



# SAFETY DATA SHEET

## Implosive Connectors



SDS according to Regulation (EC) No. 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex II-EU

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

Date issued 23.06.2015

#### 1.1. Product identifier

Product name Implosive Connectors  
 Synonyms Implosive Connectores - Full Tension Joint; Implosive Connectores - Dead End; Implosive Connectores - Jumper Terminal; Implosive Connectores - Full Tension Repair Joint

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

Use of the substance/preparation Implosive Connector.  
 The chemical can be used by the general public No

#### 1.3. Details of the supplier of the safety data sheet

##### Manufacturer

Company name Varmpresse Metall AS  
 Postal address Postboks 7  
 Postcode 2831  
 City RAUFOSS  
 Country Norge  
 Tel +47 61151787  
 Fax +47 61152556  
 E-mail post@vpmetall.no  
 Website http://vpmetall.no  
 Contact person Johnny Tollefsbøl

#### 1.4. Emergency telephone number

Emergency telephone Toxic information norway:22 59 13 00

### SECTION 2: Hazards identification

#### 2.1. Classification of substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS] Expl. 1.2; H202  
 Substance / mixture hazardous properties Explosive, severe projection hazard.

#### 2.2. Label elements

##### Hazard Pictograms (CLP)



Signal word Danger

Hazard statements	H202 Explosive, severe projection hazard.
Precautionary statements	P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P223 Keep away from any possible contact with water, because of violent reaction and possible flash fire. P240 Ground/bond container and receiving equipment. P250 Do not subject to grinding/shock/friction. P370 + P380 In case of fire: Evacuate area. P372 Explosion risk in case of fire. P373 DO NOT fight fire when fire reaches explosives.
Other Label Information (CLP)	Article 23: Explosives that are placed on the market with a view to obtaining an explosive effect or pyrotechnic effect shall be labeled and packaged in accordance with the requirements for explosives.

### 2.3. Other hazards

PBT / vPvB	PBT/vPvB assessment has not been performed.
Physico-chemical effects	The product may by fire detonate.
Health effect	Any potential hazards will be associated with direct contact with pentaerythritol tetranitrate. However, this will occur in a very small extent under normal use and handling implosive connector.  Toxic gases discharged by blasting may be harmful if inhaled.

## SECTION 3: Composition/information on ingredients

### 3.2. Mixtures

Substance	Identification	Classification	Contents
Pentaerythritol tetranitrate; pentaerythrite tetranitrate P.E.T.N. [>20 % phlegmatiser]	CAS no.: 78-11-5 EC no.: 201-084-3	Expl. 1.1;H201;	40 - 50 %
Description of the mixture	<p>Implosive connector consists of components in aluminum, steel, PVC and detonating cord. The composition varies based on type. Detonating cord are considered a risk element, and the safety data sheet is prepared in accordance to this.</p> <p>Detonating cord contains:</p> <ol style="list-style-type: none"> <li>40-50 wt-% pentaerythritol tetranitrate 50-60% inert filler by weight. Pentaerythritol tetranitrate (PETN) varies between 10 to 15 g/m cord.</li> <li>Aluminium sleeve</li> <li>May contain galvanized low-carbon steel core inside aluminium sleeve.</li> <li>May contain galvanized low carbon steel eyebolt at on end of aluminium sleeve.</li> <li>PVC protective sleeve.</li> <li>Thin polyethylene film on outside of implosive connector.</li> </ol>		
Substance comments	See section 16 for explanation of hazard statements (H) listed above.		

## SECTION 4: First aid measures

### 4.1. Description of first aid measures

General	Emergency telephone number: see section 1.4. In case of unconsciousness or severe accidents, call 112.
Inhalation	Fresh air and rest. Rinse nose and mouth with water. Get medical attention if any discomfort continues. Upon explosion injuries, contact a doctor immediately.
Skin contact	Brush off loose particles from skin. Remove contaminated clothing. Wash the skin immediately with soap and water. Get medical attention if any discomfort

	continues. Burns: Flush with water immediately. While flushing, remove clothes which do not adhere to affected area. Call an ambulance. Continue flushing during transport to hospital.
Eye contact	Remove any contact lenses. Hold the eyelids apart. Promptly rinse eyes with plenty of water (tempered at 20-30°C) for at least 15 minutes. Contact physician if irritation persists. In case of explosion injuries, get medical attention immediately.
Ingestion	Rinse mouth thoroughly with water and give large amounts of milk or water to people not unconscious. Do not induce vomiting. Get medical attention immediately! Transport to hospital. Bring the safety data sheet.

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

Acute symptoms and effects	The chemical may irritate the stomach/intestines and can cause abdominal pain, nausea, vomiting and diarrhoea. Ingestion of large amounts increases the risk of fall in blood pressure and blood damage (methaemoglobinaemia) with blue discoloration of the lips and nails as the first symptom. Toxic gases discharged by blasting may be harmful if inhaled. Can cause acute symptoms such as headaches, heart palpitations, dizziness and nausea. May cause eye irritation. Symptoms may be stinging pain and redness in the eyes.
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#### 4.3. Indication of any immediate medical attention and special treatment needed

Other Information	Treat symptomatically. After inhalation of nitrous gases patient should be observed in hospital for rest at least 24 hours, due to the risk of pulmonary edema after a symptom-free interval.
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### SECTION 5: Firefighting measures

#### 5.1. Extinguishing media

Suitable extinguishing media	Do not attempt to fight the fire. The fire may get into explosion and can not be choked with any extinguishing agent (foam, powder, carbon dioxide or sand). Every attempt increases the risk of explosion.
Improper extinguishing media	Do not attempt to fight the fire.

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

Fire and explosion hazards	Explosive, severe projection hazard. Stop all traffic and evacuate the surrounding area. Set out guards. Contact immediately police and fire departments.
Hazardous combustion products	May include, but is not limited to: Carbon monoxide (CO). Carbon dioxide (CO <sub>2</sub> ). Nitrous gases (NO <sub>x</sub> ). Ammonia. Hydrogen chloride (HCl).

#### 5.3. Advice for firefighters

Personal protective equipment	Use compressed air equipment when the chemical is involved in fire. In case of evacuation, an approved protection mask should be used. See also section 8.
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### SECTION 6: Accidental release measures

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

General measures	Avoid inhalation of dust. Avoid contact with eyes and skin. Remove all sources of ignition. Provide adequate ventilation.
Personal protection measures	Use protective equipment as referred to in section 8.

#### 6.2. Environmental precautions

Environmental precautionary measures	Do not allow to enter into sewer, water system or soil.
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#### 6.3. Methods and material for containment and cleaning up

Cleaning method	Carefully collect together. Detonating parts, PETN powder and possibly contaminated materials are collected and disposed of by authorized personnel.
Other information	No recovery without the assistance of an expert in explosives. Use proper explosion-proof equipment. Avoid shock and friction. Risk of ignition and detonation.

#### 6.4. Reference to other sections

Other instructions	See also sections 8 and 13. Referring to norwegian: FOR 2002-06-26 nr 922: Forskrift om håndtering av eksplosjonsfarlig stoff, kap. 10.
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## SECTION 7: Handling and storage

### 7.1. Precautions for safe handling

Handling	Provide adequate ventilation. Avoid spilling, skin and eye contact. Only to be handled by authorized personnel. Follow the user-manual. Never use implosive connector with damaged cord. Protect against physical damage and/or friction. Use explosion proof electric equipment. Use protective equipment as referred to in section 8. Keep away from heat. Use spark-proof tools and explosion-proof equipment.
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### Protective Safety Measures

Safety Measures To Prevent fire	Take precautionary measures against static discharges. Smoking and naked flames and other ignition sources are prohibited.
Advice on general occupational hygiene	Do not eat, drink or smoke during work. Wash contaminated clothing. Wash hands at the end of each work shift and before eating, smoking and using the toilet.

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

Storage	Store as explosives. Do not expose to heat, sparks or open fire. Store dry as explosives. Access only for authorized persons. Protect from moisture. Storage room must be locked and secured from fire.
Special risks and properties	Explosive by shock and heating. Explosion risk in case of fire.
Other Information	Comply with national regulation on the handling of explosives.

### Conditions for safe storage

Packaging compatibilities	Store in original container.
Advice on storage compatability	Incompatible materials: Water/moisture.

### 7.3. Specific end use(s)

Specific use(s)	See section 1.2.
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## SECTION 8: Exposure controls/personal protection

### 8.1. Control parameters

#### Occupational Exposure limit values

Substance	Identification	Value	TWA Year
organic dust, total dust		8-hour TWA: 5 mg/m <sup>3</sup>	2007
Hydrogen chloride (gas and aerosol mists)	CAS no.: 7647-01-0 EC no.: 231-595-7	8-hour TWA: 5 ppm 8-hour TWA: 7 mg/m <sup>3</sup>	2011
Nitrogen Dioxide	CAS no.: 10102-44-0 EC no.: 233-272-6 Index no.: 007-002-00-0	8-hour TWA: 0,6 ppm 8-hour TWA: 1,1 mg/m <sup>3</sup> , 9)	2007
Nitrogen oxide	CAS no.: 10102-43-9 EC no.: 233-271-0	8-hour TWA: 25 ppm 8-hour TWA: 30 mg/m <sup>3</sup>	2007
Other Information about threshold limit values	Occupational Exposure limit values for hydrogen chloride, nitrogen dioxide and nitrogen oxide may be generated by detonation.		

References (laws/regulations): Norwegian regulation on exposure limits: "FOR-2011-12-06-1358 Forskrift om tiltaksverdier og grenseverdier for fysiske og kjemiske faktorer i arbeidsmiljøet samt smitterisikogrupper for biologiske faktorer (forskrift om tiltaks- og grenseverdier)".

## 8.2. Exposure controls

Recommended monitoring procedures

Reference is made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents and national guidance documents for methods for the determination of hazardous substances. NS-EN 14042. NS-EN 482.

Limitation of exposure on workplace

Provide adequate ventilation. The personal protective equipment must be CE-marked and the latest version of the standards shall be used. The protective equipment and the specified standards recommended below are only suggestions, and should be selected on advice from the supplier of such equipment.

A risk assessment of the work place/work activities (the actual risk) may lead to other control measures. The protection equipments suitability and durability will depend on application.

### Respiratory protection

Respiratory protection

In case of inadequate ventilation or risk of inhalation of dust, use suitable respiratory equipment with particle filter (type P3).

Reference to relevant standard

EN 143 (Respiratory protective devices. Particle filters. Requirements, testing, marking).

### Hand protection

Hand protection

Use chemical resistant gloves. Glove thickness must be chosen in consultation with the glovesupplier, who can inform about the breakthrough time for the glove.

Suitable gloves type

Nitrile.

Reference to relevant standard

BS-EN 420 (Protective gloves. General requirements and test methods).  
BS-EN 374 (Protective gloves against chemicals and micro-organisms).

Breakthrough time

No specific information from the manufacturer.

Thickness of glove material

No specific information from the manufacturer.

### Eye / face protection

Eye protection

Wear dust resistant safety goggles where there is danger of eye contact.

Reference to relevant standard

EN 166 (Personal eye-protection. Specifications).

### Skin protection

Skin protection (except hands)

Wear suitable protective clothing of flame retardant material.

### Appropriate environmental exposure control

Environmental exposure controls

Do not allow to enter into sewer, water system or soil.

### Other Information

Other Information

Eye wash facilities and emergency shower should be available when handling this chemical.

## SECTION 9: Physical and chemical properties

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

Physical state

Cord.

Colour

Misc. colours.

Odour

No characteristic odour.

Comments, Odour limit

Not specified by the manufacturer.

Comments, pH (as supplied)

Not specified by the manufacturer.

Comments, Melting point / melting range

Not specified by the manufacturer.

Freezing point

Value: 140 - 142 °C

	Comments: Applies to Pentaerythritol tetranitrate; pentaerythrite tetranitrate P.E.T.N. [>20 % phlegmatiser].
Boiling point / boiling range	Value: > 164 °C Test reference: (Explosion).
Comments, Boiling point / boiling range	Applies to pentaerythritol tetranitrate; pentaerythrite tetranitrate P.E.T.N. [>20 % phlegmatiser].
Comments, Flash point	Not specified by the manufacturer.
Comments, Evaporation rate	Not specified by the manufacturer.
Flammability (solid, gas)	Not specified by the manufacturer.
Comments, Explosion limit	Not specified by the manufacturer.
Comments, Vapour pressure	Not specified by the manufacturer.
Comments, Vapour density	Not specified by the manufacturer.
Comments, Specific gravity	Not specified by the manufacturer.
Density	Value: 650 - 790 g/cm <sup>3</sup> Comments: Applies to pentaerythritol tetranitrate; pentaerythrite tetranitrate P.E.T.N. [>20 % phlegmatiser].
Comments, Bulk density	Not specified by the manufacturer.
Solubility description	Pentaerythritol tetranitrate: Soluble in: Acetone. Partly soluble in: Ethanol.
Solubility in water	Pentaerythritol tetranitrate: Insoluble.
Partition coefficient: n-octanol/water	Value: 1,61 Method of testing: log Pow
Spontaneous combustability	Value: > 202-205 °C Method of testing: Applies to pentaerythritol tetranitrate; pentaerythrite tetranitrate P.E.T.N. [>20 % phlegmatiser].
Comments, Decomposition temperature	Not specified by the manufacturer.
Comments, Viscosity	Not specified by the manufacturer.
Explosive properties	Explosive.
Oxidising properties	Not specified by the manufacturer.

## 9.2. Other information

### Other physical and chemical properties

Physical and chemical properties Decomposition temperature: ca 195 °C.

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

Reactivity See section: 10.2 - 10.6

### 10.2. Chemical stability

Stability Stable under normal temperature conditions and recommended use.

### 10.3. Possibility of hazardous reactions

Possibility of hazardous reactions Explosion hazard. Keep away from heat / sparks / open flames / hot surfaces. — No smoking. Do not subject to grinding / shock / friction.

### 10.4. Conditions to avoid

Conditions to avoid Risk of explosion by shock, heat, static electricity, ultrasound and radio transmitters. Protect from moisture.

### 10.5. Incompatible materials

Materials to avoid Water/moisture.

### 10.6. Hazardous decomposition products

Hazardous decomposition products Nitrous gases (NO<sub>x</sub>). Ammonia (NH<sub>3</sub>). See also section 5.2.

## SECTION 11: Toxicological information

### 11.1. Information on toxicological effects

Toxicological Information:

LD50 oral	Value: 1669 mg/kg Animal test species: Men Test reference: TDLO Comments: Applies to pentaerythritol tetranitrate; pentaerythrite tetranitrate P.E.T.N. [>20 % phlegmatiser].
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### Other information regarding health hazards

General	Is not considered a health hazard by normal use. Damaged products may cause exposure to explosives.
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### Acute toxicity, Mixture estimate

Assessment of acute toxicity classification	Based on available data, the classification criteria are not met.
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### Potential acute effects

Inhalation	Toxic gases discharged by blasting may be harmful if inhaled. Can cause headache, fatigue, nausea, dizziness and lightheadedness. Drop in blood pressure and heart palpitations.
Skin contact	Damaged product may cause exposure: Parts of the chemical might be absorbed through the skin. May cause the same symptoms as by inhalation.
Eye contact	Dust may give mechanical eye irritation. May cause stinging and redness.
Ingestion	Ingestion of large amounts increases the risk of fall in blood pressure and blood damage (methaemoglobinaemia) with blue discoloration of the lips and nails as the first symptom. The chemical may irritate the stomach/intestine and cause pain in the abdomen, upset stomach, nausea, vomiting and diarrhea.
Irritation	Based on available data, the classification criteria are not met.
Corrosivity	Based on available data, the classification criteria are not met.
Aspiration hazard	Based on available data, the classification criteria are not met.

### Delayed effects / repeated exposure

Sensitisation	Based on available data, the classification criteria are not met.
STOT-single exposure	Based on available data, the classification criteria are not met.
STOT-repeated exposure	Based on available data the classification criteria are not met.

### Carcinogenic, Mutagenic or Reprotoxic

Carcinogenicity	Based on available data, the classification criteria are not met.
Mutagenicity	Based on available data, the classification criteria are not met.
Teratogenic properties	Based on available data, the classification criteria are not met.
Reproductive toxicity	Based on available data, the classification criteria are not met.

## SECTION 12: Ecological information

### 12.1. Toxicity

Ecotoxicity	The chemical is not classified as harmful to the environment.
Aquatic, comments	Acute toxicity, EC50: 160 mg/l. Applies to pentaerythritol tetranitrate; pentaerythrite tetranitrate P.E.T.N. [>20 % phlegmatiser].

### 12.2. Persistence and degradability

Chemical oxygen demand (COD)	Value: 0,61 g/g
Comments COD	Applies to pentaerythritol tetranitrate; pentaerythrite tetranitrate P.E.T.N. [>20 % phlegmatiser].
Persistence and degradability	This product is expected to be not readily biodegradable.

### 12.3. Bioaccumulative potential

Bioaccumulative potential	Not expected to bioaccumulate.
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### 12.4. Mobility in soil

Mobility	Insoluble in water.
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### 12.5. Results of PBT and vPvB assessment

PBT assessment results	PBT assessment has not been performed.
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vPvB evaluation results vPvB assessment has not been performed.

## 12.6. Other adverse effects

Other adverse effects / Remarks Do not allow to enter into sewer, water system or soil.

## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Specify the appropriate methods of disposal	Wastes containing explosives has to be removed, taken care of (or may be repacked in approved packaging), for intermediate storage and in the fastest way be destroyed in a proper manner. The product has to be delivered to an approved disposal site. Product disposal is regulated by the Labour and Government Administration with Norwegian Directorate for Civil Protection (DSB) as the supervisory authority.
Relevant waste regulation	Norwegian regulation on the handling of explosives: FOR 2002-06-26 nr 922: Forskrift om håndtering av eksplosjonsfarlig stoff.
Product classified as hazardous waste	Yes

## SECTION 14: Transport information

### 14.1. UN number

ADR	0443
RID	0443
IMDG	0443
ICAO/IATA	0443

### 14.2. UN proper shipping name

ADR	CHARGES, EXPLOSIVE, COMMERCIAL
RID	CHARGES, EXPLOSIVE, COMMERCIAL
IMDG	CHARGES, EXPLOSIVE, COMMERCIAL
ICAO/IATA	CHARGES, EXPLOSIVE, COMMERCIAL

### 14.3. Transport hazard class(es)

ADR	1.2D
RID	1.2D
IMDG	1.2D
ICAO/IATA	1.2D

### 14.4. Packing group

Comments Not relevant.

### 14.5. Environmental hazards

Comments Not relevant.

### 14.6. Special precautions for user

EmS F-B, S-X

### 14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

#### Additional information.

Additional information. Not applicable.

## SECTION 15: Regulatory information

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

References (laws/regulations)	FOR-2012-06-16 nr 622 Norwegian regulation on classification, labeling and packaging of substances and mixtures (CLP), with later amendments. FOR-2008-05-30 nr 516 Norwegian regulation on the registration, evaluation, authorization and restriction of chemicals (REACH Regulation), with later amendments.
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Norwegian regulations on waste, no. 930/2004, from the Ministry of Environment.  
 Dangerous Goods regulations  
 Norwegian regulation on the handling of explosives.  
 Forskrift om håndtering av utgangsstoffer for eksplosiver (FOR-2015-06-02-588).

## 15.2. Chemical safety assessment

Chemical safety assessment performed No

## SECTION 16: Other information

Supplier's notes	The information contained in this SDS must be made available to all those who handle the product.
Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]	Expl. 1.2; H202;
List of relevant H-phrases (Section 2 and 3).	H202 Explosive, severe projection hazard. H201 Explosive; mass explosion hazard.
Abbreviations and acronyms used	ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road EWC = European Waste Code (a code from the EU's common classification system for waste) IARC = The International Agency for Research on Cancer IATA: The International Air Transport Association ICAO: The International Civil Aviation Organisation IMDG: The International Maritime Dangerous Goods Code LD50: Lethal dose, is the amount of a substance given to a group of test animals, which causes the death of 50%. RID: The Regulations concerning the International Carriage of Dangerous Goods by Rail PBT: Persistent, Bioaccumulative and Toxic vPvB: very Persistent and very Bioaccumulative
Important data sources used to construct the safety data sheet	Suppliers Safety data sheet dated: 10.06.2009
Information which has been added, deleted or revised	New Safety Data Sheet.
Version	1
Responsible for safety data sheet	Varmpresse Metall AS
Prepared by	National Institute of Technology as, Norway by Ida Gedde Håverstad