



MATERIAL SAFETY DATA SHEET
According to Regulation (EU) No 453/2010.

Section 1 Identification of substance/mixture and of the company/undertaking

1.1 Product Identifier

UNEX thermoplastic polyurethane

Product Description Thermoplastic polyurethane elastomer, see Section 16 for applicable grades.

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

Relevant identified uses (see section 7.3 for information on REACH registered uses)

Intended Use: Adhesive component, Coating.

Uses advised against: None unless specified elsewhere in this SDS.

1.3 Details of the supplier of the safety data sheet

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Section 2 Hazards Identification

2.1 Classification of the substance or mixture

(EC) No 1272/2008

This product does not meet the classification requirements of the current European legislation.
67/548/EC or 1999/45/EC

This product does not meet the classification requirements of the current European legislation.

For a full text of R- and H- phrases: See section 16

2.2 Label elements

(EC) No 1272/2008

Not applicable.

IF ON SKIN: For hot product, immediately immerse or flush skin with large amounts of cold water.

Treat symptomatically. Get medical attention.

Supplemental label information

None.

2.3 Other hazards

This product is not considered hazardous at ambient conditions and there are no known or expected health effects.

Processing temperatures may generate minor quantities of fumes and vapours sufficient to cause eye, skin and upper respiratory tract irritation if ventilation is inadequate.

There are no known chronic effects associated with this material.

In case of spillage, possible risk of slipping.

Section 3 Composition/Information on Ingredients

3.1 Substances Not Applicable. This material is regulated as a mixture. This product does not contain any substance which can be dangerous for the health or the environment, with exposure limits in the working place. It does not contain any persistent, bioaccumulative or toxic substance nor very persistent or very bioaccumulative.

3.2 Mixtures

(EC) No 1272/2008

This material contains no ingredients requiring disclosure under regulatory hazard criteria for this jurisdiction. See Section 11 for additional details.

67/548/EC or 1999/45/EC

This material has no known hazards under applicable laws.

Section 4 First Aid Measures**4.1 Description of first aid measures**

Skin Wash with soap and water. Get medical attention if irritation develops. For contact with molten product, do not remove contaminated clothing. Flush skin immediately with large amounts of cold water. If possible submerge area in cold water. Pack with ice. DO NOT attempt to peel polymer from skin. Seek medical attention immediately.

Eyes Treat as any foreign particulate matter. If hot melted material should splash into the eyes, flush eyes immediately with water for 15 minutes while holding the eyelids open. See a physician for treatment.

Inhaled If during its application or in case of fire processing vapours or decomposition products are inhaled, remove person to fresh air. If irritation develops or persists, obtain medical attention.

Swallowed No adverse effects anticipated. Treat symptomatically. Get medical attention.

Advice for first-aid providers

When providing first aid always protect yourself against exposure to chemicals or blood born diseases by wearing gloves, masks and eye protection. After providing first aid wash your exposed skin with soap and water.

4.2 Most important symptoms and effects, both acute and delayed

See section 11.

4.3 Indication of any immediate medical attention and special treatment needed

Note to physician: Treat symptomatically.

Section 5 Fire Fighting Measures**5.1 Extinguishing Media**

Small fire. Use dry chemical, CO₂, water spray or regular foam.

Large fire. Use water spray, water fog or regular foam. Do not use straight streams.

5.2 Special hazards arising from substance or mixture

Solid does not readily release flammable vapors. Thermoplastic polymers can burn. Protect product from flames; maintain proper clearance when using heat devices, etc. Irritating or toxic substances will be emitted upon burning, combustion or decomposition. Large masses of molten polymer held at elevated temperatures for extended periods of time may auto-ignite. Under fire conditions, polymer decomposes generating smoke and unidentified toxic and irritating compounds. See section 10 for additional information.

5.3 Advice for firefighters

Fire fighters should wear positive pressure self-contained breathing apparatus and should be equipped with protective clothing. Keep people away and isolate fire area.

Section 6 Accidental Release Measures**6.1 Personal precautions, protective equipment and emergency procedures**

In case of spillage, material on the floor may cause slipping and falls.

6.2 Environmental precautions

Prevent product from going into sewers or any water flow.

6.3 Methods and material for containment and cleaning up

In case of spill sweep up material and place in containers for re-use or disposal.

6.4 Reference to other sections

See sections 8 and 13 for additional information.

Section 7 Handling and Storage

7.1 Precautions for safe handling

Loading and unloading operations may cause nuisance dust to form. Refer to Processing Guide and/or contact your local Technical Service representative for melt processing temperature range. For most thermoplastic polyurethanes, melt processing is in the range of 177 - 232 deg. C (350 - 450 deg. F), however, some products may process at different temperatures. Heating above 232 deg. C (450 deg. F) can generate hazardous decomposition products (see Section 10). Conduct any operations emitting fumes or vapors (including thermo-forming, heat joining, cutting and or sealing of articles and clean up) under well-ventilated conditions. Avoid breathing process vapors. Do not hold product for extended periods of time at elevated temperatures or allow thick masses of hot polymer to accumulate because they can decompose emitting hazardous gasses. Do not taste, swallow, or chew products. Wash thoroughly after processing. Do not store or consume food in processing areas. Fume condensates may include hazardous contaminants from additives. Condensate may be combustible and should be periodically removed from exhaust hoods, ductwork, and other surfaces. Impervious gloves should be worn during cleanup operations to prevent skin contact. Post thermal processing activities necessary to produce molded articles (such as cutting, sanding, sawing, grinding, drilling, or regrinding) may create dust or "fines." Powders, dust, and/or fines may pose a dust explosion hazard. Do not steam sterilize articles made Unex resins. Methylene dianiline can be formed under these conditions. Electrostatic buildup may occur when pouring or transferring this product from its container. The spark produced may be sufficient to ignite vapors of flammable liquids. Always transfer product by means which avoid static buildup. Avoid pouring product directly from its container into combustible or flammable solvent. The major off-gasses from normal melt processing are expected to be water vapor and carbon dioxide. Other trace volatile organic components may also be emitted. Wash thoroughly after handling. Dispose of packaging or containers in accordance with local, regional, national and international regulations.

Pumping Temperature Not applicable.

Maximum Handling Temperature Not determined.

Maximum Loading Temperature Not determined.

7.2 Conditions for safe storage, including any incompatibilities

Use good housekeeping measures to prevent dust accumulations. Store in well ventilated cool and dry place.

Maximum Storage Temperature Not determined.

7.3 Specific end use(s)

End uses are listed in an attached exposure scenario when one is required.

Section 8 Exposure Controls/Personal Protection
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8.1 Control parameters

None known.

Other Exposure Limits None known.

8.2 Exposure controls

Prevent inhalation by providing effective general and, when necessary, local exhaust ventilation to draw spray, aerosol, fume, mist, or vapor away from workers.

Eye/face protection Safety Glasses.

Skin protection Use good industrial hygiene practices to avoid skin contact. If contact with the material may occur wear chemically protective gloves. Long sleeve shirt is recommended.

Respiratory Protection Under normal use conditions, respirator is not usually required. Use appropriate respiratory protection if the recommended exposure limit is exceeded, or if exposure to vapors is likely. Cutting operations may create small particles from this product. If inhalation of particles cannot be avoided, wear a dust respirator. Consult with an industrial hygienist to determine the appropriate respiratory protection for your specific use of this material. A respiratory protection program compliant with all applicable regulations must be followed whenever workplace conditions require the use of a respirator.

Hygiene Measures Wash thoroughly after handling this product.

Environmental exposure controls See section 6 for details.

Section 9 Physical and Chemical Properties

9.1 Information on basic physical and chemical properties

Appearance Natural, white or yellowish powder.

Odour Faint

Odour Threshold Not determined.

pH Not determined.

Melting / Freezing Point 55 - 95 °C.

Boiling Point Not determined.

Boiling Point Range Not determined.

Flash Point Not applicable.

Evaporation Rate Not determined.

Flammability (solid,gas) Material is not a flammable solid or gas.

Lower flammability or explosive limit Not determined.

Upper flammability or explosive limit Not determined.

Vapour Pressure Not determined.

Vapour Density Not determined.

Relative density 1.19 (20 °C)

Bulk Density Not determined.

Water Solubility Insoluble.

Other solubilities Soluble in esters, ketones and methylene chloride.

Partition coefficient:

n-octanol/water Not determined.

Autoignition Point Not determined.

Decomposition Temperature Not determined.

Viscosity Not determined.

9.2 Other information

The above data are typical values and do not constitute a specification.

Section 10 Stability and Reactivity

10.1 Reactivity

Carefully review all information provided in sections 10.2 - 10.6.

10.2 Chemical stability

Material is normally stable at moderately elevated temperatures and pressures. Volatiles from melt processing are expected to be water vapour, carbon dioxide and other decomposition products.

10.3 Possibility of hazardous reactions

Will not occur.

10.4 Conditions to avoid

Temperature above 200 °C.

10.5 Incompatible materials

None known, avoid contact with reactive chemicals.

10.6 Hazardous decomposition products

Thermal breakdown products may include a complex mixture of compounds, including but not limited to CO, CO₂, hydrogen cyanide, oxides of nitrogen, hydrocarbons, isocyanates, water vapour smoke. The specific materials generated will vary depending on temperature, time and other immediate environmental factors.

Section 11 Toxicological Information

11.1 Information on toxicological effects

Acute toxicity

Oral/Dermal Considered to be physiologically inert. Single dose oral toxicity is believed to be very low..

Inhalation At room temperature, exposure to vapours is unlikely. High processing temperatures may generate vapours which may cause irritation and sensitization.

Overexposure to vapors or mist may cause dizziness, headache, nausea, and/or flu-like symptoms. Avoid the inhalation of dust, mists, or vapors.

Skin corrosion / irritation



Not expected to be a primary skin irritant. Based on data from components or similar materials. Contact with heated polymer may cause thermal burns and adhesion of solidified product to the skin.

Serious eye damage / irritation

Not expected to cause eye irritation. Based on data from components or similar materials. Particulates may cause mechanical irritation. At processing or combustion temperatures this product may emit fumes and vapors that cause irritation, possibly severe, to the eyes.

Respiratory Irritation

At processing or combustion temperatures this product may emit fumes and vapors that cause irritation, possibly severe, to the respiratory tract, eyes, or skin.

Respiratory or skin sensitization

Skin No data available to indicate product or components may be a skin sensitizer at room temperature. At high temperature vapours may cause sensitization.

Respiratory No data available to indicate product or components may be respiratory sensitizers at room temperature. At high temperature vapours may cause sensitization.

Germ cell mutagenicity

No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.

Carcinogenicity

No data available to indicate any components present at greater than 0.1% may present a carcinogenic hazard.

Reproductive Toxicity

No data available to indicate either product or components present at greater than 0.1% that may cause reproductive toxicity.

STOT repeated exposure

No data available to indicate product or components present at greater than 1% are chronic health hazards.

Other information

Under decomposition conditions, isocyanates may be generated from this product. Isocyanates can cause skin sensitization and/or respiratory sensitization. Preexisting skin conditions may be aggravated by prolonged or repeated exposure. Persons with sensitive airways (e.g., asthmatics) may react to vapors.

Section 12 Ecological Information

12.1 Toxicity

- Freshwater fish** Not determined.
- Freshwater invertebrates** Not determined.
- Algae** Not determined.
- Saltwater fish** Not determined.
- Saltwater invertebrates** Not determined.
- Bacteria** Not determined.

12.2 Persistence and degradability

Not applicable.

12.3 Bioaccumulative potential

Not applicable.

12.4 Mobility in soil

Not applicable.

12.5 Results of PBT and vPvB assessment

Not Available

12.6 Other adverse effects

None known.

Section 13 Disposal Considerations

13.1 Waste treatment methods



Revision: 01/09/2014

The unused product is not considered a hazardous waste. Do not dump into any sewers, on the ground or into any body of water. All disposal practices must be in accordance with local, regional, national and international regulations. Dispose of packaging or containers in accordance with local, regional, national and international regulations.

Section 14 Transport Information

This product is not classified as dangerous for any mode of transportation.

14.1 UN number

ADR/RID Not regulated
ICAO/IATA Not regulated
IMDG Not regulated

14.2 UN proper shipping name

ADR/RID Not regulated
ICAO/IATA Not regulated
IMDG Not regulated

14.3 Transport hazard class(es)

ADR/RID Not regulated
ICAO/IATA Not regulated
IMDG Not regulated

14.4 Packing group

ADR/RID Not regulated
ICAO/IATA Not regulated
IMDG Not regulated

14.5 Environmental hazards

ADR/RID Not applicable.
ICAO/IATA Not applicable.
IMDG Not applicable.

14.6 Special precautions for users

Review classification requirements before shipping materials at elevated temperatures.

Section 15 Regulatory Information

This product does not need to be labelled according to EC regulations.

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

Global Chemical Inventories

EU H phrases: not applicable. P phrases: not applicable. EINECS status: All starting raw materials of this product are listed on EINECS. To obtain information on the REACH compliance status of this product, please visit e-mail us at info@dakotaworldwide.com
USA All components of this material are on the US TSCA Inventory or are exempt.

15.2 Chemical safety assessment



Revision: 01/09/2014

No chemical safety assessment has been carried out.

Section 16 Other Information
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Relevant R Phrases Not applicable.

Relevant hazard phrases Not determined.

Revision Indicators This MSDS has no revisions since 01 September 2014

THIS SDS COVERS THE FOLLOWING MATERIALS: Unex resins, for which the grade name consists of a base polymer that may or may not be followed by a suffix. Applicable designations follow:

Base polymers : 4104 / 11016 / 13014 / 13015 / 14051 / 5010 / 5045 / 5110 / 5115

Suffixes:

List of abbreviations and acronyms that could be (but not necessarily are) used in this safety data sheet:	
Acronym	Full text
ADR	European Agreement concerning the international carriage of dangerous goods by road
ADN	European Agreement concerning the international carriage of dangerous goods by inland waterways
AICS	Australian Inventory of Chemical Substances
AIHA WEEL	American Industrial Hygiene Association Workplace Environmental Exposure Limits
ASTM	ASTM International, originally known as the American Society for Testing and Materials (ASTM)
ATP	Adaptation to technical progress
BCF	Bioconcentration factor
BetrSichV	German Ordinance on Industrial Safety an Health
c.c.	Closed cup
CAS	Chemical Abstract Services
CESIO	European Committee of Organic Surfactants and their Intermediates
ChemG	German Chemicals Act
CLP	Classification, Labelling and Packaging
CMR	Carcinogenic-mutagenic-toxic for reproduction
DIN	German Institute of Standardization
DMEL	Derived minimum effect level
DNEL	Derived no effect level
DSL	Domestic Substance List (Canada)
EC	Effective Concentration
EC50	Half maximal effective concentration
EINECS	European Inventory of Existing Commercial Substances
EL	Effective Loading
ELINCS	European List of Notified Chemical Substances
ENCS	Existing and new Chemical Substances (Japanese inventory)
GefStoffV	German Ordinance on Hazardous Substances
GGVSEB	German ordinance for road, rail and inland waterway transportation of dangerous goods
GGVSee	German ordinance for sea transportation of dangerous goods
GLP	Good Laboratory Practice
CHS	Globally Harmonised System
GMO	Genetic Modified Organism
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization
IECSC	Inventory of Existing Chemical Substances in China
IMDG	International Maritime Dangerous Goods
ISO	International Organization for Standardization
KECI	Korean Existing Chemicals Inventory
LC	Lethal Concentration
LD	Lethal Dose
LL	Lethal Loading
LOAEL	Lowest Observable Adverse Effect Level
LOEL	Lowest Observable Effect Level
N/A	Not applicable

N/D	Not determined
NE	Not established
NDSL	Non-Domestic Substances List (Canada)
NOAEL	No Observable Adverse Effect Level
NOEC	No Observable Effect Concentration
NOEL	No Observable Effect Level
NOELR	No Observable Effect Loading Rate
NZIoC	New Zealand Inventory of Chemicals
o.c.	Open cup
OECD	Organisation for Economic Cooperation and Development
OEL	Occupational Exposure Limit
PBT	Persistent, bioaccumulative, toxic
PEC	Predicted effect concentration
PICCS	Philippine Inventory of Chemicals and Chemical Substances
PNEC	Predicted no effect concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	Convention concerning International Carriage by Rail
STOT	Specific Target Organ Toxicity
SVHC	Substances of Very High Concern
TA	Technical Instructions
TLV	Threshold Limit Value (American Conference of Governmental Industrial Hygienists)
TPR	Third Party Representative (Art. 4)
TRGS	Technical Rules for Hazardous Substances
TSCA	Toxic Substances Control Act (U.S. inventory)
UVCB	Substances of Unknown or Variable composition, Complex reaction products or Biological materials
VCI	German chemical industry association
vPvB	Very persistent, very bioaccumulative
VOC	Volatile Organic Compound
VwVwS	German Administrative Regulation on the Classification of Substances Hazardous to Waters into Water Hazard Classes
WGK	Water Hazard Class
WHO	World Health Organisation

Disclaimer of responsibility

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