

SAFETY DATA SHEET RAMAPET

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

1.1 Product identifier

Product Name	RAMAPET
Product Identification Name	N1(S), N180, R1, R180(S), R180, R182(C), R182(C) PlantPET, P184, S184, L1, W170, W176 and AH62
Name REACH	Polyethylene Terephthalate (Copolyester)
CAS number	Homopolymer 25038 - 59 - 9, Copolymer 24938 - 04 - 03
EC number	N/A
REACH number	N/A
Molecular Formula	$(C_{10}H_8O_4)_n$

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

Polyethylene terephthalate (PET) is an intermediate plastic used for food and non - food contact packaging, bottles, films and fibers.

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier:	<p>Indorama Ventures Europe BV Markweg 201, 3198 NB Europoort Rotterdam, The Netherlands</p> <p>UAB "Orion Global Pet" Metalo 16, LT-94102 Klaipeda Lithuania</p> <p>Indorama Ventures Poland Sp. z o.o. ul. Krzywa Góra 19, 87-805 Włocławek, Poland</p> <p>Indorama Ventures Química S.L.U. Poligono Industrial Guadarranque, S/N, 11360, San Roque, Cadiz, Spain.</p>
------------------------	--

1.4 Emergency telephone number 24h

For emergency health, safety and environmental information telephone:

Rotterdam	+31 181285472
Klaipeda	+37 046 300749 extension 273
Włocławek	+48 54 416 64 29
San Roque	+34 956671070

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Polyethylene terephthalate (PET) is a polymer is not classified as hazardous according to Regulation (EC) 1272/2008 (CLP).

Neither Indorama Ventures Europe BV, UAB Orion Global PET, Indorama Ventures Poland Sp. z o.o., Indorama Ventures Química S.L.U. nor their marketing affiliates shall be responsible for the use of this information, or of any product, method or apparatus mentioned, and you must make your own determination of its suitability and completeness of your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. No warranty is made of the merchantability or fitness of any product, and nothing herein waives any of the Seller's conditions of sale.

SAFETY DATA SHEET RAMAPET

2.2 Label elements

Labeling not required according to Regulation (EC) No 1272/2008 (CLP).

2.3 Other hazards

PET is not categorized as persistent, bio-accumulative or toxic (PBT) according to Regulation (EC) No. 1907/2006, Annex XIII.

PET is not very persistent or very bio-accumulative (vPvB) according to Regulation (EC) No. 1907/2006, Annex XIII.

SECTION 3: Composition/information on ingredients

Substance Mono-constituent substance
Mixtures Not applicable

Product name	CAS No	REACH No	Content	Classification according to Regulation (EC) No. 1272/2008 (CLP)
Polyethylene terephthalate (PET)	25038-59-9	N/A	100 %	Not classified as hazardous

There are no additional ingredients present which, within the current knowledge of the supplier, are classified and contribute to the classification of the substance and hence require reporting in this section.

SECTION 4: First aid measures

4.1 Description of 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.

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.

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

4.2 Most important symptoms and effects, both acute and delayed

No known significant effects or critical hazards but if necessary treat symptomatically.

Neither Indorama Ventures Europe BV, UAB Orion Global PET, Indorama Ventures Poland Sp. z o.o., Indorama Ventures Química S.L.U. nor their marketing affiliates shall be responsible for the use of this information, or of any product, method or apparatus mentioned, and you must make your own determination of its suitability and completeness of your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. No warranty is made of the merchantability or fitness of any product, and nothing herein waives any of the Seller's conditions of sale.

SAFETY DATA SHEET

RAMAPET

4.3 Indication of any immediate medical attention and special treatment needed

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

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable: In case of fire, use water spray (fog), foam, dry chemical or CO₂.

Not suitable: Do not use water jet.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture: No specific fire or explosion hazard.

Hazardous thermal decomposition products: Decomposition products may include the following materials: carbon dioxide, carbon monoxide.

5.3 Advice for firefighters

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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

Fire-fighting measures

Use self-contained breathing apparatus if respirable dust and/or fumes occur. Use water spray to cool and disperse vapors and protect personnel.

SECTION 6: Accidental Release Measures

6.1 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".

6.2 Environmental

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).

6.3 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

Neither Indorama Ventures Europe BV, UAB Orion Global PET, Indorama Ventures Poland Sp. z o.o., Indorama Ventures Química S.L.U. nor their marketing affiliates shall be responsible for the use of this information, or of any product, method or apparatus mentioned, and you must make your own determination of its suitability and completeness of your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. No warranty is made of the merchantability or fitness of any product, and nothing herein waives any of the Seller's conditions of sale.

SAFETY DATA SHEET

RAMAPET

confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

6.4 Reference to other

See Section 1 for emergency contact information.

See Section 8 for information on appropriate personal protective equipment.

See Section 13 for additional waste treatment information.

SECTION 7: Handling and Storage

7.1 Precautions for safe handling

Put on appropriate personal protective equipment (see Section 8).

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.

7.2 Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. 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.

7.3 Specific end use(s)

Recommendations: Not available.

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational exposure limits: No exposure limit value known.

Recommended monitoring procedures: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference should be made to monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

During processing of PET small amount of aldehydes are generated. The most well-known is acetaldehyde,

Neither Indorama Ventures Europe BV, UAB Orion Global PET, Indorama Ventures Poland Sp. z o.o., Indorama Ventures Química S.L.U. nor their marketing affiliates shall be responsible for the use of this information, or of any product, method or apparatus mentioned, and you must make your own determination of its suitability and completeness of your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. No warranty is made of the merchantability or fitness of any product, and nothing herein waives any of the Seller's conditions of sale.

Indorama Ventures Europe BV - UAB Orion Global PET- Indorama Ventures Poland Sp. z o.o. - Indorama Ventures Química S.L.U.

www.indoramaventures.com

SAFETY DATA SHEET

RAMAPET

AA (CAS 75-07-0), also small amounts of formaldehyde, FA (CAS 50-00-0) are formed.

In its opinion, published in September 2016, the Committee for Risk Assessment (RAC) adopted a harmonized classification and labelling at EU level for acetaldehyde; ethanal, EC Number: 200-836-8, CAS Number: 75-07-0, as in their view, there is sufficient data to categorize acetaldehyde as carcinogen 1B.

Customers are advised to check exposure to workers and apply current workplace exposure limits. There are workplace exposure limits for aldehydes and customers are advised to ensure they use the appropriate measures to their workplace. Customers should continue to monitor and record exposures on a regular basis and in addition take measures on ventilation if required. Exposure limits can be subjected to change following EU and National law. A considered risk assessment might be required when processing PET

Derived effect levels: No DELs available.

Predicted effect concentrations: No PECs available.

8.2 Exposure controls

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

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. Recommended: Goggles, face shield or other full-face protection should be worn if there is a risk of direct exposure to aerosols or splashes or when material is handled hot.

Hand protection: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Body protection: Wear work clothing with long sleeves. Protective/insulated gloves.

Other skin protection: Suitable protective footwear.

Respiratory protection: Dust-protection mask.

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.

SECTION 9: Physical and chemical properties

Physical state	Solid under normal conditions, cylindrical and spherical pellets.
Color	White in solid state and transparent in precursor state.
Odor	Odorless.
pH	Not available.
Melting point/freezing point	240 to 265°C

Initial boiling point and Not available

Neither Indorama Ventures Europe BV, UAB Orion Global PET, Indorama Ventures Poland Sp. z o.o., Indorama Ventures Química S.L.U. nor their marketing affiliates shall be responsible for the use of this information, or of any product, method or apparatus mentioned, and you must make your own determination of its suitability and completeness of your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. No warranty is made of the merchantability or fitness of any product, and nothing herein waives any of the Seller's conditions of sale.

SAFETY DATA SHEET

RAMAPET

boiling range	
Flammability (solid, gas)	Slightly flammable in the presence of the following materials or conditions: open flames, sparks and static discharge and heat. Non-flammable in the presence of the following materials or conditions: shocks and mechanical impacts, oxidizing materials and reducing materials.
Burning time	Not available.
Upper/lower flammability or explosive limits	Not available.
Vapor pressure	Not available.
Vapor density	Not available.
Density	1.39 – 1.4 g/cm ³
Solubility(ies)	Partially soluble in the following materials: acetone. Insoluble in the following materials: cold water and hot water.
Auto-ignition temperature	>500°C
Decomposition temperature	Not available.
Viscosity (intrinsic)	0.55 – 0.85 dl/g
Explosive properties	Non-explosive in the presence of the following materials or conditions: open flames, sparks and static discharge, heat, shocks and mechanical impacts, oxidizing materials and reducing materials.
Oxidizing properties	Not available.
<u>PET Dust Ignition Sensitivity & Explosion Severity:</u>	
MIE (minimum ignition Energy)	100 -200 mJ
MIT (minimum ignition temperature)	490°C
Explosion Indices	Pmax = 6.2 bar @ 750 g.m-3 (dP/dt)max = 241 bar.s-1 @ 4000 g.m-3 Kst value = 65 bar.m.s-1 St class = 1
Minimum Explosive Concentration	250 g.m-3

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: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Neither Indorama Ventures Europe BV, UAB Orion Global PET, Indorama Ventures Poland Sp. z o.o., Indorama Ventures Química S.L.U. nor their marketing affiliates shall be responsible for the use of this information, or of any product, method or apparatus mentioned, and you must make your own determination of its suitability and completeness of your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. No warranty is made of the merchantability or fitness of any product, and nothing herein waives any of the Seller's conditions of sale.

SAFETY DATA SHEET
RAMAPET**SECTION 11: Toxicological information**

Information on toxicological effects: Not available.
Skin irritation/corrosion: Not classified.
Eye damage/ irritation: Not classified.
Skin sensitization: Not classified.
Mutagenicity: Not classified.
Carcinogenicity: Not available.
Reproductive toxicity: No known significant effects or critical hazards.
Teratogenicity: Not applicable.
Specific target organ toxicity (single exposure): Not available.
Specific target organ toxicity (repeated exposure): Not available.
Aspiration hazard: Not available.

SECTION 12: Ecological information

Toxicity: Not available.
Persistence and degradability: Not available.
Bioaccumulative potential: Not available.
Mobility in soil: Not available.
Results of PBT and vPvB assessment: Not applicable. The substance is not PBT and vPvB.
Other adverse effects: Not applicable.

SECTION 13: Disposal considerations

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

Waste treatment methods**Product**

Methods of disposal: 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.

Hazardous waste: Within the present knowledge of the supplier, this product is not regarded as hazardous waste, as defined by EU Directive 91/689/EEC.

Packaging

Methods of disposal: The generation of waste should be avoided or minimized wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions: 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

Neither Indorama Ventures Europe BV, UAB Orion Global PET, Indorama Ventures Poland Sp. z o.o., Indorama Ventures Química S.L.U. nor their marketing affiliates shall be responsible for the use of this information, or of any product, method or apparatus mentioned, and you must make your own determination of its suitability and completeness of your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. No warranty is made of the merchantability or fitness of any product, and nothing herein waives any of the Seller's conditions of sale.

SAFETY DATA SHEET RAMAPET

soil, waterways, drains and sewers.

SECTION 14: Transport information

UN number: Not hazardous for transport.

UN proper shipping name: Not hazardous for transport.

Transport hazard class(es): Not hazardous for transport according ADR/RID, AND, IMDG, IATA.

Packing group: Not hazardous for transport according ADR/RID, AND, IMDG, IATA.

Packing group Environmental hazards: Not hazardous for transport according ADR/RID, AND, IMDG, IATA.

Special precautions for user: 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 73/78 and the IBC Code: Not applicable.

SECTION 15: Regulatory information

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

EU Regulation (EC) No. 1907/2006 (REACH).

International Convention for the Prevention of Pollution From Ships, MARPOL 73 in its amended form.

International Maritime Dangerous Goods (Code IMDG) according to chapter VII of the International Convention for the Safety of Life at Sea, 1974.

Annex XIV - List of substances subject to authorization: None of the components are listed.

Substances of very high concern (SVHC) according to Article 59(10) the REACH Regulation: None of the components are listed.

Other EU regulations:

Seveso II Directive: Not controlled under the Seveso II Directive.

Chemical Weapon Convention List Schedules I, II & III Chemicals: Not listed.

Montreal Protocol (Annexes A, B, C, E): Not listed.

Stockholm Convention on Persistent Organic Pollutants: Not listed.

Rotterdam Convention on Prior Inform Consent (PIC): Not listed.

UNECE Aarhus Protocol on POPs and Heavy Metals: Not listed.

International lists:

National inventory

Australia: This material is listed or exempted.

Canada: This material is listed or exempted.

China: This material is listed or exempted.

Japan: This material is listed or exempted.

Malaysia: Not determined.

New Zealand: This material is listed or exempted.

Philippines: This material is listed or exempted.

Republic of Korea: This material is listed or exempted.

Taiwan: This material is listed or exempted.

United States: This material is listed or exempted.

Neither Indorama Ventures Europe BV, UAB Orion Global PET, Indorama Ventures Poland Sp. z o.o., Indorama Ventures Química S.L.U. nor their marketing affiliates shall be responsible for the use of this information, or of any product, method or apparatus mentioned, and you must make your own determination of its suitability and completeness of your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. No warranty is made of the merchantability or fitness of any product, and nothing herein waives any of the Seller's conditions of sale.

SAFETY DATA SHEET
RAMAPET

15.2 Chemical Safety Assessment: Not applicable

SECTION 16: Other information**Abbreviations and acronyms:**

ATE = Acute Toxicity Estimate

CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No.1272/2008]

DNEL = Derived No Effect Level

EUH statement = CLP-specific Hazard statement

PNEC = Predicted No Effect Concentration

RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Not classified as hazardous. Handle in accordance with good industrial hygiene and safety practice.

Revision date

August 2017

The information contained herein is based on current knowledge and experience; no responsibility is accepted that the information is sufficient or correct in all cases. Users should consider these data only as a supplement to other information. Users should make independent determinations of suitability and completeness of information from all sources to assume proper use and disposal of these materials, the safety and health of employees and customers and protection of the environment.

Neither Indorama Ventures Europe BV, UAB Orion Global PET, Indorama Ventures Poland Sp. z o.o., Indorama Ventures Química S.L.U. nor their marketing affiliates shall be responsible for the use of this information, or of any product, method or apparatus mentioned, and you must make your own determination of its suitability and completeness of your own use, for the protection of the environment, and for the health and safety of your employees and purchasers of your products. No warranty is made of the merchantability or fitness of any product, and nothing herein waives any of the Seller's conditions of sale.