

# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

Issue date: 06/04/2024

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Version: 1.0

### SECTION 1: Identification

#### 1.1. Product identifier

Product form	Article
Name	DX-Cartridge
Product code	BU Direct Fastening

#### 1.2. Recommended use and restrictions on use

Recommended use	CARTRIDGES FOR TOOLS, BLANK
Restrictions on use	For professional use only

#### 1.3. Supplier

##### Supplier

Hilti (Canada) Corp.  
2201 Bristol Circle  
Suite 700  
Oakville, Ontario L6H 0J8  
Canada  
T +1905 8139200  
1-800-363-4458 toll free - F +1 905 813 9009

##### Department issuing data specification sheet

Hilti AG  
Feldkircherstraße 100  
Schaan, 9494  
Liechtenstein  
T +423 234 2111  
[product.compliance-direct.fastening@hilti.com](mailto:product.compliance-direct.fastening@hilti.com)

#### 1.4. Emergency telephone number

Emergency number	Emergency CONTACT (24-Hour-Number) GBK/Infotrac ID 101022 (USA domestic) 1 800 535 5053 or international (001) 352 323 3500
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### SECTION 2: Hazard identification

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

##### Classification (GHS CA)

Not classified

#### 2.2. GHS Label elements, including precautionary statements

##### GHS CA labelling

Precautionary statements (GHS CA)	P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P250 - Do not subject to friction, grinding, shock. P280 - Wear eye protection. P370+P380+P375 - In case of fire: Evacuate area. Fight fire remotely due to the risk of explosion. P372 - Explosion risk in case of fire. P401 - Store in accordance with local regulations on explosives.
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#### 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).
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# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

### 2.4. Unknown acute toxicity (GHS CA)

No data available

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Not applicable

### 3.2. Mixtures

Comments

max. net explosives weight each cartridge in mg:

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

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)

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	Chemical name / Synonyms	Product identifier	%	Classification (GHS CA)
copper	-	CAS-No.: 7440-50-8	25 – 35	Not classified
glycerol trinitrate	glycerol trinitrate; nitroglycerine	CAS-No.: 55-63-0	7 – 25	Acute Tox. 2 (Oral), H300 Acute Tox. 1 (Dermal), H310 Acute Tox. 2 (Inhalation), H330 STOT RE 2, H373
zinc	zinc powder— zinc dust (stabilised)	CAS-No.: 7440-66-6	15 – 25	Not classified
cellulose nitrate	-	CAS-No.: 9004-70-0	7 – 17	Not classified
barium nitrate	Barium nitrate	CAS-No.: 10022-31-8	1 – 3	Ox. Liq. 2, H272 Acute Tox. 3 (Oral), H301 Acute Tox. 4 (Inhalation), H332 Eye Irrit. 2A, H319
lead styphnate	lead 2,4,6-trinitro- m-phenylene dioxide; lead 2,4,6- trinitroresorcinoxi de; lead styphnate	CAS-No.: 15245-44-0	1 – 2.5	Flam. Gas 1, H220 Acute Tox. 4 (Oral), H302 Acute Tox. 4 (Inhalation:dust,mist), H332 Repr. 1, H360 STOT RE 2, H373



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

Name	Chemical name / Synonyms	Product identifier	%	Classification (GHS CA)
diphenylamine	diphenylamine	CAS-No.: 122-39-4	0.1 – 1	Acute Tox. 3 (Oral), H301 Acute Tox. 3 (Dermal), H311 Acute Tox. 3 (Inhalation), H331 Eye Irrit. 2A, H319 Carc. 2, H351 STOT RE 2, H373
tetrazene	tetrazene	CAS-No.: 109-27-3	0 – 1	Eye Irrit. 2A, H319

Full text of hazard classes and H-statements : see section 16

## SECTION 4: First-aid measures

### 4.1. Description of first aid measures

First-aid measures after inhalation	Remove person to fresh air and keep comfortable for breathing. 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. Rinse eyes with water as a precaution.
First-aid measures after ingestion	Rinse mouth. Do NOT induce vomiting. Obtain emergency medical attention. Call a poison center or a doctor if you feel unwell.
First-aid measures general	In all cases of doubt, or when symptoms persist, seek medical attention.

### 4.2. Most important symptoms and effects (acute and delayed)

Symptoms/effects	Not expected to present a significant hazard under anticipated conditions of normal use.
Potential adverse human health effects and symptoms	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.

### 4.3. Immediate medical attention and special treatment, if necessary

Other medical advice or treatment	No additional information available.
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## SECTION 5: Fire-fighting measures

### 5.1. Suitable extinguishing media

Suitable extinguishing media	Dry powder. Water spray.
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### 5.2. Unsuitable extinguishing media

Unsuitable extinguishing media	Do not use a heavy water stream.
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### 5.3. Specific hazards arising from the hazardous product

Explosion hazard	Explosion risk in case of fire.
Hazardous decomposition products in case of fire	Carbon monoxide. Carbon dioxide (CO <sub>2</sub> ). Nitrous gasses.

### 5.4. Special protective equipment and precautions for fire-fighters

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.



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

### 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.

#### 6.2. Methods and materials 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 to the regulations, wipe down with water the contaminated area. Store away from other materials.

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

#### 6.3. Reference to other sections

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

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

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.

Additional hazards when processed Hazardous waste due to potential risk of explosion.

#### 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

Storage area Store away from heat.

Information on mixed storage Keep away from : Ignition sources. Do not store with: Store according to local legislation.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

glycerol trinitrate (55-63-0)	
<b>Canada (Alberta) - Occupational Exposure Limits</b>	
Local name	Nitroglycerin (NG)
OEL TWA	0.5 mg/m <sup>3</sup>
	0.05 ppm
Notations and remarks	Substance may be readily absorbed through intact skin.
Regulatory reference	Alberta Regulation 191/2021
<b>Canada (Quebec) - Occupational Exposure Limits</b>	
Local name	Nitroglycerin
VEMP (OEL TWA EV)	0.05 ppm



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

glycerol trinitrate (55-63-0)	
Notations and remarks	Pc
Regulatory reference	S-2.1, r. 13 - Regulation respecting occupational health and safety
<b>Canada (British Columbia) - Occupational Exposure Limits</b>	
Local name	Nitroglycerin (NG)
OEL TWA	0.05 ppm
Notations and remarks	Skin
Regulatory reference	OHS Guidelines Part 5: Chemical Agents and Biological Agents (WorkSafe BC)
<b>Canada (Manitoba) - Occupational Exposure Limits</b>	
Local name	Nitroglycerin (NG)
OEL TWA	0.05 ppm
Notations and remarks	TLV® Basis: Vasodilation. Notations: Skin
Regulatory reference	ACGIH 2024
<b>Canada (New Brunswick) - Occupational Exposure Limits</b>	
Local name	Nitroglycerin (NG)
OEL TWA	0.05 ppm
Notations and remarks	Vasodilation
<b>Canada (Newfoundland and Labrador) - Occupational Exposure Limits</b>	
Local name	Nitroglycerin (NG)
OEL TWA	0.05 ppm
Notations and remarks	TLV® Basis: Vasodilation. Notations: Skin
Regulatory reference	ACGIH 2024
<b>Canada (Nova Scotia) - Occupational Exposure Limits</b>	
Local name	Nitroglycerin (NG)
OEL TWA	0.05 ppm
Notations and remarks	TLV® Basis: Vasodilation. Notations: Skin
Regulatory reference	ACGIH 2024
<b>Canada (Nunavut) - Occupational Exposure Limits</b>	
Local name	Nitroglycerin (NG)
OEL TWA	0.05 ppm
OEL STEL	0.15 ppm
Notations and remarks	Skin
Regulatory reference	Occupational Health and Safety Regulations, Nu Reg 003-2016 (Amendment R-044-2021)
<b>Canada (Northwest Territories) - Occupational Exposure Limits</b>	
Local name	Nitroglycerin (NG)
OEL TWA	0.05 ppm



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

glycerol trinitrate (55-63-0)	
OEL STEL	0.15 ppm
Notations and remarks	Skin
Regulatory reference	Occupation Health and Safety Regulations R-039-2015 (R-013-2020)
<b>Canada (Ontario) - Occupational Exposure Limits</b>	
Local name	Nitroglycerin (NG)
OEL TWAEV	0.05 ppm
Notations and remarks	Skin
Regulatory reference	Ontario Occupational Exposure Limits under Regulation 833
<b>Canada (Prince Edward Island) - Occupational Exposure Limits</b>	
Local name	Nitroglycerin (NG)
OEL TWA	0.05 ppm
Notations and remarks	TLV® Basis: Vasodilation. Notations: Skin
Regulatory reference	ACGIH 2024
<b>Canada (Saskatchewan) - Occupational Exposure Limits</b>	
Local name	Nitroglycerin (NG)
OEL TWA	0.05 ppm
OEL STEL	0.15 ppm
Notations and remarks	Skin
Regulatory reference	The Occupational Health and Safety Regulations, 2020. Chapter S-15.1 Reg 10
copper (7440-50-8)	
<b>Canada (Alberta) - Occupational Exposure Limits</b>	
Local name	Copper
OEL TWA	0.2 mg/m <sup>3</sup> Fume 1 mg/m <sup>3</sup> Dusts/mists, as Cu
Regulatory reference	Alberta Regulation 191/2021
<b>Canada (Quebec) - Occupational Exposure Limits</b>	
Local name	Copper (as Cu)
VEMP (OEL TWAEV)	0.2 mg/m <sup>3</sup> Fume 1 mg/m <sup>3</sup> Dusts & mists
Regulatory reference	S-2.1, r. 13 - Regulation respecting occupational health and safety
<b>Canada (British Columbia) - Occupational Exposure Limits</b>	
Local name	Copper, as Cu
OEL TWA	1 mg/m <sup>3</sup> Dusts and mists 0.2 mg/m <sup>3</sup> Fume
Regulatory reference	OHS Guidelines Part 5: Chemical Agents and Biological Agents (WorkSafe BC)



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

copper (7440-50-8)	
<b>Canada (Manitoba) - Occupational Exposure Limits</b>	
Local name	Copper, as Cu
OEL TWA	0.2 mg/m <sup>3</sup> (Fume) 1 mg/m <sup>3</sup> (Dusts and mists)
Notations and remarks	TLV® Basis: Irr; GI; metal fume fever
Regulatory reference	ACGIH 2024
<b>Canada (New Brunswick) - Occupational Exposure Limits</b>	
Local name	Copper Dusts and mists, as Cu
OEL TWA	1 mg/m <sup>3</sup>
Notations and remarks	Irr; GI; metal fume fever
<b>Canada (Newfoundland and Labrador) - Occupational Exposure Limits</b>	
Local name	Copper, as Cu
OEL TWA	0.2 mg/m <sup>3</sup> (Fume) 1 mg/m <sup>3</sup> (Dusts and mists)
Notations and remarks	TLV® Basis: Irr; GI; metal fume fever
Regulatory reference	ACGIH 2024
<b>Canada (Nova Scotia) - Occupational Exposure Limits</b>	
Local name	Copper, as Cu
OEL TWA	0.2 mg/m <sup>3</sup> (Fume) 1 mg/m <sup>3</sup> (Dusts and mists)
Notations and remarks	TLV® Basis: Irr; GI; metal fume fever
Regulatory reference	ACGIH 2024
<b>Canada (Nunavut) - Occupational Exposure Limits</b>	
Local name	Copper, (as Cu)
OEL TWA	0.2 mg/m <sup>3</sup> Fume 1 mg/m <sup>3</sup> Dusts and mists
OEL STEL	0.6 mg/m <sup>3</sup> Fume 3 mg/m <sup>3</sup> Dusts and mists
Regulatory reference	Occupational Health and Safety Regulations, Nu Reg 003-2016 (Amendment R-044-2021)
<b>Canada (Northwest Territories) - Occupational Exposure Limits</b>	
Local name	Copper, (as Cu)
OEL TWA	0.2 mg/m <sup>3</sup> Fume 1 mg/m <sup>3</sup> Dusts and mists
OEL STEL	0.6 mg/m <sup>3</sup> Fume 3 mg/m <sup>3</sup> Dusts and mists
Regulatory reference	Occupation Health and Safety Regulations R-039-2015 (R-013-2020)



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

copper (7440-50-8)	
<b>Canada (Ontario) - Occupational Exposure Limits</b>	
Local name	Copper - Dusts and mists, as Cu
OEL TWAEV	1 mg/m <sup>3</sup>
Regulatory reference	Ontario Occupational Exposure Limits under Regulation 833
<b>Canada (Prince Edward Island) - Occupational Exposure Limits</b>	
Local name	Copper, as Cu
OEL TWA	0.2 mg/m <sup>3</sup> (Fume) 1 mg/m <sup>3</sup> (Dusts and mists)
Notations and remarks	TLV® Basis: Irr; GI; metal fume fever
Regulatory reference	ACGIH 2024
<b>Canada (Saskatchewan) - Occupational Exposure Limits</b>	
Local name	Copper, (as Cu)
OEL TWA	0.2 mg/m <sup>3</sup> fume 1 mg/m <sup>3</sup> dusts and mists
OEL STEL	0.6 mg/m <sup>3</sup> fume 3 mg/m <sup>3</sup> dusts and mists
Regulatory reference	The Occupational Health and Safety Regulations, 2020. Chapter S-15.1 Reg 10
<b>Canada (Yukon) - Occupational Exposure Limits</b>	
Local name	Copper
OEL TWA	0.2 mg/m <sup>3</sup> Fume 1 mg/m <sup>3</sup> Dusts and mists (as Cu)
OEL STEL	0.2 mg/m <sup>3</sup> Fume 2 mg/m <sup>3</sup> Dusts and mists (as Cu)
Regulatory reference	Yukon Occupational Health Regulations O.I.C. 1986/164
diphenylamine (122-39-4)	
<b>Canada (Alberta) - Occupational Exposure Limits</b>	
Local name	Diphenylamine
OEL TWA	10 mg/m <sup>3</sup>
Regulatory reference	Alberta Regulation 191/2021
<b>Canada (Quebec) - Occupational Exposure Limits</b>	
Local name	Diphenylamine
VEMP (OEL TWAEV)	10 mg/m <sup>3</sup>
Regulatory reference	S-2.1, r. 13 - Regulation respecting occupational health and safety
<b>Canada (British Columbia) - Occupational Exposure Limits</b>	
Local name	Diphenylamine
OEL TWA	10 mg/m <sup>3</sup>
Regulatory reference	OHS Guidelines Part 5: Chemical Agents and Biological Agents (WorkSafe BC)



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

diphenylamine (122-39-4)	
<b>Canada (Manitoba) - Occupational Exposure Limits</b>	
Local name	Diphenylamine
OEL TWA	10 mg/m <sup>3</sup>
Notations and remarks	TLV® Basis: Liver & kidney dam; hematologic eff. Notations: A4 (Not classifiable as a Human Carcinogen)
Regulatory reference	ACGIH 2024
<b>Canada (Newfoundland and Labrador) - Occupational Exposure Limits</b>	
Local name	Diphenylamine
OEL TWA	10 mg/m <sup>3</sup>
Notations and remarks	TLV® Basis: Liver & kidney dam; hematologic eff. Notations: A4 (Not classifiable as a Human Carcinogen)
Regulatory reference	ACGIH 2024
<b>Canada (Nova Scotia) - Occupational Exposure Limits</b>	
Local name	Diphenylamine
OEL TWA	10 mg/m <sup>3</sup>
Notations and remarks	TLV® Basis: Liver & kidney dam; hematologic eff. Notations: A4 (Not classifiable as a Human Carcinogen)
Regulatory reference	ACGIH 2024
<b>Canada (Nunavut) - Occupational Exposure Limits</b>	
Local name	Diphenylamine
OEL TWA	10 mg/m <sup>3</sup>
OEL STEL	20 mg/m <sup>3</sup>
Regulatory reference	Occupational Health and Safety Regulations, Nu Reg 003-2016 (Amendment R-044-2021)
<b>Canada (Northwest Territories) - Occupational Exposure Limits</b>	
Local name	Diphenylamine
OEL TWA	10 mg/m <sup>3</sup>
OEL STEL	20 mg/m <sup>3</sup>
Regulatory reference	Occupation Health and Safety Regulations R-039-2015 (R-013-2020)
<b>Canada (Ontario) - Occupational Exposure Limits</b>	
Local name	Diphenylamine
OEL TWAEV	10 mg/m <sup>3</sup>
Regulatory reference	Ontario Occupational Exposure Limits under Regulation 833
<b>Canada (Prince Edward Island) - Occupational Exposure Limits</b>	
Local name	Diphenylamine
OEL TWA	10 mg/m <sup>3</sup>



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

diphenylamine (122-39-4)	
Notations and remarks	TLV® Basis: Liver & kidney dam; hematologic eff. Notations: A4 (Not classifiable as a Human Carcinogen)
Regulatory reference	ACGIH 2024
<b>Canada (Saskatchewan) - Occupational Exposure Limits</b>	
Local name	Diphenylamine
OEL TWA	10 mg/m <sup>3</sup>
OEL STEL	20 mg/m <sup>3</sup>
Regulatory reference	The Occupational Health and Safety Regulations, 2020. Chapter S-15.1 Reg 10
<b>Canada (Yukon) - Occupational Exposure Limits</b>	
Local name	Diphenylamine
OEL TWA	10 mg/m <sup>3</sup>
OEL STEL	20 mg/m <sup>3</sup>
Regulatory reference	Yukon Occupational Health Regulations O.I.C. 1986/164

### 8.2. Appropriate engineering controls

Appropriate engineering controls No additional information available.  
Environmental exposure controls Do not eat, drink or smoke during use.

### 8.3. Individual protection measures/Personal protective equipment

#### Personal protective equipment:

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

<b>Hand protection:</b>
Not required for normal conditions of use

<b>Eye protection:</b>
Chemical goggles or safety glasses. CSA Z94.3:20

<b>Skin and body protection:</b>
When using cartridge operated tools, sufficient ear protection must be worn.

<b>Respiratory protection:</b>
Respiratory protection not required in normal conditions

#### Personal protective equipment symbol(s):



#### Thermal hazard protection:

No information available.



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

### Other information:

Do not eat, drink or smoke during use.

## SECTION 9: Physical and chemical properties

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

Physical state	Solid
Appearance	No data available
Colour	According to product specification
Odour	There may be no odour warning properties, odour is subjective and inadequate to warn of overexposure.
Odour threshold	No data available
pH	No data available
Relative evaporation rate (butylacetate=1)	No data available
Relative evaporation rate (ether=1)	No data available
Melting point	No data available
Freezing point	No data available
Boiling point	No data available
Flash point	No data available
Auto-ignition temperature	No data available
Decomposition temperature	No data available
Flammability (solid, gas)	No data available
Vapour pressure	No data available
Relative vapour density at 20°C	No data available
Relative density	No data available
Solubility	No data available
Partition coefficient n-octanol/water (Log Pow)	No data available
Viscosity, kinematic	No data available
Explosive properties	Fire or projection hazard.
Explosive limits	No data available

### 9.2. Other information

Additional information	Not applicable Article
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## SECTION 10: Stability and reactivity

Reactivity	No additional information available
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Risk of explosion by shock, friction, fire or other sources of ignition. Heating may cause an explosion. At high temperatures : > 150 °C Response.
Conditions to avoid	Direct sunlight. Extremely high or low temperatures. Heat. Sparks. Open flame. Overheating. Avoid contact with hot surfaces. No flames, no sparks. Eliminate all sources of ignition.
Incompatible materials	Strong acids. Strong bases.
Hazardous decomposition products	Carbon monoxide. Carbon dioxide. Nitrogen oxides. Metal oxides. Thermal decomposition can lead to the release of irritating gases and vapours.
Hardening time:	No additional information available

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Acute toxicity (oral)	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)
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# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

Acute toxicity (dermal)	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)
Acute toxicity (inhalation)	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)

glycerol trinitrate (55-63-0)	
LD50 oral	685 mg/kg
LD50 dermal rat	> 9560 mg/kg bodyweight (OECD 402 method)
LD50 dermal	9560 mg/kg
ATE CA (oral)	5 mg/kg bodyweight
ATE CA (Dermal)	5 mg/kg bodyweight
ATE CA (Gases)	100 ppmv/4h
ATE CA (vapours)	0.5 mg/l/4h
ATE CA (dust,mist)	0.05 mg/l/4h
lead styphnate (15245-44-0)	
LD50 oral rat	> 2000 mg/kg bodyweight
LD50 dermal rat	> 2000 mg/kg bodyweight (OECD 402 method)
LC50 Inhalation - Rat (Dust/Mist)	> 5.05 mg/l/4h (OECD 403 method)
ATE CA (oral)	500 mg/kg bodyweight
ATE CA (dust,mist)	1.5 mg/l/4h
barium nitrate (10022-31-8)	
LD50 oral	355 mg/kg
ATE CA (oral)	100 mg/kg bodyweight
ATE CA (Gases)	4500 ppmv/4h
ATE CA (vapours)	11 mg/l/4h
ATE CA (dust,mist)	1.5 mg/l/4h
zinc (7440-66-6)	
LD50 oral rat	> 2000 mg/kg (OECD 401 method)
LD50 oral	2500 mg/kg
LC50 Inhalation - Rat (Dust/Mist)	5.41 mg/l/4h
ATE CA (oral)	2500 mg/kg bodyweight
ATE CA (dust,mist)	5.41 mg/l/4h
diphenylamine (122-39-4)	
LD50 oral rat	> 800 mg/kg bodyweight
LD50 oral	2480 mg/kg
LD50 dermal	5000 mg/kg
ATE CA (oral)	100 mg/kg bodyweight
ATE CA (Dermal)	300 mg/kg bodyweight



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

diphenylamine (122-39-4)	
ATE CA (Gases)	700 ppmv/4h
ATE CA (vapours)	3 mg/l/4h
ATE CA (dust,mist)	0.5 mg/l/4h

Skin corrosion/irritation	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)
Serious eye damage/irritation	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)
Respiratory or skin sensitization	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)
Germ cell mutagenicity	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)
Carcinogenicity	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)

diphenylamine (122-39-4)	
IARC group	2B - Possibly carcinogenic to humans
Reproductive toxicity	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)
STOT-single exposure	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)
STOT-repeated exposure	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)

glycerol trinitrate (55-63-0)	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.

lead styphnate (15245-44-0)	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.

diphenylamine (122-39-4)	
STOT-repeated exposure	May cause damage to organs through prolonged or repeated exposure.

Aspiration hazard	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)
Potential adverse human health effects and symptoms	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.
Symptoms/effects	Not expected to present a significant hazard under anticipated conditions of normal use.

## 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 (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

Hazardous to the aquatic environment, long-term (chronic)	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)
<b>glycerol trinitrate (55-63-0)</b>	
LC50 - Fish [1]	1.9 – 3.58 mg/l (96 h; Oncorhynchus mykiss; ASTM Designation E 729-80)
EC50 - Crustacea [1]	17.83 mg/l (48 h; Ceriodaphnia dubia; ASTM Designation E 729-80)
EC50 96h - Algae [1]	1.15 mg/l (Raphidocelis subcapitata; EPA TSCA Experimental Method 797.1060)
NOEC chronic fish	0.03 mg/l
NOEC chronic crustacea	3.23 mg/l (7 d; Ceriodaphnia dubia)
<b>lead styphnate (15245-44-0)</b>	
LC50 - Fish [1]	0.107 mg/l (96 h; Oncorhynchus mykiss; Lead)
EC50 - Crustacea [1]	7 mg/l
NOEC chronic fish	0.0189 – 1.559 mg/l (Fish; Lead)
NOEC chronic crustacea	0.0017 – 0.496 mg/l (aquatic invertebrates; Lead)
<b>barium nitrate (10022-31-8)</b>	
EC50 - Crustacea [1]	9018 mg/l
<b>zinc (7440-66-6)</b>	
LC50 - Fish [1]	169 µg/l (96h; Oncorhynchus Mykiss)
EC50 - Crustacea [1]	< 0.1 µg/l (48h; Ceriodaphnia dubia)
ErC50 algae	0.15 mg/l
NOEC chronic fish	26 µg/L (30 d; Jordanella floridae)
NOEC chronic crustacea	48 µg/L (21d; Daphnia magna; (OECD 211 method))
<b>diphenylamine (122-39-4)</b>	
EC50 - Crustacea [1]	2 mg/l (48 h; Daphnia magna; (OECD 202 method))
EC50 72h - Algae [1]	2.17 mg/l (Raphidocelis subcapitata; (OECD 201 method))
NOEC chronic algae	0.0273 mg/l
<b>tetrazene (109-27-3)</b>	
EC50 - Crustacea [1]	0.14 mg/l

### 12.2. Persistence and degradability

<b>DX-Cartridge</b>	
Persistence and degradability	Not established.
<b>glycerol trinitrate (55-63-0)</b>	
Not rapidly degradable	
Persistence and degradability	Inherently biodegradable.
Biodegradation	92.2 % (84 h)
<b>zinc (7440-66-6)</b>	
Not rapidly degradable	



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

zinc (7440-66-6)	
Persistence and degradability	Not applicable for inorganic products.
diphenylamine (122-39-4)	
Not rapidly degradable	
Persistence and degradability	Not readily biodegraded.
Biodegradation	26 % (28 d; (OECD 301D method))

### 12.3. Bioaccumulative potential

DX-Cartridge	
Bioaccumulative potential	Not established.
glycerol trinitrate (55-63-0)	
Bioaccumulative potential	Low bioaccumulation potential (Log Kow < 4).
lead styphnate (15245-44-0)	
BCF - Fish [1]	1.553
Partition coefficient n-octanol/water (Log Kow)	-2.19 (20 °C)
zinc (7440-66-6)	
Bioaccumulative potential	Bioaccumulation unlikely.
diphenylamine (122-39-4)	
Bioaccumulative potential	Low bioaccumulation potential (Log Kow < 4).
Partition coefficient n-octanol/water (Log Kow)	3.82 (20,2 °C)

### 12.4. Mobility in soil

glycerol trinitrate (55-63-0)	
Ecology - soil	Low potential for adsorption in soil.
lead styphnate (15245-44-0)	
diphenylamine (122-39-4)	
Surface tension	72.3 mN/m (20 °C; EU Method A.5)

### 12.5. Other adverse effects

Ozone	Not classified (Based on available data, the classification criteria are not met) (Based on available data, the classification criteria are not met)
Other adverse effects	No additional information available.
Other information	Avoid release to the environment.

## SECTION 13: Disposal considerations

### 13.1. Disposal 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. At high temperatures may form : Response.
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# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

### Additional information

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 cartridges are used up: European waste catalogue: 20 03 01 - mixed municipal waste . The product can be disposed of as household or factory waste.

### Ecological information

Avoid release to the environment.

## SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / RID

ADR	IMDG	IATA	RID
14.1. UN number or ID number			
UN 0323	UN 0323	UN 0323	UN 0323
14.2. UN proper shipping name			
CARTRIDGES, POWER DEVICE	CARTRIDGES, POWER DEVICE	Cartridges, power device	CARTRIDGES, POWER DEVICE
<b>Transport document description</b>			
UN 0323 CARTRIDGES, POWER DEVICE, 1.4S, (E)	UN 0323 CARTRIDGES, POWER DEVICE, 1.4S	UN 0323 Cartridges, power device, 1.4S	UN 0323 CARTRIDGES, POWER DEVICE, 1.4S
14.3. Transport hazard class(es)			
1.4S	1.4S	1.4S	1.4S
			
14.4. Packing group			
Not applicable	Not applicable	Not applicable	Not applicable
14.5. Environmental hazards			
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)	347
Limited quantities (ADR)	0
Excepted quantities (ADR)	E0
Packing instructions (ADR)	P134, LP102
Mixed packing provisions (ADR)	MP23
Transport category (ADR)	4
Special provisions for carriage - Loading, unloading and handling (ADR)	CV1, CV2, CV3
Special provisions for carriage - Operation (ADR)	S1
Tunnel restriction code (ADR)	E

#### Transport by sea

Special provisions (IMDG)	347
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# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

Limited quantities (IMDG)	0
Excepted quantities (IMDG)	E0
Packing instructions (IMDG)	P134, LP102
EmS-No. (Fire)	F-B
EmS-No. (Spillage)	S-X
Stowage category (IMDG)	01
Stowage and handling (IMDG)	SW1
Properties and observations (IMDG)	See glossary of terms in appendix B.
MFAG-No	114

### Air transport

PCA Excepted quantities (IATA)	E0
PCA Limited quantities (IATA)	Forbidden
PCA limited quantity max net quantity (IATA)	Forbidden
PCA packing instructions (IATA)	134
PCA max net quantity (IATA)	25kg
CAO packing instructions (IATA)	134
CAO max net quantity (IATA)	100kg
Special provisions (IATA)	A165
ERG code (IATA)	3L

### Rail transport

Classification code (RID)	1.4S
Special provisions (RID)	347
Limited quantities (RID)	0
Excepted quantities (RID)	E0
Packing instructions (RID)	P134, LP102
Mixed packing provisions (RID)	MP23
Transport category (RID)	4
Special provisions for carriage – Packages (RID)	W2
Special provisions for carriage - Loading, unloading and handling (RID)	CW1
Colis express (express parcels) (RID)	CE1
Hazard identification number (RID)	1.4S

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

Not applicable

## SECTION 15: Regulatory information

### 15.1. National regulations

DX-Cartridge	
Canada DSL NDSL Flags	All components of this product are listed, or excluded from listing, on the Canadian Domestic Substances List (DSL) / Non-Domestic Substances List (NDSL)

cellulose nitrate (9004-70-0)

**Listed on the Canadian DSL (Domestic Substances List)**

glycerol trinitrate (55-63-0)

**Listed on the Canadian DSL (Domestic Substances List)**



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

lead styphnate (15245-44-0)
<b>Listed on the Canadian DSL (Domestic Substances List)</b>
barium nitrate (10022-31-8)
<b>Listed on the Canadian DSL (Domestic Substances List)</b>
copper (7440-50-8)
<b>Listed on the Canadian DSL (Domestic Substances List)</b>
zinc (7440-66-6)
<b>Listed on the Canadian DSL (Domestic Substances List)</b>
diphenylamine (122-39-4)
<b>Listed on the Canadian DSL (Domestic Substances List)</b>
tetrazene (109-27-3)
<b>Listed on the Canadian NDSL (Non-Domestic Substances List)</b>

### SECTION 16: Other information

SDS Major/Minor	None
Issue date	06-04-2024
Revision date	06-04-2024
Data sources	Supplier Safety Data Sheet.

Full text of H-statements:	
H220	Extremely flammable gas.
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.
H351	Suspected of causing cancer.
H360	May damage fertility or the unborn child.
H373	May cause damage to organs through prolonged or repeated exposure.



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

Abbreviations and acronyms:	
CAS-No.	Chemical Abstract Service number
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
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
DNEL	Derived-No Effect Level
EC50	Median effective concentration
ED	Endocrine disrupting properties
EC-No.	European Community number
EN	European Standard
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
IOELV	Indicative Occupational Exposure Limit Value
LC50	Median lethal concentration
LD50	Median lethal dose
NOEC	No-Observed Effect Concentration
OECD	Organisation for Economic Co-operation and Development
N.O.S.	Not Otherwise Specified
OEL	Occupational Exposure Limit
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
STP	Sewage treatment plant
TLM	Median Tolerance Limit
TRGS	Technical Rules for Hazardous Substances
VOC	Volatile Organic Compounds
WGK	Water Hazard Class
vPvB	Very Persistent and Very Bioaccumulative
NOAEL	No-Observed Adverse Effect Level
NOAEC	No-Observed Adverse Effect Concentration
LOAEL	Lowest Observed Adverse Effect Level



# DX-Cartridge

## Safety Data Sheet

according to the Hazardous Products Regulation (WHMIS 2015)

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This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.