SAFETY DATA SHEET

Akulon® RePurposed RE

Section 1. Identification

GHS product identifier : Akulon® RePurposed RE

Other means of identification : Not available.

Product type : Solid.

Material uses : plastic products

Supplier :

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e-mail address of person responsible for this SDS : Info.Worldwise@dsm.com

Emergency telephone number : **The Netherlands: +31 (0)46 476 55 55**

Section 2. Hazards identification

OSHA/HCS status : While this material is not considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200), this SDS contains valuable information critical to the safe handling and proper use of the product. This SDS should be retained and available for employees and other users of this product.

Classification of the substance or mixture : Not classified.

GHS label elements

Signal word : No signal word.

Hazard statements : No known significant effects or critical hazards.

Precautionary statements

Prevention : Not applicable.

Response : Not applicable.

Storage : Not applicable.

Disposal : Not applicable.

Hazards not otherwise classified : Heated material can cause thermal burns.

HMIS® IV Hazardous Material Information System (U.S.A.) :

Health	/	0
Flammability		1
Physical hazards		0

The PPE (Personal Protection Equipment) designation in the HMIS is provided for use by employees at supplier sites only. Other users of this product are encouraged to evaluate the hazards of the product and assign PPE that is applicable to their specific situations.

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings and the associated label are not required on SDSs or products leaving a facility under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered trademark and service mark of the American Coatings Association, Inc.

The customer is responsible for determining the PPE code for this material. For more information on HMIS® Personal Protective Equipment (PPE) codes, consult the HMIS® Implementation Manual.

Remarks : Hazard of slipping on spilled product. Heated material can cause thermal burns. Electrostatic charging can occur during unloading or processing of this material. If necessary take precautionary measures against static discharges. The likelihood of adverse health effects arising from normal use of the product is considered very low. Appropriate precautions should be taken if the product is subjected to secondary processing. If user operations generate dust, fumes or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit. Dust may cause mechanical irritation.

Section 3. Composition/information on ingredients

Chemical description : Base polymer: Polyamide 6; CAS no. 25038-54-4.
If the color of the product is black, the product may contain up to 0.9% carbon black.

Substance/mixture : Mixture

Other means of identification : Not available.

CAS number : Not applicable.

Ingredient name	%	CAS number
Carbon black (ONLY for black- and dark-colored products)	0.1 - 0.9	1333-86-4
e-Caprolactam	0 - 0.3	105-60-2

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Remarks : The components of this product are embedded in an impervious polymer matrix and are therefore not biologically available. Any hazardous constituents are fixed in the polymer matrix and therefore present a negligible exposure risk under normal conditions of processing and handling. Additives contained in this product do not pose a risk to health unless they are liberated during processing (fumes from melting, dusts). Suitable Industrial Hygiene precautions should be implemented to prevent (respirable) dust and fume exposures. Exposure to (melting) fumes should be kept as low as possible, using suitable ventilation equipment. Dusts and fumes created from secondary processing may be irritating to respiratory tract and skin and should be considered as potentially hazardous. If user

operations generate dust, fumes or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Get medical attention if irritation occurs.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Get medical attention if symptoms occur.

Skin contact : Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Do not remove clothing adhering to skin.

Ingestion : Wash out mouth with water. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Do not induce vomiting unless directed to do so by medical personnel. Get medical attention if symptoms occur.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : Heated material can cause thermal burns resulting in pain, redness, blistering.

Ingestion : No known significant effects or critical hazards.

Over-exposure signs/symptoms

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : No specific fire or explosion hazard.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
Hydrogen cyanide (HCN).
(dense) black smoke
aldehydes
organic acids
nitrogen oxides (NO, NO_2 etc.)
ammonia (NH_3)

amines

Special protective actions for fire-fighters	:	Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.
Special protective equipment for fire-fighters	:	Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel	:	No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Put on appropriate personal protective equipment.
For emergency responders	:	If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".
Environmental precautions	:	Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Small spill	:	Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.
Large spill	:	Move containers from spill area. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures	:	Use with adequate ventilation. Local exhaust ventilation should be provided. Avoid creating dusty conditions and prevent wind dispersal. Take measures against static discharge. Keep away from sources of ignition.
Advice on general occupational hygiene	:	Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.
Conditions for safe storage, including any incompatibilities	:	Store in accordance with local regulations. Store in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10). Store in original container, protected from direct sunlight. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination. See Section 10 for incompatible materials before handling or use.
Remarks	:	Never stack pallets more than two high to prevent the risk of them falling over. Big Bags may not be stacked. Pallets should not be stacked along the aisles. In case the material is delivered in bulk silo, the silo can contain 0.5 bar dry air at maximum. Relief pressure via vent line. Never use the manlid for pressure relief.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
Carbon black (ONLY for black- and dark-colored products)	**OSHA PEL 1989 (United States, 3/1989).** TWA: 3.5 mg/m³ 8 hours. **NIOSH REL (United States, 10/2016).** TWA: 3.5 mg/m³ 10 hours. TWA: 0.1 mg of PAHs/cm³ 10 hours. **OSHA PEL (United States, 5/2018).** TWA: 3.5 mg/m³ 8 hours. **ACGIH TLV (United States, 3/2019).** TWA: 3 mg/m³ 8 hours. Form: Inhalable fraction
e-Caprolactam	**OSHA PEL 1989 (United States, 3/1989).** TWA: 1 mg/m³ 8 hours. Form: Dust STEL: 3 mg/m³ 15 minutes. Form: Dust TWA: 5 ppm 8 hours. Form: Vapor TWA: 20 mg/m³ 8 hours. Form: Vapor STEL: 10 ppm 15 minutes. Form: Vapor STEL: 40 mg/m³ 15 minutes. Form: Vapor **NIOSH REL (United States, 10/2016).** TWA: 1 mg/m³ 10 hours. Form: Dust STEL: 3 mg/m³ 15 minutes. Form: Dust TWA: 0.22 ppm 10 hours. Form: Vapor TWA: 1 mg/m³ 10 hours. Form: Vapor STEL: 0.66 ppm 15 minutes. Form: Vapor STEL: 3 mg/m³ 15 minutes. Form: Vapor **ACGIH TLV (United States, 3/2019).** TWA: 5 mg/m³ 8 hours. Form: Inhalable fraction and vapor

Appropriate engineering controls : Good general ventilation should be sufficient to control worker exposure to airborne contaminants.

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

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: safety glasses with side-shields.

Hand protection : Wear suitable gloves. When handling hot material, wear heat-resistant protective gloves that are able to withstand the temperature of molten product.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection	:	Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Respiratory protection	:	Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.
Remarks	:	If the color of the product is black, the product may contain up to 0.9% carbon black.

Section 9. Physical and chemical properties

Appearance

Physical state	:	Solid. [Pellets.]
Color	:	naturally opaque, dependent on the added pigment
Odor	:	Not available.
Odor threshold	:	Not available.
pH	:	Not available.
Melting point	:	220 to 230 °C
Boiling point	:	Not available.
Flash point	:	Closed cup: >671°F (>355°C)
Evaporation rate	:	Not available.
Flammability (solid, gas)	:	Not available.
Lower and upper explosive (flammable) limits	:	Not available.
Vapor pressure	:	Not available.
Vapor density	:	Not available.
Relative density	:	>1 (Water = 1)
Density (g/cm³)	:	>1 g/cm³
Bulk density	:	Not available.
Solubility	:	Insoluble in the following materials: cold water.
Solubility in water	:	Not available.
Solubility at room temperature	:	Not available.
Partition coefficient: n-octanol/water	:	Not available.
Auto-ignition temperature	:	> 420 °C
Decomposition temperature	:	>300°C (>572°F)
Viscosity	:	Not available.
Remarks	:	If the color of the product is black, the product may contain up to 0.9% carbon black.

Section 10. Stability and reactivity

Reactivity	:	No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	:	The product is stable.
Possibility of hazardous reactions	:	Under normal conditions of storage and use, hazardous reactions will not occur.
Conditions to avoid	:	No specific data.
Incompatible materials	:	No specific data.

Hazardous decomposition products : No specific data.

Remarks : At processing temperatures some degree of thermal degradation may occur. see section 5.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Carbon black (ONLY for black- and dark-colored products)	LD50 Dermal	Rabbit	>5000 mg/kg	-
	LD50 Oral	Rat	>15400 mg/kg	-
e-Caprolactam	LC50 Inhalation Vapor	Rat	8.2 mg/l	4 hours
	LD50 Dermal	Rat	>2000 mg/kg	-
	LD50 Oral	Rat - Male	1475 mg/kg	-
	LD50 Oral	Rat - Female	1875 mg/kg	-

Irritation/Corrosion

Not available.

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Classification

Product/ingredient name	OSHA	IARC	NTP
Carbon black (ONLY for black- and dark-colored products)	-	2B	-
e-Caprolactam	-	3	-

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Name	Category	Route of exposure	Target organs
e-Caprolactam	Category 3	Not applicable.	Respiratory tract irritation

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : No known significant effects or critical hazards.

Inhalation : No known significant effects or critical hazards.

Skin contact : Heated material can cause thermal burns resulting in pain, redness, blistering.

Ingestion : No known significant effects or critical hazards.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : No specific data.

Inhalation : No specific data.

Skin contact : No specific data.

Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Product/ingredient name	Result	Species	Dose	Exposure
ε-Caprolactam	Sub-chronic NOAEL Oral Sub-chronic NOEL Oral Sub-chronic NOAEC Inhalation Dusts and mists	Rat - Male Rat - Female Rat - Male, Female	29 mg/kg 342 mg/kg 0.245 mg/l	- - 13 weeks; 6 hours per day

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Product/ingredient name	Oral (mg/kg)	Dermal (mg/kg)	Inhalation (gases) (ppm)	Inhalation (vapors) (mg/l)	Inhalation (dusts and mists) (mg/l)
ε-Caprolactam	1475	2500	N/A	8.2	N/A

Remarks : If the color of the product is black, the product may contain up to 0.9% carbon black.

Remarks : The components of this product are embedded in an impervious polymer matrix and are therefore not biologically available. The likelihood of adverse health effects arising from normal use of the product are considered very low.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
ε-Caprolactam	Acute EC50 1000 mg/l Fresh water Acute LC50 1000 mg/l Fresh water Acute LC50 100 mg/l Chronic NOEC 1000 mg/l Fresh water	Daphnia Algae Fish Algae	48 hours 72 hours 96 hours 72 hours

Persistence and degradability

Not available.

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
ε-Caprolactam	-	-	Readily

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
ε-Caprolactam	0.12	<1	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Other adverse effects : No known significant effects or critical hazards.

Remarks : The components of this product are embedded in an impervious polymer matrix and are therefore not biologically available. This product is not biodegradable and not toxic to aquatic organisms.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	IMDG	IATA
UN number	Not regulated.	Not regulated.	Not regulated.	Not regulated.	Not regulated.
UN proper shipping name	-	-	-	-	-
Transport hazard class(es)	-	-	-	-	-
Packing group	-	-	-	-	-
Environmental hazards	No.	No.	No.	No.	No.

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Remarks : In case the material is delivered in bulk silo, the silo can contain 0.5 bar dry air at maximum. Relief pressure via vent line. Never use the manlid for pressure relief.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) CDR Exempt/Partial exemption**: See remarks

United States inventory (TSCA 8b): See remarks

	Product/ingredient name	CAS #	%
Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)	Not listed.		

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Not listed

SARA 302/304

No products were found.

SARA 304 RQ : Not applicable.

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements **Supplier notification**			

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

State regulations

Massachusetts : None of the components are listed.

New York : None of the components are listed.

New Jersey : The following components are listed: CARBON BLACK

Pennsylvania : The following components are listed: CARBON BLACK

California Prop. 65

Not available.

International regulations

Chemical Weapon Convention List Schedules I, II & III Chemicals

Ingredient name	List name	Status
Not listed.		

Montreal Protocol

Not listed.

Stockholm Convention on Persistent Organic Pollutants

Ingredient name	List name	Status
Not listed.		

Rotterdam Convention on Prior Informed Consent (PIC)

Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals

Ingredient name	List name	Status
Not listed.		

International lists

Canada inventory : See remarks

Remarks : If the color of the product is black, the product may contain up to 0.9% carbon black.

Remarks : Listings of substances in this section are based on the presence of these substances above the applicable concentration limit. Relevant declarations related to this product are available on request.

Section 16. Other information

National Fire Protection Association (U.S.A.)

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Copyright ©2001, National Fire Protection Association, Quincy, MA 02269. This warning system is intended to be interpreted and applied only by properly trained individuals to identify fire, health and reactivity hazards of chemicals. The user is referred to certain limited number of chemicals with recommended classifications in NFPA 49 and NFPA 325, which would be used as a guideline only. Whether the chemicals are classified by NFPA or not, anyone using the 704 systems to classify chemicals does so at their own risk.

History

Code : WW65700

Date of printing : 4/5/2020

Date of issue/Date of revision : 4/5/2020

Date of previous issue : 11/29/2018

Version : 2

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
N/A = Not available
SGG = Segregation Group
UN = United Nations

Procedure used to derive the classification

Classification	Justification
Not classified.	

References : Not available.

Indicates information that has changed from previously issued version.

Information : DSM Engineering Materials B.V., Global Research & Technology
Global Product Data Management
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SDS:
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Notice to reader

The information contained in the Material Safety Data Sheet is based on our data available on the date of publication. The information is intended to aid the user in controlling the handling risks; it is not to be construed as a warranty or specification of the product quality. The information may not be or may not altogether be applicable to combinations of the product with other substances or to particular applications.
The user is responsible for ensuring that appropriate precautions are taken and for satisfying themselves that the data are suitable and sufficient for the product's intended purpose. In case of any unclarity we advise consulting the supplier or an expert.

Remarks :