# SAFETY DATA SHEET

Classification (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567

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

### 1.1 Product identifier

**Product name:** ASTUTE™ Plastomer Polyethylene

**Other means of identification**

**Synonyms, Trade Names:** LLDPE Polyethylene resins, ethylene polymers

**SDS number:** NOVA-0031D

### 1.2 Relevant identified uses of the substance or mixture and uses advised against

**Identified uses:** Thermoplastic resin extruded into film, sheet or moulded into containers and other shapes.

**Uses advised against:** All uses other than the identified.

### 1.3 Details of the supplier of the safety data sheet

**Non EU Supplier**

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

**UK REACH Only Representative**

| | |
|---|---|
| Company Name: | ITS Testing Services (UK) Ltd. |
| Address: | 1-9 Brook Street<br>Brentwood, Essex, United Kingdom CM14 5NQ |
| SDS Information Email: | ies02.reach@intertek.com |

### 1.4 Emergency telephone number:

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

**Europe:** +44 20 3885 0382 (CHEMTREC) (24 Hours)

## SECTION 2: Hazards identification

### 2.1 Classification of the substance or mixture

The product has not been classified as hazardous according to the legislation in force.

**Classification (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567**

Not classified

### 2.2 Label elements

**Hazard Symbol:** No symbol

**Signal Word:** No signal word.

**Hazard Statement(s):** Not applicable

**Precautionary Statements:**

**Prevention:** P210: Keep away from heat, hot surfaces, sparks, open flames and other

ignition sources. No smoking.
P240: Ground and bond container and receiving equipment.
P241: Use explosion-proof [electrical/ventilating/lighting] equipment.
P264: Wash hands thoroughly after handling.
P271: Use only outdoors or in a well-ventilated area.
P273: Avoid release to the environment.
P280: Wear protective gloves/ protective clothing/ eye protection/ face protection.
P284: [In case of inadequate ventilation] wear respiratory protection.

**Response:** P301+P330+P331: IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P313: Get medical advice/attention.
P302+P352: IF ON SKIN: Wash with plenty of water/soap.
P332+P313: If skin irritation occurs: Get medical advice/attention.
P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

**Storage:** P401: Store in accordance with local/regional/national regulations.
P410: Protect from sunlight.

**Disposal:** P501: Dispose of contents/container in accordance with local/regional/national/international regulations.
P502: Refer to manufacturer or supplier for information on recovery or recycling.

**2.3 Other hazards** *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. PBT assessment does not apply.

## SECTION 3: Composition/information on ingredients

**3.2 Mixtures**

**General information:** No hazardous ingredients.

## SECTION 4: First aid measures

**4.1 Description of first aid measures**

**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.

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

**4.2 Most important symptoms and effects, both acute and delayed:** Thermal burns. Respiratory irritation. Mechanical irritation.

**4.3 Indication of any 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.

## SECTION 5: Firefighting 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.

**5.1 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.

**5.2 Special hazards arising from the substance or mixture:** 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.

**5.3 Advice 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. 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).

## SECTION 6: Accidental release measures

**6.1 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.

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

**6.3 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.

**6.4 Reference to other sections:** See Section 8 for recommended Personal Protective Equipment and see Section 13 for waste disposal considerations.

## SECTION 7: Handling and storage:

**7.1 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.

**7.2 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.

**7.3 Specific end use(s):** Thermoplastic resin extruded into film, sheet or moulded into containers and other shapes.

## SECTION 8: Exposure controls/personal protection

**8.1 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).
**United Kingdom:** 10 mg/m3 (TWA) (Inhalable dust.); 4 mg/m3 (TWA) (Respirable dust.); For Dust

**8.2 Exposure controls**

**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 (PPE)**

**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 that meets the requirements of the European Standard for Respiratory Protection (EN 149) 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.

**Environmental Controls:** Follow all applicable environmental protection legislation.

## SECTION 9: Physical and chemical properties

**Appearance**

| | |
|---|---|
| **Physical state:** | solid |
| **Form:** | Pellets |
| **Colour:** | white / colourless / translucent |
| **Odour:** | Minimal, Mild |
| **Odour Threshold:** | No data available. |
| **pH:** | Not applicable |
| **Melting point/freezing point:** | 95 - 135 °C (203 - 275 °F) (Melting Point) 82 - 127 °C (180 - 261 °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 [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:** | 900 - 970 kg/m3 |
| **Relative density:** | 0,900 - 0,970 |
| **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 |

## SECTION 10: Stability and reactivity

| | |
|---|---|
| **10.1 Reactivity:** | Contact with incompatible materials. Sources of ignition. Exposure to heat. |
| **10.2 Chemical stability:** | Material is stable under normal conditions. |
| **10.3 Possibility of hazardous reactions:** | Hazardous polymerization not likely to occur. |
| **10.4 Conditions to avoid:** | Avoid exposing to extended periods of heat and contact with strong oxidizing substances. |
| **10.5 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. |
| **10.6 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. |

## SECTION 11: Toxicological information

**Information on likely routes of exposure**

| | |
|---|---|
| **Inhalation:** | During processing, thermal fumes and inhalation of fine particles may cause respiratory irritation. |
| **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. |
| **Ingestion:** | Ingestion of this product is not a likely route of exposure. |

**Symptoms related to the physical, chemical and toxicological characteristics**

| | |
|---|---|
| **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.

**Ingestion:** No adverse effects due to ingestion are expected.

**11.1 Information on toxicological effects**

**Acute toxicity**

**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.

**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.

**Carcinogenicity**
**Product:** Not classified

**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 hazards**
**Product:** No data available.

## SECTION 12: Ecological information

**General information:** ASTUTE 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. ASTUTE

resins are not expected to be toxic if ingested but may represent a choking hazard if ingested by waterfowl or aquatic life.

**12.1 Toxicity**

**Acute toxicity**

**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 toxicity**

**Fish**
**Product:** NOEC : > 100 mg/l

**Aquatic Invertebrates**
**Product:** NOEC : > 100 mg/l

**Toxicity to aquatic plants**
**Product:** NOEC : > 100 mg/l

**12.2 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.

**12.3 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

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

**12.5 Results of PBT and vPvB assessment:**
**Product** PBT assessment does not apply.

**12.6 Other adverse effects:** Polyethylene resins are persistent in aquatic and terrestrial systems.

**12.7 Additional Information:** No data available.

## SECTION 13: Disposal considerations

**13.1 Waste treatment methods**

**Disposal methods:** 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.

## SECTION 14: Transport information

**ADR**
Not Regulated.

**IMDG**
Not Regulated.

**IATA**
Not Regulated.

**14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code**: Not applicable

## SECTION 15: Regulatory information

**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:**

**EU. Directive 2012/18/EU (SEVESO III) on major accident hazards involving dangerous substances, as amended.:** Not applicable

**15.2 Chemical safety assessment:** Not required. This product complies with the registration requirements of the UK REACH Regulation. The component substances have been duly registered or are exempt from registration. This covers those UK importers included in NOVA Chemicals' UK Only Representative scheme.

## SECTION 16: Other information

**Revision Information:** 21.11.2024: New SDS

**References**

| | |
|---|---|
| PBT | PBT: persistent, bioaccumulative and toxic substance. |
| vPvB | vPvB: very persistent and very bioaccumulative substance. |

**Key literature references and sources for data:** Available on request.

**Wording of the H-statements in sections 2 and 3:** none

**Training information:** Suitable information on safety in handling, storage and processing the product should be given to employees based on the existing information.

**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 ASTUTE resin grades, refer to the ASTUTE Product Data Sheets available on our web site: 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.

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

**Key/Legend:**

ACGIH = American Conference of Governmental Industrial Hygienists; ADR = Transport of Dangerous Goods by Road; ADR/RID = European Agreement of Dangerous Goods by Road/Rail; CAS = Chemical Abstracts Service; DFG = Deutsche Forschungsgemeinschaft; EC50 = Effective Concentration 50%; EEC = European Economic Community; EU = European Union; GHS = Globally Harmonized System for the Classification and Labelling of Chemicals; IARC = International Agency for Research on Cancer; IATA = International Air Transport Association; ICAO = International Civil Aviation Organization; IMDG = International Maritime Dangerous Goods; IMO = International Maritime Organization; Kow = Octanol/water partition coefficient; LC50 = Lethal Concentration 50%; LD50 = Lethal Dose 50%; LEL = Lower Explosive Limit; LFL = Lower Flammable Limit; LLV = Level Limit Ceiling Limit (Sweden dust); MAK = Maximum Concentration Value in the Workplace; NCEC = National Chemical Emergency Centre; NFPA = National Fire Protection Association; NTP = National Toxicology Program; OEL = Occupational Exposure Limit; PNOC = Particulates Not Otherwise Classified; PPE = Personal Protective Equipment; REACH = Registration, Evaluation, Authorisation and Restriction of Chemical Substances; RID = Transport of Dangerous Goods by Rail; SADT = Self Accelerating Decomposition Temperature; SCBA = Self Contained Breathing Apparatus; SDS = Safety Data Sheet; STEL = Short Term Exposure Limit; TLV = Threshold Limit Value; TWA = Time Weighted Average; UEL = Upper Explosive Limit; UFL = Upper Flammable Limit; VLA-ED = Valor límite Ambiental de Exposición Diaria (Environmental Exposure Daily Limit Value); VME = valeur limite d'exposition (Occupational Exposure Limits)

**Issue Date:** 21.11.2024

**SDS No.:** NOVA-0031D

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