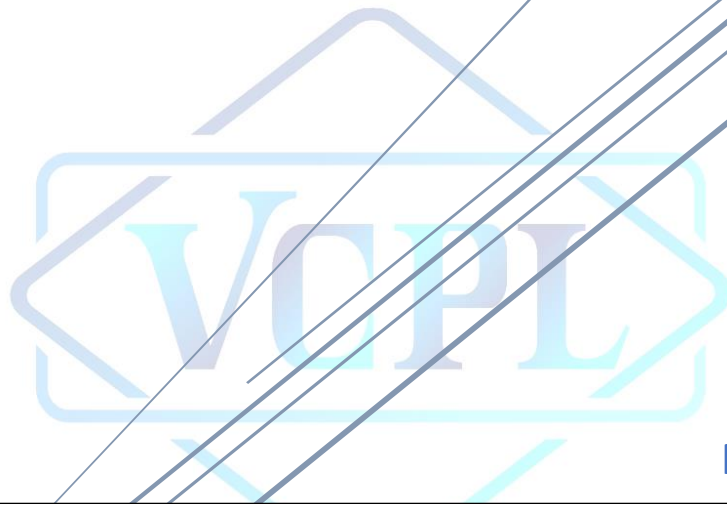


VADHER CHEMICALS PRIVATE LIMITED

Diesel Exhaust Fluid



Prepared by:

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Bhargav Vadher

Safety and storage

The urea solution is clear, non-toxic, and safe to manage. Since urea has corrosive impact on metals like aluminum, DEF is stored and transported in special containers. These containers are typically made of stainless steel. Vehicles' selective catalytic reduction (SCR) systems and DEF dispensers are designed in a manner that there is no corrosive impact of urea on them. It is recommended that DEF be stored in a cool, dry, and well-ventilated area that is out of direct sunlight. Bulk volumes of DEF are compatible for storage within polyethylene containers (HDPE, XLPE), fiberglass reinforced plastic (FRP), and steel tanks. DEF is also often handled in intermediate bulk containers for storage and shipping.

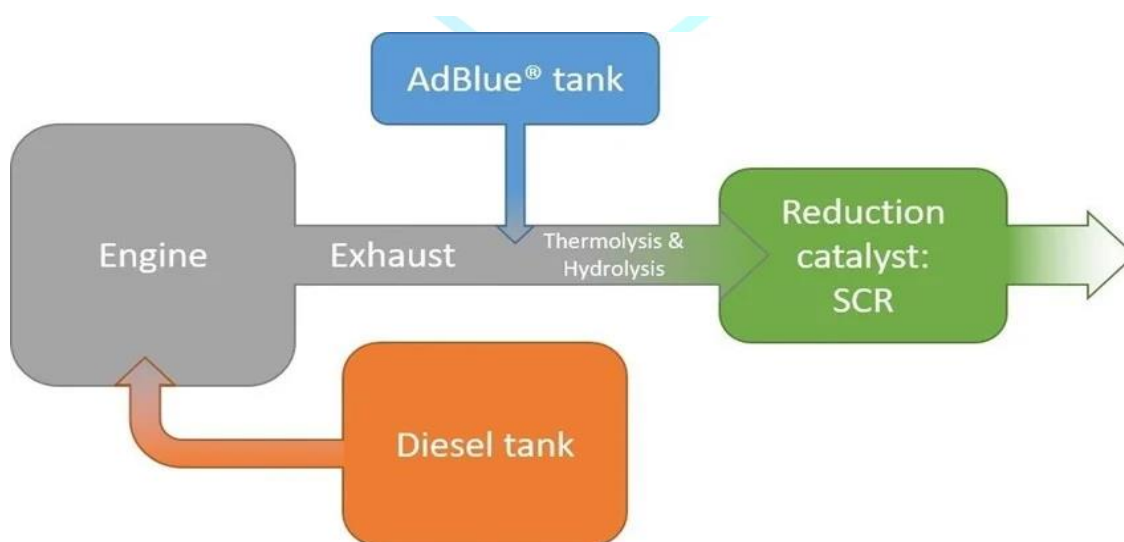
DEF is offered to consumers in a variety of quantities ranging from containers for single or repeated small usage, up to bulk carriers for consumers requiring a large amount of DEF. As of 2013, many truck stops have added DEF pumps. These are usually adjacent to fuel pumps so the driver can fill both tanks without moving the truck.

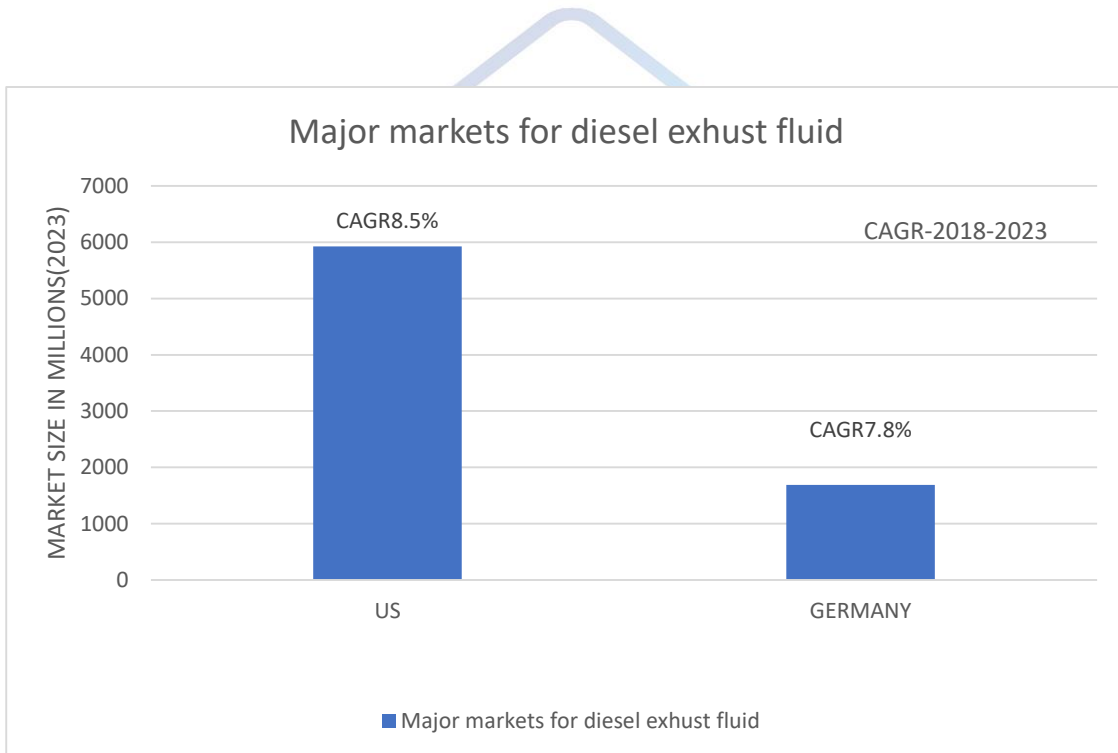
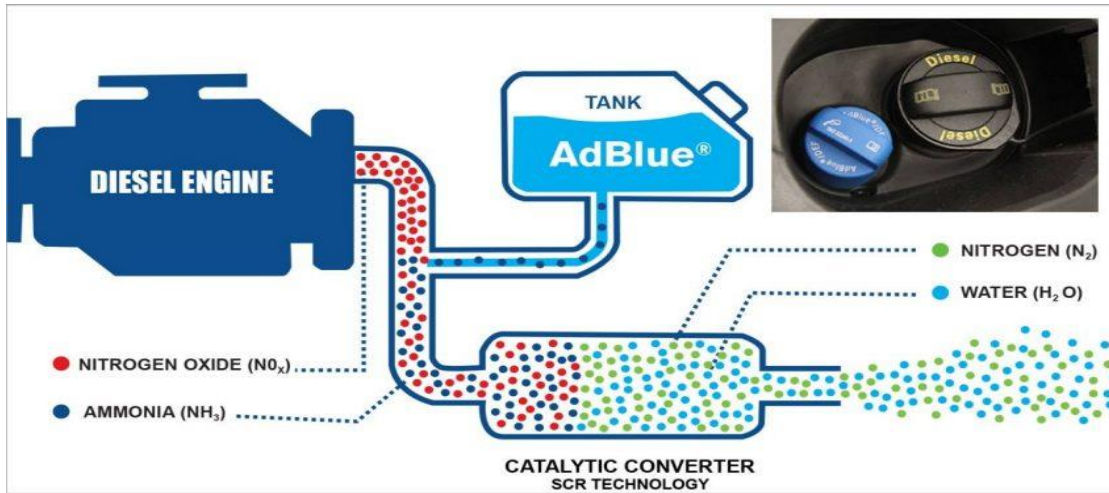
In Europe, increasing numbers of fuel stations offer AdBlue pumps, not only for large commercial vehicles but also for passenger cars.

At airports, where DEF can sometimes be required for diesel ground service vehicles, its labelling and storage must be carefully managed to avoid accidentally servicing jet aircraft with DEF instead of fuel system icing inhibitor, a mistake that has been attributed to multiple in-flight engine failure and grounding incidents.

AARAI Tested Def in India

In India, Evinblue DEF (Tested and approved by ARAI, as per the specifications of ISO 22241-2:2019 & IS 17042) is the best recommended AdBlue Product for all BS4 & BS6 diesel engines of Mercedes Benz, Tata, Bharat Benz, MG, Jeep, Mahindra, Hyundai, Ford & Eic

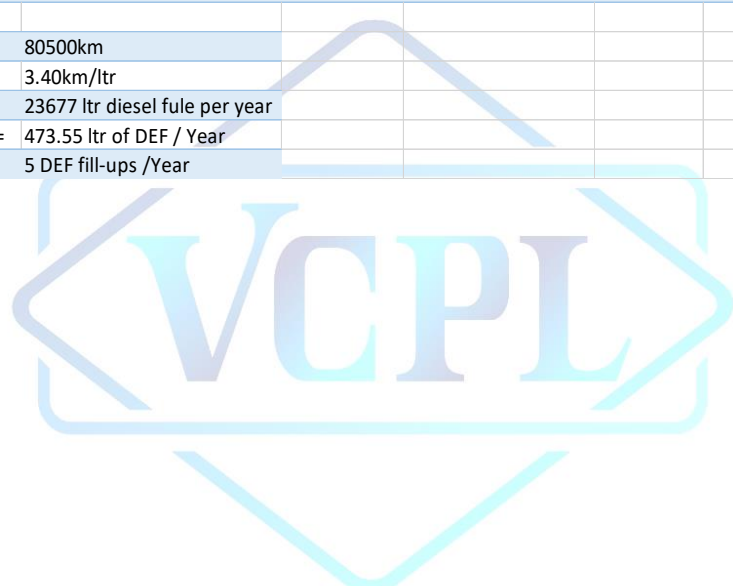




Annual KM per Vehicle		Annual total km	Average KM per Ltr per truck	Average DEF Tank Size (On vehicle)	Annual Fule Usage (ltr)	Consumption per ltr per fule	DEF Fillup per year	Estimated Def Consumption
194000		194000	2.55	100 ltr	750710	2%	5	500 ltr
Annual km for avrage truck =		194000km						
km for average truck =		2.55km/ltr						
80500km/3.40km/ltr =		23677 ltr diesel fule per year						
DEF usage @2% fo fule consumption =		500 ltr of DEF / Year						
500ltr / 100 liter tank (average size) =		5 DEF fill-ups /Year						

EXHAMPLEMedium duty

Annual KM per Vehicle		Annual total km	Average KM per Ltr per truck	Average DEF Tank Size (On vehicle)	Annual Fule Usage (ltr)	Consumption per ltr per fule	DEF Fillup per year	Estimated Def Consumption
80500		80500	3.4	100 ltr	23677	2%	5	500 ltr
Annual km for avrage truck =		80500km						
km for average truck =		3.40km/ltr						
80500km/3.40km/ltr =		23677 ltr diesel fule per year						
DEF usage @2% fo fule consumption =		473.55 ltr of DEF / Year						
474ltr / 100 liter tank (average size) =		5 DEF fill-ups /Year						



Conditions of Use

Fill into the designated tank for DEF/AUS. Do not fill into diesel/ fuel tanks.

Once opened, the container should be consumed in full to avoid contamination and negative impact on product quality.

Avoid contamination with fuel or oil. Use a dedicated spout to pour VCPL DEF into the tank.

Keep away from dust and dirt.

Typical Characteristics

Name	Method	Units	VCPL DEF
Appearance	Visual	-	Clear Liquid
Colour	Visual	-	Colourless
Density	ISO 12185	g/cm ³	1.09
Urea Content	ISO 22241-2 (B & C)	% by weight	32
Refractive Index	ISO 22241-2 (C)	-	1.38
Total Alkalinity	ISO 22241-2 (D)	%	<0.2
Biuret	ISO 22241-2 (E)	mg/kg	<0.3
Aldehyde content	ISO 22241-2 (F)	mg/kg	<5.0
Insoluble Matter	ISO 22241-2 (G)	mg/kg	<20
Phosphate, %wt	ISO 22241-2 (H)	% wt	<0.00005
Calcium, % wt	ISO 22241-2 (I)	% wt	<0.00005
Iron, %wt	ISO 22241-2 (I)	% wt	<0.00002
Copper, % wt	ISO 22241-2 (I)	% wt	<0.00002
Chromium, %wt	ISO 22241-2 (I)	% wt	<0.00002
Nickel, %	ISO 22241-2 (I)	%wt	<0.00002
Aluminium, % wt	ISO 22241-2 (I)	% wt	<0.00005
Magnesium, % wt	ISO 22241-2 (I)	% wt	<0.00005
Sodium, %wt	ISO 22241-2 (I)	% wt	<0.00005
Potassium, % wt	ISO 22241-2 (I)	% wt	<0.00005

CHEMICAL SAFETY DATA SHEET

Hazards identification

GHS label elements	
GHS Classification	Not classified.
Signal word	No signal word.
Hazard statements	No known significant effects or critical hazards.
Precautionary statements	
Prevention	Not applicable.
Response	Not applicable.
Storage	Not applicable.
Disposal	Not applicable.

Composition/information on ingredients

Substance/mixture	Mixture Urea. Water.
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There are no ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section. Occupational exposure limits, if available, are listed in bellow section.

First aid measures

Description of necessary first aid measures	
Eye contact	In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. Check for and remove any contact lenses. Get medical attention if symptoms occur.
Inhalation	If inhaled, remove to fresh air. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours. Get medical attention if symptoms occur.
Skin contact	Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention if symptoms occur.
Ingestion	Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.
Protection of first-aiders	No action shall be taken involving any personal risk or without suitable training.
<u>Most important symptoms/effects, acute and delayed</u>	See Section below for more detailed information on health effects and symptoms.
<u>Indication of immediate medical attention and special treatment needed, if necessary</u>	No specific treatment.
Specific treatments Notes to physician	Treatment should in general be symptomatic and directed to relieving any effects. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Firefighting measures

Extinguishing media	
Suitable	In case of fire, use foam, dry chemical or carbon dioxide extinguisher or spray. Do not use water jet.
Not suitable	In a fire or if heated, a pressure increase will occur and the container may burst.
Specific hazards arising from the chemical	Combustion products may include the following:
Hazardous thermal decomposition products	carbon oxides (CO, CO ₂) (carbon monoxide, carbon dioxide) nitrogen oxides (NO, NO ₂ etc.)
Special precautions for fire- fighters	No action shall be taken involving any personal risk or without suitable training. Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire.
Special protective equipment for fire- fighters	Fire-fighters should wear positive pressure self-contained breathing apparatus (SCBA) and full turnout gear.

Accidental release measures

<u>Personal precautions, protective equipment and emergency procedures</u>	
For non-emergency personnel	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilt material. Put on appropriate personal protective equipment. Floors may be slippery; use care to avoid falling.
For emergency responders	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).
<u>Methods and material for containment and cleaning up</u>	
Small spill	Stop leak if without risk. Move containers from spill area. Absorb with an inert material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.
Large spill	Stop leak if without risk. Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Contain and collect spillage with non- combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations. Dispose of via a licensed waste disposal contractor.

Exposure controls/personal protection

<u>Control parameters Occupational exposure limits</u>	
Ingredient name	None.

<p>Whilst specific OELs for certain components may be shown in this section, other components may be present in any mist, vapor or dust produced. Therefore, the specific OELs may not be applicable to the product as a whole and are provided for guidance only.</p>	
Recommended monitoring procedures	<p>If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.</p>
Appropriate engineering controls	<p>Provide exhaust ventilation or other engineering controls to keep the relevant airborne concentrations below their respective occupational exposure limits.</p>
	<p>Your supplier of personal protective equipment should be consulted for advice on selection and appropriate standards. For further information contact your national organization for standards.</p>
	<p>The final choice of protective equipment will depend upon a risk assessment. It is important to ensure that all items of personal protective equipment are compatible.</p>
	<p>All activities involving chemicals should be assessed for their risks to health, to ensure exposures are adequately controlled. Personal protective equipment should only be considered after other forms of control measures (e.g. engineering controls) have been suitably evaluated. Personal protective equipment should conform to appropriate standards, be suitable for use, be kept in good condition and properly maintained.</p>
Environmental exposure controls	<p>Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.</p>
<u>Individual protection measures</u>	
Hygiene measures	<p>Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.</p>
	<p>Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period.</p>
Eye protection	<p>Safety glasses with side shields.</p>
<u>Skin protection</u>	
Hand protection	<p>Wear protective gloves if prolonged or repeated contact is likely. Wear chemical resistant gloves. Recommended: Nitrile gloves. The correct choice of protective gloves depends upon the chemicals being handled, the conditions of work and use, and the condition of the gloves (even the best chemically resistant glove will break down after repeated chemical exposures). Most gloves provide only a short time of protection before they must be discarded and replaced. Because specific work environments and material handling practices vary, safety procedures should be developed for each intended application. Gloves should therefore be chosen in consultation with the supplier/manufacturer and with a full assessment of the working conditions.</p>
	<p>Use of protective clothing is good industrial practice.</p>
Skin protection	<p>Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.</p>
	<p>Cotton or polyester/cotton overalls will only provide protection against light superficial contamination that will not soak through to the skin. Overalls should be laundered on a regular basis. When the risk of skin exposure is high (e.g. when cleaning up spillages or if there is a risk of splashing) then chemical resistant aprons and/or impervious chemical suits and boots will be required.</p>

Other skin protection	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment.
	The correct choice of respiratory protection depends upon the chemicals being handled, the conditions of work and use, and the condition of the respiratory equipment. Safety procedures should be developed for each intended application. Respiratory protection equipment should therefore be chosen in consultation with the supplier/manufacture and with a full assessment of the working conditions.

Handling and storage

<u>Precautions for safe handling</u>	
Protective measures	Put on appropriate personal protective equipment (see Section 8).
Advice on general occupational hygiene	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Wash thoroughly after handling. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage	Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Store and use only in equipment/containers designed for use with this product. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.
Not suitable	Prolonged exposure to elevated temperature

Physical and chemical properties

<u>Appearance</u>	
Physical state	Liquid.
Color	Colorless to light yellow. Not available.
Odour	Not available.
Odour threshold pH	9.8 to 10
Melting point	-12°C (10.4°F)
Boiling point	104°C (219.2°F)
Drop Point	Not available.
Flash point	Closed cup: Not applicable. [Water content interferes with flash point determination.]
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable. Based on - Physical state Not available.
Lower and upper explosive (flammable) limits	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Relative density	Not available.
Density	>1000 kg/m ³ (>1 g/cm ³) at 20°C .
Solubility	Miscible in water
Partition coefficient: n- octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.

Stability and reactivity

Reactivity	No specific test data available for this product. Refer to Conditions to avoid and Incompatible materials for additional information.
Chemical stability	The product is stable.
Possibility of hazardous reactions	Under normal conditions of storage and use, hazardous reactions will not occur. Under normal conditions of storage and use, hazardous polymerisation will not occur.
Conditions to avoid	Avoid excessive heat.
Incompatible materials	Reactive or incompatible with the following materials: oxidizing materials.
Hazardous decomposition products	Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Toxicological information

<u>Information on toxicological effects</u>	
Aspiration hazard	Not available.
Information on likely routes of exposure	Routes of entry anticipated: Dermal, Inhalation.
<u>Potential acute health effects</u>	
Eye contact	No known significant effects or critical hazards.
Inhalation	Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
Skin contact	No known significant effects or critical hazards.
Ingestion	No known significant effects or critical hazards.
<u>Symptoms related to the physical, chemical and toxicological characteristics</u>	
Eye contact	No specific data.
Inhalation	May be harmful by inhalation if exposure to vapour, mists or fumes resulting from thermal decomposition products occurs.
Skin contact	No specific data.
Ingestion	No specific data.
<u>Delayed and immediate effects as well as chronic effects from short and long-term exposure</u>	
Eye contact	Potential risk of transient stinging or redness if accidental eye contact occurs.
Skin contact	Prolonged or repeated contact can defeat the skin and lead to irritation, cracking and/ or dermatitis.
Ingestion	Ingestion of large quantities may cause nausea and diarrhea.
<u>Potential chronic health effects</u>	
General	No known significant effects or critical hazards.
Carcinogenicity	No known significant effects or critical hazards.
Mutagenicity	No known significant effects or critical hazards.
Teratogenicity	No known significant effects or critical hazards.
Developmental effects	No known significant effects or critical hazards.
Fertility effects	No known significant effects or critical hazards.

Ecological information

Environmental effects	No known significant effects or critical hazards.
<u>Persistence and degradability</u>	Expected to be biodegradable.
Bioaccumulative potential	Not available.
Mobility	Miscible in water.
Other adverse effects	No known significant effects or critical hazards.

Disposal considerations

Disposal methods	<p>The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact with soil, waterways, drains and sewers.</p>
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Transport information

	IMDG	IATA
UN number	Not regulated.	Not regulated.
UN proper shipping name	-	-
Transport hazard class(es)	-	-
Packing group	-	-
Environmental hazards	No.	No.
Additional information	-	-
Special precautions for user	Not available.	
Transport in bulk according to Annex II of Marpol and the IBC Code	Not available.	

Regulatory information

Regulation according to other foreign laws	
REACH Status	For the REACH status of this product please consult your company contact, as identified in Section 1.
Australia inventory (AICS)	All components are listed or exempted.
Philippines inventory (PICCS)	All components are listed or exempted.
Taiwan Chemical Substances Inventory (TCSI)	All components are listed or exempted.
United States inventory (TSCA 8b)	Not determined.
Canada inventory status China inventory (IECSC)	All components are listed or exempted.
Japan inventory (ENCS)	All components are listed or exempted.
Korea inventory (KECI)	All components are listed or exempted.

Other information

<u>History</u>	
Date of issue/Date of revision	01-06-22
Date of previous issue	No previous validation.
Key to abbreviations	ACGIH = American Conference of Industrial Hygienists
	CAS Number = Chemical Abstracts Service Registry Number
	GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association
	IMDG = International Maritime Dangerous Goods OEL = Occupational Exposure Limit
	REACH = Registration, Evaluation, Authorization and Restriction of Chemicals Regulation [Regulation (EC) No. 1907/2006]
	SDS = Safety Data Sheet
	STEL = Short term exposure limit TWA = Time weighted average
	UN Number = United Nations Number, a four digit number assigned by the United Nations Committee of Experts on the Transport of Dangerous Goods.
	Varies = may contain one or more of the following 64741-88-4, 64741-89-5, 64741-95-3, 64741-96-4, 64742-01-4, 64742-44-5, 64742-45-6, 64742-52-5,
	64742-53-6, 64742-54-7, 64742-55-8, 64742-56-9, 64742-57-0, 64742-58-1,
64742-62-7, 64742-63-8, 64742-65-0, 64742-70-7, 72623-85-9, 72623-86-0,	
72623-87-1	

Indicates information that has changed from previously issued version.

Notice to reader

All reasonably practicable steps have been taken to ensure this data sheet and the health, safety and environmental information contained in it is accurate as of the date specified below. No warranty or representation, express or implied is made as to the accuracy or completeness of the data and information in this data sheet.

The data and advice given apply when the product is sold for the stated application or applications. You should not use the product other than for the stated application or applications without seeking advice from VCPL Group.

It is the user's obligation to evaluate and use this product safely and to comply with all applicable laws and regulations. The VCPL Group shall not be responsible for any damage or injury resulting from use, other than the stated product use of the material, from any failure to adhere to recommendations, or from any hazards inherent in the nature of the material.

Purchasers of the product for supply to a third party for use at work, have a duty to take all necessary steps to ensure

that any person handling or using the product is provided with the information in this sheet. Employers have a duty to tell employees and others who may be affected of any hazards described in this sheet and of any precautions that should be taken. You can contact the VCPL Group to ensure that this document is the most current available. Alteration of this document is strictly prohibited.

