Material Safety Data Sheet

Neoprene polychloroprene

Version 2.2

Revision Date 08/20/2012 Ref. 150000002482

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	:	Neoprene polychloroprene
Product Grade/Type	:	W, WM 1, WHV, WHV 100, AD, AD 10, AD 20, AD 30, AD 40
MSDS Number	:	150000002482
Product Use	:	Rubber products
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)

SECTION 2. HAZARDS IDENTIFICATION

Potential Health Effects

Inhalation : May cause nose, throat, and lung irritation. Cough, Severe shortness of breath, Difficulty in breathing, Prolonged contact may cause:, Chronic lung disease with alterations in lung function or difficulty breathing.

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
Poly(2-chloro-1,3-butadiene)	9010-98-4	>95%

Rosin	8050-09-7	<5 %
Talc (Mg3H2(SiO3)4) (asbestos-free)	14807-96-6	<1 %

SECTION 4. FIRST AID MEASURES

Skin contact	:	Wash off with soap and water. Cool skin rapidly with cold water after contact with hot polymer. Do not peel polymer from the skin. Consult a physician if necessary.
Eye contact	:	Rinse thoroughly with plenty of water, also under the eyelids. Consult a physician if necessary.
Inhalation	:	If breathed in, move person into fresh air. Move to fresh air in case of accidental inhalation of fumes from overheating or combustion. Consult a physician if necessary.
Ingestion	:	If victim is conscious: Drink water as a precaution. Consult a physician.
General advice	:	If symptoms persist, call a physician.

SECTION 5. FIREFIGHTING MEASURES

Flammable Properties Flash point	:	> 260 °C (> 500 °F) open cup
Fire and Explosion Hazard	:	Burning produces noxious and toxic fumes.
Suitable extinguishing media	:	Carbon dioxide (CO2), Foam, Water, Dry chemical
Firefighting Instructions	:	Wear self-contained breathing apparatus and protective suit. Evacuate personnel to safe areas. Do not allow run-off from fire fighting to enter drains or water courses.

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.

Safeguards (Personnel)	:	Refer to protective measures listed in sections 7 and 8.
Spill Cleanup	:	Shovel into suitable container for disposal. Clean contaminated floors and objects thoroughly while observing environmental regulations.
Accidental Release Measures	:	Try to prevent the material from entering drains or water courses.

SECTION 7. HANDLING AND STORAGE

Handling (Personnel)	:	Protect from contamination. Provide appropriate exhaust ventilation at dryers, machinery and at places where dust or volatiles can be generated. Do not breathe dust. Do not breathe fumes evolved from hot polymer. General precaution for all plastics and elastomers: Wash hands before breaks and immediately after handling the product. Regular cleaning of equipment, work area and clothing. When using do not eat, drink or smoke.
Handling (Physical Aspects)	:	General precaution for all plastics and elastomers: Take necessary action to avoid static electricity discharge (which might cause ignition of organic vapours). Avoid dust formation.
Storage	:	Keep in a dry, cool and well-ventilated place. Keep containers dry and tightly closed to avoid moisture absorption and contamination.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls	:	Use only in area provided with appropriate exhaust ventilation.
Personal protective equipment Respiratory protection	:	In case of insufficient ventilation, wear suitable respiratory equipment. Where there is potential for airborne exposures in excess of applicable limits, wear NIOSH approved respiratory protection.

Hand protection	:	Material: Nitrile rubber Glove thickness: 0.38 mm Wearing time: 8 h
Eye protection	:	Safety glasses with side-shields
Skin and body protection	:	If there is a potential for contact with hot/molten material wear heat resistant clothing and footwear.

Exposure Guidelines

Exposure Limit Values

Contains no substances with occupational exposure limit values.

Hydrogen chloride (gas)

PEL:	(OSHA)	5 ppm	7 mg/m3	TLV-C
TLV	(ACGIH)	2 ppm	TLV-C	
AEL *	(DUPONT)	5 ppm	15 minute TWA	

* 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	:	chips
Color	:	off-white, tan
Odor	:	slight, characteristic
Density	:	1.23 g/cm3 Method: ASTM D 792
Water solubility	:	insoluble

SECTION 10. STABILITY AND REACTIVITY

Conditions to avoid	:	Processing temperature > 200 °C (> 392 °F) Avoid heating for prolonged periods above the recommended upper processing limit.
Incompatibility	:	None reasonably foreseeable.
Hazardous decomposition products	:	Hazardous decomposition products: Hydrogen chloride, Carbon monoxide, Organic acids, Aldehydes, Alcohols
Hazardous reactions	:	Polymerization will not occur. During drying, cleaning and moulding, small amounts of hazardous gases and/or particulate matter may be released. These may irritate eyes, nose and throat.

SECTION 11. TOXICOLOGICAL INFORMATION

Neoprene polychloroprene

Sensitisation	:	Animal test did not cause sensitization by skin contact. (Data on the product itself)

Poly(2-chloro-1,3-butadiene)

Oral ALD	:	20,000 mg/kg , rat
Further information	:	The substance is a polymer and is not expected to produce toxic effects.

Rosin

Dermal LD50	:	> 2,000 mg/kg , rat Information given is based on data obtained from similar substances.
Oral LD50	:	7,600 mg/kg , rat Information given is based on data obtained from similar substances.
Skin irritation	:	Slight or no skin irritation, rabbit Information given is based on data obtained from similar substances.
Eye irritation	:	slight irritation, rabbit
Repeated dose toxicity	:	Oral

rat

No toxicologically significant effects were found.

Carcinogenicity	:	Animal testing did not show any carcinogenic effects.
Mutagenicity	:	Evidence suggests this substance does not cause genetic damage in animals. Tests on bacterial or mammalian cell cultures did not show mutagenic effects.
Reproductive toxicity	:	Animal testing did not show any effects on fertility.
Teratogenicity	:	Animal testing showed no developmental toxicity.

Talc (Mg3H2(SiO3)4) (asbestos-free)

Dermal	:	No adverse effects expected.
Oral LD50	:	> 5,000 mg/kg , rat
Inhalation 5 h ALC - Approximate Lethal Concentration	:	> 22 mg/l , rat eye effects Altered respiratory rate
Skin irritation	:	No adverse effects expected.
Eye irritation	:	No adverse effects expected.
Repeated dose toxicity	:	Inhalation No toxicologically significant effects were found.
Carcinogenicity	:	Tumors were noticed after prolonged inhalation toxicity testing on rats. The observed tumors do not appear to be relevant for men.
Mutagenicity	:	Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Animal testing did not show any mutagenic effects.
Reproductive toxicity	:	No adverse effects expected.
Teratogenicity	:	Evidence suggests the substance is not a developmental toxin in animals.

SECTION 12. ECOLOGICAL INFORMATION

Aquatic Toxicity

Poly(2-chloro-1,3-butadiene)

: The substance is a polymer and is not expected to produce toxic effects.

Rosin

96 h LC50	:	Danio rerio (zebra fish) > 1,000 mg/l
96 h LC50	:	Leuciscus idus (Golden orfe) > 1,000 mg/l
96 h LC50	:	Pimephales promelas (fathead minnow) > 1,000 mg/l
72 h EC50	:	Pseudokirchneriella subcapitata (green algae) > 1,000 mg/l
72 h EbC50	:	Scenedesmus capricornutum (fresh water algae) 400 mg/l
72 h ErC50	:	Scenedesmus capricornutum (fresh water algae) 410 mg/l
48 h EC50	:	Daphnia magna (Water flea) > 750 mg/l

Talc (Mg3H2(SiO3)4) (asbestos-free)

: This product has no known eco-toxicological effects.

Environmental Fate

Rosin

Biodegradability : Inherently biodegradable.

Additional ecological information : No data is available on the product itself.

SECTION 13. DISPOSAL CONSIDERATIONS

Waste Disposal : If recycling is not practicable, dispose of in compliance with local regulations. Can be landfilled or incinerated, when in compliance with local regulations. Incinerate only in incinerators capable of scrubbing out acidic combustion products.

Environmental Hazards : Offer rinsed packaging material to local recycling facilities.

If recycling is not practicable, dispose of in compliance with local regulations.

SECTION 14. TRANSPORT INFORMATION

Not classified as dangerous in the meaning of transport regulations.

SECTION 15. REGULATORY INFORMATION

EINECS Status	:	On the inventory, or in compliance with the inventory
TSCA Status	:	In compliance with TSCA Inventory requirements for commercial purposes.
AICS Status	:	On the inventory, or in compliance with the inventory
DSL Status	:	On the inventory, or in compliance with the inventory
ENCS (JP) Status	:	On the inventory, or in compliance with the inventory
KECI (KR) Status	:	On the inventory, or in compliance with the inventory
PICCS (PH) Status	:	On the inventory, or in compliance with the inventory
INV (CN) Status	:	On the inventory, or in compliance with the inventory
ISHL (JP) Status	:	On the inventory, or in compliance with the inventory
NZIOC Status	:	On the inventory, or in compliance with the inventory
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	:	WARNING! This product contains a chemical known to the State of California to cause cancer.trans-1,4-Dichlorobut-2-ene WARNING! This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.Toluene
PA Right to Know Regulated Chemical(s)	:	Substances on the Pennsylvania Hazardous Substances List present at a concentration of 1% or more (0.01% for Special Hazardous Substances): Rosin
NJ Right to Know Regulated Chemical(s)	:	Substances on the New Jersey Workplace Hazardous Substance List present at a concentration of 1% or more (0.1% for substances identified as carcinogens, mutagens or teratogens): No components present on the NJ state hazardous substance lists.

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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.

Before use read DuPont's safety information.

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.

DuPont™ Neoprene
Guide for Safety in Handling and FDA Status of Neoprene Solid Polymers

Technical Information — Rev. 8, July 2010

Beyond the hazards typically encountered in processing any polymer (e.g., static, dust generation, thermal control, etc), DuPont is not aware of specific health hazards associated with exposure to uncompounded DuPont™ Neoprene polychloroprene solid polymers. However, for all Neoprene solid polymers, routine industrial hygiene practices are recommended to avoid conditions such as excessive processing temperatures, dust formation, dust buildup and static charges. This technical bulletin includes available hazard data and handling guidance for Neoprene solid polymers. The bulletin also provides the status of DuPont™ Neoprene solid polymers with respect to applicable U.S. Food and Drug Administration regulations (Table 1). A brief description of FDA regulations pertinent to Neoprene polymers is also given.

Safety in Handling

Raw Polymer

Handling

Solid Neoprene polychloroprene polymers are supplied as chips. These materials can potentially accumulate a static charge during shipping, unloading, conveying, or pouring from the bag. Refer to the National Fire Protection Association (NFPA) RP77 “Recommended Practice on Static Electricity” for guidance in reducing the fire hazards associated with static electricity.

Warehouse storage areas used for Neoprene should display appropriate warnings. In case of fire, substantial quantities of hydrogen chloride (the US Occupational Safety, and Health Administration Permissible Exposure Limit [OSHA PEL] for HCl is 5 ppm, Ceiling) can be evolved. Appropriate eye, respiratory and skin protection from smoke and corrosive hydrogen chloride gas should be used. Decomposition product residues in water may be acidic and appropriate skin protection should be considered in fire-wastes.

Dust Inhalation Precautions

Only non-asbestiform talc (CAS No. 14807-96-6) is used as a partitioning agent on Neoprene chips to reduce massing and improve flow. Talc used for Neoprene solid polymers may have low levels of crystalline silica, typically, <1%. Free talc may become airborne during transfer or handling of the Neoprene chips. Short-term overexposure by inhalation of talc may cause irritation of the respiratory tract. Long-term overexposure may lead to chronic lung disease.

Lifetime inhalation studies with talc caused an increased incidence of lung inflammation, lung tumors and adrenal tumors in rats; no tumors were produced in mice. These effects occurred at such high dust levels that the animal’s lung clearance mechanism for inhaled dusts was overwhelmed, producing chronic lung inflammation. Lung tumors from inhalation of insoluble, low-reactivity (so called “nuisance”) particles such as talc are thought to be a rodent-specific response and, therefore, are of questionable biological relevance for man. Available epidemiology studies do not suggest a causal relationship of inhaled, non-asbestiform talc exposure with lung tumors in humans. In view of the animal studies, DuPont treats non-asbestiform talc as a possible human carcinogen. The International Agency for Research on Cancer (IARC) considers non-asbestiform talc to be unclassifiable for possible carcinogenicity in humans; further details are found in the IARC documentation (Vol. 93, 2006).

DuPont has adopted a workplace Acceptable Exposure Limit (AEL) for respirable dust from non-asbestiform talc of 0.5 mg/m^3 for an 8 and 12 hr Time Weighted Average (TWA). The OSHA PEL for non-asbestiform talc is 20 million particles per cubic foot (equivalent to approximately 3 mg/m^3).

Acute Oral Toxicity

One DuPont™ Neoprene solid polymer, DuPont™ Neoprene TW, has been tested and shown to have a very low order of acute oral toxicity. The median acutely dose in rats (LD_{50}) is in excess of 20,000 mg/kg. Other solid Neoprenes are essentially insoluble, high molecular weight polymers and as such are expected to have similarly low oral toxicity.

Skin Tests

No skin reactions were observed in human patch tests conducted with three Neoprene solid polymers (W, WRT, and WHV) by Holland and Parsons[1].

Chloroprene Monomer

Residual chloroprene monomer in DuPont™ Neoprene solid polymers is not detectable in the solid polymer at levels above 0.5 ppm, the analytical detection limit for this monomer[2].

Waste Disposal

Neoprene solid polymers may be disposed of by incineration or burial, using a method that is in compliance with federal, state, and local regulations. If incineration is employed, an excess of oxygen should be provided to assure complete combustion. Also, an absorber to remove corrosive hydrogen chloride gas from effluent gases is necessary.

Compounded Neoprene

Handling Precautions During Processing

During the processing (mixing, curing, demolding, etc.) of compounded Neoprene, some gaseous by-products or dusts will be released into the air in the immediate work area. Breathing these gases and dusts should be avoided, and adequate local and general room ventilation should be utilized to remove these substances from the work area. More information on ventilation can be found in the DuPont technical bulletin “Proper Use of Local Exhaust Ventilation During Processing of Plastics” (http://www2.dupont.com/Plastics/en_US/assets/downloads/processing/L10953.pdf). The composition and concentration of these off-gases and dusts will depend on operating conditions and the specific compounding ingredients added to the Neoprene. Since it is virtually impossible to anticipate the multitude of compounding ingredients and breakdown products from a compound of Neoprene, only generalized cautionary advice can be given. Importantly, Neoprene products or compounds should not be heated above 200 °C since harmful substances may be produced that contaminate workplace air[3,4,5]. Careful control of processing temperatures and local/room ventilation appropriate for the process must be maintained.

Label directions and handling precautions from suppliers of all ingredients should be consulted and followed. Even when it is known that there is no danger from individual compounding ingredients, there is no assurance that a combination of these ingredients will be equally nonhazardous. Thus, it is necessary for users to consider and address possible product hazards under expected conditions of use.

FDA Status of Neoprene

Table 1. Compliance of Neoprene Solid Polymers with FDA Regulations

		Complies with FDA Regulations		
		175.105 Adhesives	**175.300 Coatings**	**177.2600 Rubber Articles**
Adhesive Grades Neoprene	AD	Yes	No	No
G Family Neoprene	GNA*	Yes	Yes	Yes
	GRT	Yes	No	Yes
	GW	Yes	Yes	Yes
T Family Neoprene	TW	Yes	No	Yes, but not fatty foods
	TW 100	Yes	No	Yes, but not fatty foods
W Family Neoprene	W	Yes	Yes	Yes
	WB	Yes	No	Yes, but not fatty foods
	WD	Yes	No	Yes
	WHV	Yes	Yes	Yes
	WHV 100	Yes	Yes	Yes
	WRT	Yes	No	Yes

*DuPont recognizes that Neoprene GNA complies with FDA regulations but does not recommend its use if other types of Neoprene will work as well.

Applicable FDA Regulations

Reference: 21 CFR 175.105—Adhesives

Materials are listed that may be used as components of adhesives for packaging, transporting, or holding food where the adhesive is either separated from the food by a functional barrier; or in the case of aqueous and fatty foods, where the quantity of adhesive that contacts the food is limited to a minimal amount.

Reference: 21 CFR 175.300 — Resinous and Polymeric Coatings

Resinous and polymeric coatings may be safely used as the food-contact surface of articles intended for use in producing, manufacturing, packing, processing, preparing, treating, packaging, transporting or holding food. The coating is applied as a continuous film or enamel over a substrate so that the coating serves as a functional barrier between the food and the substrate.

Reference: 21 CFR 177.2600 — Rubber Articles Intended for Repeated Use

This regulation defines the polymers and compounding ingredients that can be used in rubber articles intended for repeated use in producing, manufacturing, packing, processing, preparing, treating, packaging, transporting, or holding food. There are limitations on the amount of certain compounding ingredients:

- Accelerators, total not to exceed 1.5% by weight of rubber product;
- Retarders, total not to exceed 10% by weight of rubber product;
- Activators, total not to exceed 5% by weight of rubber product, except magnesium oxide may be used at higher levels;
- Antioxidants and Antiozonants, total not to exceed 5% by weight of rubber product;
- Plasticizers, total not to exceed 30% by weight of rubber product;
- Fillers, no maximum given except for carbon black; channel process or furnace combustion process, total not to exceed 50% by weight of rubber product; furnace combustion black content not to exceed 10% by weight of rubber products intended for use in contact with milk or edible oils;
- Colorants used in accordance with 21 CFR 178.3297.
- Lubricants, total not to exceed 2% by weight of rubber product;
- Emulsifiers, no maximum given.
- Sulfur, no maximum given.

Substances Generally Recognized as Safe

Part 182 lists substances which are “generally recognized as safe” for food contact use. Some of these substances, listed below, are used as compounding ingredients for Neoprene:

Section 182.5191	Calcium Carbonate
Section 182.5210	Calcium Oxide
Section 182.5431	Magnesium Oxide
Section 182.5991	Zinc Oxide

Ingredients Restricted by FDA

Part 189 lists substances which, if used in contact with food, cause the food to be deemed adulterated. Although Neoprene solid polymers manufactured by DuPont do not contain ethylene thiourea (ETU), a commonly used accelerator for Neoprene, ETU is listed in 21 CFR 189.250. Neoprene polymers cured with ETU should not be used in contact with food.

Information on European Union Dangerous Preparations Directive 1999/45/EC related to Colophony Skin Sensitization

Colophony is classified as a skin contact sensitizer under European Union Dangerous Preparations Directive 1999/45/EC effective July 30, 2002. This Directive requires labeling of products that contain colophony at levels equal to or greater than 0.1% (refer to the Directives for specific details). Solid (dry type) Neoprene adhesive grade products manufactured by DuPont contain about 4% colophony (CAS No. 8050-09-7). Toxicological tests in animals with comparable products show that dry Neoprene is not a skin sensitizer. Because of this testing, dry Neoprene polymer is not subject to mandatory labeling under the above Directive despite the presence of colophony. However, when these Neoprene adhesive grade products are dissolved in organic solvents, the colophony may still be present at concentrations up to 0.8% depending on the solids content of the solutions. In the absence of data showing the adhesive is not a skin sensitizer, the adhesive could be subject to the above EU regulation.

It is recommended that manufacturers and marketers of adhesive solutions containing DuPont™ Neoprene (dry type) adhesive grade products determine whether the colophony level is above 0.1%. If the manufactured preparation has a colophony content of less than 0.1% it will not be subject to mandatory labeling (provided no other constituents necessitate mandatory labeling). Manufactured preparations that contain higher colophony contents will require the labeling and/or container notices described in the Directive.

References

1. P. Holland and C. W. Parsons, “Elastomers and Compounding Ingredients for Respirator Rubber Compositions in Relation to their Effect on the Skin,” October 1969, Chemical Defense Establishment, Salisbury, Wilts., England
2. DuPont Analytical Method N GC 1200
3. G. S. Skinner and J. H. McNeal, “Decomposition of Elastomers at High Temperatures,” Industrial and Engineering Chemistry, Vol. 40, p. 2303, December 1948.
4. K. L. Paciorek, et. al., “Thermal Oxidative Decomposition Studies of Neoprene Compositions,” American Industrial Hygiene Association Journal, January 1975, pp. 10–16.
5. I. Aracil, et. al., “TG–MS Analysis of the Thermo-Oxidative Decomposition of Polychloroprene,” Journal of Analytical Applied Pyrolysis, Vol. 79, 2007, pp. 327–336.

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