Keltan

Material safety data

Ethylene-propylene-(ter)-polymer EP(D)M

Bales / Granulate

Grades: 312, 314, 378, 4502, 4703, 4778, 4802, 480X100, 4903, 509X100, 512, 512X50 514, 520, 578, 708X15, 712, 714, 720, 740, 778, 812, 820, 8340A, 2324A

The purpose of this material safety data sheet is to provide comprehensive information on important physical, safety, toxicological and ecological aspects of the material named above, and to convey recommendations for its safe storage, handling and transport.

This Material Safety Data Sheet complies with:
- Directive 91/155/EEC of the Commission of the European Communities.

Date of issue : January 1997
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DSM

KELTAN
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bales / granulate

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according to:
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1. Chemical product and company identification

1.1	Chemical product name	KELTAN*
	Product code	EP(D)M
	Chemical name	Ethylene-propylene-(ter)polymer
1.2	Manufacturer	DSM Elastomers Europe bv. P.O. Box 43 6130 AA SITTARD The Netherlands
1.3	Emergency telephone number	The Netherlands Tel. +31 (0) 46 476 10 92

2. Composition/information on ingredients

This chemical product is a preparation:

common chemical name	ethylene propylene (ter)polymer
formula	$(-CH_2-CH_2(CH_3))_x(-CH_2-CH_2)_y$-(cycloalkadiene),
generic name	polyolefin
CAS number	25034/71/3 and 25038/36/2
synonym(s)	EP(D)M
oil-extended grades	contain paraffinic oil
granulated grades	May contain polyethylene and/or polypropylene, and utilise small amounts of talc, calcium stearate and/or polyethylene powder as separating agents.
ingredients contributing to the hazard	none

3. Hazard identification

The most important hazards are:

Health hazard	*Specific hazards*	*Main symptoms*
Lung toxin	Avoid breathing the fumes, vapour or free traces of diene evolved during processing	Coughing
Skin hazard	Material is unlikely to cause irritation but skin contact should be minimized	None
Eye hazard	Dust from grinding,etc.	Red eyes
Ingestion	No hazard	N/a

The material is not classified as being a dangerous preparation according to EC Directive 88/379 and the subsequent amendments. See also Section 15.

R(isk) phrases n/a.

* *Registered tradename of DSM*

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4. First aid measures

Inhalation	When fumes of molten material have been inhaled: - move person to fresh air - rest in half upright position - loosen clothing - keep warm. In case of respiratory problems move person to first aid station or hospital for medical treatment.
Skin contact	Under normal conditions : Wash with soap and water. During processing any burns should be cooled as quickly as possible by means of cold water. Cover the wound with sterile dressing and move person to first aid station or hospital for medical treatment.
Eye contact	Any material entering the eye should be flushed out with copious volumes of water.
Ingestion	No special protection requirements under normal conditions.

5. Fire-fighting measures

Extinguishing media	Water, water/foam, ABC fire extinguishing powder. In case of fire or smouldering during processing, storage or transport, water, water/foam and ABC powder can be used. Make sure that all equipment is suitably shut down and disconnected from the electrical mains. The water or water/foam can best be applied by spray cooling.
Not to be used for reasons of safety	N/a
Specific hazards	
Solid	Treat the material as a solid that can burn. Products which contain oil are combustible as indicated by the flash point (see Section 9). Bales and granulate burn slowly with a relative high smoke density and the possibility of flaming drips.

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Liquids	During fire and smouldering, oil can be released from oil-extended grades. When using extinguishing water or water/foam, the water-oil mixture has to be collected and properly disposed of.
Gases	Hot vapours from heated material can be extremely flammable in air or oxygen in the case of stoichiometric mixtures. Other explosion hazards are unknown.
Combustion products	CO, CO_2, H_2O, low molecular products, various hydrocarbons
Protection of firefighters	Full emergency equipment with self-contained breathing apparatus should be worn to protect fire fighters from any hazardous decomposition or combustion products. Note: cool fire-exposed boxes, containers or pallets with water.

6. Accidental release measures

Personal precautions	Prevent release of dust during grinding by use of filters. Protect skin, eyes and hands (see Section 8).
Environmental precautions	For disposal considerations see Section 13.
Cleaning-up methods	Use suitable industrial vacuum cleaners to suck up crumbs or dust. Shovel or sweep up spilt material. Avoid generation of dust clouds. Put into containers for reclaiming or disposal.

7. Handling and storage

7.1 Handling

Precautions

General precautions	Avoid any contact with hot materials.
Personal protection	For more information on personal protection when handling the material see Section 8.
Hygienic precautions	Adequate washing facilities, with supplies of mild soap and hand cleansers should be available at all working locations. Never use solvents for cleaning hands. Smoking, eating and drinking in working and storage areas should be prohibited.

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Advice on technical measures

Ventilation: general machanical	A power ventilation system should be installed where: a) processing at high temperatures e.g. vulcanisation, is carried out, b) bales are being ground or machined.
Ventilation: local exhaust	It is advised to install local exhaust ventilation in the vicinity of processing machines.
Prevention of dust generation	Handling: When handling bales dust will not normally occur. During grinding dust can be generated. The use of a dust mask is advised. During the cutting of bales, dust is not normally formed. Some dust may be generated from the separating agents used for granulated grades (talc, calcium stearate and/or polyethylene powder) Filtering: take the utmost care to prevent dust explosion and apply proper local grounding wherever powdered material is present.
Prevention of fire and explosion	See Section 7.2.

7.2 Storage

Technical measures & storage conditions	When green rubber, whether oil-extended or not, is stored under unfavourable conditions, its physical and/or chemical characteristics may change to some degree. Eventually, this may render the rubber unsuitable for use, for instance because of hardening or softening effects. This results in changes in the processing behaviour and/or in the properties and surface of the resulting vulcanisates. Such changes, due to environmental influences, may be caused by only one factor, or by a combination of factors, the most important of which are the effects of oxygen, light, temperature and humidity. Since the harmful effects of these factors can be minimized by a careful choice of the storage conditions, we would like to draw your attention to a number of important measures to be taken when storing green rubber. The guidelines given below relate to the principal storage conditions of the standard delivery forms of our KELTAN EP(D)M.
Storage accomodation	The storage area should be clean, dry and properly ventilated. Storage outdoor should be avoided.
Temperature	EP(D)M in its unvulcanized state tends to crystallize at temperatures lower than 15°C. EP(D)M that has been stored at temperatures below 15°C can therefore give rise to mixing problems, resulting in the presence of undispersed polymer particles in the final product. This most likely to occur with greenstrenght grades, but may also be observed in amorphous grades. The minimum storage temperature should preferably be 15°C. If a storage temperature below 15°C cannot be avoided it is recommended to transfer the green rubber to a suitable place, which has been heated to well

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above room temperature, and allow the material enough time to recover from crystallization before further processing.
For storage over a long time period the recommended maximum temperature is 25°C, to slow down ageing.
Humid conditions should be avoided, since moisture can influence the processing and curing behaviour of the material. Relative humidity should preferably be kept below 65%.

Light

Daylight, but also artificial light with a substantial content of UV-light, may adversely affect the stability of green EP(D)M rubber.
Depending on the grade and the exposure time, chain rupture and/or crosslinking may occur.
In view of this, exposure to light should be restricted to a minimum.
KELTAN EP(D)M is shipped in boxes which, when kept closed, adequately protect the material against light. Once taken from the box it is advisable to use black or at least opaque covers to protect the material during storage.
It should be emphasized that oil-extended grades, and especially oil-extended ENB grades, are more susceptible to light degradation than other grades. Therefore, unprotected storage of oil-extended grades for a period longer than 1-3 days (depending on the actual conditions) should be avoided, even in a storage area which meets all the other conditions described.

Oxygen

When possible, green EP(D)M rubber should be protected from excessive air circulation and should not be stored near electrical equipment that could be a source of ozone.

Contamination

KELTAN EP(D)M rubber should be stored in an area which meets the usual standards of cleanliness, even though the product is wrapped in PE or EVA-foil or PE-bags. All direct contact with foreign materials and with other kinds of rubber should be avoided. It is recommended to keep the material in its original packaging until the moment it is to be used.

Warehousing

Depending on the construction of the packaging, it is possible to stack the product in a straight line above each other. This should be done very carefully, because otherwise, there will be a risk of damaging the packaging or causing a safety hazard. The following table shows the stack height of the different packagings.

Packaging	*Stack height*
Boxpallets (small footprint, high profile)	2
Boxpallets (large footprint, low profile)	3
Pallets with corrugated cardboard packaging	2
Stretch wrap packaging	2
Aluminum returnable box (filled)	4
Aluminum returnable box (empty)	28

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Stock rotation	Green EP(D)M rubber should not be stored for any longer than necessary. It is therefore recommended to use the "Fi-Fo" (First in-first out) stock rotation system.

8. Exposure controls/personal protection

Control parameters	Threshold Limit Values (TLV) of dienes and extender oil which may be liberated during processing are: - dienes - ACGIH-TLV (TWA) equals 25 mg/m³ (= 5ppm), - oil mist - TLV (TWA) equals 5 mg/m³ with an STEL of 10 mg/m³. Using normal processing conditions and local exhaust these levels of exposure will not normally be reached. Dust is unlikely to be produced.
Personal protective equipment	
Respiratory protection	When the threshold limit value (TLV) is expected to be exceeded a protective mask and/or exhaust ventilation will be necessary.
Hand protection	Protective gloves are recommended to handle oil-extended grades and granulate. Skin contact with hot rubber or compounds should be avoided by wearing protective (heat resistant) gloves.
Eye protection	Safety glasses are recommended if dust is generated from grinding. Heat resistant face shields should be worn during purging and processing.
Skin and body protection	Skin contact with hot rubber or hot compounds should be avoided by wearing protective, heat resistant suits and boots.

9. Physical and chemical properties

Polymer properties	
physical state	"solid"
form	bales or granulate
colour	natural opaque, brown in case of oil extended grades
odour	weak paraffinic
pH value	n/a
relative density	860-900 kg/m³
bulk density	depending on bale or granulate structure
melting point/range	n/a
softening point/range	n/a
viscosity	
boiling point/range	n/a
vapour pressure	n/a
vapour density	n/a
evaporation rate	n/a
volatile matter (wt. %)	0.3 (typical value)
solubility in water	insoluble

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solubility in other substances	Soluble in hydrocarbons such as: - alkanes: hexane, heptane, octane, decane, dodecane, iso-octane, isododecane - cycloalkanes: cyclo-octane, decaline, cyclododecane - aromatic substances: butylbenzene, octylbenzene - oils: paraffinic oil, naphthenic oil, to a lesser extent in aromatic oil. For detailed information, please ask for a copy of the brochure "KELTAN - Resistance to Oil".
partition coefficient (n-octanol/water)	n/a
miscibility	n/a
volume conductivity	low, danger of static charges
Safety properties according to ASTM D1929/77	
auto ignition temperature	non oil-extended polymers >370 °C oil extended polymers >370 °C
flash point	non oil-extended polymers >365 °C oil extended polymers >360 °C
Dust explosive properties	Dust explosion is unlikely, because the product is not supplied in small particle sizes (< 500 µm).

10. Stability and reactivity

The material is chemically stable, but under certain conditions hazardous reactions can take place.

Conditions to avoid

Dust formation	Dust formation is unlikely to occur. During grinding of the bales or granules dust explosion danger can arise when particles smaller than 500 µm are formed.
Electrostatic charging	Whenever small particles are transported (pneumatic transport systems, ventilation systems, etc.) apply proper local grounding to prevent build-up of static electricity.
Gas/vapour air mixtures	At high temperatures inert gases should wherever possible be applied in order to strongly reduce oxygen concentrations. Flammable gases are formed only at higher than usual processing temperatures.
Processing temperatures	Do not exceed 300 °C. Long term high temperatures will cause degradation of the material with chances of ignition.
Long term exposure	No special precautions are necessary.
Materials to avoid	Strong oxidizing agents.

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Hazardous decomposition products	On thermal degradation, reaction products of section 5 can be formed. Although highly dependent on temperature and environmental conditions, a variety of decomposition products may be present, ranging from simple hydrocarbons (e.g. methane, ethane, propane) to toxic and/or irritating gases (e.g. carbon monoxide, carbon dioxides, acids, ketones, aldehydes).
Changes in physical appearance	Degradation will occur only at extreme temperatures (above the decomposition temperature).

11. Toxicological information

Acute toxicity	None (estimated LD_{50} oral rat > 5000 mg/kg)
Local effects	None, fines in eyes may cause irritation.
Chronic short and long term toxicity	None
Sensitization	None
Specific effects (carcinogenicity, mutagenicity, teratogenicity, narcosis)	None

12. Ecological information

Mobility	None
Persistence/degradability	Not biodegradable
Bioaccumulation	None
Ecotoxicity	There is no indication that this material is a risk to the environment.
Aquatic toxicity	This material is a water insoluble non-toxic solid material.

13. Disposal considerations

The disposal of this material, as well as used packaging, present no toxic or ecological hazard. It can be burnt under controlled conditions or be disposed of in landfills, or be recycled.

Note: Additional national or regional provisions may apply.

14. Transport information

For all grades, both oil and non oil extended, no special precautions have to be met, as EP(D)M is not classified under shipping regulations for dangerous goods.

15. Regulatory information

Labelling	No labelling required under EC-Directive 88/379/EEC
EEC classification	Not a dangerous preparation.

Note: Additional national legislation relevant to this matter may be in force.

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16. Other information

Recommended application(s)	Elastomeric component in rubber compounds, plastics modification and oil modification, for applications in automotive, construction, wire and cable and general rubber goods.
Technical information	For additional information please contact:

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The Netherlands

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