SAFETY DATA SHEET

1. Identification of the substance or mixture and of the supplier

GHS Product identifier: NOVAPOL® Polyethylene (Grades that Contain Diatomaceous Earth)

Other means of identification

Common name(s), synonym(s): LDPE, HPLDPE, MDPE Polyethylene resins, ethylene polymers

SDS number NOVA-0029B

Recommended use of the chemical and restrictions on use

Recommended use: Thermoplastic resin extruded into film, sheet or moulded into containers and other shapes.

Recommended restrictions: All uses other than the identified.

Supplier's details

Supplier

Company Name: NOVA Chemicals International (SA)
Address: Avenue de la Gare 14
1700 Fribourg, Switzerland
Telephone: +41-26-426-5757
SDS Information Email: msdsemail@novachem.com

Emergency telephone number:

+1-800-561-6682, +1-403-314-8767 (NOVA Chemicals) (24 hours)

Asia Pacific: +65 3158 1074 (NCEC) (24 hours)

2. Hazard(s) identification

Hazard Classification

Not classified

Label Elements

Hazard Symbol: No symbol

Signal Word: No signal word.

Hazard Statement: not applicable

Precautionary Statements:

Prevention: Keep out of reach of children. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Ground and bond container and receiving equipment. Use explosion-proof [electrical/ventilating/lighting] equipment. Wash hands thoroughly after handling. Use only outdoors or in a well-ventilated area. Avoid release to the environment. Wear protective gloves/protective clothing/eye protection/face protection. [In case of inadequate ventilation] wear respiratory protection.

Response: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Get medical advice/attention. IF ON SKIN: Wash with plenty of water/soap. If skin irritation occurs: Get medical advice/attention. IF INHALED: Remove person to fresh air and keep comfortable for breathing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage: Store in accordance with local/regional/national regulations. Protect from sunlight.

Disposal: Dispose of contents/container in accordance with local/regional/national/international regulations. Refer to manufacturer or supplier for information on recovery or recycling.

Other hazards which do not result in GHS classification: This mixture is a preparation containing polymers and additives. Although it may contain components that may be classified, the product does not present a danger to human health by inhalation, ingestion or contact with the skin or to the aquatic environment in the form in which it is placed on the market. *If small particles are generated during further processing, handling or by other means,* may form combustible dust concentrations in air. Spilled product may create a dangerous slipping hazard. Under fire conditions, product will readily burn and emit irritating smoke. Molten material will produce thermal burns. Polyethylene is an essentially biologically inert solid and considered non-toxic. It is stable (does not decompose) in landfills or in aquatic systems.

3. Composition/information on ingredients

Mixtures

Chemical Identity	Common name and synonyms	CAS number	Content in percent (%)*
Silica, cristobalite	Crystalline silica	14464-46-1	0,1 - 0,3%

* All concentrations are percent by weight.

Additional Information: The silica, cristobalite is inextricably bound or coated in the resin.

4. First-aid measures

Description of necessary first-aid measures

Ingestion: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. Get medical advice/attention.

Inhalation: IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention.

Skin Contact: IF ON SKIN: Wash with plenty of water/soap. If skin irritation occurs: Get medical advice/attention.

Eye contact: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical advice/attention.

Most important symptoms/effects, acute and delayed

Symptoms: Thermal burns. Respiratory irritation. Mechanical irritation. The silica, cristobalite is inextricably bound or coated in the resin, which minimizes the likelihood of exposure.

Indication of immediate medical attention and special treatment needed

Treatment:	After adequate first aid, no further treatment is required unless symptoms reappear. For more detailed medical emergency support information, call +1-800-561-6682 or +1-403-314-8767 (24 hours, NOVA Chemicals Emergency Response). Burns should be treated as thermal burns. Molten resin will come off as healing occurs; therefore, immediate removal from the skin is not necessary. Treatment should be directed at the control of symptoms and the clinical condition of the patient. No adverse effects due to ingestion are expected. The silica, cristobalite is inextricably bound or coated in the resin, which minimizes the likelihood of exposure.

5. Fire-fighting measures

General Fire Hazards:	Solid resins support combustion but do not meet combustible definition. Product will burn at high temperatures but is not considered flammable. Under fire conditions, product will readily burn and emit irritating smoke. Powdered material may form explosive dust-air mixtures.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media:	Water fog or water spray. Small fires: Dry chemical, carbon dioxide (CO2) or foam.
Unsuitable extinguishing media:	Avoid water in straight hose stream; will scatter and spread fire.
Specific hazards arising from the chemical:	Upon heating, polyethylene may emit various oligomers, waxes and oxygenated hydrocarbons as well as carbon dioxide, carbon monoxide and small amounts of other organic vapours (e.g. aldehydes, acrolein). Inhalation of these decomposition products may be hazardous. Powdered material may form explosive dust-air mixtures. Risk of dust-air explosion is increased if flammable vapours are also present. Static discharge: material can accumulate static charges which may cause an incendiary electrical discharge.

Special protective action for firefighters

Special fire fighting procedures:	Keep upwind. Keep unauthorised personnel away. Move containers from fire area if you can do so without risk. Fight fire from maximum distance or use unmanned holders or monitor nozzles. Apply extinguishing media carefully to avoid creating airborne dust. Water may be used to flood the area. Use water spray to cool fire exposed surfaces and to protect personnel. Avoid inhaling any smoke and combustion materials. Remove and isolate contaminated clothing and shoes. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply.
Special protective equipment for firefighters:	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures:	Isolate area. Alert stand-by emergency and fire fighting personnel. Dust deposits should not be allowed to accumulate on surfaces, as these may form an explosive mixture if they are released into the atmosphere in sufficient concentration.
Environmental Precautions:	Prevent entry into waterways, sewer, basements or confined areas.

Methods and material for containment and cleaning up:

Wear appropriate personal protective equipment. Do not touch or walk through spilled material. In case of leakage, eliminate all ignition sources. Stop leak if safe to do so. Prevent entry into waterways, sewer, basements or confined areas. Spilled product may create a dangerous slipping hazard. Use appropriate tools to put the spilled solid in an appropriate disposal or recovery container. Recover and reclaim or recycle, if practical. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air).

7. Handling and storage

Precautions to ensure safe handling:

Keep out of reach of children. Keep away from uncontrolled heat and incompatible materials. Ground all material handling and transfer equipment. Wash hands thoroughly after handling. Prevent dust accumulation to minimise explosion hazard. For additional information on control of static and minimizing potential dust and fire hazards, refer to NFPA-654, "Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids, 2013 Edition". Use in a well-ventilated area. Avoid release to the environment. Wear eye protection/protective gloves as needed/wear full face-shield during thermal processing if contact with molten material is possible/wear respirator if dusty. Spilled product may create a dangerous slipping hazard.

Conditions for safe storage, including any incompatibilities:

Store in accordance with all current regulations and standards. Storage area should be clearly identified, well-illuminated and clear of obstruction. Store in closed, grounded and properly designed vessels. Keep away from uncontrolled heat and incompatible materials. Protect from sunlight. Outdoor storage of product in bags requires protection from ultra-violet sunlight by use of a UV stabilized bag or alternate means. Avoid accumulation of dust by frequent cleaning and suitable construction of storage and handling areas. Keep shovels and vacuum systems readily available for cleanup of loose material. DO NOT enter filled bulk containers and attempt to walk over product, due to risk of slipping and possible suffocation. Use a fall arrest system when working near open bulk containers.

8. Exposure controls/personal protection

Control Parameters

Occupational Exposure Limits

During dusty conditions ACGIH recommends for Particles (insoluble or poorly soluble) not otherwise specified a TWA of 10 mg/m3 (inhalable particles), 3 mg/m3 TWA (respirable particles).
Indonesia: 10 mg/m3 (TWA) (Inhalable particles.); 3 mg/m3 (TWA) (Respirable particles.); For Particles.
The silica, cristobalite is inextricably bound or coated in the resin, which minimizes the likelihood of exposure.

Chemical Identity	Type	Exposure Limit Values	Source
Silica, cristobalite	NAB	0,05 mg/m3	Indonesia. OELs (Minister of Manpower and Transmigration Regulation No. Per.13/MEN/X/2011 concerning Threshold Limit Values, Annex II) (11 2011)
Silica, cristobalite - Respirable fraction.	TWA	0,025 mg/m3	US. ACGIH Threshold Limit Values (03 2014)

Appropriate Engineering Controls:	Engineering methods to reduce hazardous exposure are preferred controls. Methods include mechanical ventilation (dilution and local exhaust) process or personal enclosure, remote and automated operation, control of process conditions, leak detection and repair systems, and other process modifications. Ensure all exhaust ventilation systems are discharged to outdoors, away from air intakes and ignition sources. Supply sufficient replacement air to make up for air removed by exhaust systems. Administrative (procedure) controls and use of personal protective equipment may also be required. 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. Use only appropriately classified electrical equipment and powered industrial trucks.

Individual protection measures, such as personal protective equipment

General information:	Personal protective equipment (PPE) should not be considered a long-term solution to exposure control. Employer programs to properly select, fit, maintain and train employees to use equipment must accompany PPE. Consult a competent industrial hygiene resource, the PPE manufacturer's recommendation, and/or applicable regulations to determine hazard potential and ensure adequate protection.
Eye/face protection:	Safety glasses. Wear a face shield when working with molten material.
Skin Protection	
Hand Protection:	Wear gloves to protect against thermal burns.
Other:	Wear appropriate clothing to prevent any possibility of skin contact. Wear work clothes with long sleeves and pants. Safety footwear with good traction is recommended to help prevent slipping. Static Dissipative (SD) rated footwear is also recommended.
Respiratory Protection:	Appropriate approved air-purifying respirator or self-contained breathing apparatus should be used. Air supplied breathing apparatus must be used when oxygen concentrations are low or if airborne concentrations exceed the limits of the air-purifying respirators.
Hygiene measures:	Use effective control measures and PPE to maintain worker exposure to concentrations that are below these limits. Ensure that eyewash stations and safety showers are in close proximity to work locations.

9. Physical and chemical properties

Appearance	
Physical state:	solid
Form:	Pellets or Granular powder
Colour:	white / colourless / translucent
Odour:	Minimal, Mild
Odour threshold:	No data available.
pH:	not applicable
Melting point/freezing point:	105 - 125 °C (221 - 257 °F) (Melting Point) 80 - 105 °C (176 - 221 °F) (Softening point)
Initial boiling point and boiling range:	not applicable
Flash Point:	not applicable
Evapouration rate:	not applicable
Flammability (solid, gas):	May form combustible dust concentrations in air.

Upper/lower limit on flammability or explosive limits

Flammability limit - upper (%):	not applicable
Flammability limit - lower (%):	not applicable
Vapour pressure:	not applicable
Vapour density:	not applicable
Relative density:	0,910 - 0,940
Solubility(ies)	
Solubility in water:	Insoluble in water
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	not applicable
Auto-ignition temperature:	330 - 410 °C (626 - 770 °F)
Decomposition temperature:	> 300 °C (> 572 °F)
Viscosity:	not applicable

10. Stability and reactivity

Reactivity:	Contact with incompatible materials. Sources of ignition. Exposure to heat.
Chemical Stability:	Material is stable under normal conditions.
Possibility of Hazardous Reactions:	Hazardous polymerization not likely to occur.
Conditions to Avoid:	Avoid exposing to heat and contact with strong oxidising substances. Avoid processing material over 300 °C (572 °F).
Incompatible Materials:	Strong oxidising agents. Organic solvents, ether, gasoline, lubricating oils, chlorinated hydrocarbons and aromatic hydrocarbons may react with and degrade polyethylene. Powdered material may form explosive dust-air mixtures. Risk of dust-air explosion is increased if flammable vapours are also present.
Hazardous Decomposition Products:	Upon decomposition, polyethylene may emit various oligomers, waxes and oxygenated hydrocarbons as well as carbon dioxide, carbon monoxide and small amounts of other organic vapours (e.g. aldehydes, acrolein). Inhalation of these decomposition products may be hazardous.

11. Toxicological information

Information on likely routes of exposure

Ingestion:	Ingestion of this product is not a likely route of exposure.
Inhalation:	During processing, thermal fumes and inhalation of fine particles may cause respiratory irritation. The silica, cristobalite is inextricably bound or coated in the resin, which minimizes the likelihood of exposure.
Skin Contact:	During processing, contact with powder or fines may cause mechanical irritation. Molten material will produce thermal burns. The silica, cristobalite is inextricably bound or coated in the resin, which minimizes the likelihood of exposure.
Eye contact:	During processing, contact with powder or fines may cause mechanical irritation. Molten material will produce thermal burns. The silica, cristobalite is inextricably bound or coated in the resin, which minimizes the likelihood of exposure.

Symptoms related to the physical, chemical and toxicological characteristics

Ingestion:	No adverse effects due to ingestion are expected.

Inhalation: Respiratory irritation.

Skin Contact: Mechanical irritation. Thermal burns. Negligible irritation of the skin based on chemical structure (polymer).

Eye contact: Mechanical irritation. Thermal burns. May cause mild, short-lasting discomfort to eyes.

Information on toxicological effects

Acute toxicity (list all possible routes of exposure)

Oral
Product: LD50: > 5.000 mg/kg

Dermal
Product: Not classified for acute toxicity based on available data.

Inhalation
Product: Not classified for acute toxicity based on available data.

Repeated dose toxicity
Product: No data available.

Skin Corrosion/Irritation
Product: No data available.

Specified substance(s):
Silica, cristobalite — Irritating. May cause abrasion to skin. The silica, cristobalite is inextricably bound or coated in the resin, which minimizes the likelihood of exposure.

Serious Eye Damage/Eye Irritation
Product: No data available.

Specified substance(s):
Silica, cristobalite — Irritating. May cause abrasion to cornea. The silica, cristobalite is inextricably bound or coated in the resin, which minimizes the likelihood of exposure.

Respiratory or Skin Sensitisation
Product: No data available.

Carcinogenicity
Product: Not classified

IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:
Silica, cristobalite — Overall evaluation: 1. Carcinogenic to humans.

ACGIH Carcinogens:
Silica, cristobalite — Group A2: Suspected human carcinogen.

Germ Cell Mutagenicity

In vitro
Product: There are no known or reported genetic effects.

In vivo
Product: There are no known or reported genetic effects.

Reproductive toxicity
Product: There are no known or reported reproductive effects.

Specific Target Organ Toxicity - Single Exposure

Product: No data available.

Specific Target Organ Toxicity - Repeated Exposure

Product: No data available.

Specified substance(s):

Silica, cristobalite — Lungs, Respiratory system - The silica, cristobalite is inextricably bound or coated in the resin, which minimizes the likelihood of exposure.

Aspiration Hazard

Product: Not classified.

Other effects: No data available.

12. Ecological information

General information: NOVAPOL® resins are expected to be inert in the environment. They float on water and are not biodegradable. They are not expected to bioconcentrate (accumulate in the food chain) due to their high molecular weight. NOVAPOL® pellets are not expected to be toxic if ingested but may represent a choking hazard if ingested by waterfowl or aquatic life.

Ecotoxicity

Acute hazards to the aquatic environment

Fish

Product: LC 50 (96 h): > 100 mg/l

Aquatic Invertebrates

Product: EC 50 (Daphnia magna, 48 h): > 100 mg/l

Toxicity to aquatic plants

Product: EC 50 (72 h): > 100 mg/l

Chronic hazards to the aquatic environment

Fish

Product: NOEC : > 100 mg/l

Aquatic Invertebrates

Product: NOEC : > 100 mg/l

Toxicity to aquatic plants

Product: NOEC : > 100 mg/l

Persistence and Degradability

Biodegradation

Product: Not readily degradable. Under optimal oxidation conditions, >99% of polyethylene will remain intact after exposure to microbial actions. Product will slowly change (embrittle) in the presence of sunlight, but will not fully breakdown. Product buried in landfill has been found to be stable over time. No toxic degradation products are known to be produced.

BOD/COD Ratio

Product: No data available.

Bioaccumulative Potential

Bioconcentration Factor (BCF)

Product: Pellets may accumulate in the digestive systems of birds and aquatic life, causing injury and possible death due to starvation.

Partition Coefficient n-octanol / water (log Kow)

Product: Log Kow: not applicable

Mobility

Mobility in Soil: Biologically persistent. This product has not been found to migrate through soils.

Other Adverse Effects: Pellets are persistent in aquatic and terrestrial systems.

13. Disposal considerations

Disposal methods

Disposal instructions: Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal. Preferred disposal methods for polyethylene in order of preference are: 1) clean and reuse if possible, 2) recover and resell through plastic recyclers or resin brokers, 3) incinerate with waste heat recovery and 4) landfill. DO NOT ATTEMPT TO DISPOSE OF BY UNCONTROLLED INCINERATION. Open burning of plastics at landfills should not be undertaken.

Contaminated Packaging: Check regional, national and local environmental regulations prior to disposal.

14. Transport information

IMDG

Not regulated.

IATA

Not regulated.

15. Regulatory information

Federal regulations

Indonesia. Dangerous Substances that Must be Registered (Regulation of the Minister of Health of the Republic of Indonesia)

Not regulated

Indonesia. Prohibited Substances (Government Regulation No. 74 of 2001 regarding Management of Hazardous and Poisonous Substances, Attachment II, Table 1)

Not regulated

Indonesia. Restricted Substances (Government Regulation No. 74 of 2001 regarding Management of Hazardous and Poisonous Substances, Attachment II, Table 2)

Not regulated

Indonesia. Precursor Chemicals (Ministry of Industry and Trade Decree No. 647/MPP/Kep/10/2004 concerning Regulation on Import of Precursors, Attachment 1)

Not regulated

Indonesia. CWC (Law of RI No. 9 of 2008 re: Prohibition on the Use of Chemicals as Chemical Weapon)

Not regulated

Indonesia. Ozone Depleting Substances (ODS) (Regulation of the Minister of Trade No. 03/M-DAG/PER/1/2012, Annexes I & II
Not regulated

Inventory status

Canada DSL Inventory List:	On or in compliance with the inventory
US TSCA Inventory:	On or in compliance with the inventory

16.Other information, including date of preparation or last revision

Issue Date: 20.02.2018

Revision Information: 20.02.2018: New SDS

Version #: 0.0

Source of information: Available on request.

Other information:

Exposure to the Hazardous Combustion and Decomposition Products as described in the SDS, Sections 5 and 10, may be linked with various acute and chronic health effects. These effects include irritation of eyes and upper respiratory tract primarily from the aldehydes, breathing difficulties, systemic toxicity such as liver, kidney, and central nervous system effects.

NOVA Chemicals has monitored worker exposures to emissions during commercial-scale processing of polyethylene. Concentrations of hazardous decomposition products were determined to be well below established exposure limits in the workplace. "Quantitation of Employee Exposure to Emission Products Generated By Commercial-Scale Processing of Polyethylene" is available in the Am. Ind. Hyg. Assoc. J. 56:809-814 (1995) and "Quantification of Emission Compounds Generated During Commercial-Scale Processing of Advanced SCLAIRTECH™ Polyethylene" is available in the Journal of Plastic Film & Sheeting Volume 26 Issue 2, April 2010.

For information on ventilation considerations for the control of volatile air contaminants from polyethylene, please request a copy of NOVA Chemicals' publication, "Ventilation Guidelines for Heat-Processing Polyethylene Resins".

For additional information on unloading hopper cars containing plastic resins, refer to NOVA Chemicals' publication, "Hopper Car Unloading Guide".

For information on processing properties, selection of NOVAPOL resin grades, refer to the NOVAPOL Product Data Sheets available on our web site, under Products & Applications: http://www.novachemicals.com.

For additional information on preventing pellet loss, refer to published plastic industry publications and resources under 'Operation Clean Sweep'; now downloadable from the web at http://www.opcleansweep.org/.

Polyethylene fines and dust particles are listed as a Class I combustible dust by the National Fire Protection Association (see NFPA-68, Table F.1 (e)). For additional information on control of static and minimizing potential dust and fire hazards, refer to NFPA-654, "Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing and Handling of Combustible Particulate Solids, 2013 Edition".

Explosivity testing was done on one NOVAPOL® LLDPE, one LDPE and one HDPE resins with Pmax = 4.8-5.7 bar, Kst = 12-17 (bar m/s) and Minimum Ignition Energy (MIE) = 1000-10,000; dust explosion class = St 1; this data was obtained for polyethylene with a final particle size of 100% <250 um and moisture content between 0 and 0.2%. Similar results are expected for the remaining NOVAPOL® polyethylene resin grades.

For NOVAPOL resin grade specific information including food contact compliance statements, please contact your sales representative or refer to NOVA Chemicals' polyethylene Product Data Sheets.

Abbreviations and acronyms:

ACGIH = American Conference of Governmental Industrial Hygienists; BOD = Biochemical Oxygen Demand; CAS = Chemical Abstracts Service; EC50 = Effective Concentration 50%; GHS = Globally Harmonized System for the Classification and Labelling of Chemicals; IARC = International Agency for Research on Cancer; IATA = International Air Transport Association; IMDG = International Maritime Dangerous Goods; Kow = Octanol/water partition coefficient; LC50 = Lethal Concentration 50%; LD50 = Lethal Dose 50%; NCEC = National Chemical Emergency Centre; NFPA = National Fire Protection Association; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; NRCC = National Registration Centre for Chemicals; OEL = Occupational Exposure Limit; OSHA = Occupational Safety and Health Administration; PNOC = Particulates Not Otherwise Classified; PPE = Personal Protective Equipment; SCBA = Self Contained Breathing Apparatus; SDS = Safety Data Sheet; STEL = Short Term Exposure Limit; TLV = Threshold Limit Value; TWA = Time Weighted Average

Disclaimer:

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