according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU

#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: **0338**Version: **2.0 en**date of compilation: 2016-06-15
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Replaces version of: 2016-06-15

Version: (1.0)

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

#### 1.1 Product identifier

Article number 0338

Registration number (REACH) 01-2119473980-30-xxxx

 Index No
 606-004-00-4

 EC number
 203-550-1

 CAS number
 108-10-1

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

**Identified uses:** laboratory chemical

#### 1.3 Details of the supplier of the safety data sheet

Carl Roth GmbH + Co KG Schoemperlenstr. 3-5 D-76185 Karlsruhe Germany

**Telephone:** +49 (0) 721 - 56 06 0 **Telefax:** +49 (0) 721 - 56 06 149

**e-mail:** sicherheit@carlroth.de **Website:** www.carlroth.de

Competent person responsible for the safety data : Department Health, Safety and Environment

sheet

e-mail (competent person) : sicherheit@carlroth.de

1.4 Emergency telephone number

Emergency information service Poison Centre Munich: +49/(0)89 19240

#### **SECTION 2: Hazards identification**

#### 2.1 Classification of the substance or mixture

#### Classification according to Regulation (EC) No 1272/2008 (CLP)

#### Classification acc. to GHS

Section	Hazard class	Hazard class and cat- egory	Hazard state- ment
2.6	flammable liquid	(Flam. Liq. 2)	H225
3.11	acute toxicity (inhal.)	(Acute Tox. 4)	H332
3.3	serious eye damage/eye irritation	(Eye Irrit. 2)	H319
3.8R	specific target organ toxicity - single exposure (respiratory tract ir- ritation)	(STOT SE 3)	H335

United Kingdom (en) Page 1 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

#### **Supplemental hazard information**

Code	Supplemental hazard information
EUH066	repeated exposure may cause skin dryness or cracking

#### Remarks

For full text of H-phrases: see SECTION 16. For full text of abbreviations: see SECTION 16.

#### 2.2 Label elements

#### Labelling according to Regulation (EC) No 1272/2008 (CLP)

Signal word Danger







#### **Hazard statements**

H225 Highly flammable liquid and vapour

H319 Causes serious eye irritation

H332 Harmful if inhaled

H335 May cause respiratory irritation

#### **Precautionary statements**

#### **Precautionary statements - prevention**

P210 Keep away from heat, hot surfaces, sparks, open flames. No smoking.

P280 Wear protective gloves/eye protection.

#### **Precautionary statements - response**

P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact

lenses, if present and easy to do. Continue rinsing.

#### Supplemental hazard information

EUH066 Repeated exposure may cause skin dryness or cracking.

Labelling of packages where the contents do not exceed 125 ml

Signal word: Danger

Symbol(s)





EUH066 Repeated exposure may cause skin dryness or cracking.

#### 2.3 Other hazards

There is no additional information.

United Kingdom (en) Page 2 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

### **SECTION 3: Composition/information on ingredients**

#### 3.1 Substances

Name of substance Isobutyl methyl ketone

Index No 606-004-00-4

Registration number (REACH) 01-2119473980-30-xxxx

EC number 203-550-1 CAS number 108-10-1 Molecular formula  $C_6H_{12}O$  Molar mass 100,2  $^g/_{mol}$ 

### **SECTION 4: First aid measures**

#### 4.1 Description of first aid measures



#### **General notes**

Take off contaminated clothing.

#### Following inhalation

Provide fresh air. If breathing is irregular or stopped, immediately seek medical assistance and start first aid actions.

#### Following skin contact

Rinse skin with water/shower. In all cases of doubt, or when symptoms persist, seek medical advice.

#### Following eye contact

Irrigate copiously with clean, fresh water for at least 10 minutes, holding the eyelids apart. In case of eye irritation consult an ophthalmologist.

#### **Following ingestion**

Rinse mouth. Do not induce vomiting. Aspiration hazard. Call a physician immediately.

#### 4.2 Most important symptoms and effects, both acute and delayed

Irritation, Cough, Headache, Vertigo, Gastrointestinal complaints, Nausea, Dyspnoea

#### 4.3 Indication of any immediate medical attention and special treatment needed

Give sodium sulfate as laxative (1 tablespoon in 1 glass of water).

United Kingdom (en) Page 3 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

### **SECTION 5: Firefighting measures**

#### 5.1 Extinguishing media

#### Suitable extinguishing media

Co-ordinate fire-fighting measures to the fire surroundings foam, dry extinguishing powder, carbon dioxide (CO2)

#### Unsuitable extinguishing media

water jet

#### 5.2 Special hazards arising from the substance or mixture

Combustible. Vapours can form explosive mixtures with air.

#### **Hazardous combustion products**

In case of fire may be liberated: carbon monoxide (CO), carbon dioxide (CO2)

#### 5.3 Advice for firefighters

Vapours are heavier than air. Fight fire with normal precautions from a reasonable distance. Wear self-contained breathing apparatus.

### **SECTION 6: Accidental release measures**

#### 6.1 Personal precautions, protective equipment and emergency procedures

#### For non-emergency personnel

Do not breathe vapour/spray. Avoid contact with skin and eyes. Avoidance of ignition sources.

#### **6.2** Environmental precautions

Keep away from drains, surface and ground water. Explosive properties.

#### 6.3 Methods and material for containment and cleaning up

#### Advices on how to contain a spill

Covering of drains.

#### Advices on how to clean up a spill

Absorb with liquid-binding material (e.g. sand, diatomaceous earth, acid- or universal binding agents).

#### Other information relating to spills and releases

Place in appropriate containers for disposal. Ventilate affected area.

#### 6.4 Reference to other sections

Hazardous combustion products: see section 5. Personal protective equipment: see section 8. Incompatible materials: see section 10. Disposal considerations: see section 13.

United Kingdom (en) Page 4 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

### **SECTION 7: Handling and storage**

#### 7.1 Precautions for safe handling

Provide adequate ventilation. When not in use, keep containers tightly closed.

• Measures to prevent fire as well as aerosol and dust generation



Keep away from sources of ignition - No smoking.

Take precautionary measures against static discharge. Due to danger of explosion, prevent leakage

of vapours into cellars, flues and ditches.

#### Advice on general occupational hygiene

Wash hands before breaks and after work. When using do not smoke.

#### 7.2 Conditions for safe storage, including any incompatibilities

Store in a well-ventilated place. Keep container tightly closed.

#### **Incompatible substances or mixtures**

Observe hints for combined storage.

#### **Consideration of other advice**

Not required.

#### Ventilation requirements

Use local and general ventilation.

#### Specific designs for storage rooms or vessels

Recommended storage temperature: 15 - 25 °C.

#### 7.3 Specific end use(s)

No information available.

### **SECTION 8: Exposure controls/personal protection**

#### 8.1 Control parameters

#### **National limit values**

#### **Occupational exposure limit values (Workplace Exposure Limits)**

Contr		CAS No	Nota- tion	Identifi- er	TWA [pp m]	TWA [mg/m	STEL [pp m]	STEL [mg/m <sup>3</sup> ]	Source
EU	methyl isobutyl ketone	108-10-1		IOELV	20	83	50	208	2000/39/EC
GB	4-methylpentan-2-one	108-10-1		WEL	50	208	100	416	EH40/2005

#### Notation

STEL Short-term exposure limit: a limit value above which exposure should not occur and which is related to a 15-minute period unless otherwise specified

TWA Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of the control of the con

Time-weighted average (long-term exposure limit): measured or calculated in relation to a reference period of 8 hours time-weighted average

United Kingdom (en) Page 5 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

### **Biological limit values**

Coun- try	Name of agent	Parameter	Nota- tion	Identifi- er	Value	Material	Source
GB	4-methylpentan-2-one	4-methylpentan-2-one		BMGV	20 µmol/l	urine	EH40/200 5

#### Relevant DNELs/DMELs/PNECs and other threshold levels

#### human health values

Endpoint	Threshold level	Protection goal, route of exposure	Used in	Exposure time
DNEL	83 mg/m³	human, inhalatory	worker (industry)	chronic - systemic effects
DNEL	208 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	acute - systemic effects
DNEL	83 mg/m³	human, inhalatory	worker (industry)	chronic - local effects
DNEL	208 mg/m <sup>3</sup>	human, inhalatory	worker (industry)	acute - local effects
DNEL	11,8 mg/kg bw/day	human, dermal	worker (industry)	chronic - systemic effects

#### • environmental values

Endpoint	Threshold level	Environmental compartment
PNEC	0,6 <sup>mg</sup> / <sub>l</sub>	freshwater
PNEC	0,06 <sup>mg</sup> / <sub>l</sub>	marine water
PNEC	1,5 <sup>mg</sup> / <sub>l</sub>	water
PNEC	27,5 <sup>mg</sup> / <sub>l</sub>	sewage treatment plant (STP)
PNEC	8,27 <sup>mg</sup> / <sub>kg</sub>	freshwater sediment
PNEC	0,83 <sup>mg</sup> / <sub>kg</sub>	marine sediment
PNEC	1,3 <sup>mg</sup> / <sub>kg</sub>	soil

#### 8.2 Exposure controls

#### Individual protection measures (personal protective equipment)







#### **Eye/face protection**

Use safety goggle with side protection.

#### Skin protection

#### hand protection

Wear suitable gloves. Chemical protection gloves are suitable, which are tested according to EN 374. For special purposes, it is recommended to check the resistance to chemicals of the protective gloves mentioned above together with the supplier of these gloves.

United Kingdom (en) Page 6 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

#### · type of material

Butyl caoutchouc (butyl rubber)

#### material thickness

0.7mm

#### • breakthrough times of the glove material

>240 minutes (permeation: level 5)

#### other protection measures

Take recovery periods for skin regeneration. Preventive skin protection (barrier creams/ointments) is recommended.

Flame-retardant protective clothing.

#### **Respiratory protection**

Respiratory protection necessary at: Aerosol or mist formation. Type: A (against organic gases and vapours with a boiling point of > 65 °C , colour code: Brown).

#### **Environmental exposure controls**

Keep away from drains, surface and ground water.

### SECTION 9: Physical and chemical properties

#### 9.1 Information on basic physical and chemical properties

#### **Appearance**

Physical state liquid (fluid)

Colour colourless

Odour characteristic

Odour threshold 0,04 - 0,08 ppm

#### Other physical and chemical parameters

pH (value) This information is not available.

Melting point/freezing point -84 °C

Initial boiling point and boiling range 114 - 118 °C at 1.013 hPa

Flash point 14 °C

Evaporation rate no data available Flammability (solid, gas) not relevant (fluid)

**Explosive limits** 

lower explosion limit (LEL)
 upper explosion limit (UEL)
 8 vol%

Explosion limits of dust clouds not relevant Vapour pressure 20 hPa at 20 °C Density  $0.8 \, {}^{9}/_{cm^3}$  at 20 °C

Vapour density 3,46 (air = 1)
Bulk density Not applicable

Relative density Information on this property is not available.

United Kingdom (en) Page 7 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

Solubility(ies)

Water solubility  $\sim 19^{9}/_{1}$  at 20 °C

Partition coefficient

n-octanol/water (log KOW) 1,9

Soil organic carbon/water (log KOC) 2,008 (ECHA)

Auto-ignition temperature 460 °C - (DIN 51794)
Decomposition temperature no data available

Viscosity

• dynamic viscosity 0,59 mPa s at 20 °C

Explosive properties Shall not be classified as explosive

Oxidising properties none

9.2 Other information

Temperature class (EU, acc. to ATEX)

T1 (Maximum permissible surface temperature

on the equipment: 450°C)

### **SECTION 10: Stability and reactivity**

#### 10.1 Reactivity

Risk of ignition. Vapours can form explosive mixtures with air. May form explosive peroxides.

#### **10.2** Chemical stability

Reactivity if exposed to light. Reactivity if exposed to air.

#### 10.3 Possibility of hazardous reactions

Violent reaction with: Bases, Reducing agents, Strong oxidiser

#### 10.4 Conditions to avoid

Direct light irradiation. Keep away from heat.

#### 10.5 Incompatible materials

different plastic and rubber, copper

#### 10.6 Hazardous decomposition products

Peroxides.

### **SECTION 11: Toxicological information**

#### 11.1 Information on toxicological effects

#### **Acute toxicity**

Exposure route	Endpoint	Value	Species	Source
inhalation: vapour	LC50	11,6 <sup>mg</sup> / <sub>l</sub> /4h	rat	ECHA
oral	LD50	2.080 <sup>mg</sup> / <sub>kg</sub>	rat	TOXNET
dermal	LD50	>2.000 <sup>mg</sup> / <sub>kg</sub>	rat	

United Kingdom (en) Page 8 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

#### Skin corrosion/irritation

Shall not be classified as corrosive/irritant to skin.

#### Serious eye damage/eye irritation

Causes serious eye irritation.

#### Respiratory or skin sensitisation

Shall not be classified as a respiratory or skin sensitiser.

#### Summary of evaluation of the CMR properties

Shall not be classified as germ cell mutagenic, carcinogenic nor as a reproductive toxicant

#### • Specific target organ toxicity - single exposure

May cause respiratory irritation.

#### • Specific target organ toxicity - repeated exposure

Shall not be classified as a specific target organ toxicant (repeated exposure).

#### **Aspiration hazard**

Shall not be classified as presenting an aspiration hazard.

#### Symptoms related to the physical, chemical and toxicological characteristics

#### If swallowed

gastrointestinal complaints

#### • If in eyes

Causes serious eye irritation

#### If inhaled

Irritation to respiratory tract, cough, Dyspnoea

#### • If on skin

repeated exposure may cause skin dryness or cracking

#### Other information

Other adverse effects: Headache, Vertigo, Inebriation, Nausea, Narcosis, Liver and kidney damage

### **SECTION 12: Ecological information**

#### 12.1 Toxicity

acc. to 1272/2008/EC: Shall not be classified as hazardous to the aquatic environment.

#### **Aquatic toxicity (acute)**

Endpoint	Value	Species	Source	Exposure time
LC50	>179 <sup>mg</sup> / <sub>l</sub>	zebra fish (Danio rerio)	ECHA	96 h
EC50	>200 <sup>mg</sup> / <sub>l</sub>	daphnia magna	ECHA	48 h

#### **Aquatic toxicity (chronic)**

Endpoint	Value	Species	Source	Exposure time
EC50	3.623 <sup>mg</sup> / <sub>l</sub>	aquatic invertebrates	ECHA	24 h
NOEC	30 <sup>mg</sup> / <sub>l</sub>	aquatic invertebrates	ECHA	21 d
LOEC	64 <sup>mg</sup> / <sub>l</sub>	aquatic invertebrates	ECHA	21 d

United Kingdom (en) Page 9 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

#### 12.2 Process of degradability

The substance is readily biodegradable. Theoretical Oxygen Demand: 2,715 <sup>mg</sup>/<sub>mg</sub> Theoretical Carbon Dioxide: 2,636 <sup>mg</sup>/<sub>mg</sub>

Process	Degradation rate	Time
biotic/abiotic	83 %	28 d

#### 12.3 Bioaccumulative potential

Does not significantly accumulate in organisms.

n-octanol/water (log KOW) 1,9

12.4 Mobility in soil

Henry's law constant 18,75 Pa m³/<sub>mol</sub> at 20 °C

The Organic Carbon normalised adsorption 2,008

coefficient

#### 12.5 Results of PBT and vPvB assessment

Data are not available.

#### 12.6 Other adverse effects

Data are not available.

### **SECTION 13: Disposal considerations**

#### 13.1 Waste treatment methods

This material and its container must be disposed of as hazardous waste. Dispose of contents/container in accordance with local/regional/national/international regulations.

#### Sewage disposal-relevant information

Do not empty into drains.

#### Waste treatment of containers/packagings

It is a dangerous waste; only packagings which are approved (e.g. acc. to ADR) may be used.

#### 13.2 Relevant provisions relating to waste

The allocation of waste identity numbers/waste descriptions must be carried out according to the EEC, specific to the industry and process.

#### 13.3 Remarks

Waste shall be separated into the categories that can be handled separately by the local or national waste management facilities. Please consider the relevant national or regional provisions.

United Kingdom (en) Page 10 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

CECTION	4.4. Tueses	E	
SECTION	14: Trans	port int	ormation
		~ ~	~

**14.1** UN number **1245** 

**14.2** UN proper shipping name **METHYL ISOBUTYL KETONE** 

Hazardous ingredients Isobutyl methyl ketone

**14.3** Transport hazard class(es)

Class 3 (flammable liquids)

**14.4** Packing group II (substance presenting medium danger)

**14.5** Environmental hazards none (non-environmentally hazardous acc. to the danger-

ous goods regulations)

#### 14.6 Special precautions for user

Provisions for dangerous goods (ADR) should be complied within the premises.

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

The cargo is not intended to be carried in bulk.

#### 14.8 Information for each of the UN Model Regulations

#### • Transport of dangerous goods by road, rail and inland waterway (ADR/RID/ADN)

UN number 1245

Proper shipping name METHYL ISOBUTYL KETONE

Particulars in the transport document UN1245, METHYL ISOBUTYL KETONE, 3, II, (D/E)

Class 3
Classification code F1
Packing group II
Danger label(s) 3



Excepted quantities (EQ) E2
Limited quantities (LQ) 1 L
Transport category (TC) 2
Tunnel restriction code (TRC) D/E
Hazard identification No 33
Emergency Action Code 3YE

#### • International Maritime Dangerous Goods Code (IMDG)

UN number 1245

Proper shipping name METHYL ISOBUTYL KETONE

Particulars in the shipper's declaration UN1245, METHYL ISOBUTYL KETONE, 3, II, 14°C

c.c.

Class 3
Packing group II

United Kingdom (en) Page 11 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

Danger label(s) 3



Special provisions (SP)

Excepted quantities (EQ) E2
Limited quantities (LQ) 1 L

EmS F-E, S-D

Stowage category B

• International Civil Aviation Organization (ICAO-IATA/DGR)

UN number 1245

Proper shipping name Methyl isobutyl ketone

Particulars in the shipper's declaration UN1245, Methyl isobutyl ketone, 3, II

Class 3
Packing group II
Danger label(s) 3



Excepted quantities (EQ) E2
Limited quantities (LQ) 1 L

### **SECTION 15: Regulatory information**

- 15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture Relevant provisions of the European Union (EU)
  - Regulation 649/2012/EU concerning the export and import of hazardous chemicals (PIC) Not listed.
  - Regulation 1005/2009/EC on substances that deplete the ozone layer (ODS) Not listed.
  - Regulation 850/2004/EC on persistent organic pollutants (POP) Not listed.
  - Restrictions according to REACH, Annex XVII

Name of substance	Wt%	Type of registration	No
Isobutyl methyl ketone	100	1907/2006/EC annex XVII	3
Isobutyl methyl ketone	100	1907/2006/EC annex XVII	40

United Kingdom (en) Page 12 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

List of substances subject to authorisation (REACH, Annex XIV)

not listed

#### Seveso Directive

2012/18/EU (Seveso III)				
No	Dangerous substance/hazard categories	Qualifying quantity ( plication of lower a quiren	and upper-tier re-	Notes
P5c	flammable liquids (cat. 2, 3)	5.000	50.000	51)

#### Notation

51) Flammable liquids, categories 2 or 3 not covered by P5a and P5b

• Limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products (2004/42/EC, Deco-Paint Directive)

VOC content 100 %

Directive on industrial emissions (VOCs, 2010/75/EU)

VOC content 100 %

Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS) - Annex II

not listed

Regulation 166/2006/EC concerning the establishment of a European Pollutant Release and Transfer Register (PRTR)

not listed

Directive 2000/60/EC establishing a framework for Community action in the field of water policy (WFD)

not listed

#### **National inventories**

Substance is listed in the following national inventories:

- EINECS/ELINCS/NLP (Europe)
- DSL/NDSL (Canada)
- REACH (Europe)
- Toxic Substance Control Act (TSCA)

#### 15.2 Chemical Safety Assessment

No Chemical Safety Assessment has been carried out for this substance.

United Kingdom (en) Page 13 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

### **SECTION 16: Other information**

### **Abbreviations and acronyms**

Abbr.	Descriptions of used abbreviations		
2000/39/EC	Comission Directive establishing a first list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC		
ADN	Accord européen relatif au transport international des marchandises dangereuses par voies de navigation intérieures (European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways)		
ADR	Accord européen relatif au transport international des marchandises dangereuses par route (European Agreement concerning the International Carriage of Dangerous Goods by Road)		
CAS	Chemical Abstracts Service (service that maintains the most comprehensive list of chemical substances)		
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures		
CMR	Carcinogenic, Mutagenic or toxic for Reproduction		
DGR	Dangerous Goods Regulations (see IATA/DGR)		
DMEL	Derived Minimal Effect Level		
DNEL	Derived No-Effect Level		
EH40/2005	EH40/2005 Workplace exposure limits (http://www.nationalarchives.gov.uk/doc/open-government-licence/)		
EINECS	European Inventory of Existing Commercial Chemical Substances		
ELINCS	European List of Notified Chemical Substances		
EmS	Emergency Schedule		
GHS	"Globally Harmonized System of Classification and Labelling of Chemicals" developed by the United Nations		
IATA	International Air Transport Association		
IATA/DGR	Dangerous Goods Regulations (DGR) for the air transport (IATA)		
ICAO	International Civil Aviation Organization		
IMDG	International Maritime Dangerous Goods Code		
index No	the Index number is the identification code given to the substance in Part 3 of Annex VI to Regulation (EC) No 1272/2008		
IOELV	indicative occupational exposure limit value		
MARPOL	International Convention for the Prevention of Pollution from Ships (abbr. of "Marine Pollutant")		
NLP	No-Longer Polymer		
PBT	Persistent, Bioaccumulative and Toxic		
PNEC	Predicted No-Effect Concentration		
ppm	parts per million		
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals		
RID	Règlement concernant le transport International ferroviaire des marchandises Dangereuses (Regulations concerning the International carriage of Dangerous goods by Rail)		
STEL	short-term exposure limit		
TWA	time-weighted average		
VOC	Volatile Organic Compounds		
vPvB	very Persistent and very Bioaccumulative		
WEL	workplace exposure limit		

United Kingdom (en) Page 14 / 15

according to Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU



#### Isobutyl methyl ketone ROTIPURAN® ≥ 99 %, p.a., ACS

article number: 0338

#### Key literature references and sources for data

Regulation (EC) No. 1907/2006 (REACH), amended by 2015/830/EU

Regulation (EC) No. 1272/2008 (CLP, EÚ GHS)
Dangerous Goods Regulations (DGR) for the air transport (IATA)

International Maritime Dangerous Goods Code (IMDG)

#### List of relevant phrases (code and full text as stated in chapter 2 and 3)

Code	Text
H225	highly flammable liquid and vapour
H319	causes serious eye irritation
H332	harmful if inhaled
H335	may cause respiratory irritation

#### **Disclaimer**

The above information describes exclusively the safety requirements of the product and is based on our present-day knowledge. The information is intended to give you advice about the safe handling of the product named in this safety data sheet, for storage, processing, transport and disposal. The information cannot be transferred to other products. In the case of mixing the product with other products or in the case of processing, the information on this safety data sheet is not necessarily valid for the new made-up material.

United Kingdom (en) Page 15 / 15