

MATERIAL SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: LINEAR LOW DENSITY POLYETHYLENE - Grades designated by LL or LLP prefix
Product Description: LLDPE without polymer processing aid, see Section 16 for applicable grades.
MSDS Number: 19889

Intended Use: Coatings, Extrusion and moulding, Film blowing

COMPANY IDENTIFICATION

Supplier: IMPERIAL OIL CHEMICAL
240 4th Avenue S.W.
CALGARY, ALBERTA T2P 3M9 Canada
24 Hour Environmental / Health Emergency Telephone 1-866-232-9563
Transportation Emergency Phone Number 1-866-232-9563
Product Technical Information 800-668-0177

SECTION 2 COMPOSITION / INFORMATION ON INGREDIENTS

No Reportable Hazardous Substance(s) or Complex Substance(s).

SECTION 3 HAZARDS IDENTIFICATION

This material is not considered to be hazardous according to regulatory guidelines see Section 15.

PHYSICAL/CHEMICAL EFFECTS

WARNING: May form combustible dust concentrations in air (during processing/handling). Spilled pellets present a slipping hazard on hard surfaces. Contact with hot material can cause thermal burns which may result in permanent damage. Material can accumulate static charges which may cause an ignition.

HEALTH EFFECTS

If dust is generated, it could scratch the eyes and cause minor irritation to the respiratory tract. When heated, the vapour/fumes given off may cause respiratory tract irritation.

NFPA Hazard ID:	Health: 1	Flammability: 1	Reactivity: 0
HMIS Hazard ID:	Health: 1	Flammability: 1	Reactivity: 0

SECTION 4 FIRST AID MEASURES

INHALATION

At ambient/normal handling temperatures, no adverse effects due to inhalation of dust are expected. In case of adverse exposure to vapours and / or aerosols formed at elevated temperatures, immediately remove the

affected victim from exposure. Administer artificial respiration if breathing is stopped. Keep at rest.

SKIN CONTACT

For hot product: Immediately immerse in or flush affected area with large amounts of cold water to dissipate heat. Cover with clean cotton sheeting or gauze and get prompt medical attention.

EYE CONTACT

Flush thoroughly with water. If irritation occurs, get medical assistance.

INGESTION

No adverse effects due to ingestion are expected.

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO₂) to extinguish flames.

Inappropriate Extinguishing Media: Straight streams of water

FIRE FIGHTING

Fire Fighting Instructions: Assure an extended cooling down period to prevent re-ignition. Evacuate area. Prevent run-off from fire control or dilution from entering streams, sewers or drinking water supply. Fire-fighters should use standard protective equipment and in enclosed spaces, self-contained breathing apparatus (SCBA). Use water spray to cool fire exposed surfaces and to protect personnel.

Unusual Fire Hazards: Explosion: Avoid generating dust; fine dust dispersed in air in sufficient concentration and in the presence of an ignition source is a potential dust explosion hazard.

Hazardous Combustion Products: Smoke, Fume, Incomplete combustion products, Oxides of carbon, Flammable hydrocarbons

FLAMMABILITY PROPERTIES

Flash Point [Method]: N/A

Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D

Autoignition Temperature: N/A

SECTION 6 ACCIDENTAL RELEASE MEASURES

NOTIFICATION PROCEDURES

In the event of a spill or accidental release, notify relevant authorities in accordance with all applicable regulations.

PROTECTIVE MEASURES

Avoid contact with spilled material. 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 (for example, clearing dust surfaces with compressed air). Prevent dust exposure to ignition sources. For example, use non-sparking tools and prohibit smoking, flares, sparks or flames in

immediate area. See Section 5 for fire fighting information. See the Hazard Identification Section for Significant Hazards. See Section 4 for First Aid Advice. See Section 8 for advice on the minimum requirements for personal protective equipment. Additional protective measures may be necessary, depending on the specific circumstances and/or the expert judgment of the emergency responders.

SPILL MANAGEMENT

Land Spill: Spilled pellets present a slipping hazard on hard surfaces. Prevent dust cloud. Small Dry Spills: With clean shovel, place material into clean, dry container and cover loosely; move containers from spill area.

Water Spill: Stop leak if you can do so without risk. Confine the spill immediately with booms. Warn other shipping. Skim from surface

Water spill and land spill recommendations are based on the most likely spill scenario for this material; however, geographic conditions, wind, temperature, (and in the case of a water spill) wave and current direction and speed may greatly influence the appropriate action to be taken. For this reason, local experts should be consulted. Note: Local regulations may prescribe or limit action to be taken.

ENVIRONMENTAL PRECAUTIONS

Prevent entry into waterways, sewers, basements or confined areas. For Large Spills: Cover spill with plastic sheet or tarpaulin to minimise spreading.

SECTION 7

HANDLING AND STORAGE

HANDLING

Minimize dust generation and accumulation. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Dust from material can accumulate electrostatic charges due to friction from transfer and mixing operations and cause an electrical spark (ignition source). Provide adequate precautions to ignition sources, such as electrical grounding and bonding, inert atmosphere or non-sparking tools. However, bonding and grounds may not eliminate the hazard for static accumulation. Consult local applicable standards for guidance. Refer to NFPA 654, Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids and EN 61241, Electrical Apparatus for Use in the Presence of Combustible Dust for safe handling. Avoid elevated temperatures for prolonged periods of time. Eliminate all ignition sources (no smoking, flares, sparks or flames in immediate area). Prevent small spills and leakage to avoid slip hazard. DO NOT handle, store or open near an open flame, sources of heat or sources of ignition. Protect material from direct sunlight. Care should be taken when storing and handling this product. Apart from the specific nature of the polymer product, conditions such as humidity, sunlight and temperature have an influence on the way the product behaves during storage and handling. Special attention should be paid to avoid inappropriate stacking of palletised bags or other package units. Indeed, polymer products may be dimensionally unstable under certain conditions. Avoid conditions generating heat during transfer operations.

Loading/Unloading Temperature: [Ambient]

Transport Temperature: [Ambient]

Transport Pressure: [Ambient]

Static Accumulator: This material is a static accumulator.

STORAGE

The container choice, for example storage vessel, may effect static accumulation and dissipation. Store in a

cool, dry place with adequate ventilation. Keep away from incompatible materials, open flames and high temperatures. Do not store in open or unlabelled containers.

Storage Temperature: [Ambient]

Storage Pressure: [Ambient]

Suitable Containers/Packing: Bulk Containers; Hopper Cars; Bags; Boxes; Drums; Octatiner; Silos

Suitable Materials and Coatings (Chemical Compatibility): Aluminium; Polyethylene Bags

SECTION 8

EXPOSURE CONTROLS / PERSONAL PROTECTION

Exposure limits/standards for materials that can be formed when handling this product: For dusty conditions, ACGIH recommends for insoluble and poorly soluble particles not otherwise specified an 8-hour TWA of 10 mg/m³ (inhalable particles), 3 mg/m³ (respirable particles). Product may also contain varying levels of additives, such as slip and antiblocking agents (talc or silica), antioxidants, stabilizers, and corrosion inhibitors. Certain grades may contain cristobalite, a form of crystalline silica, as an additive that is encapsulated in the polymer. Inhaled crystalline silica in an occupational environment is recognized as a known human carcinogen. However, the potential for release of silica to the air when this polymer is handled has been assessed and the encapsulated silica within the polymer is not expected to pose a health hazard when processed under normal conditions of use.

NOTE: Limits/standards shown for guidance only. Follow applicable regulations.

ENGINEERING CONTROLS

The level of protection and types of controls necessary will vary depending upon potential exposure conditions. Control measures to consider:

Adequate ventilation should be provided so that exposure limits are not exceeded. **SPECIAL PRECAUTIONS:** Should significant vapors/fumes be generated during thermal processing of this product, it is recommended that work stations be monitored for the presence of thermal degradation by-products which may evolve at elevated temperatures (for example, oxygenated components). Processors of this product should assure that adequate ventilation or other controls are used to control exposure. It is recommended that the current ACGIH-TLVs for thermal degradation by-products be observed. Contact your local sales representative for further information. It is recommended that all dust control equipment such as local exhaust ventilation and material transport systems involved in handling of this product are designed and maintained to minimize dust generation and accumulation. Ensure that dust-handling systems (such as exhaust ducts, dusts collectors, vessels, and processing equipment) are designed to minimize the potential for dust ignition and prevent explosion propagation. For example, use explosion relief vents, an explosion suppression system or inert equipment internals. Additional examples of proper equipment include using only appropriately classified electrical equipment and powered industrial trucks.

PERSONAL PROTECTION

Personal protective equipment selections vary based on potential exposure conditions such as applications, handling practices, concentration and ventilation. Information on the selection of protective equipment for use with this material, as provided below, is based upon intended, normal usage.

Respiratory Protection: If engineering controls do not maintain airborne contaminant concentrations at a level which is adequate to protect worker health, an approved respirator may be appropriate. Respirator selection, use, and maintenance must be in accordance with regulatory requirements, if applicable. Types of respirators to be considered for this material include:

Particulate air-purifying respirator approved for dust or oil mist is recommended.

For high airborne concentrations, use an approved supplied-air respirator, operated in positive pressure mode. Supplied air respirators with an escape bottle may be appropriate when oxygen levels are inadequate, gas/vapour warning properties are poor, or if air purifying filter capacity/rating may be exceeded.

Hand Protection: Any specific glove information provided is based on published literature and glove manufacturer data. Glove suitability and breakthrough time will differ depending on the specific use conditions. Contact the glove manufacturer for specific advice on glove selection and breakthrough times for your use conditions. Inspect and replace worn or damaged gloves. The types of gloves to be considered for this material include:

If product is hot, thermally protective, chemical resistant gloves are recommended. If contact with forearms is likely, wear gauntlet style gloves.

Eye Protection: If dusty conditions exist, chemical goggles are recommended.

Skin and Body Protection: Any specific clothing information provided is based on published literature or manufacturer data. The types of clothing to be considered for this material include:

If product is hot, thermally protective, chemical resistant apron and long sleeves are recommended.

Specific Hygiene Measures: Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. Discard contaminated clothing and footwear that cannot be cleaned. Practise good housekeeping.

ENVIRONMENTAL CONTROLS

Comply with applicable environmental regulations limiting discharge to air, water and soil. Protect the environment by applying appropriate control measures to prevent or limit emissions.

SECTION 9

PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Solid
Form: Pellet, Granule, Powder
Colour: Clear to Opaque, White to Off-White
Odour: None to Mild
Odour Threshold: N/A

IMPORTANT HEALTH, SAFETY, AND ENVIRONMENTAL INFORMATION

Relative Density (at 15 °C): 0.9 - 0.95
Bulk Density: 0.4 g/cc at 20°C - 1 g/cc at 20°C
Flash Point [Method]: N/A
Flammable Limits (Approximate volume % in air): LEL: N/D UEL: N/D
Autoignition Temperature: N/A
Boiling Point / Range: N/A
Vapour Density (Air = 1): N/A
Vapour Pressure: N/A
Evaporation Rate (n-butyl acetate = 1): N/A

pH: N/A
Log Pow (n-Octanol/Water Partition Coefficient): N/A
Solubility in Water: Negligible
Viscosity: N/A
Oxidizing Properties: See Hazards Identification Section.

OTHER INFORMATION

Freezing Point: N/D
Melting Point: 115°C (239°F) - 130°C (266°F)
Molecular Weight: > 25000
Hygroscopic: No
Decomposition Temperature: N/D

SECTION 10	STABILITY AND REACTIVITY
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STABILITY: Material is stable under normal conditions.

CONDITIONS TO AVOID: Avoid elevated temperatures for prolonged periods of time.

MATERIALS TO AVOID: Strong oxidizers

HAZARDOUS DECOMPOSITION PRODUCTS: Material does not decompose at ambient temperatures.

HAZARDOUS POLYMERIZATION: Will not occur.

SECTION 11	TOXICOLOGICAL INFORMATION
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ACUTE TOXICITY

<u>Route of Exposure</u>	<u>Conclusion / Remarks</u>
Inhalation	
Toxicity: No end point data for material.	Minimally Toxic. Based on chemical structure (polymers).
Irritation: No end point data for material.	Negligible hazard at ambient/normal handling temperatures.
Ingestion	
Toxicity: No end point data for material.	Minimally Toxic. Based on chemical structure (polymers).
Skin	
Toxicity: No end point data for material.	Minimally Toxic. Based on chemical structure (polymers).
Irritation: No end point data for material.	Negligible irritation to skin at ambient temperatures. Based on chemical structure (polymers).
Eye	
Irritation: No end point data for material.	May cause mild, short-lasting discomfort to eyes. Based on chemical structure (polymers).

CHRONIC/OTHER EFFECTS

For the product itself:

Dust may be irritating to the eyes and respiratory tract.

Elevated temperatures or mechanical action may form vapours, mists or fumes which may be irritating to the eyes and respiratory tract.

Contains:

Additives that are encapsulated in the polymer. Under the normal conditions for processing and use of this polymer the encapsulated additives are not expected to pose any health hazard. However, grinding of the

polymer is not recommended without the use of appropriate measures to control exposure (see Section 8 - Engineering Controls).

CMR Status:

Chemical Name	CAS Number	List Citations
TALC	14807-96-6	3

--REGULATORY LISTS SEARCHED--

1 = IARC 1 3 = IARC 2B 5 = ACGIH A1
2 = IARC 2A 4 = ACGIH ALL 6 = ACGIH A2

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Material -- Not expected to be harmful to aquatic organisms.
Material -- Not expected to be harmful to terrestrial organisms.

MOBILITY

Material -- Low solubility and floats and is expected to migrate from water to the land. Expected to partition to sediment and wastewater solids.

PERSISTENCE AND DEGRADABILITY

Biodegradation:

Material -- Expected to be persistent.

Hydrolysis:

Material -- Transformation due to hydrolysis not expected to be significant.

Photolysis:

Material -- Transformation due to photolysis not expected to be significant.

Atmospheric Oxidation:

Material -- Transformation due to atmospheric oxidation not expected to be significant.

BIOACCUMULATION POTENTIAL

Material -- Potential to bioaccumulate is low.

SECTION 13 DISPOSAL CONSIDERATIONS

Disposal recommendations based on material as supplied. Disposal must be in accordance with current applicable laws and regulations, and material characteristics at time of disposal.

DISPOSAL RECOMMENDATIONS

Suitable routes of disposal are supervised incineration, preferentially with energy recovery, or appropriate recycling methods in accordance with applicable regulations and material characteristics at the time of disposal

SECTION 14	TRANSPORT INFORMATION
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LAND (TDG): Not Regulated for Land Transport

LAND (DOT): Not Regulated for Land Transport

SEA (IMDG): Not Regulated for Sea Transport according to IMDG-Code

AIR (IATA): Not Regulated for Air Transport

SECTION 15	REGULATORY INFORMATION
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WHMIS Classification: Not controlled

This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the (M)SDS contains all the information required by the Controlled Products Regulations.

CEPA: All components of this material are either on the Canadian Domestic Substances List (DSL), exempt, or have been notified under CEPA.

Complies with the following national/regional chemical inventory requirements TSCA

The Following Ingredients are Cited on the Lists Below:

Chemical Name	CAS Number	List Citations
OCTADECANOIC ACID, ZINC SALT (ZINC STEARATE)	557-05-1	6
TALC	14807-96-6	6

--REGULATORY LISTS SEARCHED--

1 = TSCA 4
2 = TSCA 5a2

3 = TSCA 5e
4 = TSCA 6

5 = TSCA 12b
6 = NPRI

Contact Sales / Marketing group for complete chemical inventory listing applicable to product.

SECTION 16	OTHER INFORMATION
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N/D = Not determined, N/A = Not applicable

THIS SAFETY DATA SHEET CONTAINS THE FOLLOWING REVISIONS:

Revision Changes:

Section 06: Protective Measures information was modified.
Section 01: Company Mailing Address information was modified.
Section 09: Bulk Density information was modified.
Section 11: Dermal Lethality Test Data information was modified.
Section 11: Oral Lethality Test Data information was modified.
Section 11: Inhalation Lethality Test Data information was modified.
Section 11: Dermal Irritation Test Data information was modified.
Section 11: Eye Irritation Test Data information was modified.
Section 11: Inhalation Irritation Test Data information was modified.
Section 09: Relative Density - Header information was modified.
Section 08: Eye Protection information was modified.
Section 14: LAND (TDG) - Header information was modified.
Section 11: Inhalation Lethality Test Comment information was modified.
Section 15: National Chemical Inventory Listing - Header information was modified.
Section 16: Materials Covered information was modified.
Section 11: Additional Health Information information was modified.
Section 16: MSN, MAT ID information was modified.
Section 09: Melting Point C(F) information was modified.
Section 11: Tox Table - Header information was modified.
Section 01: Company Contact Methods Sorted by Priority information was modified.
Section 15: List Citation Table - Header information was modified.
Section 09: Decomposition Temperature information was added.
Section 09: Decomposition Temp - Header information was added.
Section 15: Canadian List Citations Table information was added.
Section 11: Chemical Name - Header information was added.
Section 11: CAS Number - Header information was added.
Section 11: List Citation - Header information was added.
Section 11: Tox List Cited Table information was added.
Section 15: Chemical Name - Header information was added.
Section 15: CAS Number - Header information was added.
Section 15: List Citations -Header information was added.

THIS MSDS COVERS THE FOLLOWING MATERIALS: ExxonMobil™ LLDPE resins for which the grade name consists of a base polymer designated by a LL or LLP prefix followed by a suffix referring to an additive package. Applicable designations follow. | Base polymers : | LL 1000S | LL 1001 | LL 1002 | LL 1004 | LL 1015 | LL 1201 | LL 1433 | LL 3000S | LL 3001 | LL 3002 | LL 3003 | LL 3402 | LL 3404 | LL 4004 | LL 5002 | LL 5100 | LL 5202 | LL 5252 | LL 60 | LL 6100 | LL 6101 | LL 6201 | LL 6202 | LL 6235 | LL 6301 | LL 6407 | LL 8360 | LL 8446 | LL 8450 | LL 8460 | LL 8501 | LL 8555 | LLP 8360 | LLP 8450 | LLP 8460 | LLP 8501 | LLP 8555 | Possible additive packages : | 09 | 17 | 19 | 21 | 24 | 25 | 28 | 29 | 32 | 38 | 39 | 48 | 67 | 80 | 82 | EL | KA | KI | KW | RQ | X29 | X31 | X59 | X72 | X74 | X75 | X76 | XR | XV | YB | ZB | ZZ

WHMIS Classification: Not controlled

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