

From: John Osborne <John.Osborne@gza.com>
Sent: Monday, August 26, 2019 3:21 PM
To: Stoltz, Carrie R - DNR
Cc: Bob Scarcelli (bscarcelli@charternex.com)
Subject: Response to July 25, 2019 Correspondence related to Rhinelander Municipal Well No. 7; BRRTS # 02-44-584094
Attachments: FINAL 20.0156342.00 Response to Request for Information_Rhinelander WI 8-26-19.pdf

Greetings Carrie:

In a letter dated July 25, 2019 you requested Charter NEX at 3606 Red Arrow Drive in Rhinelander, WI provide to the Wisconsin Department of Natural Resources information related to its operations in response to the detection of PFAS in Rhinelander Municipal Well No. 7. GZA GeoEnvironmental, Inc., (GZA) has worked with Charter NEX staff to compile and review relevant information and prepare the attached letter with supporting documentation for your review.

Please feel free to reach out to me with any questions. We would appreciate you confirming receipt of this letter.

Thank you,

John

John C. Osborne, P.G.
Principal Hydrogeologist/ Senior Vice President
GZA | 20900 Swenson Drive, Suite 150| Waukesha, WI 53186
Direct: 262-754-2590 | Cell: 262-424-2042 | john.osborne@gza.com | www.gza.com

GEOTECHNICAL | ENVIRONMENTAL | ECOLOGICAL | WATER | CONSTRUCTION MANAGEMENT

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August 26, 2019
File No. 20.0156342.00

Ms. Carrie Stoltz, Hydrogeologist
Wisconsin Department of Natural Resources
107 Sutliff Avenue
Rhineland, Wisconsin 54501-3349

Subject: Response to Request for Information Related to Rhineland Municipal Well No. 7
3606 Red Arrow Drive
Rhineland, Wisconsin
BRRS No. 02-44-584094

Dear Mrs. Stoltz:

GZA GeoEnvironmental, Inc. (GZA) is pleased to present this document on behalf of Charter NEX Films (Charter NEX), located at 3606 Red Arrow Drive in Rhineland, Wisconsin ("Site"), in response to a request issued by the Wisconsin Department of Natural Resources (WDNR), dated July 25, 2019 ("Letter Request"). Please note that this report is subject to the Limitations provided in Attachment 1.

BACKGROUND

We understand that testing of the City of Rhineland municipal well No. 7 ("Well No. 7") during 2019 has resulted in the detection of per- and polyfluoroalkyl substances (PFAS) during two sampling events. The WDNR is seeking evidence for the source of the PFAS detections and has reached out to Charter NEX largely based on its physical proximity to impacted Well No. 7. Based on the correspondence, the WDNR is investigating whether Charter NEX or past property users or occupants may potentially be responsible for causing or contributing to the PFAS impacts observed at Well No. 7. GZA, with the assistance of Charter NEX staff, has compiled this correspondence with supporting information to assist in evaluating the likelihood of Charter NEX property contributing to the PFAS detections in Well No. 7.

GZA understands that the City of Rhineland municipal wells were voluntarily sampled and tested on May 30, 2019, in response to a citizen question regarding the City's drinking water. Samples were collected by the Wisconsin State Lab of Hygiene. Sample results indicated that PFAS was detected in water from Well No. 7 at a level above the United States Environmental Protection Agency's (USEPA) lifetime health advisory level of 70 nanograms per liter (ng/L) and the Wisconsin Department of Health Services-proposed groundwater level (20 ng/L). The two constituents detected in Well No. 7 were perfluorooctanoic acid (PFOA), which was detected at 25.2 parts per trillion (ppt) and perfluorooctanesulfonic acid (PFOS), which was detected at 79.6 ppt. The PFAS level (total PFAS) for Well No. 7 was 104.8 ppt for the May 30, 2019 sample. Subsequently, the Rhineland Water and Wastewater Utility shut down Well No. 7 on June 24, 2019. The water from Well No. 7 was tested again on June 27, 2019, and resulted in a total PFAS concentration of 86.9 ppt.

Another local source of water, Crescent Town Spring, located on South River Road approximately 2 miles southeast of Well No. 7 and approximately ¾-mile southeast of the Site, was also tested for PFAS in late July 2019. According to the Town of Crescent website, the test results indicated



a significantly elevated level of perfluorohexanesulfonic acid (PFHxS) and the Oneida County Health Department has recommended not drinking the spring water. Sample results from the Crescent Town Spring indicate a detection of 92.6 ppt for PFHxS.

To assist the WDNR in its review, the following document provides background information on the Site, the use of the Site by Charter NEX, historical use of the Site, and our present knowledge of the storage, use, and waste streams associated with the Site, as presented below.

SITE INFORMATION

Site Location

The Site, consisting of one parcel, is located at 45.623° North latitude and -89.463° West longitude in the City of Rhinelander, Oneida County, Wisconsin. A Site Location Map is provided as Figure 1.

Site Description

Based on information obtained from the Oneida County GIS website, the Site is made up of following tax parcel:

Parcel Number/PIN	Parcel Address	Parcel Size
RH 9011-0801	3606 Red Arrow Drive	8.04 Acres

The approximately 8-acre Site is improved with one approximately 74,500 square-foot building, consisting of office, manufacturing, and warehouse areas. A paved parking lot and driveway are located east, south, and southwest of the building. An unpaved driveway encircles the building to the north and northwest. The undeveloped portions of the Site to the southeast and northwest are primarily wooded. A railroad siding is located adjacent to the northern and eastern Site boundaries. A figure showing the location of the Site and Well No. 7 is provided as Figure 2.

Current Site Use

The Site is currently used as a manufacturing facility for plastic film. Charter NEX occupies the building, which consists of office, production, and warehouse areas, and raw material and finished product storage areas. Charter NEX processes polymer pellets into plastic sheeting and thin films using a blown extrusion process. The plastic films produced at the Site are the raw components for films used in the food packaging and medical industries. It is important to note that these plastic films do not contain grease or oil-resistant layering or surface applications, but instead are the raw films utilized by many packaging manufacturers for their specific packaging needs. The property is listed on the Oneida County Land Records as being owned by American Plastics Co. Inc.

Adjoining Property Uses

The following properties about the Site:

Direction	Property Description
North	The Soo Line Railroad, beyond which is the Rhinelander Oneida County Airport.
East	A railroad siding, beyond which are residential properties.
South	Highway 8, beyond which is an industrial building operated by Lake Shore Systems (manufactures and fabricates heavy equipment used in the maritime and mining industries). Beyond the Lake Shore Systems property, the land is undeveloped and primarily owned by Hodag Sports Club.
West	A property owned and operated by Kerry Inc., which manufactures and transports dry goods, food products, and condiments. Approximately ½-mile west of the Site are additional industrial operations operated by Ponsse USA (manufactures heavy equipment for forestry), Laser Pros International (manufactures laser printer parts), and Advanced Barrier Extrusion (manufactures plastic films).



Site Utilities

The City of Rhinelander provides potable water and sanitary sewer services to the Site and Wisconsin Public Service provides electrical and natural gas services to the Site.

ENVIRONMENTAL SETTING

The following subsections provide information regarding the general physiographic, hydrologic, and soil conditions in the area of the Site.

Topography and Surface Water Characteristics

Based on a review of the Lake Julia Quadrangle, Wisconsin United States Geological Survey (USGS) Topographic Map (1982), the ground surface elevation at the Site ranges from approximately 1,600 to 1,610 feet above mean sea level (msl). The nearest water bodies are small ponds and wetlands named Twin Lakes, located approximately 1,200 feet northeast of the Site. Heal Creek is located approximately 2,100 feet west of the Site at an elevation of approximately 1,550 feet msl. The Wisconsin River is also located approximately ¾-mile east of the Site at an elevation of approximately 1,525 feet msl. Local area topography is presented on Figure 1.

Geology and Groundwater Characteristics

Based on a review of construction reports for water wells located within approximately ¼-mile of the Site and a depth to bedrock map of Wisconsin, bedrock is expected to be present at a depth ranging from approximately 130 to 200 feet below ground surface (bgs) in the Site vicinity. Unconsolidated deposits, primarily consisting of sand and gravel are underlain by Precambrian-age metavolcanic bedrock.

Based on a review of Site area topography and surface water hydrology, groundwater is expected to be encountered at the Site ranging from approximately 20 to 40 feet bgs, resulting in a water elevation of about 1,570 feet msl. Water well construction reports within 1 mile of the Site typically list groundwater levels between 20 and 50 feet bgs. Regional groundwater flow direction at the Site is expected to be southeast, influenced to the greatest degree by the Wisconsin River located southeast of the Site as the regional groundwater discharge feature. The River is located approximately 3,500 feet to the southwest with an approximately 80 feet of elevation change.

Well No. 7 is located approximately 1.1 miles northwest of the Site at an elevation of approximately 1,610 feet msl. Groundwater flow near Well 7 appears to primarily be southeast toward wetlands associated with Hoist Lake, located approximately ¼-mile southeast of Well No. 7. Based on a review of the well construction log, Well No. 7 was installed in 2008 to a depth of 88 feet bgs and was recorded to have a static water level of 17 feet bgs. Well No. 7 is screened in the sand and gravel aquifer from approximately 60 to 88 feet bgs with a static water elevation of approximately 1,593 feet msl.

HISTORICAL USE INFORMATION

Site and Area History Summary

Based on review of available topographic maps, aerial photography, and documents provided by Charter NEX, GZA has put together a brief history of the Site. The Site and Site vicinity remained undeveloped, with the exception of the Soo Railroad Line in the early 1900s. The Rhinelander Oneida County Airport, located north of the Site, and Highway 8, located south of the Site, were constructed in the 1950s. Based on a review of maps and aerial photographs, the Site building was likely constructed in the early 1990s. A 1992 aerial photograph shows that the southeastern portion of the current building was constructed on the Site. A deed dated May 8, 1993, shows that the American Real Estate Corporation took ownership of the parcel from the City of Rhinelander and began operating as American Plastics. In 2005, Appleton Papers acquired American Plastics until 2010, when it was acquired by the private equity firm of Mason Wells and then ultimately combined with NEX Performance Films to form Charter NEX Films. Subsequent ownership changes followed in 2012, including the



private equity firm of Pamplona Capital Management, LLP and the 2017 acquisition by Leonard Green & Partners, LP. Through these ownership changes, Site operations and manufacturing processes remained essentially unchanged.

The Site building has been used by American Plastics/Charter NEX Films since 1993. Additions to the northwest part of the Site building occurred pre-1998 and again between 2008 and 2010.

Historic Topographic Map Review

GZA reviewed a set of topographic maps gathered from the USGS Historical Topographic map explorer website. Topographic maps dated 1940, 1949, 1954, 1959, 1966, 1982, and 1989, included the Site area and were reviewed. The topographic maps indicated the following features:

- 1940 and 1949 - The Soo Line Railroad is present north of the Site. Highway 8 has not yet been constructed and the Site vicinity is primarily undeveloped. Wetlands are present northeast and southwest of the Site.
- 1954, 1959, and 1966 - The Rhinelander Oneida County Airport first appears on the 1954 topographic map. Highway 8 has been constructed south of the Site. The Site vicinity remains undeveloped.
- 1982 and 1989 - No buildings are shown constructed on the Site. A few residential buildings are shown approximately 750 feet southeast and northeast of the Site. Fox Ranch Road has been constructed approximately $\frac{3}{4}$ -mile west of the Site; however, the topographic map does not show the presence of any structures that may be associated with Well No. 7.

Aerial Photograph Review

GZA reviewed aerial photographs dated 1938, 1992, 1998, 2005, 2008, 2010, and 2015. The aerial photographs indicated the following features:

- 1938 - The Site and surrounding areas are not developed. The Soo Rail line is present north of the Site. The Site vicinity is primarily forested, with some agricultural land use approximately $\frac{3}{4}$ -mile northeast of the Site.
- 1992 - A building is present on the Site, which comprises the southeastern portion of the current building footprint. Some residential buildings have been constructed east of the Site along Highway 8. Another large commercial/industrial building has been constructed approximately 750 feet southwest of the Site. No other industrial buildings are present west of the Site.
- 1998, 2005, 2008, 2010, and 2015 - The building has a large addition on the northwest side in the 1998 aerial photograph and a smaller addition on the northwest side is also visible in the 2010 aerial photograph. New industrial/commercial buildings have been constructed within 1 mile west of the Site in the 2005 aerial photograph.

MANUFACTURING PROCESS REVIEW

The film manufacturing process conducted by Charter NEX involves a blown extrusion process to produce high-performance polyethylene films. The extrusion process utilized at the Site includes the following:

- The polymer material starts in a pellet form, during which the pellets are successively compacted and melted to form a continuous, viscous liquid. This molten plastic is then forced, or extruded, through an annular die.
- Air is injected through a hole in the center of the die and the pressure causes the extruded melt to expand into a bubble. The air entering the bubble replaces air leaving it so that even and constant pressure is maintained to ensure uniform thickness of the film.
- The bubble is pulled continually upwards from the die and a cooling ring blows air onto the film. The film can also be cooled from the inside using internal bubble cooling. This reduces the temperature inside of the bubble, while maintaining the bubble diameter.



- At a critical temperature point, solidification occurs and the film moves into a set of nip rollers, which collapse the bubble and flatten it into two flat film layers. The puller rolls pull the film onto windup rollers. The film passes through idler rolls during this process to ensure that there is uniform tension in the film. Between the nip rollers and the windup rollers, the film may pass through a treatment center, depending on the application. During this stage, the film may be slit to form one or two films.

To confirm the raw materials used in manufacturing at the Site, Charter NEX provided seven Safety Data Sheets (SDSs) for polymer/resin products. The polymer products and key attributes are summarized in Table 1 and the SDSs are provided in Attachment 2. The SDSs indicate that a byproduct of thermal decomposition of the pelleted polymers can be low molecular weight hydrocarbons, alcohols, aldehydes, acids, and ketones. To further evaluate these products for the potential to contain PFAS, GZA contacted the product manufacturers for additional information. In response, Dow Chemical provided its Regulatory Data Sheets on each of its materials. The data sheets indicated that the product “is not intentionally manufactured or formulated to contain...Perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS) or perfluoroalkyls” with the caveat that it has not specifically analyzed for these compounds. Furthermore, it is Charter NEX’s understanding that none of the raw materials or any by-products are designed to contain PFAS. A sample regulatory data sheet is provided in Attachment 3.

ENVIRONMENTAL HISTORY OF THE SITE

Charter NEX has provided GZA with a document dated January 6, 2000, generated by Great Lakes Realty Advisory Group, which reports the results of a property inspection and appraisal for the Site. The inspection document indicates that “No architectural or engineering study, property survey, soil study, or environmental investigation has been made” for the Site property up to that time period.

Charter NEX also provided GZA a copy of a document titled, “Environmental Compliance Assessment,” dated May 2006, authored by Brown and Caldwell, based on its environmental compliance assessment of the Site on May 11, 2006. The stated objective of the work was to determine the Site’s compliance with applicable federal, state, and local environmental regulations. The assessment notes that waste streams produced in the blow extrusion process utilized at the Site include air emissions (ozone), a water bath which overflows to the sanitary sewer noting that the extruded film passes through water bath of potable water after it is blown and solidified), scrap film, and used gear oil. The assessment also reports that plastic resin pellets are stored in 10 resin silos. The resin pellets are delivered on a weekly basis by rail. A closed loop non-contact cooling water system operates at the Site to cool the processing equipment. A 500-gallon reserve propylene glycol tank is located at the chiller and a 1,000-gallon propylene glycol underground storage tank (UST) associated with the cooling system is located near the silos in the northeastern portion of the building. Charter NEX reported that the USTs are presently in use as described above.

A review of the WDNR’s RR Sites map indicates that the Site has not currently or historically been the focus of an environmental study. The closest BRRS listing to the Site was from the Rhinelander Oneida County Airport, located just north of the Site. GZA also checked the Wisconsin Department of Agriculture, Trade, and Consumer Protection (DATCP) storage tank database and no tanks were listed for the Site. Also, the Site was not listed on the WDNR Solid and Hazardous Waste Information System (SHWIMS) database.

CONCLUSIONS

Charter NEX and its precursor companies operating at the Site have been consistently involved with blown plastics extrusion operations since the first development of the Site in about 1993. Polymer pellets are used as raw material and reformed into films that are processed in rolls and sent off the Site as component materials for other more advanced packaging operations. Charter NEX does not coat or treat any of its films or receive recycled plastics where quality control and extreme variation of raw material composition would occur. None of the polymers utilized currently or in the past are formulated to contain PFAS. Also, very little waste is generated, and that waste is in the form of excess plastic sheeting.



Furthermore, the waste streams involving this operation are limited to a relatively small volume of non-contact cooling water, water bath overflow that enters the sanitary sewer system, and excess plastic sheeting. In GZA's opinion, based on the raw material, product, and waste handling processes used at the Site, there appears to be no evidence of the use or potential discharge of airborne, water-based, or other materials containing PFAS at the Site. Additionally, from a hydrogeologic standpoint, the Site groundwater is expected to flow in a southeasterly direction toward the Wisconsin River and away from the location of Well No. 7.

We hope you find our information responsive to your requests. Should you have any questions or comments, please feel free to contact the undersigned at (262) 754-2560.

Very truly yours,

GZA GeoEnvironmental, Inc.

A handwritten signature in blue ink, appearing to read "Elizabeth Stapleton Yu".

Elizabeth Stapleton Yu
Assistant Project Manager/Hydrogeologist

A handwritten signature in blue ink, appearing to read "Bernard G. Fenelon".

Bernard G. Fenelon, P.G.
Senior Consultant/Reviewer

A handwritten signature in blue ink, appearing to read "John C. Osborne".

John C. Osborne, P.G.
Senior Principal Hydrogeologist

J:\156300to156399\156342 Rhinelander\Report\FINAL 20.0156342.00 Response to Request for Information_Rhinelander WI 8-26-19.docx

Attachments

cc: Mr. Bill Dowing, Charter NEX
Mr. Bob Scarcelli, Charter NEX



TABLES

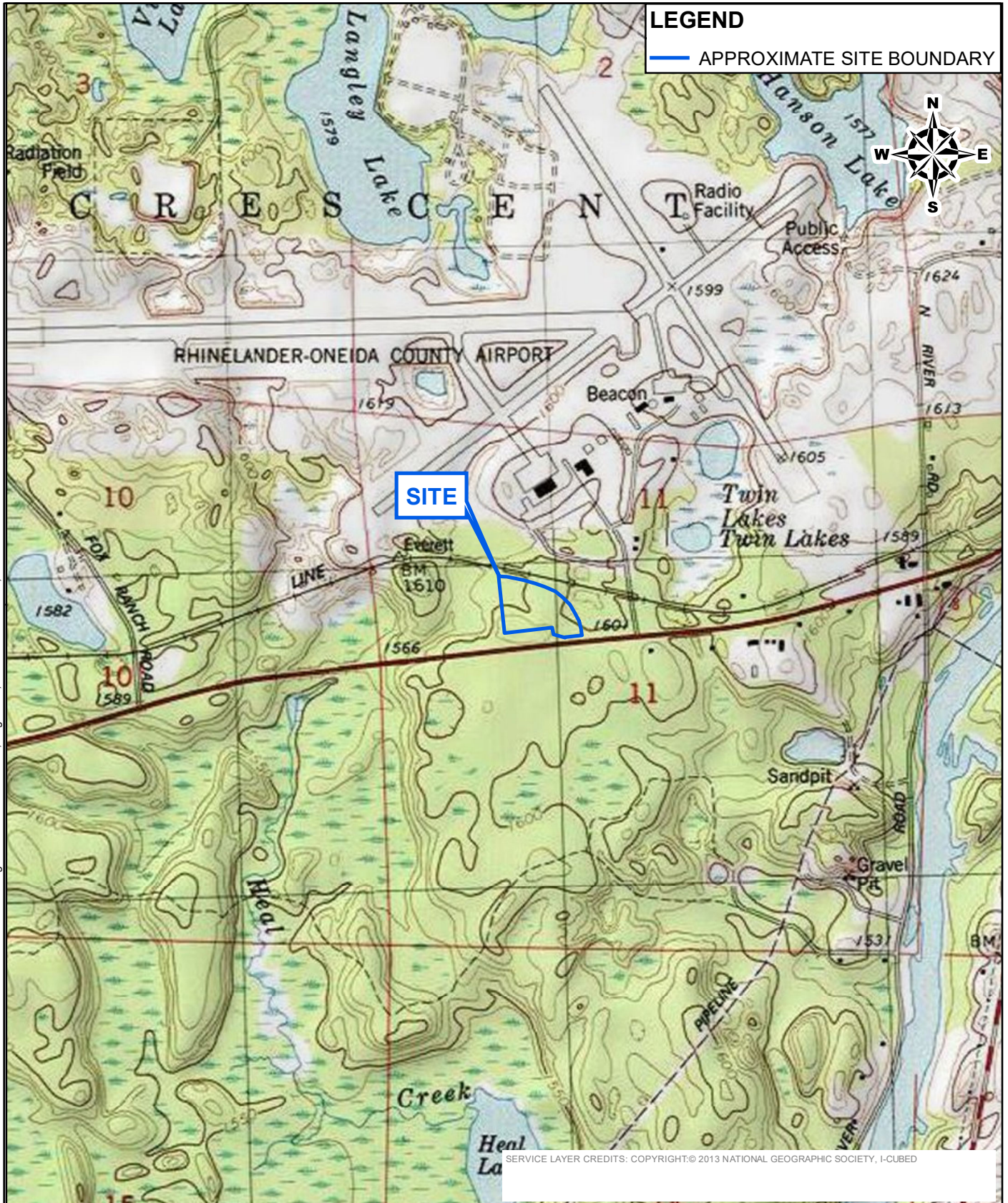
TABLE 1
POLYMERS/RESINS UTILIZED AT THE RHINELANDER CHARTER NEX FACILITY

Product Name	Manufacturer	Synonyms	Ingredients	Form	Color	Water Solubility	Toxicological Information
Bynel 4140 Adhesive Resin	DuPont	None	Maleic Anhydride Modified Polyolefin	Pellet	Clear or Pigmented	Insoluble	No data available. Expected to have low toxicity based on insolubility in water.
Affinity PL 1850G Polyolefin Plastomer	The DOW Chemical Company	1-Octene, Polymer With Ethene	Ethylene-1-octene Copolymer	Pellet	Translucent	Negligible	Not expected to be toxic, but material in pellet form may mechanically cause adverse effects if ingested by wildlife. May cause choking if swallowed by humans.
Marlex 5561 Polyethylene	Chevron Phillips Chemical Company	None	Polyethylene	Pellet	Opaque	Negligible	Not expected to be toxic, but material in pellet form may mechanically cause adverse effects if ingested by wildlife. May cause choking if swallowed by humans.
DOWLEX 2045G Polyethylene Resin	The DOW Chemical Company	Polyethylene	Ethylene-1-octene Copolymer	Pellet	Translucent to White	Negligible	Not expected to be toxic, but material in pellet form may mechanically cause adverse effects if ingested by wildlife. May cause choking if swallowed by humans.
Soarnol	The Nippon Synthetic Chemical Industry Co.	None	Ethylene-vinyl Acetate-vinyl Alcohol Copolymer	Pellet	White, Light Yellow	Insoluble	No data available. Expected to have low toxicity based on insolubility in water.
DOW DFDA-7059 NT 7 Linear Low Density Polyethylene Resin	The DOW Chemical Company	1-Butene, Polymer With Ethene	1-Butene, Polymer With Ethene (99%) and Tris-nonylphenyl Phosphite (0.2%)	Pellet	Translucent to White	Negligible	Not expected to be toxic, but material in pellet form may mechanically cause adverse effects if ingested by wildlife. May cause choking if swallowed by humans.
Ultramid B40 01	BASF Corporation	None	Not Listed	Pellet	Colorless	Insoluble	No data available. Expected to have low toxicity based on insolubility in water.



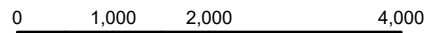
FIGURES

© 2019 - GZA GeoEnvironmental, Inc. \\GZAWAUKESHAI\obs\1563000\1563342_Rhineland\Figures\Site Location.mxd, August 22, 2019 - 10:59:07 AM, madeline.salo



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SCALE IN FEET

CHARTER NEX
 3606 RED ARROW DRIVE
 RHINELANDER, WISCONSIN

PREPARED BY:
GZA GeoEnvironmental, Inc.
 Engineers and Scientists
 www.gza.com

PREPARED FOR:
CHARTER NEX FILMS, INC.

SITE LOCATION

PROJ MGR: ERS	REVIEWED BY: JCO	CHECKED BY: ERS	FIG 1
DESIGNED BY: MJS	DRAWN BY: MJS	SCALE: 1 in = 2,000 ft	
DATE: 08/22/2019	PROJECT NO: 20.0156342.00	REVISION NO:	

SHEET NO: 1 OF 2

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LEGEND

- - - APPROXIMATE PROPERTY BOUNDARY



MUNICIPAL WELL NO. 7



RHINELANDER-ONEIDA COUNTY AIRPORT

HOIST LAKE

SOUTH FOX RANCH ROAD

INDUSTRIAL

RAILROAD

INDUSTRIAL

AIRPORT ROAD

RED ARROW DRIVE

US 8

RAILROAD

INDUSTRIAL

US 8

SPRING

INDUSTRIAL

US 8

HEAL CREEK

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0 350 700 1,400

SCALE IN FEET

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CHARTER NEX
3606 RED ARROW DRIVE
RHINELANDER, WISCONSIN

SITE PLAN

PREPARED BY:
GZA GeoEnvironmental, Inc.
Engineers and Scientists
www.gza.com

PREPARED FOR:
CHARTER NEX FILMS, INC.

PROJ MGR: ERS
DESIGNED BY: MJS
DATE: 08/22/2019

REVIEWED BY: JCO
DRAWN BY: MJS
PROJECT NO: 20.0156342.00

CHECKED BY: ERS
SCALE: 1 in = 700 ft
REVISION NO:
2
SHEET NO: 2 OF 2



ATTACHMENT 1

Limitations



LIMITATIONS

Standard of Care

1. GZA's findings and conclusions are based on the work conducted as part of the Scope of Services set forth in the proposal and/or report and reflect our professional judgment. These findings and conclusions must be considered not as scientific or engineering certainties, but rather as our professional opinions concerning the limited data gathered during the course of our work. Conditions other than described in this report may be found at the subject location(s).
2. GZA's services were performed using the degree of skill and care ordinarily exercised by qualified professionals performing the same type of services, at the same time, under similar conditions, at the same or a similar property. No warranty, expressed or implied, is made. Specifically, GZA does not and cannot represent that the site contains no hazardous material, oil, or other latent condition beyond that observed by GZA during its study. Additionally, GZA makes no warranty that any response action or recommended action will achieve all of its objectives or that the findings of this study will be upheld by a local, state, or federal agency.
3. In conducting our work, GZA relied upon certain information made available by public agencies, Client and/or others. GZA did not attempt to independently verify the accuracy or completeness of that information. Inconsistencies in this information which we have noted, if any, are discussed in the report.

Subsurface Conditions

4. The generalized soil profile(s) provided in our report are based on widely-spaced subsurface explorations and are intended only to convey trends in subsurface conditions. The boundaries between strata are approximate and idealized, and were based on our assessment of subsurface conditions. The composition of strata and the transitions between strata may be more variable and more complex than indicated. For more specific information on soil conditions at a specific location, refer to the exploration logs.
5. Water level readings have been made in test holes (as described in the report) and monitoring wells at the specified times and under the stated conditions. These data have been reviewed and interpretations have been made in this report. Fluctuations in the level of the groundwater, however, occur due to temporal or spatial variations in areal recharge rates, soil heterogeneities, the presence of subsurface utilities and/or natural or artificially induced perturbations. The observed water table may be other than indicated in the report.

Compliance with Codes and Regulations

6. GZA used reasonable care in identifying and interpreting applicable codes and regulations necessary to execute our scope of work. These codes and regulations are subject to various and possibly contradictory interpretations. Interpretations and compliance with codes and regulations by other parties are beyond our control.

Interpretation of Data

7. Our opinions are based on available information, as described in the report, and on our professional judgment. Additional observations made over time and/or space may not support the opinions provided in the report.

Additional Information

8. In the event that Client or others authorized to use this report obtain information on environmental or hazardous waste issues at the site not contained in this report, such information shall be brought to GZA's attention forthwith. GZA will evaluate such information and, on the basis of this evaluation, may modify the conclusions stated in this report.

Additional Services

9. GZA recommends that we be retained to provide services during any future investigations, design, implementation activities, construction and/or property development/ redevelopment at the site. This will allow us the opportunity to: i) observe conditions and compliance with our design concepts and opinions; ii) allow for changes in the event that conditions are other than anticipated; iii) provide modifications to our design; and iv) assess the consequences of changes in technologies and/or regulations.



ATTACHMENT 2

Safety Data Sheets for Polymers Used in Manufacturing

**BYNEL[®] 4140 adhesive resin**

Version 2.3

Revision Date 08/10/2011

Ref. 130000019785

This SDS adheres to the standards and regulatory requirements of the United States and may not meet the regulatory requirements in other countries.

SECTION 1. PRODUCT AND COMPANY IDENTIFICATION

Product name : BYNEL[®] 4140 adhesive resin
MSDS Number : 130000019785

Manufacturer : DuPont
1007 Market Street
Wilmington, DE 19898

Product Information : 1-800-441-7515 (outside the U.S. 1-302-774-1000)
Medical Emergency : 1-800-441-3637 (outside the U.S. 1-302-774-1139)
Transport Emergency : CHEMTREC: 1-800-424-9300 (outside the U.S. 1-703-527-3887)

SECTION 2. HAZARDS IDENTIFICATION

Potential Health Effects

Eyes : Resin particles, like other inert materials, are mechanically irritating to eyes.

Ingestion : Is not considered a potential route of exposure.

Carcinogenicity

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, or OSHA, as a carcinogen.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS-No.	Concentration
Maleic anhydride modified polyolefin		>99%

**BYNEL[®] 4140 adhesive resin**

Version 2.3

Revision Date 08/10/2011

Ref. 130000019785

SECTION 4. FIRST AID MEASURES

- Skin contact : In case of contact, immediately flush eyes or skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash contaminated clothing before reuse. The material is not likely to be hazardous by skin contact, but cleansing the skin after use is advisable. Cool skin rapidly with cold water after contact with molten material. Do not attempt to remove material from the skin. Obtain medical treatment for thermal burn.
- Eye contact : In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.
- Inhalation : If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.
- Ingestion : Not a probable route of exposure. However, in case of accidental ingestion, call a physician.

SECTION 5. FIREFIGHTING MEASURES

- Flammable Properties
- Flash point : no data available
- Autoignition temperature : 350 °C (662 °F)
- Fire and Explosion Hazard : Material in pellet form may accumulate static charge when poured from one container to another. Failure or malfunction of temperature control systems on processing equipment, such as extruders, may create explosion hazards. Molten polyethylene tends to flow or drip and will propagate fire.
- Suitable extinguishing media : Water, Foam, Dry chemical, Carbon dioxide (CO₂)
- Firefighting Instructions : Wear self-contained breathing apparatus (SCBA). The solid polymer can only be burned with difficulty. Evacuate personnel and keep upwind of fire. Grounding and elimination of the static charge is recommended.



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SECTION 6. ACCIDENTAL RELEASE MEASURES

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Spill Cleanup : Shovel or sweep up.

Accidental Release Measures : Do not discharge to streams, ponds, lakes or sewers.

SECTION 7. HANDLING AND STORAGE

Handling (Personnel) : Before using, read the product bulletin.

Handling (Physical Aspects) : When opening containers, avoid breathing vapours that may be emanating.

Storage : Keep containers dry and tightly closed to avoid moisture absorption and contamination. Store in a cool, dry place.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls : See Bulletin "Proper Use of Local Exhaust Ventilation During Processing of Plastics". When hot processing this material, use local and/or general exhaust ventilation to maintain the concentration of vapors and fumes below exposure limits. Use static controls. Static charges can cause explosions in solvent and dust laden atmospheres.

Personal protective equipment
Respiratory protection : A respiratory protection program that meets country requirements must be followed whenever workplace conditions warrant respirator use. Consult the respirator manufacturer to determine the appropriate type of equipment for a given application. Observe respirator use limitations specified by the manufacturer.
Consult the OSHA respiratory protection information located at 29CFR 1910.134.



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- Hand protection : Additional protection: Protective gloves
- Eye protection : Wear safety glasses with side shields. Wear tightly fitting chemical splash goggles and face shield when possibility exists for eye and face contact due to spattering or splashing of molten material.
- Skin and body protection : Where there is potential for skin contact, have available and wear as appropriate, impervious gloves, apron, pants, jacket, hood and boots. If there is a potential for contact with hot/molten material wear heat resistant clothing and footwear.

Exposure Guidelines

Exposure Limit Values

Dust (inhalable and respirable fraction)

PEL:	(OSHA)	5 mg/m3	8 hr. TWA	Respirable fraction. All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by the Particulates Not Otherwise Regulated (PNOR) limit which is the same as the inert or nuisance dust limit of Table Z-3.
		Remarks		
PEL:	(OSHA)	15 mg/m3	8 hr. TWA	Total dust.
TLV	(ACGIH)	10 mg/m3	TWA	Inhalable particles.
TLV	(ACGIH)	3 mg/m3	TWA	Respirable particles.

Maleic anhydride

PEL:	(OSHA)	0.25 ppm	1 mg/m3	8 hr. TWA
PEL:	(OSHA)	0.25 ppm	1 mg/m3	8 hr. TWA
TLV	(ACGIH)	0.1 ppm	TWA	
TLV	(ACGIH)	0.01 mg/m3	TWA	
AEL *	(DUPONT)	0.1 ppm	8 & 12 hr. TWA	

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* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

Form	: pellets
Color	: clear or pigmented
Odor	: mild, hydrocarbon-like
Melting point/range	: 130 °C (266 °F)
Water solubility	: insoluble

SECTION 10. STABILITY AND REACTIVITY

Stability	: Stable at normal temperatures and storage conditions.
Conditions to avoid	: Temperature > 250 °C (> 482 °F) Decomposes on heating.
Incompatibility	: Strong acids high temperatures
Hazardous decomposition products	: Decomposition is a function of both processing temperature and time at that temperature. Decomposition can occur below the recommended processing temperature limit. At temperatures above the "conditions to avoid" temperature, thermal decomposition of the resin becomes rapid. Hazardous decomposition products: Hazardous decomposition products may include:, Carbon monoxide, Organic acids, Aldehydes, Alcohols, Acrolein
Hazardous reactions	: Polymerization will not occur.

SECTION 11. TOXICOLOGICAL INFORMATION

BYNEL [®] 4140 adhesive resin Further information	: There is no data available for this product.
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SECTION 12. ECOLOGICAL INFORMATION

Additional ecological information : No data is available on the product itself. Toxicity is expected to be low based on insolubility in water.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Disposal : Preferred options for disposal are recycling, incineration with energy recovery, and landfill. The high fuel value of this product makes incineration very desirable for material that cannot be recycled. Treatment, storage, transportation, and disposal must be in accordance with applicable federal, state/provincial, and local regulations.

SECTION 14. TRANSPORT INFORMATION

Not classified as dangerous in the meaning of transport regulations.

SECTION 15. REGULATORY INFORMATION

TSCA Status : In compliance with TSCA Inventory requirements for commercial purposes.
NZ HSNO Status : Exempt

SARA 313 Regulated Chemical(s) : SARA 313: This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

California Prop. 65 : Chemicals known to the State of California to cause cancer, birth defects or any other harm: none known

PA Right to Know : Substances on the Pennsylvania Hazardous Substances List present at a



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Regulated Chemical(s) concentration of 1% or more (0.01% for Special Hazardous Substances):
None known.

NJ Right to Know : Substances on the New Jersey Workplace Hazardous Substance List present
Regulated Chemical(s) at a concentration of 1% or more (0.1% for substances identified as
carcinogens, mutagens or teratogens): None known.

SECTION 16. OTHER INFORMATION

Restrictions for use : Do not use DuPont materials in medical applications involving implantation in the human body or contact with internal body fluids or tissues unless the material has been provided from DuPont under a written contract that is consistent with DuPont policy regarding medical applications and expressly acknowledges the contemplated use. For further information, please contact your DuPont representative. You may also request a copy of the DuPont POLICY Regarding Medical Applications H-50103-3 and DuPont CAUTION Regarding Medical Applications H-50102-3.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Significant change from previous version is denoted with a double bar.



SAFETY DATA SHEET

THE DOW CHEMICAL COMPANY

Product name: AFFINITY™ PL 1850G Polyolefin Plastomer

Issue Date: 07/18/2018

Print Date: 01/10/2019

THE DOW CHEMICAL COMPANY encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: AFFINITY™ PL 1850G Polyolefin Plastomer

Recommended use of the chemical and restrictions on use

Identified uses: Polyolefin Plastomer For industrial conversion as a raw material for manufacture of articles or goods.

COMPANY IDENTIFICATION

THE DOW CHEMICAL COMPANY
2030 DOW CENTER
MIDLAND MI 48674-0000
UNITED STATES

Customer Information Number:

800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: CHEMTREC +1 800-424-9300

Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification

GHS classification in accordance with 29 CFR 1910.1200
Combustible dust

Label elements

Signal word: **WARNING!**

Hazards

If small particles are generated during further processing, handling or by other means, may form combustible dust concentrations in air.

Other hazards

Slipping hazard.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: 1-Octene, polymer with ethene
This product is a substance.

Component	CASRN	Concentration
Ethylene-1-octene copolymer	26221-73-8	> 99.0 %

4. FIRST AID MEASURES

Description of first aid measures

General advice:

First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Skin contact: Wash off with plenty of water. Seek first aid or medical attention as needed. If molten material comes in contact with the skin, do not apply ice but cool under ice water or running stream of water. DO NOT attempt to remove the material from skin. Removal could result in severe tissue damage. Seek medical attention immediately. Suitable emergency safety shower facility should be immediately available.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Ingestion: If swallowed, seek medical attention. May cause gastrointestinal blockage. Do not give laxatives. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed:

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed

Notes to physician: If burn is present, treat as any thermal burn, after decontamination. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam.

Unsuitable extinguishing media: None known.

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Pneumatic conveying and other mechanical handling operations can generate combustible dust. To reduce the potential for dust explosions, do not permit dust to accumulate. Dense smoke is emitted when burned without sufficient oxygen.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Soak thoroughly with water to cool and prevent re-ignition. If material is molten, do not apply direct waterstream. Use fine water spray or foam. Cool surroundings with water to localize fire zone. Hand held dry chemical or carbon dioxide extinguishers may be used for small fires.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Spilled material may cause a slipping hazard. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Sweep up. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Use with adequate ventilation. No smoking, open flames or sources of ignition in handling and storage area. Good housekeeping and controlling of dusts are necessary for safe handling of product. Pneumatic conveying and other mechanical handling operations can generate combustible dust. To reduce the potential for dust explosions, electrically bond and ground equipment and do not permit dust to accumulate. Dust can be ignited by static discharge. When appropriate, unique handling information for containers can be found on the product label. Workers should be protected from the possibility of contact with molten resin. Do not get molten material in eyes, on skin or clothing. Avoid breathing process fumes. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Store in accordance with good manufacturing practices. Store indoors. Store in a cool, dry place. Store away from direct sunlight or ultraviolet light. No special storage conditions required.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Exposure controls

Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields). If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

Skin protection

Hand protection: Chemical protective gloves should not be needed when handling this material. Consistent with general hygienic practice for any material, skin contact should be minimized. Use gloves to protect from mechanical injury. Selection of gloves will depend on the task. Use gloves with insulation for thermal protection, when needed.

Other protection: No precautions other than clean body-covering clothing should be needed.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. Use an approved air-purifying respirator when vapors are generated at increased temperatures or when dust or mist is present.

The following should be effective types of air-purifying respirators: When dust/mist are present use a/an Particulate filter. When combinations of vapors, acids, or dusts/mists are present use a/an Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Pellets.
Color	Translucent
Odor	Odorless
Odor Threshold	No test data available
pH	Not applicable
Melting point/range	No test data available
Freezing point	Not applicable
Boiling point (760 mmHg)	Not applicable
Flash point	closed cup Not applicable
Evaporation Rate (Butyl Acetate = 1)	Not applicable

Flammability (solid, gas)	May form combustible dust concentrations in air during processing, handling or other means.
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Vapor Pressure	Not applicable
Relative Vapor Density (air = 1)	Not applicable
Relative Density (water = 1)	0.84 - 0.94 <i>ASTM D 792</i>
Water solubility	negligible
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Kinematic Viscosity	Not applicable
Explosive properties	No test data available
Oxidizing properties	No test data available
Molecular weight	> 10,000 g/mol <i>Estimated.</i>

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No data available

Chemical stability: Stable.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Exposure to elevated temperatures can cause product to decompose.

Incompatible materials: None known.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Processing may release fumes and other decomposition products. At temperatures exceeding melt temperatures, polymer fragments can be released. Fumes can be irritating. Decomposition products can include and are not limited to: Aldehydes. Alcohols. Organic acids. Decomposition products can include trace amounts of: Hydrocarbons.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. May cause choking if swallowed.

Single dose oral LD50 has not been determined.

Typical for this family of materials.
LD50, Rat, > 5,000 mg/kg Estimated.

Acute dermal toxicity

No adverse effects anticipated by skin absorption.

The dermal LD50 has not been determined.

Typical for this family of materials.
LD50, Rabbit, > 2,000 mg/kg Estimated.

Acute inhalation toxicity

No adverse effects are anticipated from single exposure to dust. Vapors released during thermal processing may cause respiratory irritation.

The LC50 has not been determined.,

Skin corrosion/irritation

Prolonged contact is essentially nonirritating to skin.

Mechanical injury only.

Under normal processing conditions, material is heated to elevated temperatures; contact with the material may cause thermal burns.

Serious eye damage/eye irritation

Solid or dust may cause irritation or corneal injury due to mechanical action.

Elevated temperatures may generate vapor levels sufficient to cause eye irritation. Effects may include discomfort and redness.

Sensitization

For skin sensitization:

No relevant data found.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Additives are encapsulated in the product and are not expected to be released under normal processing conditions or foreseeable emergency.

Carcinogenicity

No relevant data found.

Teratogenicity

No relevant data found.

Reproductive toxicity

No relevant data found.

Mutagenicity

No relevant data found.

Aspiration Hazard

Based on physical properties, not likely to be an aspiration hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Acute toxicity to fish

Not expected to be acutely toxic, but material in pellet or bead form may mechanically cause adverse effects if ingested by waterfowl or aquatic life.

Persistence and degradability

Biodegradability: This water-insoluble polymeric solid is expected to be inert in the environment. Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected.

Bioaccumulative potential

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Mobility in soil

In the terrestrial environment, material is expected to remain in the soil.
In the aquatic environment, material is expected to float.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device. Landfill.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Not regulated for transport

Transport in bulk according to Annex I or II of MARPOL 73/78 and the IBC or IGC Code

Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Combustible dust

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Pennsylvania Worker and Community Right-To-Know Act:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

United States TSCA Inventory (TSCA)

All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Revision

Identification Number: 11003536 / A001 / Issue Date: 07/18/2018 / Version: 5.1

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

THE DOW CHEMICAL COMPANY urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

US

AFFINITY™ PL 1850G Polyolefin Plastomer

WARNING

Hazards: If small particles are generated during further processing, handling or by other means, may form combustible dust concentrations in air. **Supplemental information** Slipping hazard. No special storage conditions required.

Refer to the Safety Data Sheet before use.

COMPANY IDENTIFICATION

THE DOW CHEMICAL COMPANY
2030 DOW CENTER
MIDLAND MI 48674-0000
UNITED STATES

**EMERGENCY TELEPHONE
NUMBER**

24-Hour Emergency Contact:
CHEMTREC +1 800-424-9300
Local Emergency Contact:
800-424-9300

Customer Information Number:
800-258-2436



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Revision

Identification Number: 11003536 / A001 / Issue Date:
07/18/2018 / Version: 5.1

**Marlex® 5561 Polyethylene**

Version 3.2

Revision Date 2018-02-26

SECTION 1: Identification of the substance/mixture and of the company/undertaking**Product information**

Product Name : Marlex® 5561 Polyethylene
Material : 1042507, 1040487, 1040490, 1042510, 1042505, 1042506,
1042509, 1042508, 1044445, 1044444, 1044443, 1044442,
1044441

Company : Chevron Phillips Chemical Company LP
10001 Six Pines Drive
The Woodlands, TX 77380

Emergency telephone:**Health:**

866.442.9628 (North America)

1.832.813.4984 (International)

Transport:

CHEMTREC 800.424.9300 or 703.527.3887(int'l)

Asia: CHEMWATCH (+612 9186 1132) China: 0532 8388 9090

EUROPE: BIG +32.14.584545 (phone) or +32.14583516 (telefax)

Mexico CHEMTREC 01-800-681-9531 (24 hours)

South America SOS-Cotec Inside Brazil: 0800.111.767 Outside Brazil: +55.19.3467.1600

Argentina: +(54)-1159839431

Responsible Department : Product Safety and Toxicology Group

E-mail address : SDS@CPChem.com

Website : www.CPChem.com

MEDICAL APPLICATION CAUTION: Do not use this material in medical applications involving permanent implantation in the human body or permanent contact with internal body fluids or tissues fluids or tissues.

Do not use this material in medical applications involving brief or temporary implantation in the human body or contact with internal body fluids or tissues unless the material has been provided directly from Chevron Phillips Chemical Company LP or its legal affiliates under an agreement which expressly acknowledges the contemplated use.

Chevron Phillips Chemical Company LP and its legal affiliates makes no representation, promise, express warranty or implied warranty concerning the suitability of this material for use in implantation in the human body or in contact with internal body fluids or tissues.

SECTION 2: Hazards identification**Classification of the substance or mixture**

SDS Number:100000000556

1/11

Marlex® 5561 Polyethylene

Version 3.2

Revision Date 2018-02-26

This product has been classified in accordance with the hazard communication standard 29 CFR 1910.1200; the SDS and labels contain all the information as required by the standard.

Classification

: Combustible dust

Labeling

Signal Word : Warning

Hazard Statements : May form combustible dust concentrations in air.
While this product may not be a combustible dust as sold, further processing or handling may form combustible dust concentration in air.

Potential Health Effects

- Physical Hazards : Pellets may cause a slip hazard on hard surfaces. Mechanical processing may form combustible dust concentrations in air and thermal processing at elevated temperatures may generate formaldehyde.
- Inhalation : Repeated exposure to dust from this material may cause respiratory irritation. Fumes generated during thermal processing may cause irritation of the upper respiratory tract.
- Skin : Contact with the skin is not expected to cause prolonged or significant irritation. Contact with the skin is not expected to cause an allergic response. If this material is heated, thermal burns may result from contact. Thermal burns may include pain or feeling of heat, discolorations, swelling, and blistering.
- Eyes : Contact with the eyes may cause irritation due to the abrasive action. Not expected to cause prolonged or significant eye irritation. Thermal burns may result if heated material contacts eye.
- Ingestion : Ingestion of this product is not a likely route of exposure.

Carcinogenicity:**IARC**

No ingredient of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP

No ingredient of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

SECTION 3: Composition/information on ingredients

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Component	CAS-No.	Weight %
Polyethylene	9002-88-4	99 - 100

SECTION 4: First aid measures

- If inhaled : Move to fresh air in case of accidental inhalation of dust or fumes from overheating or combustion. If symptoms persist, call a physician.
- In case of skin contact : If the molten material gets on skin, quickly cool in water. Seek immediate medical attention. Do not try to peel the solidified material from the skin or use solvents or thinners to dissolve it.
- In case of eye contact : In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
- If swallowed : Do not induce vomiting without medical advice.

SECTION 5: Firefighting measures

- Flash point : No data available
- Autoignition temperature : No data available
- Suitable extinguishing media : Water. Water mist. Dry chemical. Carbon dioxide (CO₂). Foam. If possible, water should be applied as a spray from a fogging nozzle since this is a surface burning material. The application of high velocity water will spread the burning surface layer. Avoid the use of straight streams that may create a dust cloud and the risk of a dust explosion. Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Specific hazards during fire fighting : Risks of ignition followed by flame propagation or secondary explosions can be caused by the accumulation of dust, e.g. on floors and ledges.
- Special protective equipment for fire-fighters : Use personal protective equipment. Wear self-contained breathing apparatus for firefighting if necessary.
- Further information : This material will burn although it is not easily ignited.
- Fire and explosion protection : Treat as a solid that can burn. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.
- Hazardous decomposition products : Normal combustion forms carbon dioxide, water vapor and may produce carbon monoxide, other hydrocarbons and hydrocarbon oxidation products (ketones, aldehydes, organic acids) depending on temperature and air availability. Incomplete combustion can also produce formaldehyde.

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SECTION 6: Accidental release measures

- Personal precautions : Sweep up to prevent slipping hazard. Avoid breathing dust. Avoid dust formation.
- Environmental precautions : Do not contaminate surface water. Prevent product from entering drains.
- Methods for cleaning up : Clean up promptly by sweeping or vacuum.
- Additional advice : 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).

SECTION 7: Handling and storage**Handling**

- Advice on safe handling : Use good housekeeping for safe handling of the product. Keep out of water sources and sewers.

Spilled pellets and powders may create a slipping hazard.

Electrostatic charge may accumulate and create a hazardous condition when handling this material. To minimize this hazard, bonding and grounding may be necessary, but may not by themselves be sufficient. At elevated temperatures (>350°F, >177°C), polyethylene can release vapors and gases, which are irritating to the mucous membranes of the eyes, mouth, throat, and lungs. These substances may include acetaldehyde, acetone, acetic acid, formic acid, formaldehyde and acrolein. Based on animal data and limited epidemiological evidence, formaldehyde has been listed as a carcinogen. Following all recommendations within this SDS should minimize exposure to thermal processing emissions.

- Advice on protection against fire and explosion : Treat as a solid that can burn. Avoid generating dust; fine dust dispersed in air in sufficient concentrations, and in the presence of an ignition source is a potential dust explosion hazard.

Storage

- Requirements for storage areas and containers : Keep in a dry place. Keep in a well-ventilated place.
- Advice on common storage : Do not store together with oxidizing and self-igniting products.

SECTION 8: Exposure controls/personal protection**Ingredients with workplace control parameters**

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US

Ingredients	Basis	Value	Control parameters	Note
Nuisance Dust	OSHA Z-3	TWA	15 mg/m3	Total dust
	OSHA Z-3	TWA	5 mg/m3	(respirable dust)

Control as Particulate Not Otherwise Classified (PNOC). The ACGIH Guideline* for respirable dust is 3.0 mg/m³ and 10.0 mg/m³ for total dust. The OSHA PEL for respirable dust is 5.0 mg/m³ and 15.0 mg/m³ for total dust.

* This value is for inhalable (total) particulate matter containing no asbestos and < 1.0% crystalline silica.

Engineering measures

Consider the potential hazards of this material (see Section 2), applicable exposure limits, job activities, and other substances in the work place when designing engineering controls and selecting personal protective equipment. If engineering controls or work practices are not adequate to prevent exposure to harmful levels of this material, the personal protective equipment listed below is recommended. The user should read and understand all instructions and limitations supplied with the equipment since protection is usually provided for a limited time or under certain circumstances.

Personal protective equipment

- Respiratory protection : No respiratory protection is normally required. If heated material generates vapor or fumes that are not adequately controlled by ventilation, wear an appropriate respirator. Use the following elements for air-purifying respirators: Organic Vapor and Formaldehyde. Use a positive pressure, air-supplying respirator if there is potential for uncontrolled release, exposure levels are not known, or other circumstances where air-purifying respirators may not provide adequate protection. Dust safety masks are recommended when the dust concentration is excessive.
- Eye protection : Use of safety glasses with side shields for solid handling is good industrial practice. If this material is heated, wear chemical goggles or safety glasses with side shields or a face shield. If there is potential for dust, use chemical goggles.
- Skin and body protection : At ambient temperatures use of clean and protective clothing is good industrial practice. If the material is heated or molten, wear thermally insulated, heat-resistant gloves that are able to withstand the temperature of the molten product. If this material is heated, wear insulated clothing to prevent skin contact if engineering controls or work practices are not adequate.

SECTION 9: Physical and chemical properties**Information on basic physical and chemical properties****Appearance**

- Form : Pellets
 Physical state : Solid
 Color : Opaque
 Odor : Mild to no odor
 Odor Threshold : No data available

Safety data

- Flash point : No data available
 Lower explosion limit : Not applicable

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Upper explosion limit	: Not applicable
Autoignition temperature	: No data available
Thermal decomposition	: Low molecular weight hydrocarbons, alcohols, aldehydes, acids and ketones can be formed during thermal processing.
pH	: Not applicable
Melting point/range	: 90 - 140 °C (194 - 284 °F)
Freezing point	Not applicable
Initial boiling point and boiling range	: Not applicable
Vapor pressure	: Not applicable
Relative density	: Not applicable
Density	: 0.91 - 0.97 g/cm ³
Water solubility	: Negligible
Partition coefficient: n-octanol/water	: No data available
Solubility in other solvents	: No data available
Viscosity, dynamic	: Not applicable
Viscosity, kinematic	: Not applicable
Relative vapor density	: Not applicable
Evaporation rate	: Not applicable

SECTION 10: Stability and reactivity

Reactivity	: This material is considered non-reactive under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Chemical stability	: This material is considered stable under normal ambient and anticipated storage and handling conditions of temperature and pressure.
Possibility of hazardous reactions	
Conditions to avoid	: Avoid prolonged storage at elevated temperature.
Materials to avoid	: Avoid contact with strong oxidizing agents.

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- Thermal decomposition : Low molecular weight hydrocarbons, alcohols, aldehydes, acids and ketones can be formed during thermal processing.
- Hazardous decomposition products : Normal combustion forms carbon dioxide, water vapor and may produce carbon monoxide, other hydrocarbons and hydrocarbon oxidation products (ketones, aldehydes, organic acids) depending on temperature and air availability. Incomplete combustion can also produce formaldehyde.
- Other data : No decomposition if stored and applied as directed.

SECTION 11: Toxicological information

- Marlex® 5561 Polyethylene**
Acute oral toxicity : Presumed Not Toxic
- Marlex® 5561 Polyethylene**
Acute inhalation toxicity : Presumed Not Toxic
- Marlex® 5561 Polyethylene**
Acute dermal toxicity : Presumed Not Toxic
- Marlex® 5561 Polyethylene**
Skin irritation : No skin irritation
- Marlex® 5561 Polyethylene**
Eye irritation : No eye irritation
- Marlex® 5561 Polyethylene**
Sensitization : Did not cause sensitization on laboratory animals.
- Marlex® 5561 Polyethylene**
Further information : This product contains POLYMERIZED OLEFINS. During thermal processing (>350°F, >177°C) polyolefins can release vapors and gases (aldehydes, ketones and organic acids) which are irritating to the mucous membranes of the eyes, mouth, throat, and lungs. Generally these irritant effects are all transitory. However, prolonged exposure to irritating off-gases can lead to pulmonary edema. Formaldehyde (an aldehyde) has been classified as a carcinogen based on animal data and limited epidemiological evidence.

SECTION 12: Ecological information**Ecotoxicity effects**

Elimination information (persistence and degradability)

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- Bioaccumulation : Does not bioaccumulate.
- Mobility : The product is insoluble and floats on water.
- Biodegradability : This material is not expected to be readily biodegradable.

Ecotoxicology Assessment

- Additional ecological information : This material is not expected to be harmful to aquatic organisms., Fish or birds may eat pellets which may obstruct their digestive tracts.

SECTION 13: Disposal considerations

The information in this SDS pertains only to the product as shipped.

Use material for its intended purpose or recycle if possible. This material, if it must be discarded, may meet the criteria of a hazardous waste as defined by US EPA under RCRA (40 CFR 261) or other State and local regulations. Measurement of certain physical properties and analysis for regulated components may be necessary to make a correct determination. If this material is classified as a hazardous waste, federal law requires disposal at a licensed hazardous waste disposal facility.

SECTION 14: Transport information

The shipping descriptions shown here are for bulk shipments only, and may not apply to shipments in non-bulk packages (see regulatory definition).

Consult the appropriate domestic or international mode-specific and quantity-specific Dangerous Goods Regulations for additional shipping description requirements (e.g., technical name or names, etc.) Therefore, the information shown here, may not always agree with the bill of lading shipping description for the material. Flashpoints for the material may vary slightly between the SDS and the bill of lading.

US DOT (UNITED STATES DEPARTMENT OF TRANSPORTATION)

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IMO / IMDG (INTERNATIONAL MARITIME DANGEROUS GOODS)

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

IATA (INTERNATIONAL AIR TRANSPORT ASSOCIATION)

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

ADR (AGREEMENT ON DANGEROUS GOODS BY ROAD (EUROPE))

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

RID (REGULATIONS CONCERNING THE INTERNATIONAL TRANSPORT OF

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DANGEROUS GOODS (EUROPE)

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

ADN (EUROPEAN AGREEMENT CONCERNING THE INTERNATIONAL CARRIAGE OF DANGEROUS GOODS BY INLAND WATERWAYS)

NOT REGULATED AS A HAZARDOUS MATERIAL OR DANGEROUS GOODS FOR TRANSPORTATION BY THIS AGENCY.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

SECTION 15: Regulatory information**National legislation**

SARA 311/312 Hazards : Combustible dust

CERCLA Reportable Quantity : This material does not contain any components with a CERCLA RQ.

SARA 302 Reportable Quantity : This material does not contain any components with a SARA 302 RQ.

SARA 302 Threshold Planning Quantity : No chemicals in this material are subject to the reporting requirements of SARA Title III, Section 302.

SARA 304 Reportable Quantity : This material does not contain any components with a section 304 EHS RQ.

SARA 313 Ingredients : This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Clean Air Act

Ozone-Depletion Potential : This product neither contains, nor was manufactured with a Class I or Class II ODS as defined by the U.S. Clean Air Act Section 602 (40 CFR 82, Subpt. A, App.A + B).

This product does not contain any hazardous air pollutants (HAP), as defined by the U.S. Clean Air Act Section 112 (40 CFR 61).

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This product does not contain any chemicals listed under the U.S. Clean Air Act Section 112(r) for Accidental Release Prevention (40 CFR 68.130, Subpart F).

This product does not contain any chemicals listed under the U.S. Clean Air Act Section 111 SOCM I Intermediate or Final VOC's (40 CFR 60.489).

US State Regulations

Pennsylvania Right To Know

: No components are subject to the Pennsylvania Right to Know Act.

New Jersey Right To Know

: No components are subject to the New Jersey Right to Know Act.

California Prop. 65
Ingredients

: This product does not contain any chemicals known to the State of California to cause cancer, birth, or any other reproductive defects.

Notification status

Europe REACH : On the inventory, or in compliance with the inventory

United States of America (USA) : On TSCA Inventory

TSCA

Canada DSL : All components of this product are on the Canadian DSL

Australia AICS : On the inventory, or in compliance with the inventory

New Zealand NZIoC : On the inventory, or in compliance with the inventory

Japan ENCS : On the inventory, or in compliance with the inventory

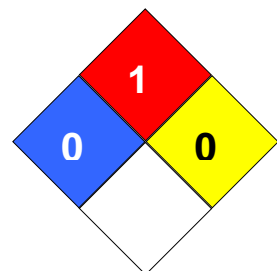
Korea KECI : On the inventory, or in compliance with the inventory

Philippines PICCS : On the inventory, or in compliance with the inventory

China IECSC : On the inventory, or in compliance with the inventory

SECTION 16: Other information**NFPA Classification**

: Health Hazard: 0
Fire Hazard: 1
Reactivity Hazard: 0



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Further information

Legacy SDS Number : 240370

Significant changes since the last version are highlighted in the margin. This version replaces all previous versions.

The information in this SDS pertains only to the product as shipped.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

Key or legend to abbreviations and acronyms used in the safety data sheet

ACGIH	American Conference of Government Industrial Hygienists	LD50	Lethal Dose 50%
AICS	Australia, Inventory of Chemical Substances	LOAEL	Lowest Observed Adverse Effect Level
DSL	Canada, Domestic Substances List	NFPA	National Fire Protection Agency
NDSL	Canada, Non-Domestic Substances List	NIOSH	National Institute for Occupational Safety & Health
CNS	Central Nervous System	NTP	National Toxicology Program
CAS	Chemical Abstract Service	NZIoC	New Zealand Inventory of Chemicals
EC50	Effective Concentration	NOAEL	No Observable Adverse Effect Level
EC50	Effective Concentration 50%	NOEC	No Observed Effect Concentration
EGEST	EOSCA Generic Exposure Scenario Tool	OSHA	Occupational Safety & Health Administration
EOSCA	European Oilfield Specialty Chemicals Association	PEL	Permissible Exposure Limit
EINECS	European Inventory of Existing Chemical Substances	PICCS	Philippines Inventory of Commercial Chemical Substances
MAK	Germany Maximum Concentration Values	PRNT	Presumed Not Toxic
GHS	Globally Harmonized System	RCRA	Resource Conservation Recovery Act
>=	Greater Than or Equal To	STEL	Short-term Exposure Limit
IC50	Inhibition Concentration 50%	SARA	Superfund Amendments and Reauthorization Act.
IARC	International Agency for Research on Cancer	TLV	Threshold Limit Value
IECSC	Inventory of Existing Chemical Substances in China	TWA	Time Weighted Average
ENCS	Japan, Inventory of Existing and New Chemical Substances	TSCA	Toxic Substance Control Act
KECI	Korea, Existing Chemical Inventory	UVCB	Unknown or Variable Composition, Complex Reaction Products, and Biological Materials
<=	Less Than or Equal To	WHMIS	Workplace Hazardous Materials Information System
LC50	Lethal Concentration 50%		



SAFETY DATA SHEET

THE DOW CHEMICAL COMPANY

Product name: DOWLEX™ 2045G Polyethylene Resin

Issue Date: 07/18/2018

Print Date: 01/05/2019

THE DOW CHEMICAL COMPANY encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: DOWLEX™ 2045G Polyethylene Resin

Recommended use of the chemical and restrictions on use

Identified uses: A polyethylene plastic - For industrial conversion as a raw material for manufacture of articles or goods.

COMPANY IDENTIFICATION

THE DOW CHEMICAL COMPANY
2030 DOW CENTER
MIDLAND MI 48674-0000
UNITED STATES

Customer Information Number:

800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: CHEMTREC +1 800-424-9300

Local Emergency Contact: 800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification

GHS classification in accordance with 29 CFR 1910.1200
Combustible dust

Label elements

Signal word: **WARNING!**

Hazards

If small particles are generated during further processing, handling or by other means, may form combustible dust concentrations in air.

Other hazards

Slipping hazard.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: Polyethylene
This product is a substance.

Component	CASRN	Concentration
Ethylene-1-octene copolymer	26221-73-8	> 99.0 %

4. FIRST AID MEASURES

Description of first aid measures

General advice:

First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Skin contact: Wash off with plenty of water. Seek first aid or medical attention as needed. If molten material comes in contact with the skin, do not apply ice but cool under ice water or running stream of water. DO NOT attempt to remove the material from skin. Removal could result in severe tissue damage. Seek medical attention immediately. Suitable emergency safety shower facility should be immediately available.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Ingestion: If swallowed, seek medical attention. May cause gastrointestinal blockage. Do not give laxatives. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed:

Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed

Notes to physician: If burn is present, treat as any thermal burn, after decontamination. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam.

Unsuitable extinguishing media: None known.

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Pneumatic conveying and other mechanical handling operations can generate combustible dust. To reduce the potential for dust explosions, do not permit dust to accumulate. Dense smoke is emitted when burned without sufficient oxygen.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Soak thoroughly with water to cool and prevent re-ignition. If material is molten, do not apply direct waterstream. Use fine water spray or foam. Cool surroundings with water to localize fire zone. Hand held dry chemical or carbon dioxide extinguishers may be used for small fires.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Spilled material may cause a slipping hazard. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Sweep up. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Use with adequate ventilation. No smoking, open flames or sources of ignition in handling and storage area. Good housekeeping and controlling of dusts are necessary for safe handling of product. Pneumatic conveying and other mechanical handling operations can generate combustible dust. To reduce the potential for dust explosions, electrically bond and ground equipment and do not permit dust to accumulate. Dust can be ignited by static discharge. When appropriate, unique handling information for containers can be found on the product label. Workers should be protected from the possibility of contact with molten resin. Do not get molten material in eyes, on skin or clothing. Avoid breathing process fumes. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Store in accordance with good manufacturing practices. Store indoors. Store in a cool, dry place. Store away from direct sunlight or ultraviolet light.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

If exposure limits exist, they are listed below. If no exposure limits are displayed, then no values are applicable.

Exposure controls

Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields). If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

Skin protection

Hand protection: Chemical protective gloves should not be needed when handling this material. Consistent with general hygienic practice for any material, skin contact should be minimized. Use gloves to protect from mechanical injury. Selection of gloves will depend on the task. Use gloves with insulation for thermal protection, when needed.

Other protection: No precautions other than clean body-covering clothing should be needed.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. Use an approved air-purifying respirator when vapors are generated at increased temperatures or when dust or mist is present.

The following should be effective types of air-purifying respirators: When dust/mist are present use a/an Particulate filter. When combinations of vapors, acids, or dusts/mists are present use a/an Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Pellets.
Color	Translucent to white
Odor	Odorless to mild
Odor Threshold	No test data available
pH	Not applicable
Melting point/range	Variable
Freezing point	Not applicable
Boiling point (760 mmHg)	Not applicable
Flash point	closed cup Not applicable
Evaporation Rate (Butyl Acetate = 1)	Not applicable

Flammability (solid, gas)	May form combustible dust concentrations in air during processing, handling or other means.
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Vapor Pressure	Not applicable
Relative Vapor Density (air = 1)	Not applicable
Relative Density (water = 1)	0.83 - 0.97 <i>ASTM D 792</i>
Water solubility	Negligible
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Kinematic Viscosity	Not applicable
Explosive properties	Not explosive
Oxidizing properties	no oxidising properties
Molecular weight	No data available
Volatile Organic Compounds	No test data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No data available

Chemical stability: Stable.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Exposure to elevated temperatures can cause product to decompose.

Incompatible materials: None known.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Processing may release fumes and other decomposition products. At temperatures exceeding melt temperatures, polymer fragments can be released. Fumes can be irritating. Decomposition products can include and are not limited to: Aldehydes. Alcohols. Organic acids. Decomposition products can include trace amounts of: Hydrocarbons.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts. May cause choking if swallowed.

Single dose oral LD50 has not been determined.

Typical for this family of materials.
LD50, Rat, > 5,000 mg/kg Estimated.

Acute dermal toxicity

No adverse effects anticipated by skin absorption.

The dermal LD50 has not been determined.

Typical for this family of materials.
LD50, Rabbit, > 2,000 mg/kg Estimated.

Acute inhalation toxicity

No adverse effects are anticipated from single exposure to dust. Vapors released during thermal processing may cause respiratory irritation.

The LC50 has not been determined.,

Skin corrosion/irritation

Prolonged contact is essentially nonirritating to skin.

Mechanical injury only.

Under normal processing conditions, material is heated to elevated temperatures; contact with the material may cause thermal burns.

Serious eye damage/eye irritation

Solid or dust may cause irritation or corneal injury due to mechanical action.

Elevated temperatures may generate vapor levels sufficient to cause eye irritation. Effects may include discomfort and redness.

Sensitization

For skin sensitization:

No relevant data found.

For respiratory sensitization:

No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Additives are encapsulated in the product and are not expected to be released under normal processing conditions or foreseeable emergency.

Carcinogenicity

No relevant data found.

Teratogenicity

No relevant data found.

Reproductive toxicity

No relevant data found.

Mutagenicity

No relevant data found.

Aspiration Hazard

Based on physical properties, not likely to be an aspiration hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity**Acute toxicity to fish**

Not expected to be acutely toxic, but material in pellet or bead form may mechanically cause adverse effects if ingested by waterfowl or aquatic life.

Persistence and degradability

Biodegradability: This water-insoluble polymeric solid is expected to be inert in the environment. Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected.

Bioaccumulative potential

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Mobility in soil

In the terrestrial environment, material is expected to remain in the soil.
In the aquatic environment, material is expected to float.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device. Landfill.

14. TRANSPORT INFORMATION

DOT

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

**Transport in bulk
according to Annex I or II
of MARPOL 73/78 and the
IBC or IGC Code**

Not regulated for transport
Consult IMO regulations before transporting ocean bulk

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Sections 311 and 312

Combustible dust

Superfund Amendments and Reauthorization Act of 1986 Title III (Emergency Planning and Community Right-to-Know Act of 1986) Section 313

This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

Pennsylvania Worker and Community Right-To-Know Act:

To the best of our knowledge, this product does not contain chemicals at levels which require reporting under this statute.

California Prop. 65

This product does not contain any chemicals known to State of California to cause cancer, birth defects, or any other reproductive harm.

United States TSCA Inventory (TSCA)

All components of this product are in compliance with the inventory listing requirements of the U.S. Toxic Substances Control Act (TSCA) Chemical Substance Inventory.

16. OTHER INFORMATION

Revision

Identification Number: 187240 / A001 / Issue Date: 07/18/2018 / Version: 5.1

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Full text of other abbreviations

AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada); ECx - Concentration associated with x% response; EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

THE DOW CHEMICAL COMPANY urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

US

DOWLEX™ 2045G Polyethylene Resin

WARNING

Contains: Ethylene-1-octene copolymer / 26221-73-8

Hazards: If small particles are generated during further processing, handling or by other means, may form combustible dust concentrations in air. **Supplemental information** Slipping hazard.

Refer to the Safety Data Sheet before use.

COMPANY IDENTIFICATION

THE DOW CHEMICAL COMPANY
2030 DOW CENTER
MIDLAND MI 48674-0000
UNITED STATES

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact:

CHEMTREC +1 800-424-9300

Local Emergency Contact:

800-424-9300

Customer Information Number:

800-258-2436



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Revision

Identification Number: 187240 / A001 / Issue Date:
07/18/2018 / Version: 5.1

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

Soarnol

The Nippon Synthetic
Chemical Industry Co., Ltd.

Revision Date : 9 September 2016 Version 2.1 GB / EN

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

1.1 Product identifier

Trade name : Soarnol standard grades V2504RB, VH2704RB,
DT2903, D2908, DT2904R, DT2904RB, DC3212B, DC3203RB,
DC3203F, DC3203FB, E3808, ET3803RB, ET3803,
A4412, A4412B, AT4403, AT4403B, H4815B, BX6304B, BX6804B,
TF2905B, BF3203B, BF3205B

Substance name : Ethylene-vinyl acetate-vinyl alcohol Copolymer

CAS-No. : 26221-27-2

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

Use of the Substance/Mixture : Packaging, Polymer

1.3 Details of the supplier of the safety data sheet

Company : The Nippon Synthetic Chemical Industry Co., Ltd.
Soarnol Dept. Sales and Marketing Div.
Shibaura Renasite Tower, 9-1, Shibaura 3-chome, Minato-ku
Tokyo, 108 - 0023, Japan

Telephone : +81-3-6436-2814

E-mail address : #ngc-msds-evoh@mail.nichigo.co.jp

Importer

Company : Nippon Gohsei (UK) Limited
Soarnol House, Saltend
HU13 8DS Kingston upon Hull, United Kingdom

Telephone : +44 (0)1482 333320

1.4 Emergency telephone number

+44 (0)1865 407333 (CARECHEM 24)

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification (REGULATION (EC) No 1272/2008)

Not a hazardous substance or mixture.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Not a hazardous substance or mixture.

Additional Labelling:

EUH210 : Safety data sheet available on request.

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2.3 Other hazards

None known.

SECTION 3: Composition/information on ingredients

3.1 Substances

Substance name : Ethylene-vinyl acetate-vinyl alcohol Copolymer (EVOH)

CAS-No. : 26221-27-2

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice : In the case of accident or if you feel unwell, seek medical advice immediately.
When symptoms persist or in all cases of doubt seek medical advice.

Protection of first-aiders : First Aid responders should pay attention to self-protection, and use the recommended personal protective equipment when the potential for exposure exists.

If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.

In case of skin contact : Wash with water and soap as a precaution.
Get medical attention if symptoms occur.

In case of eye contact : Flush eyes with water as a precaution.
Get medical attention if irritation develops and persists.

If swallowed : If swallowed, DO NOT induce vomiting.
Get medical attention if symptoms occur.
Rinse mouth thoroughly with water.

4.2 Most important symptoms and effects, both acute and delayed

None known.

4.3 Indication of any immediate medical attention and special treatment needed

Treatment : Treat symptomatically and supportively.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical

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Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Specific hazards during fire-fighting : Exposure to combustion products may be a hazard to health.

Hazardous combustion products : Carbon oxides

5.3 Advice for firefighters

Special protective equipment for firefighters : In the event of fire, wear self-contained breathing apparatus.
Use personal protective equipment.

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Use water spray to cool unopened containers.
Remove undamaged containers from fire area if it is safe to do so.
Evacuate area.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Follow safe handling advice and personal protective equipment recommendations.

6.2 Environmental precautions

Environmental precautions : Discharge into the environment must be avoided.
Prevent further leakage or spillage if safe to do so.
Retain and dispose of contaminated wash water.
Local authorities should be advised if significant spillages cannot be contained.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Sweep up or vacuum up spillage and collect in suitable container for disposal.
Local or national regulations may apply to releases and disposal of this material, as well as those materials and items employed in the clean-up of releases. You will need to determine which regulations are applicable.
Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.

6.4 Reference to other sections

See sections: 7, 8,11,12 and 13.

SECTION 7: Handling and storage

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7.1 Precautions for safe handling

- Technical measures : See Engineering measures under EXPOSURE CONTROLS/PERSONAL PROTECTION section.
- Local/Total ventilation : Use only with adequate ventilation.
- Advice on safe handling : Do not swallow.
Avoid contact with eyes.
Avoid prolonged or repeated contact with skin.
Handle in accordance with good industrial hygiene and safety practice.
Take care to prevent spills, waste and minimize release to the environment.
- Hygiene measures : Ensure that eye flushing systems and safety showers are located close to the working place. When using do not eat, drink or smoke.
Wash contaminated clothing before re-use.

7.2 Conditions for safe storage, including any incompatibilities

- Requirements for storage areas and containers : Keep in properly labelled containers. Store in accordance with the particular national regulations.
- Advice on common storage : Do not store with the following product types:
Strong oxidizing agents
- Recommended storage temperature : $\leq 4^{\circ}\text{C}$

7.3 Specific end use(s)

- Specific use(s) : No data available
-

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

No data available

8.2 Exposure controls

Engineering measures

Ensure adequate ventilation, especially in confined areas.
Minimize workplace exposure concentrations.

Personal protective equipment

Eye protection : Wear the following personal protective equipment:
Safety glasses

Hand protection
Material : Chemical-resistant gloves

Remarks : Choose gloves to protect hands against chemicals depending on the concentration and quantity of the hazardous substance and specific

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to place of work. Breakthrough time is not determined for the product. Change gloves often! For special applications, we recommend clarifying the resistance to chemicals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday.

Skin and body protection : Skin contact must be avoided by using impervious protective clothing (gloves, aprons, boots, etc).

Respiratory protection : No personal respiratory protective equipment normally required.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance : solid

Colour : white, light yellow

Odour : odourless

Odour Threshold : No data available

PH : No data available

Melting point/freezing point : 150-200 °C

Initial boiling point and boiling range : No data available

Flash point : \approx 300 °C

Evaporation rate : Not applicable

Flammability (solid, gas) : Not classified as a flammability hazard

Upper explosion limit : No data available

Lower explosion limit : No data available

Vapour pressure : Not applicable

Relative vapour density : Not applicable

Density : 1.10-1.24 g/cm³

Bulk density : 640 - 800 kg/m³

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Solubility(ies)

Water solubility : insoluble (15 °C)

Solubility in other solvents : soluble
Solvent: Dimethyl sulfoxide

soluble
Solvent: Water-Alcohol Mixed Solvent

insoluble
Solvent: toluene

insoluble
Solvent: isobutyl methyl ketone

insoluble
Solvent: Benzene

insoluble
Solvent: ethyl acetate

Partition coefficient: : No data available
n-octanol/water

Auto-ignition temperature : > 420 °C

Decomposition temperature : > 300 °C

Viscosity

Viscosity, dynamic : Not applicable

Explosive properties : Not explosive

Oxidizing properties : The substance or mixture is not classified as oxidizing.

9.2 Other information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Not classified as a reactivity hazard.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : Can react with strong oxidizing agents.

10.4 Conditions to avoid

Conditions to avoid : None known.

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10.5 Incompatible materials

Materials to avoid : Oxidizing agents

10.6 Hazardous decomposition products

No hazardous decomposition products are known.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Information on likely routes of exposure : Skin contact
Ingestion
Eye contact

Acute toxicity

Acute oral toxicity : LD50 (Rat) > 5,000 mg/kg

Acute inhalation toxicity : No data available

Acute dermal toxicity : No data available

Skin corrosion/irritation

Not classified based on available information.

Serious eye damage/eye irritation

Not classified based on available information.

Respiratory or skin sensitisation

Skin sensitisation

Not classified based on available information.

Respiratory sensitisation

Not classified based on available information.

Germ cell mutagenicity

Not classified based on available information.

Carcinogenicity

Not classified based on available information.

Reproductive toxicity

Not classified based on available information.

STOT - single exposure

Not classified based on available information.

STOT - repeated exposure

Not classified based on available information.

Repeated dose toxicity

Not classified based on available information.

Aspiration toxicity

Not classified based on available information.

SECTION 12: Ecological information

12.1 Toxicity

No data available

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12.2 Persistence and degradability

No data available

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Not relevant

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Dispose of in accordance with local regulations.
According to the European Waste Catalogue, Waste Codes are not product specific, but application specific.
Waste codes should be assigned by the user, preferably in discussion with the waste disposal authorities.

Contaminated packaging : Empty containers should be taken to an approved waste handling site for recycling or disposal.
If not otherwise specified: Dispose of as unused product.

SECTION 14: Transport information

14.1 UN number

Not regulated as a dangerous good

14.2 UN proper shipping name

Not regulated as a dangerous good

14.3 Transport hazard class(es)

Not regulated as a dangerous good

14.4 Packing group

Not regulated as a dangerous good

14.5 Environmental hazards

Not regulated as a dangerous good

14.6 Special precautions for user

Not applicable

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code

Remarks : Not applicable for product as supplied.

SECTION 15: Regulatory information

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

Regulation (EC) No 649/2012 of the European Parliament and the Council concerning the export and import of dangerous chemicals : Not applicable

Regulation (EC) No 1005/2009 on substances that deplete the ozone layer : Not applicable

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Regulation (EC) No 850/2004 on persistent organic pollutants : Not applicable

Seveso III: Directive 2012/18/EU of the European Parliament : Not applicable
and of the Council on the control of major-accident hazards
involving dangerous substances.

15.2 Chemical safety assessment

A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Full text of other abbreviations

ADN - European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways; ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road; AICS - Australian Inventory of Chemical Substances; ASTM - American Society for the Testing of Materials; bw - Body weight; CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DSL - Domestic Substances List (Canada); ECHA - European Chemicals Agency; EC-Number - European Community number; ECx - Concentration associated with x% response; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; n.o.s. - Not Otherwise Specified; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RID - Regulations concerning the International Carriage of Dangerous Goods by Rail; SADT - Self-Accelerating Decomposition Temperature; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TRGS - Technical Rule for Hazardous Substances; TSCA - Toxic Substances Control Act (United States); UN - United Nations; vPvB - Very Persistent and Very Bioaccumulative

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Further information

Sources of key data used : Internal technical data, data from raw material SDSs, OECD eChem
to compile the Safety Data Sheet Portal search results and European Chemicals Agency,
<http://echa.europa.eu/>

Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should re-view the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

GB/EN



SAFETY DATA SHEET

DOW CHEMICAL CANADA ULC

Product name: DOW™ DFDA-7059 NT 7 Linear Low Density Polyethylene Resin

Issue Date: 10/06/2017

Print Date: 08/03/2019

DOW CHEMICAL CANADA ULC encourages and expects you to read and understand the entire (M)SDS, as there is important information throughout the document. We expect you to follow the precautions identified in this document unless your use conditions would necessitate other appropriate methods or actions.

1. IDENTIFICATION

Product name: DOW™ DFDA-7059 NT 7 Linear Low Density Polyethylene Resin

Recommended use of the chemical and restrictions on use

Identified uses: A polyethylene plastic - For industrial conversion as a raw material for manufacture of articles or goods.

COMPANY IDENTIFICATION

DOW CHEMICAL CANADA ULC
#2400, 215 - 2ND STREET S.W.
CALGARY AB T2P 1M4
CANADA

Customer Information Number:

800-258-2436
SDSQuestion@dow.com

EMERGENCY TELEPHONE NUMBER

24-Hour Emergency Contact: 1-800-424-9300

Local Emergency Contact: 1-800-424-9300

2. HAZARDS IDENTIFICATION

Hazard classification

This product is not hazardous under the criteria of the Hazardous Products Regulation (HPR) as implemented under the Workplace Hazardous Materials Information System (WHMIS 2015).

Other hazards

Slipping hazard.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Synonyms: 1-Butene, polymer with ethene

This product is a substance.

Component	CASRN	Concentration
-----------	-------	---------------

1-Butene, polymer with ethene	25087-34-7	> 99.0 %
Tris-nonylphenyl Phosphite	26523-78-4	< 0.2 %

4. FIRST AID MEASURES

Description of first aid measures

General advice: First Aid responders should pay attention to self-protection and use the recommended protective clothing (chemical resistant gloves, splash protection). If potential for exposure exists refer to Section 8 for specific personal protective equipment.

Inhalation: Move person to fresh air; if effects occur, consult a physician.

Skin contact: Wash off with plenty of water. Seek first aid or medical attention as needed. If molten material comes in contact with the skin, do not apply ice but cool under ice water or running stream of water. DO NOT attempt to remove the material from skin. Removal could result in severe tissue damage. Seek medical attention immediately. Suitable emergency safety shower facility should be immediately available.

Eye contact: Flush eyes thoroughly with water for several minutes. Remove contact lenses after the initial 1-2 minutes and continue flushing for several additional minutes. If effects occur, consult a physician, preferably an ophthalmologist.

Ingestion: If swallowed, seek medical attention. May cause gastrointestinal blockage. Do not give laxatives. Do not induce vomiting unless directed to do so by medical personnel.

Most important symptoms and effects, both acute and delayed: Aside from the information found under Description of first aid measures (above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and effects are described in Section 11: Toxicology Information.

Indication of any immediate medical attention and special treatment needed

Notes to physician: If burn is present, treat as any thermal burn, after decontamination. If lavage is performed, suggest endotracheal and/or esophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIREFIGHTING MEASURES

Suitable extinguishing media: Water fog or fine spray. Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam.

Unsuitable extinguishing media: None known.

Special hazards arising from the substance or mixture

Hazardous combustion products: During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion products may include and are not limited to: Carbon monoxide. Carbon dioxide.

Unusual Fire and Explosion Hazards: Pneumatic conveying and other mechanical handling operations can generate combustible dust. To reduce the potential for dust explosions, do not permit dust to accumulate. Dense smoke is emitted when burned without sufficient oxygen.

Advice for firefighters

Fire Fighting Procedures: Keep people away. Isolate fire and deny unnecessary entry. Soak thoroughly with water to cool and prevent re-ignition. If material is molten, do not apply direct waterstream. Use fine water spray or foam. Cool surroundings with water to localize fire zone. Hand held dry chemical or carbon dioxide extinguishers may be used for small fires.

Special protective equipment for firefighters: Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or not used, fight fire from a protected location or safe distance.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures: Spilled material may cause a slipping hazard. Use appropriate safety equipment. For additional information, refer to Section 8, Exposure Controls and Personal Protection.

Environmental precautions: Prevent from entering into soil, ditches, sewers, waterways and/or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning up: Contain spilled material if possible. Sweep up. Collect in suitable and properly labeled containers. See Section 13, Disposal Considerations, for additional information.

7. HANDLING AND STORAGE

Precautions for safe handling: Use with adequate ventilation. No smoking, open flames or sources of ignition in handling and storage area. Good housekeeping and controlling of dusts are necessary for safe handling of product. Pneumatic conveying and other mechanical handling operations can generate combustible dust. To reduce the potential for dust explosions, electrically bond and ground equipment and do not permit dust to accumulate. Dust can be ignited by static discharge. When appropriate, unique handling information for containers can be found on the product label. Workers should be protected from the possibility of contact with molten resin. Do not get molten material in eyes, on skin or clothing. Avoid breathing process fumes. See Section 8, EXPOSURE CONTROLS AND PERSONAL PROTECTION.

Conditions for safe storage: Store in accordance with good manufacturing practices. Store indoors. Store in a cool, dry place. Store away from direct sunlight or ultraviolet light.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Exposure limits are listed below, if they exist.

Consult local authorities for recommended exposure limits.

Exposure limits have not been established for those substances listed in the composition, if any have been disclosed.

Exposure controls

Engineering controls: Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, general ventilation should be sufficient for most operations. Local exhaust ventilation may be necessary for some operations.

Individual protection measures

Eye/face protection: Use safety glasses (with side shields). If there is a potential for exposure to particles which could cause eye discomfort, wear chemical goggles. If exposure causes eye discomfort, use a full-face respirator.

Skin protection

Hand protection: Chemical protective gloves should not be needed when handling this material. Consistent with general hygienic practice for any material, skin contact should be minimized. Use gloves to protect from mechanical injury. Selection of gloves will depend on the task. Use gloves with insulation for thermal protection, when needed.

Other protection: No precautions other than clean body-covering clothing should be needed.

Respiratory protection: Respiratory protection should be worn when there is a potential to exceed the exposure limit requirements or guidelines. If there are no applicable exposure limit requirements or guidelines, wear respiratory protection when adverse effects, such as respiratory irritation or discomfort have been experienced, or where indicated by your risk assessment process. Use an approved air-purifying respirator when vapors are generated at increased temperatures or when dust or mist is present.

The following should be effective types of air-purifying respirators: When dust/mist are present use a/an Particulate filter. When combinations of vapors, acids, or dusts/mists are present use a/an Organic vapor cartridge with a particulate pre-filter.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance

Physical state	Pellets.
Color	Translucent to white
Odor	Odorless to mild
Odor Threshold	No test data available
pH	Not applicable
Melting point/range	Variable
Freezing point	Not applicable

Boiling point (760 mmHg)	Not applicable
Flash point	closed cup Not applicable
Evaporation Rate (Butyl Acetate = 1)	Not applicable
Flammability (solid, gas)	Not expected to form explosive dust-air mixtures.
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Vapor Pressure	Not applicable
Relative Vapor Density (air = 1)	Not applicable
Relative Density (water = 1)	0.83 - 0.97 <i>ASTM D 792</i>
Water solubility	Negligible
Partition coefficient: n-octanol/water	No data available
Auto-ignition temperature	No test data available
Decomposition temperature	No test data available
Kinematic Viscosity	Not applicable
Explosive properties	No
Oxidizing properties	No
Molecular weight	No data available

NOTE: The physical data presented above are typical values and should not be construed as a specification.

10. STABILITY AND REACTIVITY

Reactivity: No data available

Chemical stability: Stable.

Possibility of hazardous reactions: Polymerization will not occur.

Conditions to avoid: Exposure to elevated temperatures can cause product to decompose.

Incompatible materials: None known.

Hazardous decomposition products: Decomposition products depend upon temperature, air supply and the presence of other materials. Processing may release fumes and other decomposition products. At temperatures exceeding melt temperatures, polymer fragments can be released. Fumes can be irritating. Decomposition products can include and are not limited to: Aldehydes. Alcohols. Organic acids. Decomposition products can include trace amounts of: Hydrocarbons.

11. TOXICOLOGICAL INFORMATION

Toxicological information appears in this section when such data is available.

Acute toxicity

Acute oral toxicity

Very low toxicity if swallowed. Harmful effects not anticipated from swallowing small amounts.
May cause choking if swallowed.

Single dose oral LD50 has not been determined.

Typical for this family of materials.
LD50, Rat, > 5,000 mg/kg Estimated.

Acute dermal toxicity

No adverse effects anticipated by skin absorption.

The dermal LD50 has not been determined.

Typical for this family of materials.
LD50, Rabbit, > 2,000 mg/kg Estimated.

Acute inhalation toxicity

No adverse effects are anticipated from single exposure to dust. Vapors released during thermal processing may cause respiratory irritation.

The LC50 has not been determined.,

Skin corrosion/irritation

Prolonged contact is essentially nonirritating to skin.
Mechanical injury only.

Under normal processing conditions, material is heated to elevated temperatures; contact with the material may cause thermal burns.

Serious eye damage/eye irritation

Solid or dust may cause irritation or corneal injury due to mechanical action.
Elevated temperatures may generate vapor levels sufficient to cause eye irritation. Effects may include discomfort and redness.

Sensitization

For skin sensitization:
No relevant data found.

For respiratory sensitization:
No relevant data found.

Specific Target Organ Systemic Toxicity (Single Exposure)

Evaluation of available data suggests that this material is not an STOT-SE toxicant.

Specific Target Organ Systemic Toxicity (Repeated Exposure)

Based on available data, repeated exposures are not anticipated to cause significant adverse effects.

Carcinogenicity

No relevant data found.

Teratogenicity

No relevant data found.

Reproductive toxicity

No relevant data found.

Mutagenicity

No relevant data found.

Aspiration Hazard

Based on physical properties, not likely to be an aspiration hazard.

12. ECOLOGICAL INFORMATION

Ecotoxicological information appears in this section when such data is available.

Toxicity

Acute toxicity to fish

Not expected to be acutely toxic, but material in pellet or bead form may mechanically cause adverse effects if ingested by waterfowl or aquatic life.

Persistence and degradability

Biodegradability: This water-insoluble polymeric solid is expected to be inert in the environment. Surface photodegradation is expected with exposure to sunlight. No appreciable biodegradation is expected.

Bioaccumulative potential

Bioaccumulation: No bioconcentration is expected because of the relatively high molecular weight (MW greater than 1000).

Mobility in soil

In the terrestrial environment, material is expected to remain in the soil.
In the aquatic environment, material is expected to float.

13. DISPOSAL CONSIDERATIONS

Disposal methods: DO NOT DUMP INTO ANY SEWERS, ON THE GROUND, OR INTO ANY BODY OF WATER. All disposal practices must be in compliance with all Federal, State/Provincial and local laws and regulations. Regulations may vary in different locations. Waste characterizations and compliance with applicable laws are the responsibility solely of the waste generator. AS YOUR SUPPLIER, WE HAVE NO CONTROL OVER THE MANAGEMENT PRACTICES OR MANUFACTURING PROCESSES OF PARTIES HANDLING OR USING THIS MATERIAL. THE INFORMATION PRESENTED HERE PERTAINS ONLY TO THE PRODUCT AS SHIPPED IN ITS INTENDED CONDITION AS DESCRIBED IN MSDS SECTION: Composition Information. FOR UNUSED & UNCONTAMINATED PRODUCT, the preferred options include sending to a licensed, permitted: Recycler. Reclaimer. Incinerator or other thermal destruction device. Landfill.

14. TRANSPORT INFORMATION

TDG

Not regulated for transport

Classification for SEA transport (IMO-IMDG):

Not regulated for transport
Consult IMO regulations before transporting ocean bulk

**Transport in bulk
according to Annex I or II
of MARPOL 73/78 and the
IBC or IGC Code**

Classification for AIR transport (IATA/ICAO):

Not regulated for transport

This information is not intended to convey all specific regulatory or operational requirements/information relating to this product. Transportation classifications may vary by container volume and may be influenced by regional or country variations in regulations. Additional transportation system information can be obtained through an authorized sales or customer service representative. It is the responsibility of the transporting organization to follow all applicable laws, regulations and rules relating to the transportation of the material.

15. REGULATORY INFORMATION

Canadian Domestic Substances List (DSL)

All substances contained in this product are listed on the Canadian Domestic Substances List (DSL) or are not required to be listed.

16. OTHER INFORMATION

Revision

Identification Number: 101232687 / A208 / Issue Date: 10/06/2017 / Version: 4.2

Most recent revision(s) are noted by the bold, double bars in left-hand margin throughout this document.

Information Source and References

This SDS is prepared by Product Regulatory Services and Hazard Communications Groups from information supplied by internal references within our company.

DOW CHEMICAL CANADA ULC urges each customer or recipient of this (M)SDS to study it carefully and consult appropriate expertise, as necessary or appropriate, to become aware of and understand

the data contained in this (M)SDS and any hazards associated with the product. The information herein is provided in good faith and believed to be accurate as of the effective date shown above. However, no warranty, express or implied, is given. Regulatory requirements are subject to change and may differ between various locations. It is the buyer's/user's responsibility to ensure that his activities comply with all federal, state, provincial or local laws. The information presented here pertains only to the product as shipped. Since conditions for use of the product are not under the control of the manufacturer, it is the buyer's/user's duty to determine the conditions necessary for the safe use of this product. Due to the proliferation of sources for information such as manufacturer-specific (M)SDSs, we are not and cannot be responsible for (M)SDSs obtained from any source other than ourselves. If you have obtained an (M)SDS from another source or if you are not sure that the (M)SDS you have is current, please contact us for the most current version.

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1. Identification

Product identifier used on the label

Ultramid® B40 01

Recommended use of the chemical and restriction on use

Recommended use*: Polymer

Recommended use*: Polymer; for industrial processing only

Suitable for use in industrial sector: Polymers industry

* The "Recommended use" identified for this product is provided solely to comply with a Federal requirement and is not part of the seller's published specification. The terms of this Safety Data Sheet (SDS) do not create or infer any warranty, express or implied, including by incorporation into or reference in the seller's sales agreement.

Details of the supplier of the safety data sheet

Company:

BASF CORPORATION

100 Park Avenue

Florham Park, NJ 07932, USA

Telephone: +1 973 245-6000

Emergency telephone number

CHEMTREC: 1-800-424-9300

BASF HOTLINE: 1-800-832-HELP (4357)

Other means of identification

Chemical family: No data available.

Synonyms: Polyamide PA6

2. Hazards Identification

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Classification of the product

No need for classification according to GHS criteria for this product.

Label elements

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The product does not require a hazard warning label in accordance with GHS criteria.

Hazards not otherwise classified

No specific dangers known, if the regulations/notes for storage and handling are considered.

3. Composition / Information on Ingredients

According to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

Under the referenced regulation, this product does not contain any components classified for health hazards above the relevant cut off value.

4. First-Aid Measures

Description of first aid measures

General advice:

Remove contaminated clothing. Burns caused by molten material require hospital treatment.

If inhaled:

Keep patient calm, remove to fresh air. Seek medical attention.

If on skin:

Wash affected areas thoroughly with soap and water. If irritation develops, seek medical attention. Burns caused by molten material require hospital treatment.

If in eyes:

In case of contact with the eyes, rinse immediately for at least 15 minutes with plenty of water. If irritation develops, seek medical attention.

If swallowed:

No hazards anticipated.

Most important symptoms and effects, both acute and delayed

Symptoms: (Further) symptoms and / or effects are not known so far

Hazards: No hazard is expected under intended use and appropriate handling.

Indication of any immediate medical attention and special treatment needed

Note to physician

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:

water spray, foam, dry powder, carbon dioxide

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Special hazards arising from the substance or mixture

Hazards during fire-fighting:

carbon monoxide, hydrogen cyanide, can be emitted at > 300 °C

Under special fire conditions traces of other toxic substances are possible. Formation of further decomposition and oxidation products depends upon the fire conditions.

Advice for fire-fighters

Protective equipment for fire-fighting:

Firefighters should be equipped with self-contained breathing apparatus and turn-out gear.

Further information:

Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

6. Accidental release measures

Further accidental release measures:

High risk of slipping due to leakage/spillage of product.

Personal precautions, protective equipment and emergency procedures

No special precautions necessary.

Environmental precautions

No special precautions necessary. This product is not regulated by RCRA. This product is not regulated by CERCLA ('Superfund').

Methods and material for containment and cleaning up

For small amounts: Pick up with suitable appliance and dispose of.

For large amounts: Pick up with suitable appliance and dispose of.

7. Handling and Storage

Precautions for safe handling

Avoid contact with skin and eyes. Wear suitable protective clothing and gloves. Handle in accordance with good industrial hygiene and safety practice.

Protection against fire and explosion:

Take precautionary measures against static discharges.

Conditions for safe storage, including any incompatibilities

The product in undamaged packing need not be stored separately.

Suitable materials for containers: Stainless steel 1.4301 (V2), Stainless steel 1.4401, Aluminium, High density polyethylene (HDPE)

Storage stability:

Protect against moisture.

8. Exposure Controls/Personal Protection

No occupational exposure limits known.

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Advice on system design:

Provide local exhaust ventilation to control dusts/vapours.

Personal protective equipment

Respiratory protection:

Wear respiratory protection if ventilation is inadequate. Wear a NIOSH-certified (or equivalent) organic vapour/particulate respirator.

Hand protection:

Wear gloves to prevent contact during mechanical processing and/or hot melt conditions.

Eye protection:

Safety glasses with side-shields.

Body protection:

Body protection must be chosen based on level of activity and exposure.

General safety and hygiene measures:

Wear protective clothing to prevent contact during mechanical processing and/or hot melt conditions. Avoid inhalation of dust. Handle in accordance with good industrial hygiene and safety practice.

9. Physical and Chemical Properties

Form:	pellets	
Odour:	odourless	
Odour threshold:	not applicable	
Colour:	colourless	
pH value:	not soluble	
Melting temperature:	approx. 220 °C	(DIN 53765)
onset of boiling:	not applicable	
Sublimation point:	No applicable information available.	
Flash point:	not applicable, the product is a solid	
Flammability:	not highly flammable	
Flammability of Aerosol Products:	not applicable, the product does not form flammable aerosoles	
Lower explosion limit:	For solids not relevant for classification and labelling.	
Upper explosion limit:	For solids not relevant for classification and labelling.	
Autoignition:	> 400 °C	(ASTM D1929)
Vapour pressure:	not applicable	
Density:	approx. 1.15 g/cm ³	
Relative density:	No data available.	
Bulk density:	640 - 740 kg/m ³	
Vapour density:	not applicable, The product is a non-volatile solid.	
Partitioning coefficient n-octanol/water (log Pow):	not applicable	
Self-ignition temperature:	not self-igniting	
Thermal decomposition:	> 300 °C May decompose if overheated and/or subjected to prolonged heating.	
Viscosity, dynamic:	not applicable, the product is a solid	
Viscosity, kinematic:	not applicable, the product is a solid	

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Solubility in water:	insoluble
Solubility (quantitative):	No applicable information available.
Solubility (qualitative):	No applicable information available.
Evaporation rate:	not applicable, The product is a non-volatile solid.

10. Stability and Reactivity

Reactivity

No hazardous reactions if stored and handled as prescribed/indicated.

Corrosion to metals:
No corrosive effect on metal.

Oxidizing properties:
not fire-propagating

Chemical stability

The product is stable if stored and handled as prescribed/indicated.

Possibility of hazardous reactions

No hazardous reactions known.

Conditions to avoid

Temperature: > 300 degrees Celsius
Avoid prolonged exposure to extreme heat.

Incompatible materials

No substances known that should be avoided.

Hazardous decomposition products

Decomposition products:
Hazardous decomposition products: carbon monoxide, hydrogen cyanide, caprolactam
Thermal decomposition products: caprolactam, The substances/groups of substances mentioned may be released during processing.

Thermal decomposition:
> 300 °C
May decompose if overheated and/or subjected to prolonged heating.

11. Toxicological information

Primary routes of exposure

Routes of entry for solids and liquids are ingestion and inhalation, but may include eye or skin contact. Routes of entry for gases include inhalation and eye contact. Skin contact may be a route of entry for liquefied gases.

Acute Toxicity/Effects

Acute toxicity
Assessment of acute toxicity: Contact with molten product may cause thermal burns. The resin in pelleted form poses a low hazard.

Oral

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Type of value: ATE
Value: > 5,000 mg/kg

Inhalation

Not inhalable due to the physico-chemical properties of the product.

Dermal

Type of value: ATE
Value: > 5,000 mg/kg

Assessment other acute effects

No applicable information available.

Irritation / corrosion

Assessment of irritating effects: Thermal decomposition products of the substance can irritate the eyes, skin, and respiratory tract.

Sensitization

Assessment of sensitization: Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

Aspiration Hazard

not applicable

Chronic Toxicity/Effects

Repeated dose toxicity

Assessment of repeated dose toxicity: Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

Genetic toxicity

Assessment of mutagenicity: Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

Carcinogenicity

Assessment of carcinogenicity: Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

Reproductive toxicity

Assessment of reproduction toxicity: Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

Other Information

Based on our experience and the information available, no adverse health effects are expected if handled as recommended with suitable precautions for designated uses.

Symptoms of Exposure

(Further) symptoms and / or effects are not known so far

Medical conditions aggravated by overexposure

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Data available do not indicate that there are medical conditions that are generally recognized as being aggravated by exposure to this substance/product. See MSDS section 11 - Toxicological information.

12. Ecological Information

Toxicity

Aquatic toxicity

Assessment of aquatic toxicity:

There is a high probability that the product is not acutely harmful to aquatic organisms. The product has not been tested. The statement has been derived from the structure of the product.

Persistence and degradability

Assessment biodegradation and elimination (H₂O)

Experience shows this product to be inert and non-degradable.

Bioaccumulative potential

Bioaccumulation potential

The product will not be readily bioavailable due to its consistency and insolubility in water.

Additional information

Add. remarks environm. fate & pathway:

Due to the consistency of the product, dispersion into the environment is impossible. Therefore no negative effects on the environment may be anticipated based on the present state of knowledge.

13. Disposal considerations

Waste disposal of substance:

Check for possible recycling. Dispose of in accordance with national, state and local regulations.

Container disposal:

Dispose of in accordance with national, state and local regulations. Packs must be completely emptied. Completely emptied packagings can be given for recycling.

14. Transport Information

Land transport

USDOT

Not classified as a dangerous good under transport regulations

Sea transport

IMDG

Not classified as a dangerous good under transport regulations

Air transport

IATA/ICAO

Not classified as a dangerous good under transport regulations

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15. Regulatory Information

Federal Regulations

Registration status:

Chemical TSCA, US released / listed

EPCRA 311/312 (Hazard categories): Refer to SDS section 2 for GHS hazard classes applicable for this product.

NFPA Hazard codes:

Health: 1 Fire: 1 Reactivity: 0 Special:

HMIS III rating

Health: 1 Flammability: 1 Physical hazard: 0

16. Other Information

SDS Prepared by:

BASF NA Product Regulations
SDS Prepared on: 2019/07/29

We support worldwide Responsible Care® initiatives. We value the health and safety of our employees, customers, suppliers and neighbors, and the protection of the environment. Our commitment to Responsible Care is integral to conducting our business and operating our facilities in a safe and environmentally responsible fashion, supporting our customers and suppliers in ensuring the safe and environmentally sound handling of our products, and minimizing the impact of our operations on society and the environment during production, storage, transport, use and disposal of our products.

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END OF DATA SHEET



ATTACHMENT 3

Dow Chemical Regulatory Data Sheet for Dowlex™ 2045G Polyethylene Resin



DOWLEX™ 2045G Polyethylene Resin

Global Chemical Inventory Compliance

All components of this product are compliant with the country/region Chemical Inventories as per the following table or are exempt:

Country	Inventory	Y/N
Europe	REACH	Yes
Canada	DSL	Yes
Canada	NDSL	N/A
United States	TSCA	Yes
Australia	AICS	Yes

Country	Inventory	Y/N
China	IECSC	Yes
Japan	ENCS	Yes
Korea	KECI	Yes
New Zealand	NZIoC	Yes
Philippines	PICCS	Yes
Taiwan	TCSI	Yes

US FDA Food Contact Status

When used unmodified and processed in accordance with Good Manufacturing Practices (GMP) for food contact applications, this product will comply with the U.S. Food and Drug Administration's food additive regulation 21 CFR 177.1520(c), paragraph 3.2a, under the Federal Food, Drug, and Cosmetic Act. This product may be used to produce articles or components of articles used in contact with food for all food types described in Table 1 and Conditions of Use A-H described in Table 2 of U.S. FDA's regulation 21 CFR § 176.170(c). The preceding statement refers to regulatory requirements only, not to the product's physical utility. It is the responsibility of the article producer or food packager to determine that the article is suitable for its intended use.

US FDA Drug Master File (DMF)

This product is listed under FDA Drug Master File 22316. Please contact Dow's Customer Information Group if you require more information (<http://www.Dow.com/en-us/contact-us-cig>).

US Pharmacopoeia (USP)

This product has not been assessed under U.S. Pharmacopoeia. Please contact Dow's Customer Information Group if you require further information (<http://www.Dow.com/en-us/contact-us-cig>).

Canadian Food Contact (HPFB or CFIA)

This product has been granted Canadian Health Products and Food Branch (HPFB) No Objection Status, it is the responsibility of the end user to consult HPFB before using this product in a food contact or pharmaceutical packaging application.

European Commission Regulation (EU) No 10/2011 (Food Contact)

The composition of this product complies with the requirements for use in contact with food of European Commission Regulation (EU) No 10/2011, including any subsequent amendments that are in force prior to the effective date of this Regulatory Data Sheet. Contact Dow at FGLREGL@dow.com to obtain the extended food contact certification letter for this product.

China Food Contact Compliance

This resin complies with China GB9685-2016 Food Safety National Standard: Use of Additives for Food contact Materials and Article, GB4806.6-2016 Food Safety National Standard: Food-contact Use Plastic Resins and GB 4806.1-2016 Food Safety National Standard: General Safety Requirements for Food-Contact Materials and Articles. The manufacturing process of this product complies with the relevant requirements of GB31603-2015: General Hygiene Standard for Production of Food Contact Materials and Articles as applicable to plastic resin production. Please contact Dow at FGLREGL@dow.com to obtain the extended food contact certification letter for this product.

Japan Hygienic Olefin and Styrene Plastics Association (JHOSPA)

This product is registered under the Japan Hygienic Olefin and Styrene Plastics Association (JHOSPA) for use in food contact packaging applications.

India Standard for Contact with Food, Pharmaceuticals, or Drinking Water

This product complies with the requirements of Indian Standard IS 10146:1982, Specification for Polyethylene for its safe use in Contact with Foodstuffs, Pharmaceuticals and Drinking Water and IS 10141:2001, Positive List of constituents of Polyethylene in Contact with Foodstuffs, Pharmaceuticals and Drinking Water, and may be regarded as safe for use when properly processed. The preceding statement refers to regulatory requirements only, not to the product's physical utility. It is the responsibility of the article producer or food packager to determine that the article is suitable for its intended use. Please contact Dow's Customer Information Group if you require further information (<http://www.Dow.com/en-us/contact-us-cig>).

Latin America MERCOSUR Food Contact Status

This product complies with MERCOSUR GMC Resolution No. 56/92, Resolution No. 32/07 and Resolution No. 02/12.

Brazil ANVISA Food Contact Status

This product complies with ANVISA RDC Resolution 105/1999, Resolution No. 17/2008, Resolution No. 51/2010, Resolution No. 52/2010 and Resolution No. 56/2012.

Colombia INVIMA Food Contact Status

This product complies with Resolution 4143/2012, of Instituto Nacional de Vigilancia de Medicamentos y Alimentos.

Animal Derived Components (BSE/TSE)

To the best of our knowledge, this product is not manufactured or formulated with ingredients of animal origin.

Plant Derived Components

This product may contain one or more substances(s) synthesized from plant extracts, i.e. hydrolysis of plant oils into fatty acids and/or their derivatives, as per information from our raw material suppliers.

Palm Oil Derived Components

Palm oil, as such, is not used in the manufacturing of this product; however, palm oil derivatives are used in the manufacturing of one or more raw materials utilized in the production of this product. These palm oil derivatives are only purchased from suppliers which are members of the "Roundtable on Sustainable Palm Oil" (RSPO).



Food Allergens

To the best of our knowledge, there are no raw materials, including additives, that have their origin in peanuts, soybeans, milk, eggs, fish, shellfish (mollusks), crustaceans, tree nuts, mustard, celery, sesame, sunflowers, lupine, animal or vegetable proteins, caffeine, monosodium glutamate (MSG), colorants (including carmine and cochineal), corn, wheat, barley, rye, triticale, gluten, mushrooms, yams, and/or phenylalanine and its derivatives. No sulfates, sulfites, or sulfur dioxide are used in the synthesis of this material. This evaluation is based on information provided by our raw material and additive suppliers for the presence of the allergen-stimulating substances shown above. Therefore, although we believe this product to be free of the specified known allergy stimulating food substances, we cannot guarantee this.

Materials from Genetically Modified Organisms

To the best of our knowledge, there are no raw materials, including additives, that have been derived from genetically modified organisms (GMO). This is based on information from our additive suppliers. Therefore, although we believe this product to be GMO free, we cannot guarantee it at this time.

Kosher

The raw materials used in the manufacture of this product are derived from non-animal sources. There is no animal fat, no animal derived materials, grain derived, or fermentation products used in this product. The product is not certified as kosher but will comply with the kosher dietary laws. Therefore, this product can be used with kosher products without compromising the status of the products.

Halal

This product has not been manufactured or formulated with animal fats or ingredients derived from animal or fermentation products.

REACH

For information on Dow and the European Union regulation for Registration, Evaluation, Authorization and Restriction of Chemicals (REACH), visit our website, <https://reach.dow.com/>.

This product is not manufactured or formulated with any of the Substances of Very High Concern (SVHC) as per the candidate list that was current as of the effective date of this regulatory datasheet that would require reporting under this regulation. Current information can be found at the ECHA website. <https://echa.europa.eu/candidate-list-table>. Please contact Dow's Customer Information Group for more information (<http://www.Dow.com/en-us/contact-us-cig>).

EU Directive 2011/65/EU (RoHS)

This product complies with the requirements of Article 4.1 of EU Directive 2011/65/EU (RoHS 2), as amended (Directive (EU) 2015/863 inclusive) (RoHS 3). It is not intentionally manufactured or formulated with cadmium, hexavalent chromium, lead, mercury, polybrominated biphenyls (PBB), polybrominated diphenyl ethers (PBDE), Bis(2-ethylhexyl) phthalate (DEHP), Butyl benzyl phthalate (BBP), Dibutyl phthalate (DBP), or Diisobutyl phthalate (DIBP).

EU Directive 2012/19/EU on Waste Electrical and Electronic Equipment (WEEE)

EU Directive 2012/19/EU on WEEE: Selective treatment of the waste (Annex VII). None of the substances listed in Annex VII are intentionally added or used in the formulation of this product with the following exception. This product is a hydrocarbon; however, liquid hydrocarbons are not present in this product.



Heavy Metals, EU 94/62/EC and Coalition of Northeastern Governors (CONEG)

This product conforms to the Coalition of Northeastern Governors (CONEG) and the European Directive 94/62/EC, as amended, on Packaging and Packaging Waste, Article 11. Any incidental levels of lead, cadmium, hexavalent chromium, and mercury do not exceed 100 ppm total.

Toy Safety - ASTM F963 / EN 71-3

This product is not formulated with antimony, arsenic, barium, boron, cadmium, chromium, cobalt, copper, mercury, lead, nickel, selenium, strontium or tin. To the best of our knowledge, it does not contain these substances above the limits set in ASTM F 963-11, Section 4.3.5.2. This product complies with the requirements of EN 71 Safety of Toys - Part 3, Migration of Certain Elements.

Mineral Oil Aromatic Hydrocarbons / Mineral Oil Saturated Hydrocarbons

This product is not intentionally formulated with Mineral Oil Aromatic Hydrocarbons (MOAH) or Mineral Oil Saturated Hydrocarbons (MOSH); however, trace amounts (ppm) of food grade, White Mineral Oil (MOSH) in compliance with Commission Regulation (EU) No 10/2011 and U.S. FDA food contact requirements may be present.

Consumer Product Safety Improvement Act of 2008 (CPSIA)

This product is not manufactured or formulated with lead, di-(2-ethylhexyl)phthalate (DEHP), dibutyl phthalate (DBP), or benzyl butyl phthalate (BBP). To the best of our knowledge, it does not contain these materials above the limits set in the Consumer Product Safety Improvement Act of 2008, Title 1, Sections 101 and 108.

Canadian Environmental Protection Act Challenge Substances

This product is not intentionally manufactured or formulated with the Batch Lists of Canadian Environmental Protection Agency (CEPA) Challenge Substances released as of the effective date of this document. However, we do not analyze for these specific substances.

(<http://www.chemicalsubstanceschimiques.gc.ca/challenge-defi/index-eng.php>)

Butylated Hydroxytoluene (BHT) (CAS# 128-37-0)

This product is not formulated with Butylated Hydroxytoluene (BHT - CAS # 128-37-0); however, it may contain trace amounts up to a maximum of 5 ppm.

Clean Air Act

This product is not manufactured or formulated with Class I or II substances as defined under 40 CFR part 82 of the Clean Air Act of 1990, as amended (58 FR 8136).

California Proposition 65 (Safe Drinking Water and Toxic Enforcement Act of 1986)

This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute as of the effective date of this regulatory datasheet.



Zinc and Zinc Compounds

This product is not manufactured or formulated with Zinc or Zinc Compounds; however, we do not analyze for these specific substances.

Conflict Minerals (Dodd-Frank Wall Street Reform and Consumer Protection Act)

This product is not intentionally manufactured or formulated with the listed conflict minerals as per Section 1502 of the Dodd-Frank Wall Street Reform and Consumer Protection Act; however, we do not analyze for these specific substances or compounds.

- Columbite-Tantalite – refined into Tantalum (Ta) (CAS # 7440-25-7)
- Cassiterite – refined into Tin (Sn) (CAS # 7440-31-5)
- Wolframite – refined into Tungsten (W) (CAS # 7440-33-7)
- Gold (Au) (CAS # 7440-57-5)

For more information please visit Dow's Corporate Website - <https://corporate.dow.com/en-us/about/codes-of-conduct>.

Substances and Chemicals

This product is not intentionally manufactured or formulated with the following substances or compounds; however, we do not analyze for these substances or compounds.

- Acrylamide
- Adipates
- Alkylphenols and Alkylphenol ethoxylates belonging to the group of potential estrogen mimics - Specifically - nonylphenol, octylphenol, butylphenol, dodecylphenol
- Antimony and Antimony compounds
- Aromatic amines
- Arsenic and Arsenic compounds
- Asbestos
- Azo compounds
- Beryllium and Beryllium compounds
- Biocides
- Bis(2-ethylhexyl) adipate (DEHA)
- Bisphenol compounds, including but not limited to: BPA, BPB, BPC, BPE, BPF, BPS, and BPZ
- Butylated Hydroxyanisole (BHA)
- Cadmium and Cadmium compounds
- Chlorofluorocarbons (CFCs) or Hydrochlorofluorocarbons (HCFCs)
- Colorants or pigments
- Chlorinated paraffins
- Colophony
- Copper and Copper compounds
- Dimethylfumarate (DMF)
- 1,4 - Dioxane
- Dioxins or furans
- Endocrine disruptors (proven by the industry)
- Epoxy derivatives listed in EU Regulation (EC) No 1895/2005
 - Bisphenol A diglycidyl ether (BADGE) (CAS # 1675-54-3)



RDS - DOWLEX™ 2045G Polyethylene Resin

- Bisphenol F diglycidyl ether (BFDGE) (CAS # 39817-09-9)
- Novolac Glycidyl Ethers (NOGE)

Fiberglass

Flavorings or Fragrances

Fluorotelomers

Formaldehyde

Fungicides, pesticides, preservatives, or fumigants

Halogenated (Brominated or chlorinated) or phosphorous based flame retardants

Halogenated organic compounds

Hexachlorobenzene

Human Derived substances

Isocyanates

Materials derived from the Jatropha Plant

Melamine

Mercury and Mercury compounds

Nano materials

Natural rubber latex, dry natural rubber, or synthetic latex

Nickel and nickel compounds

Nitroso compounds

Organotin compounds

Ozone-depleting chemicals (includes lists under the Montreal Protocol & Regulation (EC) No 1005/2009)

Parabens

Pentachlorophenol

Perchlorates

Perfluorooctanoic acid (PFOA), perfluorooctane sulfonate (PFOS) or perfluoroalkyls

Phthalates / Phthalate esters

Photoinitiators, including: benzophenone, hydroxybenzophenone, and 4-methylbenzophenone, and

Isopropylthioxanthone (ITX)

Plasticizers

Polycyclic Aromatic Hydrocarbons (PAHs)

Polybrominated Diphenyl Ethers (PBDEs)

Polychlorinated and Polybrominated Biphenyls (PCBs and PBBs)

Polychlorinated and Polybrominated Naphthalenes

Polychlorinated and Polybrominated Terphenyls (PCTs and PBTs)

Polyvinylidene Chloride (PVDC)

Polyvinyl Chloride (PVC)

Radioactive Substances

Recycled materials

Silicone

Silver and silver compounds

Styrene

Sulfonamides

Tertiary butylhydroquinone (TBHQ) CAS# 1948-33-0

Triclosan (2,4,4'-trichloro-2'-hydroxydiphenylether)

Tris(2-chloroethyl)phosphate (TCEP) CAS# 115-96-8

Tris(nonylphenyl)phosphite (TNPP)

Vinyl Chloride Monomer (VCM)

Xylene



Supersedes all versions prior to Effective Date

Product Stewardship

The Dow Chemical Company and its subsidiaries ("Dow") has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our Product Stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take the appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products—from the initial concept and research, to manufacture, use, sale, disposal and recycle of each product.

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- a. long-term or permanent contact with internal bodily fluids or tissues. "Long-term" is contact which exceeds 72 continuous hours;
- b. use in cardiac prosthetic devices regardless of the length of time involved ("cardiac prosthetic devices" include, but are not limited to, pacemaker leads and devices, artificial hearts, heart valves, intra-aortic balloons and control systems, and ventricular bypass-assisted devices);
- c. use as a critical component in medical devices that support or sustain human life; or
- d. use specifically by pregnant women or in applications designed specifically to promote or interfere with human reproduction.

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