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E C - SAFETY DATA SHEET

State of: 03/2004 (2nd Edition)

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Cartridges for captive bolt stunners 9 mm x 17

No. 90 00 150

1. Identification of the substance / preparation and of the company / undertaking:

- 1.1 Identification of the substance or preparation:
Trade name: Cartridges for captive bolt stunners 9 mm
green, yellow, blue and red
- 1.2 Company / undertaking identification:
Manufacturer: RUAG Ammotec GmbH Distributor: COTRAN Corporation
Kronacher Str. 63 574 Park Ave
D - 90765 Fürth Portsmouth, RI 02871
- 1.3 Emergency Contact: CHEMTREC
1 (800) 424-9300 (domestic)
1 (703) 527-3887 (international)

2. Composition / information on ingredients:

- 2.1 General description:
Cartridges for technical purposes consisting of a brass shell case with primer cap (center fire ignition) and propellant.
Colored labeling after charge: green, yellow, blue and red.
Within the cartridges the explosive components (propellant and primer charge) are hermetically separated from the environment. They can only be opened by force destroying the complete structure.
- 2.2 Chemical characterization of hazardous ingredients
- 2.2.1 Type of propellant: double base
mass per cartridge (ca. data): green: 370 mg, yellow: 390 mg, blue: 410 mg, red: 460 mg
- | CAS-No. | Name | Content |
|-----------|----------------------------------|----------|
| 9004-70-0 | Nitrocellulose (Cellulosenitrat) | ca. 73 % |
| 55-63-0 | Nitroglycerine | ca. 26 % |
| 122-39-4 | Diphenylamine | ca. 1 % |
- 2.2.2 Priming composition (in primer cap): SINOXID mass per cartridge: ca. 26 mg
- | CAS-No. | Name | Content |
|------------|--------------------------------------|----------|
| | <u>Priming agents</u> | ca. 41 % |
| 15245-66-0 | Leadtrinitroresorcinate | |
| 31330-63-9 | Tetrazen | |
| | <u>Oxidation agents</u> | ca. 43 % |
| 10022-31-8 | Barium nitrate | |
| 1309-60-0 | Lead dioxide | |
| | <u>Reducing agents and additives</u> | ca. 16 % |
| 12013-56-8 | Calcium silicide | |
| 1345-04-6 | Antimony sulfide | |
- 2.3 Identification letter, R-phrases:
Propellant: E, T+ 2 - 11 - 23/24/25 - 27 - 33
Primer charge: E, T 61 - 3 - 20/22 - 33 - 62
- 2.4 Additional information:
Packed articles don't represent a significant risk.
In conformity with the regulations for the usage, no health hazards arise.

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3. Hazards identification:

- 3.1 General Information:
In case of free ignition of cartridges the trajectory and maximum range of the projectile are unknown.
- 3.2 Hazard Designation:
Heat or impact on the primer cap or other mechanical effort, which can carry to damage of the shell, or mechanical attempts to remove the propellant powder or the primer combustion, may cause an immediate ignition of the cartridge.
- 3.3 Specific hazards for human and environment: See point 6.

4. First aid measures:

(n.a. for intact cartridges ("n.a." = not applicable))

- 4.1 General information:
Medical aid is required in case of symptoms as irritation of respiratory tracts, which are obviously due to inhalation of combustion gas. Let inhale Dexamethason-spray.
- 4.2 Further information at contact with ingredients:
- | | |
|---------------------|--|
| After inhalation: | See 4.1 |
| After skin contact: | Wash affected spot with much water and soap. Remove dirty clothes immediately. |
| After eye contact: | Rinse well with water at least 15 minutes. If the irritation remains contact a doctor. |
| After swallowing: | Rinse out mouth and drink immediately plenty of water (only if person is conscious). Do not provoke vomiting without medical advice. Call medical aid. |

5. Fire-fighting measures:

- 5.1 Suitable extinguishing media: Water or extinguishing powder from safe distance.
- 5.2 Extinguishing media which must not be used for safety reasons: N.a.
- 5.3 Special exposure hazards arising from the substance or preparation itself, combustion products, resulting gases:
After ignition of the cartridge the explosion will occur suddenly.
Arising combustion products/gases: s. point 10.3.
Avoid inhalation of combustion gases.
- 5.4 Special protective equipment for firefighting:
Protective gloves, face protection and helmet as well as respirator are necessary.
- 5.5 Further information:
- 5.5.1 If fire involves cargo:
Fight fire with all available means but only from protected position.
A mass explosion is not to be expected.
Warn uninterested people; inform quickly fire department and police.
- 5.5.2 Actions in case of fire in the surrounding:
Remove vehicle out of designated fire zone.
Fight fire in the surrounding with all available means.
Prevent fire from reaching the cargo.

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6. Accidental release measures:

6.1 Personal precautions:

Propellant exposed (dismantled) from a cartridge is toxic by inhalation, if swallowed or in contact with skin, very toxic in contact with skin, easily flammable and explosive; in small bulk heights without confinement easily flammable. The primer charge is very explosive. Inhalation of dust, skin contact as well as ignition sources such as friction, impact, heat, sparks and electrostatic charge are absolutely to be avoided.

Precautions at transport accidents:

Secure road and warn other road users.
Keep unauthorized persons away and point to danger.
Keep away ignition sources and open fire; no smoking

6.2 Precautions after unintentional exposing:

Secure vicinity and keep unauthorized persons away, point out ignition hazards.
Put up warning signs; inform the police.

6.3 Environmental precautions:

Pick up possibly scattered cartridges only by hand, forward to authorized disposal personal. Exposed explosives have to be carefully wiped up and have to be phlegmatized in a special marked container filled with water. The affected place has to be cleaned wet. Do not get into soil, water, sewerage or groundwater.

7. Handling and storage:

7.1 Handling

7.1.1 Hints for safe handling:

Keep away from heat and open fire.
Do not throw the cartridges and do not open or deform them with force, neither mechanically nor thermally.

Caution – ignition sensitive to impact!

Delivery only allowed in closed original packaging.

Use only in for this determined and authorized devices.

The handling with the cartridges is only allowed by qualified personnel.

7.1.2 Hints for protection against fire and explosion:

No smoking

Keep away ignition sources and open fire.

7.2 Storage

7.2.1 Storage conditions:

Only to be stored in packages authorized by transportation regulations in appropriate rooms. Store cool and dry. Optimal storage temperature: 20°C (68°F).
Protect against theft and unauthorized take-off.

7.2.2 Hints on storage assembly / Prohibition on storage assembly:

Do not store together with highly flammable substances

7.2.3 Further information on storage conditions:

Storage group: 1.4

Compatibility group: S

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8. Exposure limitation and personal protective equipment

- 8.1 Additional information on design of technical facilities:
At use in rooms these have to be therefore authorized and well ventilated (suitable room / object exhaust) The rooms have to be cleaned wet regularly. Control the compliance of occupational exposure limits (Germany: MAK-value) concerning the sufficient room / object exhaust.
- 8.2 Substances with workplace related and controlled limit values:
- | | |
|-----------------------------------|-----------------------|
| MAK-value for carbon monoxide: | 35 mg/m ³ |
| MAK-value for nitrous gases: | 9,5 mg/m ³ |
| MAK-value for lead compounds: | 0,1 mg/m ³ |
| MAK-value for barium compounds: | 0,5 mg/m ³ |
| MAK-value for antimony compounds: | 0,5 mg/m ³ |
- 8.3 Personal protective equipment:
- | | |
|--|---|
| General protection and hygiene measures: | Do not eat, drink and smoke while using.
Keep order and cleanness. |
| Respiratory protection: | Not required |
| Hand protection: | Not required |
| Eye protection: | Not required |
| Body protection: | Not required |
| Ear protection: | Use ear protection if noise level > 85 dB(A) |

9. Physical and chemical properties

- 9.1 Appearance: Metal case
- 9.2 Safety-relevant data:
- | | |
|---------------------------|---|
| Flash point in degrees C: | N.a. |
| Ignition sources: | Sensitive to impact |
| Ignition temperature: | Ca. 167 °C (ca. 332°F) (deflagration point) |
| Auto-ignition: | See ignition temperature |
- Annotation: Another physical dates n.a.

10. Stability and reactivity:

- 10.1 Conditions to avoid / hazardous reactions:
Heat or impact on the primer cap leads to the individual ignition of the cartridges.
- 10.2 Substances to avoid:
Avoid contact with acids, lyes, oils and aromatic hydrocarbons.
- 10.3 Reaction products / after conversion becoming free gases:
The combustion gases contain carbon monoxide and nitrous gases. The fumes contain lead, barium and antimony compounds.
- 10.4 Dangerous polymerization: None

11. Toxicological information:

Classification for LD / LC 50 – values: n.a.

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12. Ecological information:

There are no ecological problems to be expected if handled and used properly.

13. Disposal considerations:

13.1 Recommendation

Completely fired cartridges may be forwarded to a metal recycling plant, no hazardous waste.

13.2 Further disposal information

Not fired cartridges, which can not put to the intended use, have to be passed on to authorized persons in observance of the local administrative regulations, particularly of the hazardous materials regulations according to point 14.

Waste code number (according Decision 2000/532/EC in current form): 16 04 01 "ammunition" (requires special monitoring).

14. Transport information:

14.1 U.N - proper shipping name

CARTRIDGES, POWER DEVICE

14.2 Classification code and UN-number

1.4 S, UN 0323

14.3 Packing regulations / instructions

Valid packing in conformity with packing directives as well as in conformity with BAM notice according ADR /RID/IMDG-Code: P134 according ICAO-TI and IATA-DGR: 134

Inner packaging: Receptacle e.g. of fibreboard, metal or plastic.

Intermediate packaging: Not necessary, in accordance with agreed delivery conditions

Outer packaging: Type approved and authorized box in packing group II.

e.g. fibreboard boxes (4G) or boxes of natural wood, ordinary (4C1)

14.4 Information of mass in mg

Net explosive mass per cartridge: green: 400 mg, yellow: 420 mg, blue: 440 mg, red: 490 mg

Total mass per cartridge: green: 2,54 g, yellow: 2,56 g, blue: 2,58 g, red: 2,60 g

14.5 Another information:

According subsection 1.1.3.6 ADR the exemption limit is unlimited.

Note in transport document according ADR:

„LOAD NOT EXCEEDING THE EXEMPTION LIMITS PRESCRIBED IN SECTION 1.1.3.6“

The transport according to ICAO-TI/IATA-DGR is permitted in cargo hold of passenger aircrafts and in cargo aircrafts.

15. Regulatory information

15.1 Labeling as per EC Directives

EG/R - phrases: not required

EG/S - phrases: not required

15.2 National regulations

Subject to the hazardous materials regulation (GefStoffV) dated September 27, 2002 except parts two and three. Requirements for storage rooms according to the German Explosive Law in accordance with 2nd SprengV. Subject to German Weapon Law.

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16. Other information

16.1 Additional substance-related information:

National:

The cartridges are authorized by the German Proof House in Munich, duly marked to current regulations and released in accordance with C. I. P.-regulations.

International:

Transfer to other parties and receive of cartridges is subject to current regulations in accordance to national law.

16.2 Division responsible for the edition of the Safety Data Sheet:

Environmental protection / license
administration (STU) – unit Stadeln

Contact person:

Dr. Bernd Niekisch

Phone. +49 911 7930-261

FAX : +49 911 7930-428

16.3 Information for update:

Editorial revision of all chapters.

16.4 Further information:

The information in the safety data sheet reflects the current state of knowledge of our products. It serves to describe the handling and safety requirements relevant to the product.

No binding statements as to the contractually agreed product characteristics may be inferred therefrom.

This safety data sheet is printed automatically and hence unsigned.