

# DX-Cartridge

## Product Safety Information Sheet

A safety data sheet is not required for this product under Article 31 of REACH. This Product Safety Information Sheet has been created on a voluntary basis  
Issue date: 20/10/2021      Revision date: 20/10/2021      Supersedes version of: 19/09/2017      Version: 3.5

### SECTION 1 Identification of the substance/mixture and of the company/undertaking

#### 1.1. Product identifier

Product form	Article
Trade name	DX-Cartridge
Product code	BU Direct Fastening

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

##### 1.2.1. Relevant identified uses

Industrial/Professional use spec	For professional use only
Use of the substance/mixture	CARTRIDGES FOR TOOLS, BLANK

##### 1.2.2. Uses advised against

No additional information available

#### 1.3. Details of the supplier of product safety information sheet

##### Supplier

Hilti (Schweiz) AG  
Soodstrasse 61  
8134 Adliswil - Schweiz  
T +41 844 84 84 85 - F +41 844 84 84 86  
[info@hilti.ch](mailto:info@hilti.ch)

##### Department issuing data specification sheet

Hilti Entwicklungsgesellschaft mbH  
Hiltistrasse 6  
86916 Kaufering - Deutschland  
T +49 8191 906310 - F +49 8191 90176310  
[df-hse@hilti.com](mailto:df-hse@hilti.com)

#### 1.4. Emergency telephone number

Emergency number	Schweizerisches Toxikologisches Informationszentrum – 24h Service +41 44 251 51 51 (international)
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### SECTION 2 Hazards identification

#### 2.1. Classification of the substance or mixture

**Classification according to Regulation (EC) No. 1272/2008 [CLP] Mixtures/Substances: SDS EU > 2015: According to Regulation (EU) 2015/830, 2020/878 (REACH Annex II)**

Explosives, Division 1.4      H204

Full text of H-statements: see section 16

##### Adverse physicochemical, human health and environmental effects

No additional information available

#### 2.2. Label elements

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

Hazard pictograms (CLP)



GHS01

Signal word (CLP)

Warning

Hazard statements (CLP)

H204 - Fire or projection hazard.

Precautionary statements (CLP)

P210 - Keep away from heat, hot surfaces, open flames, sparks. — No smoking.

P250 - Do not subject to shock, friction, grinding.

P280 - Wear eye protection.

P372 - Explosion risk in case of fire.

P370+P380+P375 - In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion.

P401 - Store in accordance with local regulations on explosives.

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Extra phrases

Category of the pyrotechnic article: other pyrotechnic articles Cat. P1  
(BAM EC-Type-Examination Certificate No. 0589.PYR.3800/12 or 0589.PYR.3804/12 respectively).

### 2.3. Other hazards

Other hazards which do not result in classification

This article contains hazardous substances or preparations not intended to be released under normal or reasonably foreseeable conditions of use. The dismantling of the article is prohibited!. Keep away from ignition sources (including static discharges).

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII

This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

Component	
cellulose nitrate (9004-70-0)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
glycerol trinitrate (55-63-0)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
lead styphnate (15245-44-0)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
barium nitrate (10022-31-8)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
copper (7440-50-8)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
zinc (7440-66-6)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
diphenylamine (122-39-4)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
tetrazene (109-27-3)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

Component	
cellulose nitrate(9004-70-0)	The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605
glycerol trinitrate(55-63-0)	The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

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Component	
lead styphnate(15245-44-0)	The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605
barium nitrate(10022-31-8)	The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605
copper(7440-50-8)	ED: not yet assessed
zinc(7440-66-6)	The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605
diphenylamine(122-39-4)	The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605
tetrazene(109-27-3)	The substance is not included in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or is not identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

### SECTION 3 Composition/information on ingredients

#### 3.1. Substances

Not applicable

#### 3.2. Mixtures

Comments

max. net explosives weight each cartridge in mg:

Caliber 6.8/11 (cal .27 short) white: 130; brown: 140; green: 160; yellow: 180; red: 230; titanium: 230; black: 260

Caliber 6.8/18 (cal .27 long) green: 190; yellow: 220; blue: 300; red: 330; black: 410

Caliber 6.3/10 (cal. 25) green 120; yellow: 190; red: 230; black: 250

Caliber 5.5/16 (cal .22) grey: 105; brown: 120; green: 175; yellow: 210; red: 270

Within the cartridges the explosive ingredients (gun powder and priming composition) are hermetically separated from the environment. They will be only opened with effort and under destruction of the article.

Propellant powder: glycerol trinitrate containing nitrocellulose powder

Mass per cartridge: essentially dependent on the required power (100-400 mg)

Priming composition: SINOXID (initiating explosive) Mass per cartridge: 22-33 mg in the mean.

Exposed propellant powder outside a cartridge is harmful if swallowed and highly flammable; without tamping no explosion risk.

Packed safety cartridges don't represent a significant risk.

In case of reaction no dangerous fragments or projectiles will be formed.

Mechanical or thermal attempts to expose the primer composition lead to an immediate reaction of the dangerous ingredients.

Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
cellulose nitrate	CAS-No. 9004-70-0	5 - 21	Expl. 1.1, H201

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Name	Product identifier	%	Classification according to Regulation (EC) No. 1272/2008 [CLP]
glycerol trinitrate substance with a Community workplace exposure limit	CAS-No. 55-63-0 EC-No. 200-240-8 EC Index-No. 603-034-00-X	2 - 10	Unst. Expl., H200 Acute Tox. 2 (Oral), H300 Acute Tox. 1 (Dermal), H310 Acute Tox. 2 (Inhalation), H330 STOT RE 2, H373 Aquatic Chronic 2, H411
lead styphnate substance listed as REACH Candidate	CAS-No. 15245-44-0 EC-No. 239-290-0 EC Index-No. 609-019-00-4 REACH-no 01-2119543737-30	0.1 - 3	Unst. Expl., H200 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation), H332 Repr. 1A, H360Df STOT RE 2, H373 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
barium nitrate substance with a Community workplace exposure limit	CAS-No. 10022-31-8 EC-No. 233-020-5 EC Index-No. 056-002-00-7	0.1 - 3	Ox. Sol. 2, H272 Acute Tox. 3 (Oral), H301 Acute Tox. 4 (Inhalation), H332 Eye Irrit. 2, H319
copper	CAS-No. 7440-50-8 EC-No. 231-159-6	0 – 2	Aquatic Acute 1, H400 Aquatic Chronic 3, H412
zinc	CAS-No. 7440-66-6 EC-No. 231-175-3 EC Index-No. 030-001-01-9	0 – 2	Aquatic Acute 1, H400 Aquatic Chronic 1, H410
diphenylamine	CAS-No. 122-39-4 EC-No. 204-539-4 EC Index-No. 612-026-00-5	0.1 - 1	Acute Tox. 3 (Oral), H301 Acute Tox. 3 (Dermal), H311 Acute Tox. 3 (Inhalation), H331 Eye Irrit. 2, H319 STOT RE 2, H373 Aquatic Acute 1, H400 Aquatic Chronic 1, H410
tetrazene	CAS-No. 109-27-3	0 – 1	Unst. Expl., H200 Eye Irrit. 2, H319 Aquatic Acute 1, H400 Aquatic Chronic 1, H410

Full text of H- and EUH-statements: see section 16

## SECTION 4 First aid measures

### 4.1. Description of first aid measures

First-aid measures general	In all cases of doubt, or when symptoms persist, seek medical attention.
First-aid measures after inhalation	Allow affected person to breathe fresh air. Allow the victim to rest.
First-aid measures after skin contact	Remove affected clothing and wash all exposed skin area with mild soap and water, followed by warm water rinse.
First-aid measures after eye contact	Rinse immediately with plenty of water. Obtain medical attention if pain, blinking or redness persists.
First-aid measures after ingestion	Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention.

### 4.2. Most important symptoms and effects, both acute and delayed

Symptoms/effects	Not expected to present a significant hazard under anticipated conditions of normal use.
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### 4.3. Indication of any immediate medical attention and special treatment needed

No additional information available

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### SECTION 5 Firefighting measures

#### 5.1. Extinguishing media

Suitable extinguishing media	Dry powder. Water spray.
Unsuitable extinguishing media	Do not use a heavy water stream.

#### 5.2. Special hazards arising from the substance or mixture

Hazardous decomposition products in case of fire	Carbon monoxide. Carbon dioxide (CO <sub>2</sub> ). Nitrous gasses.
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#### 5.3. Advice for firefighters

Firefighting instructions	Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire fighting water from entering the environment.
Protection during firefighting	Do not enter fire area without proper protective equipment, including respiratory protection.

### SECTION 6 Accidental release measures

#### 6.1. Personal precautions, protective equipment and emergency procedures

General measures	Remove ignition sources. Use special care to avoid static electric charges. No open flames. No smoking.
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##### 6.1.1. For non-emergency personnel

Emergency procedures	Evacuate unnecessary personnel.
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##### 6.1.2. For emergency responders

Protective equipment	Equip cleanup crew with proper protection.
Emergency procedures	Ventilate area.

#### 6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

#### 6.3. Methods and material for containment and cleaning up

Methods for cleaning up	Pick up loose cartridges only by hand. Exposed ingredients must be swept up carefully and phlegmatized in a water container, labelled according the regulations, wipe down with water the contaminated area. Store away from other materials.
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#### 6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For further information refer to section 13.

### SECTION 7 Handling and storage

#### 7.1. Precautions for safe handling

Additional hazards when processed	Hazardous waste due to potential risk of explosion.
Precautions for safe handling	Do not subject to grinding, shock, friction. Take precautionary measures against static discharge. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work.
Hygiene measures	Do not eat, drink or smoke when using this product. Always wash hands after handling the product.

#### 7.2. Conditions for safe storage, including any incompatibilities

Storage conditions	Keep only in the original container in a cool, well ventilated place away from : Direct sunlight, Heat sources. Store in a dry place.
Incompatible products	Strong bases. Strong acids.
Storage temperature	5 – 25 °C
Information on mixed storage	Keep away from : Ignition sources. Do not store with: Store according to local legislation.
Storage area	Store away from heat.

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### 7.3. Specific end use(s)

No additional information available

## SECTION 8 Exposure controls/personal protection

### 8.1. Control parameters

#### 8.1.1. National occupational exposure and biological limit values

DX-Cartridge	
EU - Indicative Occupational Exposure Limit (IOEL)	
Local name	Glycerol trinitrate
IOEL TWA	0,095 mg/m <sup>3</sup>
IOEL TWA [ppm]	0,01 ppm
IOEL STEL	0,19 mg/m <sup>3</sup>
IOEL STEL [ppm]	0,02 ppm
Notes	Skin
Regulatory reference	COMMISSION DIRECTIVE (EU) 2017/164
Switzerland - Occupational Exposure Limits	
Local name	Diphénylamine / Diphenylamin
MAK (OEL TWA) [1]	10 mg/m <sup>3</sup> (i) / (e)
MAK (OEL TWA) [2]	0,01 ppm
KZGW (OEL STEL)	0,19 mg/m <sup>3</sup>
KZGW (OEL STEL) [ppm]	0,02 ppm
Critical toxicity	Rein, Sang, Foie / Niere, Blut, Leber
Notation	R, SS <sub>c</sub> / H, SS <sub>c</sub>
Remark	NIOSH, OSHA
Regulatory reference	www.suva.ch, 01.01.2021
Switzerland - Biological limit values	
Local name	Nitroglycérine / Glycerintrinitrat
BAT	0,5 µg/l (2.75 nmol/l; Paramètre biologique: 1,2-Dinitrate de glycérine; Substrat d'examen: Plasma/Sérum; Moment du prélèvement: Fin de l'exposition, de la période de travail.) / (2.75 nmol/l; Biologischer Parameter: 1,2-Glycerindinitrat; Untersuchungsmaterial: Plasma/Serum; Probennahmezeitpunkt: Expositionsende, bzw. Schichtende.) 0,5 µg/l (2.75 nmol/l; Paramètre biologique: 1,3-Dinitrate de glycérine; Substrat d'examen: Plasma/Sérum; Moment du prélèvement: Fin de l'exposition, de la période de travail.) / (2.75 nmol/l; Biologischer Parameter: 1,3-Glycerindinitrat; Untersuchungsmaterial: Plasma/Serum; Probennahmezeitpunkt: Expositionsende, bzw. Schichtende.)
Regulatory reference	Ordonnance 832.30 (OPA), article 50 al. 3, www.suva.ch/valeurs-limites / Verordnung 832.30 (VUV), Art. 50 Abs. 3, www.suva.ch/grenzwerte
glycerol trinitrate (55-63-0)	
EU - Indicative Occupational Exposure Limit (IOEL)	
IOEL TWA	0,095 mg/m <sup>3</sup>
IOEL TWA [ppm]	0,01 ppm
IOEL STEL	0,19 mg/m <sup>3</sup>
IOEL STEL [ppm]	0,02 ppm
Switzerland - Occupational Exposure Limits	
Local name	Nitroglycérine
MAK (OEL TWA) [1]	0,094 mg/m <sup>3</sup>
MAK (OEL TWA) [2]	0,01 ppm
KZGW (OEL STEL)	0,094 mg/m <sup>3</sup>
KZGW (OEL STEL) [ppm]	0,01 ppm
Remark	15 min

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<b>diphenylamine (122-39-4)</b>	
Switzerland - Occupational Exposure Limits	
Local name	Diphénylamine
MAK (OEL TWA) [1]	10 mg/m <sup>3</sup>
<b>barium nitrate (10022-31-8)</b>	
EU - Indicative Occupational Exposure Limit (IOEL)	
IOEL TWA	0,5 mg/m <sup>3</sup> ((Ba))
<b>copper (7440-50-8)</b>	
Switzerland - Occupational Exposure Limits	
Local name	Cuivre et ses composés inorganiques
MAK (OEL TWA) [1]	0,1 mg/m <sup>3</sup>
KZGW (OEL STEL)	0,2 mg/m <sup>3</sup>
Remark	4x15

### 8.1.2. Recommended monitoring procedures

No additional information available

### 8.1.3. Air contaminants formed

No additional information available

### 8.1.4. DNEL and PNEC

No additional information available

### 8.1.5. Control banding

No additional information available

## 8.2. Exposure controls

### 8.2.1. Appropriate engineering controls

No additional information available

### 8.2.2. Personal protection equipment

#### Personal protective equipment

When using cartridge operated tools, sufficient ear protection must be worn.

#### Personal protective equipment symbol(s)



#### 8.2.2.1. Eye and face protection

##### Eye protection

Safety glasses

#### 8.2.2.2. Skin protection

##### Skin and body protection

When using cartridge operated tools, sufficient ear protection must be worn.

#### 8.2.2.3. Respiratory protection

No additional information available

#### 8.2.2.4. Thermal hazards

No additional information available

### 8.2.3. Environmental exposure controls

#### Other information

Do not eat, drink or smoke during use.

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No additional information available

### SECTION 9 Physical and chemical properties

#### 9.1. Information on basic physical and chemical properties

Physical state	Solid
Colour	According to product specification.
Odour	Not available
Odour threshold	Not available
Melting point	Not available
Freezing point	Not available
Boiling point	Not available
Flammability	Not available
Explosive properties	Fire or projection hazard.
Explosive limits	Not applicable
Lower explosive limit (LEL)	Not applicable
Upper explosive limit (UEL)	Not applicable
Flash point	Not applicable
Auto-ignition temperature	Not applicable
Decomposition temperature	Not available
pH	Not available
pH solution	Not available
Viscosity, kinematic	Not applicable
Solubility	Not available
Partition coefficient n-octanol/water (Log Kow)	Not available
Vapour pressure	Not available
Vapour pressure at 50 °C	Not available
Density	Not available
Relative density	Not available
Relative vapour density at 20 °C	Not applicable
Particle size	Not available
Particle size distribution	Not available
Particle shape	Not available
Particle aspect ratio	Not available
Particle aggregation state	Not available
Particle agglomeration state	Not available
Particle specific surface area	Not available
Particle dustiness	Not available

#### 9.2. Other information

##### 9.2.1. Information with regard to physical hazard classes

No additional information available

##### 9.2.2. Other safety characteristics

Additional information Not applicable. Article

### SECTION 10 Stability and reactivity

#### 10.1. Reactivity

No additional information available

#### 10.2. Chemical stability

Stable under normal conditions.

#### 10.3. Possibility of hazardous reactions

Not established.



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### 10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures. Heat. Sparks. Open flame. Overheating.

### 10.5. Incompatible materials

Strong acids. Strong bases.

### 10.6. Hazardous decomposition products

Carbon monoxide. Carbon dioxide. Nitrogen oxides. Metal oxides. Thermal decomposition can lead to the release of irritating gases and vapours.

## SECTION 11 Toxicological information

### 11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity (oral)	Not classified
Acute toxicity (dermal)	Not classified
Acute toxicity (inhalation)	Not classified

<b>glycerol trinitrate (55-63-0)</b>	
LD50 oral rat	685 mg/kg bodyweight (Rat, Male / female, Experimental value, Oral, 14 day(s))
LD50 oral	685 mg/kg
LD50 dermal rat	> 9560 mg/kg bodyweight (Equivalent or similar to OECD 402, Rat, Male / female, Experimental value, Dermal)
ATE CLP (oral)	5 mg/kg bodyweight
ATE CLP (dermal)	5 mg/kg bodyweight
ATE CLP (gases)	100 ppmv/4h
ATE CLP (vapours)	0,5 mg/l/4h
ATE CLP (dust,mist)	0,05 mg/l/4h
<b>lead styphnate (15245-44-0)</b>	
ATE CLP (oral)	500 mg/kg bodyweight
ATE CLP (gases)	4500 ppmv/4h
ATE CLP (vapours)	11 mg/l/4h
ATE CLP (dust,mist)	1,5 mg/l/4h
<b>diphenylamine (122-39-4)</b>	
LD50 oral rat	> 800 mg/kg bodyweight (Rat, Male, Experimental value, Oral)
ATE CLP (oral)	100 mg/kg bodyweight
ATE CLP (dermal)	300 mg/kg bodyweight
ATE CLP (gases)	700 ppmv/4h
ATE CLP (vapours)	3 mg/l/4h
ATE CLP (dust,mist)	0,5 mg/l/4h
<b>barium nitrate (10022-31-8)</b>	
LD50 oral rat	50 – 300 mg/kg bodyweight (OECD 423: Acute Oral Toxicity – Acute Toxic Class Method, Rat, Female, Experimental value, Oral, 14 day(s))
LD50 oral	355 mg/kg
LD50 dermal rat	> 2000 mg/kg bodyweight (OECD 402: Acute Dermal Toxicity, 24 h, Rat, Male / female, Experimental value, Dermal, 14 day(s))
LC50 Inhalation - Rat	> 1,1 mg/l (OECD 403: Acute Inhalation Toxicity, 4 h, Rat, Male / female, Experimental value, Inhalation (aerosol), 14 day(s))
ATE CLP (oral)	50 mg/kg bodyweight
ATE CLP (gases)	4500 ppmv/4h
ATE CLP (vapours)	11 mg/l/4h
ATE CLP (dust,mist)	1,5 mg/l/4h
<b>zinc (7440-66-6)</b>	
LD50 oral rat	> 2000 mg/kg bodyweight (OECD 401: Acute Oral Toxicity, Rat, Male / female, Experimental value, Oral, 14 day(s))

Skin corrosion/irritation	Not classified
Additional information	Based on available data, the classification criteria are not met
Serious eye damage/irritation	Not classified
Additional information	Based on available data, the classification criteria are not met

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Respiratory or skin sensitisation	Not classified
Additional information	Based on available data, the classification criteria are not met
Germ cell mutagenicity	Not classified
Additional information	Based on available data, the classification criteria are not met
Carcinogenicity	Not classified
Additional information	Based on available data, the classification criteria are not met
Reproductive toxicity	Not classified
Additional information	Based on available data, the classification criteria are not met
STOT-single exposure	Not classified
Additional information	Based on available data, the classification criteria are not met
STOT-repeated exposure	Not classified
Additional information	Based on available data, the classification criteria are not met

<b>glycerol trinitrate (55-63-0)</b>	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.
<b>lead styphnate (15245-44-0)</b>	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.
<b>diphenylamine (122-39-4)</b>	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard	Not classified
Additional information	Based on available data, the classification criteria are not met

### 11.2. Information on other hazards

#### 11.2.1. Endocrine disrupting properties

No additional information available

#### 11.2.2. Other information

Potential adverse human health effects and symptoms

No additional information available, No harmful effects are to be expected if used properly. The contained ingredients can be harmful, but they are hermetically enclosed in the article and can not be released. The dismantling of the article is prohibited.

## SECTION 12 Ecological information

### 12.1. Toxicity

Ecology - general	No harmful effects are to be expected if used properly. The contained ingredients can be harmful, but they are hermetically enclosed in the article and can not be released. The dismantling of the article is prohibited.
Hazardous to the aquatic environment, short-term (acute)	Not classified
Hazardous to the aquatic environment, long-term (chronic)	Not classified

<b>glycerol trinitrate (55-63-0)</b>	
LC50 - Fish [1]	1,9 mg/l (ASTM E729-80, 96 h, Oncorhynchus mykiss, Flow-through system, Fresh water, Experimental value, Lethal)
NOEC chronic fish	0,03 mg/l
<b>lead styphnate (15245-44-0)</b>	
EC50 - Crustacea [1]	7 mg/l
<b>diphenylamine (122-39-4)</b>	
EC50 - Crustacea [1]	2 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Fresh water, Experimental value, Locomotor effect)
ErC50 algae	2,17 mg/l (OECD 201: Alga, Growth Inhibition Test, 72 h, Pseudokirchneriella subcapitata, Experimental value, GLP)
NOEC chronic algae	0,0273 mg/l
<b>barium nitrate (10022-31-8)</b>	
EC50 - Crustacea [1]	9018 mg/l

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<b>barium nitrate (10022-31-8)</b>	
EC50 72h - Algae [1]	> 45,6 mg/l (OECD 201: Alga, Growth Inhibition Test, Pseudokirchneriella subcapitata, Static system, Fresh water, Experimental value, Growth rate)
<b>tetrazene (109-27-3)</b>	
EC50 - Crustacea [1]	0,14 mg/l
<b>copper (7440-50-8)</b>	
LC50 - Fish [1]	200 µg/l (96 h, Salmo gairdneri, Flow-through system, Fresh water, Weight of evidence, Lethal)
EC50 - Crustacea [1]	109 – 798 µg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Static system, Fresh water, Weight of evidence, Locomotor effect)
EC50 72h - Algae [1]	230 µg/l (OECD 201: Alga, Growth Inhibition Test, Pseudokirchneriella subcapitata, Static system, Fresh water, Weight of evidence, Growth rate)
<b>zinc (7440-66-6)</b>	
LC50 - Fish [1]	0,169 mg/l (Other, 96 h, Oncorhynchus mykiss, Static system, Fresh water, Read-across, Zinc ion)
EC50 - Crustacea [1]	416 µg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Ceriodaphnia dubia, Static system, Fresh water, Experimental value)
ErC50 algae	0,15 mg/l

### 12.2. Persistence and degradability

<b>DX-Cartridge</b>	
Persistence and degradability	Not established.
<b>glycerol trinitrate (55-63-0)</b>	
Persistence and degradability	Readily biodegradable in water.
Biochemical oxygen demand (BOD)	53,6 g O <sub>2</sub> /g substance
<b>diphenylamine (122-39-4)</b>	
Persistence and degradability	Not readily biodegradable in water.
ThOD	2,39 g O <sub>2</sub> /g substance
<b>barium nitrate (10022-31-8)</b>	
Persistence and degradability	Biodegradability: not applicable.
Chemical oxygen demand (COD)	Not applicable (inorganic)
ThOD	Not applicable (inorganic)
<b>copper (7440-50-8)</b>	
Persistence and degradability	Biodegradability in soil: not applicable. Biodegradability: not applicable.
Biochemical oxygen demand (BOD)	Not applicable
Chemical oxygen demand (COD)	Not applicable
ThOD	Not applicable
BOD (% of ThOD)	Not applicable
<b>zinc (7440-66-6)</b>	
Persistence and degradability	Biodegradability: not applicable.
Chemical oxygen demand (COD)	Not applicable (inorganic)
ThOD	Not applicable (inorganic)

### 12.3. Bioaccumulative potential

<b>DX-Cartridge</b>	
Bioaccumulative potential	Not established.
<b>glycerol trinitrate (55-63-0)</b>	
Bioaccumulative potential	Low potential for bioaccumulation (Log Kow < 4).
<b>diphenylamine (122-39-4)</b>	
BCF - Fish [1]	51 – 253 (Cyprinus carpio, Literature study, Test duration: 8 weeks)
Partition coefficient n-octanol/water (Log Pow)	3,71 – 3,84 (Weight of evidence approach, OECD 107: Partition Coefficient (n-octanol/water): Shake Flask Method, 20.2 °C)
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).
<b>barium nitrate (10022-31-8)</b>	
Bioaccumulative potential	Not bioaccumulative.

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<b>copper (7440-50-8)</b>	
Bioaccumulative potential	Bioaccumulation: not applicable.
<b>zinc (7440-66-6)</b>	
BCF - Fish [1]	0,002 (40 day(s), Danio rerio, Semi-static system, Fresh water, Read-across)
Bioaccumulative potential	Low potential for bioaccumulation (BCF < 500).

### 12.4. Mobility in soil

<b>glycerol trinitrate (55-63-0)</b>	
Ecology - soil	Low potential for adsorption in soil.
<b>diphenylamine (122-39-4)</b>	
Surface tension	71,8 mN/m (20 °C, 90 %, EU Method A.5: Surface tension)
Partition coefficient n-octanol/water (Log Koc)	2,818 – 2,917 (log Koc, SRC PCKOCWIN v2.0, Calculated value)
Ecology - soil	Low potential for adsorption in soil. May be harmful to plant growth, blooming and fruit formation.
<b>barium nitrate (10022-31-8)</b>	
Surface tension	No data available in the literature
Ecology - soil	Adsorption to soil is possible.
<b>copper (7440-50-8)</b>	
Ecology - soil	Adsorbs into the soil.
<b>zinc (7440-66-6)</b>	
Surface tension	No data available in the literature
Ecology - soil	Adsorbs into the soil.

### 12.5. Results of PBT and vPvB assessment

<b>DX-Cartridge</b>	
This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII	
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII	
<b>Component</b>	
cellulose nitrate (9004-70-0)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
glycerol trinitrate (55-63-0)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
lead styphnate (15245-44-0)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
barium nitrate (10022-31-8)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
copper (7440-50-8)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
zinc (7440-66-6)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
diphenylamine (122-39-4)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII
tetrazene (109-27-3)	This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

### 12.6. Endocrine disrupting properties

No additional information available

### 12.7. Other adverse effects

Additional information

Avoid release to the environment.

## SECTION 13 Disposal considerations

### 13.1. Waste treatment methods

Product/Packaging disposal recommendations

Dispose in a safe manner in accordance with local/national regulations. Refer to manufacturer/supplier for information on recovery/recycling.

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### Additional information

Cartridge strips with unused cartridges: Hazardous waste due to risk of explosion. European waste catalogue: 16 04 01\* - waste ammunition. If possible use up the cartridges or store them for your next project.

If not possible to use up the cartridges - The strip is mixed municipal waste and the cartridge itself is "waste ammunition" and has to be disposed of by an authorized/certified company.

If cartridges are used up: European waste catalogue: 20 03 01 - mixed municipal waste .

The product (cartridges and strip) can be disposed of as household or factory waste.

Avoid release to the environment.

### Ecology - waste materials

## SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / RID

ADR	IMDG	IATA	RID
<b>14.1. UN number or ID number</b>			
UN 0014	UN 0014	UN 0014	UN 0014
<b>14.2. UN proper shipping name</b>			
CARTRIDGES FOR TOOLS, BLANK	CARTRIDGES FOR TOOLS, BLANK	Cartridges for tools, blank	CARTRIDGES FOR TOOLS, BLANK
Transport document description			
UN 0014 CARTRIDGES FOR TOOLS, BLANK, 1.4S, (E)	UN 0014 CARTRIDGES FOR TOOLS, BLANK, 1.4S	UN 0014 Cartridges for tools, blank, 1.4S	UN 0014 CARTRIDGES FOR TOOLS, BLANK, 1.4S
<b>14.3. Transport hazard class(es)</b>			
1.4S	1.4S	1.4S	1.4S
<b>14.4. Packing group</b>			
Not applicable	Not applicable	Not applicable	Not applicable
<b>14.5. Environmental hazards</b>			
Dangerous for the environment: No	Dangerous for the environment: No Marine pollutant: No	Dangerous for the environment: No	Dangerous for the environment: No
No supplementary information available			

### 14.6. Special precautions for user

#### Overland transport

Classification code (ADR)	: 1.4S
Special provisions (ADR)	: 364
Limited quantities (ADR)	: 5kg
Packing instructions (ADR)	: P130
Mixed packing provisions (ADR)	: MP23, MP24
Transport category (ADR)	: 4
Tunnel restriction code (ADR)	: E

#### Transport by sea

Special provisions (IMDG)	: 364
Limited quantities (IMDG)	: 5 kg

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Packing instructions (IMDG)	: P130
EmS-No. (Fire)	: F-B
EmS-No. (Spillage)	: S-X
Stowage category (IMDG)	: 01
Stowage and handling (IMDG)	: SW1
MFAG-No	: 114

### Air transport

PCA packing instructions (IATA)	: 130
PCA max net quantity (IATA)	: 25kg
CAO packing instructions (IATA)	: 130
Special provisions (IATA)	: A802

### Rail transport

Special provisions (RID)	: 364
Limited quantities (RID)	: 5kg
Packing instructions (RID)	: P130, LP101

## 14.7. Maritime transport in bulk according to IMO instruments

Not applicable

## SECTION 15 Regulatory information

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

#### 15.1.1. EU-Regulations

Contains one substance (s) from the list of candidate substances of REACH in a concentration > 0,1%: Lead styphnate (EC 239-290-0, CAS 15245-44-0)

Category of the pyrotechnic article: other pyrotechnic articles Cat. P1

(BAM EC-Type-Examination Certificate No. 0589.PYR.3800/12 or 0589.PYR.3804/12 respectively)

Substances subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals: Lead compounds (15245-44-0), Diphenylamine (122-39-4)

Contains no substance subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

#### 15.1.2. National regulations

No additional information available

### 15.2. Chemical safety assessment

No chemical safety assessment has been carried out

## SECTION 16 Other information

A safety data sheet is not required for this product under Article 31 of REACH. This Product Safety Information Sheet has been created on a voluntary basis

### Indication of changes:

Section	Changed item	Change	Comments
3.2	Product information	Modified	

Abbreviations and acronyms	
ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
DMEL	Derived Minimal Effect level

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Abbreviations and acronyms	
DNEL	Derived-No Effect Level
EC50	Median effective concentration
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Median lethal concentration
LD50	Median lethal dose
LOAEL	Lowest Observed Adverse Effect Level
NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
OECD	Organisation for Economic Co-operation and Development
PBT	Persistent Bioaccumulative Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS	Safety Data Sheet
vPvB	Very Persistent and Very Bioaccumulative

Full text of H- and EUH-statements:	
Acute Tox. 1 (Dermal)	Acute toxicity (dermal), Category 1
Acute Tox. 2 (Inhalation)	Acute toxicity (inhal.), Category 2
Acute Tox. 2 (Oral)	Acute toxicity (oral), Category 2
Acute Tox. 3 (Dermal)	Acute toxicity (dermal), Category 3
Acute Tox. 3 (Inhalation)	Acute toxicity (inhal.), Category 3
Acute Tox. 3 (Oral)	Acute toxicity (oral), Category 3
Acute Tox. 4 (Inhalation)	Acute toxicity (inhal.), Category 4
Acute Tox. 4 (Oral)	Acute toxicity (oral), Category 4
Aquatic Acute 1	Hazardous to the aquatic environment — Acute Hazard, Category 1
Aquatic Chronic 1	Hazardous to the aquatic environment — Chronic Hazard, Category 1
Aquatic Chronic 2	Hazardous to the aquatic environment — Chronic Hazard, Category 2
Aquatic Chronic 3	Hazardous to the aquatic environment — Chronic Hazard, Category 3
Expl. 1.1	Explosives, Division 1.1
Expl. 1.4	Explosives, Division 1.4
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Ox. Sol. 2	Oxidising Solids, Category 2
Repr. 1A	Reproductive toxicity, Category 1A
STOT RE 2	Specific target organ toxicity — Repeated exposure, Category 2
Unst. Expl.	Explosives, Unstable explosives
H200	Unstable explosives.
H201	Explosive; mass explosion hazard.
H204	Fire or projection hazard.
H272	May intensify fire; oxidiser.
H300	Fatal if swallowed.
H301	Toxic if swallowed.
H302	Harmful if swallowed.
H310	Fatal in contact with skin.
H311	Toxic in contact with skin.
H319	Causes serious eye irritation.
H330	Fatal if inhaled.
H331	Toxic if inhaled.
H332	Harmful if inhaled.
H360Df	May damage the unborn child. Suspected of damaging fertility.
H373	May cause damage to organs through prolonged or repeated exposure.



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Full text of H- and EUH-statements:	
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.
H412	Harmful to aquatic life with long lasting effects.

Classification and procedure used to derive the classification for mixtures according to Regulation (EC) 1272/2008 [CLP]		
Expl. 1.4	H204	Expert judgment

SDS\_EU\_Hilti