

SAFETY DATA SHEET

1. Identification of the hazardous chemical and of the supplier

Product identifier: NOVAPOL® Polyethylene

Other means of identification

**Common name(s),
synonym(s):** HDPE, HPLDPE, LDPE, LLDPE, LMDPE, MDPE Polyethylene resins,
ethylene polymers
SDS number: NOVA-0029C

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.

Manufacturer/Importer/Supplier/Distributor Information

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

GHS label elements

Hazard Symbol: No symbol
Signal Word: No signal word.
Hazard Statement: not applicable

Precautionary Statements:

Prevention: 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:	<i>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.</i>

3. Composition/information on ingredients

Mixtures

Composition Comments: The components are not hazardous or are below required disclosure limits.

4. First-aid measures

Inhalation:	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Get medical advice/attention.
Ingestion:	IF SWALLOWED: Rinse mouth. Do NOT induce vomiting. 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.

Indication of immediate medical attention and special treatment needed

Treatment: After adequate first aid, no further treatment is required unless symptoms reappear. 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.

5. Fire-fighting measures

General Fire Hazards: Polyethylene is a noncombustible solid, but dusts may form explosive mixtures in air. Product will burn at high temperatures but is not considered flammable. Under fire conditions, product will readily burn and emit irritating smoke.

Suitable (and unsuitable) extinguishing media

Suitable extinguishing media:	Water fog or water spray. Small fires: Dry chemical, carbon dioxide (CO ₂) 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 equipment and precautions for fire-fighters

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. Fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard. 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 fire-fighters: Wear positive pressure self-contained breathing apparatus (SCBA).

6. Accidental release measures

Personal precautions, protective equipment and emergency procedures: Isolate area. Alert stand-by emergency and fire-fighting personnel. Wear appropriate personal protective equipment. For additional information, refer to Section 8.

Methods and material for containment and cleaning up: Avoid standing or walking on spilled product. Spilled product may create a dangerous slipping hazard. In case of leakage, eliminate all ignition sources. Stop leak if safe to do so. 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. Avoid dispersal of dust in the air (i.e., clearing dust surfaces with compressed air). Use appropriate tools to put the spilled solid in an appropriate disposal or recovery container. Use non-sparking tools. Recover and reclaim or recycle, if practical.

Environmental precautions: Prevent entry into waterways, sewer, basements or confined areas.

7. Handling and storage

Precautions for safe handling: Keep away from uncontrolled heat and incompatible materials. Wash hands thoroughly after handling. Minimise dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dry powders can build static electricity charges when subjected to the friction of transfer and mixing operations. Provide adequate precautions, such as electrical grounding and bonding, or inert atmospheres. Ground all material handling and transfer equipment. 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", current edition. Use in a well-ventilated area. 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.

Avoid release to the environment.

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).

Philippines: 15 millions of particles per cubic foot of air (TWA) (Respirable fraction.); 50 millions of particles per cubic foot of air (TWA) (Total dust.); For Inert or Nuisance particulates.

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 that dust-handling systems (such as exhaust ducts, dust collectors, vessels, and processing equipment) are designed in a manner to prevent the escape of dust into the work area (i.e., there is no leakage from the equipment). 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 NIOSH approved air-purifying respirator or self-contained breathing apparatus should be used. Supplied air 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 - 135 °C (221 - 275 °F) (Melting Point) 85 - 127 °C (185 - 261 °F) (Softening point)
Initial boiling point and boiling range:	not applicable
Flash Point:	not applicable
Evaporation rate:	not applicable
Flammability (solid, gas):	May form combustible dust concentrations in air [if small particles are generated during further processing, handling or by other means.]
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
Density:	905 - 965 kg/m ³
Relative density:	0.905 - 0.965
Solubility(ies)	
Solubility in water:	Insoluble in water
Solubility (other):	No data available.
Partition coefficient (n-octanol/water):	not applicable
Auto-ignition temperature:	No data available.
Decomposition temperature:	> 300 °C (> 572 °F)
Viscosity:	not applicable
Other information	
Explosive properties:	No data available.
Oxidising Properties:	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 extended periods of heat and contact with strong oxidizing substances.
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

Inhalation:	During processing, thermal fumes and inhalation of fine particles may cause respiratory irritation.
Ingestion:	Ingestion of this product is not a likely route of exposure.
Skin Contact:	During processing, contact with powder or fines may cause mechanical irritation. Molten material will produce thermal burns.
Eye contact:	During processing, contact with powder or fines may cause mechanical irritation. Molten material will produce thermal burns.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation:	Respiratory irritation.
Ingestion:	No adverse effects due to ingestion are expected.
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:	LD 50: > 5,000 mg/kg (estimated)
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.**Serious Eye Damage/Eye Irritation****Product:** No data available.**Respiratory or Skin Sensitisation****Product:** No data available.**Carcinogenicity****Product:** Not classified**IARC Monographs on the Evaluation of Carcinogenic Risks to Humans:**

No carcinogenic components identified

ACGIH Carcinogen List:

No carcinogenic components identified

Philippines Carcinogenicity:

No carcinogenic components identified

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.**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® resins 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:** Polyethylene resins 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:** not applicable**Mobility in soil:**

Biologically persistent. This product has not been found to migrate through soils.

Other adverse effects:

Polyethylene resins are persistent in aquatic and terrestrial systems.

13. Disposal considerations**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**ADR**

Not Regulated.

IATA

Not Regulated.

IMDG

Not Regulated.

15. Regulatory information**Safety, health and environmental regulations specific for the product in question****Philippines. CCO chemicals (Chemical Control Orders, as published in DENR DAO 1997-39 as amended)**

Not regulated

Philippines. Controlled Precursors & Essential Chemicals (Comprehensive Dangerous Drugs Act of 2002 (Republic Act 9165), as amended thru Dangerous Drugs Board Regulations)

Not regulated

Philippines. Ozone Depleting Substances (ODS) (Chemical Control Order, DENR Admin. Order No. 2013-25)

Not regulated

Philippines. Priority Chemical List (PCL) (DENR Administrative Order)

Not regulated

Philippines. Narcotic and Psychotropic Substances (Comprehensive Dangerous Drugs Act of 2002 (Republic Act 9165), as amended)

Not regulated

Philippines. Hazardous Wastes (DENR Administrative Order 2013-22 Revised Procedures and Standards for the Management of Hazardous Wastes, Table 2.1)

Not regulated

Inventory status:

Philippines. Inventory of Chemicals and Chemical Substances (PICCS): On or in compliance with the inventory

16. Other information, including date of preparation or last revision**Issue Date:** 25.09.2023**Revision Information:** 25.09.2023: New SDS**Version #:** 1.0**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; 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

Source of information:

Available on request.

Further 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 polyethylene resin loss, refer to published plastic industry publications and resources under Operation Clean Sweep® product stewardship program; 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", current edition.

Explosivity testing was done on one NOVAPOL® LLDPE, one LDPE and one HDPE resins with P_{max} = 4.8-5.7 bar, K_{st} = 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 µm 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.

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