

Safety data sheet

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BASF Safety data sheet according to UN GHS 4th rev.

Date / Revised: 28.04.2017

Version: 3.0

Product: **Diethanolamine pure**

(ID no. 30036874/SDS_GEN_00/EN)

Date of print 29.04.2017

1. Identification

Product identifier

Diethanolamine pure

Chemical name: diethanolamine

CAS Number: 111-42-2

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

Relevant identified uses: Chemical used in synthesis and/or formulation of industrial products

Recommended use: Chemical

Uses advised against: Due to the possibility of nitrosamine formation in water-miscible or water-based cooling lubricants should not contain more than 0,25% Diethanolamine in its application state.

Details of the supplier of the safety data sheet

Company:

BASF SE

67056 Ludwigshafen

GERMANY

Operating Division Intermediates

Telephone: +49 621 60-0

E-mail address: ci-qshe-request@basf.com

Emergency telephone number

International emergency number:

Telephone: +49 180 2273-112

2. Hazards Identification

Classification of the substance or mixtureAccording to UN GHS criteria

Acute Tox. 4 (oral)
 Skin Corr./Irrit. 2
 Eye Dam./Irrit. 1
 STOT RE (Kidney, Liver, Blood) 2
 Aquatic Acute 2

For the classifications not written out in full in this section the full text can be found in section 16.

Label elementsGlobally Harmonized System (GHS)

Pictogram:



Signal Word:

Danger

Hazard Statement:

H318	Causes serious eye damage.
H315	Causes skin irritation.
H302	Harmful if swallowed.
H373	May cause damage to organs (Kidney, Liver, Blood) through prolonged or repeated exposure.
H401	Toxic to aquatic life.

Precautionary Statements (Prevention):

P280	Wear protective gloves and eye/face protection.
P273	Avoid release to the environment.
P260	Do not breathe dust/gas/mist/vapours.
P270	Do not eat, drink or smoke when using this product.
P264	Wash with plenty of water and soap thoroughly after handling.

Precautionary Statements (Response):

P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310	Immediately call a POISON CENTER or doctor/physician.
P303 + P362	IF ON SKIN (or hair): Wash with plenty of soap and water.
P330	Rinse mouth.
P362 + P364	Take off contaminated clothing and wash it before reuse.

Precautionary Statements (Disposal):

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P501	Dispose of contents/container to hazardous or special waste collection point.
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According to UN GHS criteria

Hazard determining component(s) for labelling: DIETHANOLAMINE

Other hazardsAccording to UN GHS criteria

If applicable information is provided in this section on other hazards which do not result in classification but which may contribute to the overall hazards of the substance or mixture.

In the presence of nitrosating agents, it is possible that this substance forms nitrosamines. The nitrosamine formation is facilitated by the following parameters: High concentration of reacting agents (respectively high vapor pressure of volatile reacting agents for gas phase reactions), high process temperature, formation of aerosols, low pH in aqueous systems, catalysts. The nitrosamine formation can be prevented or reduced by suitable inhibitors.

3. Composition/Information on Ingredients**Substances**Chemical nature

2,2'-iminodiethanol; diethanolamine
 CAS Number: 111-42-2
 EC-Number: 203-868-0
 INDEX-Number: 603-071-00-1

Hazardous ingredients (GHS)

According to UN GHS criteria

2,2'-iminodiethanol; diethanolamine	
Content (W/W): >= 99,3 %	Acute Tox. 4 (oral)
CAS Number: 111-42-2	Skin Corr./Irrit. 2
EC-Number: 203-868-0	Eye Dam./Irrit. 1
INDEX-Number: 603-071-00-1	STOT RE (Kidney, Liver, Blood) 2
	Aquatic Acute 2
	H318, H315, H302, H373, H401

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Mixtures

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Not applicable

4. First-Aid Measures

Description of first aid measures

Remove contaminated clothing. If danger of loss of consciousness, place patient in recovery position and transport accordingly. Apply artificial respiration if necessary. First aid personnel should pay attention to their own safety.

If inhaled:

Keep patient calm, remove to fresh air, seek medical attention. Immediately administer a corticosteroid from a controlled/metered dose inhaler.

On skin contact:

Immediately wash thoroughly with plenty of water, apply sterile dressings, consult a skin specialist.

On contact with eyes:

Immediately wash affected eyes for at least 15 minutes under running water with eyelids held open, consult an eye specialist.

On ingestion:

Immediately rinse mouth and then drink 200-300 ml of water, seek medical attention.

Most important symptoms and effects, both acute and delayed

Symptoms: Overexposure may cause: vomiting, nausea, coughing, headache, Further symptoms are possible

Indication of any immediate medical attention and special treatment needed

Treatment: Treat according to symptoms (decontamination, vital functions), no known specific antidote.

5. Fire-Fighting Measures

Extinguishing media

Suitable extinguishing media:
water spray, dry powder, foam, carbon dioxide

Special hazards arising from the substance or mixture

nitrogen oxides, carbon oxides

The substances/groups of substances mentioned can be released in case of fire. Under certain conditions in case of fire other hazardous combustion products may be generated.

Advice for fire-fighters

Special protective equipment:

Wear self-contained breathing apparatus and chemical-protective clothing.

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Further information:

Dispose of fire debris and contaminated extinguishing water in accordance with official regulations.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures

Avoid inhalation. Avoid contact with the skin, eyes and clothing.

Environmental precautions

Do not discharge into drains/surface waters/groundwater.

Methods and material for containment and cleaning up

For large amounts: Pump off product.

For residues: Pick up with suitable absorbent material (e.g. sand, sawdust, general-purpose binder, kieselguhr).

Clean contaminated floors and objects thoroughly with water and detergents, observing environmental regulations. Collect waste in suitable containers, which can be labeled and sealed. Incinerate or take to a special waste disposal site in accordance with local authority regulations.

Reference to other sections

Information regarding exposure controls/personal protection and disposal considerations can be found in section 8 and 13.

7. Handling and Storage

Precautions for safe handling

Ensure thorough ventilation of stores and work areas. Handle in accordance with good industrial hygiene and safety practice. When using do not eat, drink or smoke. Hands and/or face should be washed before breaks and at the end of the shift.

Protection against fire and explosion:

Prevent electrostatic charge - sources of ignition should be kept well clear - fire extinguishers should be kept handy.

Conditions for safe storage, including any incompatibilities

Segregate from acids and acid forming substances.

Unsuitable materials for containers: Aluminium, Galvanized carbon steel (Zinc), Paper/Fibreboard

Storage stability:

Storage temperature: < 40 °C

Storage duration: 12 Months

May discolour after lengthy storage.

From the data on storage duration in this safety data sheet no agreed statement regarding the warranty of application properties can be deduced.

In the presence of nitrosating agents it is possible that this product forms nitrosamines.

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Specific end use(s)

See exposure scenario(s) in the attachment to this safety data sheet.

8. Exposure Controls/Personal Protection

Control parameters

Components with occupational exposure limits

111-42-2: 2,2'-iminodiethanol; diethanolamine

Exposure controls

Personal protective equipment

Respiratory protection:

Respiratory protection in case of vapour/aerosol release.

Combination filter for gases/vapours of organic compounds and solid and liquid particles (f.e. EN 14387 Type A-P2)

Hand protection:

Chemical resistant protective gloves (EN 374)

Suitable materials also with prolonged, direct contact (Recommended: Protective index 6, corresponding > 480 minutes of permeation time according to EN 374):

e.g. nitrile rubber (0.4 mm), chloroprene rubber (0.5 mm), polyvinylchloride (0.7 mm) and other
Manufacturer's directions for use should be observed because of great diversity of types.

Supplementary note: The specifications are based on tests, literature data and information of glove manufacturers or are derived from similar substances by analogy. Due to many conditions (e.g. temperature) it must be considered, that the practical usage of a chemical-protective glove in practice may be much shorter than the permeation time determined through testing.

Eye protection:

Tightly fitting safety goggles (splash goggles) (e.g. EN 166)

Body protection:

Body protection must be chosen depending on activity and possible exposure, e.g. apron, protecting boots, chemical-protection suit (according to EN 14605 in case of splashes or EN ISO 13982 in case of dust).

General safety and hygiene measures

Avoid contact with the skin, eyes and clothing. Handle in accordance with good industrial hygiene and safety practice. Wearing of closed work clothing is required additionally to the stated personal protection equipment. Hands and/or face should be washed before breaks and at the end of the shift. Gloves must be inspected regularly and prior to each use. Replace if necessary (e.g. pinhole leaks). Take off immediately all contaminated clothing. Wash contaminated clothing before reuse. When using, do not eat, drink or smoke.

9. Physical and Chemical Properties

Information on basic physical and chemical properties

Form:	solidified, liquid	
Colour:	colourless	
Odour:	mild, ammonia-like	
Odour threshold:	Not determined due to potential health hazard by inhalation.	
pH value:	11,3 (100 g/l, 30 °C)	
Melting point:	27,4 °C	(other)
Boiling point:	269,9 °C (1.013 hPa) Cannot be distilled without decomposition at normal pressure.	(other)
Flash point:	176 °C	(DIN 51758, closed cup)
Evaporation rate:	Value can be approximated from Henry's Law Constant or vapor pressure.	
Flammability:	not flammable	(UN Test N.1 (ready combustible solids))
Lower explosion limit:	2,1 %(V) (156 °C)	(air)
Upper explosion limit:	10,6 %(V) (193 °C)	(air)
Ignition temperature:	375 °C	(Regulation 440/2008/EC, A.15)
Vapour pressure:	0,000085 hPa (20 °C)	(calculated)
Density:	1,0953 g/cm ³ (23,8 °C)	
Relative density:	1,09 (20 °C) (in liquid state)	(calculated)
Relative vapour density (air):	negligible	
Solubility in water:	miscible	
Partitioning coefficient n-octanol/water (log Kow):	-2,18 (25 °C; pH value: 7,1)	(OECD Guideline 107)
Self ignition:	Temperature: 20 °C not self-igniting	Test type: Spontaneous self-ignition at room-temperature.
	The value has not be determined because of the low risk of self-ignition in consequence of the low melting point.	Test type: Self-ignition at high temperatures.
Thermal decomposition:	125 °C, 40 kJ/kg (DSC (OECD 113))	

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	310 °C, > 380 kJ/kg (DSC (OECD 113))	
Viscosity, dynamic:	390,9 mPa.s (30 °C)	(calculated (from kinematic viscosity))
Viscosity, kinematic:	357,2 mm ² /s (30 °C)	(DIN 51562)
Explosion hazard:	not explosive	
Fire promoting properties:	not fire-propagating	(other)

Other information

Self heating ability:	Not tested on account of the low melting-point. It is not a substance capable of spontaneous heating.	
Bulk density:	1,09 g/cm ³ (20 °C)	
pKA:	8,99 (25 °C)	(other)
Volatility/water - air:	The substance will not evaporate into the atmosphere from the water surface. The data refer to the uncharged form of the substance.	
Adsorption/water - soil:	KOC: 10; log KOC: 0,99 Adsorption to solid soil phase is not expected. The data refer to the charged form of the substance.	(calculated)
Surface tension:	Based on chemical structure, surface activity is not to be expected.	
Grain size distribution:	Test substance	The substance / product is marketed or used in a non solid or granular form.
Molar mass:	105,14 g/mol	

10. Stability and Reactivity

Reactivity

Corrosion to metals:	Corrosive effects to metal are not anticipated. In the presence of water or moisture metal corrosion cannot be excluded.	
Formation of flammable gases:	Remarks:	Forms no flammable gases in the presence of water.

Possibility of hazardous reactions

Reacts with acids. The progress of reaction is exothermic. Reacts with oxidizing agents. Reacts with halogenated compounds. Reacts with acid chlorides. Incompatible with acid chlorides and acid anhydrides.

In the presence of nitrosating agents this substance can form nitrosamines.

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Conditions to avoid

Temperature: 60 °C

Avoid excessive temperatures. See MSDS section 7 - Handling and storage.

Incompatible materials

Substances to avoid:

oxidizing agents, nitrosating agents, acid forming substances, acids, isocyanates

Hazardous decomposition products

:

No hazardous decomposition products if stored and handled as prescribed/indicated.

Hazardous decomposition products:

carbon oxides, nitrogen oxides, nitrous gases

11. Toxicological Information

Information on toxicological effects

Acute toxicity

Assessment of acute toxicity:

Of moderate toxicity after single ingestion. Virtually nontoxic after a single skin contact. The substance can be absorbed through the skin. Inhalation-risk test (IRT): The inhalation of a highly saturated vapor-air-mixture represents no acute hazard (mortality after an hour or later).

Experimental/calculated data:

LD50 rat (oral): approx. 1.600 mg/kg (BASF-Test)

rat (by inhalation): 8 h (BASF-Test)

Inhalation-risk test (IRT): No mortality within 8 hours as shown in animal studies. The inhalation of a highly saturated vapor-air mixture represents no acute hazard.

| (dermal): Study does not need to be conducted.

LD50 rabbit (dermal): 12.970 mg/kg

Irritation

Assessment of irritating effects:

Skin contact causes irritation. May cause severe damage to the eyes.

Experimental/calculated data:

| Skin corrosion/irritation rabbit: Irritant. (BASF-Test)

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Serious eye damage/irritation rabbit: irreversible damage (BASF-Test)
The European Union (EU) has classified this substance with 'Risk of serious damage to eyes' (R41)

Respiratory/Skin sensitization

Assessment of sensitization:

Skin sensitizing effects were not observed in animal studies.

Experimental/calculated data:

Guinea pig maximization test guinea pig: Non-sensitizing. (OECD Guideline 406)

Germ cell mutagenicity

Assessment of mutagenicity:

No mutagenic effect was found in various tests with bacteria and mammalian cell culture. The substance was not mutagenic in a test with mammals.

Carcinogenicity

Assessment of carcinogenicity:

The whole of the information assessable provides no indication of a carcinogenic effect. Under certain conditions the substance can form nitrosamines. Nitrosamines are carcinogenic in animal studies. IARC (International Agency for Research on Cancer) has classified this substance as group 2B (The agent is possibly carcinogenic to humans).

Reproductive toxicity

Assessment of reproduction toxicity:

The product has not been fully tested. The statements have been derived in parts from products of a similar structure or composition. The results of animal studies gave no indication of a fertility impairing effect.

Developmental toxicity

Assessment of teratogenicity:

In animal studies the substance did not cause malformations.

Specific target organ toxicity (single exposure)

Assessment of STOT single:

The available information is not sufficient for the evaluation of specific target organ toxicity.

Repeated dose toxicity and Specific target organ toxicity (repeated exposure)

Assessment of repeated dose toxicity:

Repeated oral exposure may affect certain organs.

Aspiration hazard

No aspiration hazard expected.

12. Ecological Information

Toxicity

Assessment of aquatic toxicity:

Acutely toxic for aquatic organisms. The inhibition of the degradation activity of activated sludge is not anticipated when introduced to biological treatment plants in appropriate low concentrations.

Toxicity to fish:

LC50 (96 h) 460 mg/l, *Oncorhynchus mykiss* (Fish test acute, static)

Nominal values (confirmed by concentration control analytics)

LC50 (96 h) 1.460 mg/l, *Pimephales promelas* (Fish test acute, static)

Nominal concentration. Literature data.

Aquatic invertebrates:

EC50 (48 h) 30,1 mg/l, *Ceriodaphnia dubia* (Daphnia test acute)

The details of the toxic effect relate to the nominal concentration. Literature data.

EC50 (48 h) 55 mg/l, *Daphnia magna* (Daphnia test acute, static)

The details of the toxic effect relate to the nominal concentration. Literature data.

Aquatic plants:

EC50 (72 h) 9,5 mg/l (growth rate), *Pseudokirchneriella subcapitata* (Algal growth inhibition test)

The details of the toxic effect relate to the nominal concentration.

EC10 (72 h) 1,4 mg/l (growth rate), *Pseudokirchneriella subcapitata* (Algal growth inhibition test)

The details of the toxic effect relate to the nominal concentration.

Microorganisms/Effect on activated sludge:

EC20 (0,5 h) > 1.000 mg/l, activated sludge, domestic, aerobic (OECD Guideline 209, aquatic)

Nominal concentration.

Chronic toxicity to fish:

Study scientifically not justified.

Chronic toxicity to aquatic invertebrates:

EC10 (21 d) 1,05 mg/l, *Daphnia magna* (OECD Guideline 202, part 2, semistatic)

Nominal values (confirmed by concentration control analytics)

Assessment of terrestrial toxicity:

Toxic effects have been observed in studies with soil living organisms.

Soil living organisms:

EC50 (63 d) 776 mg/kg, *Eisenia sp.* (OECD Guideline 207)

The details of the toxic effect relate to the nominal concentration. Literature data.

EC50 (28 d) 4.205 mg/kg, *Folsomia candida* (other)

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The details of the toxic effect relate to the nominal concentration. Literature data.

Terrestrial plants:

EC50 (21 d) 2.761 mg/kg, terrestrial plants (other)

EC50 (21 d) 1.632 mg/kg, terrestrial plants (other)

EC50 (14 d) 4.706 mg/kg, terrestrial plants (other)

Other terrestrial non-mammals:

No data available.

Persistence and degradability

Assessment biodegradation and elimination (H₂O):

Readily biodegradable (according to OECD criteria).

Elimination information:

93 % BOD of the ThOD (28 d) (OECD 301F; ISO 9408; 92/69/EEC, C.4-D) (aerobic, activated sludge, domestic)

Assessment of stability in water:

According to structural properties, hydrolysis is not expected/probable.

Information on Stability in Water (Hydrolysis):

According to structural properties, hydrolysis is not expected/probable.

Bioaccumulative potential

Assessment bioaccumulation potential:

Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Bioaccumulation potential:

Because of the n-octanol/water distribution coefficient (log Pow) accumulation in organisms is not to be expected.

Mobility in soil

Assessment transport between environmental compartments:

Volatility: The substance will not evaporate into the atmosphere from the water surface. The data refer to the uncharged form of the substance.

Adsorption in soil: Adsorption to solid soil phase is not expected. The data refer to the charged form of the substance.

Results of PBT and vPvB assessment

According to Annex XIII of Regulation (EC) No.1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH): The product does not fulfill the criteria for PBT (Persistent/bioaccumulative/toxic) and vPvB (very persistent/very bioaccumulative). Self classification

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Other adverse effects

The substance is not listed in Regulation (EC) 1005/2009 on substances that deplete the ozone layer.

Additional information

Sum parameter

Chemical oxygen demand (COD): 1.352 mg/g

Biochemical oxygen demand (BOD) Incubation period 5 d: 885 mg/g

Other ecotoxicological advice:

Due to the pH-value of the product, neutralization is generally required before discharging sewage into treatment plants.

13. Disposal Considerations

Waste treatment methods

Incinerate in suitable incineration plant, observing local authority regulations.

A waste code in accordance with the European waste catalog (EWC) cannot be specified, due to dependence on the usage.

The waste code in accordance with the European waste catalog (EWC) must be specified in cooperation with disposal agency/manufacturer/authorities.

Contaminated packaging:

Contaminated packaging should be emptied as far as possible; then it can be passed on for recycling after being thoroughly cleaned.

14. Transport Information

Land transport

ADR

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for	None known

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user

RID

Not classified as a dangerous good under transport regulations

UN number: Not applicable

UN proper shipping name: Not applicable

Transport hazard class(es): Not applicable

Packing group: Not applicable

Environmental hazards: Not applicable

Special precautions for user: None known

Inland waterway transport**ADN**

Not classified as a dangerous good under transport regulations

UN number: Not applicable

UN proper shipping name: Not applicable

Transport hazard class(es): Not applicable

Packing group: Not applicable

Environmental hazards: Not applicable

Special precautions for user: None known

Transport in inland waterway vessel

UN number: UN9005

UN proper shipping name: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S, MOLTEN (contains DIETHANOLAMINE)

Transport hazard class(es): 9, N3

Packing group: Not applicable

Environmental hazards: yes

Type of inland waterway vessel: N

Cargo tank design: 4

Cargo tank type: 2

Sea transport**IMDG**

Not classified as a dangerous good under transport regulations

UN number: Not applicable

UN proper shipping name: Not applicable

Transport hazard class(es): Not applicable

Packing group: Not applicable

Environmental hazards: Not applicable

Special precautions for user: None known

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user

Air transport

IATA/ICAO

	Not classified as a dangerous good under transport regulations
UN number:	Not applicable
UN proper shipping name:	Not applicable
Transport hazard class(es):	Not applicable
Packing group:	Not applicable
Environmental hazards:	Not applicable
Special precautions for user	None known

UN number

See corresponding entries for "UN number" for the respective regulations in the tables above.

UN proper shipping name

See corresponding entries for "UN proper shipping name" for the respective regulations in the tables above.

Transport hazard class(es)

See corresponding entries for "Transport hazard class(es)" for the respective regulations in the tables above.

Packing group

See corresponding entries for "Packing group" for the respective regulations in the tables above.

Environmental hazards

See corresponding entries for "Environmental hazards" for the respective regulations in the tables above.

Special precautions for user

See corresponding entries for "Special precautions for user" for the respective regulations in the tables above.

Transport in bulk according to Annex II of MARPOL and the IBC Code

Regulation:	IBC
Shipment approved:	1
Pollution name:	Diethanolamine
Pollution category:	Y
Ship Type:	3

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15. Regulatory Information

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

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

16. Other Information

Assessment of the hazard classes according to UN GHS criteria (most recent version)

Acute Tox. 4 (oral)
 Skin Corr./Irrit. 2
 Eye Dam./Irrit. 1
 Aquatic Acute 2
 STOT RE (Kidney, Liver, Blood) 2

Full text of classifications, hazard symbols and hazard statements, if mentioned in section 2 or 3:

Acute Tox.	Acute toxicity
Skin Corr./Irrit.	Skin corrosion/irritation
Eye Dam./Irrit.	Serious eye damage/eye irritation
STOT RE	Specific target organ toxicity — repeated exposure
Aquatic Acute	Hazardous to the aquatic environment - acute
H318	Causes serious eye damage.
H315	Causes skin irritation.
H302	Harmful if swallowed.
H373	May cause damage to organs (Kidney, Liver, Blood) through prolonged or repeated exposure.
H401	Toxic to aquatic life.

The data contained in this safety data sheet are based on our current knowledge and experience and describe the product only with regard to safety requirements. This safety data sheet is neither a Certificate of Analysis (CoA) nor technical data sheet and shall not be mistaken for a specification agreement. Identified uses in this safety data sheet do neither represent an agreement on the corresponding contractual quality of the substance/mixture nor a contractually designated use. It is the responsibility of the recipient of the product to ensure any proprietary rights and existing laws and legislation are observed.

Vertical lines in the left hand margin indicate an amendment from the previous version.