Technical Data Sheet

Material Identification	
Trade Name	4ocean Plastic-HDPE
4ocean Code	HDPE-NH100
Chemical Name	High Density Polyethylene
Origin	Haiti

Material Properties		
Property	**Nominal Value**	**Standard**
Color	Translucent Dark Yellow	-
Solid Density	951.95 kg/m3	ASTM D792-20
Moisture Content	0.026 %	ISO 15512
Melt Flow Rate	0.3 g/10min	ASTM D1238 (Load 2.16kg)
Hardness	68 Shore D	ASTM D2240
Mechanical Properties		
Izod Impact Resistance	347 J/m	ASTM D256-10
Tensile Strength	21.9 Mpa	ASTM D638
Tensile Modulus	902 MPa	
Tensile Elongation	15.9%	
Flexural Strength	22.8 MPa	ASTM D790
Flexural Modulus	742 Mpa	
Flexural Strain @ Yield	7.67%	

Safety Data Sheet

According to OSHA HCS 2012 (29 CFR 1910.1200)

4ocean Plastic™- HDPE

Section 1. Identification

Product Identifier High Density Polyethylene (HDPE) resin

Product type Plastic Pellets

Recommended use of the chemical and restrictions to use
Molded and extruded plastic articles

Supplier's details
4ocean Public Benefit Corporation
3600 FAU Blvd
Boca Raton, FL 33431
(561)270-0650
info@4ocean.com

Emergency telephone number (561)270-0650

Section 2. Hazards Identification

Primary Routes of Exposure Eyes or skin contact

Inhalation Health injuries not expected. Not a probable route of exposure under ordinary conditions.

Skin contact Health injuries not expected. Possible mechanical irritation.

Eye contact Health injuries not expected. Possible mechanical irritation from dust.

Ingestion Health injuries not expected. Not a probable route of exposure.

Chronic effects Ongoing exposure may aggravate acute effects

Carcinogenicity See Section 11

Signal word: Warning

Hazard statements: May form combustible dust concentrations in air.

Hazards not otherwise classified:

COMBUSTIBLE DUSTS. If small particles are generated during processing, handling, or by any other means, combustible dust concentrations in air may form. Fine dust clouds may form explosive mixtures with air. Combustible dust hazard is posed only by particle size. All additive materials (monomers, additives and pigment) are totally encapsulated within the resin and cannot be released in pure form and are not a component of the combustible dust hazard.

MECHANICAL IRRITANT. Handling and/or processing of this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose and throat.

This material is not hazardous by OSHA communication definition.

Section 3. Composition/Information on Ingredients

Substance/mixture Polyethylene Plastic

Common name and synonyms HDPE, high density polyethylene

CAS number/other identifiers **9002-88-4**

Ingredient name	Concentration (%)	CAS number
Ethene homopolymer	0-99	9002-88-4
Additives	0-5	

Proprietary Concentrations shown as ranges are to protect confidentiality or due to product variation.

Section 4. First Aid Measures

Description of necessary first aid measures

Eye contact Health injuries not expected. Possible mechanical irritation from dust or powder.

Immediately flush eyes with plenty of water, continuing to rinse for at least 10 minutes. Occasionally lift the upper and lower eyelids. Remove any contact lenses. If redness or pain persists, seek medical attention.

Inhalation Health injuries not expected. Not a probable route of exposure under normal conditions.

Solid material is not likely to be hazardous by inhalation. If symptoms persist, seek medical attention.

If affected by fumes from heated material, remove affected person from source of exposure and move into fresh air. If not breathing, provide artificial respiration. If breathing is difficult, administer oxygen. Seek medical attention.

Skin contact Health injuries not expected. Possible mechanical irritation.

Solid, cool material contact: wash with soap and water.

If burned by contact with hot material, immediately flush skin with large amounts of cold water, submerging in cold water if possible to dissipate the heat. Do not attempt to detach polymer adhering to the skin. Do not attempt to remove clothing attached with molten material. Seek immediate medical attention for thermal burns.

Ingestion Health injuries not expected. Not a probable route of exposure.

If in the unlikely event that ingestion occurs, follow common guidelines for ingestion first aid. Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Seek medical attention if adverse health effects persist or are severe. If unconscious, place in recovery position and seek immediate medical attention. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Section 5. Fire-Fighting Measures

Suitable extinguishing media Water fog, dry chemical powder, carbon dioxide (CO_2) or foam, sand or earth as appropriate for material in surrounding fire. Carbon dioxide may displace oxygen; use caution when applying CO_2 in a confined space.

Unsuitable extinguishing media Water jet. Avoid using direct streams of water on molten burning material to avoid\ scattering the material and spreading fire.

Specific hazards arising from the chemical

Possibly combustible at high temperature.

Material melts in proximity to fire, which may result in slippery surfaces. Static charges on solid or melted materials may ignite combustible atmospheres.
Airborne dusts of this material in an enclosed space and the presence of an ignition source may pose an explosion hazard. Consult NFPA Bulletin 654, “Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids,” for safe handling procedures. As with any fire, wear NIOSH/MSHA approve positive pressure self-contained breathing apparatus and full protective clothing.

Hazardous thermal decomposition products

Decomposition products may include the following materials:
carbon dioxide carbon monoxide
low molecular weight oligomers (C6-18) of polyethylene

The major decomposition products. Degradation products may include trace amounts of acrolein, formaldehyde, acetaldehyde, acetone, acetic acid, formic acid, and other organic vapors.

Special protective equipment for fire-fighters

Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel

Take no action involving any personal risk or without suitable training. Evacuate surrounding areas. Prevent any unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Shut off and avoid all ignition sources. Allow no flares, smoking or flames in hazard area. Avoid breathing dust. Provide adequate ventilation. Wear appropriate respirator when ventilation is not adequate. Wear appropriate personal protective equipment.

For emergency responders

If specialized clothing is required to deal with spill, take note of any information in Section 8 on suitable and unsuitable materials. See also above information in "For non-emergency personnel".

Environmental precautions

No special environmental precautions required. Avoid dispersal of spilled material in runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air). Use water sparingly to minimize the environmental contamination.

Methods and materials for containment and cleaning up

Remove containers from spill area. Use spark-proof tools and explosion-proof equipment. Vacuum, sweep up, or gather material and place in a designated, labeled waste container. Pellets spilled on the floor can present a slipping hazard on hard surfaces. Remove containers from spill area.

Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Avoid creating dusty conditions and prevent wind dispersal.

Section 7. Handling & Storage

Precautions for safe handling

Protective measures

Wear appropriate personal protective equipment (see Section 8). Do not ingest. Avoid contact with eyes, skin and clothing. Avoid breathing dust. Avoid the creation of dust when handling and avoid any possible sources of ignition (spark or flame). Prevent dust accumulation. Use only with adequate ventilation. Wear appropriate respirator when ventilation is not adequate. Keep in original container or an approved alternative made from a compatible material. Keep tightly closed when not in use. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. To avoid fire or explosion, take precautionary measures against electrostatic discharges. Dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material. Empty containers may retain product residue and can be hazardous. Explosion hazards apply only to dusts, not pellet forms of this product.

Minimize dust generation and accumulation. Pneumatic conveying of pellets can generate large static electrical charges due to friction from transfer and mixing operations. Electrical discharge in presence of air can cause an explosion. Routine housekeeping should be instituted to ensure that dusts do not accumulate on surfaces. Electrical equipment and lighting should be protected to appropriate standards to prevent dust coming into contact with hot surfaces, sparks or other ignition sources. Fine dust clouds may form explosive mixtures with air. To avoid fire or explosion, dissipate static electricity during transfer by grounding and bonding containers and equipment before transferring material, using inert atmosphere, and non-sparking tools. 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.

Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in a segregated and approved area, in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Eliminate all ignition sources. Keep separate from oxidizing materials. Store only in approved containers. Keep container tightly closed and sealed until ready for use. Protect material from direct sunlight. Care should be taken when storing and handling this product.

Loading/Unloading Temperature: Ambient

Storage Temperature & Pressure: Ambient

Transport Temperature & Pressure: Ambient

Static Accumulator: Yes

Suitable Containers/Packing: Bulk Containers; Hopper Cars; Bags; Boxes; Drums; Silos
Suitable Materials and Coatings (Chemical Compatibility): Aluminum, Wood and Paper Board, Polyethylene Bags

Section 8. Exposure Controls/Personal Protection

Control parameters
Occupational exposure limits

Ingredient name	Exposure limits	
Polyethylene Copolymer with ethylene	**ACGIH TLV (United States).** Particulates Not Otherwise Specified TWA Total: 10 mg/m³ 8 hours Particulates Not Otherwise Specified TWA Respirable Fraction: 3 mg/m³ 8 hours hours	**OSHA PEL (United States).** Particulates Not Otherwise Specified TWA Total: 15 mg/m³ 8 hours Particulates Not Otherwise Specified TWA Respirable Fraction: 5 mg/m³ 8
Polyethylene	**ACGIH TLV (United States).** Particulates Not Otherwise Specified Otherwise Specified TWA Total: 10 mg/m³ 8 hours	**OSHA PEL (United States).** Particulates Not TWA Total: 15

mg/m³ 8 hours Particulates Not Otherwise Specified Particulates Not Otherwise Specified
TWA Respirable Fraction: 3 mg/m³ 8 hours TWA Respirable Fraction: 5 mg/m³ 8 hours

Appropriate engineering controls Use only with adequate ventilation. General room ventilation is adequate for storage and ordinary handling. If operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below recommended or regulatory limits. The engineering controls also need to keep gas, vapor or dust concentrations below any lower explosive limits. Use explosion-proof ventilation equipment.

Environmental exposure controls Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Eye/face protection Wear coverall chemical splash goggles when the possibility exists for eye or face contact from airborne material. Wear a face shield when working with molten material.

Protective clothing If there is potential for contact with hot/molten material, wear heat-resistant impervious clothing and footwear. Special protective clothing is not needed for normal use. Gloves are recommended as good industrial practice.

Respiratory protection **R**espirators are not needed for normal use. Where airborne concentrations are expected to exceed exposure limits, a NIOSH approved respirator should be selected based on the form and concentration of the contaminant in air and in accordance with the OSHA Respiratory Protection Standard (29 CFR 1910.134).

Recommended Decontamination Facilities Eyewash station, washing facilities.

Section 9. Physical & Chemical Properties

Appearance			
Physical state, color	Translucent Beige Pellets	**Bulk Density**	Variable
Odor	Mild	**Vapor pressure**	Not applicable
Odor threshold	Not available	**Vapor density (Air = 1)**	Not applicable
pH	Not available	**Specific Gravity (@ 23°C)**	Not available
Melting point	108-138°C (220-280°F)	**Solubility (H_2O)**	Insoluble (cold or hot)
Boiling point	Not available	**Partition coefficient: noctanol/ Water**	No data
Flash point	650-750°F		
Evaporation rate	Not applicable	**Auto-ignition temperature**	700-850°F
Flammability (solid, gas)	May ignite	**Lower and upper explosive (flammable) limits**	Not available
Decomposition temperature	No data	**Viscosity**	Not available

Section 10. Stability & Reactivity

Reactivity Stable under normal conditions of storage or use. No specific test data related to reactivity available for this product or its ingredients.

Chemical stability The product is stable under normal conditions of storage and use.

Possibility of hazardous Reactions Under normal conditions of storage and use, hazardous reactions not anticipated. Under normal conditions of storage and use, hazardous polymerization will not occur.

Avoid strong oxidizing agents. Avoid processing material over 329ºC (625ºF).

Incompatibility

Conditions to avoid May react with strong oxidizing agents. Organic solvents, ether, gasoline, lubricating oils, chlorinated hydrocarbons and aromatic hydrocarbons may react with and degrade polyethylene. Avoid exposure to open flame or exceeding recommended processing conditions. If heated to more than 650°F, the product may form vapors or fumes which could cause irritation of the respiratory tract, coughing, and shortness of breath. Avoid the creation of dust-air mixtures when handling and avoid all possible sources of ignition (spark or flame). To avoid fire or explosion, avoid static charge buildup by dissipating static electricity during transfer by grounding and bonding containers and equipment before transferring material. Avoid contact with incompatible materials.

Incompatible materials Reactive or incompatible with the following materials:
oxidizing materials and agents or amines

Hazardous decomposition Products Material does not decompose at ambient temperatures. Burning can produce carbon monoxide and/or carbon dioxide and other harmful products. The major decomposition products are oxides of carbon, water vapor, trace low molecular weight hydrocarbons.

Section 11. Toxicological Information

Information on the likely routes of exposure Oral, Dermal, Inhalation, Eyes.

Information on Toxicological Effects

Acute Toxicity	Hazard	LC50/LD50 Data
Inhalation	Unlikely to be harmful	>5 mg/L (dust, estimated)
Dermal	Unlikely to be harmful	>2 g/kg (estimated)
Oral	Unlikely to be harmful	>5 g/kg (estimated)

Specific target organ toxicity No information available on the mixture, however none of the components have been classified for target organ toxicity (or are below the concentration threshold for classification).

Potential acute health effects

Eye contact Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the eyes.

Inhalation Exposure to airborne concentrations above statutory or recommended exposure limits may cause irritation of the nose, throat and lungs.

Skin contact No known significant effects or critical hazards.

Ingestion No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact Adverse symptoms may include the following:
Irritation, redness

Inhalation Adverse symptoms may include the following:
respiratory tract irritation, coughing

Skin contact No specific data

Ingestion No specific data

Potential chronic health effects Repeated or prolonged inhalation of dust may lead to chronic respiratory irritation.

Mutagenicity
Conclusion/Summary: No component of this product at levels greater than or equal to 0.1% is classified by established regulatory criteria as a mutagen.

Carcinogenicity
Conclusion/Summary: Neither this product, nor its components at concentrations greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

Reproductive toxicity
Conclusion/Summary: No known significant effects or critical hazards.

Teratogenicity
Conclusion/Summary: No component of this product at levels greater than or equal to 0.1% is classified by established regulatory criteria as teratogenic or embryotoxic.

Section 12. Ecological Information

Ecotoxicity
Conclusion/Summary: No known or expected ecotoxicity. Wildlife may ingest plastic pellets or materials. Although not toxic, such materials may physically block the digestive system, causing starvation or death. Polyethylene is an essentially biologically inert solid. It is considered non-toxic and stable, and therefore does not decompose in landfills or aquatic systems.

Persistence and degradeability
Biodegradation: More than 99% of material will remain intact after exposure to microbes.
Hydrolysis: Transformation due to hydrolysis not expected to be significant.
Photolysis: Material will embrittle in the presence of sunlight, but not completely break down.
Atmospheric Oxidation: Transformation due to atmospheric oxidation not expected to be significant.

Mobility in soil
Soil/water partition coefficient (K_{OC}) Not available. Polyethylene has not been found to migrate through soils.

Mobility This product is not likely to move rapidly with surface or groundwater flows because of its low water solubility. If released to waterways, polyethylene pellets float. Product should be recovered from land or waterways following spills.

Section 13. Disposal Considerations

Whenever possible, this material should be recycled. Please see www.plasticsrecycling.org/ for extensive information on recycling PET and other polymer products.

Wherever possible, the generation of waste should be avoided or minimized.

DO NOT ATTEMPT TO DISPOSE OF BY UNCONTROLLED INCINERATION. Open burning of plastics at landfills

is not acceptable.

Disposal of this product and its by-products should be in compliance with the requirements of environmental protection, waste disposal legislation and any regional local authority at all times.

Section 14. Transport Information

Land: US D.O.T. 49 CFR 172.101:	Not regulated as a hazardous material for land transport
Land: Canadian TDG:	Not regulated as a hazardous material for land transport
UN Proper Shipping Name/Number:	Not regulated
Sea: IMDG:	Not regulated as a hazardous material for sea transport
Air: IATA and IACO:	Not regulated as a hazardous material for air transport

Section 15. Regulatory Information

U.S. Federal regulations

EPA Storm Water Regulations: Resin pellets are classified as “significant materials” and should be prevented from entering drains, ditches, basements, or waterways. Site emission reporting may be required, so please check applicable regulations.

OSHA HAZARD COMMUNICATION STANDARD: This material is not classified as hazardous in accordance with OSHA 29 CFR 1910.1200, if used for its intended purposes.

CWA / OPA: Plastic pellets are defined by the US EPA under the Clean Water Act (40CFR122.26) as a "significant material" which requires any industrial plant that may expose pellets to storm water to secure a storm water permit. Violations of the rule carry the same penalties as other Clean Water Act violations. Pellets found in storm water runoff are subject to EPA regulations with the potential for substantial fines and penalties.

California Proposition 65:
This material has not been tested for any chemicals which are known to the State of California to cause cancer, birth defects or other reproductive harm at concentrations that trigger the warning requirements of California Proposition 65.

Section 16. Other Information

Dust Hazard Publications
Polyethylene fines and dust particles have been listed as a Class I combustible dust by the National Fire Protection Association in NFPA-68, Table E.1(e)). For information on minimizing potential dust and fire hazards and controlling static, please refer to NFPA- 654 "Standard for the Prevention of Fire and Dust Explosions in Chemical, Dye, Pharmaceutical and Plastics Industries."

National Fire Protection Association (U.S.A.) NFPA
704 Hazard Class Health: 0 **Flammability:** 1
Instability: 0

1 (Minimal)
2 (Slight)
3 (Moderate)
4 (Serious)
5 (Severe)

Reprinted from NFPA 704-2001, Identification of the Hazards of Materials for Emergency Response

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