NOVA Chemicals®

Material Safety Data Sheet

Material Name: SCLAIR® Polyethylene Not Colored (All Grades)

MSDS ID: NOVA-0031

Section 1 - Product and Company Identification

Synonyms: HDPE, VLDPE, LLDPE, LMDPE, Polyethylene resins, ethylene polymers
Chemical Name: Polyethylene
Chemical Family: Polymer
Material Use: Thermoplastic resin extruded into film, sheet or pipe, or molded into bottles, containers, lids and other items.
Chemical Formula: $(CH_2)(CH_2)_x$

NOVA Chemicals Inc.
1550 Coraopolis Heights Road
Moon Township, PA 15108

In case of Emergency

1-800-561-6682, 1-403-314-8767 (NOVA Chemicals)(24 hours)
1-800-424-9300 (CHEMTREC-USA)
1-613-996-6666 (Canutec-Canada)(24 hours)

Section 2 – Composition / Information on Ingredients

CAS #	Component	Percent by Wt.
9002-88-4	Polyethylene (Ethene homopolymer) *	>98
Not Available	Additives ***	0-1
68855-54-9	Flux-calcined diatomaceous earth **	0-1

Additional Information

* This product may also be described as 1-Butene, polymer with ethene (CAS #25087-34-7), as 1-Octene polymer with ethene (CAS #26221-73-8), or as 1-Octene, polymer with 1-butene and ethene (CAS # 28829-58-5).
** Flux-calcined diatomaceous earth may contain up to 75% crystalline silica. It is added to some SCLAIR grades (e.g. film resins).
*** Other chemical additives including antioxidants, stabilizers, processing aids and anti-static compounds may be formulated into various polyethylene resin grades in a total concentration of less than 1% wt/wt.

This product is not considered hazardous under 29 CFR 1910.1200 (Hazard Communication). This material is not a controlled product under Canadian WHMIS regulations.

This material is not regulated as a hazardous material for transportation.

See Section 8 for applicable exposure limits. See Section 11 for applicable toxicity data.

Section 3 - Hazards Identification

HMIS Ratings: Health: 0* **Fire:** 1 **Reactivity:** 0
*Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe * = Chronic hazard*

NFPA Ratings: Health: 0 **Fire:** 1 **Reactivity:** 0
Hazard Scale: 0 = Minimal 1 = Slight 2 = Moderate 3 = Serious 4 = Severe

Emergency Overview

CAUTION: Product is a clear to white solid, in a granular powder or pellet form having minimal odor. Under fire conditions, product will readily burn and emit a heavy, irritating smoke. Powders or fines may form explosive air-dust mixtures. Considered non-toxic. Contact with molten material may cause thermal burns. May be mildly irritating to the eyes, skin and respiratory system. Spilled product may create a slipping hazard.

Potential Health Effects: Eyes

Contact with hot or molten material may cause severe injury, including in extreme contact possible blindness. Contact of powder or fines with eye may cause mechanical irritation.

Potential Health Effects: Skin

Contact with hot or molten material may cause severe thermal burns. Contact of powder or fines with skin may cause mild to more serious irritation, that is increased by mechanical rubbing or if skin is dry.

Potential Health Effects: Ingestion

Ingestion of this product is unlikely. However, ingestion of product may produce mild gastrointestinal irritation and disturbances.

Potential Health Effects: Inhalation

Inhalation of fine particles may cause respiratory irritation. Fumes produced while thermal processing may cause irritation, pulmonary edema and a possible asthma-like response. The crystalline silica is inextricably bound or coated in the polyethylene; this appears to prevent any toxic reaction to the lungs.

Section 4 - First Aid Measures

First Aid: Eyes

Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Do not rub. Seek medical attention if irritation persists.

First Aid: Skin

Remove dusty or contaminated clothing. Wash affected area with mild soap and water. Apply moisturizers to prevent excessive drying. Seek medical attention if irritation persists.

First Aid: Hazardous Skin Contact

In case of contact with molten product, cool rapidly with water and seek immediate medical attention. DO NOT attempt to remove molten product, or molten product that has cooled, from skin because skin will tear easily.

First Aid: Inhalation

Move person to non-contaminated air. Assist breathing if necessary. Seek medical attention if unconscious or if any other symptoms persist. Inhalation of smoke following a fire may result in delayed pulmonary edema; seek immediate medical attention.

First Aid: Ingestion

Material is not expected to be absorbed from the gastrointestinal tract. Do not induce vomiting. Seek medical attention if any discomfort or other symptom persists.

First Aid: Notes to Physician

For more detailed medical emergency support information call 1-800-561-6682 (NOVA Chemicals Emergency Response, 24 hours). Burns should be treated as thermal burns. Molten resin will come off as healing occurs; therefore, immediate removal from the skin is not necessary. Treat symptomatically. Treatment of overexposure should be directed at the control of symptoms and the clinical condition of the patient. After adequate first aid, no further treatment is required unless symptoms reappear. Ingested material should pass through the digestive system without injury. The crystalline silica is inextricably bound or coated in the polyethylene; this appears to prevent any toxic reaction to the lungs.

Section 5 - Fire Fighting Measures

Flammability Class:	Not flammable	**Flash Point:**	Not applicable
Upper flammability limit:	Not applicable	**Flash Point Method:**	Not applicable
Lower flammability limit:	Not applicable	**Auto Ignition:**	330ºC-410ºC (630ºF-770ºF)

General Fire Hazards

Solid resins support combustion but do not meet combustible definition. Under fire conditions, product will readily burn and emit a heavy, irritating black smoke. High concentration of airborne powders or dust may form explosive mixture with air.

Explosion Hazards

Powders or dusts may form an explosive mixture with air. Risk of dust-air explosion is increased if flammable vapors are also present. May accumulate hazardous static charge.

Hazardous Combustion Products

Carbon dioxide, carbon monoxide, aldehydes, acrolein and small amounts of other organic vapors may be produced. Inhalation of these decomposition products may be hazardous.

Extinguishing Media

Water fog or water spray. For small fires can also use dry chemical or carbon dioxide or foam. Avoid high pressure, direct water stream that may spread molten or burning resins.

Fire Fighting Equipment/Instructions

Position upwind. Keep unnecessary personnel away. Set up to fight fire at a safe distance. Firefighters should wear full protective clothing including self-contained breathing apparatus. Avoid inhaling combustion products. Cool fire exposed vessels with cold water. Control runoff waters to prevent entry of plastic pellets into sewers, drains, and waterways. Seek medical attention for burns due to contact with molten material.

Section 6 - Accidental Release Measures

Evacuation Procedures

Isolate area. Keep unnecessary personnel away. Extinguish or remove possible ignition sources.

Small Spills

Stop leak, contain spill, and prevent entry into sewers, and waterways. Spilled product may create a slipping hazard. Use appropriate tools to put the spilled solid in an appropriate disposal or recovery container. Reuse or recycle where possible. Consult your local or regional authorities. Meet any applicable regulations.

Large Spills

Stop leak, contain spill, and prevent entry into sewers and waterways. Spilled product may create a dangerous slipping hazard. Isolate, contain, and recover. Use appropriate instruments to put the spilled material in an appropriate recovery or disposal container. Reuse or recycle where possible. Consult your local or regional authorities. Meet any applicable regulations.

Special Procedures

Contact local police and appropriate emergency telephone numbers provided in Section 1. Ensure statutory and regulatory reporting requirements in the applicable jurisdiction are met.

Persons not wearing appropriate protective equipment should be excluded from area of spill until clean-up has been completed. Wear appropriate protective equipment and clothing during clean-up.

Section 7 - Handling and Storage

Handling Procedures

Handle in contained and properly designed equipment systems. Use with adequate ventilation. Avoid ingestion and inhalation. Keep away from uncontrolled heat and incompatible materials. Ground all material handling and transfer equipment to dissipate build-up of static electricity. Keep handling areas free of loose pellets and dust build-up. Every effort should be made to prevent the accumulation of powders or fine dusts around material handling systems. 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 in Chemical, Dye, Pharmaceutical and Plastics Industries." Spilled product may create a dangerous slipping hazard.

Incompatibility

May react with strong oxidizing agents. Organic solvents, ether, gasoline, lubricating oils, chlorinated hydrocarbons and aromatic hydrocarbons may react with and degrade polyethylene. Powders or dusts may form an explosive mixture with air. Risk of dust-air explosion is increased if flammable vapors are also present.

Storage Procedures

Storage area should be clearly identified, well illuminated, clear of obstruction and accessible only to trained and authorized personnel. Store in closed, grounded and properly designed vessels, away from uncontrolled heat and incompatible materials. Avoid accumulation of dust by frequent cleaning and suitable construction of storage and handling areas. Keep shovels and vacuum systems readily available for clean up 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.

Section 8 – Exposure Controls / Personal Protection

Exposure Guidelines

A: General Material Information

Follow all applicable exposure limits.

Note: In this product, any crystalline silica content is inextricably bound or coated in the polyethylene. This appears to prevent any toxic reaction to the lungs. Thus the ACGIH exposure limits for Particulates (Insoluble) Not Otherwise Specified (PNOS) are considered applicable.

B: Component Exposure Limits

ACGIH, OSHA, NIOSH, EPA, TSCA, Alberta, and Ontario exposure limit lists have been checked for those components with CAS registry numbers. Other exposure limits may apply. Check with authorities.

Polyethylene (Ethene homopolymer) * (9002-88-4)

ACGIH:	10 mg/m3 TWA (inhalable fraction); 3 mg/m3 TWA (respirable fraction) (related to Particulates (insoluble or poorly soluble) not otherwise specified (PNOS))
OSHA:	15 mg/m3 TWA (total dust); 5 mg/m3 TWA (respirable fraction) (related to Particulates not otherwise regulated)
Alberta:	5 mg/m3 TWA (respirable mass); 10 mg/m3 TWA (total mass) (related to Nuisance particulates)
Ontario:	10 mg/m3 TWAEV (inhalable); 3 mg/m3 TWAEV (respirable. both must contain no asbestos and less than 1% crystalline silica) (related to Particulates (Insoluble) Not Otherwise Classified)

Flux-calcined diatomaceous earth ** (68855-54-9)

ACGIH:	0.05 mg/m3 TWA (respirable fraction) (related to Silica, crystalline, quartz)
OSHA:	0.1 mg/m3 TWA (respirable dust) (related to Silica-crystalline, quartz)
NIOSH:	0.05 mg/m3 TWA (respirable dust) (related to Silica, crystalline) 50 mg/m3 IDLH (respirable dust) (related to Silica, crystalline, quartz)
Alberta:	2 mg/m3 TWA (respirable mass); 5 mg/m3 TWA (total mass) 2 mg/m3 TWA (respirable mass); 5 mg/m3 TWA (total mass); 0.1 mg/m3 TWA (respirable mass); 0.3 mg/m3 TWA (total mass) (related to Quartz)
Ontario:	0.10 mg/m3 TWAEV (related to Silica, quartz)

Engineering Controls

Ventilation should effectively remove and prevent buildup of any dust or heated vapors generated from the handling and processing of this product. Ensure that eyewash stations and safety showers are proximal to the workstation location. Use non-sparking, grounded ventilation systems separate from other exhaust systems.

PERSONAL PROTECTIVE EQUIPMENT

Personal Protective Equipment: Eyes/Face

Wear safety glasses during normal handling. Wear face shield during thermal processing if contact with molten materials is likely.

Personal Protective Equipment: Skin/Hands/Feet

To avoid burns from contact with molten product, use thermal insulating gloves and other protective clothing (such as long sleeved shirts and long pants). Safety footwear with good traction is recommended to help prevent slipping.

Personal Protective Equipment: Respiratory

When dusts or thermal processing fumes are generated and ventilation is not sufficient to effectively remove them, appropriate NIOSH approved respiratory protection must be provided.

Personal Protective Equipment: General

Personal protective equipment (PPE) must not be considered a long term solution to exposure control. PPE must be accompanied by employer programs to properly select, maintain, clean, fit and use equipment. Consult a competent industrial hygiene resource to determine hazard potential and/or the PPE manufacturers and applicable regulations to ensure adequate protection.

Section 9 - Physical & Chemical Properties

Physical state and appearance:	Solid, pellets, powder or granules	**Color:**	Clear to white
Odor:	Minimal, sweet	**pH:**	Not applicable
Vapor Pressure:	Not applicable	**Vapor Density (Air=1):**	Not applicable
Dispersion properties:	Is not dispersed in cold water, hot water	**Boiling Point:**	Not applicable
Melting Point:	105ºC - 135ºC (221ºF - 275ºF)	**Solubility (H2O):**	Insoluble
Specific Gravity (Water=1):	0.905 - 0.965	**Softening Point:**	85ºC - 127ºC (185ºF - 261ºF)
Evaporation Rate (n-Butyl Acetate=1):	Not applicable		

Section 10 - Stability & Reactivity Information

Chemical Stability

Stable

Chemical Stability: Conditions to Avoid

Avoid strong oxidizing agents. Avoid processing material over 300ºC (572ºF).

Incompatibility

May react with strong oxidizing agents. Organic solvents, ether, gasoline, lubricating oils, chlorinated hydrocarbons and aromatic hydrocarbons may react with and degrade polyethylene. Powders or dusts may form an explosive mixture with air. Risk of dust-air explosion is increased if flammable vapors are also present.

Hazardous Polymerization

Not likely to occur.

Corrosivity

Product is not corrosive.

Hazardous Decomposition

Upon heating, polyethylene may emit various oligomers, waxes and other oxygenated hydrocarbons as well as carbon dioxide, carbon monoxide, aldehydes, acrolein and small amounts of other organic vapors. Inhalation of these decomposition products may be hazardous.

Section 11 - Toxicological Information

A: Acute Toxicity - General Material Information

Material is considered essentially inert and non-toxic. Exposures to high levels of dust or heated fumes may cause irritation and possible pulmonary edema. Contact with molten material may cause burns.

The following information has been found for its components. However, the product is expected to present a lesser degree of hazard since the hazardous components are incorporated in a polymer matrix:
Flux-calcined diatomaceous earth/crystalline silica - Inhalation may cause discomfort or irritation to the respiratory tract and nasal passages. May be irritating to eyes and skin.

B: Acute Toxicity - LD50/LC50

Polyethylene (Ethene homopolymer) * (9002-88-4)

Inhalation LC50 Mouse: 12 gm/m3/30M

C: Chronic Toxicity - General Material Information

Product has minimal chronic toxicity. Most polyethylene particles are large and non-respirable. Target organ is the respiratory system. There are no reported reproductive or genetic effects.

The following information has been found for its components. However, the product is expected to present a lesser degree of hazard since the hazardous components are incorporated in a polymer matrix:

Flux-calcined diatomaceous earth/crystalline silica - IARC has classified crystalline silica as a Group 1 (carcinogenic to humans). However, the crystalline silica is considered bound into the polyethylene; this appears to prevent any toxic reaction to the skin or lungs.

D: Chronic Toxicity - Carcinogenic Effects

ACGIH, IARC, OSHA, and NTP carcinogen lists have been checked for those components with CAS registry numbers.

Polyethylene (Ethene homopolymer) * (9002-88-4)

IARC: Supplement 7, 1987; Monograph 19, 1979 (Group 3 (not classifiable))

Flux-calcined diatomaceous earth ** (68855-54-9)

ACGIH: A2 - Suspected Human Carcinogen (related to Silica, crystalline - Quartz)
NTP: Known Carcinogen (related to Silica, crystalline (respirable size)) (Select Carcinogen)
IARC: Monograph 68, 1997; (inhaled in the form of quartz or cristobalite from occupational sources) (related to Silica, quartz)
Monograph 68, 1997 (related to Silica, crystalline (general form)) (Group 1 (carcinogenic to humans))

Section 12 - Ecological Information

Ecotoxicity

Polyethylene is an essentially biologically inert solid and considered non-toxic. It is stable (does not decompose) in landfills or in aquatic systems.

Environmental Fate

If released into watercourses, polyethylene may be persistent in aquatic systems. It is readily recovered from land following spills.

Mobility

This product has not been found to migrate through soils.

Persistence/Degradability

Product does not readily degrade. 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 and non-toxic over time. No toxic degradation products or leachate are known to be produced.

Bioaccumulation/Accumulation

Pellets may accumulate in the digestive systems of birds and aquatic life, causing injury and possible death.

Section 13 - Disposal Considerations

U.S./Canadian Waste Number & Descriptions

A: General Material Information

This product is not known to generate hazardous wastes according to US RCRA and Canadian CEPA regulations. The use, mixing or processing of this material may alter this product. Check federal, provincial/state and local environmental regulations prior to disposal. Consider reduction of non-hazardous wastes by 1) clean and reuse where possible 2) recover and resale through recycled plastic or scrap brokers 3) incinerate with heat recovery and 4) landfill. Recycling and disposal by incineration must be in accordance with applicable regulations. DO NOT ATTEMPT TO DISPOSE OF BY UNCONTROLLED INCINERATION. Open burning of plastics at landfills is not acceptable.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

Section 14 - Transportation Information

US DOT Information

Shipping Name: Not regulated as a Hazardous Material for Transportation.

Canadian TDG Information

Shipping Name: Not regulated as a Hazardous Material for Transportation.

International Air Transport Association (IATA) and ICAO Regulations

Shipping Name: Not regulated as a Hazardous Material for Transportation.

International Maritime Dangerous Goods (IMDG) Regulations

Shipping Name: Not regulated as a Hazardous Material for Transportation.

Section 15 - Regulatory Information

A: International Regulations

Components of this product have been checked against the following Chemical Inventories. Components not identified on EINECS are exempt from the listing (i.e. as polymers whose monomers are listed).

Component Analysis - International Inventory Status

Component	CAS #	US - TSCA	CANADA - DSL	EU - EINECS
Polyethylene (Ethene homopolymer) *	9002-88-4	Yes	Yes	Exempt
Flux-calcined diatomaceous earth **	68855-54-9	Yes	Yes	Yes
Polyethylene (1-Butene, polymer with ethene)	25087-34-7	Yes	Yes	Exempt
1-Octene, polymer with ethene	26221-73-8	Yes	Yes	Exempt
1-Octene, polymer with 1-butene and ethene	28829-58-5	Yes	Yes	Exempt

B: USA Federal & State Regulations

General Material Information

The EPA Storm Water Regulations classify resin pellets as "significant materials". Prevent pellets from entering drains, ditches or waterways.

For food contact compliance statements for specific resin grades, please contact your sales representative.

USA Right-to-Know - Federal

None of this product's components are listed under SARA Section 302 (40 CFR 355 Appendix A), SARA Section 313 (40 CFR 372.65), or CERCLA (40 CFR 302.4).

USA Right-to-Know - State

The following components appear on one or more of the following state hazardous substances lists. Some components (including those present only in trace quantities, and therefore not listed in this document) may be included on the Right To Know lists of other U.S. states. The reader is therefore cautioned to contact his or her NOVA Chemicals representative or NOVA Chemicals' Product Integrity group for further U.S. State Right To Know information.

Component	CAS	NJ	PA
Flux-calcined diatomaceous earth ** (^{0}related to Silica, Quartz) (^{0*}related to Quartz (SiO2)	68855-54-9	Yes^{0}	Yes^{0*}

C: Canadian Regulations - Federal and Provincial

Canadian Federal WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Minimum Concentration
Flux-calcined diatomaceous earth	68855-54-9	1%; English Item 1402; French Item 1489 1%; English Item 1406; French Item 1491 (related to Silica-crystalline, quartz)

WHMIS Classification

Workplace Hazardous Materials Information Systems (WHMIS): This product has been classified in accordance with the hazard criteria of the Canadian Controlled Product Regulations (CPR), and the MSDS contains all of the information required by the CPR.

Not controlled under WHMIS.

Provincial Regulations

Under the Alberta Environmental Protection and Enhancement Act - Release Reporting Guideline June 2001, "Persistent Plastics" are reportable when entering a watercourse.

Section 16 - Other Information

Label Information

PRECAUTIONS:
CAUTION: Product is a clear to white solid, in a granular powder or pellet form having minimal odor. Under fire conditions, products will readily burn and emit a heavy, irritating black smoke. Powders or fines may form explosive air-dust mixtures. Considered non-toxic. Contact with molten material may cause thermal burns. May be mildly irritating to the eyes, skin, and respiratory system. Spilled product may create a slipping hazard.
FIRST AID: Remove dusty or contaminated clothing. Wash affected area with mild soap and water. Apply moisturizers to prevent excessive drying. Seek medical attention if irritation persists. In case of contact with molten product, cool rapidly with water and seek immediate medical attention. Do not attempt to remove molten product from skin because skin will tear easily.
EYES: Immediately flush eyes with water for at least 15 minutes, while holding eyelids open. Do not rub. Seek medical attention if irritation persists.
INHALATION: Move person to non-contaminated air.
INGESTION: Do not induce vomiting. Seek medical attention if any discomfort or other symptom persists.
IN CASE OF A LARGE SPILL: Stop leak, contain spill, and prevent entry into sewers and waterways. Spilled product may create a dangerous slipping hazard. Use appropriate instruments to put the spilled material in an appropriate recovery or disposal container. Reuse or recycle where possible. Consult you local or regional authorities. Meet any applicable regulations.

References

Available on request.

Special Considerations

NOVA Chemicals has monitored worker exposures to emissions during commercial scale processing polyethylene. Concentrations of hazardous decomposition products as described under normal heat processing (Section 10) were determined to be well below established exposure limits in the workplace. This information is available on request in a NOVA Chemicals' report, "Quantitation of Employee Exposure to Volatile Emission Products Generated by Commercial-Scale Processing of Polyethylene". For more information on indoor ventilation basics, refer to NOVA Chemicals "Ventilation Guidelines for Heat-Processing Polyethylene Resins."

For additional information on unloading hopper cars containing plastic resins, refer to NOVA Chemicals' 'A Guide to Railcar Unloading.'

For information on processing properties, selection of product grades and Product Data Sheets please visit our web site: http://www.novachem.com.

'For additional information on preventing pellet loss, refer to published Plastic Industries (SPI, APC) publications and resources under 'Operation Clean Sweep'.

Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists; CAS = Chemical Abstracts Service; CPR = Controlled Products Regulations; DSL = Domestic Substances List; EINECS = European Inventory of Existing Commercial Chemical Substances; EPA = Environmental Protection Agency; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NJTSR = New Jersey Trade Secret Registry; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; TSCA = Toxic Substances Control Act. CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act; DOT = Department of Transportation; FDA = Food and Drug Administration; IDL = Ingredient Disclosure List; RCRA = Resource Conservation and Recovery Act; SARA = Superfund Amendments and Reauthorization Act; TDG = Transportation of Dangerous Goods.

Validated by Business Review Team/Product Integrity Group. Verified by Product Steward on 4/14/2003

Contact: Product Integrity Group
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Other Information

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This is the end of MSDS # NOVA-0031