SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006 (REACH)
and Commission Regulation (EU) No 453/2010

WAVE PRO by RESIN PRO

1. IDENTIFICATION OF THE SUBSTANCE AND OF THE COMPANY

1.1 Product identifier	
Substance name	Titanium dioxide
Trade name	WAVE PRO by Resin Pro
EC#	236-675-5
CAS#	13463-67-7
Molecular formula	TIO2
This substance not classified according to the Annex I of Directive 67/548/EEC and Annex VI of Regulation (EC) No 1272/2008	
REACH Pre-registration No	17-2120068077-53-0000
1.2 Relevant identified uses of the substance or mixture and uses advised against	
Identified uses	White pigments for application in coating materials, printing inks, man-made fibers, plastics, paper, glass, viereous enamels, ceramic products
Uses advised against	None
1.3 Details of the supplier of the safety data sheet	
Manufacturer/Supplier	Resin Pro srl – Via 25 Aprile z.i.snc – 19021 Arola SP
Only representative	RESIN PRO SRL Via 25 Aprile – Z.I.snc, 19021 Arcola SP P.IVA: 01473200119 • REA SP-210889 +39 0187 955108 E-mail: info@resinpro.it
1.4 Emergency telephone number	Centro Antiveleni Napoli - 0039 081 5453333

2. HAZARDS IDENTIFICATION

2.1 Classification of the substance	
Product is not classified according to Regulation (EC) No 1272/2008, and Council Directive 67/548/EEC	
Human Heath effects	
Inhalation	Inhalation of dust may cause discomfort. Inhalation exposure to large amounts may cause a temporary drying effect or irritation of mucous membranes. Exposure to dust may lead to

	aggravation of pre-existing upper respiratory and lung diseases.
Eyes	Inert foreign body hazard
Skin	Prolonged contact may result in scaling/irritations due to drying of the skin and/or mechanical abrasion related to skin-to-clothing contact or skin-to-skin contact.
Ingestion	No adverse health effects anticipated by this route during proper industrial handling.
2.2 Label elements	
No labeling is required according to Regulation (EC) No 1272/2008 [CLP/GHS]	
2.3 Other hazards	
Titanium dioxide is neither a PBT nor a vPvB substance.	

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances			
Chemical name	EC #	CAS #	Concentration range % (w/w)
Titanium Dioxide	236-675-5	13463-67-7	98%min

4. FIRST AID MEASURES

4.1 Description of first aid measures	
General information	Provide rest, warm conditions, comfort position, fresh air availability.

4.2. Most important symptoms and effects, both acute and delayed	
In case of inhalation	Remove to fresh air. Get medical attention for any breathing difficulty
In case of eye contact	In the case of contact with eyes, rinse immediately with plenty of water. If symptoms persist, call a physician.
In case of skin contact	Wash skin with soap and water Use of moisturizer may be helpful.
In case of ingestion	If large amounts were swallowed, give water to drink and get medical advice.
Information to physician	Treat symptomatically and supportively.
First aid arsenal	Universal medical kit with a set of drugs (in consultation with the medical department of the enterprise).
4.3 Indication of any immediate medical attention and special treatment needed	
Immediate first aid attention is not expected	

5. FIREFIGHTING MEASURES

5.1. Extinguishing media	
Suitable extinguishing media	Use any means suitable for extinguishing surrounding fire.
Unsuitable extinguishing Media	Do not scatter spilled material with high pressure water streams in case of large fire
5.2. Special hazards arising from the substance or mixture	
Hazardous combustion products	Not available
Special protective equipment for	Wear full protective clothing and NIOSH-approved self-

fire-fighters	contained breathing apparatus in case of large fire.
Flammable properties	Non-flammable, non-explosive, see section 9
5.3 Advice for fire-fighters	
A violent or incandescent reaction with metals (aluminum, calcium, magnesium, potassium, sodium, zinc, and lithium) may occur at high temperatures	

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures	
Personal precautions	Avoid inhalation of dust by arranging adequate ventilation, or use an appropriate dust mask. Avoid excessive contact with the skin. Use appropriate personal protective equipment.
Emergency procedures	Pick up spills and place in a suitable container for reclamation or disposal, using a method that does not generate dust (e.g. vacuum, sweeping) Ventilate area of leak or spill. Keep unauthorized personnel away.
6.2. Environmental precautions	
Avoid dust dispersion to the environment. Prevent leakages from entering drains and ditches that lead to natural waterways.	
6.3. Methods and material for containment and cleaning up	
Avoid dust formation. Provide adequate ventilation.	
6.4. Reference to other sections	
Information about personal precautions - see Section 8. Information about waste disposal - see Section 13.	

7. HANDLING AND STORAGE

7.1. Precautions for safe handling	
Precautions for safe handling	Avoid raising and breathing dust. Observe good industrial hygiene practice for chemical handling.
Fire preventions	None, as product has no flammable properties. See section 5.
Aerosol and dust generation preventions	Use local exhaust ventilation or other appropriate engineering controls to maintain dust exposures below occupational exposure limit.
Electrostatics prevention	As a matter of good prastice take measures to prevent the build up of electrostatic charge, such as ensuring all equipment is electrically grounded.
Safe transporting	Adhere to the rules on the transport of goods, which operate for the appropriate type of transport. Not violate the integrity of container. During loading works execute instructions and rules for the appropriate works.
Advice on general occupational	Do not eat, drink and smoke in work areas, wash hands after use, remove contaminated clothing and protective equipment before entering eating areas.
7.2. Conditions for safe storage, including any incompatibilities	
Technical measures and storage	Store in manufacturer's package in cool and dry area where it is safe from contamination and exposure to atmospheric precipitations (rain, snow) and subsoil waters.
Packaging materials	PP woven bag with polyethylene liner
Requirements for storage rooms and vessels	Special requirements for storage structures are not established. The product is to be stored at room temperature

	and normal humidity environment.
7.3. Specific end use(s)	
None	

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1. Control parameters

Occupational exposure limits

Chemical Name	Country	OEL
TITANIUM DIOXIDE	United Kingdom	STEL: 30 g/m3 STEL: 12 mg/m3 TWA: 10 mg/m3 TWA: 4 mg/m3
	France	VME:10 mg/m3
	Spain	VLA-ED: 10mg/m3
	Portugal	TWA: 10 mg/m3
	The Netherlands	MAC:10 mg/m3
	Denmark	TWA: 6 mg/m3
	Austria	STEL: 10 mg/m3 MAK: 5 mg/m3
	Switzerland	MAK: 3 mg/m3
	Poland	NDS: 10.0 mg/m3
	Norway	TWA: 5 mg/m3 STEL: 10 mg/m3
	Ireland	TWA: 10 mg/m3 (respirable fraction)
	Belgium	TWA: 10 mg/m3
	Greece	TWA: 10 mg/m3 TWA: 5 mg/m3
	Sweden	5 mg/m3 (total dust)
	United States	TLV-TWA: 10 mg/m3 TWA: 15 mg/m3

DNEL/DMEL values:

DNEL/DMEL			Exposure route	Exposure frequency	Remark
Worker		Consumer			
Industry	Professional				
	DNEL = 10 mg/m3		Inhalation	Long-term	
		DNEL = 700 mg/kg bw/day	oral	Long-term	

PNEC values:

PNEC			Exposure route	Exposure frequency	Remark
Worker		Consumer			
Industry	Professional				
	PNEC = 0.127 mg/L		Freshwater		
	PNEC = 1 mg/L		Marine water		
	PNEC ≥1000mg/L bw		Sediment (fresh water)		
	PNEC =100mg/L bw		Sediment (Marine water)		
	PNEC =100mg/L bw		soil		

8.2 Exposure controls	
Occupational exposure controls	
Appropriate engineering controls	Ensure sufficient ventilation. Reduce inhalation hazards in minimising the occupational exposure.
Respiratory protection	Use half mask respirators conforming to EN149 with dust filters according to EN 143 (P2 or P3).
Eye/face protection	Wear dust-proof glasses according to the EN166.
Skin protection	Use protective clothing.
General hygiene considerations	Emergency eyewash and safety shower should be in close proximity as a matter of good practice. Wash hands and face thoroughly with mild soap before eating and drinking.
Environmental exposure controls	
Measures to prevent exposure	In air and wastewater the product doesn't form any toxic compounds in the presence of other substances or factors. Do not allow material to contaminate ground water system.
Consumer exposure controls	
Measures related to consumer uses of the substance	additional measures are not required

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties	
Appearance	Solid, white powder

Odour	Odourless
Odour threshold	Not applicable
pH	6,5-8,0 (1 : 10 water suspension)
Melting point/range (°C)	1855C (3371F)
Initial boiling point/range (°C)	3000
Flash point (°C)	not applicable
Evaporation rate	not applicable
Flammability	not applicable
Upper/lower flammability or explosive limits	not applicable
Vapour pressure	not applicable
Vapour density	not applicable
Relative density	3.9
Water solubility (20°C in g/l)	unsoluble (below the LOD of 1 µg/L at pH 6, 7 and 8)
Partition coefficient n-Octanol/Water (log Po/w)	In accordance with Column 2 of REACH Annex VII, does not need to be conducted as the substance is inorganic.
Auto-ignition temperature (°C)	not applicable
Decomposition temperature (°C)	not applicable
Viscosity	not applicable
Explosive properties	not applicable
Oxidising properties	not applicable
9.2 Other information	
No other information	

10. STABILITY AND REACTIVITY

Reactivity	Not reactive under regular storage and use conditions.
Chemical stability	Stable under recommended storage and handling conditions. In case of emissions into atmosphere the substance doesn't form toxic compounds.
Possibility of hazardous reactions	None under normal processing.
Conditions to avoid	None
Incompatible materials	None
Hazardous decomposition products	None

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects.	
Toxicokinetics, metabolism and distribution	
Non-human toxikological data	No bioaccumulation potential based on study results. Titanium dioxide as an inorganic substance is not metabolised.
Human toxikological data	No substantial accumulation of titanium was observed in tissues following oral administration of titanium dioxide. Titanium dioxide as an inorganic substance is not metabolised.
Acute toxicity	
For acute inhalation toxicity there are two animal studies of which one has been performed according to OECD TG 403 and which shows no signs of acute toxicity after inhalation exposure to titanium dioxide. Several animal studies on acute oral exposure are available, conducted according to OECD guidelines 401, 420, 425 or according to state of the art methodology at that time. There are no reliable reports whatsoever on acute dermal toxicity in the public domain. However, the conduct of an acute dermal toxicity study is unjustified as inhalation of the substance is considered as major route of exposure and physicochemical properties and derma absorption data of the substance do not suggest a significant rate of	

absorption through the skin.				
Exposure	Value	Exposure time period	Species	Method
oral	LD50 > 5000mg/kg bw	Not specified	Rat	OECD Guideline 425
inhalation	LD50 > 6.82mg/L	4 hours	Rat	The study was conducted according to state of the art methodology at that time.

Irritation	Skin	not irritating
	Eye	not irritating
	Respiratory tract	not irritating
	Titanium dioxide has been tested in three in vivo skin irritation and one eye irritation study. All tests show a negative response, thus titanium dioxide does not require classification either as skin or as eye irritant.	
Respiratory or skin sensitisation	Not sensitizing Titanium dioxide has been tested in two different systems for sensitising properties. Both study types show a negative response, thus titanium dioxide does not require classification as sensitiser.	
Germ cell mutagenicity	Negative Titanium dioxide did not show a significant or dose-dependent increase in chromosome aberrations in the bone marrow of male mice via i. p. injection up to the maximum dose of 2500mg/kg bw 17 and 36 hours after dosing. Titanium dioxide did not show a significant or dose-dependent increase in micronucleated cells in the bone marrow of male mice via i. p. injection up to the maximum dose of 1500mg/kg bw 24 hours after dosing. None of the in vitro genotoxicity studies rated as reliable showed any effect in bacterial reverse mutation assays, in mammalian cell gene mutation tests (TK assay) or in mammalian cell chromosome aberration tests, thus supporting the negative findings in the in vivo tests as cited above. The classification criteria acc. to regulation (EC) 1272/2008 as germ cell mutagen are also not met.	
Carcinogenicity	Carcinogen rating for titanium dioxide is not warranted Overall, the epidemiological evidence from well-conducted investigations has not shown that exposure to titanium dioxide is correlated to any detectable carcinogenic potential for humans. Titanium Dioxide is listed by IARC as possibly carcinogenic to humans (Group 2B). This listing is based on inadequate evidence of carcinogenicity in humans and sufficient evidence in experimental animals.	
Toxicity for reproduction	study scientifically unjustified	
STOT-single exposure	The classification criteria acc. to regulation (EC) 1272/2008 as specific target organ toxicant (STOT) single exposure, oral are not met since no reversible or irreversible adverse health effects were observed immediately or delayed after exposure and no effects were observed at the guidance value, oral for a Category 1 classification of 300 mg/kg bw and at the guidance value, oral for a Category 2 classification of 2000 mg/kg bw. No classification required. The classification criteria acc. to regulation (EC) 1272/2008 as specific target organ toxicant (STOT) single exposure, inhalation dust/mist/fume are not met since no reversible or irreversible adverse health effects were observed immediately or delayed after exposure and no effects were observed at the guidance value, inhalation dust/mist/fume for a Category 1 classification of 1.0 mg/L/4h and at the guidance value, inhalation dust/mist/fume for a Category 2 classification of 5.0 mg/L/4h. Therefore, no classification is required. Finally, any category 3 classification should primarily be based on human data. It can be safely assumed that standard occupational hygiene measures provide a sufficient level of worker protection.	
Repeated dose toxicity		

Exposure	Value	Exposure time period	Species	Method
oral	NOAEL: 3,500 mg/kg bw/day	chronic	rat	
inhalation	NOAEC: 10 mg/m3	chronic	rat	

STOT-repeated exposure	The following observations have been made in experimental animals and in human epidemiological studies: (i) No systemic toxicity was shown to result from chronic inhalation exposure in rats to high concentrations of pigment grade titanium dioxide (ii) Particle overload is observed for insoluble particles such as titanium dioxide (Levy, 1995), wherebythe rat is the most sensitive species studied, and species-specific differences are demonstrated in variousmechanistic animal studies (Oberdörster, 1996). It has been demonstrated with reasonable certainty that lung overload conditions are not relevant for human health and, therefore, results based on these data do not justify classification. (iii) It has also been clearly demonstrated through epidemiological studies of titanium dioxide –exposed workers that there is no causal link between titanium dioxide exposure and the risk of non-malignant respiratory disease in humans/ For the reasons presented above, no classification for specific target organ toxicant (STOT) repeated exposure, inhalation is required.

12. ECOLOGICAL INFORMATION

12.1 Toxicity			
Aquatic toxicity	Effect dose	Exposure Time	Species
Acute toxicity to fish	LC50 = 1000 mg/L	96 hour	different fish species
Acute toxicity to aquatic invertebrates	EC50/LC50 = 1000 mg/L	72 hour	different invertebrate species
Acute toxicity to aglae	EC50/LC50 = 61 mg/L	72 hour	Pseudokirchneriella subcapitata

12.2 Persistence and degradability		
Abiotic Degradation		
Half time	Method	Remark
		According to column 2 from Annex VIII from the REACH regulation, a study on hydrolysis as function of the pH does not need to be conducted if the substance is highly insoluble in water.
Biodegradation		study scientifically unjustified

12.3 Bioaccumulative potential
Ti concentrations in various fish tissues stayed constant over the concentration range of TiO2 in water tested (0-1 mg TiO2/L), resulting in decreasing BCF with increasing TiO2 concentrations. Therefore, TiO2 not considered as bioaccumulative.
12.4 Mobility in soil
There is no evidence of mobility of this product
12.5 Results of PBT and vPvB assessment
According to Annex XIII of regulation (EC) 1907/2006 a PBT and vPvB assessment shall not be conducted for titanium dioxide as inorganic substance.
12.6 Other adverse effects
None

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods	
Appropriate disposal / Product	Waste disposal in strict correspondence with the state and local laws and regulations.
Waste codes / waste designations according to EWC / AVV	None, waste is not classified as hazardous according to the Commission Decision 2000/532/EC
Appropriate disposal /Packaging	Dispose of container and unused contents in accordance with federal, state and local requirements.

14. TRANSPORT INFORMATION

14.1. UN 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 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable
14.8 Additional information	The product is transported by railway (RID), road (ADR), and sea (IMDG) transport. The cargo is classified as non-hazardous in compliance with the international rules of carriage.

15. REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance
EU regulation
This product is not classified according to Directive 67/548/EC, Directive 1999/45/EC, Regulation (EC) No 1272/2008

16. OTHER INFORMATION

Relevant R- , H-, EUH-phrases	none
Abbreviation	PEL - permissible exposure limit OEL – occupational exposure limit REL – recommended exposure limit DNEL - derived no-effect level PNEC - predicted no effect concentration LD50 – lethal dose LC50 – lethal concentration EC50 - half maximal effective concentration NOAEL - no observed adverse effect level PBT or vPvB - persistent, bioaccumulative and toxic or very persistent very bioaccumulative STEL - Short Term Exposure Limit TLV-TWA - Threshold limit value (ACGIH) – time weighted average TWA: Time-weighted average MAK: Maximal arbeitsplatz konzentration (German) - Maximum allowable concentration
Training instructions	Read carefully the SDS before using the product
Further information	The data contained in the safety data sheet is based on our present knowledge. However, this shall not constitute a

	guarantee for any specific product features and shall not establish a legally valid contractual relationship.