILITY IN WATER
NA	Negligible
FLASH POINT	VISCOSITY
>75 °C	NA
FLAMMABLE LIMITS	VAPOR DENSITY (AIR = 1)
LEL: NA UEL: NA	NA
AUTOIGNITION TEMPERATURE	EVAPORATION RATE (WATER = 1)
NE	NA

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## SECTION 10 - STABILITY AND REACTIVITY

<p><b>STABILITY</b> STABLE <b>X</b></p> <p>Stable under normal conditions of transport and storage. Individual devices may initiate when subjected to fire, supersonic shock or high-energy projectile impact. Multiple devices in close proximity with each other will not mass explode.</p>	<p><b>CONDITIONS TO AVOID:</b></p> <p>Keep away from heat, flame, ignition sources and strong shock. Do not attempt to disassemble.</p>
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**INCOMPATIBILITY (MATERIALS TO AVOID):**  
 Corrosives, acids, organic solvents, organic compounds, phosphorous, sulfur, alkalines.

**HAZARDOUS DECOMPOSITION OR BYPRODUCTS:**  
 Nitrous Oxides (NOx) at low temperatures, Nitrogen (N2). Carbon Monoxide (CO). Ammonia (NH4). Carbon dioxide (CO2).

<p><b>HAZARDOUS POLYMERIZATION:</b></p> <p>Will not occur.</p>	<p><b>CONDITIONS TO AVOID:</b></p> <p>None related to polymerization.</p>
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## SECTION 11 - TOXICOLOGICAL INFORMATION

Hazardous Components	CAS # EINECS #	LD50 of Ingredient (Specify Species and Route)	LC50 of Ingredient (Specify Species)
Nitrocellulose	9004-70-0 NR	Oral Rat>5000mg/kg.	NE
Dinitrotoluene	606-20-2 210-106-0	Oral, rat: LD50 = 177 mg/kg	Inhalation, rat: LC50 = 240 mg/m3/6H.
Potassium nitrate	7757-79-1 231-818-8	Oral, Rat: LD50=3540 mg/kg	NE
Graphite	7782-42-5 231-955-3	NE	NE
Diphenylamine Stabilizer	122-39-4 204-539-4	Oral, rat: LD50 = 1120 mg/kg	NE
Nitroglycerin	55-63-0 200-240-8	Oral,Rat:LD50=105mg/kg.	NE
Rosin	8050-0-7 232-475-7	NE	NE
Calcium Carbonate	1317-65-3 215-279-6	NE	NE
Dinitrobenzene	25154-54-5 246-673-6	Oral LD50, rat: < 50 mg/kg (Eastman Kodak).	NE
Sodium Sulfate	7757-82-6 231-820-9	Oral, mouse: LD50=5989mg/kg.	NE
Stannic Oxide	1332-29-2 215-569-2	Oral, mouse: LD50=>20gm/kg	NE
Deterrent	NR NR	NR	NR
TV	NR NR	NR	NR

## SECTION 12 - ECOLOGICAL INFORMATION

This product has not been tested for environmental compatibility however based on the ingredients utilized it is biodegradable but is acutely toxic to some marine organisms. Components are monitored by EPA. This product should generally not be placed in bodies of water or in sewers. When a hazardous materials incident requires that material be flushed into a sewer system or body of water (such as firefighting or spill cleanup), prompt notification of pertinent authorities must take place in order for remediation to begin. Failure to follow procedures for environmental notification and cleanup may result in sanctions from authorities.

## SECTION 13 - DISPOSAL CONSIDERATIONS

**WASTE DISPOSAL METHOD:** **ONLY TRAINED AND QUALIFIED PERSONNEL SHOULD DISPOSE OF PRODUCT!!!**

Disposal is required by a licensed propellant and /or explosives disposal facility only and in accordance with all applicable local ,state and federal regulations governing disposal of Class 1.4S explosives. Disposal of explosives should be carried out under the direct supervision of a qualified person. For industrial disposal, federal hazardous waste regulations allow open burning of explosive wastes in permitted facilities. Burn in the open in an isolated location in small, shallow piles not over one inch deep. Stay upwind. Do not breathe products of combustion. State or local regulations may be more stringent than federal regulations. For disposal of small quantities, contact state or local environmental agencies for options. **DO NOT DISPOSE IN NORMAL TRASH RECEPTACLES!!**

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## SECTION 14 - TRANSPORT INFORMATION

<b>PROPER SHIPPING NAME:</b> Cartridges, power device, 1.4S, UN-0323		<b>EX#</b> 2008050318	
<b>DOT HAZARD CLASS / Pack Group:</b> 1.4S/PGII  <b>REFERENCE:</b> 49CFR  <b>UN / NA IDENTIFICATION NUMBER:</b> UN-0323  <b>LABEL:</b> Explosives 1.4S, Oxidizer 5.1, Toxic 6.0, Marine Pollutant.  <b>HAZARD SYMBOLS:</b>	<b>IATA HAZARD CLASS / Pack Group:</b> 1.4S, PGII  <b>IMDG HAZARD CLASS:</b> 1.4S Explosives, Oxidizer 5.1, Toxic 6.0, Marine Pollutant.  <b>RID/ADR Dangerous Goods Code:</b> Explosives 1.4S  <b>UN TDG Class / Pack Group:</b> UN-0323/PGII.  <b>Hazard Identification Number (HIN):</b> 556		



Note: Transportation information provided is for reference only. Client is urged to consult CFR 49 parts 100 - 177, IMDG, IATA, EU, United Nations TDG, and WHMIS (Canada) TDG information manuals for detailed regulations and exceptions covering specific container sizes, packaging materials and methods of shipping.

## SECTION 15 - REGULATORY INFORMATION

**TSCA (USA - Toxic Substance Control Act):** Listed.

**SARA TITLE III (USA - Superfund Amendments and Reauthorization Act):**

Acute Health: Yes	Chronic Health: Yes
Fire: Yes	Sudden Release of Pressure: Yes
Reactive: Yes	

**313 REPORTABLE INGREDIENTS:** This material contains Potassium Nitrate (listed as Water Dissociable Nitrate Compounds), (CAS#7757-79-1) which are subject to the reporting requirements of Section 313 of SARA Title III and 40 CFR Part 373. It also contains Nitroglycerin (CAS#55-63-0), Dinitrobenzene (CAS# 25154-54-5), Diphenylamine (CAS# 122-39-4), and Dinitrotoluene (CAS# 25321-14-6), which are also subject to these reporting requirements.

**CERCLA (USA - Comprehensive Response Compensation and Liability Act):** RQ for Nitroglycerin is 10lbs. RQ for Dinitrobenzenes is 100lbs (45.4Kg), RQ for Dinitrotoluene is 100lbs (45.4Kg).

**California Prop 65, Safe Drinking Water and Toxic Enforcement Act of 1986:**

CAS 606-20-2 Dinitrotoluene, Cancer. CAS 25154-54-5 Dinitrobenzene, Male Reproductive Toxicity.

**CPR (Canadian Controlled Products Regulations):** Listed

**IDL (Canadian Ingredient Disclosure List):** Listed, Diphenylamine.

**DSL / NDSL (Canadian Domestic Substances List / Non-Domestic Substances List):** Ingredients listed






**EINECS (European Inventory of Existing Commercial Chemical Substances):** Nitrocellulose not referenced.

**WGK Water Quality Index:** 3

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## SECTION 15 - REGULATORY INFORMATION *Continued*

RISK PHRASES:	SYMBOL(S) REQUIRED FOR EU LABEL	SAFETY PHRASES:
<p><b>R3</b> : Extreme risk of explosion by shock, friction, fire or other sources of ignition.</p> <p><b>R9</b>: Explosive when mixed with combustible material.</p> <p><b>R23/24/25</b> : Toxic by inhalation, in contact with skin and if swallowed.</p> <p><b>R33</b> : Danger of cumulative effects.</p> <p><b>R43</b> : May cause sensitization by skin contact.</p> <p><b>R45</b>: May cause cancer.</p> <p><b>R50/53</b> : Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.</p> <p><b>R68</b>: Possible risks of irreversible effects.</p>	 (+E): Explosive   (+T): Toxic   (+F): Flammable   (+O): Oxidizer   (+N) Dangerous for the environment.	<p><b>S1/2</b> : Keep locked up and out of the reach of children.</p> <p><b>S3</b> : Keep in a cool place.</p> <p><b>S15</b> : Keep away from heat.</p> <p><b>S16</b> : Keep away from sources of ignition – no smoking.</p> <p><b>S24</b> : Avoid contact with skin.</p> <p><b>S26</b> : In case of contact with eyes, rinse immediately with plenty of water and seek medical attention.</p> <p><b>S27</b> : Take off immediately all contaminated clothing.</p> <p><b>S28</b> : After contact with skin, wash immediately with plenty of soap and water.</p> <p><b>S33</b> : Take precautionary measures against static discharges.</p> <p><b>S35</b> : This material and its container must be disposed of in a safe way.</p> <p><b>S36/37</b> : Wear suitable protective clothing and gloves.</p> <p><b>S37</b> : Wear suitable gloves.</p> <p><b>S45</b> : In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).</p> <p><b>S60</b> : This material and its container must be disposed of as hazardous waste.</p> <p><b>S61</b> : Avoid release to the environment. Refer to special instructions/Safety data sheets.</p>

## SECTION 16 - OTHER INFORMATION

**Legend:** ND=Not Determined, NE=Not established, NR= Not referenced, NA= Not applicable.

HMIS HAZARD RATINGS	HEALTH:	2	0 = INSIGNIFICANT
	FLAMMABILITY:	4	1 = SLIGHT
	PHYSICAL HAZARD:	4	2 = MODERATE
	PERSONAL PROTECTIVE EQUIPMENT:	B	3 = HIGH
			4 = EXTREME

**REVISION SUMMARY:**  
 Revised to GHS/EU protocols 08/14/2008 supersedes 6/14/2008. JTV.

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The information contained herein is believed to be accurate but is not warranted to be so. Data and calculations are based on information furnished by the manufacturer of the product and manufacturers of the components of the product. Users are advised to confirm in advance of need that information is current, applicable and suited to the circumstances of use. Vendor assumes no responsibility for injury to vendee or third persons proximately caused by the material if reasonable safety procedures are not adhered to as stipulated in the data sheet. Furthermore, vendor assumes no responsibility for injury caused by abnormal use of this material even if reasonable safety procedures are followed. Any questions regarding this product should be directed to the manufacturer of the product as described in Section 1.