

**1. IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING****1.1. Product identifier**

Substance name: Modifier powder quasicrystalline

Trade name: Modifier powder quasicrystalline

Reach registration number: A registration number is not available for this substance as the substance or its uses are exempted from registration, the annual tonnage does not require a registration or the registration is envisaged for a later registration deadline.

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

Identified uses: Designed for use in composite materials, polymers, rubbers, adhesives, paint and varnish systems, in friction units of mechanisms with oil lubrication, in babbitts

Uses advised against: Any other than the above identified.

**1.3. Details of the supplier of the Safety Data Sheet**

Supplier: «Nanocom» LLC

Street address: 143026, Moscow, Territory SKOLKOVO Innovation Center, Bolshoy Boulevard, house 42, building 1, room 84

Country ID/Postcode/Place:

Telephone number/Fax: 8(495)488-71-56

E-mail address: info@nanocom.ru

**1.4. Emergency telephone number** 8(495)488-71-56**2. HAZARDS IDENTIFICATION****2.1** Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [EU-GHS/CLP]:

**2.2 Label Elements**

Labelling according Regulation (EC) No 1272/2008 [CLP]:

Hazard pictogram: N/A

Signal word: N/A

Hazard statement(s), H and EUH: N/A

Precautionary statement(s): N/A

**3. COMPOSITION / INFORMATION ON INGREDIENTS****3.1. Substances**

Mixture. All grades of the modifier as the main phase should contain a quasicrystal of the Al-Cu-Fe system in the form of quasicrystalline compounds

Name	Weight % content	CAS-No.	EC-No.	Classification according to Regulation (EC) No. 1278/2008 (CLP)	Classification according to 67/548/EEC	TSCAINV 092019
Aluminum (Al)	45,42	7429-90-5	231-072-3	N/A	N/A	7327, 7429905.00 ACTIV
Copper (Cu)	32,9	7440-50-8	231-159-6	N/A	N/A	14802 7440508.00 ACTIV
Iron (Fe)	21,68	7439-89-6	231-096-4	N/A	N/A	14751 7439896.00 ACTIV

**4. FIRST AID MEASURES****4.1. Description of first aid measures****4.1.1. General advice**

Remove stained clothing. In case of any uncertainty or any symptoms, to seek medical advice immediately and show this safety data sheet or product label. Take care to protect own health. In case of burns, it is necessary to proceed in accordance with first aid for burns

#### **4.1.2. If inhaled**

Immediately move affected person to fresh air. Immediately, respective based on affecting symptoms, call a medical care.

#### **4.1.3. In case of skin contact**

Wash affected skin with soap and water, rinse thoroughly and eventually apply a protective cosmetic cream. Do not use any solvents. In case of skin irritation or other difficulties, consult next steps with a specialist

#### **4.1.4. In case of eye contact**

Open eyelid, or remove the contact lens and flush the eye continuously with running water for at least 15 minutes. Consult next steps with an ophthalmologist.

#### **4.1.5. If swallowed**

Thoroughly rinse the mouth. Do not induce vomiting. Keep the affected person in warm and quiet environment. Immediately call a medical care.

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

See section 2.2 and section 11.

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

No data available.

## **5. FIRE FIGHTING MEASURES**



### **5.1. Extinguishing media**

When involved in the packaging process Suitable extinguishing media: extinguishing powder or sand. Unsuitable extinguishing media: water, CO<sub>2</sub>, halogen-based extinguishing products

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

When burning, the combustion gases and steam can be produced. The inhalation of decomposition combustion products may result in health damage.

### **5.3. Advice for fire-fighters**

Warning! Use black glasses during firefighting – the danger of blindness. The metal burns with a dazzling light which can damage the retina. The eye protection is required. The protective equipment must be chosen according to the fire greatness. Use appropriate protective breathing mask with independent air supply and possibly full protective clothing.

### **5.4. Further information**

Warning! Use black glasses during firefighting – the danger of blindness. The metal burns with a dazzling light which can damage the retina. The eye protection is required. The protective equipment must be chosen according to the fire greatness. Use appropriate protective breathing mask with independent air supply and possibly full protective clothing.

### **5.4. Further information**

Use water spray to cool unopened containers. If possible, remove the products within undamaged containers from danger area. Contaminated extinguishing water must be stored separately, do not discharge it into the drains. The fire extinguishing water or used fire-fighting media with combustion residues must be disposed in accordance with relevant regulations.

## **6. ACCIDENTAL RELEASE MEASURES**

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

Respect the guidelines specified in sections 7 and 8. Avoid contact with eyes, skin and clothing. The area must be sufficiently ventilated. No entry to unauthorized. Do not smoke. In case of possible negative impact due vapors use breathing apparatus.

### **6.2. Environmental precautions**

Avoid the increase of leaking amount. Do not allow the product get into the drains, surface and ground waters and soils. In case of greater leaks into the environment, to proceed according to local regulations (Water Act, point 16.3) and to contact the relevant departments of local authorities, environmental department.

### **6.3. Methods and materials for containment and cleaning up**

After the burnout, the spilled product must be picked up and collect within suitable labeled containers. Next steps of disposal process are governed by rules within the section 13. To protect health from exposure by substances contained in air, see the hygienic limit values of exposure, as specified in section 8, paragraph 8.1. Thoroughly wash the affected area and used tools with suitable detergent. Do not use solvents.

## **7. HANDLING AND STORAGE**

### **7.1. Precautions for safe handling**

Before usage, it is necessary to become familiar with the content of sections 2, 6, 8 and 11. It is necessary to respect the health and safety regulations for chemical handling. Keep product containers tightly closed. Ensure adequate ventilation or appropriate local workspace exhaustion. Avoid dust creation. Avoid product contact with eyes and skin. Respect the guidelines and instructions for usage on the product packaging label. Do not eat, drink or smoke during work. Before break and after work, wash your hands and take off contaminated clothing. Store this clothing separately

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

### 7.2.1. Technical measures and storage conditions

Keep containers tightly closed. Prohibit smoking. Prevent access by unauthorized persons. Pay attention to instructions on the product packaging. Store in a dry, cool, and well ventilated place. Protect from direct sunlight and heat exposure. Keep away from foodstuffs, beverages and feeds. Store separately from oxidizing agents, acids, alkalis, acetylene, ammonia.

### 7.2.2. Packaging materials

Store in original packaging.

### 7.2.3. Requirements for storage rooms and vessels

Store in a dry, cool and well ventilated place. Store in original packaging (fireproof container).

### 7.3. Specific end uses

Product usage is specified by its manufacturer within the instruction manual, which is on the package label or in attached documentation.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1. Control parameters

There are no exposure limits.

#### 8.2.1. Appropriate engineering controls

Ensure adequate ventilation. This can be secured by local exhaust from the workplace, or by a total air handling system

#### 8.2.2. Personal protective equipment

##### 8.2.2.1. Eye/face protection

Safety glasses with side-shields conforming to EN166. Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU).

##### 8.2.2.2. Body Protection

Use protective clothing with long sleeves, respectively safety protective footwear (EN 344)

##### 8.2.2.3. Skin protection

Handle with gloves. Gloves must be inspected prior to use. Use a proper glove removal technique (without touching outer surface of the gloves) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. Very appropriate is to use hand protective cream. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it. Material: Nitrile rubber Minimum layer thickness: 0.11 mm Break-through time: 480 min Handle with gloves. Gloves must be inspected prior to use. Use a proper glove removal technique (without touching outer surface of the gloves) to avoid skin contact with this product. Dispose of contaminated gloves after use in accordance with applicable laws and good laboratory practices. Wash and dry hands. Very appropriate is to use hand protective cream. The selected protective gloves have to satisfy the specifications of EU Directive 89/686/EEC and the standard EN 374 derived from it. Material: Nitrile rubber Minimum layer thickness: 0.11 mm Break-through time: 480 min

##### 8.2.2.4. Respiratory protection

Under normal conditions is not respiration protection required. In case of insufficient ventilation and dust production use a respirator with appropriate filter for solid particles with a size < 50 nm.

### 8.3. Environmental exposure controls

Do not let the product enter drains.



## 9 PHYSICAL AND CHEMICAL PROPERTIES

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

a) Appearance Form:	solid - powder (nanomaterial)
b) Colour:	black
c) Granulometry:	on customer request
d) Specific surface:	on customer request
e) Specific gravity:	4 g/cm <sup>3</sup> (20°C)
f) Surface charge:	no data available
g) Zeta potential:	no data available
h) Odour:	no odour
i) Odour Threshold:	no odour
j) pH:	no data available
k) Melting point/freezing point:	no data available
l) Melting point/range:	no data available
m) Boiling point and boiling range:	no data available
n) Flash point:	no data available
o) Evaporation rate:	no data available
p) Flammability (solid, gas):	no data available
q) Upper/lower flammability or explosive limits:	no data available
r) Vapour pressure:	no data available

s) Vapour density:	no data available
t) Relative density:	no data available
u) Solubility	substance is possible to thin with water
v) Partition coefficient n-octanol/water:	no data available
w) Auto-ignition temperature:	no data available
x) Decomposition temperature:	1500° C
y) Viscosity:	no data available
z) Explosive properties:	no data available
aa) Oxidizing properties:	no data available

## 10. STABILITY AND REACTIVITY

### 10.1. Reactivity

With water - a small volume of hydrogen is generated in water reaction (less than 1l/1kg·hr)

### 10.2. Chemical stability

Stable under recommended storage conditions

### 10.3. Possibility of hazardous reactions

No data available

### 10.4. Conditions to avoid

Avoid air, elevated temperatures, ignition sources

### 10.5. Incompatible materials

Oxidizing agents, acids, acetylene, ammonia.

### 10.6. Hazardous decomposition products

The product can produce hazardous decomposition products at high temperatures. In case of fire, see Section 5.

## 11. TOXICOLOGICAL INFORMATION

### 11.1. Information on toxicological effects

Acute toxicity:

Acute toxicity of the product components

LD <sub>50</sub> , oral, sewer rat:	30 000 mg/kg
LD <sub>50</sub> , dermal, sewer rat or rabbit:	Not tested
LC <sub>50</sub> , inhalation, sewer rat, for aerosols or particles for 4 hours:	Not tested
Skin corrosion/irritation:	Can irritate skin
Serious eye damage/eye irritation:	Can cause eye irritation
Respiratory or skin sensitization:	No data available.
Germ cell mutagenicity:	No data available.
Carcinogenicity:	No data available.
Reproductive toxicity:	No data available.
Specific target organ toxicity - single exposure:	No data available.
Specific target organ toxicity - repeated exposure:	No data available.
Aspiration hazard:	Dust inhalation can irritate the respiratory system
Additional Information:	RTECS: No data available.

## 12. ECOLOGICAL INFORMATION

### 12.1. Toxicity

Acute toxicity of the product	g/L
LC <sub>50</sub> (96 hours, fish):	3.17
EC <sub>50</sub> (48 hours, daphnia):	13.8
IC <sub>50</sub> (72 hours, algae):	1.2

### 12.2. Persistence and degradability

No data available.

### 12.3. Bioaccumulative potential

No data available.

### 12.4. Mobility in soil

No data available.

### 12.5. Results of PBT and vPvB assessment

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very accumulative (vPvB) at least of 0.1% or higher

### 12.6. Other adverse effects

Substance is not classified as dangerous for the environment.

## 13. DISPOSAL CONSIDERATIONS

### 13.1. Waste treatment methods

#### 13.1.1. Product / Packaging disposal

The substance and its surpluses must be put only to specified area for waste and must be dispose together with the sorted waste, e.g. in waste incinerators.

### 13.1.2. Contaminated packaging

Empty the containers completely. Hand empty containers over to an authorized company that has permissions for their removal. Dispose waste in accordance with relevant local regulations with suitable devices. Sort and put other waste according to type of material into containers for recycling or to places specified by local authorities

	Catalogue No.	Waste type name	Waste classification
Substance	06 03 99	Wastes not otherwise specified	Hazardous waste
Burned substance	06 03 16	Metallic oxides other than those mentioned under No. 06 03 15	Other waste
Container	15 01 04	Metal packaging	Other waste

### 13.1.3. Other disposal recommendations

Waste Catalogue (according to section 16.3). Determined waste catalogue numbers are recommended based on probable usage of this product. Based on special usage and its real disposal by user, the other waste catalogue numbers can be used as well.

## 14. TRANSPORTATION INFORMATION/ D.O.T. HAZARD CLASSIFICATION

### 14.1 UN/ID Number

ADR/RID: N/A  
IMDG: N/A  
ICAO/IATA: N/A

### 14.2 UN proper

#### shipping name

ADR/RID: N/A  
IMDG: N/A  
ICAO/IATA: N/A

### 14.3 Transport hazard

#### class(es)

ADR/RID: N/A  
IMDG: N/A  
ICAO/IATA: N/A

### 14.4 Packaging group

ADR/RID: N/A  
IMDG: N/A  
ICAO/IATA: N/A

### 14.5 Environmental

#### hazards

ADR/RID: N/A  
IMDG: N/A  
ICAO/IATA: N/A

### 14.6 Special

#### precautions for user

Transport category: N/A  
Tunnel restriction code: N/A  
Packing instructions: N/A

### 14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

No data available

## 15. REGULATORY INFORMATION

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

Authorisations and/or restrictions on use: None

#### 15.1.1. Other EU legislation

The European Parliament and Council Regulation (EC) No. 1907/2006 REACH

#### 15.1.2. National regulations

Act No. 371/2008 Coll., which amends Act No. 356/2003 Coll., on chemical substances and chemical preparations as amended Public notice No. 369/2005 Coll., which amends Public notice No. 232/2004 Coll., which implement certain provisions of the Act on chemical substances and chemical preparations and on certain acts amending related to the classification, packaging and to labelling of hazardous chemicals and chemical preparations Government decree No. 178/2001 Coll., which sets the health protection conditions of workers at work Act No. 185/2001 Coll., on waste and on certain other acts amending, as amended Ministry of Environment public notice No. 381/2001 Coll., which establishes the Waste Catalogue. Act No. 94/2004 Coll., which amend Act No. 477/2001 Coll., on packaging and on some acts amending (Act on packaging), as amended Act No. 254/2001 Coll., on waters and on certain other acts amending (Water Act) Act No. 258/2000 Coll., on the public health protection and on some related acts amending, as amended European Agreement about international transport of dangerous goods (ADR), announced under No. 64/1987 Coll., as amended Convention on International Transport (COTIF), announced under No. 8 / 1985 Coll., as amended Act No. 49/1997 Coll., on civil aviation and on amending and supplementing of Act No. 455/1991 Coll. Act No. 61/2000 Coll., on nautical navigation, as amended Act No. 86/2002 Coll., on Air protection, as amended Public notice No.

355/2002 Coll., which sets emission limits and other operation conditions for other stationary sources of air pollution, which emit volatile organic compounds from processes employing organic solvents and from petrol storage and distribution

## 16. OTHER INFORMATION

### 16.1. The full text of H-Statements

N/A

### 16.2. Explanatory notes

Ecotoxicological and toxicological data were obtained from ESIS (European Chemical Substances Information System), specifically from IUCLID (International Uniform Chemical Information Data Base). The database lists the properties of substances that are classified in Annex I of Directive 67/548/EEC, as well as substances for substances without this classification. For additional information was also used the chemical database of Merck company. Material safety data sheet contains necessary data for ensuring of health protection at work and environmental protection. These data correspond to the current state of knowledge and experience and are in compliance with applicable laws and regulations. They cannot be considered as a guarantee for appropriateness and usability for particular application. Material Safety Data Sheet is a property of private or legal person referred in section 1, paragraph 1.3 and is protected by copyright. Any copying, distribution or sale without the owner's agreement is strictly prohibited.

General director  
«Nanocom» LLC

/ Denis Filippov /

Stamp of the company

