

## SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

### 1.1. Product identifier

Trade name: **HTF COMPACT®**  
Chemical type: mixture

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

Recommended Use: Heat Transfer Fluid used in thermal systems.  
Uses advised against: Any application which is different from the above identified uses.

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

Company name: TCT SRL  
Address: VIA PER PANDI, 3 - 72100 Brindisi - ITALY  
Phone: +39 0831 574272  
E-mail: info@tctnanotech.com

### 1.4. Emergency telephone number

+39 0831 574272 (available only during office hours 9:00-17:30)

## SECTION 2: HAZARDS IDENTIFICATION

### 2.1. Classification of the substance or mixture

#### Classification according to GHS criteria

Hazardous to the aquatic environment — Acute Hazard, Category 1; H400  
Hazardous to the aquatic environment — Chronic Hazard, Category 1; H410

### 2.2. Label elements

#### Labelling according to GHS criteria

#### Hazard pictograms:



#### Signal word:

Warning

#### Hazard statements:

H410 Very toxic to aquatic life with long lasting effects.

#### Precautionary statements:

P273 Avoid release to the environment.  
P391 Collect spillage.  
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

### 2.3. Other hazards

#### Physical and chemical:

Not expected under recommended conditions of use and storage.

#### For human health:

See SECTION 4.2.

#### For the environment:

Product constituents do not satisfy the criteria for PBT or vPvB classification according to Annex XIII of Regulation (EC) 1907/2006 (REACH).

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

### 3.2. Mixtures

Constituents	CAS no	EC no	INDEX no	Registration no	CLP classification	% w/w
copper(II) oxide	1317-38-0	215-269-1	029-016-00-6	exempted (manufactured < 1 ton/year)	Aquatic Acute 1; H400 M-factor <sub>acute</sub> = 100 Aquatic Chronic 1; H410 M-factor <sub>chronic</sub> = 1	40 - 45

## SECTION 4: FIRST AID MEASURES

### 4.1. Description of first aid measures

General information:	Call a doctor if you feel unwell or in case of doubt on health conditions. The first responders must always wear appropriate personal protective equipment (see SECTION 8.2).
Contact with the eyes:	Rinse cautiously with water for several minutes, holding the eyelids open. If eye irritation occurs, get an ophthalmologist advice.
Contact with the skin:	Wash with plenty of soap and water. If skin irritation or rash occurs, get medical advice.
Inhalation:	If breathing is difficult, remove victim to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms, call a doctor.
Ingestion:	Rinse mouth with water. Do not induce vomiting. Never give anything by mouth if the person is not conscious. If significant amounts are ingested, call a doctor.

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

Contact with the eyes:	Contact with the eyes may cause mechanical irritation and conjunctival redness.
Contact with the skin:	Contact with the skin may cause mechanical irritation.
Inhalation:	High concentration of fine dust may cause respiratory tract irritation, cough and breathing difficulties.
Ingestion:	In high amount, may cause diarrhea and vomiting.

#### 4.3. Indication of any immediate medical attention and special treatment needed

For indication of any immediate medical attention, see SECTION 4.1. Basic first aid and symptomatic treatment.

### SECTION 5. FIREFIGHTING MEASURES

#### 5.1. Extinguishing media

Suitable:	Use extinguishing media appropriate to the source of the fire and the surrounding area.
Unsuitable:	Do not use direct water stream (may spread fire).

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

The product is not flammable. In case of fire, metallic oxides may evolve.

#### 5.3. Advice for firefighters

Evacuate and isolate the area until complete fire extinction, by limiting access only to trained personnel. Firefighters must always wear appropriate protective equipment: positive pressure self-contained breathing apparatus [ref. EN 137]; fireproof clothing [ref. EN 469]; fireproof gloves [ref. EN 659]; firefighter's boots [ref. HO A29-A30]. Ensure adequate ventilation. Avoid breathing fumes/gases/vapours. Avoid contact with eyes, skin and clothing. Stay upwind. Remove containers if it can be done without risk. Alternatively, cool containers exposed to fire with water spray. Prevent the contaminated extinguishing water flowing into drains or waterways.

### SECTION 6. ACCIDENTAL RELEASE MEASURES

#### 6.1. Personal precautions, protective equipment, and procedures in case of emergency

For non-emergency personnel:	Alert the emergency personnel. Avoid breathing dust/mist. Avoid contact with eyes, skin and clothing.
For emergency responders:	Evacuate and isolate the area until complete dispersion of the product. Eliminate all ignition sources if it can be done without risk. Ensure adequate ventilation. Avoid breathing dust/mist. Avoid contact with eyes, skin and clothing. Wear appropriate personal protective equipment (see SECTION 8.2).

#### 6.2. Environmental precautions

Prevent the product from leaking into the environment and run off into drains, surface waters and groundwater. Alert competent authorities if significant amounts into drains or watercourses.

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

Adsorb the spillage with an inert material. Collect with mechanical means. Transfer into a suitable and properly labelled container. Dispose of in accordance with local/regional/national/international regulations. Clean surface thoroughly to remove residual contamination.

#### 6.4. Reference to other sections

For information on personal protection see SECTION 8.2. For information on disposal considerations, see SECTION 13.1.

### SECTION 7. HANDLING AND STORAGE

#### 7.1. Precautions for safe handling

Ensure adequate ventilation. Avoid breathing dust/mist. Avoid contact with eyes, skin and clothing. Wear appropriate personal protective equipment (see SECTION 8.2). Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. Avoid the accumulation of static discharges. Keep away from incompatible materials (see SECTION 10.5). Do not eat, drink or smoke when using this product. Wash hands after use. Handle in accordance with good industrial hygiene and safety practices.

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

Store in a cool, dry and well ventilated place. Store only in the original container, tightly closed and properly labelled. Avoid exposure to moisture and direct sunlight. Avoid the accumulation of static discharges. Store away from incompatible materials (see SECTION 10.5).

**7.3. Specific end use(s)**

See SECTION 1.2.

**SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION**

**8.1. Control parameters**

Copper, dusts and mists	Limit value - Eight hours (mg/m <sup>3</sup> )	Limit value - Short hours (mg/m <sup>3</sup> )
ACGIH	1	
Australia	1	
Austria	1 (inhalable aerosol)	
Belgium	1	
Canada - Ontario	1	
Canada - Québec	1	
Denmark	1	2
France	1	2
Germany (DFG)	0,01 (respirable fraction)	0,02 (respirable fraction)
Hungary	1	4
Ireland	1	
New Zealand	1	
People's Republic of China	1	
Poland	1	2
Romania	0,5	1,5 (respirable fraction)
Singapore	1	
South Korea	1	2
Spain	1	
Sweden	1	
Switzerland	0,1 (inhalable aerosol)	0,2 (inhalable aerosol)
The Netherlands	0,1 (inhalable aerosol)	
United Kingdom	1	2
USA - OSHA	1	

**8.2. Exposure controls**

Wear personal protective equipment in accordance with standards set by relevant legislation. Consult the supplier in all cases before making a final decision.

Skin protection:	No special personal protective equipment required.
Hand protection:	Not needed under recommended conditions of use. In case of prolonged contact with the product, wear work gloves impervious to chemicals made of nitrile rubber (thickness $\geq$ 0.35 mm ; permeation time > 480 minutes) or equivalent materials [ref. EN 374].
Eye protection:	Not needed under recommended conditions of use.
Respiratory protection:	Not needed under recommended conditions of use. If workplace limits are/could be exceeded, wear a half mask with a P3 type filter [ref. EN 140/143]. A final decision on respiratory protection must be taken in all cases on the basis of known or anticipated exposure levels, product hazards and safe working limits of the selected device.
Technical and hygienic measures:	Provide local exhaust ventilation suction or other devices to maintain the levels of particles in the air below the recommended exposure limits. Ensure monitoring of emissions in the air and in the environment. Do not eat, drink or smoke when using this product. Wash hands after use. Wash periodically clothes and personal protective equipment to remove contaminants. Handle in accordance with good industrial hygiene and safety practices.
Environmental measures:	Ensure compliance with the relevant legislation regarding water protection and waste management. Avoid dispersing in the environment and discharging into drains, surface waters and

	groundwater.
Thermal hazards:	Not expected under recommended conditions of use and storage.

## SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

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

Appearance:	dark grey dispersion
Odour:	odourless
Odour threshold:	not relevant for product classification purposes
pH:	9.5 ± 0.2 @ 25 °C
Melting/freezing point:	not relevant for product classification purposes
Initial boiling point and boiling range:	not relevant for product classification purposes
Flash point:	not flammable
Evaporation rate:	not relevant for product classification purposes
Flammability (solid, gas):	not flammable
Upper/lower flammability or explosive limits:	not relevant (non flammable liquid)
Vapour pressure:	not relevant for product classification purposes
Vapour density:	not relevant for product classification purposes
Relative density:	not relevant for product classification purposes
Solubility:	dispersible in water
Partition coefficient: n-octanol/water:	not relevant [inorganic mixture]
Auto-ignition temperature:	not self-igniting (aqueous solution)
Decomposition temperature:	not relevant for product classification purposes
Viscosity:	not relevant for product classification purposes
Explosive properties:	not explosive (aqueous solution)
Oxidising properties:	non-oxidising (based on the information on product constituents)

### 9.2. Other information

Not available.

## SECTION 10. STABILITY AND REACTIVITY

### 10.1. Reactivity

No particular danger of reaction with other substances under recommended conditions of use.

### 10.2. Chemical stability

Stable under recommended conditions of use and storage.

### 10.3. Possibility of hazardous reactions

Not known and/or expected.

### 10.4. Conditions to avoid

Avoid exposure to moisture and direct sunlight. Avoid the accumulation of static discharges. Avoid contact with incompatible materials.

### 10.5. Incompatible materials

Strong acids, strong bases and strong oxidising agents.

### 10.6. Hazardous decomposition products

Not expected under recommended conditions of use and storage.

## SECTION 11. TOXICOLOGICAL INFORMATION

### 11.1. Information on toxicological effects

#### Acute toxicity

Copper oxide	LD50 oral (rat) > 2500 mg/kg
	LD50 dermal (rat) > 2000 mg/kg

No bibliographic information was found about acute toxicity effects resulting from exposure to the product by oral, dermal or inhalation route. Based on available data for product constituents, the classification criteria are not met.

#### Skin corrosion/irritation

Copper oxide | In vivo (rabbit) → not irritating

No bibliographic information was found about corrosion/irritation effects due to skin contact with the product. Based on available data for product constituents, the classification criteria are not met.

#### Serious eye damage/irritation

Copper oxide	In vivo (rabbit) → not irritating
No bibliographic information was found about corrosion/irritation effects due to eye contact with the product. Based on available data for product constituents, the classification criteria are not met.	
<u>Respiratory or skin sensitisation</u>	
Copper oxide	In vivo (guinea pig) → not sensitising
No bibliographic information was found about respiratory or skin sensitisation effects resulting from exposure to the product. Based on available data for product constituents, the classification criteria are not met.	
<u>Germ cell mutagenicity</u>	
Copper oxide	In vitro (bacteria) → not mutagenic [read-across from copper sulphate pentahydrate]
Copper oxide	In vitro (mammalian cells) → not mutagenic [read-across from copper sulphate pentahydrate]
No bibliographic information was found about germ cell mutagenicity effects resulting from exposure to the product. Based on available data for product constituents, the classification criteria are not met.	
<u>Carcinogenicity</u>	
Copper oxide	Although the available animal and human data on copper and its compounds are deficient in several respects, the findings do not raise concerns with respect to carcinogenic activity.
No bibliographic information was found about carcinogenicity effects resulting from exposure to the product. Based on available data for product constituents, the classification criteria are not met.	
<u>Reproductive toxicity</u>	
Copper oxide	NOAEL <sub>effects on fertility</sub> oral (rat) = 24 mg Cu/kg bw/day [read-across from copper sulphate pentahydrate]
Copper and copper compounds cannot be considered as potential teratogenic compounds due to the complex role of copper in regulating normal foetus development in humans.	
No bibliographic information was found about reproductive toxicity effects resulting from exposure to the product. Based on available data for product constituents, the classification criteria are not met.	
<u>STOT-single exposure</u>	
No bibliographic information was found about STOT effects resulting from single exposure to the product. Based on available data for product constituents, the classification criteria are not met.	
<u>STOT-repeated exposure</u>	
Copper oxide	NOAEL oral, 90-day (rat) = 16.7 mg Cu/kg bw/day [read-across from copper sulphate pentahydrate]
No bibliographic information was found about STOT effects resulting from repeated exposure to the product. Based on available data for product constituents, the classification criteria are not met.	
<u>Aspiration hazard</u>	
No bibliographic information was found about hazard resulting from aspiration of the product. Based on available data for product constituents, the classification criteria are not met.	
<b>SEZIONE 12: ECOLOGICAL INFORMATION</b>	
<b>12.1. Toxicity</b>	
Copper oxide	L(E)C50 aquatic organisms = 10 - 100 µg Cu/l [acute]
	NOEC aquatic organisms = 10 - 100 µg Cu/l [chronic]
No bibliographic information was found about environmental effects of the product. Based on available data for the constituent "Copper oxide", the product must be classified as very toxic to aquatic life with long lasting effects.	
<b>12.2. Persistence and degradability</b>	
Copper oxide	Biodegradation does not apply to inorganic compound).
Not relevant for the product (aqueous solution of an inorganic substance).	
<b>12.3. Bioaccumulative potential</b>	
Copper oxide	Copper is well regulated in all living organisms.
Based on the information available for its constituents, the product is not expected to be bioaccumulative.	
<b>12.4. Mobility in soil</b>	
Copper oxide	Copper ions bind strongly to soil.
Based on the information available for its constituents, the product is not expected to be mobile in soil.	
<b>12.5. Results of PBT and vPvB assessment</b>	
Product constituents do not satisfy the criteria for PBT or vPvB classification according to Annex XIII of Regulation (EC) 1907/2006 (REACH).	
<b>12.6. Other adverse effects</b>	
Product constituents do not have effects on the ozone layer.	

## SECTION 13. DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

Product:	Dispose of in accordance with local/regional/national regulations. Do not discharge into sewer. The following EWC code can be assigned to the product: 16 03 03* - inorganic wastes containing hazardous substances. However, a waste code must be agreed with a company authorized to manage the waste.
Packaging:	Empty containers may contain residues and must be cleaned up according to appropriate methods and then re-used or disposed of in accordance with applicable legislation.

## SECTION 14. TRANSPORT INFORMATION

The product is subject to the provisions of existing legislation governing the transport of dangerous goods by road (ADR), rail (RID), sea (IMDG Code) and air (IATA).

### 14.1. UN number

ADR/RID:	3082
IMDG Code:	3082
IATA:	3082

### 14.2. UN proper shipping name

ADR/RID:	Environmentally hazardous substance, liquid, n.o.s. (copper(II) oxide)
IMDG Code:	Environmentally hazardous substance, liquid, n.o.s. (copper(II) oxide)
IATA:	Environmentally hazardous substance, liquid, n.o.s. (copper(II) oxide)

### 14.3. Transport hazard class(es)

ADR/RID:	9
IMDG Code:	9
IATA:	9

### 14.4. Packing group

ADR/RID:	III
IMDG Code:	III
IATA:	III

### 14.5. Environmental hazards

The product is hazardous for the environment (marine pollutant).

### 14.6. Special precautions for user

ADR/RID:	Kemler no. = 90 Tunnel code = E
IMDG Code:	EmS = F-A, S-F
IATA:	-

### 14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable.

## SECTION 15. REGULATORY INFORMATION

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

#### Regulation (EC) 1907/2006 (REACH):

Substances of very high concern included in the candidate list for Authorisation:	none
Substances subjected to Authorisation procedure (Annex XIV):	none
Substances subjected to Restriction procedure (Annex XVII):	none

#### Directive 2012/18/EU:

Substances included in the categories covered by the Seveso III Directive:	Copper oxide (E1, environmental hazard)
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### 15.2. Chemical safety assessment

A chemical safety assessment has not been performed for the product.

## SECTION 16. OTHER INFORMATION

#### Evaluation method:

The classification of the product is based on the calculation methods defined in Regulation (EC) 1272/2008 (CLP).

Full text of the Hazard Statements (H) mentioned in SECTION 2 and SECTION 3:



H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
<b>Key references and data sources:</b>	
<ul style="list-style-type: none"> <li>▪ Globally Harmonized System (GHS)</li> <li>▪ Regulation (EC) 1272/2008 (CLP) (and its subsequent modifications and amendments)</li> <li>▪ Regulation (EC) 1907/2006 (REACH) (and its subsequent modifications and amendments)</li> <li>▪ SDS of raw materials suppliers</li> </ul>	
<b>Advice on any training appropriate for workers:</b>	
The staff responsible for handling the product should be informed about its hazards and potential risks related to its use and be instructed on the precautions to be taken in order to avoid or limit exposure.	
<b>Acronyms:</b>	
ADR:	european agreement concerning the international carriage of dangerous goods by road
CLP:	classification labelling and packaging
EC:	effective concentration
EWC:	european waste catalogue
IATA:	international air transport association
IMDG Code:	international maritime dangerous goods code
LC:	lethal concentration
LD:	lethal dose
NOAEL:	no observed adverse effect level
NOEC:	no observed effect concentration
PBT:	persistent, bioaccumulative and toxic
REACH:	registration, evaluation and authorization of chemicals
RID:	regulations concerning the international carriage of dangerous goods by rail
vPvB:	very persistent and very bioaccumulative
<b>Notes:</b>	
The indications provided in this safety data sheet are correct to the best of our knowledge at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation and disposal and is not to be considered a warranty or quality specification. The user must verify its suitability and completeness, also in accordance to each specific use of the product.	