

MSDS SHEETS FOR TITAN MANUFACTURED PRODUCTS

- SHAPED CHARGES
- POWER CHARGE IGNITER – BAKER & GO
- BAKER STYLE SECONDARY
- POWER CHARGES – SB1 (1-1/2" SHORTY), SB2 (BAKER #20 SLOW BURN), SB3 (3-1/2" SHORTY), SB4 (3-5/8" COMPACT)& SB5 (BAKER #10 SLOW BURN)

IDENTITY (As Used on Label and List)

TRADE NAMES OR SYNONYMS: Shaped Charges, Jet Charges, Perforators, Perforating Charges, Jet Cutters, Tubing Cutters, Drill Pipe Cutters, Casing Cutters, etc.

CHARGES, SHAPED

Section I -- Name, Address and Telephone numbers.

Titan Specialties, LTD.

143 HCR 4361

Milford, Texas U.S.A. 76670

Emergency Telephone Number:

1-800-424-9300 or 1-703-527-3887

Telephone Number for Information:

1-972-493-2580

Website for Information:

www.titanspecialties.com

Section II -- Hazardous Ingredients/Identity Information

Hazardous Components (Specific Chemical Identity: Common Name(s))

	Shaped Charges, RDX Explosive			Shaped Charges, HMX Explosive		
	OSHA PEL	ACGIH TLV	C.A.S. No.	OSHA PEL	ACGIH TLV	C.A.S. No.
Cyclotrimethylene Trinitramine (RDX)	NE	0.5 mg/M3	121-82-4	NA	NA	NA
Cyclotetramethylene Tetranitramine (HMX)	NA	NA	NA	NE	NE	2691-41-0
Desensitizing Wax	NE	NE	NE	NE	NE	NE
Corrosion Resistant Steel	NE	NE	NE	NE	NE	NE
Graphite	15 mppcf	2 mg/M3	7782-42-5	15 mppcf	2 mg/M3	7782-42-5
Copper	1 mg/M3	1 mg/M3	7440-50-8	1 mg/M3	1 mg/M3	7440-50-8
Lead	0.05 mg/M3	0.05 mg/M3	7439-92-1	0.05 mg/M3	0.05 mg/M3	7439-92-1
Tungsten	NE	5 mg/M3	7440-33-7	NE	5 mg/M3	7440-33-7

	Shaped Charges, HNS Explosive			Shaped Charges, PYX Explosive		
	OSHA PEL	ACGIH TLV	C.A.S. No.	OSHA PEL	ACGIH TLV	C.A.S. No.
Hexanitrostilbene (HNS)	NE	NE	20062-22-0	NA	NA	NA
2, 6-Bis (Picrylamino)-3, 5-Dinitropyridine (PYX)	NA	NA	NA	NE	NE	38082-89-2
Desensitizing Wax	NE	NE	NE	NE	NE	NE
Corrosion Resistant Steel	NE	NE	NE	NE	NE	NE
Graphite	15 mppcf	2 mg/M3	7782-42-5	15 mppcf	2 mg/M3	7782-42-5
Copper	1 mg/M3	1 mg/M3	7440-50-8	1 mg/M3	1 mg/M3	7440-50-8
Lead	0.05 mg/M3	0.05 mg/M3	7439-92-1	0.05 mg/M3	0.05 mg/M3	7439-92-1
Tungsten	NE	5 mg/M3	7440-33-7	NE	5 mg/M3	7440-33-7

NE = Not Established

NA = Not Applicable

M3 = Cubic Meter

Section III -- Physical/Chemical Characteristics

Appearance and Odor : Solid. Explosive shaped charges contained in metal housings.

Section IV -- Fire and Explosion Hazard Data

Extinguishing Media : None

Special Fire Fighting Procedures : **DO NOT FIGHT FIRES! EXPLOSION MAY OCCUR!** Isolate area. Evacuate area for at least 1500 ft. (460 meters). Consult U.S. D.O.T. Emergency Response Guide or local emergency response personnel for further details.

Unusual Fire and Explosion Hazards: May detonate with impact, flame or heat. Hazardous gases, including nitrogen oxides, may be produced in fire.

Section V -- Reactivity Data

Stability: Conditions to Avoid -- Detonates with impact, friction, flame, heat or electrostatic discharge.

Incompatibility: Materials to Avoid -- Acids and Alkalis.

Hazardous Decomposition or Byproducts: Detonation produces hazardous fragments. Gases produced may contain carbon monoxide and nitrogen oxide.

Hazardous Polymerization: Will not occur.

Section VI -- Health Hazard Data

Health Hazard (Acute and Chronic): Shaped charges do not present a health hazard in normal handling and use. However the product is high explosive and detonation may cause severe physical injury, including death.

Carcinogenicity: Lead is classified by IARC as possible carcinogenic to humans, but having no human evidence of carcinogenicity. All other components are not listed carcinogenic by NTP, IARC, or OSHA.

Signs and Symptoms of Exposure:

Inhalation of powders may cause nervous system irregularities including headaches and dizziness.

Dust contact with skin may cause minor skin irritation. Lead poisoning can result in damage to central and peripheral nervous systems, the blood forming organs, leading to anemia. Lead may impair the reproductive system of men and women. There is increasing evidence that lead exposure may effect blood pressure in adults

Emergency and First Aid Procedure: Remove victim to fresh air. Wash skin with soap. See physician

Section VII -- Precautions for Safe Handling and Use

Steps to be Taken in Case Material is Released or Spilled :

Clean up should be done only by personnel experienced in handling explosives. Isolate area and remove sources of impact, friction, flame, heat, electrostatic energy, RF energy. Wear safety glasses, gloves and dust respirator (if area is dusty).

Clean up , sweep up with non-sparking tools.

Transportation: Transport in accordance with local, state and/or country regulations.

Waste Disposal Method: Contact an authorized explosives disposal agency or facility. Improper disposal may result in severe personnel injury, including death.

Precautions to Be Taken in Handling and Storing:

Keep away from impact, friction, flame, heat, electrical, or electrostatic energy. Do not attempt to disassemble. Store in accordance with local and safety and regulatory requirements.

Other Precautions:

Do not consume food, drink, or tobacco in area where they may become contaminated with these materials.

After handling or other exposure, immediately wash thoroughly with soap and water.

Section VIII -- Control Measures

Respiratory Protection: Not normally required

Ventilation: Not normally required

Protective Gloves:

Not normally required

Eye Protection:

Safety glasses recommended

Other Protective Clothing or Equipment: Not normally required. Clothing should not have propensity to build up electrostatic energy.

Work/Hygienic Practices: Use normal good hygienic practices

MATERIAL SAFETY DATA SHEET

Primary Igniter

Section 1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Primary Igniter, Baker Style**
Primary Igniter, GO Style

Other Name: Igniters

Company:

Titan Specialties, Ltd.

11785 Hwy 152

P.O. Box 2316

Pampa, Texas U.S.A. 79066

Telephone – Non-Emergency: 1-806-665-3781

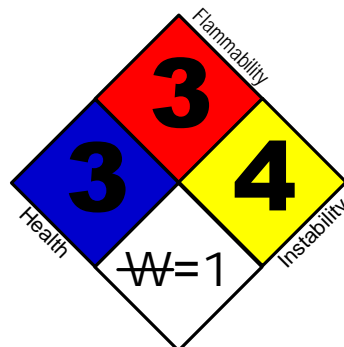
Website: www.titanspecialties.com

Emergency Telephone Number

CHEMTREC:

1-800-424-9300, or

1-703-527-3887



Section 2. HAZARDS IDENTIFICATION

2.1 Emergency Overview.

- Article containing pyrotechnic chemical mixture.
- **DANGER! RAPID DEFLAGRATION MAY OCCUR FROM BURNING; EXCESSIVE IMPACT; RAPID OR PROLONGED HEATING; OR APPLICATION OF OTHER SOURCES OF IGNITION. HAZARDS OF THIS REACTION MAY INCLUDE HEAT, FLAME, AND POISONOUS OXIDES OF NITROGEN.**
- Do NOT fight fire involving Igniters. EVACUATE.
- See ERG Guide 114.

2.2 OSHA Regulatory Status. EXPLOSIVE ARTICLE.

2.3 Potential Health Effects.

- Injury or death due to heat and flame from an unplanned, unprotected deflagration of the Igniter.
- Poisonous Oxides of Nitrogen are produced as a combustion by-product.

2.4 Potential Environmental Effects.

- Physical damage due to heat and flame.
- In the unlikely event that the pyrotechnic chemical mixture is exposed, both potassium perchlorate and potassium nitrate (Pyrodex® ingredient) are water soluble.

Section 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Component	CAS Number
Pyrodex®, Pyrotechnic Mixture	---
Magnesium Powder	7439-95-4

Section 4. FIRST AID MEASURES

Seek medical attention. Be aware of wounds and burns. Treat for shock. Remove to fresh air. Administer oxygen as required.

Section 5. FIRE FIGHTING MEASURES

5.1 Flammable Properties.

- DANGER! RAPID DEFLAGRATION MAY OCCUR FROM BURNING; EXCESSIVE IMPACT; RAPID OR PROLONGED HEATING; OR APPLICATION OF OTHER SOURCES OF IGNITION. HAZARDS OF THIS REACTION MAY INCLUDE HEAT, FLAME, AND POISONOUS OXIDES OF NITROGEN.

5.2 Extinguishing Media.

- DANGER! Do NOT fight fires involving Igniters.
- If the pyrotechnic chemical mixture is exposed, the magnesium component will react with water to form hydrogen.

5.3 Protection of Firefighters.

- DANGER! Do NOT fight fires involving Igniters.
- Isolate for 500 meters (1/3 mile) in all directions.
- Evacuate, including emergency responders, for 500 meters (1/3 mile) in all directions.

Section 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions.

- For large spill, consider initial evacuation of 250 meters (800 feet) in all directions.
- If spill involves fire or a significant potential for fire, refer to Section 5.

6.2 Environmental Precautions.

- None specific for spill of Igniters.

6.3 Methods for Containment.

- None specific for spill of Igniters.

6.4 Methods of Clean-up.

- Clean-up should be handled by competent explosives handler/response personnel.

6.5 Other Information.

- Remove all potential ignition sources.

Section 7. HANDLING AND STORAGE

7.1 Handling.

- In general, buyers and users may have to prove their competence to authorities and may be obliged by law to keep a storage record.
- Federal, state, county, and local laws and ordinances may govern the handling and storage of igniters.

7.2 Storage.

- Avoid storage at temperature above 125°F.
- The manner of construction of storeroom containers and buildings, permissible stacking heights, and minimum distance between storage and other buildings are in most cases officially specified.

Section 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Exposure Guidelines.

Component	OSHA		ACGIH	
	TWA	STEL	TWA	STEL
Pyrodex®	N.E.	N.E.	N.E.	N.E.
Magnesium Powder	N.E.	N.E.	N.E.	N.E.

8.2 Engineering Controls.

- Utilize ATF P 5400.7, 29 CFR §1910.109, industry consensus standards, and applicable state, county, and local regulations for engineering controls.

8.3 Personal Protective Equipment (PPE).

- For normal handling, specific PPE is not specified. Consult user's procedures.
- Use of safety glasses is a good general practice.
- In case of fire, use a supplied air respirator for protection from NO_x.
- Danger! In case of an emergency that could result in ignition of the Igniter(s), distance from the event is required to provide adequate protection. Do not rely on PPE alone for protection.

Section 9. PHYSICAL AND CHEMICAL PROPERTIES

- 9.1 Appearance of Exposed Pyrotechnic Material..... Grey Powder-to-Solid
- 9.2 Impact Sensitivity, Modified BOM, TIL..... 41 cm
- 9.3 Friction sensitivity, ABL, TIL greater than 800 lbf @ 8 ft/s
- 9.4 Solubility in Water
- Pyrodex Partially.
 - Magnesium Powder Insoluble.
- 9.5 Odor None

Section 10 STABILITY AND REACTIVITY

- 10.1 Chemical Stability.
- Stable.
 - Hazardous polymerization will not occur.
 - Will explode (rapid deflagration) when subjected to adequate sources of ignition.
- 10.2 Conditions to Avoid.
- Heat, Flame, Moisture, Contact with Oxidizing Materials, Other Sources of Ignition.
 - Do not store at temperatures above 125°F.
- 10.3 Incompatible Materials—As Related to Exposed Pyrotechnic Chemical Composition.
- Oxidizing Agents, Reducing Agents, Strong Acids, Combustible Materials, Organic Materials, Most Common Metals, Moisture.
- 10.4 Hazardous Decomposition Products.
- Heat, Pressure, Oxides of Carbon, Oxides of Nitrogen, Oxides of Sulfur
- 10.5 Possibility of Hazardous Reactions.
- DANGER! RAPID DEFLAGRATION MAY OCCUR FROM BURNING; EXCESSIVE IMPACT; RAPID OR PROLONGED HEATING; OR APPLICATION OF OTHER SOURCES OF IGNITION. HAZARDS OF THIS REACTION MAY INCLUDE HEAT, FLAME, AND POISONOUS OXIDES OF NITROGEN.

Section 11. TOXICOLOGICAL INFORMATION

- 11.1 Igniter as Intact Article.
- No toxicological effects are anticipated.
- 11.2 Exposed Pyrotechnic Chemical Mixture from Damaged Igniter(s).
- Potassium Nitrate, Pyrodex® ingredient, is an experimental teratogen. Experimental reproduction effects and mutagenic data are reported.
- 1.3 Deflagration By-Products.
- Include Oxides of Nitrogen which are experimental teratogens. Experimental reproductive effects and mutagenic data are reported.

Section 12. ECOLOGICAL INFORMATION

- 12.1 No ecological impact is anticipated from an intact Igniter.
- 12.2 In the unlikely event that the pyrotechnic chemical mixture is exposed, the mixture is moderately soluble in water.

Section 13. DISPOSAL CONSIDERATIONS

- 13.1 Exhibits the Reactivity Characteristic, D003, per 40 CFR §261.23. Other federal, state, county, or local regulations may apply.
- 13.2 Use RCRA permitted treatment/disposal facility experienced with processing explosive waste.

Section 14. TRANSPORT INFORMATION

Nomenclature	Primary Igniter Baker Style	Primary Igniter GO Style
UN Proper Shipping Name and Number	Igniters, UN0454	Igniters, UN0454
UN Classification Code	1.4S	1.4S
Reference Number	EX2005090463	EX2005090461
Production Designation/Part Number	6000-000-050, Primary Igniter for Baker No. 10 & No. 20 Style Setting Tool	6035-000-050, Primary Igniter for GO & Compact Style Setting Tools

Section 15 REGULATORY INFORMATON

Regulatory Requirement	Status
Toxic Substance Control Act Inventory	All components of the Pyrodex® plus all other components of the pyrotechnic mixture are registered.
SARA Title III, Extremely Hazardous Substances	None
EPCRA Toxic Chemical	None
CERCLA Hazardous Substances	None
Hazard Categories per 40 CFR §370.2 & 29 CFR §1910.1200	
Immediate (Acute) Health Hazard	Toxic NO _x , deflagration by-products.
Delayed (Chronic) Health Hazard	None
Fire Hazard	EXPLOSIVE ARTICLE capable of violent deflagration with temperatures from 1500°C
Sudden Release of Pressure	EXPLOSIVE ARTICLE
Reactive	Water Reactive: Magnesium Powder as incorporated into the pyrotechnic composition matrix

Section 16. OTHER INFORMATION

16.1 NFPA Ratings

- Health Hazard is the capability of a material to cause personal injury due to contact with or entry into the body via inhalation, ingestion, skin contact, or eye contact
 - o Health = 3, Materials that, under emergency conditions, can cause serious or permanent injury.
- Flammability Hazard is an assessment of a material's susceptibility to burning.
 - o Flammability = 3, Materials that burn with extreme rapidity, usually by reason of self-contained oxygen.
- Instability Hazard is the capability of a material to rapidly release energy by themselves.
 - o Instability = 4, Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures.
- Water Reactivity Hazard is the capability of the material to react violently or explosively with water.
 - o W = 1, Materials that react with water, producing either heat or gas leading to pressurization or toxic or flammable gas hazards.

References.

1. Documentation of the TLVs® and BEIs® with Other Worldwide Occupational Exposure Values, ACGIH® Worldwide, CD-ROM, 2005 Edition.
2. Kohler, J., Explosives, 4th Edition, VHC Publishers, Federal Republic of Germany, 1993, Page 140.
3. *Material Safety Data Sheets — Preparation*, ANSI Z400.1-2004.
4. *Hazard Communication*, U.S. code of Federal Regulations, Title 29, Part 1910, Section 1200.
5. *Precautionary Labeling*, ANSI Z129.1-2000.
6. The Merck Index, 12th Edition, Merck Research Laboratories, 1996.
7. Lewis, Richard. J., Sax's Dangerous Properties of Industrial Materials, 10th Edition, Volume 3, John Wiley & Sons, Inc., 2000.
8. *Identification of the Hazards of Materials for Emergency Response*, NFPA 704-2001.
9. *Hazardous Chemicals Data*, NFPA 49-2001
10. Unpublished test data for Impact and Friction Threshold Initiation Levels (TIL)

MATERIAL SAFETY DATA SHEET

Secondary Igniter Pellet

Section 1. PRODUCT AND COMPANY IDENTIFICATION

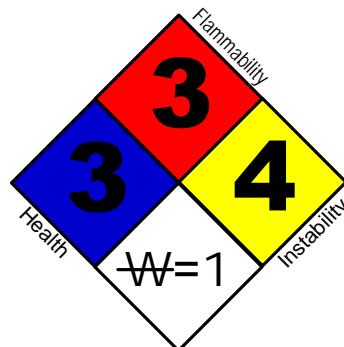
Product Name: **Secondary Igniter Pellet**
Other Name: Substance Explosive n.o.s.
Company:
Titan Specialties, Ltd.
11785 Hwy 152
P.O. Box 2316
Pampa, Texas U.S.A. 79066
Telephone – Non-Emergency: 1-806-665-3781
Website: www.titanspecialties.com

Emergency Telephone Number

CHEMTREC:

1-800-424-9300, or

1-703-527-3887



Section 2. HAZARDS IDENTIFICATION

2.1 Emergency Overview.

- Pyrotechnic Pellet.
- DANGER! RAPID DEFLAGRATION MAY OCCUR FROM BURNING; EXCESSIVE IMPACT; RAPID OR PROLONGED HEATING; OR APPLICATION OF OTHER SOURCES OF IGNITION. HAZARDS OF THIS REACTION MAY INCLUDE HEAT, FLAME, AND POISONOUS OXIDES OF NITROGEN.
- Do NOT fight fire involving Secondary Igniter Pellets. EVACUATE.
- See ERG Guide 114.

2.2 OSHA Regulatory Status. EXPLOSIVE.

2.3 Potential Health Effects.

- Injury or death due to heat and flame from an unplanned, unprotected deflagration of Secondary Igniter Pellets.
- Poisonous Oxides of Nitrogen are produced as a combustion by-product.

2.4 Potential Environmental Effects.

- Physical damage due to heat and flame.
- Potassium perchlorate and potassium nitrate (Pyrodex® ingredient) are water soluble.

Section 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Component	CAS Number
Pyrodex®, Pyrotechnic Mixture	---
Potassium Perchlorate	7778-74-7
Magnesium Powder	7439-95-4

Section 4. FIRST AID MEASURES

- 4.1 Seek medical attention. Be aware of wounds and burns. Treat for shock. Remove to fresh air. Administer oxygen as required.

Section 5. FIRE FIGHTING MEASURES

5.1 Flammable Properties.

- DANGER! RAPID DEFLAGRATION MAY OCCUR FROM BURNING; EXCESSIVE IMPACT; RAPID OR PROLONGED HEATING; OR APPLICATION OF OTHER SOURCES OF IGNITION. HAZARDS OF THIS REACTION MAY INCLUDE HEAT, FLAME, AND POISONOUS OXIDES OF NITROGEN.

5.2 Extinguishing Media.

- DANGER! Do NOT fight fires involving Secondary Igniter Pellets.
- If the pyrotechnic chemical mixture is exposed, the magnesium component will react with water to form hydrogen.

5.3 Protection of Firefighters.

- DANGER! Do NOT fight fires involving Secondary Igniter Pellets.
- Isolate for 500 meters (1/3 mile) in all directions.
- Evacuate, including emergency responders, for 500 meters (1/3 mile) in all directions.

Section 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions.

- For large spill, consider initial evacuation of 250 meters (800 feet) in all directions.
- If spill involves fire or a significant potential for fire, refer to Section 5.

6.2 Environmental Precautions.

- None specific to spill of Secondary Igniter Pellets.

6.3 Methods for Containment.

- None specific to spill of Secondary Igniter Pellets.

6.4 Methods of Clean-up.

- Clean-up should be handled by competent explosives handler/response personnel.

6.5 Other Information.

- Remove all potential ignition sources.

Section 7. HANDLING AND STORAGE

7.1 Handling.

- In general, buyers and users may have to prove their competence to authorities and may be obliged by law to keep a storage record.
- Federal, state, county, and local laws and ordinances may govern the handling and storage of Secondary Igniter Pellets.

7.2 Storage.

- Avoid storage at temperature above 125°F.
- The manner of construction of storeroom containers and buildings, permissible stacking heights, and minimum distance between storage and other buildings are in most cases officially specified.

Section 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Exposure Guidelines.

Component	OSHA		ACGIH	
	TWA	STEL	TWA	STEL
Pyrodex®	N.E.	N.E.	N.E.	N.E.
Potassium Perchlorate	N.E.	N.E.	N.E.	N.E.
Magnesium Powder	N.E.	N.E.	N.E.	N.E.

8.2 Engineering Controls.

- Utilize ATF P 5400.7, 29 CFR §1910.109, industry consensus standards, and applicable state, county, and local regulations for engineering controls.

8.3 Personal Protective Equipment (PPE).

- For normal handling, specific PPE is not specified. Consult user's procedures.
- Use of safety glasses is a good general practice.
- In case of fire, use a supplied air respirator for protection from NO_x.
- Danger! In case of an emergency that could result in ignition of the Secondary Igniter Pellets, distance from the event is required to provide adequate protection. Do not rely on PPE alone for protection.

Section 9. PHYSICAL AND CHEMICAL PROPERTIES

- 9.1 Appearance of Exposed Pyrotechnic Material..... Grey Cylindrical Pellet
- 9.2 Impact Sensitivity, Modified BOM, TIL..... 11 cm
- 9.3 Friction Sensitivity, ABL..... 25 lbf @ 8 ft/s
- 9.4 Solubility in Water
- Pyrodex..... Partially.
 - Potassium Perchlorate Soluble.
 - Magnesium Powder Insoluble.
- 9.5 Odor None.

Section 10 STABILITY AND REACTIVITY

- 10.1 Chemical Stability.
- Stable.
 - Hazardous polymerization will not occur.
 - Will violently deflagrate when subjected to adequate sources of ignition.
- 10.2 Conditions to Avoid.
- Heat, Flame, and Other Sources of Ignition.
 - Do not store at temperatures above 125°F.
- 10.3 Incompatible Materials.
- Oxidizing Agents, Reducing Agents, Strong Acids, Combustible Materials, Organic Materials, Most Common Metals, Moisture.
- 10.4 Hazardous Decomposition Products.
- Heat, Pressure, Oxides of Carbon, Oxides of Nitrogen, Oxides of Sulfur.
- 10.5 Possibility of Hazardous Reactions.
- DANGER! RAPID DEFLAGRATION MAY OCCUR FROM BURNING; EXCESSIVE IMPACT; RAPID OR PROLONGED HEATING; OR APPLICATION OF OTHER SOURCES OF IGNITION. HAZARDS OF THIS REACTION MAY INCLUDE HEAT, FLAME, AND POISONOUS OXIDES OF NITROGEN.

Section 11. TOXICOLOGICAL INFORMATION

- 11.1 Exposed Secondary Igniter Pellet.
- Potassium Perchlorate is an experimental teratogen.
 - Potassium Nitrate, Pyrodex® ingredient, is an experimental teratogen. Experimental reproduction effects and mutagenic data are reported.
- 11.2 Deflagration By-Products.
- Includes Oxides of Nitrogen. Nitrogen oxides are reported to be experimental teratogens. Experimental reproductive effects and mutagenic data are reported.

Section 12. ECOLOGICAL INFORMATION

12.1 An exposed Secondary Igniter Pellet is moderately soluble in water.

Section 13. DISPOSAL CONSIDERATIONS

- 13.1 Exhibits the Reactivity Characteristic, D003, per 40 CFR §261.23. Other federal, state, county, or local regulations may apply.
- 13.2 Use RCRA permitted treatment/disposal facility experienced with processing explosive waste.

Section 14. TRANSPORT INFORMATION

- 14.1 Nomenclature..... Secondary Igniter Pellet
- 14.2 UN Proper Shipping Name and Number Substances, explosive, n.o.s. (Potassium Perchlorate, Potassium Nitrate)
- 14.3 UN Classification Code 1.4C
- 14.4 Reference Number EX2005090462
- 14.5 Product Designation/Part Number..... 600-000-060 (Secondary Ignition Pellet for 10 & 20 Baker Style Setting Tools)

Section 15 REGULATORY INFORMATON

Regulatory Requirement	Status
Toxic Substance Control Act Inventory	All components of the Pyrodex® plus all other components of the pyrotechnic mixture are registered.
SARA Title III, Extremely Hazardous Substances	None
EPCRA Toxic Chemical	None
CERCLA Hazardous Substances	None
Hazard Categories per 40 CFR §370.2 & 29 CFR §1910.1200	
Immediate (Acute) Health Hazard	Toxic NOx, deflagration by-products.
Delayed (Chronic) Health Hazard	None
Fire Hazard	EXPLOSIVE ARTICLE capable of violent deflagration with temperatures from 1500°C
Sudden Release of Pressure	EXPLOSIVE ARTICLE
Reactive	Water Reactive: Magnesium Powder as incorporated into the pelleted pyrotechnic composition

Section 16. OTHER INFORMATION

16.1 NFPA Ratings

- Health Hazard is the capability of a material to cause personal injury due to contact with or entry into the body via inhalation, ingestion, skin contact, or eye contact
 - o Health = 3, Materials that, under emergency conditions, can cause serious or permanent injury.
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 - o Flammability = 3, Materials that burn with extreme rapidity, usually by reason of self-contained oxygen.
- Instability Hazard is the capability of a material to rapidly release energy by themselves.
 - o Instability = 4, Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures.
- Water Reactivity Hazard is the capability of the material to react violently or explosively with water.
 - o W = 1, Materials that react with water, producing either heat or gas leading to pressurization or toxic or flammable gas hazards.

References.

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3. *Material Safety Data Sheets — Preparation*, ANSI Z400.1-2004.
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5. *Precautionary Labeling*, ANSI Z129.1-2000.
6. The Merck Index, 12th Edition, Merck Research Laboratories, 1996.
7. Lewis, Richard. J., Sax's Dangerous Properties of Industrial Materials, 10th Edition, Volume 3, John Wiley & Sons, Inc., 2000.
8. *Identification of the Hazards of Materials for Emergency Response*, NFPA 704-2001.
9. *Hazardous Chemicals Data*, NFPA 49-2001
10. Unpublished test data for Impact and Friction Threshold Initiation Levels (TIL)

MATERIAL SAFETY DATA SHEET

Power Charge

Section 1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: **Power Charge, SB-1, SB-2, SB-3, SB-4, SB-5**

Other Name: Cartridges, Oil Well

Company:

Titan Specialties, Ltd.

11785 Hwy 152

P.O. Box 2316

Pampa, Texas U.S.A. 79066

Telephone – Non-Emergency: 1-806-665-3781

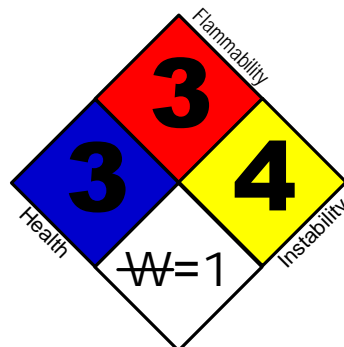
Website: www.titanspecialties.com

Emergency Telephone Number

CHEMTREC:

1-800-424-9300, or

1-703-527-3887



Section 2. HAZARDS IDENTIFICATION

2.1 Emergency Overview.

- Article containing pyrotechnic chemical mixture.
- **DANGER!** VIOLENT DEFLAGRATION MAY OCCUR FROM BURNING; EXCESSIVE IMPACT; RAPID OR PROLONGED HEATING; OR APPLICATION OF OTHER SOURCES OF IGNITION. HAZARDS OF THIS REACTION MAY INCLUDE HEAT, FLAME, AND POISONOUS OXIDES OF NITROGEN.
- Do NOT fight fires involving Power Charges. EVACUATE.
- See ERG Guide 114.

2.2 OSHA Regulatory Status. EXPLOSIVE ARTICLE.

2.3 Potential Health Effects.

- Injury or death due to heat and flame from an unplanned, unprotected violent deflagration of the Power Charge.
- Poisonous Oxides of Nitrogen are produced as a combustion by-product.
- **CARCINOGEN.** While Barium Chromate has not been identified as a carcinogen, Chromium VI compounds are listed by NTP as "Known to be Human Carcinogens". Based on the NTP classification, OSHA classifies Chromium VI compounds as "Carcinogens". Barium Chromate is a Chromium VI compound. Since the pyrotechnic mixture contains more than 0.1% Barium Chromate, the entire mixture is considered to be a carcinogen per 29 CFR 1910.1200. [Exposure of and contact with the pyrotechnic mixture is unlikely.]

2.4 Potential Environmental Effects.

- Physical damage due to heat and flame.

Section 3. COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Component	CAS Number
Aluminum	7429-90-5
Ammonium Perchlorate	7790-98-9
Barium Chromate	10294-40-3
Charcoal Powder	7440-44-0
Sodium Nitrate	7631-99-4
Strontium Nitrate	10042-76-9

Section 4. FIRST AID MEASURES

Seek medical attention. Be aware of wounds and burns. Treat for shock. Remove to fresh air. Administer oxygen as required.

Section 5. FIRE FIGHTING MEASURES

5.1 Flammable Properties.

- DANGER! VIOLENT DEFLAGRATION MAY OCCUR FROM BURNING; EXCESSIVE IMPACT; RAPID OR PROLONGED HEATING; OR APPLICATION OF OTHER SOURCES OF IGNITION. HAZARDS OF THIS REACTION MAY INCLUDE HEAT, FLAME, AND POISONOUS OXIDES OF NITROGEN.

5.2 Extinguishing Media.

- DANGER! Do NOT fight fires involving Power Charges.

5.3 Protection of Firefighters.

- DANGER! Do NOT fight fires involving Power Charges.
- Isolate for 500 meters (1/3 mile) in all directions.
- Evacuate, including emergency responders, for 500 meters (1/3 mile) in all directions.

Section 6. ACCIDENTAL RELEASE MEASURES

6.1 Personal Precautions.

- For large spill, consider initial evacuation of 250 meters (800 feet) in all directions.
- If spill involves fire or a significant potential for fire, refer to Section 5.

6.2 Environmental Precautions.

- None specific to spill of Power Charges.

6.3 Methods for Containment.

- None specific to spill of Power Charges.

6.4 Methods of Clean-up.

- Clean-up should be handled by competent explosives handler/response personnel.

6.5 Other Information.

- Remove all potential ignition sources.

Section 7. HANDLING AND STORAGE

7.1 Handling.

- In general, buyers and users may have to prove their competence to authorities and may be obliged by law to keep a storage record.
- Federal, state, county, and local laws and ordinances may govern the handling and storage of Power Charges.

7.2 Storage.

- Avoid storage at temperatures above 125°F.
- The manner of construction of storeroom containers and buildings, permissible stacking heights, and minimum distance between storage and other buildings may be officially specified.

Section 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Exposure Guidelines.

Component	OSHA		ACGIH	
	TWA	STEL	TWA	STEL
Aluminum	N.E.	N.E.	N.E.	N.E.
Ammonium Perchlorate	N.E.	N.E.	N.E.	N.E.
Barium Chromate	0.1 mg/m ³	N.E.	0.05 mg/m ³	N.E.
	Chromium VI Compounds are classified as "Carcinogens" per 29 CFR 1910.1200 via NTP listing.			
Charcoal Powder	N.E.	N.E.	N.E.	N.E.
Sodium Nitrate	N.E.	N.E.	N.E.	N.E.
Strontium Nitrate	N.E.	N.E.	N.E.	N.E.

8.2 Engineering Controls.

- Utilize ATF P 5400.7, 29 CFR §1910.109, industry consensus standards, and applicable state, county, and local regulations for engineering controls.

8.3 Personal Protective Equipment (PPE).

- For normal handling, specific PPE is not specified. Consult user's procedures.
- Use of safety glasses is a good general practice.
- In case of fire, use a supplied air respirator for protection from NO_x.
- DANGER ! In case of an emergency that could result in ignition of the Power Charge(s), distance from the event is required to provide adequate protection. Do not rely on PPE alone for protection.

Section 9. PHYSICAL AND CHEMICAL PROPERTIES

- | | |
|--|--|
| 9.1 Appearance of Exposed Pyrotechnic Material | Grey Solid |
| 9.2 Impact Sensitivity, Modified BOM, TIL | 13 cm (based on Charge topping composition) |
| 9.3 Friction Sensitivity, ABL, TIL | 50 lbf @ 8 ft/s (based on Charge topping composition) |
| 9.4 Solubility in Water | Chemical components are incorporated into an epoxy matrix which should minimize the solubility of the ammonium perchlorate, sodium nitrate, and strontium nitrate. |
| 9.5 Odor | None |

Section 10 STABILITY AND REACTIVITY

10.1 Chemical Stability.

- Stable.
- Hazardous polymerization will not occur.
- Will undergo violent deflagration when subjected to adequate sources of ignition.

10.2 Conditions to Avoid.

- Heat, Flame, and Other Sources of Ignition.
- Do not store at temperatures above 125°F.

10.3 Incompatible Materials – As Related to Exposed Pyrotechnic Chemical Composition.

- Oxidizing Agents, Reducing Agents, Strong Acids, Combustible Materials, Organic Materials, Moisture.

10.4 Hazardous Decomposition Products.

- Heat, Flame, Oxides of Carbon, Oxides of Nitrogen

10.5 Possibility of Hazardous Reactions.

- DANGER! VIOLENT DEFLAGRATION MAY OCCUR FROM BURNING; EXCESSIVE IMPACT; RAPID OR PROLONGED HEATING; OR APPLICATION OF OTHER SOURCES OF IGNITION. HAZARDS OF THIS REACTION MAY INCLUDE HEAT, FLAME, AND POISONOUS OXIDES OF NITROGEN.

Section 11. TOXICOLOGICAL INFORMATION

11.1 No toxicological effects are anticipated from the intact Power Charge.

11.2 In the unlikely event that the pyrotechnic chemical mixture is exposed, note that all ingredients are incorporated into an epoxy matrix. This incorporation should be considered when evaluating toxicological data for individual chemical components.

11.3 CARCINOGEN.

- Barium Chromate is a Chromium VI compound.
- NTP *Annual Report on Carcinogens* lists Chromium VI compounds as "Known to be Human Carcinogens".
- OSHA defines any NTP listing of "Known to be Human Carcinogens" as a "Carcinogen".
- OSHA requires that any mixture containing greater than 0.1% of a carcinogen will be considered, as a whole, to be a carcinogen, unless testing of the mixture proves otherwise.

11.4 Deflagration by-products include oxides of nitrogen. Nitrogen oxides are reported to be experimental teratogens. In addition, experimental reproductive effects and mutagenic data are reported.

Section 12. ECOLOGICAL INFORMATION

12.1 No ecological impact is anticipated from an intact Power Charge. In the unlikely event that the pyrotechnic chemical mixture is exposed, note that all ingredients are incorporated into an epoxy matrix. This incorporation should be considered a likely mitigating factor when evaluating ecological data for individual chemical components.

12.2 Violent deflagration of the charge may result in physical damage due to heat and flame.

Section 13. DISPOSAL CONSIDERATIONS

13.1 Exhibits the Reactivity Characteristic, D003, per 40 CFR §261.23. Other federal, state, county, or local regulations may apply.

13.2 Use RCRA permitted treatment/disposal facility experienced with processing explosive waste.

Section 14. TRANSPORT INFORMATION

- 14.1 Nomenclature..... Power Charge, SB-1, SB-2, SB-3, SB-4, SB-5
- 14.2 UN Proper Shipping Name and Number Cartridges, oil well, UN0278
- 14.3 UN Classification Code 1.4C
- 14.4 Reference Number EX2005110242
- 14.5 Product Designation/Part Number..... 6000-000-170-1 (in Division 1.4 Packaging)
6000-000-170-2 (in Division 1.4 Packaging)
6000-000-170-3 (in Division 1.4 Packaging)
6000-000-170-4 (in Division 1.4 Packaging)
6000-000-170-5 (in Division 1.4 Packaging)

NOTE, when not packaged in the prescribed packaging, these Oil well cartridges shall be classed UN0277, 1.3C.

Section 15 REGULATORY INFORMATION

Regulatory Requirement	Status
Toxic Substance Control Act Inventory	All components of pyrotechnic mixture are registered.
SARA Title III, Extremely Hazardous Substances	None
EPCRA Toxic Chemical	Chromium Compound [Barium Chromate] < 4% Aluminum in the Charge or as exposed pyrotechnic composition is not a "dust or fume" and therefore is not listed. When the Charge is ignited, aluminum may transition through a fume phase and therefore should be listed as a Toxic Chemical. Al < 12%.
CERCLA Hazardous Substances	None
Hazard Categories per 40 CFR §370.2 & 29 CFR §1910.1200	
Immediate (Acute) Health Hazard	Toxic NO _x deflagration by-products
Delayed (Chronic) Health Hazard	29 CFR 1910.1200: Carcinogen as result of NTP <i>Annual Report on Carcinogens</i> listing of Chromium VI Compounds.
Fire Hazard	EXPLOSIVE ARTICLE capable of violent deflagration with temperatures from 1500°C
Sudden Release of Pressure	EXPLOSIVE ARTICLE
Reactive	Water Reactive: Aluminum Powder as incorporated into the pyrotechnic composition matrix

Section 16. OTHER INFORMATION

16.1 NFPA Ratings

- Health Hazard is the capability of a material to cause personal injury due to contact with or entry into the body via inhalation, ingestion, skin contact, or eye contact
 - o Health = 3, Materials that, under emergency conditions, can cause serious or permanent injury.
- Flammability Hazard is an assessment of a material's susceptibility to burning.
 - o Flammability = 3, Materials that burn with extreme rapidity, usually by reason of self-contained oxygen.
- Instability Hazard is the capability of a material to rapidly release energy by themselves.
 - o Instability = 4, Materials that in themselves are readily capable of detonation or explosive decomposition or explosive reaction at normal temperatures and pressures.
- Water Reactivity Hazard is the capability of the material to react violently or explosively with water.
 - o W = 1, Materials that react with water, producing either heat or gas leading to pressurization or toxic or flammable gas hazards.

References.

1. Documentation of the TLVs® and BEIs® with Other Worldwide Occupational Exposure Values, ACGIH® Worldwide, CD-ROM, 2005 Edition.
2. Kohler, J., Explosives, 4th Edition, VHC Publishers, Federal Republic of Germany, 1993, Page 140.
3. Material Safety Data Sheets — Preparation, ANSI Z400.1-2004.
4. Hazard Communication, U.S. code of Federal Regulations, Title 29, Part 1910, Section 1200.
5. Precautionary Labeling, ANSI Z129.1-2000.
6. The Merck Index, 12th Edition, Merck Research Laboratories, 1996.
7. Lewis, Richard. J., Sax's Dangerous Properties of Industrial Materials, 10th Edition, Volume 3, John Wiley & Sons, Inc., 2000.
8. Identification of the Hazards of Materials for Emergency Response, NFPA 704-2001.
9. Hazardous Chemicals Data, NFPA 49-2001
10. Unpublished test data for Impact and Friction Threshold Initiation Levels (TIL)