



5N PLUS

## CADMIUM TELLURIDE

This Safety Data Sheet complies with EC Directives 91/155 and 1272/2008 and with the Globally Harmonized System of Classification and Labelling of Chemicals (GHS)

**SECTION 1. IDENTIFICATION OF THE SUBSTANCE AND THE COMPANY**

<b>Product name</b>	Cadmium telluride
<b>Chemical formula</b>	CdTe
<b>Synonym</b>	Tellurure de cadmium (French), Cadmiumtellurid (Deutsch)
<b>EC # (European Chemical Substance)</b>	215-149-9
<b>CAS # (Chemical Abstracts Service)</b>	1306-25-8
<b>Use of the substance</b>	Photovoltaic modules and semiconductor industry
<b>Supplier/manufacturer</b>	5N Plus Inc. 4385 Garand Street Saint-Laurent, Québec Canada H4R 2B4
<b>Contact information</b>	Maxime Cossette, 5N Plus Inc.
<b>Telephone number</b>	+ 1 514 856 0644 - 2395
<b>E-mail</b>	<a href="mailto:ehs@5nplus.com">ehs@5nplus.com</a>
<b>Telephone number (emergency)</b>	CANUTEC: +1 (613) 996-6666 (collect calls are accepted)
<b>Website</b>	<a href="http://www.5nplus.com">www.5nplus.com</a>

**SECTION 2. HAZARDS IDENTIFICATION**

<b>Physical state</b>	Powder
<b>Colour</b>	Black
<b>Risk status</b>	Harmful, dangerous for the environment
<b>Emergency overview</b>	May be toxic by inhalation
<b>Routes of entry</b>	Ingestion, inhalation
<b>Potential acute health effects</b>	
<b>Eyes</b>	No reported effects
<b>Skin</b>	No reported effects
<b>Inhalation</b>	Deep inhalation of the fumes or dust of cadmium and its compounds may cause symptoms such as coughing, dyspnea and tightening of the chest resembling those caused by metal fume fever, but which in the worst case can progress into pneumonia, pulmonary edema and death as a consequence of respiratory arrest. Acute exposure to cadmium compounds can result in residual emphysema or in fibrosis.
<b>Ingestion</b>	Ingestion of cadmium and its compounds may cause abdominal pain, diarrhea, headache, nausea and vomiting.
<b>Potential chronic health effects</b>	At this time there are a limited number of cadmium telluride toxicological studies so we refer to the health effects reported for cadmium as a precautionary principle. (Please note that testing of CdTe with Bacterial Reverse Mutation Assay showed no mutagenic or cytotoxic effect.)

For toxicological information, see Section 11

**SECTION 3. COMPOSITION OF/INFORMATION REGARDING CONSTITUENTS**

Name	Symbol	CAS #	EC #	IUPAC Name	Percentage (%)	Classification
Cadmium telluride	CdTe	1306-25-8	215-149-9	None	100	H332, H411

**SECTION 4. FIRST AID**

<b>Eye contact</b>	Check for and remove any contact lenses. In the event of contact with eyes, rinse immediately with plenty of water. Get medical attention.
<b>Skin contact</b>	In case of contact, wash affected area with soap and large amounts of water. Remove and wash any contaminated clothing. Dust may provoke skin irritation.
<b>Inhalation</b>	If inhaled, move to fresh air. Get immediate medical attention.
<b>Ingestion</b>	Rare in industry. If the person is unconscious, do not give anything to drink or induce vomiting. Get immediate medical attention.
<b>Note to attending physician</b>	There is no specific antidote. Please contact poison center.

**SECTION 5. FIRE FIGHTING MEASURES**

<b>Flammability of the product</b>	This product is not flammable
<b>Products of combustion</b>	May evolve metal oxides fumes above melting point (cadmium oxides, tellurium oxides)
<b>Extinguishing media</b>	

<b>Suitable</b>	Use an extinguishing agent suitable for the surrounding fire.
<b>Not suitable</b>	None known
<b>Special exposure hazards</b>	Toxic metal oxides can form in the event of fire.
<b>Special protective equipment for firefighters</b>	Firefighters should wear self-contained breathing apparatus (SCBA).

## SECTION 6. ACCIDENTAL RELEASE MEASURES

<b>Personal precautions</b>	Safety glasses and impervious gloves. Wear at least a P3 type particle filter respirator if the airborne concentrations are above the exposure limit. If the airborne concentrations are unknown, wear approved self-contained breathing apparatus.
<b>Environmental precautions</b>	Avoid dispersal of spilled material. Prevent runoff and contact with soil, waterways, drains or sewers.
<b>Methods for cleaning-up</b>	Vacuum the spilled material with an appropriate Class H Vacuum and place in an appropriate container for disposal in a safe place. Avoid creating dusty conditions and prevent wind dispersal.

## SECTION 7. HANDLING AND STORAGE

<b>Handling</b>	Avoid inhalation and dust ingestion. Avoid creating dusty conditions. Wear suitable respiratory equipment in case of insufficient ventilation. If ingested or inhaled get immediate medical attention.
<b>Storage</b>	Keep in tightly closed containers. Keep in a dry and well ventilated area. Keep away from acids.

## SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limits values		
Product Name	8-hour total weight average (TWA) permissible exposure limit (PEL)	Short Term Exposure Limits (STELs)
Cadmium telluride	<p><b>AUSTRIA</b> : 0.15 mg/m<sup>3</sup> (as Cd)</p> <p><b>CANADA-QUEBEC</b>: 0.025 mg/m<sup>3</sup> (as Cd)</p> <p><b>DENMARK</b> : 0.005 mg/m<sup>3</sup> (as Cd)</p> <p><b>FRANCE</b> : 0.05 mg/m<sup>3</sup> (as Cd)</p> <p><b>GERMANY</b>: TRGS 905 (cadmium and cadmium compounds)</p> <p><b>HUNGARY</b>: 0.015 mg/m<sup>3</sup> (as Cd)</p> <p><b>SPAIN</b> : 0.01 mg/m<sup>3</sup> inhalable aerosol (as Cd) 0.002 mg/m<sup>3</sup> respirable aerosol (as Cd)</p> <p><b>SWEDEN</b> : 0.02 mg/m<sup>3</sup> (as Cd)</p> <p><b>SWITZERLAND</b> : 0.015 mg/m<sup>3</sup> inhalable aerosol (as Cd)</p> <p><b>UNITED KINGDOM</b> : 0.025 mg/m<sup>3</sup></p> <p><b>USA – ACGIH</b> : 0.01 mg/m<sup>3</sup> inhalable aerosol (as Cd) 0.002 mg/m<sup>3</sup> respirable aerosol (as Cd)</p> <p><b>USA - OSHA</b> : 0.005 mg/m<sup>3</sup> (as Cd)</p>	<p><b>AUSTRIA</b> : 0.6 mg/m<sup>3</sup> (as Cd)</p> <p><b>DENMARK</b> : 0.010 mg/m<sup>3</sup> (as Cd)</p> <p><b>HUNGARY</b>: 0.060 mg/m<sup>3</sup> (as Cd)</p>

### Occupational exposure controls

<b>Environmental exposure controls</b>	Use only in well ventilated areas. If handling generates dust, fumes, gases, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.
<b>Eye protection</b>	Safety glasses
<b>Skin protection</b>	Lab coat
<b>Respiratory protection</b>	If there is a risk of exceeding exposure limits, use at least a P3 filter respirator for toxic particles.
<b>Hand protection</b>	Natural rubber (latex)

### Personal safety equipment pictograms



## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

<b>Appearance</b>	Powder
<b>Odor</b>	Odorless
<b>Color</b>	Black
<b>Molecular weight</b>	240 g/mol
<b>Molecular formula</b>	CdTe

<b>Melting point</b>	1091°C
<b>pH</b>	Not applicable
<b>Boiling point</b>	1130°C
<b>Flash point</b>	Not applicable
<b>Flammability</b>	Not flammable
<b>Oxidizing properties</b>	Not applicable
<b>Relative density</b>	5.85 g/cm <sup>3</sup> (Water : 1)
<b>Solubility</b>	
<b>Water solubility</b>	Insoluble
<b>Fat solubility</b>	Insoluble
<b>Partition coefficient</b>	Not available
<b>Viscosity</b>	Not applicable

## **SECTION 10. STABILITY AND REACTIVITY**

<b>Conditions to avoid</b>	Keep away from strong acids and excessive heat.
<b>Materials to avoid</b>	Strong acids
<b>Hazardous decomposition products</b>	May evolve metal oxides fumes above melting point.

## **SECTION 11. TOXICOLOGICAL INFORMATION**

### **Toxicological data**

<b>Product/ingredient name</b>	<b>Test</b>	<b>Result</b>	<b>Route/Species</b>
Cadmium telluride	LC50 (4 hours)	2710 mg/m <sup>3</sup>	Inhalation/Rats
	LD50	> 2000 mg/kg	Oral/Rats

### **Acute effects**

<b>Eyes</b>	No effects reported
<b>Skin</b>	No effects reported
<b>Ingestion</b>	Ingestion of cadmium and its compounds may cause abdominal pain, diarrhea, headache, nausea and vomiting.
<b>Inhalation</b>	Deep inhalation of the fumes or dust of cadmium and its compounds may cause symptoms such as coughing, dyspnea and tightening of the chest resembling those caused by metal fume fever, but which in the worst case, can progress into pneumonia, pulmonary edema and death as a consequence of respiratory arrest. Acute exposure can result in residual emphysema or in fibrosis.

### **Potential chronic health effects**

<b>Carcinogenicity</b>	Not classified by the EC Directive 1272/2008. Listed in the Technical Rule TRGS 905
<b>Mutagenicity</b>	Not classified ( <i>testing of CdTe with Bacterial Reverse Mutation Assay showed no mutagenic or cytotoxic effect.</i> )
<b>Teratogenic effects</b>	Not classified

## **SECTION 12. ECOLOGICAL INFORMATION**

### **Ecotoxicity data**

<b>Product/ingredient name</b>	<b>Species</b>	<b>Period</b>	<b>Test</b>
Cadmium telluride	<i>no data available</i>		

<b>Environmental precautions</b>	This product is classified as toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment (classification applicable for cadmium and its compounds).
<b>Breakdown products</b>	This product is insoluble in water
<b>Toxicity of biodegradation products</b>	Not available

## **SECTION 13. DISPOSAL CONSIDERATIONS**

<b>Waste disposal</b>	The generation of waste should be avoided or minimized wherever possible. Avoid dispersal of spilled material and prevent runoff and contact with soil, waterways, drains or sewers. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional and local authority requirements.
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## **SECTION 14. TRANSPORTATION INFORMATION**

<b>Regulatory Information</b>	<b>Proper shipping name</b>	<b>Class</b>	<b>UN Number</b>	<b>PG</b>	<b>Labeling</b>
UN/IMDG/IATA Class	Not classified	Not classified	Not classified	Not classified	Not classified
ADR/RID Class	Not classified	Not classified	Not classified	Not classified	Not classified
GGVSE	Not classified	Not classified	Not classified	Not classified	Not classified

## SECTION 15. REGULATORY INFORMATION

### EU Regulation

#### Hazard Statements

This chemical substance is classified as follows according to the criteria of the EC Directive

H332 Harmful if inhaled  
H411 Toxic to aquatic life with long lasting effects

#### Warning!



### Precautionary Statements

P281 Use personal protective equipment as required.  
P270 Do not eat, drink or smoke when using this product.  
P308+P313 IF exposed or concerned: Get medical advice/attention.  
P273 Avoid release to the environment.  
P391 Collect spillage.  
P501 Dispose of contents/container to approved disposal companies

### WGK Classification

### C&L Notification

### REACH Registration

Class 3  
Reference number : 02-2119702251-57-0000  
2018 Deadline

## SECTION 16. OTHER INFORMATION

### References

Directive 91/155/EEC  
European Commission's Joint Research Centre Databases  
EPA Ecotox Databases

### Glossary

**LD50** - Indicates the dose that is lethal to 50% of an exposed group.  
**LC50**: Indicates the concentration of the chemical that is lethal to 50% of the exposed animals.

### Author

### Title

### Email

### Tel.

### Version

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### Address information request to

Maxime Cossette  
EH&S Manager – 5N Plus Inc.  
[maxime.cossette@5nplus.com](mailto:maxime.cossette@5nplus.com)  
+ 514-856-0644, ext. 2395  
2  
December 17, 2010  
November 16, 2010  
EH&S Department – 5N Plus Inc.  
4385 Garand Street, Saint-Laurent, Québec, Canada H4R 2B4  
Phone : +1 514 856 0644 email : ehs@5nplus.com

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