SAFETY DATA SHEET

SMALL CALIBER AMMUNITION

Centerfire rifle cartridge with inert lead-free copper projectile

PDM nr. 104805

Safety Data Sheet according to
Regulation (EC) No. 1907/2006 (REACH)

REVISION DATE: April 1st 2021

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SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1 Product identifier

Centerfire rifle cartridge with inert lead-free copper projectile

1.2 Relevant identified uses

Small arms ammunition.

1.3 Details of the supplier of the safety data sheet

Company / Manufacturer: Nammo Lapua Oy
Company address: P.O. Box 5, FIN-62101 Lapua Finland
Telephone number: Int. +358 10 5233 800
Telefax number: Int. +358 6 4310 244
E-mail address (competent person): safetydata.lapua@nammo.com

1.4 *Emergency telephone number*

Use your national or local emergency number.
(In Finland, Poison information center +358-9-471 977)

SECTION 2: HAZARDS IDENTIFICATION

2.1 Classification of the substance or mixture

Classification according to CLP-regulation (EC) no. 1272/2008 [CLP]

Expl. 1.4; H204

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP]

Hazard pictograms:

GHS01

Signal word: **Warning**

Hazard statements:
H204: Fire or projection hazard

Precautionary statements:
P102: Keep out of reach of children.
P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280: Wear protective gloves/ protective clothing/eye protection/ hearing protection.
P401: Store in accordance with national/international regulations as applicable.
P501: Dispose of contents/ container in accordance with local/national/international regulation.

2.3 Other hazards

The product is composed of finished metal parts which completely seal the cartridge. Do not disassemble, break or destroy the cartridge by violence. This article contains hazardous substances or mixtures not intended to be released under normal or reasonably foreseeable conditions of use. These include very toxic compounds. When the ammunition is fired, a small amount of particles will be generated and they may be slightly irritating to the eyes and respiratory tract. The particles may contain trace amounts of substances like copper, zinc and lead. Gases like COx and NOx are also generated. When shooting indoors, good ventilation that extracts gases forward from the shooter is required. The dismantling of this article is prohibited.

SECTION 3: COMPOSITION / INFORMATION ON INGREDIENTS

3.1 Substances

Not applicable

3.2 Mixtures

The product is comprised of four components. Typically, in rifle ammunition, case corresponds to 50 %, bullet 40 %, powder 10% and primer 1 % of the weight. So the minor elements of powder and primer make up a very small fraction of the compounds in the loaded cartridge. The hazardous ingredients contained in each are listed:

1. **Projectile**: Copper
2. **Case** (Brass): Copper, Zinc
3. **Propellant**: Nitrocellulose, Nitroglycerin, 3-methyl-1,1-diphenylurea, Diphenylamine, 1,3-diethyldiphenylurea, Graphite, Centralite I, Potassium Bitartrate, Tributycitrate, Diisoamyl Phtalate
4. **Primer**: Copper, Zinc, Lead Styphnate, Antimony (III) sulphide, Barium nitrate, Lead dioxide, Nitrocellulose, Nitroglycerin, Tetrazene.

Substances:

Components	% approx. by weight	CAS and EC numbers	Classification according to Regulation (EC) No 1272/2008 (CLP)
Copper (solid metal)	70 – 80	7440-50-8 231-159-6	Aquatic Chronic 2 H411 (in granulated form)*
Zinc (solid metal)	10 – 15	7440-66-6 231-175-3	Zinc powder: Pyr. Sol. 1 H250, Water-react. 1 H260, Aquatic Acute 1 H400, Aquatic Chronic 1 H410*
Nitrocellulose (Cellulose nitrate)	5 - 15	9004-70-0 682-719-5	Expl. 1.1 H201*
Nitroglycerin (Glycerol trinitrate)	0 – 4	55-63-0 200-240-8	Unst. Expl. H200, Acute Tox. 2 H300, Acute Tox. 1 H310, Acute Tox. 2 H330, STOT RE 2 H373, Aquatic Chronic 2 H411*
Lead Styphnate	< 0.1	15245-44-0 239-290-0	Expl. 1.1 H201, Acute Tox. 4 H302, Acute Tox. 4 H332, STOT RE 2 H373, Repr. 1A H360Df, Aquatic Acute 1 H400, Aquatic Chronic 1 H410*
Barium Nitrate	< 0.1	10022-31-8 233-020-5	None

* Harmonised classification.

See full text of H-phrases in chapter 16.

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

Inhalation
If inhaling vapors from fire: Fresh air, rest. Get medical attention. In case of irritation from the gases and particles during normal use of product: Fresh air, rest. In case of unconsciousness, keep the person in side-lying position for transport to the hospital.

Skin contact
In case of contact with the product´s interior components, take off contaminated clothing. Wash skin with soap and water. Call a POISON CENTER/doctor/physician if you feel unwell.

Eye contact
In case of contact with the product´s interior components, rinse with water. Remove contact lenses, if present and easy to do. Get medical attention if irritation persists.

Ingestion
Rinse mouth. Do not induce vomiting. Call a poison center or doctor.

4.2 Most important symptoms and effects, both acute and delayed

Can cause headache, dizziness, nausea, and hypotension. Interior components are toxic.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: FIRE FIGHTING MEASURES

5.1 Extinguishing media

Extinguishing media:	Water, water spray
Unsuitable extinguishing media:	None known.

5.2 Special hazards arising from the substance or mixture

DO NOT fight fires involving explosives. Burning produces gases containing carbon monoxide and nitro fumes. Risk of lung damage during continuous exposure. In case of a fire, high risk of splinters.

5.3 Advice for firefighters

Extinguish with water from a protected position. Flame resistant fully covered clothing. Do not breathe fumes from fires or vapours from decomposition. Fire fighters should use a self-contained breathing apparatus, a fully protective suit and necessary protective equipment. DO NOT fight fire when fire reaches explosives. Evacuate area.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Not applicable for a complete sealed cartridge. Avoid skin and eye contact. Do not breathe dust or fumes. Evacuate danger area. Do not allow product to spread into the environment. Use appropriate personal protection equipment (PPE).

6.2 Environmental precautions

Hazardous waste due to potential risk of explosion. Prevent from entering sewers or the immediate environment (groundwater).

6.3 Methods and material for containment and cleaning up

Contain and collect as any solid. Collect using non-sparking tools. Reuse if undamaged. Otherwise keep for disposal by experts. Remove all sources of ignition.

6.4 Reference to other sections

For information on safe handling see section 7, the protective equipment section, and for waste disposal see section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Avoid formation of dust. Ensure good ventilation at the workplace. Avoid all exposure. Wear recommended personal protective equipment. No smoking, flames, sparks or welding. Prevent static electricity. Use power tools and appliances rated for explosives. Use tools that prevent sparking. Avoid striking the primer of unfired/misfired cartridges or shocking during handling, storage, or use. If possible, keep eye washes nearby. A bullet of the fired cartridge has a long range and can cause serious injury or death. Always be sure of the backstop, and practice always safe muzzle control. Avoid firing at surfaces that could result in ricochet, such as water, rocks or any other hard or flat surfaces. Avoid breathing fumes during the firing.

7.2 Conditions for safe storage, including any incompatibilities

Store in original package in a cool and dry room at a safe distance from sources of ignition. No smoking. Protect against static electricity, shock, and friction. Keep only in facilities intended for explosives. Keep out of reach of children. Store locked up. Product is incompatible with ammonia and amines.

7.3 Specific end use(s)

Uses according to section 1.2.

SECTION 8: EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters

EU:
Nitroglycerin: Long-Term: 0.095 mg/m3, 0.01 ppm, Short-term: 0.19 mg/m3, 0.02 ppm.

8.2 Exposure controls

Personal protective equipment
Respiratory Protection: In case of dust use particle filter mask P2.
Ventilation: Local exhaust ventilation is recommended if significant dusting occurs. During shooting, burning powder and primer produce harmful compounds, such as, e.g., lead, copper, carbon monoxide and NO_x. Risk is especially high in poorly ventilated indoor shooting ranges. Use protective clothing.

Hand protection:	Homologated chemically resistant gloves are needed when touching damaged cartridge
Eye protection:	Safety glasses with side protection.
Hearing protection:	Hearing protection needed during shooting.
General Hygiene	No special instructions for general hygiene

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Appearance:	Cartridge shaped, metallic solid body
Odour:	None
Melting point: :	Not available
Boiling point:	Not available
Flash point:	Not available
Ignition temp:	Approximately 170^{o} C
Relative density(g/m^{3}):	Not available
Solubility in water:	Insoluble in original packaging or as a complete cartridge. Damaged cartridge can leak water-soluble components.

9.2 Other information:

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SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity

The product might react to friction, heat and/or strong shocks.

10.2 Chemical stability

The product is stable at normal handling and storage (room temperature) conditions. Do not expose to heat, or ignition sources as this could cause an explosion.

10.3 Possibility of hazardous reactions

The product is combustible. Risk of explosion.

10.4 Conditions to avoid

Avoid heat, flames, static electricity and other ignition sources. Avoid strong shocks.

10.5 Incompatible materials

Oxidizing agents, acids, alkalis, ammonia and amines.

10.6 Hazardous decomposition products

Toxic gases and fumes generated in case of fire, including nitrous gases and carbon monoxide among others.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity:	No toxicological effects from the complete cartridge. Damaged cartridge can leak components that are fatal (oral, skin) or toxic (inhalation).

Skin corrosion/irritation:	Not classified. Damaged cartridge can leak components or dust that can cause irritation.
Serious eye damage/irritation:	Not classified. Damaged cartridge can leak components or dust that can cause eye irritation.
Respiratory or skin sensitisation:	Not classified.
Germ cell mutagenicity:	Not classified.
Carcinogenicity:	Not classified.
Reproductive toxicity:	Not classified.
Specific target organ toxicity - single exposure:	Not classified.
Specific target organ toxicity – repeated exposure:	Not classified.
Aspiration hazard:	Not classified.

Nitroglycerin
Propellant inside the cartridge may contain a significant amount of Nitroglycerin which has acute toxicity and can be fatal by inhalation, ingestion or skin contact. Nitroglycerin causes acute and chronic effects on the vascular grinding regulation system. The substance is addictive. Studies (A & H 1985:31) show an increased risk for heart disease after many years of exposure (> 20 years). Nitroglycerin reacts rapidly during shooting to non-toxic products.

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity

No toxicological effects from the complete cartridge. Damaged cartridge can leak components that can cause eco toxicological effects. Information on individual constituents are as follows;

Copper:
For granulated copper, the classification is Aquatic Chronic 2, H411. International Copper Association has prepared technical guidance for the classification of copper metal (2020). The concentration of copper ions released in 7-day T/D testing of copper massive measured at a mass loading rate of 100 mg/L and a pH of 6 (100 µg/L) exceeds the acute copper ERV at pH 6 (12 µg/L), so copper massive is classified as an Acute Aquatic Toxicity Category 3 hazard. Notably, this acute aquatic toxicity hazard category does not exist in the European Union's environmental hazard classification scheme. Copper massive is not classified as a chronic aquatic toxicity hazard under the GHS because (1) copper metal is considered both rapidly removable from the water column and non-bioaccumulative, and (2) the copper ion release from 28-day T/D testing of copper massive measured at a mass loading rate of 1 mg/L and a pH of 6 (3.4 µg/L) is lower than the chronic copper ERV at pH 6 (13 µg Cu/L).

Nitroglycerin: Classified as Aquatic Chronic 2, H411: Toxic to aquatic life with long lasting effects. (ECHA harmonized classification).

Zinc:

Zinc dust is classified as Aquatic Acute 1, H400 and Aquatic Chronic 1 H410. There is not harmonized classification of massive zinc metal and ECHA's registration data for massive zinc states that data is conclusive but not sufficient for classification. The following concentrations of zinc have been reported as lethal to fish:

Rainbow trout fingerlings: 0,13mg/l, 12 – 24 hours.
Bluegill sunfish: 6 hours TLM = 1,9 – 3,6 mg/l (soft water, 30ºC).
Rainbow trout: 4 mg/l (hard water) 3 days.
Sticklebacks: 1mg/l (soft water) 24 hours.

The presence of copper appears to have a synergistic effect on the toxicity of zinc in fish.

12.2 Persistence and degradability
Not applicable.

12.3 Bioaccumulative potential
Not applicable.

12.4 Mobility in soil
Not applicable.

12.5 Results of PBT and vPvB assessment
Not applicable.

12.6 Other adverse effects
No harmful effects are expected if used properly. The contained ingredients can be harmful for the environment, but they are enclosed in the article and cannot be released. The product should not be allowed to enter drains or water-sources.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods
The waste must be disposed of in accordance with Directive 2008/98/EC and other national and local regulations. May not be mixed with other waste. Waste must be classified as hazardous. Proposal for waste code: 16 04 01* discarded ammunition.

SECTION 14: TRANSPORT INFORMATION

14.1. UN number

UN 0012

14.2. UN proper shipping name

CARTRIDGES FOR WEAPONS, INERT PROJECTILE or CARTRIDGES, SMALL ARMS.

14.3. Transport hazard class(es)
Class 1.
1.4S

14.4. Packing group
II

14.5. Environmental hazards
-

14.6. Special precautions for user
LQ: 5 kg.
Tunnel: E

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code
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SECTION 15: REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

This product is classified and labeled according to European Union regulations or respective national laws.
Regulation (EC) No. 1272/2008. on Classification, labeling and packaging of substances and mixtures (CLP)
EC regulation 1907/2006 concerning Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
Waste Framework Directive 2008/98/EC

15.2 Chemical safety assessment

A chemical safety assessment has not been conducted on this product.

SECTION 16: OTHER INFORMATION

This SDS has been compiled and is solely intended for this product. Do not disassemble, break or destroy the cartridge by violence. This information is based upon the present state of our knowledge.

Revision date: See first page.

Revision comments: This is the first version.

Used literature:

- ECHA database for chemicals and their registration data. Available at: https://echa.europa.eu/fi/home (Accessed 3.11.2020).
- Regulation (EC) No. 1272/2008. on Classification, labeling and packaging of substances and mixtures (CLP).
- EC regulation 1907/2006 concerning Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
- International Copper Association (ICA), 21.1.2020. Technical Guidance for the Classification of Copper Metal Under the Globally Harmonized System for Classification and Labelling of Chemicals (GHS). Available at: https://copperghs.org/wp-content/uploads/2020/01/Hazard-Classification-of-Copper_Report_Condensed_FINAL.pdf (Accessed 3.11.2020).

Classifications:

- Acute Tox. 1: Acute toxicity, category 1
- Acute Tox. 2: Acute toxicity, category 2
- Acute Tox. 4: Acute toxicity, category 4
- Aquatic Acute 1: Short-term (acute) aquatic hazard, category 1
- Aquatic Chronic 1: Long-term (chronic) aquatic hazard, category 1
- Aquatic Chronic 2: Long-term (chronic) aquatic hazard, category 2
- Expl. 1.1 Explosives, division 1.1
- Expl. 1.4: Explosives, division 1.4
- Pyr. Sol. 1: Pyrophoric solids, category 1
- Unst. Expl.: Unstable explosive
- Water-react. 1: Substances and mixtures which in contact with water emit flammable gases, category 1

Hazard statements:

- H200: Unstable explosive
- H201: Explosive; mass explosion hazard
- H204: Fire or projection hazard
- H250: Catches fire spontaneously if exposed to air
- H260: In contact with water releases flammable gases which may ignite spontaneously
- H300: Fatal if swallowed
- H302: Harmful if swallowed
- H310: Fatal in contact with skin
- H330: Fatal if inhaled
- H332: Harmful if inhaled
- H400: Very toxic to aquatic life
- H410: Very toxic to aquatic life with long-lasting effects
- H411: Toxic to aquatic life with long-lasting effects

Precautionary statements:

- P102: Keep out of reach of children.
- P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P280: Wear protective gloves/ protective clothing/eye protection.
- P401: Store in accordance with national/international regulations as applicable.
- P501: Dispose of contents/ container in accordance with local/national/international regulation.

Liability statement

The information in this SDS is correct to the best of our knowledge, belief, and belief at the date of its publication. The information applies only to this product and should only be used as a guide for safe handling, use, transport and disposal. The information must not be used as a guarantee or as a basis for quality assurance.