MATERIAL SAFETY DATA SHEET (MSDS)

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

1.1. Product identifier

Product name : Vetro Power Solar Panel Nano-shield
Product code :

1.2. Recommended Use Uses advised against

1.2.1. Relevant identified uses of the substance or mixture and uses advised against: No further relevant information available.
Application of the substance / the preparation: Coatings

1.3. Details of the supplier of the safety data sheet

Zyax Chem PVT LTD
3rd Floor, Kamer Building,
38 Cawasji Patel Street, Fort,
Mumbai - 400001, India.
Contact No: +91 8779240420
info@zyax.in - www.zyax.in

1.4. Emergency telephone number

Emergency number : +91 22 2757 3899

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP]

Flammable liquids, Category 2	H225
Serious eye damage/eye irritation, Category 2	H319
Specific target organ toxicity — Single exposure, Category 3, Narcosis	H336

Full text of H- and EUH-statements: see section 16

Adverse physicochemical, human health and environmental effects
Highly flammable liquid and vapour.
May cause drowsiness or dizziness.
Causes serious eye irritation.

2.2. Label elements
Labelling according to Regulation (EC) No. 1272/2008 [CLP]

Hazard pictograms (CLP)

Signal word (CLP) Danger
Contains propan-2-ol; isopropyl alcohol; isopropanol
Hazard statements (CLP) H225 - Highly flammable liquid and vapour.
H319 - Causes serious eye irritation.
H336 - May cause drowsiness or dizziness.
Precautionary statements (CLP) P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources.
No smoking.

P233 - Keep container tightly closed.
P243 - Take action to prevent static discharges.
P261 - Avoid breathing spray, vapours.
P280 - Wear eye protection, protective gloves.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove
contact lenses, if present and easy to do. Continue rinsing.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P403+P233 - Store in a well-ventilated place. Keep container tightly closed.
P410 - Protect from sunlight.
P501 - Dispose of contents/container to hazardous or special waste collection point, in accordance with local, regional, national and/or international regulation.

2.3 Other hazards

Other hazards which do not result in classification

In use, may form flammable/explosive vapour-air mixture.
Repeated or prolonged skin contact may cause dermatitis and defatting.

This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

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 [CLP]
propan-2-ol; isopropyl alcohol; isopropanol substance with national workplace exposure limit(s) (GB)	(CAS-No.) 67-63-0 (EC-No.) 200-661-7 (EC Index-No.) 603-117-00-0 (REACH-no) 01-2119457558-25	60 - 70	Flam. Liq. 2, H225 Eye Irrit. 2, H319 STOT SE 3, H336
ethanol substance with national workplace exposure limit(s) (GB)	(CAS-No.) 64-17-5 (EC-No.) 200-578-6 (EC Index-No.) 603-002-00-5	20 - 30	Flam. Liq. 2, H225
tetraethyl orthosilicate substance with national workplace exposure limit(s) (GB); substance with a Community workplace exposure limit	(CAS-No.) 78-10-4 (EC-No.) 201-083-8	1 - 5	Flam. Liq. 3, H226 Acute Tox. 4 (Inhalation:dust,mist), H332 Eye Irrit. 2, H319 STOT SE 3, H335

Full text of H- and EUH-statements: see section 16

SECTION 4: FIRST AID MEASURES

4.1 Description of first aid measures

First-aid measures general	Call a poison center or a doctor if you feel unwell.
First-aid measures after inhalation	Remove person to fresh air and keep comfortable for breathing.
First-aid measures after skin contact	Rinse skin with water/shower. Take off immediately all contaminated clothing.
First-aid measures after eye contact	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.
First-aid measures after ingestion	Rinse mouth out with water. Do not induce vomiting. Call a physician immediately.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms/effects	May cause drowsiness or dizziness.
Symptoms/effects after inhalation	In case of over-exposure or in confined areas : Dizziness, headaches, nausea.
Symptoms/effects after skin contact	Repeated or prolonged skin contact may cause dermatitis and defatting.
Symptoms/effects after eye contact	Eye irritation.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	Water spray. Dry powder. Foam. Carbon dioxide.
Unsuitable extinguishing media	high volume water jet.

5.2 Special hazards arising from the substance or mixture

Fire hazard	Highly flammable liquid and vapour.
Hazardous decomposition products in case of fire	Carbon oxides (CO, CO2).

5.3 Advice for firefighters

Protection during firefighting	Do not attempt to take action without suitable protective equipment. Self-contained breathing apparatus. Complete protective clothing.
Other information	Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations. Do not allow run-off from fire-fighting to enter drains or water courses.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

6.1.1. For non-emergency personnel

Emergency procedures	Ventilate spillage area. No open flames, no sparks, and no smoking. Avoid breathing spray, vapours. Avoid contact with skin and eyes.

6.1.2. For emergency responders

Protective equipment	Do not attempt to take action without suitable protective equipment. For further information refer to section 8: "Exposure controls/personal protection".

6.2 Environmental precautions

Avoid release to the environment. Prevent entry to sewers and public waters.
Notify authorities if product enters sewers or public waters.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up	Take up liquid spill into absorbent material. Notify authorities if product enters sewers or public waters.
Other information	Dispose of materials or solid residues at an authorized site.

6.4 Reference to other sections

For further information refer to section 13.

SECTION 7: HANDLING AND STORAGE

7.1 Precautions for safe handling

Precautions for safe handling	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use only non-sparking tools. Flammable vapours may accumulate in the container. Wear personal protective equipment. Use only outdoors or in a well-ventilated area. Avoid breathing vapours. Avoid contact with skin and eyes.
Hygiene measures	Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Take off immediately all contaminated clothing and wash it before reuse.

7.2 Conditions for safe storage, including any incompatibilities

Technical measures	Ground/bond container and receiving equipment. Take precautionary measures against static discharge.
Storage conditions	Store in a well-ventilated place. Keep cool. Keep container tightly closed.
Incompatible products	Oxidizing agent.
Heat and ignition sources	Keep away from sources of ignition - No smoking. Keep away from any flames or sparking source.
Information on mixed storage	Keep away from oxidizing agents.
Storage area	Keep out of frost. Store away from heat. Protect from sunlight.

7.3 Specific end use(s)

No additional information available

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

8.1.1 National occupational exposure and biological limit values

tetraethyl orthosilicate (78-10-4)	
United Kingdom - Occupational Exposure Limits	
Local name	Tetraethyl orthosilicate
WEL TWA (OEL TWA) [1]	44 mg/m³
WEL TWA (OEL TWA) [2]	5 ppm
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE

ethanol (64-17-5)	
United Kingdom - Occupational Exposure Limits	
Local name	Ethanol
WEL TWA (OEL TWA) [1]	1920 mg/m³
WEL TWA (OEL TWA) [2]	1000 ppm
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE

propan-2-ol; isopropyl alcohol; isopropanol (67-63-0)	
United Kingdom - Occupational Exposure Limits	
Local name	Propan-2-ol
WEL TWA (OEL TWA) [1]	999 mg/m³
WEL TWA (OEL TWA) [2]	400 ppm
WEL STEL (OEL STEL)	1250 mg/m³
WEL STEL (OEL STEL) [ppm]	500 ppm
Regulatory reference	EH40/2005 (Fourth edition, 2020). HSE

8.1.2. Recommended monitoring procedures
No additional information available

8.1.3. Air contaminants formed
No additional information available

8.1.4. DNEL and PNEC
No additional information available

8.1.5. Control banding
No additional information available

8.2 Exposure controls

8.2.1. Appropriate engineering controls
Appropriate engineering controls:
Ensure good ventilation of the work station.

8.2.2. Personal protection equipment
Personal protective equipment symbol(s):

8.2.2.1. Eye and face protection

Eye protection:
Safety glasses

8.2.2.2. Skin protection

Skin and body protection:
Long sleeved protective clothing

Hand protection:					
In case of repeated or prolonged contact wear gloves. Choosing the proper glove is a decision that depends not only on the type of material, but also on other quality features, which differ for each manufacturer. Please follow the instructions related to the permeability and the penetration time provided by the manufacturer					
Type	Material	Permeation	Thickness (mm)	Penetration	Standard
	Neoprene rubber (HNBR)	6 (> 480 minutes)	0,75		EN ISO 374

8.2.2.3. Respiratory protection

Respiratory protection:
Not required for normal conditions of use. In case of insufficient ventilation, wear suitable respiratory equipment

8.2.2.4. Thermal hazards
No additional information available

8.2.3. Environmental exposure controls
Environmental exposure controls:
Avoid release to the environmen

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

Physical state :	Liquid
Colour :	Colourless.
Odour :	alcoholically.
Odour threshold :	Not available
Melting point :	Not applicable
Freezing point :	Not available
Boiling point :	Not available
Flammability :	Not applicable
Explosive limits :	Not available
Lower explosion limit :	Not available
Upper explosion limit :	Not available
Flash point :	12 °C
Auto-ignition temperature :	Not available
Decomposition temperature :	Not available
pH :	3 – 5
Viscosity, kinematic :	Not available
Solubility :	Miscible with water.
Partition coefficient n-octanol/water (Log Kow) :	Not available
Vapour pressure :	Not available
Vapour pressure at 50 °C :	Not available
Density :	0.8 g/ml
Relative density :	Not available

Relative vapour density at 20 °C :	Not available
Particle size :	Not applicable
Particle size distribution :	Not applicable
Particle shape :	Not applicable
Particle aspect ratio :	Not applicable
Particle aggregation state :	Not applicable
Particle agglomeration state :	Not applicable
Particle specific surface area :	Not applicable
Particle dustiness :	Not applicable

9.2. Other information

9.2.1. Information with regard to physical hazard classes
No additional information available

9.2.2. Other safety characteristics
No additional information available

SECTION 10: STABILITY AND REACTIVITY

10.1 Reactivity
Highly flammable liquid and vapour.

10.2 Chemical stability
Stable under normal conditions.

10.3 Possibility of hazardous reactions
No dangerous reactions known under normal conditions of use.

10.4 Conditions to avoid
Avoid contact with hot surfaces. Heat. No flames, no sparks. Eliminate all sources of ignition.

10.5 Incompatible materials:
Oxidizing agent.

10.6 Hazardous decomposition products:
Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: TOXICOLOGICAL INFORMATION

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

Acute toxicity (oral) :	Not classified
Acute toxicity (dermal) :	Not classified
Acute toxicity (inhalation) :	Not classified

tetraethyl orthosilicate (78-10-4)	
LD50 oral rat	2500 mg/kg (OECD 403 method)
LC50 Inhalation - Rat	10 – 16 mg/l spray

propan-2-ol; isopropyl alcohol; isopropanol (67-63-0)	
LD50 oral rat	5840 mg/kg bodyweight Animal: rat, Guideline: OECD Guideline 401 (Acute Oral Toxicity)
LD50 oral	4396 mg/kg bodyweight
LD50 dermal	12800 mg/kg bodyweight
LC50 Inhalation - Rat (Dust/Mist)	46600 mg/l

Skin corrosion/irritation : Not classified
pH:3 – 5

Serious eye damage/irritation : Causes serious eye irritation.
pH:3 – 5

Respiratory or skin sensitisation : Not classified

Germ cell mutagenicity : Not classified

Carcinogenicity : Not classified

ethanol (64-17-5)	
IARC group	1 - Carcinogenic to humans

Reproductive toxicity : Not classified

STOT-single exposure : May cause drowsiness or dizziness.

tetraethyl orthosilicate (78-10-4)	
STOT-single exposure	May cause respiratory irritation.

propan-2-ol; isopropyl alcohol; isopropanol (67-63-0)	
STOT-single exposure	May cause drowsiness or dizziness.

STOT-repeated exposure : Not classified

tetraethyl orthosilicate (78-10-4)	
NOAEL (oral, rat, 90 days)	10 mg/kg bodyweight/day (OECD 422 method)

Aspiration hazard : Not classified

11.2. Information on other hazards

No additional information available

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity

Ecology - general : We have no quantitative data concerning the ecological effects of this produ

Hazardous to the aquatic environment, short-term (acute) : Not classified

Hazardous to the aquatic environment, long-term (chronic) : Not classified

tetraethyl orthosilicate (78-10-4)	
LC50 - Fish [1]	> 245 mg/l Brachydanio rerio (zebra-fish)
EC50 - Crustacea [1]	≥ 245 mg/l Daphnia magna (Water flea)
EC50 72h - Algae [1]	> 75 mg/l Pseudokirchneriella subcapitata
NOEC chronic fish	> 245 ml/l Brachydanio rerio (zebra-fish)

propan-2-ol; isopropyl alcohol; isopropanol (67-63-0)	
LC50 - Fish [1]	9640 mg/l
EC50 - Other aquatic organisms [1]	13299 mg/l waterflea
EC50 - Other aquatic organisms [2]	> 1000 mg/l

12.2. Persistence and degradability

Nanorepel Glass	
Persistence and degradability	No data is available on the degradability of this product. Isopropanol. Ethanol. Readily biodegradable.

tetraethyl orthosilicate (78-10-4)	
Persistence and degradability	hydrolysis product. Ethanol. silicic acid.
Biodegradation	98 % 28 days

12.3. Bioaccumulative potential

tetraethyl orthosilicate (78-10-4)	
Bioaccumulative potential	Not potentially bioaccumulable.

propan-2-ol; isopropyl alcohol; isopropanol (67-63-0)	
Partition coefficient n-octanol/water (Log Pow)	0.05

12.4. Mobility in soil

No additional information available

12.5. Results of PBT and vPvB assessment

Nanorepel Glass
This substance/mixture does not meet the PBT criteria of REACH regulation, annex XIII
This substance/mixture does not meet the vPvB criteria of REACH regulation, annex XIII

12.6. Endocrine disrupting properties

No additional information available

12.7. Other adverse effects

No additional information available

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods

Waste treatment methods	Dispose of contents/container in accordance with licensed collector's sorting instructions.
Product/Packaging disposal recommendations	Dispose in a safe manner in accordance with local/national regulations.
Additional information	Flammable vapours may accumulate in the container. Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities. Waste code can't be determined according to the European Waste Catalogue (EWC), since it depends on the use of the product.
R code/ D code	D10 - Incineration on land

SECTION 14: TRANSPORT INFORMATION

ADR	IMDG	IATA
14.1. UN number or ID number		
UN 1987	UN 1987	UN 1987
14.2. UN proper shipping name		
ALCOHOLS, N.O.S. (CONTAINS : propan-2-ol; isopropyl alcohol; isopropanol ; ethanol)	ALCOHOLS, N.O.S. (CONTAINS : propan-2-ol; isopropyl alcohol; isopropanol ; ethanol)	Alcohols, n.o.s. (CONTAINS : propan-2-ol; isopropyl alcohol; isopropanol ; ethanol)
Transport document description		
UN 1987 ALCOHOLS, N.O.S. (CONTAINS : propan-2-ol; isopropyl alcohol; isopropanol ; ethanol), 3, II, (D/E)	UN 1987 ALCOHOLS, N.O.S. (CONTAINS : propan-2-ol; isopropyl alcohol; isopropanol ; ethanol), 3, II	UN 1987 Alcohols, n.o.s. (CONTAINS : propan-2-ol; isopropyl alcohol; isopropanol ; ethanol), 3, II
14.3. Transport hazard class(es)		
3	3	3
		
14.4. Packing group		
II	II	II
14.5. Environmental hazards		
Dangerous for the environment : No	Dangerous for the environment : No Marine pollutant : No	Dangerous for the environment : No
No supplementary information available		

14.6. Special precautions for user

Overland transport

Classification code (ADR) :	F1
Special provisions (ADR) :	274, 601, 640C
Limited quantities (ADR) :	1l
Excepted quantities (ADR) :	E2
Packing instructions (ADR) :	P001
Mixed packing provisions (ADR) :	MP19
Portable tank and bulk container instructions (ADR) :	T7
Portable tank and bulk container special provisions (ADR) :	TP1, TP8, TP28
Tank code (ADR) :	L1.5BN
Vehicle for tank carriage :	FL
Transport category (ADR) :	2
Special provisions for carriage - Operation (ADR) :	S2, S20
Hazard identification number (Kemler No.) :	33
Orange plates :	
Tunnel restriction code (ADR) :	D/E
EAC code :	•3YE

Transport by sea

Special provisions (IMDG) :	274
Limited quantities (IMDG) :	1 L
Excepted quantities (IMDG) :	E2
Packing instructions (IMDG) :	P001
IBC packing instructions (IMDG) :	IBC02
Tank instructions (IMDG) :	T7
Tank special provisions (IMDG) :	TP1, TP8, TP28
EmS-No. (Fire) :	F-E
EmS-No. (Spillage) :	S-D
Stowage category (IMDG) :	B

Air transport

PCA Excepted quantities (IATA) :	E2
PCA Limited quantities (IATA) :	Y341
PCA limited quantity max net quantity (IATA) :	1L
PCA packing instructions (IATA) :	353
PCA max net quantity (IATA) :	5L
CAO packing instructions (IATA) :	364
CAO max net quantity (IATA) :	60L
Special provisions (IATA) :	A3, A180
ERG code (IATA)	3L

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

Contains no REACH substances with Annex XVII restrictions
Contains no substance on the REACH candidate list
Contains no REACH Annex XIV substances
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.
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

15.1.2. National regulations

No additional information available

15.2. Chemical safety assessment

No chemical safety assessment has been carried out

SECTION 16: OTHER INFORMATION

Abbreviations and acronyms:	
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
BLV	Biological limit value
BOD	Biochemical oxygen demand (BOD)
COD	Chemical oxygen demand (COD)
DMEL	Derived Minimal Effect level
DNEL	Derived-No Effect Level
EC-No.	European Community number
EC50	Median effective concentration
EN	European Standard
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Median lethal concentration
LD50	Median lethal dose
LOAEL	Lowest Observed Adverse Effect Level
NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
OECD	Organisation for Economic Co-operation and Development
OEL	Occupational Exposure Limit
PBT	Persistent Bioaccumulative Toxic
PNEC	Predicted No-Effect Concentration
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS	Safety Data Sheet
STP	Sewage treatment plant
ThOD	Theoretical oxygen demand (ThOD)
TLM	Median Tolerance Limit
VOC	Volatile Organic Compounds
CAS-No.	Chemical Abstract Service number
N.O.S.	Not Otherwise Specified
vPvB	Very Persistent and Very Bioaccumulative
ED	Endocrine disrupting properties

Full text of H- and EUH-statements:	
Acute Tox. 4 (Inhalation:dust,mist)	Acute toxicity (inhalation:dust,mist) Category 4
Eye Irrit. 2	Serious eye damage/eye irritation, Category 2
Flam. Liq. 2	Flammable liquids, Category 2
Flam. Liq. 3	Flammable liquids, Category 3
H225	Highly flammable liquid and vapour.
H226	Flammable liquid and vapour.
H319	Causes serious eye irritation.
H332	Harmful if inhaled.
H335	May cause respiratory irritation.
H336	May cause drowsiness or dizziness.
STOT SE 3	Specific target organ toxicity – Single exposure, Category 3, Narcosis

SDS EU (REACH Annex II)
This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.