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

1.1. Product identifier

Trade name	TYTANPOL®
Product Codes (class)	R-001, R-002, R-003, R-210, R-211, R-310

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

The most common uses are:
White pigment used as colouring and opacifying agent in the following industries: paints and varnishes, plastics, synthetic fibres, paper, rubber, ceramics, cement, cosmetics and printing.
Uses advised against have not been identified.

1.3. Details of the supplier of the safety data sheet

Grupa Azoty Zakłady Chemiczne „Police” S.A.
Internet: grupaazoty.com

ul. Kuźnicka 1, 72-010 Police
Phone: + 48 91 317 1090
Telefax: + 48 91 317 3103

Person responsible for the safety data sheet: *e-mail:* **reach-sds@grupaazoty.com**

1.4. Emergency telephone number

Telephone no: + 48 91 434 67 54 (24h)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

According to Regulation (EC) no. 1272/2008 the mixture is not classified as hazardous.

Human health effects

Skin effects	Skin is not penetrated, but prolonged contact can cause irritation.
Eyes effects	Feeling of a chemically neutral body in the eyes.
Swallowing	No hazard during normal industrial use.
Inhalation	Chemically neutral dust. Excessive exposure may cause temporary drying effect and/or irritation of mucous membranes.

2.2. Label elements

According to Regulation (EC) no. 1272/2008 the mixture is not classified as hazardous.
Additional information:
EUH210 Safety data sheet available on request.

2.3. Other hazards

Titanium dioxide is neither a PBT nor a vPvB substance.

The components mentioned in section 3 have not been included in the list established in accordance with Art. 59 sec. 1 of Regulation (EC) 1907/2006 as having endocrine disrupting properties, no information is available on their endocrine disrupting properties in accordance with the criteria set out in Commission Delegated Regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605.
Risk of atmosphere dusting.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

Components which do not affect classification:

Component	% w/w	CAS number	WE number	Classification (Regulation (EC) no. 1272/2008)
Titanium dioxide	min. 82	13463-67-7	236-675-5	-
	Registration number: 01-2119489379-17-0004			
1,1,1-trimethylolpropane	max. 0,45	77-99-6	201-074-9	Repr. 2; H361fd
	Registration number: 01-2119486799-10-XXXX			

Abbreviations are explained in Section 16.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation	Move or carry the victim from the dusty area to fresh air. Keep warm and calm. If not breathing, irregular breathing or when breathing has ceased call a physician and designated personnel shall perform cardiopulmonary resuscitation. If symptoms persist, consult a doctor.
Skin contact	Remove contaminated clothing and shoes, wash skin with soap and water.
Eye contact	Remove contact lenses. Immediately rinse with a lot of water for at least 15 minutes. If irritation persists, consult a doctor.
Swallowing	The material is non-toxic and does not persist in the digestive tract. No negative effects for the health after exposure through this route are expected, however in the case of ingestion increase intake of liquid to flush the substance from the organism. Should negative symptoms occur and persist, consult with a doctor.

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

Acute and delayed symptoms and effects do not occur in normal conditions of use of (see section 11).

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

Medical assistance is needed in case of inhalation of large amounts of dust.

SECTION 5: Firefighting measures

5.1. Extinguishing media

Suitable extinguishing media	Water and any media appropriate for burning materials.
Unsuitable extinguishing media	None

5.2. Special hazards arising from the substance or mixture

TYTANPOL® pigments are non-flammable and do not increase fire hazard - no hazardous combustion products.
Packing materials (paper, plastics) are flammable materials. Fire of packing materials extinguish with available extinguishing agents, e.g. internal hydrants or fire extinguishers.

5.3. Advice for firefighters

The product is neutral and is non-flammable. Use standard protective equipment for firefighters.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

Avoid producing and inhaling dusts. In case of excessive dusting use dustproof goggles and dust mask protecting respiratory system. Provide adequate ventilation.
Pigments are not irritating but can absorb moisture and natural oils from the surface of the skin. In case of prolonged exposure, use protective clothes and gloves.

6.2. Environmental precautions

Prevent entry into the ground, storm sewers and water reservoirs and watercourses.

6.3. Methods and material for containment and cleaning up

Spilt titanium dioxide pigment waste shall be swept or collected with a shovel (avoiding dust formation) to a labelled container and transfer for recovery or neutralization following environmental protection regulations.
Product can cause slippery conditions if wet. Even at low concentration, the product renders that discharged waste water is highly visible.

6.4. Reference to other sections

See section 13 for waste disposal.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

TYTANPOL® pigments may cause dust formation due to their fine grain size. The transport and reloading system should be designed in such a manner to minimize dust release.
It is recommended to use an efficient local and general ventilation.
Pneumatic transport of the product and the use of plastic packaging (bags, film) can generate electrostatic discharges. Suitable precautions should be maintained when performing such activities.
TYTANPOL® pigments can be packed without delay after production and depending on storage conditions may retain for a very long time elevated temperature (up to 70°C), therefore care must be taken when handling these products, particularly when introducing them to production with solvents.
Local exhaust ventilation systems may be necessary. Limit dust formation to the minimum and ensure systematic dust removal in production and storage rooms. Take precautions to prevent electrostatic discharge.
Note: If wet the product may result in slippery surfaces!

7.2. Conditions for safe storage, including any incompatibilities
Protect the packaged product against packaging damage, store in a covered place not exposed to outdoor conditions, with relative humidity not exceeding 70%. Pigmenting properties of product may be deteriorated by excessive compression and for this reason during stacking do not exceed number of 3 layers of pallets.
Any unintentional contact with water should be avoided since moisture detrimentally affects the product. Avoid breathing dust. Follow good industrial hygiene practice concerning chemicals handling. Handling systems and areas should be operated in order to reduce dust exposure.

7.3. Specific end use(s)
The mixture is not classified as a dangerous substance. Exposure scenarios have not been made.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

a) Titanium dioxide:

	Limit value - Eight hours	**Limit value - Short term**
	mg/m³	mg/m³
Austria	5 (respirable fraction)	10 (respirable fraction,
Belgium	10	-
Denmark	6 (total dust)	12 (total dust)
France	11 (inhalable aerosol)	-
Germany	0,3 (respirable fraction, except ultrafine particles, multiplied by the material density)	2,4 (respirable fraction, except ultrafine particles, multiplied by the material density, 15 minutes average value)
Ireland	10 (inhalable fraction), 4 (respirable fraction)	-
Latvia	10	-
Norway	5	-
Poland	10 (inhalable fraction),	-
Romania	10	15 (15 minutes average value)
Spain	10 (inhalable fraction)	-
Sweden	5 (inhalable aerosol)	-
Switzerland	3 (respirable aerosol)	-
USA – OSHA	15 (inhalable fraction)	-
United Kingdom	10 (inhalable fraction), 4 (respirable fraction)	-

Source of information: http://limitvalue.ifa.dguv.de/

b) 1,1,1- trimethylolpropane:

	Limit value – Eight hours	**Limit value – Short term**
	mg/m³	mg/m³
Sweden	5 (total dust)	-

Source of information: http://limitvalue.ifa.dguv.de/

DNEL[1] values for employees

		Titanium dioxide	1,1,1-trimethylolpropane
Acute - systemic effects	Dermal	-	-
Acute - systemic effects	Inhalation	-	-
Acute - local effects	Dermal	-	--
Acute - local effects	Inhalation	-	-
Long-term - systemic effects	Dermal	-	0,94 mg/kg b.w./day
Long-term - systemic effects	Inhalation	-	3,3 mg/m³
Long-term - local effects	Inhalation	DNEL = 1,25 mg/m³	-
Long-term - local effects	Dermal	-	-
Local effects	Eyes	-	-

DNEL values for the general population

		Titanium dioxide	1,1,1-trimethylolpropane
Acute - systemic effects	Dermal	-	-
Acute - systemic effects	Inhalation	-	-
Acute - systemic effects	Oral	-	-
Acute - local effects	Dermal	-	-
Acute - local effects	Inhalation	-	-
Long-term - systemic effects	Dermal	-	0,34 mg/kg b.w./day
Long-term - systemic effects	Inhalation	-	0,58 mg/m3
Long-term - systemic effects	Oral	-	0,34 mg/kg b.w./day
Long-term - local effects	Inhalation	DNEL = 210 µg/m³	-
Long-term - local effects	Dermal	-	-
Local effects	Eyes	-	-

PNEC values[2]

	Titanium dioxide	1,1,1-trimethylolpropane
Freshwater	-	-
Marine water	-	-
Fresh water - intermittent release	-	-
Soil	-	-
Sediments (freshwater)	-	-
Sediments (marine water)	-	-
Air	-	-
Sewage treatment plant	-	100 mg/l

8.2. Exposure controls
Personal protection equipment

Eye or face protection	It is recommended to use dustproof googles or glasses with side protections (tightly fitting around the eyes).
Skin protection	Use protective clothing selected depending on the work performed and the related hazard, resulting from occupational risk assessment on the given work position.
Hand protection	Use protective gloves selected depending on the work performed

[1] **DNEL** Derived No-Effect Level

[2] **PNEC** Predicted No-Effect Concentration

	and the related hazard, resulting from occupational risk assessment on the given work position.
Respiratory protection	Use protective masks selected depending on the work performed and the related hazard (dust concentration in the work environment), resulting from occupational risk assessment on the given work position.

Personal protective equipment for first-aiders
If allowed dust concentration limit is exceeded use an appropriate respiratory protective equipment and protective glasses (goggles) or glasses with side walls (tightly fitting to the eyes).

Collective protection equipment
Use installation dust extraction systems and ensure efficient general ventilation and local exhaust ventilation maintaining dust concentration below the occupational exposure limit. If the concentration is exceeded, use personal protection equipment as above.

Personal hygiene measures
People with sensitive skin would benefit from using a barrier cream or lotion, in anticipation of excessive or prolonged skin contact.

Environmental exposure controls
Do not remove the substance to sewage and natural water courses. Prevent contamination of underground waters.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Solid (at temp. 20°C, 101,3 kPa)
Colour	white powder
Odour	odorless
Melting point/freezing point	Rutile: 1843°C (at 1013 hPa)
Boiling point or initial boiling point and boiling range	3000°C (at 1013 hPa)
Flammability	Non-flammable
Lower and upper explosion limit	No explosive properties
Flash point	Not applicable to inorganic substances
Auto-ignition temperature	Not applicable
Decomposition temperature	Not applicable
pH	6,5 – 8,5
Kinematic viscosity	Not applicable to solids in room temperature
Solubility	Practically insoluble (<1,51 µg/l at temp. 19,9°C)
Partition coefficient n-octanol/water (log value)	Not applicable to inorganic substances
Vapour pressure	Not applicable – solid with melting point of over 300°C
Density and/or relative density	Rutile: 4,26 (at temp. 20°C)
Relative vapour density	Not applicable to solids
Particle characteristics	Percentage of particles with aerodynamic diameter ≤ 10 µm (EN 15051-3 method):

Average (%)	Minimum (%)	Maximum(%)
0,005	0,004	0,007

9.2. Other information

Explosive properties	Non-explosive
Oxidizing properties	Non-oxidizing
Solubility in organic solvents	Insoluble

SECTION 10: Stability and reactivity

10.1. Reactivity
Non-reactive mixture .

10.2. Chemical stability
Mixture is stable in normal conditions .

10.3. Possibility of hazardous reactions
None known.

10.4. Conditions to avoid
None.

10.5. Incompatible materials
Chemically non-reactive, insoluble in acids and bases (with the exception for concentrates sulphuric acid and concentrated hydrofluoric acid).

10.6. Hazardous decomposition products
None known.

SECTION 11: Toxicological information

11.1. Information on hazard classes as defined in Regulation (EC) No 1272/2008

a) Titanium dioxide

Acute toxicity	Oral	Not observed LD50 > 5000 mg/kg bw
	Dermal	No information available
	Respiratory tract	Not observed LC50 > 6.82 mg/L (rat)
Corrosion/irritation	Dermal	Not irritant
	Eyes	Not irritant
	Respiratory tract	Not irritant
Sensitisation	Dermal	Not sensitizing
	Respiratory tract	
Repeated dose toxicity	Oral	Not observed NOAEL 3500 mg/kg bw/d
	Respiratory tract	Not observed
	Dermal	Not observed
Germ cell mutagenicity		Genotoxicity: negative
Carcinogenicity	Oral	Not observed
	Dermal	No information available

	Respiratory tract	Not observed
Reproductive toxicity	Effect on fertility oral	Not observed
	Effect on fertility dermal	No information available
	Effect on fertility respiratory tract	Not observed
	Effect on developmental toxicity oral	Not observed NOAEL = 1000 mg/kg bw/d (subacute, rat)
	Effect on developmental toxicity respiratory tract	No information available
	Effect on developmental toxicity dermal	No information available
Specific target organ toxicity (STOT)-single exposure (SE)	Not classified	
Specific target organ toxicity (STOT)-repeated exposure (RE)	Not classified	
Aspiration hazard	Not classified	

b) 1,1,1- trimethylolpropane

Acute toxicity	Oral	No adverse effect observed LD50 14700 mg/kg b.w.
	Dermal	No adverse effect observed LD50 > 10000 mg/kg b.w.
	Respiratory tract	No adverse effect observed LC50 (4h) > 0,85 mg/l
Corrosion/irritation	Dermal	No adverse effect observed (not irritating to skin)
	Eyes	No adverse effect observed (not irritating to eyes)
	Respiratory tract	No information available
Sensitisation	Dermal	Not sensitising
	Respiratory tract	No information available
Repeated dose toxicity	Oral	Adverse effect observed (NOAEL = 67 mg/kg b.w./day (subchronic, rat))
	Respiratory tract	No information available
	Dermal	No information available
Germ cell mutagenicity	Genotoxicity: negative	
Carcinogenicity	Not classified based on available information.	
Reproductive toxicity	Substance classified as Repr. 2, H361fd (Reproductive toxicity, category 2, "Suspected of damaging fertility. Suspected of damaging the unborn child."): Oral: Effect on fertility - adverse effect observed (NOAEL = 225 mg/kg b.w./day (subchronic, rat))	

	Study type: Fertility/Early Embryonic Development Species: Rat, male and female Dose administration route: Oral Dose: 740 - 2200 - 6600 Parts per million General toxicity parents: NOAEL: 740 Parts per million General toxicity F1: NOAEL: 740 Parts per million General toxicity F2: LOAEL: 740 Parts per million Fertility: NOAEL: 2200 Parts per million Early embryonic development: LOAEL: 740 ppm Method: OECD Test Guideline 443 Result: Effects on Fetal Development. GLP, Good Laboratory Practice: yes Effect on developmental toxicity - adverse effect observed (NOAEL = 100 mg/kg b.w./day (rat)) Study type: Prenatal Species: Rat, female Dose administration route: Oral Dose: 100 - 300 - 1000 Milligrams per kilogram General toxicity in mothers: NOAEL: 100 mg/kg body weight Teratogenicity: NOAEL: 100 mg/kg body weight Developmental toxicity: NOAEL: 100 mg/kg body weight Embryo-fetal toxicity: NOAEL: 100 mg/kg body weight Method: OECD Test Guideline 414 Result: Embryotoxicity and adverse effects on offspring were observed only at high doses that were toxic to the mothers. GLP, Good Laboratory Practice: yes Study type: Prenatal Species: Rabbit, female Dose administration route: Oral Dose: 50 - 150 - 450 Milligrams per kilogram General toxicity in mothers: NOAEL: >= 450 mg/kg body weight Teratogenicity: NOAEL: >= 450 mg/kg body weight Developmental toxicity: NOAEL: >= 450 mg/kg body weight Embryo-fetal toxicity: NOAEL: >= 450 mg/kg body weight Method: OECD Test Guideline 414 GLP, Good Laboratory Practice: yes <u>Respiratory tract:</u> No information available <u>Dermal:</u> No information available Toxicity to reproduction - Assessment: Some evidence of negative impact on sexual and reproductive functions based on animal studies. Some evidence of negative impact on development based on animal studies.
Specific target organ toxicity (STOT)-single exposure (SE)	Not classified based on available information
Specific target organ toxicity (STOT)-repeated exposure (RE)	

Aspiration hazard	

11.2. Information on other hazards
No information is available on endocrine disrupting properties according to the criteria set out in the relevant Regulations ((EC) No 1907/2006, (EU) 2017/2100, (EU) 2018/605).

SECTION 12: Ecological information

12.1. Toxicity

a) Titanium does not meet toxicity criterion (T).

Assessment of threat to aquatic environment (including sediment)

Short-term toxicity to fish	LC50[3] for fish (freshwater) > 1000 mg/l LC50 for fish (saltwater) > 10,000 mg/l
Long-term toxicity for fish	NOEC ≥ 160 – 1000 mg/L
Short-term toxicity to aquatic invertebrates	EC504/LC50 for freshwater invertebrates > 1000 mg/l EC50/LC50 for marine invertebrates > 10000 mg/l
Long-term toxicity for aquatic invertebrates	EC50: > 10 mg/l for aquatic invertebrates (Daphnia magna)
Algae and aquatic plants	NOEC ≥ 100 mg/l for algae/cyanobacteria (freshwater) NOEC ≥ 5600 mg TiO2/l for algae/cynobacteria (marine waters)
Benthic organisms	EC10/LC10 or NOEC (freshwater) > 100000 mg/kg dry weight EC10/LC10 or NOEC (saltwater) > 14989 mg/kg dry weight
Aquatic microorganisms (wastewater treatment plant)	NOEC > 10000 mg/l

Assessment of threat to terrestrial environment

Soil organisms, including microbes, plants and invertebrates	NOEC > 1000 mg/kg dry weight

b) 1,1,1-trimethylolopropane – low toxicity for aquatic organisms

Short-term toxicity to fish	LC50 (Alburnus alburnus (common bleak): > 1000 mg/l Endpoint: mortality; Exposure time: 96 h; Test type: static test; Analytical observation: no; GLP, Good Laboratory Practice: no
Long-term toxicity for fish	Due to the very low toxicity of trimethylpropane to fish and the low bioaccumulation potential in fish, there is no need to conduct a long-term toxicity test on fish.
Short-term toxicity to aquatic invertebrates	EC50 (Daphnia magna): 13,000 mg/l Endpoint: Slowered movement; exposure time: 48 h; Test type: static test; GLP, Good Laboratory Practice: no; Comments: Freshwater
Long-term toxicity for aquatic invertebrates	NOEC: > 1000 mg/l Exposure time: 21 d; Species: Daphnia magna; Analytical monitoring: No information available.; GLP, Good Laboratory Practice: no; Comments: Freshwater

[3] **LC50** Lethal concentration

[4] **EC50** Half maximal effective concentration

Algae and aquatic plants	EC50 (Pseudokirchneriella subcapitata): > 1000 mg/l Endpoint: Biomass; Exposure time: 72 h; GLP, Good Laboratory Practice: no; Comments: Freshwater
Benthic organisms	The study is scientifically unjustified. Trimethylolpropane has a low partition coefficient of 1.5, indicating a low potential for adsorption onto sediment. Its water solubility is very high, so the likelihood of direct or indirect distribution into sediment is very low. Furthermore, its bioaccumulation potential is low.
Aquatic microorganisms (wastewater treatment plant)	EC50 (active sediment) or EC10 or NOEC: > 1000 mg/l Endpoint: Reduction in respiration; Exposure time: 3 h; Analytical monitoring: No information available.; Method: Regulation (EC) no. 440/2008, Annex, C.11; GLP, Good Laboratory Practice: yes; Comments: Freshwater

Assessment of threats to the terrestrial environment

Soil organisms, including microbes, plants, and invertebrates	Toxicity testing for terrestrial organisms is not scientifically justified. Testing is warranted if the substance is toxic to aquatic organisms, persistent, and/or has a high sorption potential. The substance does not meet these criteria.

12.2. Persistence and degradability
Titanium dioxide does not fulfill persistent (P) nor very persistent (vP) criteria.
1,1,1-trimethylolpropane – biodegradability:
Test type: aerobic; Result: Not easily biodegradable.
Inoculum: activated sludge, unadapted; Concentration: 19 mg/l; Biodegradation: 6%; Exposure time: 28 d; Method: Testing directive 301E OECD; GLP: yes;
Test type: oxygen; Inoculum: activated sludge; Concentration: 100 mg/l; Result: Undergoes natural biodegradation. Biodegradation: 100%; Exposure time: 28 d; Method: Testing directive 302B OECD; GLP: yes.

12.3. Bioaccumulative potential
Titanium dioxide does not fulfill the B and vB criteria.
1,1,1-trimethylolpropane:
Bioaccumulation: Species: Cyprinus carpio; Exposure time: 42 d; Bioconcentration factor (BCF): < 17; Method: Testing directive 305C OECD; GLP: yes.
Partition coefficient: n-octanol/water: log Pow: -0.47 (26°C) Method: measured; ; GLP, Good Laboratory Practice: No information available.

12.4. Mobility in soil
Titanium dioxide pigments have very low mobility, because they are insoluble in water and other solvents.
1,1,1-trimethylolopropane - Distribution between environmental components - Koc: 1.499, log Koc: 0.176.

12.5. Results of PBT and vPvB assessment
Titanium dioxide and 1,1,1-trimethylolopropane do not meet the criteria as PBT or vPvB substances.

12.6. Endocrine disrupting properties
No information is available on endocrine disrupting properties according to the criteria set out in the relevant Regulations ((EC) No 1907/2006, (EU) 2017/2100, (EU) 2018/605).

12.7. Other adverse effects
No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods
Remove the waste of the mixture and packaging wastes according to environmental regulations (including both wastes and packaging regulations) and transfer adequately to the recovery or disposal to entities with appropriate permits.
Packaging not classified as hazardous waste.
In case of spill of the mixture - see Section 6 of the safety data sheet.

SECTION 14: Transport information

The mixture is not classified, i.e. it is not considered a hazardous material in accordance with the UN Orange Book and international transport codes e.g. RID (railway), ADR (road transport) and IMDG (sea transport).

14.1. UN number or ID number
Not applicable.

14.2. UN proper shipping name
Not applicable.

14.3. Transport hazard class(es)
Not applicable.

14.4. Packing group
Not applicable.

14.5. Environmental hazards
Not applicable.

14.6. Special precautions for user
Not applicable.

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

EU Regulations

- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18th December 2006 concerning Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No. 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EEC and 2000/21/EC (with later changes).

- Regulation (EC) No. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (with later changes).

15.2. Chemical safety assessment
Chemical safety assessment for titanium dioxide was carried out.

SECTION 16: Other information

Full text of H-statements	H361fd- Suspected of damaging fertility. Suspected of damaging the unborn child.
Full text of other acronyms	Repr. 2 – Reproductive toxicity category 2
Trainings	Personnel with direct contact with the mixture shall be familiarized with this safety data sheet
Revisions	Sections: 1-6, 8, 9, 11-13, 15.