FOREWORD

INTRODUCTION

2-BUTENE

CAS N°: 107-07-7
Identifiers, Physical and Chemical properties

Substance

<table>
<thead>
<tr>
<th>End Point</th>
<th>IDENTIFIERS, PHYSICAL AND CHEMICAL PROPERTIES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chemical Name</td>
<td>2-Butene</td>
</tr>
<tr>
<td>Common Name</td>
<td>2-Butene</td>
</tr>
<tr>
<td>CAS Number</td>
<td>107-01-7</td>
</tr>
<tr>
<td>RTECS Number</td>
<td>EM2932000</td>
</tr>
</tbody>
</table>

Synonyms

- beta.-Butene
- Pseudobutylene
- beta.-Butylene

Properties & Definitions

- Molecular Formula: C4H8
- Molecular Weight: 56.1
- State: Gas
- Octanol/Water Partition Coefficient: log Pow = 1.85
- Impurities: In Dow Europe product: n-butane 1.11 vol%; 1-butene 0.935 vol%; isobutylene +/-200 volppm; ethylacetylene <20 volppm; 1,3-butadiene 240 volppm. In shell product: n-butane 41.3%; isobutylene 0.4%; C5 0.4%.
- Definitions: Composed of two structural formes: trans-2-butene and cis-2-butene 100% 2-butene = 70% cis and 30% trans.

Overall Evaluation

SIDS INITIAL ASSESSMENT

This chemical is presently of low priority.

SUMMARY OF REASONS SUPPORTING THE RECOMMENDATION

2-Butene is manufactured in a closed system and used in the production of gasolines, butadiene and other chemicals. Based upon the available information, the initial assessment gave indications for concern at peak concentration for humans and no indications for concern for the aquatic environment.

However, the assessment is considered to be limited by:

- the available exposure data concern only one site in the Netherlands.
- no exposure data for 2-butene per se were available; but only as a part of total C4 chemicals.
Production-Trade

Chemical Name : 2-Butene
CAS Number : 107-01-7
Geographic Area : EUR
Area Specifications : W

Production

Quantity Year

20000 T - P/Y

General Comments : No information for other production site.

References

!SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 4, (1993)
#DOWEU*
Dow Europe, Unpublished Report or Communications, (1992)
Uses

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>2-Butene</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAS Number</td>
<td>107-01-7</td>
</tr>
<tr>
<td>Geographic Area</td>
<td>EUR</td>
</tr>
<tr>
<td>Area Specifications</td>
<td>W</td>
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</tbody>
</table>

Use

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Year</th>
<th>Comments</th>
</tr>
</thead>
</table>

References

<table>
<thead>
<tr>
<th>Secondary References</th>
<th>!SIDSP*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 4, (1993)</td>
</tr>
</tbody>
</table>
Study

*End Point* : Pathway into the Environment and Environmental Fate.

*Chemical Name* : 2-Butene

*CAS Number* : 107-01-7

Test Method and Conditions

*Test method description* : Fugacity model, Mackay level 1

Quantity Transported

<table>
<thead>
<tr>
<th>Medium</th>
<th>to Medium</th>
<th>Quantity</th>
<th>Time</th>
<th>Year to Year</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>to AIR</td>
<td>99 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Calculated)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>to AQ</td>
<td>&lt;0.1 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Calculated)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>to SOIL</td>
<td>&lt;0.1 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Calculated)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>to SED</td>
<td>&lt;0.1 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Calculated)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>to FISH</td>
<td>&gt;0.1 %</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Calculated)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

More than 0.1% in suspended matters (calculated value). From these calculations it can be concluded that almost all 2-butene will partition into the atmosphere.

*General Comments* : Based on emissions from cracking installations for the production of other chemicals e.g. ethene, butadiene and propene, an emission factor of 0.02% and 0.2% was estimated for production and processing respectively.

References

*Primary Reference* : CMSHAF


*Secondary Reference* : !SIDSP*

OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)
Quantity Transported

<table>
<thead>
<tr>
<th>Medium to Medium</th>
<th>Quantity</th>
<th>Time</th>
<th>Year to Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>to AIR</td>
<td>Concentration: 4.84E-11 mg/m^3 (330m from the emission point, height 50m) calculations based on plume model.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

References

Primary Reference  : OECDM*  
OECD Screening Assessment Model System (SAMS), (1992)

Secondary Reference  : !SIDSP*  
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 6, (1993)

Study

End Point  : Pathway into the Environment and Environmental Fate.
Chemical Name  : 2-Butene
CAS Number  : 107-01-7

Pathway and Transport

Pathway  : AIR
Pathway description  : Evaporation

Quantity Transported

<table>
<thead>
<tr>
<th>Medium to Medium</th>
<th>Quantity</th>
<th>Time</th>
<th>Year to Year</th>
</tr>
</thead>
</table>
| to AIR | 4.2%  
Evaporation from gasoline fuel tank: 4.2 vol% of total evaporated hydrocarbons. |
| to AIR | 0.2-0.3%  
Evaporation from carburetor: 0.2-0.3 vol% of total evaporated hydrocarbons. |
| to AIR | 0.6%  
In exhaust of diesel engine: 0.6% of emitted hydrocarbons. |

References

Primary Reference  : HBEDC*  

Secondary Reference  : !SIDSP*  
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)
Study

End Point : HUMAN INTAKE AND EXPOSURE
Chemical Name : 2-Butene
CAS Number : 107-01-7

Test Subject

Organism Medium Specification Route Lifestage Sex
HUMAN IHL
Species/strain/system : Average exposure 8 hours. Exposition due to leaking in cracking installations and during transport.

Test Results

Intake Spec. Date
11.5 mg/m³ EHE max (maximum estimated human exposure) = 5 ppm or 11.5 mg/m³ equivalent to the peak concentration at working place.

<0.23 mg/m³ TWA (time-weighted average) at working place or EHE mean <0.1 ppm, (calculated).

General Comments : EHE based on measurement of C4 chemicals.

References

Secondary Reference : ISIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 5, (1993)
Photodegradation

Study

End Point : PHOTODEGRADATION
Chemical Name : 2-Butene
CAS Number : 107-01-7
Study type : LAB
Medium : AIR

Test Method and Conditions

Test method description : Unknown
Temperature : 27 C

Test Results

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Time</th>
<th>Comments on result</th>
</tr>
</thead>
<tbody>
<tr>
<td>50 % LOSS</td>
<td>0.3 h</td>
<td>T/2 with NO</td>
</tr>
<tr>
<td>50 % LOSS</td>
<td>10-11 mi</td>
<td>T/2 with NO2. The reported time is 0.17 hours.</td>
</tr>
</tbody>
</table>

General Comments : Levels of 2-butene in air will be low due to the rapid photodegradation.

References

Primary Reference : ESTHAG

Secondary Reference : OECD/SIDS.
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 7, (1993)

Study

End Point : PHOTODEGRADATION
Chemical Name : 2-Butene
CAS Number : 107-01-7
Study type : LAB
Medium : AIR

Test Substance

Description of the test substance : cis-2-Butene and trans-2-butene

Test Method and Conditions

Test method description : Unknown
Temperature : 25 C
### Test Results

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Time</th>
<th>Comments on result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Reaction with hydroxyl radicals both measured at 25C. Reaction constants are: cis-butene: $k = 5.6E^-5$/s, trans-2-butene: $k = 6.4E^-5$/s. At lower temperatures reaction constants will be higher.</td>
</tr>
</tbody>
</table>

### References

**Primary Reference**: CHREAY  

**Secondary Reference**: !SIDSP*  
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 7, (1993)
Hydrolysis Study

End Point : HYDROLYSIS
Chemical Name : 2-Butene
CAS Number : 107-01-7
Study type : LAB
Medium : AQ
Specifications : FRESH

Test Substance

Description of the test substance : cis-2-Butene and trans-2-butene

Test Method and Conditions

Test method description : Unknown

Exposure

Dose / Concentration : The release of both isomers from an aqueous solution was tested at 5 concentrations.

Test Results

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Time</th>
<th>Comments on result</th>
</tr>
</thead>
<tbody>
<tr>
<td>700 mg/l</td>
<td>3 h</td>
<td>After maximum 3 hours, the observed levels showed a decrease from 700mg/l to &lt;1mg/l (detection limit). DT50 is 5-25 minutes, depending on the concentration tested (at ambient temperature).</td>
</tr>
</tbody>
</table>

References

Primary Reference : #DOWEU*
Dow Europe, Unpublished Report or Communications, (1992)

Secondary Reference : !SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 7, (1993)
Mammalian Acute Toxicity

Study

End Point : MAMMALIAN ACUTE TOXICITY
Chemical Name : 2-Butene
CAS Number : 107-01-7

Test Results

<table>
<thead>
<tr>
<th>Organism</th>
<th>Medium</th>
<th>Spec.</th>
<th>Route</th>
<th>Lifestage</th>
<th>Sex</th>
<th>Effect</th>
<th>Effect Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>MOUSE</td>
<td>IHL</td>
<td>ADULT</td>
<td></td>
<td>LC50</td>
<td></td>
<td>Mouse inhalation LC50 was estimated as 977mg/m3.</td>
<td></td>
</tr>
</tbody>
</table>

References

Primary Reference : RTECS*

Secondary Reference : SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 7, (1993)

Study

End Point : MAMMALIAN ACUTE TOXICITY
Chemical Name : 2-Butene
CAS Number : 107-01-7

Exposure Period : 4 h

Test Method and Conditions

Test method description : OECD No. 403, GLP : yes.

Test Results

<table>
<thead>
<tr>
<th>Organism</th>
<th>Medium</th>
<th>Spec.</th>
<th>Route</th>
<th>Lifestage</th>
<th>Sex</th>
<th>Effect</th>
<th>Effect Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAT</td>
<td>IHL</td>
<td>ADULT</td>
<td></td>
<td>LC50</td>
<td></td>
<td>Rat inhalation LC50 was estimated as &gt;23.1g/m3.</td>
<td></td>
</tr>
</tbody>
</table>

References

Primary Reference : #RHVTDT

Secondary Reference : !SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 7, (1993)
Study

End Point : MAMMALIAN TOXICITY
Chemical Name : 2-Butene
CAS Number : 107-01-7
Study type : LAB

Test Subject

Organism Medium Specification Route Lifestage Sex Number exposed Number controls
RAT IHL ADULT M F

Species/strain/system : Wistar albino (Hsd/Cpd: WU)

Test Substance

Description of the test substance : 2-Butene (cis-2-butene 42.4%, trans-2-butene 55.3%)

Test Method and Conditions

Test method description : OECD Combined Repeated Dose Reproductive/Developmental Toxicity Screening Test. GLP: yes.

Exposure

Exposure Period : 39-46 d
Frequency : 6 h/d
7 d/wk
Dose / Concentration : 5.7-11.5 g/m3
Exposure comments : Doses were 0, 5.7, and 11.5g/m3.

Test Results

<table>
<thead>
<tr>
<th>Organ</th>
<th>Effect</th>
<th>Rev.</th>
<th>OnSet</th>
<th>Sex</th>
<th>Affected in Exposed - Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>NEF</td>
</tr>
<tr>
<td>BW</td>
<td>DECR</td>
<td></td>
<td></td>
<td></td>
<td>F</td>
</tr>
<tr>
<td>BEHAV</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>F</td>
</tr>
</tbody>
</table>
| BLOOD | BIOCH  | M    |       |     | Estimated dose of low concern (EDLC) was calculated as = 11.4mg/m3 using an uncertainty factor of 500.
References

**Primary Reference**: #RHVTDT

**Secondary Reference**: !SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 7, (1993)
Study

**End Point** : MUTAGENICITY
**Chemical Name** : 2-Butene
**CAS Number** : 107-01-7
**Study type** : LAB

Test Subject

<table>
<thead>
<tr>
<th>Organism</th>
<th>Medium</th>
<th>Specification</th>
<th>Route</th>
<th>Lifestage</th>
<th>Sex</th>
<th>Number exposed</th>
<th>Number controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>BACT</td>
<td>VTR</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Species/strain/system** : Salmonella Typhimurium TA98, TA100, TA1535, TA1537

Test Method and Conditions

**Test method description** : OECD No. 471; Safefarm definitive protocol Tx 3569 (amended). GLP: yes.

Exposure

**Exposure Period** : 10-80 %
**Exposure comments** : Doses of 10, 20, 40, 60, or 80% tested with and without metabolic activation. Positive control with and without S9 mix were included. Negative control: clean, dry air. 2 replicates.

Test Results

<table>
<thead>
<tr>
<th>Organ</th>
<th>Effect</th>
<th>Rev.</th>
<th>OnSet</th>
<th>Sex</th>
<th>Affected in</th>
<th>Exposed - Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Negative results with and without metabolic activation.

**CHNG**

Minimum concentration at which toxicity to bacteria was observed is 60%.

References

**Primary Reference** : #URSPH*

**Secondary Reference** : !SIDSP*
OECD/SIDS, Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 8, (1993)
Study

End Point : MUTAGENICITY
Chemical Name : 2-Butene
CAS Number : 107-01-7
Study type : LAB

Test Subject

Organism | Medium | Specification | Route | Lifestage | Sex | Number exposed | Number controls
--------- | ------- |-------------- |-------|-----------|-----|----------------|-----------------|
RAT       | VTR     |              |       |           |     |                |                 
Species/strain/system : Rat lymphocytes

Test Substance

Description of the test substance : cis-2-Butene 42.2% and trans-2-butene 55.3%.

Test Method and Conditions


Exposure

Exposure Type : SHORT
Dose / Concentration : 40-60 %
Exposure comments : Concentrations: 40, 50, or 60% of cis-2-butene and trans-2-butene mixed with dry air. Positive control: -S9 mix: (EMS). Positive control: +S9 mix: cyclophosphamide (CP), vinylchloride 50%. Negative control: clean dry air. Harvest time 20, 30 hours.

Test Results

<table>
<thead>
<tr>
<th>Organ</th>
<th>Effect</th>
<th>Rev.</th>
<th>OnSet</th>
<th>Sex</th>
<th>Exposed - Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>CELL</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Lowest concentration producing cell toxicity: > 60% with and without metabolic activation.

NEF

Genotoxic effect was absent with and without metabolic activation under the test conditions.

References

Primary Reference : #URSPH*

Secondary Reference : !SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 12, (1993)
Study

End Point: REPRODUCTION
Chemical Name: 2-Butene
CAS Number: 107-01-7
Study type: LAB

Test Subject

<table>
<thead>
<tr>
<th>Organism</th>
<th>Medium</th>
<th>Specification</th>
<th>Route</th>
<th>Lifestage</th>
<th>Sex</th>
<th>Number exposed</th>
<th>Number controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAT</td>
<td>IHL</td>
<td>M</td>
<td>F</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Species/strain/system: Wistar albino rats (Had/Cpd: WU)

Test Method and Conditions

Test method: OECD Combined Repeated Dose and Reproductive/Developmental Toxicity Screening Test. GLP: yes.

Exposure

Frequency: 6 h/d
7 d/wk

Dose / Concentration: 5.7-11.5 g/m3

Test Results

<table>
<thead>
<tr>
<th>Organ</th>
<th>Effect</th>
<th>Rev.</th>
<th>OnSet</th>
<th>Sex</th>
<th>Affected in Exposed - Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>NEF</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

No Adverse Effect Level for the parental generation was reported as = 5.7g/m3.

NEF

No Adverse Effect Level for F1 generation was reported as 11.5g/m3. Effective dose of low concern (repro.) was calculated as = 23mg/m3.

NEF

No effects on the number of pups born, sex, ratio and viability index.

References

Primary Reference: #RHVTDT

Secondary Reference: !SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, 8, (1993)
Aquatic Acute Toxicity

Study

End Point: AQUATIC ACUTE TOXICITY
Chemical Name: 2-Butene
CAS Number: 107-01-7

Species/strain/system: Fathead minnow (Pimephales promelas)
Exposure Period: 96 h

Test Method and Conditions

Test method description: Estimation of aquatic effects data for 2-butene using Quantitative Structure-Activity Relationships (QSAR's) using the equation log LC50 = -0.85 log kow - 1.41. Value of log kow = 1.85.

Test Results

<table>
<thead>
<tr>
<th>Organism</th>
<th>Medium</th>
<th>Spec.</th>
<th>Route</th>
<th>Lifestage</th>
<th>Sex</th>
<th>Effect</th>
<th>Effect Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>FISH</td>
<td>AQ</td>
<td>FRESH</td>
<td></td>
<td></td>
<td></td>
<td>LC50</td>
<td>LC50 = 58mg/l.</td>
</tr>
</tbody>
</table>

General Comments: QSAR's can be used to estimate the toxicity of a compound. 2-Butene can be classified as an inert chemical which acts by a narcosis-type or baseline toxicity.

References

Secondary Reference: !SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)
Aquatic Toxicity

Study

End Point : AQUATIC TOXICITY
Chemical Name : 2-Butene
CAS Number : 107-01-7

Test Subject

<table>
<thead>
<tr>
<th>Organism</th>
<th>Medium</th>
<th>Specification</th>
<th>Route</th>
<th>Lifestage</th>
<th>Sex</th>
<th>Number exposed</th>
<th>Number controls</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRUS</td>
<td>AQ</td>
<td>FRESH</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Species/strain/system : Water flea (Daphnia magna)

Test Method and Conditions

Test method description : Estimation of aquatic effects data for 2-butene using Quantitative Structure-Activity Relationships (QSAR's) using the equation log EC50 = -0.95 log kow -1.19, and log kow = 1.85.

Exposure

Exposure Type : ACUTE
Exposure Period : 48 h

Test Results

<table>
<thead>
<tr>
<th>Organ</th>
<th>Effect</th>
<th>Rev.</th>
<th>OnSet</th>
<th>Sex</th>
<th>Affected in Exposed - Controls</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>EC50</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EC50 = 63mg/l.

General Comments : QSAR's can be used to estimate the toxicity of a compound. 2-Butene can be classified as an inert chemical which acts by a narcosis-type or baseline toxicity.

References

Secondary Reference : !SIDSP*
OECD/SIDS. Screening Information Data Set (SIDS) of OECD High Production Volume Chemicals Programme, (1993)
### Substance

**Chemical Name:** 2-butene  
**Reported Name:** 2-butene  
**CAS Number:** 107-01-7

#### DEU REG

<table>
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<tr>
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<th>Type</th>
<th>Subject</th>
<th>Spec.</th>
<th>Description</th>
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<tbody>
<tr>
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<td>REG</td>
<td>CLASS</td>
<td>LABEL</td>
<td>CLASS RQR</td>
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</tr>
<tr>
<td></td>
<td></td>
<td>PACK</td>
<td></td>
<td>RQR</td>
<td></td>
</tr>
</tbody>
</table>

CLASSIFICATION AND LABELLING IN GERMANY IS GENERALLY THE SAME AS FOR THE EEC (SEE OJEC** L180, 1991). HOWEVER, SLIGHT MODIFICATIONS MAY BE INTRODUCED FOR SOME SUBSTANCES IN THE GERMAN LEGISLATION.

**Title:** ORDINANCE ON HAZARDOUS SUBSTANCES. (GEFAHRSTOFFVERORDNUNG)  
**Reference:** BGZBAD, I, 1931, 1991  
**Effective Date:** 15JUN1991  
**Entry / Update:** APR1992

#### RUS REG

<table>
<thead>
<tr>
<th>Area</th>
<th>Type</th>
<th>Subject</th>
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3.0MG/M3 1X/D, 3.0MG/M3 AV/D (APPLIES TO BUTENE ISOMERS MIXTURE)

**Title:**  
**Reference:** PDKAV*, 3086-84, 1984  
**Effective Date:** AUG1984  
**Entry / Update:** SEP1985

#### RUS REG

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0.2 MG/L. (APPLIES TO ALL BUTENE ISOMERS) HAZARD CLASS: III

**Title:**  
**Reference:** SPNPV*, 4630-88, 1988  
**Effective Date:** 1JAN1989  
**Entry / Update:** JUL1990

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**IRPTC Data Profile**
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#### EEC REG

**Area** | **Type** | **Subject** | **Spec.** | **Description** |
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#### EEC REG

**Area** | **Type** | **Subject** | **Spec.** | **Description** |
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**CLASS** | **LABEL** | **RQR** | **PACK** | CLASS: F - HIGHLY FLAMMABLE; EXTREMELY FLAMMABLE LIQUEFIED GAS (R 13). LABEL: F - HIGHLY FLAMMABLE; EXTREMELY FLAMMABLE LIQUEFIED GAS (R 13); KEEP CONTAINER IN A WELL-VENTILATED PLACE (S 9); KEEP AWAY FROM SOURCES OF IGNITION - NO SMOKING (S 16); TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGES (S 33). IT SHOULD BE STATED ON THE LABEL WHETHER IT IS A SPECIFIC ISOMER OR A MIXTURE OF ISOMERS. **Title**: COUNCIL DIRECTIVE 67/548/EEC OF 27 JUNE 1967 ON THE APROXIMATION OF THE LAWS, REGULATIONS AND ADMINISTRATIVE PROVISIONS RELATING TO THE CLASSIFICATION, PACKAGING AND LABELLING OF DANGEROUS SUBSTANCES **Reference**: OJEC**, 196, 1, 1967 **Effective Date**: 1JUL1992 Official Journal of the European Communities **Last Amendment**: OJEC**, L 180, 79, 1991 **Entry / Update**: APR1992 Official Journal of the European Communities