Onyx ESD, Onyx ESD v2

Safety Data Sheet

According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

Revision Date: 05/23/2024 Date of Issue: 11/12/2019 Version: 3.0

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

1.1. Product Identifier

Product Form : Mixture

Product Name : Onyx ESD, Onyx ESD v2

1.2. Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

1.2.1. Relevant Identified Uses

Use of the Substance/Mixture : MarkForged 3D printing material.

1.2.2. Uses Advised Against

No additional information available

1.3. Details of the Supplier of the Safety Data Sheet

Company

MarkForged, Inc
60 Tower Rd
Waltham, MA 02451
T: 866-496-1805 (9:00 A.M to 6:00 P.M. EST)
support@markforged.com
markforged.com

1.4. Emergency Telephone Number

Emergency Number : +1 703-741-5970 / 1-800-424-9300 (Chemtrec)

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the Substance or Mixture

Classification According to Regulation (EC) No. 1272/2008

Not classified

2.2. Label Elements

Labelling According to Regulation (EC) No. 1272/2008 [CLP]

No labelling applicable

2.3. Other Hazards

Other Hazards Not Contributing to the Classification : Under normal conditions of use, this product is not expected to generate dust. However, if dust is generated, use non-sparking tools for clean-up. Vacuum cleanup is preferred. Utilize dust suppressants if necessary. Do not allow dust to accumulate in the workplace. Utilize proper ventilation systems with explosion relief valves. Risk of thermal burns on contact with molten product.

PBT: not relevant – no registration required

vPvB: not relevant – no registration required

The substance/mixture does not contain substance(s) equal to or greater than 0.1% by weight that are present in the list established in accordance with Article 59(1) of REACH for having endocrine disrupting properties, or identified as having endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product Identifier	%	Classification According to Regulation (EC) No. 1272/2008
Carbon substance with national workplace exposure limit(s) (AT, PL)	(CAS-No.) 7440-44-0 (EC-No.) 231-153-3;931-328-0	9,9 – 15	Not classified
Carbon black substance with national workplace exposure limit(s) (BE, CZ, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, PL, PT, SE, SK, NO)	(CAS-No.) 1333-86-4 (EC-No.) 215-609-9;435-640-3	8 – 12	Not classified

SECTION 4: FIRST AID MEASURES

4.1. Description of First-aid Measures

First-Aid Measures General : Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-Aid Measures After Inhalation : When symptoms occur: go into open air and ventilate suspected area. Obtain medical attention if breathing difficulty persists.

First-Aid Measures After Skin Contact : Gently wash with plenty of soap and water. Cool skin rapidly with cold water after contact with molten product. Removal of solidified molten material from skin requires medical assistance.

First-Aid Measures After Eye Contact : No health effects expected. If irritation does occur, flush with lukewarm, gently flowing water for 5 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if irritation develops or persists. Removal of solidified molten material from the eyes requires medical assistance.

First-Aid Measures After Ingestion : Rinse mouth. Do NOT induce vomiting. Obtain medical attention.

4.2. Most Important Symptoms and Effects Both Acute and Delayed

Symptoms/Effects : Not expected to present a significant hazard under anticipated conditions of normal use. Prolonged contact with large amounts of dust may cause mechanical irritation. Risk of thermal burns on contact with molten product.

Symptoms/Effects After Inhalation : Not expected to present a significant inhalation hazard under anticipated conditions of normal use. For particulates and dust: Prolonged exposure may cause irritation.

Symptoms/Effects After Skin Contact : Prolonged exposure may cause skin irritation. Risk of thermal burns on contact with molten product. Fumes may cause irritation of the skin and eyes.

Symptoms/Effects After Eye Contact : May cause slight irritation to eyes. Risk of thermal burns on contact with molten product. Fumes from thermal decomposition may cause eye irritation.

Symptoms/Effects After Ingestion : Ingestion may cause adverse effects. Gastrointestinal irritation.

Chronic Symptoms : Unexpected under normal conditions of use. All compounds classified as carcinogen and specific target organ toxicity – repeated exposure in this product act via inhalation. Since these compounds are not respirable and bound in a polymer matrix, the overall product is not classified as a carcinogen or specific target organ toxicity – repeated exposure. In the event of dust exposure: May cause cancer by inhalation. Causes damage to organs (respiratory system) through prolonged or repeated exposure (inhalation).

4.3. Indication of Any Immediate Medical Attention and Special Treatment Needed

If exposed or concerned, get medical advice and attention. If medical advice is needed, have product container or label at hand.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing Media

Suitable Extinguishing Media : Water spray, fog, carbon dioxide (CO_2), alcohol-resistant foam, or dry chemical.

Unsuitable Extinguishing Media : Do not use a heavy water stream. Use of heavy stream of water may spread fire. Application of water stream to hot product may cause frothing and increase fire intensity. Do not use water when molten material is involved, may react violently or explosively on contact with water.

5.2. Special Hazards Arising From the Substance or Mixture

Fire Hazard : Not considered flammable but may burn at high temperatures.

Explosion Hazard : Product is not explosive. Contains substances that are combustible dusts. If the product is processed and dusts are generated and become dispersed with an ignition source, this may cause a combustible dust explosion. Keep dust levels to a minimum and follow applicable regulations.

Reactivity : Hazardous reactions will not occur under normal conditions.

Hazardous Combustion Products : Thermal decomposition generates: Carbon oxides (CO, CO_2). Hydrocarbons. Nitrogen oxides. Hydrogen cyanide.

5.3. Advice for Firefighters

Precautionary Measures Fire : Exercise caution when fighting any chemical fire.

Firefighting Instructions : Use water spray or fog for cooling exposed containers. Do not breathe fumes from fires or vapours from decomposition. Avoid raising dust.

Protection During Firefighting : Do not enter fire area without proper protective equipment, including respiratory protection.

Other Information : Do not allow run-off from fire fighting to enter drains or water courses. Do not add water to molten material as this may cause spattering.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal Precautions, Protective Equipment and Emergency Procedures

General Measures : Avoid prolonged contact with eyes, skin and clothing. Avoid breathing dust. Avoid generating dust.

6.1.1. For Non-Emergency Personnel

Protective Equipment : Use appropriate personal protective equipment (PPE).

Emergency Procedures : Evacuate unnecessary personnel.

Measures In Case Of Dust Release : Dust suppressant.

6.1.2. For Emergency Responders

Protective Equipment : Equip cleanup crew with proper protection.

Emergency Procedures : Upon arrival at the scene, a first responder is expected to recognise the presence of dangerous goods, protect oneself and the public, secure the area, and call for the assistance of trained personnel as soon as conditions permit. Ventilate area.

6.2. Environmental Precautions

Prevent entry to sewers and public waters.

6.3. Methods and Materials for Containment and Cleaning Up

For Containment : Contain solid spills with appropriate barriers and prevent migration and entry into sewers or streams.

Methods for Cleaning Up : Clean up spills immediately and dispose of waste safely. Cool molten material to limit spreading. Recover the product by vacuuming, shoveling or sweeping. For particulates and dust: Vacuum clean-up is preferred. If sweeping is required use a dust suppressant. Avoid generation of dust during clean-up of spills. Transfer spilled material to a suitable container for disposal. Contact competent authorities after a spill.

6.4. Reference to Other Sections

See Section 8 for exposure controls and personal protection and Section 13 for disposal considerations.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for Safe Handling

Additional Hazards When Processed : Risk of thermal burns on contact with molten product. When processed, the product dust is combustible. Use care during processing to minimize generation of dust. . This product contains carbon black bound in the matrix of the product. Under normal and intended conditions of use carbon black is not expected to be released and bioavailable. If product is heavily processed and dust is released carbon black particles may become inhalable. If carbon black dust is inhaled this product is suspected of causing cancer. Causes damage to organs (respiratory system) through prolonged or repeated exposure (inhalation). This product and any fibers or dust are electrically conductive and may interfere with electrical systems and processes, use proper precautions.

Precautions for Safe Handling : Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Avoid creating or spreading dust. Avoid breathing dust. Avoid prolonged contact with eyes, skin and clothing. Use appropriate personal protective equipment (PPE).

Hygiene Measures : Handle in accordance with good industrial hygiene and safety procedures.

7.2. Conditions for Safe Storage, Including Any Incompatibilities

Technical Measures : Comply with applicable regulations. Avoid creating or spreading dust.

Storage Conditions : Store in accordance with applicable national storage class systems. Keep container closed when not in use. Store in a dry, cool and well-ventilated place. Keep/Store away from direct sunlight, extremely high or low temperatures and incompatible materials.

Incompatible Materials : Strong acids, strong bases, strong oxidisers.

7.3. Specific End Use(S)

MarkForged 3D printing material.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control Parameters

Please see section 16 for the legal basis of limit value information in section 8.1, including the national legislation or provision which gives rise to a given limit.

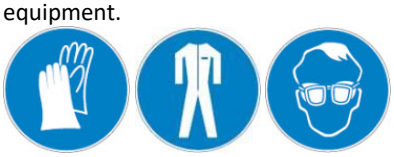
Carbon (7440-44-0)		
Austria	OEL TWA (Legal Basis:BGBl. II Nr. 254/2018)	5 mg/m³ (alveolar dust with <1% Quartz, respirable fraction)
Austria	OEL STEL (Legal Basis:BGBl. II Nr. 254/2018)	10 mg/m³ (alveolar dust with <1% Quartz, respirable fraction)
Poland	OEL TWA (Legal Basis:Dz. U. 2020 Nr. 61)	6 mg/m³ (synthetic-inhalable fraction)
Carbon black (1333-86-4)		
Belgium	OEL TWA (Legal Basis:Royal Decree 21/01/2020)	3 mg/m³
Croatia	OEL TWA (Legal Basis:OG No. 91/2018)	3,5 mg/m³
Croatia	OEL STEL (Legal Basis:OG No. 91/2018)	7 mg/m³
Czech Republic	OEL TWA (Legal Basis:Reg. 41/2020)	2 mg/m³ (dust)
Denmark	OEL TWA (Legal Basis:BEK No. 698 of 28/05/2020)	3,5 mg/m³
Estonia	OEL TWA (Legal Basis:Regulation No. 105)	3 mg/m³ (dust (Dusts)
Finland	OEL TWA (Legal Basis:HTP-ARVOT 2020)	3,5 mg/m³
Finland	OEL STEL (Legal Basis:HTP-ARVOT 2020)	7 mg/m³
France	OEL TWA (Legal Basis:INRS ED 984)	3,5 mg/m³
Greece	OEL TWA (Legal Basis:PWHSE)	3,5 mg/m³
Greece	OEL STEL (Legal Basis:PWHSE)	7 mg/m³
Hungary	OEL TWA (Legal Basis:Decree No. 05/2020)	3 mg/m³ (respirable)
Ireland	OEL TWA (Legal Basis:2020 COP)	3 mg/m³ (inhalable fraction)
Ireland	OEL STEL (Legal Basis:2020 COP)	15 mg/m³ (calculated-inhalable fraction)
USA ACGIH	OEL TWA (Legal Basis:IMDFN1)	3 mg/m³ (inhalable particulate matter)
Norway	OEL TWA (Legal Basis:FOR-2020-04-06-695)	3,5 mg/m³
Norway	OEL STEL (Legal Basis:FOR-2020-04-06-695)	7 mg/m³ (value calculated)
Poland	OEL TWA (Legal Basis:Dz. U. 2020 Nr. 61)	4 mg/m³ (inhalable fraction)
Portugal	OEL TWA (Legal Basis:Portuguese Norm NP 1796:2014)	3 mg/m³
Portugal	OEL Chemical Category (Legal Basis:Portuguese Norm NP 1796:2014)	A3 - Confirmed Animal Carcinogen with Unknown Relevance to Humans
Slovakia	OEL TWA (Legal Basis:Gov. Decree 33/2018)	2 mg/m³ (respirable fraction, 5% or less fibrogenic component) 10 mg/m³ (respirable fraction, greater than 5% fibrogenic component) 10 mg/m³ (total aerosol)
Spain	OEL TWA (Legal Basis:OELCAIS)	3,5 mg/m³
Sweden	OEL TLV (Legal Basis:AFS 2018:1)	3 mg/m³ (inhalable fraction)
Particulates not otherwise regulated (PNOR) (Not applicable)		
Belgium	OEL TWA (Legal Basis:Royal Decree 21/01/2020)	3 mg/m³ (alveolar fraction) 10 mg/m³ (inhalable fraction)
France	OEL TWA (Legal Basis:INRS ED 984)	10 mg/m³ (restrictive limit-inhalable) 5 mg/m³ (restrictive limit-alveolar fraction)
Ireland	OEL TWA (Legal Basis:2020 COP)	10 mg/m³ (total inhalable) 4 mg/m³ (respirable)
Ireland	OEL STEL (Legal Basis:2020 COP)	30 mg/m³ (calculated-total inhalable) 12 mg/m³ (calculated-respirable)
USA ACGIH	OEL TWA (Legal Basis:IMDFN1)	3 mg/m³ Respirable fraction 10 mg/m³ Total Dust
Norway	OEL TWA (Legal Basis:FOR-2020-04-06-695)	10 mg/m³ (total dust) 5 mg/m³ (respirable dust)
Norway	OEL STEL (Legal Basis:FOR-2020-04-06-695)	20 mg/m³ (value calculated-total dust) 10 mg/m³ (value calculated-respirable dust)
Portugal	OEL TWA (Legal Basis:Portuguese Norm NP 1796:2014)	10 mg/m³ (inhalable fraction, particulate matter containing no Asbestos and <1% Crystalline silica) 3 mg/m³ (respirable fraction, particulate matter containing no Asbestos and <1% Crystalline silica)
Slovakia	OEL TWA (Legal Basis:Gov. Decree 33/2018)	10 mg/m³
Spain	OEL TWA (Legal Basis:OELCAIS)	10 mg/m³ (the terms soluble and insoluble are understood with reference to water-inhalable fraction) 3 mg/m³ (the terms soluble and insoluble are understood with reference to water-respirable fraction)

Monitoring methods : A specific exposure sampling method is not available.

8.2. Exposure Controls

Appropriate Engineering Controls : Suitable eye/body wash equipment should be available in the vicinity of any potential exposure. Avoid creating or spreading dust. For particulates and dust: Ensure adequate ventilation, especially in confined areas. Maintain sufficient mechanical or natural ventilation to assure concentrations remain below PEL/TLV. Use local exhaust if necessary. Power equipment should be equipped with properly designed dust collection devices. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product contain explosion relief vents or an explosion suppression system or an oxygen-deficient environment. Ensure all national/local regulations are observed.

Personal Protective Equipment : Not generally required. The use of personal protective equipment may be necessary as conditions warrant. Gloves. Protective clothing. Protective goggles. Personal protective equipment should be chosen in accordance with Regulation (EU) 2016/425, CEN standards, and in discussion with the supplier of the protective equipment.



Materials for Protective Clothing : Chemically resistant materials and fabrics.

Hand Protection : Wear protective gloves.

Eye Protection : Chemical goggles or safety glasses.

Skin and Body Protection : Wear suitable protective clothing. When working with hot material, use suitable thermally protective clothing.

Respiratory Protection : If exposure limits are exceeded or irritation is experienced, approved respiratory protection should be worn. In case of inadequate ventilation, oxygen deficient atmosphere, or where exposure levels are not known wear approved respiratory protection.

Thermal Hazard Protection : When working with hot material, use suitable thermally protective clothing.

Environmental Exposure Controls : Avoid release to the environment.

Consumer Exposure Controls : Use only as directed. Do not breathe dust.

Other Information : When using, do not eat, drink or smoke.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on Basic Physical and Chemical Properties

Physical State	: Solid
Colour, Appearance	: No data available
Colour	: No data available
Odour	: Odorless
Odour Threshold	: No data available
pH	: Not available
pH solution	: Not available
Evaporation Rate	: No data available
Melting Point	: Not available
Freezing Point	: Not available
Boiling Point	: No data available
Flash Point	: No data available
Auto-Ignition Temperature	: Not applicable
Decomposition Temperature	: > 300 °C (572 °F)
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
Density	: > 1 g/cm³
Solubility	: Negligible. Water: Negligible
Partition Coefficient n-Octanol/Water	: No data available

Viscosity	: No data available
Explosive Properties	: No data available
Oxidising Properties	: No data available
Explosive Limits	: Not applicable
Particle Size	: Not available
Particle Size Distribution	: Not available
Particle Shape	: Not available
Particle Aspect Ratio	: Not available
Particle Aggregation State	: Not available
Particle Agglomeration State	: Not available
Particle Specific Surface Area	: Not available
Particle Dustiness	: Not available

9.2. Other Information

No additional information available

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

Hazardous reactions will not occur under normal conditions.

10.2. Chemical Stability

Stable under recommended handling and storage conditions (see section 7).

10.3. Possibility of Hazardous Reactions

Hazardous polymerization will not occur.

10.4. Conditions to Avoid

Direct sunlight, extremely high or low temperatures, and incompatible materials. Avoid creating or spreading dust.

10.5. Incompatible Materials

Strong acids, strong bases, strong oxidisers.

10.6. Hazardous Decomposition Products

Thermal decomposition generates: Carbon oxides (CO, CO_2). Nitrogen oxides. Hydrogen cyanide.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information On Hazard Classes As Defined In Regulation (Ec) No 1272/2008

Likely Routes of Exposure	: Dermal
Acute Toxicity (Oral)	: Not classified (Based on available data, the classification criteria are not met)
Acute Toxicity (Dermal)	: Not classified (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)

Carbon (7440-44-0)	
LD50 Oral Rat	> 10000 mg/kg

Carbon black (1333-86-4)	
LD50 Oral Rat	> 8000 mg/kg

Skin Corrosion/Irritation	: Not classified (Based on available data, the classification criteria are not met)
Eye Damage/Irritation	: Not classified (Based on available data, the classification criteria are not met)
Respiratory or Skin Sensitisation	: Not classified (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)
Carcinogenicity	: Not classified (All compounds classified as carcinogen in this product act via inhalation. Since these compounds are not respirable and bound in a polymer matrix, the overall product is not classified as a carcinogen)

Carbon black (1333-86-4)	
IARC Group	2B

Reproductive Toxicity	: Not classified (Based on available data, the classification criteria are not met)
Specific Target Organ Toxicity (Single Exposure)	: Not classified (Based on available data, the classification criteria are not met)
Specific Target Organ Toxicity (Repeated Exposure)	: Not classified (All compounds classified as STOT-RE in this product act via inhalation. Since these compounds are not respirable and bound in a polymer matrix, the overall product is not classified as a STOT-RE)
Aspiration Hazard	: Not classified (Based on available data, the classification criteria are not met)

Symptoms/Injuries After Inhalation : Not expected to present a significant inhalation hazard under anticipated conditions of normal use. For particulates and dust: Prolonged exposure may cause irritation.

Symptoms/Injuries After Skin Contact : Prolonged exposure may cause skin irritation. Risk of thermal burns on contact with molten product. Fumes may cause irritation of the skin and eyes.

Symptoms/Injuries After Eye Contact : May cause slight irritation to eyes. Risk of thermal burns on contact with molten product. Fumes from thermal decomposition may cause eye irritation.

Symptoms/Injuries After Ingestion : Ingestion may cause adverse effects. Gastrointestinal irritation.

Chronic Symptoms : Unexpected under normal conditions of use. All compounds classified as carcinogen and specific target organ toxicity – repeated exposure in this product act via inhalation. Since these compounds are not respirable and bound in a polymer matrix, the overall product is not classified as a carcinogen or specific target organ toxicity – repeated exposure. In the event of dust exposure: May cause cancer by inhalation. Causes damage to organs (respiratory system) through prolonged or repeated exposure (inhalation).

11.2. Information On Other Hazards

Based on available data this substance/the substances in this mixture not listed below do(es) not have endocrine disrupting properties with respect to humans as it does not meet the criteria set out in section A of Regulation (EU) No 2017/2100 and/or the criteria set out in Regulation (EU) 2018/605, or the substance(s) are not required to be disclosed.

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Hazardous To The Aquatic Environment, Short-Term (Acute) : Not classified (Based on available data, the classification criteria are not met)

Hazardous To The Aquatic Environment, Long-Term (Chronic) : Not classified (Based on available data, the classification criteria are not met)

Carbon black (1333-86-4)	
EC50 - Crustacea [1]	5600 mg/l (Exposure time: 24 h - Species: Daphnia magna)

12.2. Persistence and Degradability

Onyx ESD, Onyx ESD v2	
Persistence and Degradability	Not established.

12.3. Bioaccumulative Potential

Onyx ESD, Onyx ESD v2	
Bioaccumulative Potential	Not established.

12.4. Mobility in Soil

Onyx ESD, Onyx ESD v2	
Ecology - Soil	Not established.

12.5. Results of PBT and vPvB Assessment

Onyx ESD, Onyx ESD v2
PBT: not relevant – no registration required
vPvB: not relevant – no registration required

12.6. Endocrine Disrupting Properties

Based on available data this substance/the substances in this mixture not listed below do(es) not have endocrine disrupting properties with respect to non-target organisms as it does not meet the criteria set out in section B of Regulation (EU) No 2017/2100 and/or the criteria set out in Regulation (EU) 2018/605, or the substance(s) are not required to be disclosed.

12.7. Other Adverse Effects

Other Information : Avoid release to the environment.

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste Treatment Methods

Waste Treatment Methods : Material should be recycled if possible. Dispose of contents/container to local, regional, national, and international regulations.

Product/Packaging Disposal Recommendations : Material should be recycled if possible. Dispose of contents/container in accordance with local, regional, national, and international regulations.

Ecology - Waste Materials : Avoid release to the environment.

SECTION 14: TRANSPORT INFORMATION

The shipping description(s) stated herein were prepared in accordance with certain assumptions at the time the SDS was authored, and can vary based on a number of variables that may or may not have been known at the time the SDS was issued.

In accordance with ADR / RID / IMDG / IATA / ADN

14.1. UN Number or ID Number
Not regulated for transport
14.2. UN Proper Shipping Name
Not regulated for transport
14.3. Transport Hazard Class(Es)
Not regulated for transport
14.4. Packing Group
Not regulated for transport
14.5. Environmental Hazards
Not regulated for transport

14.6. Special Precautions For User

No additional information available

14.7. Maritime Transport in Bulk According to IMO instruments

Not applicable

SECTION 15: REGULATORY INFORMATION

15.1. Safety, Health and Environmental Regulations/Legislation Specific for the Substance or Mixture

15.1.1. EU-Regulations

15.1.1.1. REACH Annex XVII Information

Contains no REACH substances with Annex XVII restrictions

15.1.1.2. REACH Candidate List Information

Contains no substance on the REACH candidate list

15.1.1.3. POP (2019/1021) - Persistent Organic Pollutants Information

Contains no substance subject to Regulation (EU) No 2019/1021 of the European Parliament and of the Council of 20 June 2019 on persistent organic pollutants

15.1.1.4. PIC Regulation EU (649/2012) - Export and Import of Hazardous Chemicals Information

Contains no substance subject to Regulation (EU) No 649/2012 of the European Parliament and of the Council of 4 July 2012 concerning the export and import of hazardous chemicals.

15.1.1.5. REACH Annex XIV Information

Contains no REACH Annex XIV substances

15.1.1.6. Substances Depleting the Ozone layer (1005/2009) Information

No additional information available

15.1.1.7. EC Inventory Information

Carbon (7440-44-0)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances)

Carbon black (1333-86-4)
Listed on the EEC inventory EINECS (European Inventory of Existing Commercial Chemical Substances) Listed on ELINCS (European List of Notified Chemical Substances)

15.1.1.8. Other Information

No additional information available

15.1.2. National Regulations

No additional information available

15.1.3. International Inventory Lists

Carbon (7440-44-0)
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active Listed on the Canadian DSL (Domestic Substances List) Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory) Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances) Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory Listed on KECL/KECI (Korean Existing Chemicals Inventory) Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China) Listed on NZIoC (New Zealand Inventory of Chemicals) Listed on INSQ (Mexican National Inventory of Chemical Substances) Listed on the TCSI (Taiwan Chemical Substance Inventory) Listed on the NCI (Vietnam - National Chemicals Inventory)

Carbon black (1333-86-4)
Listed on the United States TSCA (Toxic Substances Control Act) inventory - Status: Active
Listed on the Canadian DSL (Domestic Substances List)
Listed on the Canadian IDL (Ingredient Disclosure List)
Listed introduction on Australian Industrial Chemicals Introduction Scheme (AICIS Inventory)
Listed on PICCS (Philippines Inventory of Chemicals and Chemical Substances)
Listed on the Japanese ENCS (Existing & New Chemical Substances) inventory
Listed on KECL/KECI (Korean Existing Chemicals Inventory)
Listed on IECSC (Inventory of Existing Chemical Substances Produced or Imported in China)
Listed on NZIoC (New Zealand Inventory of Chemicals)
Listed on the Japanese ISHL (Industrial Safety and Health Law)
Listed on INSQ (Mexican National Inventory of Chemical Substances)
Listed on the TCSI (Taiwan Chemical Substance Inventory)
Listed on the NCI (Vietnam - National Chemicals Inventory)

15.2. Chemical Safety Assessment

No chemical safety assessment has been carried out

SECTION 16: OTHER INFORMATION

Date of Preparation or Latest Revision : 05/23/2024

Data Sources : Information and data obtained and used in the authoring of this safety data sheet could come from database subscriptions, official government regulatory body websites, product/ingredient manufacturer or supplier specific information, and/or resources that include substance specific data and classifications according to GHS or their subsequent adoption of GHS.

Other Information : According to Regulation (EC) No. 1907/2006 (REACH) with its amendment Regulation (EU) 2020/878

Indication of Changes

No additional information available

Abbreviations and Acronyms

ACGIH – American Conference of Governmental Industrial Hygienists
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
BCF - Bioconcentration Factor
BEI - Biological Exposure Indices (BEI)
BOD – Biochemical Oxygen Demand
CAS No. - Chemical Abstracts Service Number
CLP – Classification, Labeling and Packaging Regulation (EC) No 1272/2008
COD – Chemical Oxygen Demand
EC – European Community
EC50 - Median Effective Concentration
EEC – European Economic Community
EINECS – European Inventory of Existing Commercial Chemical Substances
EmS-No. (Fire) - IMDG Emergency Schedule Fire
EmS-No. (Spillage) - IMDG Emergency Schedule Spillage
EU – European Union
ErC50 - EC50 in Terms of Reduction Growth Rate
GHS – Globally Harmonized System of Classification and Labeling of Chemicals
IARC - International Agency for Research on Cancer
IATA - International Air Transport Association
IBC Code - International Bulk Chemical Code
IMDG - International Maritime Dangerous Goods
IPRV - Ilgalaikio Poveikio Ribinis Dydis
IOELV – Indicative Occupational Exposure Limit Value
LC50 - Median Lethal Concentration
LD50 - Median Lethal Dose
LOAEL - Lowest Observed Adverse Effect Level
LOEC - Lowest-Observed-Effect Concentration
Log Koc - Soil Organic Carbon-water Partitioning Coefficient
Log Kow - Octanol/water Partition Coefficient
Log Pow - Ratio of the equilibrium concentration (C) of a dissolved substance in a two-phase system consisting of two largely immiscible solvents, in this case octanol and water
MAK – Maximum Workplace Concentration/Maximum Permissible Concentration
MARPOL - International Convention for the Prevention of Pollution
NDS - Najwyzsze Dopuszczalne Stezenie
NDSCh - Najwyzsze Dopuszczalne Stezenie Chwilowe
NDSP - Najwyzsze Dopuszczalne Stezenie Pulapowe
NOAEL - No-Observed Adverse Effect Level
NOEC - No-Observed Effect Concentration
NRD - Nevirsytinas Ribinis Dydis
NTP – National Toxicology Program
OEL - Occupational Exposure Limits
PBT - Persistent, Bioaccumulative and Toxic
PEL - Permissible Exposure Limit
pH – Potential Hydrogen
REACH – Registration, Evaluation, Authorisation, and Restriction of Chemicals
RID – Regulations Concerning the International Carriage of Dangerous Goods by Rail
SADT - Self Accelerating Decomposition Temperature
SDS - Safety Data Sheet
STEL - Short Term Exposure Limit
STOT - Specific Target Organ Toxicity
TA-Luft - Technische Anleitung zur Reinhaltung der Luft
TEL TRK – Technical Guidance Concentrations
ThOD – Theoretical Oxygen Demand
TLM - Median Tolerance Limit
TLV - Threshold Limit Value
TPRD - Trumpalaikio Poveikio Ribinis Dydis
TRGS 510 - Technische Regel für Gefahrstoffe 510 - Lagerung von Gefahrstoffen in ortsbeweglichen Behältern
TRGS 552 – Technische Regeln für Gefahrstoffe - N-Nitrosamine
TRGS 900 - Technische Regel für Gefahrstoffe 900 – Arbeitsplatzgrenzwerte
TRGS 903 - Technische Regel für Gefahrstoffe 903 - Biologische Grenzwerte
TSCA - Toxic Substances Control Act
TWA - Time Weighted Average
VOC – Volatile Organic Compounds
VLA-EC - Valor Límite Ambiental Exposición de Corta Duración
VLA-ED - Valor Límite Ambiental Exposición Diaria
VLE – Valeur Limite D'exposition
VME – Valeur Limite De Moyenne Exposition
vPvB - Very Persistent and Very Bioaccumulative
WEL – Workplace Exposure Limit
WGK - Wassergefährdungsklasse

Limit Value Legal Basis*

*Includes the below and any related regulations/provisions, and subsequent amendements

EU - 2019/1831 EU in accor. with 98/24/EC - Directive 2019/1831/EU of October 24, 2019 establishing a fifth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC, and amending Commission Directives 2000/39/EC.

EU - 2019/1243/EU, and 98/24/EC) - Council Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work and amendment Regulation (EU) 2019/1243.

Austria - BGBl. II Nr. 254/2018 - Ordinance on Limit Values for Workplace Substances and on Carcinogens from the Federal Ministry of Economics and Labour, Published in 2003, Appendix 1: Substance List, Published through: Ministry of Economics and Labour of the Republic of Austria amended through the Government Gazette II (BGBL. II) No 119/2004) & BGBI. II No. 242/2006, BGBI. II No. 243/2007, lastly changed through BGBl. I Nr. 51/2011), BGBl. II Nr. 186/2015, BGBl. II Nr. 288/2017 amended by BGBl. II Nr. 254/2018.

Austria - BLV BGBl. II Nr. 254/2018 - Ordinance on health monitoring at the workplace 2008, published through BGBl. II Nr. 224/2007 by Austria Minister for Labor and Social Affairs, Lastly changed through BGBl. II Nr. 254/2018

Belgium - Royal Decree 21/01/2020 - Royal decree amending title 1 relating to chemical agents in Book VI of the code of well-being at work, with regard to the list of limit values of exposure to chemical agents and title 2 relating to carcinogens, mutagens and reprotoxics of Book VI of the code of well-being at work (1)

Bulgaria - Reg. No. 13/10 -
Regulation No. 13 of December 30, 2003 on the Protection of Workers from Hazards Related to Exposure to Chemical Agents at Work Labor Code, Annex No.1 Limit values of chemical agents in the air of the working environment, and Annex № 2 Biological limit values of chemical agents and their metabolites (bio markers of exposure) or bio markers of effect Amended by: 71/2006, 67/2007, 2/2012, 46/2015, 73/2018, 5/2020), and Regulation No.10 of September 26, 2003 on the Protection of Workers from the Risks Associated with Exposure to Carcinogens and Mutagens at Work Annex No.1 Occupational Exposure Limits, Amended by: 8/2004, 46/2015, 5/2020

Croatia - OG No. 91/2018 - Regulation on the Protection of Workers from Exposure to Hazardous Chemicals at Work, the Limit Values of Exposure and the Biological Limit Values. Official Gazette No. 91 of October 12, 2018

Cyprus - KDP 16/2019 - Government of Cyprus Cabinet of Ministers Regulation 268/2001 - Safety and Health in the Working Environment (Chemical Substances) Article 38, As amended by Regulation 16/2019 and Cabinet of Ministers Regulation 153/2001 - Safety and Health in the Working Environment (Chemical Substances-Carcinogens), as amended by Regulation 493/2004 - Safety and Health in the Working Environment (Chemical Substances - Carcinogens) AND Law 47(I) 2000 - Occupational Health and Safety (Asbestos), as amended by Decree 316/2006.

Czech Republic - Reg. 41/2020 - Regulation 41/2020 amending Regulation 361/2007 of Coll. establishing Occupation Exposure Limits as amended

Czech Republic - Decree No. 107/2013 - Decree No. 107/2013 Coll., amending Decree No. 432/2003 Coll., laying down the conditions for the application of the work into categories, limit values for the parameters of biological exposure tests, collection of biological material conditions for the implementation of biological exposure tests and requirements for reporting work with asbestos and biological agents

Denmark - BEK No. 698 of 28/05/2020 - Order on Limit Values for Substances and Materials, The Statutory Order No. 507 of May 17, 2011, Appendix 1 - Limits for air pollution, etc. and Appendix 3 - Biological Exposure Values, Amended by: No. 986 of October 11, 2012, No. 655 of May 31, 2018, No. 1458 December 13, 2019, No. 698 of May 28, 2020

Estonia - Regulation No. 105 - Health and Safety Requirements for the Use of Dangerous Chemicals and Materials Containing Them and Occupational Exposure Limits to Chemical Agents
Government of the Republic, Regulation No. 105 of 20 March 2001, Amended 17 October 2019, and 17 January, 2020.

Finland - HTP-ARVOT 2020 - Concentrations Known to be Hazardous, 654/2020 OEL values 2020 Publications of Ministry of Social Affairs and Health 2020:24 Annexes1, 2 and 3.

France - INRS ED 984 - Occupational Exposure Limit Values to Chemical Agents in France Published 2016 by the INRS National Institute of Research and Safety Health and safety of work, revised, updated by: Decree 2016-344, JORF No 0119, and Decree 2019-1487.

France - Decree 2009-1570 - Decree 2009-1570 of December 15, 2009, relative to the control of chemical risk on workplaces.

Greece - PWHSE - Occupational Exposure Limits - Protection of workers' health and safety from exposure to certain chemical substances during the workday, (latest amendment 82/2018) and Occupation Exposure Limits - Protection of workers' health and safety from exposure to certain carcinogenic and mutagenic chemical substances (latest amendment 26/2020), and Presidential Decree 212/2006 - Protection of workers that are exposed to asbestos.

Hungary - Decree 05/2020 - 5/2020. (II. 6.) ITM decree on the protection of the health and safety of workers from the risks related to chemical agents

Ireland - 2020 COP - 2020 Code of Practice for the Chemical Agents Regulations, Schedule 1

Italy - Decree 81 - Title IX, Annex XLIII and XXXVIII, Professional Exposure Limits and Annex XXXIX Mandatory Biological Limit Values and Health Monitoring, Article 1, Law 123 of August 3, 2007, Legislative Decree 81 of April 9, 2008, Last amended: January 2020

Italy - IMDFN1 - Ministerial Decree of August 20, 1999 Final Note (1)

Latvia - Reg. No. 325 - Cabinet of Ministers Regulation No. 325 - Labour Protection Requirements when Coming in Contact with Chemical Substances at Workplaces, Amended by Cabinet of Ministers Regulation No. 92, 163, 407 and No. 11.

Lithuania - HN 23:2011 - Lithuanian Hygiene Standard HN 23:2011 Occupational Exposure Limit Values, Amended by Order V-695/A1-272.

Luxembourg - A-N 684 - Grand-Ducal Regulation of 20 July 2018 amending the Grand-Ducal Regulation of 14 November 2016 concerning the protection of the safety and health of employees against the risks associated with chemical agents in the workplace. Official journal of the Grand-Duke of Luxembourg, A-N°684 of 2018

Malta - MOSHAA Ch. 424 - Malta Occupational Health and Safety Authority Act: Chapter 424 as amended by: Legal Notice 353, 53, 198, and 57.

Netherlands- OWCRLV - Occupational Working Conditions Regulation, Limit Values for substances harmful to health, Annex XVIII, Updated from August 1, 2020.

Norway - FOR-2020-04-060695 - Regulations concerning action and limit values for physical and chemical agents in the working environment and classified biological agents, FOR-2011-12-06-1358, Updated by: FOR-2020-04-06-695, FOR-2020-03-23-402, FOR-2018-12-20-2186, FOR-2018-08-21-1255, FOR-2017-12-20-2353.

Poland - Dz. U. 2020 Nr. 61 - Regulation of the Minister of Family, Labor and Social Policy of June 12, 2018 on the Highest Allowable Concentrations and Intensities of Factors Harmful to Health in the Work Environment Dz.U. 2018 Nr. 1286 of June 12, 2018, Annex 1 - List of values of the highest permissible chemical concentrations and dust factors harmful to health in the work environment, amended by: Dz. U. 2020 Nr. 61.

Portugal - Portuguese Norm NP 1796:2014 - Occupational exposure limits and biological exposure indices to chemical agents. Table 1 - Occupational exposure limits and biological exposure indices to chemical agents (OELs), Law Decree 35/2020.

Romania - Gov. Dec. No 1.218 - Governmental Decision No. 1.218 from 06/09/2006 on the minimum health and safety requirements for protection of workers from the risks related to exposure to chemical agents, Annex No. 1 Mandatory National Occupational Exposure Limit Values for Chemical Agents. Amended by Decision no. 157, 584, 359, and 1.

Slovakia - Gov. Decree 33/2018 - Government Decree of Slovak Republic 33/2018 on January 17, 2018 amending Government Decree of Slovak Republic 355/2006 about protection of health of employees when working with chemical agents

Slovenia - No. 79/19 - Regulation for protection of workers against risks related to carcinogenic or mutagenic substances exposure. Annex III - Classification and binding levels of carcinogenic or mutagenic substances for occupational exposure. The Official Journal of the Republic of Slovenia, No. 101/2005. Amended by 38/15, 79/19. Regulation for protection of workers against risks related to exposure to chemical substances at the workplace. Republic of Slovenia, No. 100/2001 . Annex I - List of Binding Occupational Exposure Limit Values. Amended by 39/05, 53/07, 102/10, 38/15, 78/18, 78/19

Spain - AFS 2018:1 - NATIONAL INSTITUTE FOR HEALTH AND SAFETY AT WORK. Occupational exposure limits for chemical agents in Spain. Tables 1 and 3. Latest edition Feb. 2019

Sweden - AFS 2018:1 - Statute Book of the Swedish Work Environment Authority, AFS 2018:1
The Swedish Work Environment Authority's Ordinance and General Guidance on Hygienic Limit Values

Germany - TRGS 900 - Occupational Exposure Limits, Technical Rules for Dangerous Substances, latest amendment March, 2020
Germany - TRGS 903 - Biological Threshold Limits (BGW-Values), Technical Rules for Dangerous Substances, latest amendment March, 2020
Gibraltar - LN. 2018/131 - Factories (Control of Chemical Agents at Work) Regulations 2003 LN. 2003/035, amended by LN. 2008/035, LN. 2008/050, LN. 2012/021, LN. 2015/143, LN. 2018/181.
EU GHS SDS (2020/878)
Switzerland - OLVSNAIF - Occupational Limit Values 2020 Swiss National Accident Insurance Fund. List of Biological Limit Values (BAT-Werte) and List of MAK Values.

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