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MATERIAL SAFETY DATA SHEET

January 2011

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TRANSPORTATION EMERGENCIES
CALL CHEMTREC 1-800-424-9300

Material Safety Data Sheet

REVISION NO.: 4
REVISION DATE: **04/07/2010**

I. PRODUCT IDENTIFICATION

PRODUCT NAME: BALL POWDER® Propellant
SYNONYMS: Smokeless Propellant
PRODUCT CODES: WC, WAA®, WCR®, WMG®, WMR®, WRF®, WPR®, WPT®, WSX®, SPI, SHP, WCUNI, OBP®, SMP®, M38, M47, M48

OSHA REGULATORY STATUS: This product may be considered to be a hazardous chemical under the OSHA Hazard Communication Standard, 29 CFR 1910.1200. Applicable OSHA hazard classifications: explosive, toxic, blood toxin, skin and eye irritant.

II. PRODUCT COMPOSITION / EXPOSURE LIMITS

COMPONENT	CAS NO.	WEIGHT %	OSHA (PEL)	ACGIH (TLV)
Nitroglycerin	55-63-0	0-42	2 mg/m^3 ceiling (skin)	0.05 ppm TWA (skin)
Dibutyl Phthalate	84-72-2	0-10	5 mg/m^3 TWA	5 mg/m^3 TWA
Polyester Adipate	Supplier proprietary	0-10	None established	None established
Akardite II	13114-72-2	0-3	None established	None established
Ethyl Centralite (diethyldiphenylurea)	85-98-3	0-10	None established	None established
Rosin	8050-09-07	0-5	None established	None established
Ethyl Acetate	141-78-6	0-2	400 ppm TWA	400 ppm TWA
Diphenylamine	122-39-4	0-1.5	None established	None established
N-Nitrosodiphenylamine	86-30-6	0-1.5	None established	None established
Potassium Nitrate	7757-79-1	0-3	None established	None established
Potassium Sulfate	7778-80-5	0-3	None established	None established
Tin Dioxide	18282-10-5	0-1.5	2 mg/m^3 TWA	2 mg/m^3 TWA
Graphite	7782-42-5	0.02-1	5 mg/m^3 TWA	2 mg/m^3 TWA
Calcium Carbonate	1317-65-3	0-1	15 mg/m^3 TWA	10 mg/m^3 TWA
Trade Secret Component 1	Proprietary	0-10	None established	None established
Trade Secret Component 2	Proprietary	0-10	5 mg/m^3 TWA	3 mg/m^3 TWA
Trade Secret Component 3	Proprietary	0-5	None established	10 mg/m^3 TWA
Nitrocellulose	9004-70-0	Balance to 100	None established	None established

III. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: DANGER! FLAMMABLE/EXPLOSIVE. ACCIDENTAL FIRE OR EXPLOSION COULD CAUSE SEVERE INJURY OR DEATH. AVOID IMPACT, FRICTION, HEAT, SPARKS OR FLAME.

MAY BE HARMFUL IF INHALED OR INGESTED. HARMFUL UPON CONTACT WITH SKIN OR EYES.

ROUTES OF ENTRY: Inhalation, ingestion and skin/eye contact

POTENTIAL HEALTH EFFECTS:

INHALATION: Dust or vapor is irritating to the nose, mouth, throat and lungs. Dilation of blood vessels with drop in blood pressure and headache, cyanosis, and mental confusion may result from the nitroglycerin in the product. Headache may be severe and can remain for a few hours to several days. It typically starts at the forehead preceded by a sensation of warmth and fullness in the head and may extend to the back of the neck. Nausea, vomiting and abdominal pain may also occur.

INGESTION: Irritating to the gastrointestinal tract. Additional effects would be similar to those described for acute inhalation exposure.

EYES: Irritation may occur with inflammation of the conjunctive. Effects should not result in permanent impairment of vision.

SKIN: Dermal exposure may cause irritation which would subside rapidly upon removal of material without permanent damage. Additional effects would be similar to those described for acute inhalation exposure.

CHRONIC HEALTH EFFECTS: No additional effects are known or have been reported beyond those described for inhalation exposure.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: Anemia and cardiovascular disease.

CARCINOGENICITY: This product contains N-Nitrosodiphenylamine, which is reported as a possible human carcinogen by IARC.

IV. FIRST AID MEASURES

EYES: Immediately flush with large amounts of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. If eye irritation develops, call a physician.

SKIN: Immediately flush with water for at least 15 minutes. Call a physician. If clothing comes in contact with the product, the clothing should be removed immediately and should be laundered before re-use.

INGESTION: Immediately drink large quantities of water. Induce vomiting. Call a physician at once. DO NOT give anything by mouth if the person is unconscious or if having convulsions.

INHALATION: If person experiences nausea, headache or dizziness, person should stop work immediately and move to fresh air until these symptoms disappear. If breathing is difficult, administer oxygen, keep the person warm and at rest. Call a physician. In the event that an individual inhales enough vapor to lose consciousness, person should be moved to fresh air at once and a physician should be called immediately. If breathing has stopped, artificial respiration should be administered immediately.

V. FIRE-FIGHTING MEASURES

FLAMMABILITY LIMITS IN AIR (% BY VOLUME): LEL - Not Applicable UEL - Not Applicable

FLASH POINT: Not Applicable

AUTOIGNITION TEMPERATURE: 190-200 °C

EXPLOSIVE: Yes

FLAMMABLE: Yes

PYROPHORIC: No

NFPA RATINGS: Not Established

HMIS RATINGS:

Health:	2	Moderate
Flammability:	4	Severe
Reactivity:	4	Severe

EXTINGUISHING MEDIA: Large volumes of water should be applied as quickly as possible from automatic sprinklers or fire hose.

SPECIAL FIRE-FIGHTING PROCEDURES: Fires involving smokeless propellant should not be fought unless extinguishing media can be applied from a well protected (e.g. behind a berm or barricade) and distant location from the point of fire.

PERSONAL PROTECTION FOR FIRE-FIGHTING: Self-contained breathing apparatus (SCBA) and protective clothing must be worn. Protective clothing includes, but is not limited to, impervious boots, gloves, hard hat and chemically impermeable suit. Wash all clothing prior to reuse.

HAZARDOUS PRODUCTS OF COMBUSTION: Combustion products vary depending on fire conditions and other combustibles present in the fire. The predominant products will be carbon dioxide and oxides of nitrogen. Under some conditions, methane, carbon monoxide, irritating aldehydes and carboxylic acids and hydrogen cyanide may be formed.

VI. ACCIDENTAL RELEASE MEASURES

FOR ALL TRANSPORTATION ACCIDENTS, CALL CHEMTREC AT 1-800-424-9300.
REPORTABLE QUANTITY (per 40 CFR 302.4): Nitroglycerin (10 lbs.); Dibutyl Phthalate (10 lbs.); N-Nitrosodiphenylamine (100 lbs.); Ethyl Acetate (5000 lbs.)

SPILL MITIGATION PROCEDURES:
Clean up spills imediately using non-sparking utensils. Use caution, material is sensitive to ignition from sources such as heat, flame, impact, friction or sparks. Non-flammable or flame retardant clothing should be worn at all times.

AIR RELEASE: Not Applicable

WATER RELEASE: This material is heavier than water. Create an overflow dam with filtration capabilities to retain material. Divert water flow or stop flow if possible. Gather wet material using non-sparking utensils. Keep material damp until ready for disposal.

LAND SPILL: Clean-up of spill materials may be accomplished using non-sparking utensils. Non-flammable or flame retardant clothing should be worn at all times. Wet spill materials prior to initiating clean-up.

SPILL RESIDUES: Dispose of per guidelines under Section XIII. DISPOSAL CONSIDERATIONS

VII. HANDLING AND STORAGE

STORAGE CONDITIONS: Store in a cool, dry, well-ventilated place away from all sources of ignition.

RECOMMENDED STORAGE CONDITIONS: 21 °C (70 °F), 50% Relative Humidity (decomposition becomes measurable above 50 °C (122 °F))

DO NOT SUBJECT TO MECHANICAL SHOCK.

AVOID EXPOSURE TO SUNLIGHT OR ARTIFICIAL ULTRAVIOLET LIGHT.

PRODUCT STABILITY AND SHELF LIFE LIMITATIONS: Smokeless powder contains stabilizers and deteriorates very slowly under proper storage conditions. Old smokeless powder should be checked for deterioration regularly. Deteriorating smokeless powder produces an acidic odor and may produce reddish-brown fumes. Dispose of deteriorating smokeless powder through, for example, controlled open burning in small quantities (product should be submerged in water until burned).

Smokeless powder should not be exposed to excessive heat, as this can accelerate deterioration. Deterioration produces an acidity that accelerates further reaction and has been known, because of heat generated by the reaction, to cause spontaneous combustion.

INCOMPATIBLE MATERIALS FOR PACKAGING: No incompatible packaging materials known. Must be stored in original shipping container.

INCOMPATIBLE MATERIALS FOR STORAGE OR TRANSPORT: This product may react with acids, alkalis, oxidizers and amines, and should not be stored with such materials.

For additonal information regarding handling and storage guidelines, see "Properties and Storage of Smokeless Powder", published by the SPORTING ARMS AND AMMUNITION MANUFACTURES' INSTITUTE, INC. (SAAMI), 11 Mile High Road, Newtown, CT 06405 (www.saami.org)

VIII. EXPOSURE CONTROLS / PERSONAL PROTECTION

PERSONAL PROTECTION FOR ROUTINE USE OF PRODUCT:

RESPIRATORY PROTECTION: Respiratory protection not normally needed. If significant dusting occurs, a NIOSH approved respirator with organic vapor cartridge and particulate filter should be worn.

VENTILATION: Local exhaust ventilation is recommended if significant dusting occurs. Otherwise, use general exhaust ventilation.

SKIN PROTECTIVE EQUIPMENT: Impermeable gloves

OTHER: Safety glasses with side shields, flame retardant outerwear (e.g. coveralls or lab coat)

IX. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE:	Granular solid
FREEZING POINT:	Not Applicable
BOILING POINT:	Not Applicable
DECOMPOSITION TEMPERATURE:	Decomposition becomes measurable above 50 °C (122 °F)
AUTOIGNITION TEMPERATURE:	190-200 °C
SPECIFIC GRAVITY:	1.2-1.6
BULK DENSITY:	0.5-1 (g/cc)
pH at 25 °C:	Not Applicable
VAPOR PRESSURE at 25 °C:	< 1 mm Hg
SOLUBILITY IN WATER:	Negligible
VOLATILES, PERCENT BY VOLUME:	< 2
EVAPORATION RATE:	Negligible
VAPOR DENSITY:	Not Applicable
MOLECULAR WEIGHT:	Not Applicable - Mixture
ODOR:	None
COEFFICIENT OIL/WATER DISTR.:	No Data

X. STABILITY AND REACTIVITY

TEMPERATURES ABOVE 50 °C (122 °F):	Decomposition becomes measurable
MECHANICAL SHOCK OR IMPACT:	Yes, can ignite due to impact
ELECTRICAL (STATIC) DISCHARGE:	Yes, can ignite due to static discharge (minimum ignition energy 200 mJ)
HAZARDOUS POLYMERIZATION:	Will not occur
INCOMPATIBLE MATERIALS:	Strong acids, alkalis, oxidizers, amines
HAZARDOUS DECOMPOSITION PRODUCTS:	Carbon monoxide, carbon dioxide, oxides of nitrogen
OTHER CONDITIONS TO AVOID:	Direct sunlight and open flame

SUMMARY OF REACTIVITY:

OXIDIZER:	No
PYROPHORIC:	No
ORGANIC PEROXIDE:	No
WATER REACTIVE:	No
OTHER:	EXPLOSIVE

XI. TOXICOLOGOCAL INFORMATION

Toxilogical studies of the complete BALL POWDER® product mixture have not been conducted.

INTERACTIONS WITH OTHER CHEMICALS WHICH ENHANCE TOXICITY:
None known or reported.

ANIMAL TOXICOLOGY
ACUTE TOXICITY:
INHALATION LC 50: No available data
DERMAL LD 50: No available data
ORAL LD 50: Approximately 250 mg/kg (rat) based on acute oral toxicity of nitroglycerin
IRRITATION: Irritant to skin or eyes

ACUTE TARGET ORGAN TOXICITY:
Nitroglycerin will produce dilation of blood vessels and drop in blood pressure which may affect the heart. It has also been shown to cause methemoglobinemia (cyanosis).

CHRONIC TARGET ORGAN TOXICITY:
Diphenylamine has been shown to induce kidney damage. The low concentration of this material in, and the nature of the product, would preclude development of such an effect.

REPRODUCTIVE AND DEVELOPMENTAL TOXICITY:
There are no known or reported effects on reproductive function or fetal development.

CARCINOGENICITY:
This product contains N-Nitrosodiphenylamine, which is reported as a possible human carcinogen by IARC.

MUTAGENICITY:
This product or any of its ingredients are not known or reported to be mutagenic.

XII. ECOLOGOCAL INFORMATION

AQUATIC TOXICITY: Components of this product (Dibutyl Phlalate, Diphenylamine, Nitroglycerin) are known to be toxic to aquatic organisms.

XIII. DISPOSAL CONSIDERATIONS

If this product becomes a waste, it meets the criteria of a hazardous waste as defined under 40 CFR 261 and would have EPA hazardous waste number D003.

If this product becomes a waste, it will be a hazardous waste which is subject to the Land Disposal Restrictions under 40 CFR 268 and must be managed accordingly.

If this material becomes a waste, it may be treated by controlled burning in small quantities, such as in a RCRA-permitted open burn unit (if permissible by relevant regulatory agencies). Material should be spread in thin layers and ignited from a safe distance.

CARE MUST BE TAKEN TO PREVENT ENVIRONMENTAL CONTAMINATION FROM THE USE OF THIS MATERIAL. THE USER OF THIS MATERIAL HAS THE RESPONSIBILITY TO DISPOSE OF UNUSED MATERIAL, RESIDUES AND CONTAINERS IN COMPLIANCE WITH ALL RELEVANT LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS REGARDING TREATMENT, STORAGE AND DISPOSAL FOR HAZARDOUS AND NONHAZARDOUS WASTES.

XIV. TRANSPORT INFORMATION

THIS MATERIAL IS REGULATED AS A DOT HAZARDOUS MATERIAL.

DOT DESCRIPTION FROM THE HAZARDOUS MATERIALS TABLE 49 CFR 172.101:
LAND (U.S. DOT): POWDER, SMOKELESS, 1.3C, UN0161, PG II
WATER (IMO): POWDER, SMOKELESS, 1.3C, UN0161, PG II
AIR (IATA/ICAO): FORBIDDEN

HAZARD LABEL/PLACARD: EXPLOSIVE 1.3C
EMERGENCY GUIDE NO.: 112

XV. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT:
Components of this product are listed on the Toxic Substance Control Act inventory.

SUPERFUND AMENDMENT AND REAUTHORIZATION ACT TITLE III:
HAZARD CATEGORIES, PER 40 CFR 370.2:
HEALTH: Immediate (Acute)
PHYSICAL: Fire Hazard; Sudden Release of Pressure

EMERGENCY PLANNING AND COMMUNITY RIGHT TO KNOW, PER 40 CFR 355: Not Applicable - product contains no Appendix A Extremely Hazardous Substances

SUPPLIER NOTIFICATION REQUIREMENTS, PER 40 CFR 372.45:
This mixture or tradename product contains a toxic chemical or chemicals subject to the reporting requirements of Section 313 of Titie III of the Superfund Amendments and Reauthorization Act of 1986 and 40 CFR 372. Specific chemicals: Dibutyl Phthalate, Nitroglycerin, N-Nitrosodiphenylamine, Diphenylamine

XVI. OTHER INFORMATION

THE INFORMATION IN THIS MATERIAL SAFETY DATA SHEET SHOULD BE PROVIDED TO ALL WHO WILL USE, HANDLE, STORE, TRANSPORT, OR OTHERWISE BE EXPOSED TO THIS PRODUCT. THIS INFORMATION HAS BEEN PREPARED FOR THE GUIDANCE OF PLANT ENGINEERING, OPERATIONS AND MANAGEMENT AND FOR PERSONS WORKING WITH OR HANDLING THIS PRODUCT. THIS INFORMATION IS BELIEVED TO BE RELIABLE AND UP TO DATE AS OF THE DATE OF PUBLICATION, BUT NO WARRANTY IS IMPLIED. ADDITIONALLY, IF THIS MATERIAL SAFETY DATA SHEET IS MORE THAN THREE YEARS OLD, YOU SHOULD CONTACT ST. MARKS POWDER, INC. AT THE PHONE NUMBER LISTED BELOW TO CONFIRM THAT THIS INFORMATION IS CURRENT.

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