Safety Data Sheet
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1 Identification of the substance/mixture and of the company/undertaking

· **1.1 Product identifier**

· **Trade name: MODEL 4441 40mm OC Powder Barricade Projectile**

· **Article number:** Model 4441

· **1.2 Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.

· **Application of the substance / the preparation** Explosive product.

· **1.3 Details of the supplier of the Safety Data Sheet**

· **Manufacturer/Supplier:**
Combined Systems, Inc.
388 Kinsman Rd.
Jamestown, PA 16134
Phone: (724) 932-2177

· **1.4 Emergency telephone number:**
ChemTel Inc.
(800)255-3924, +1 (813)248-0585

2 Hazards identification

· **2.1 Classification of the substance or mixture**

· **Classification according to Regulation (EC) No 1272/2008**


GHS01 exploding bomb

Expl. 1.4 H204 Fire or projection hazard.


GHS07

Acute Tox. 4 H302 Harmful if swallowed.
Acute Tox. 4 H312 Harmful in contact with skin.
Acute Tox. 4 H332 Harmful if inhaled.

· **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**


Xn; Harmful

R20/21/22: Harmful by inhalation, in contact with skin and if swallowed.

R5: Heating may cause an explosion.

· **Information concerning particular hazards for human and environment:**
The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

· **Classification system:**
The classification is according to the latest editions of the EU-lists, and extended by company and literature data.
The classification is in accordance with the latest editions of international substances lists, and is supplemented by information from technical literature and by information provided by the company.

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· **2.2 Label elements**
· **Labelling according to Regulation (EC) No 1272/2008**
The product is classified and labelled according to the CLP regulation.
· **Hazard pictograms**



GHS01 GHS07

· **Signal word** Warning

· **Hazard-determining components of labelling:**
Oleoresin Capsicum
glycerol trinitrate
· **Hazard statements**
H204 Fire or projection hazard.
H302+H312+H332 Harmful if swallowed, in contact with skin or if inhaled.
· **Precautionary statements**
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P250 Do not subject to grinding/shock/friction.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P373 DO NOT fight fire when fire reaches explosives.
P370+P380 In case of fire: Evacuate area.
P372 Explosion risk in case of fire.
· **Hazard description:**
· **WHMIS-symbols:**
F - Dangerously reactive material

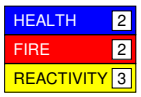


· **NFPA ratings (scale 0 - 4)**



Health = 2
Fire = 2
Reactivity = 3

· **HMIS-ratings (scale 0 - 4)**



Health = 2
Fire = 2
Reactivity = 3

Warning: Contains lead salt(s). Long-term health hazard.

· **HMIS Long Term Health Hazard Substances**
None of the ingredients is listed.

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· **2.3 Other hazards**
· **Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **Explosive Product Notice**
PREVENTION OF ACCIDENTS IN THE USE OF EXPLOSIVES - 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.

WARNING - All explosives are dangerous and must be carefully handled and used following approved 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. 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.

3 Composition/information on ingredients

· **3.2 Mixtures**
· **Description:** Mixture of substances listed below with nonhazardous additions.

· **Dangerous components:**		
CAS: 1309-48-4 EINECS: 215-171-9 Index number: 025-199-09-0	magnesium oxide substance with a Community workplace exposure limit	<10%
CAS: 8023-77-6 EINECS: 288-920-0	Oleoresin Capsicum T R25; Xn R21; Xi R36/37/38 Acute Tox. 2, H300; Acute Tox. 3, H311 Skin Irrit. 2, H315; Eye Irrit. 2, H319; STOT SE 3, H335	<10%
CAS: 55-63-0 EINECS: 200-240-8 Index number: 603-034-00-X	glycerol trinitrate T+ R26/27/28; E R3; N R51/53 R33 Unst. Expl., H200 Acute Tox. 2, H300; Acute Tox. 1, H310; Acute Tox. 2, H330 STOT RE 2, H373 Aquatic Chronic 2, H411 Flam. Liq. 2, H225	<10%

· **Additional information:** For the wording of the listed risk phrases refer to section 16.

4 First aid measures

· **4.1 Description of first aid measures**
· **General information:**
Immediately remove any clothing soiled by the product.

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In case of irregular breathing or respiratory arrest provide artificial respiration.
Take affected persons out into the fresh air.
· **After inhalation:**
Supply fresh air; consult doctor in case of complaints.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:**
Immediately wash with water and soap and rinse thoroughly.
If skin irritation continues, consult a doctor.
· **After eye contact:**
Remove contact lenses if worn.
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· **After swallowing:**
Unlikely route of exposure.
Rinse out mouth and then drink plenty of water.
Do not induce vomiting; call for medical help immediately.
· **4.2 Most important symptoms and effects, both acute and delayed**
Blast injury if mishandled.
Coughing
Breathing difficulty
Dizziness
Nausea
· **Hazards**
Danger of blast or crush-type injuries.
Danger of impaired breathing.
Danger of circulatory collapse.
· **4.3 Indication of any immediate medical attention and special treatment needed**
Contains nitroglycerin. Consult literature for specific antidotes.
Product may produce physical injury if mishandled. Treatment of these injuries should be based on the blast and compression effects.
In cases of irritation to the lungs, initial treatment with cortical steroid inhalants.
If necessary oxygen respiration treatment.

5 Firefighting measures

· **5.1 Extinguishing media**
· **Suitable extinguishing agents:**
Flood area with water. If no water is available, carbon dioxide, dry chemical or earth may be used. If the fire reaches the cargo, withdraw and let fire burn.
· **For safety reasons unsuitable extinguishing agents:** None.
· **5.2 Special hazards arising from the substance or mixture**
Product may explode if burned in confined space. Individual cartridges may explode. Mass explosion of many cartridges at once is unlikely.
Hazardous combustions products: Metal Compounds, Carbon Monoxide, Carbon Dioxide, Nitrous Oxides, Various complex oxides of metals, Nitrogen.
Formation of toxic gases is possible during heating or in case of fire.
· **5.3 Advice for firefighters**
· **Protective equipment:**
Wear self-contained respiratory protective device.

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Do not inhale explosion gases or combustion gases.
Wear fully protective suit.

· **Additional information**
Cool endangered receptacles with water spray.
Eliminate all ignition sources if safe to do so.
Evacuate area and fight fire from from the upwind side.
In case of major fire and large quantities: Evacuate area. Fight fire remotely due to the risk of explosion.
Flammability Classification: (defined by 29 CFR 1910.1200) Explosive. Can explode under fire conditions. Individual devices will randomly explode. Will not mass explode if multiple devices are involved. Burning material may produce toxic and irritating vapors. In unusual cases, shrapnel may be thrown from exploding devices under containment. See 2008 Emergency response Guidebook for further information.

6 Accidental release measures

· **6.1 Personal precautions, protective equipment and emergency procedures**
Use respiratory protective device against the effects of fumes/dust/aerosol.
Keep away from ignition sources.
Remove persons from danger area.
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Protect from heat.
Isolate area and prevent access.

· **6.2 Environmental precautions:** Do not allow to enter sewers/ surface or ground water.

· **6.3 Methods and material for containment and cleaning up:**
Pick up mechanically.
Send for recovery or disposal in suitable receptacles.
Dispose contaminated material as waste according to item 13.

· **6.4 Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **7.1 Precautions for safe handling**
Ensure good ventilation/exhaustion at the workplace.
Handle with care. Avoid jolting, friction and impact.

· **Information about fire - and explosion protection:**
Protect against electrostatic charges.
Prevent impact and friction.
Keep respiratory protective device available.
Emergency cooling must be available in case of nearby fire.

· **7.2 Conditions for safe storage, including any incompatibilities**

· **Storage:**

· **Requirements to be met by storerooms and receptacles:**
Avoid storage near extreme heat, ignition sources or open flame.

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· **Information about storage in one common storage facility:**
Store away from foodstuffs.
Do not store together with oxidizing and acidic materials.
· **Further information about storage conditions:**
Store in dry conditions.
Protect from heat and direct sunlight.
· **7.3 Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

· **Additional information about design of technical facilities:** No further data; see item 7.

· **8.1 Control parameters**

· **Ingredients with limit values that require monitoring at the workplace:**	
1309-48-4 magnesium oxide	
PEL (USA)	15* mg/m³ fume; *total particulate
TLV (USA)	10* mg/m³ *as inhalable fraction
EL (Canada)	Short-term value: 10** mg/m³ Long-term value: 10* 3** mg/m³ *inhalable fume;**respirable dust and fume
EV (Canada)	10 mg/m³ inhalable
55-63-0 glycerol trinitrate	
PEL (USA)	Short-term value: C 2 mg/m³, C 0,2 ppm Skin
REL (USA)	Short-term value: 0,1 mg/m³ Skin
TLV (USA)	0,46 mg/m³, 0,05 ppm Skin
EL (Canada)	0,05 ppm Skin
EV (Canada)	0,5 mg/m³, 0,05 ppm Skin

· **DNELs** No further relevant information available.
· **PNECs** No further relevant information available.
· **Additional information:** The lists valid during the making were used as basis.

· **8.2 Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Wash hands before breaks and at the end of work.
Do not inhale gases / fumes / aerosols.

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Avoid contact with the eyes and skin.

· **Respiratory protection:**



Combined Organic Vapor and Particulate Respirator is recommended for use during all processing activities.

Wear positive pressure NIOSH or European EN149 vapor respirators when deploying product in large quantities.

· **Protection of hands:**



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**



Safety glasses

· **Body protection:** Protective work clothing

· **Limitation and supervision of exposure into the environment**
No further relevant information available.

· **Risk management measures**
See Section 7 for additional information.
Organizational measures should be in place for all activities involving this product.
No further relevant information available.

9 Physical and chemical properties

· **9.1 Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

Form:	Solid material
Colour:	Dark grey
· **Odour:**	Characteristic

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· **Odour threshold:**	Not determined.
· **pH-value:**	Not applicable.
· **Change in condition**	
Melting point/Melting range:	Undetermined.
Boiling point/Boiling range:	Undetermined.
· **Flash point:**	Not applicable.
· **Flammability (solid, gaseous):**	Not determined.
· **Ignition temperature:**	Not determined.
· **Decomposition temperature:**	Not determined.
· **Self-igniting:**	Product is not self-igniting.
· **Danger of explosion:**	Extreme risk of explosion by shock, friction, fire or other sources of ignition.
· **Explosion limits:**	
Lower:	Not determined.
Upper:	Not determined.
· **Vapour pressure:**	Not applicable.
· **Density:**	Not determined.
· **Relative density**	Not determined.
· **Vapour density**	Not applicable.
· **Evaporation rate**	Not applicable.
· **Solubility in / Miscibility with water:**	Insoluble.
· **Partition coefficient (n-octanol/water):**	Not determined.
· **Viscosity:**	
Dynamic:	Not applicable.
Kinematic:	Not applicable.
· **9.2 Other information**	No further relevant information available.

10 Stability and reactivity

· **10.1 Reactivity**
· **10.2 Chemical stability**
· **Thermal decomposition / conditions to be avoided:**
No decomposition if used and stored according to specifications.
· **10.3 Possibility of hazardous reactions**
Danger of explosion.
Reacts with strong acids and oxidizing agents.
· **10.4 Conditions to avoid**
Keep ignition sources away - Do not smoke.

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Store away from oxidizing agents.
Keep away from heat and direct sunlight.
· **10.5 Incompatible materials:** No further relevant information available.
· **10.6 Hazardous decomposition products:**
Hydrocarbons
Nitrogen oxides
Poisonous gases/vapours
Carbon monoxide and carbon dioxide
Toxic metal oxide smoke
Leadoxide vapour

11 Toxicological information

· **11.1 Information on toxicological effects**
· **Acute toxicity:**

· **LD/LC50 values relevant for classification:**		
8023-77-6 Oleoresin Capsicum		
Oral	LD50	47,2 mg/kg (mouse)
		3000 mg/kg (rat)
Dermal	LD50	512 mg/kg (mouse)
55-63-0 glycerol trinitrate		
Oral	LD50	115 mg/kg (mouse)
		105 mg/kg (rat)
Dermal	LD50	29 mg/kg (rat)
		280 mg/kg (rabbit)

· **Primary irritant effect:**
· **on the skin:** No irritant effect.
· **on the eye:** No irritating effect.
· **Sensitization:** No sensitizing effects known.
· **Additional toxicological information:**
The product shows the following dangers according to the calculation method of the General EU Classification Guidelines for Preparations as issued in the latest version:
Harmful

12 Ecological information

· **12.1 Toxicity**
· **Aquatic toxicity:** No further relevant information available.
· **12.2 Persistence and degradability** No further relevant information available.
· **12.3 Bioaccumulative potential** No further relevant information available.
· **12.4 Mobility in soil** No further relevant information available.

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· **Additional ecological information:**
· **General notes:**
This statement was deduced from the properties of the single components.
The product contains heavy metals. Avoid transfer into the environment. Specific preliminary treatments are necessary
Due to available data on eliminability/decomposition and bioaccumulation potential prolonged term damage of the environment can not be excluded.
Water hazard class 2 (German Regulation) (Self-assessment): hazardous for water
Do not allow product to reach ground water, water course or sewage system.
Danger to drinking water if even small quantities leak into the ground.
· **12.5 Results of PBT and vPvB assessment**
· **PBT:** Not applicable.
· **vPvB:** Not applicable.
· **12.6 Other adverse effects** No further relevant information available.

13 Disposal considerations

· **13.1 Waste treatment methods**
· **Recommendation**
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
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. Residual materials should be treated as hazardous.

· **Uncleaned packaging:**
· **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

· **14.1 UN-Number**	
· **DOT, ADR, IMDG, IATA**	UN0301
· **14.2 UN proper shipping name**	
· **DOT, IMDG, IATA**	AMMUNITION, TEAR-PRODUCING WITH BURSTER, EXPELLING CHARGE OR PROPELLING CHG
· **ADR**	0301 AMMUNITION, TEAR-PRODUCING WITH BURSTER, EXPELLING CHARGE OR PROPELLING CHG
· **14.3 Transport hazard class(es)**	
· **DOT, ADR, IMDG, IATA**	



· **Class**	1.4

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· **Label**	1.4G
· **14.4 Packing group** · **DOT, ADR, IMDG, IATA**	II
· **14.5 Environmental hazards:** · **Marine pollutant:**	No
· **14.6 Special precautions for user** · **EMS Number:**	Not applicable. F-A,S-Q
· **14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable.
· **Transport/Additional information:**	DOT: EX2002040003
· **UN "Model Regulation":**	UN0301, 0301, 1.4G, II

15 Regulatory information

· **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
· **United States (USA)**
· **SARA**

· **Section 355 (extremely hazardous substances):**

None of the ingredients is listed.

· **Section 313 (Specific toxic chemical listings):**

55-63-0	glycerol trinitrate
7440-50-8	copper
7440-66-6	zinc powder -zinc dust (pyrophoric)

· **TSCA (Toxic Substances Control Act):**

All ingredients are listed.

· **Proposition 65 (California):**

· **Chemicals known to cause cancer:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients is listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients is listed.

· **Chemicals known to cause developmental toxicity:**

15245-44-0	lead 2,4,6-trinitro-m-phenylene dioxide

· **Carcinogenic Categories**

· **EPA (Environmental Protection Agency)**

7440-50-8	copper	D

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7440-66-6	zinc powder -zinc dust (pyrophoric)	II
10022-31-8	barium nitrate	CBD

· **IARC (International Agency for Research on Cancer)**

1345-04-6	antimony sulphide	3

· **TLV (Threshold Limit Value established by ACGIH)**

1309-48-4	magnesium oxide	A4
10022-31-8	barium nitrate	A4

· **NIOSH-Ca (National Institute for Occupational Safety and Health)**

None of the ingredients is listed.

· **OSHA-Ca (Occupational Safety & Health Administration)**

None of the ingredients is listed.

· **Canada**

· **Canadian Domestic Substances List (DSL)**

All ingredients are listed.

· **Canadian Ingredient Disclosure list (limit 0.1%)**

None of the ingredients is listed.

· **Canadian Ingredient Disclosure list (limit 1%)**

1309-48-4	magnesium oxide

· **15.2 Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Relevant phrases**

H200 Unstable explosives.
H225 Highly flammable liquid and vapour.
H300 Fatal if swallowed.
H310 Fatal in contact with skin.
H311 Toxic in contact with skin.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H330 Fatal if inhaled.
H335 May cause respiratory irritation.
H373 May cause damage to organs through prolonged or repeated exposure.
H411 Toxic to aquatic life with long lasting effects.

R21 Harmful in contact with skin.
R25 Toxic if swallowed.
R26/27/28 Very toxic by inhalation, in contact with skin and if swallowed.
R3 Extreme risk of explosion by shock, friction, fire or other sources of ignition.
R33 Danger of cumulative effects.
R36/37/38 Irritating to eyes, respiratory system and skin.

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R51/53 Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
ACGIH: American Conference of Governmental Industrial Hygienists
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
DNEL: Derived No-Effect Level (REACH)
PNEC: Predicted No-Effect Concentration (REACH)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent

· **Sources**
SDS Prepared by:
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