

Safety Data Sheet

SECTION 1 : Identification

A. GHS Product Name: LM Grade BUTAC

B. Other means of identification : Not available

C. Recommended use of the chemical and restrictions on use

Recommended use : Solvent and extraction agents, Washing and cleaning products

Restriction on use : Use for recommended use only

D. Supplier's information

Company name : Korea Alcohol Industrial Co., LTD.

Address : (Headquater) 14, Tapsil-ro 35beon-gil, Giheung-gu, Yongin-si, Gyeonggi-do
(Ulsan office) 66, Sanggae-ro, Nam-gu, Ulsan

Telephone number : (Headquater)031-881-8100, (Ulsan office)052-259-4761~2

Respondent : Not available

Fax : Not available

E. Emergency phone number

Opening hours : (Headquater)031-881-8100, (Ulsan office)052-259-4761~2

Other comments (e.g. language(s) of the phone service) : www.ka.co.kr / Sales or HSE Department

SECTION 2 : Hazard identification

A. Classification of the substance or mixture

Flammable liquids : Category 3

Specific target organ toxicity(single exposure) : Category 3 (respiratory irritation, narcotic effects)

Reproductive toxicity: Category 2

B. GHS label elements, including precautionary statements

Pictogram and symbol :



Signal word : Danger

Hazard statements :

H226 Flammable liquid and vapour

H335 May cause respiratory irritation
H336 May cause drowsiness or dizziness
H361 Suspected of damaging fertility or the unborn child

Precautionary statements

Prevention :

P203 Obtain, read and follow all safety instructions before use.
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P233 Keep container tightly closed.
P240 Ground and bond container and receiving equipment.
P241 Use explosion-proof electrical/ventilating/lighting equipment.
P242 Use non-sparking tools.
P243 Take action to prevent static discharges.
P261 Avoid breathing mist/vapours.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection

Response :

P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P370+P378 In case of fire: Use adequate to extinguish.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P312 Call a POISON CENTER/doctor if you feel unwell.

Storage :

P405 Store locked up.
P403+P235 Store in a well-ventilated place. Keep cool.
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal :

P501 Dispose of contents/container to in accordance with federal, state and local environmental control regulations.

C. Other hazards which do not result in classification

Not available

SECTION 3: Composition/information on ingredients

Chemical Name	Common Name (Synonyms)	CAS No.	EC number	Content (%)
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Butyl acetate	n-Butyl Acetate	123-86-4	204-658-1	99.8800
Water	Water	7732-18-5*	231-791-2	0.0080
n-Butanol	n-Butyl alcohol	71-36-3*	200-751-6	0.0030
s-Butyl acetate	2-Butyl acetate	105-46-4*	203-300-1	0.0010
iso-Butyl acetate	2-Methylpropyl acetate	110-19-0*	203-745-1	0.0600
Ethyl butyrate	Butanoic acid ethyl ester	105-54-4*	203-306-4	0.0100
Di-butyl ether	1,1'-Oxybisbutane	142-96-1*	205-575-3	0.0150
iso-amyl acetate	3-Methyl-1-butanol acetate	123-92-2*	204-662-3	0.0010
Active amyl acetate	2-Methyl-1-butanol acetate	624-41-9*	210-843-8	0.0010
Acetaldehyde Ethyl Butyl Acetal	1-Butoxy-1-ethoxyethane	57006-87-8*	Not available	0.0010
Butyl propionate	n-Butyl Propionate	590-01-2*	209-669-5	0.0170
Ethyl acetate	Acetic acid ethyl ester	141-78-6*	205-500-4	0.0010
Acetaldehyde Di Butyl Acetal	1,1'-[Ethylidenebis(oxy)]di butane	871-22-7*	212-804-0	0.0010
Butyraldehyde Di Butyl Acetal	1,1-dibutoxybutane	5921-80-2*	Not available	0.0010

SECTION 4: First-aid measures

A. Description of necessary first-aid measures

After eye contact

In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.

Call emergency medical service.

After skin contact

IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].

Call emergency medical service.

Remove contaminated clothing and shoes and isolate contaminated area.

In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.

Wash skin with soap and water.

After inhalation

Move victim to fresh air.

Give artificial respiration if victim is not breathing.

Give oxygen if breathing is difficult.

Keep victim warm and quiet.

If exposed to plenty of dusts or fumes, flush with fresh air and get medical attention in the case of cough or other symptoms.

After ingestion

Call emergency medical service.

B. Most important symptoms and effects, both acute and delayed

- May cause respiratory irritation
- May cause drowsiness or dizziness
- Suspected of damaging fertility or the unborn child

C. Indication of immediate medical attention and notes for physician, if necessary

- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

SECTION 5: Fire-fighting measures

A. Suitable extinguishing media

- Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
- Use dry sand or earth to smother fire.

B. Specific hazards arising from the chemical

- Containers may explode when heated.
- HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.
- Spilled material may create fire or explosion hazard.
- May cause vapor explosion and poison hazard indoors, outdoors or in sewers.
- Vapors may form explosive mixtures with air.
- Fire will produce irritating, corrosive and/or toxic gases.
- May violently polymerize and result in fire and explosion.
- Vapors may travel to a source of ignition and ignite.
- May form explosive mixtures at the flashpoint or above.
- Highly flammable liquid and vapour

C. Special protective actions for fire-fighters

- Rescuers should put on appropriate protective gear.
- Many liquids are lighter than water.
- Most vapors are heavier than air. They will spread along ground and collect in low or confined areas
- Substance may be transported hot.
- Move containers from fire area if you can do it without risk.

- In case of the tank fire, extinguish at maximum distance or use unmanned fire extinguishing equipment.
- In case of the tank fire, keep cooling down the tank with plenty of water after fire is extinguished.
- In case of tank fire, if there is a high sound level on the pressure relief device or if the tank is discolored, immediately withdraw it.
- In the case of a tank fire, withdraw from the tank engulfed in flames.
- In the case of a large-scale fire of a tank, use unmanned fire extinguishing equipment and, if not possible, leave it to burn.

SECTION 6: Accidental release measures

A. Personal precautions, protective equipment and emergency procedures

- The very fine particles may cause a fire or explosion, eliminate all ignition sources.
- Do not touch or walk through spilled material.
- ELIMINATE all ignition sources.
- All equipment used when handling the product must be grounded.
- Stop leak if you can do it without risk.
- A vapor suppressing foam may be used to reduce vapors.
- Please note that materials and conditions to avoid.
- Clean up spills immediately, observing precautions in protective equipment section.

B. Environmental precautions :

- Prevent entry into waterways, sewers, basements or confined areas.

C. Methods and materials for containment and cleaning up

- Dike and collect water used to fight fire.
- Absorb or cover with dry sand, earth or other non-combustible material and transfer to containers.
- Large Spill; Dike far ahead of liquid spill for later disposal.
- Use clean non-sparking tools to collect absorbed material.
- Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.
- Absorb the liquid and scrub the contaminated area with detergent and water.

7. HANDLING AND STORAGE

A. Precautions for safe handling

- Use explosion-proof [electrical/ventilating/lighting] equipment.
- Use non-sparking tools.
- Take action to prevent static discharges.

- Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition.
- Follow all MSDS/label precautions even after container is emptied because they may retain product residues.
- All equipment used when handling the product must be grounded.
- Please note that there are materials and conditions to avoid.
- Please work with reference to engineering controls and personal protective equipment.
- Be careful to heat.
- You need measurement of air concentration and ventilation in low, closed and confined areas due to lack of oxygen.
- Use only in a well-ventilated area.
- Use care in handling/storage.
- Loosen closure cautiously before opening.
- Avoid breathing vapors from heated material.
- Do not enter storage area unless adequately ventilated.

B. Conditions for safe storage, including any incompatibilities

- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- Keep container tightly closed.
- Empty drums should be drained completely and properly blocked and immediately returned to a drum control or placed properly.

SECTION 8: Exposure controls/personal protection

A. Control parameters

Korea regulation

Butyl acetate TWA=150 ppm, STEL=200 ppm

ACGIH regulation

Butyl acetate TWA=50 ppm, STEL=150 ppm

Biological exposure index

Butyl acetate TWA=150 ppm, STEL=200 ppm

B. Appropriate engineering controls

- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.
- Facilities for storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
- In the case of producing dust, fume or mist, use adequate ventilation to keep below the exposure limit.

C. Individual protection measures, such as personal protective equipment.(PPE)

Respiratory protection

- If exposure concentration of the material exceeds the permitted exposure standards, Wear NIOSH or European Standard EN 149 approved full or half face piece (with goggles) respiratory protective equipment.

Eye protection

- Wear appropriate protective goggles by considering physical and chemical properties of chemicals.

Hand protection

- Wear appropriate protective gloves by considering physical and chemical properties of chemicals.

Body protection

- Wear appropriate protective clothing by considering physical and chemical properties of chemicals.

SECTION 9: Physical and chemical properties and safety characteristics

A. Appearance

Physical state : liquid

Colour : Colorless

B. Odour : Fruity smell

C. Odor threshold : 7~20 ppm

D. Melting point/freezing point : -78°C

E. Boiling point or initial boiling point and boiling range : 126°C

F. Flash point : 27 °C (Closed cup)

G. Lower and upper explosion limit/ flammability limit : 1.3 % / 7.6 %

H. Flammability : Not applicable

I. Auto-ignition temperature : 415 °C (1010 hPa)

J. Decomposition temperature : Not available

K. pH : 6.2 (20 °C)

L. Kinematic viscosity : 0.66 mm²/s (40 °C), 0.732mPa s (20 °C) (viscosity)

M. Solubility : 0.7 g/100 mL (20 °C)

N. Partition coefficient n-octanol/water (log value) : Log Pow=2.3 (25 °C, pH 7)

O. Vapour pressure : 1.2 kPa (20 °C)

P. Density and/or relative density : 0.882

Q. Relative vapour density : 4.0 (air=1)

R. Particle characteristics : Not available

S. Evaporation rate : Not available

T. Molecular weight : 116.158

SECTION 10: Stability and reactivity

A. Reactivity

- May violently polymerize and result in fire and explosion.
- May form explosive mixtures at the flashpoint or above.
- Flammable liquid and vapour
- Containers may explode when heated.
- HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.
- Spilled material may cause fire or explosion hazard
- May cause vapor explosion and poison hazard indoors, outdoors or in sewers.
- Can decompose at high temperatures forming toxic gases.
- Stable under normal temperatures and pressures.

B. Chemical stability

- Stable under normal temperatures and pressures.

C. Possibility of hazardous reactions

- May violently polymerize and result in fire and explosion.
- May form explosive mixtures at the flashpoint or above.
- Flammable liquid and vapour
- Containers may explode when heated.
- HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.
- Spilled material may cause fire or explosion hazard
- May cause vapor explosion and poison hazard indoors, outdoors or in sewers.
- Can decompose at high temperatures forming toxic gases.

D. Conditions to avoid

- Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking

E. Incompatible materials

- combustibles, reducing agents

F. Hazardous decomposition products

- irritating, corrosive and/or toxic gases.

SECTION 11: Toxicological information

A. Information on likely routes of exposure

- May cause respiratory irritation
- May cause drowsiness or dizziness
- Suspected of damaging fertility or the unborn child

B. Acute toxicity

Oral

Butyl acetate Rat_LD50=10,760 mg/kg bw (OECD Guideline 423 equivalent or similar to guideline)

Dermal

Butyl acetate Rabbit_LD50>14112 mg/kg bw (OECD Guideline 402 equivalent or similar to guideline)

Inhalation

Butyl acetate Rat_LC50> 21 mg/L air/4 hr/vapor(No death) (OECD Guideline 403, GLP) (WOE)

C. Skin corrosion/irritation

Butyl acetate As a result of the test using rabbit, there were no symptoms, and the average score of erythema and edema was negative for 72 hours. (equivalent or similar to OECD Guideline 404)

D. Serious eye damage/irritation

Butyl acetate As a result of the eyes irritation test using rabbit, All symptoms are reversible and negative within 14 days. (OECD Guideline 405, GLP)

E. Respiratory or skin sensitization**Respiratory sensitization**

Butyl acetate Not available

Skin sensitization

Butyl acetate As a result of Maximization test, sensitization did not appear in humans. (Vaseline with 4% butyl acetate)

F. Germ cell mutagenicity

Butyl acetate in vivo- As a results of Mammalian red blood cell micronucleus test using mouse : Negative (OECD Guideline 474, GLP)
in vitro- As a results of Gene mutation test using S. typhimurium TA98, TA100, TA1535, TA1537, TA1538 and E. coli WP2 uvrA : Negative (equivalent or similar to OECD Guideline 471)

G. Carcinogenicity

Butyl acetate

- KOSHA Not applicable
- IARC Not applicable
- ACGIH Not applicable
- NTP Not applicable
- OSHA Not applicable
- EU CLP Not applicable

H. Reproductive toxicity

Butyl acetate As a result of the test using rat, F0 generation had no effect on

reproductive function, no teratogenic effects in all treat groups, and the development of the fetus was delayed as the gestation period of the F0 generation was prolonged.

Reproductive toxicity(NOEC=2000 ppm), Developmental toxicity(NOEC=750 ppm) (OECD Guideline 416, GLP)

As a result of developmental toxicity test using rat, weight loss, liver weight reduction, and developmental toxicity (fetal size reduction) were observed when exposed to 1500ppm (7230mg / m³) before and during pregnancy, but the effect of maternal toxicity could not be excluded..

LOAEC(Maternal toxicity)=1,500 ppm LOAEC(Developmental toxicity)=1,500 ppm NOAEC(Teratogenicity)=1,500 ppm(equivalent or similar to OECD Guideline 414), GLP)

I. STOT-single exposure

Butyl acetate

As a result of acute oral toxicity test using rats, death occurred, and the surviving subjects had liver discoloration and gastric swelling, and recovered within 1-2 days. (equivalent or similar to OECD Guideline 423)

As a result of acute dermal toxicity test using rabbit, there was no death and lung discoloration at high dose (14112 mg/kg). (equivalent or similar to OECD Guideline 402)

As a result of acute inhalation toxicity test using rat, no death was observed at a vapor concentration of 6867 ppm. Symptoms observed on the day of exposure include eye and respiratory irritation, dyspnea, ataxia, and neurological weakness. (CNS depression)

J. STOT-repeated exposure

Butyl acetate

As a result of a 90-day repeated oral toxicity test using rat, gross lesions occurred in liver, kidney and heart in the low and medium-dose groups (30, 125 mg/kg bw/d), and ataxia occurred in the high-dose group(500 mg/kg bw/d). , NOAEL=125 mg/kg bw/day, LOAEL=500 mg/kg bw/day (GLP)

As a result of 90-day repeated inhalation toxicity test using rat, abnormal red blood cells (poikilocytosis, Anisopoikilocytosis) occurred in all dose groups, the kidney weight was remarkably low at 1500 and 3000 ppm, and gastric bleeding occurred at 3000 ppm, NOEC=500 ppm (2.4 mg/L) (GLP)

K. Aspiration hazard

Butyl acetate

Not available

12. ECOLOGICAL INFORMATION

A. Toxicity

Fish

Butyl acetate 96 hr_{LC50}(Pimephales promelas)=18 mg/L (OECD Guideline 203 equivalent or similar to guideline)

Crustaceans

Butyl acetate 48 hr_{EC50}(Daphnia magna)=44 mg/L (OECD Guideline 202 equivalent or similar to guideline)

21 d_{NOEC}(Daphnia magna)=23.2 mg/L (reproduction) (Read-Across CAS No.: 110-19-0) (OECD Guideline 211, GLP)

Algae

Butyl acetate 72 hr_{EC50}(Pseudokirchneriella subcapitata)=397 mg/L (growth rate) (OECD Guideline 201, GLP)

B. Persistence and degradability

Persistence

Butyl acetate Log Pow=2.3 (25 °C, pH 7) (OECD Guideline 117, GLP)

Degradability

Butyl acetate 28d_{BOD}=83% (O₂ Consumption measurement) (OECD Guideline 301 D)

C. Bioaccumulative potential

Bioaccumulation

Butyl acetate BCF=5.028 L/kg

Biodegradation

Butyl acetate Not available

D. Mobility in soil

Butyl acetate Log K_{oc}=0.989

E. Other adverse effects

Butyl acetate Not available

SECTION 13: Disposal considerations

A. Disposal methods

- Waste must be disposed of in accordance with federal, state and local environmental control regulations.

B. Disposal considerations

- Waste must be disposed of in accordance with federal, state and local environmental control

regulations.

SECTION 14: Transport information

- A. UN number : 1123
- B. UN Proper shipping name : BUTYL ACETATES
- C. Transport hazard class(es) : 3
- D. Packing group, if applicable : III
- E. Environmental hazards : Not applicable
- F. Special precautions for user
 - In case of fire : F-E
 - In case of leakage : S-D
- G. Transport in bulk according to IMO instruments : Not applicable

15. REGULATORY INFORMATION

A. Regulation Information

U.S.A management information (OSHA Regulation)	Not applicable
U.S.A management information (CERCLA Regulation)	Not applicable
U.S.A management information (EPCRA 302 Regulation)	Not applicable
U.S.A management information (EPCRA 304 Regulation)	Not applicable
U.S.A management information (EPCRA 313 Regulation)	Not applicable
Substance of Rotterdam Convention	Not applicable
Substance of Stockholm Convention	Not applicable
Substance of Montreal Protocol	Not applicable
EU classification (classification) Butyl acetate	Flammable liquids : Category 3 Specific target organ toxicity(single exposure) : Category 3(narcotic effects)
EU classification (risk phrases)	Not applicable
EU SVHC list	Not applicable

EU Authorisation List Not applicable

EU Restriction list Not applicable

B. KOREA Regulatory information

Occupational Safety and Health Act

Butyl acetate Control parameters inventory substance
Controlled chemical substances
Working environment measurement substance
(Measurement : every 6 months)

Chemicals Control Act Not applicable

Safety Control of Dangerous Substances Act

Butyl acetate 4th class (Flammable liquids) 2nd Petroleum crude oils
insoluble liquid (Designated quantity 1000L)

Wastes Control Act The waste which is produced in the facility is designated
wastes and industrial wastes under Wastes Control Act
Enforcement Ordinance [Annex1]

C. Other regulation

Persistent Organic Pollutants Act Not applicable

SECTION 16: Other information

A. Information sources and references

- Korean SDS of N-butyl Acetate provided by Korea Alcohol Industrial Co., LTD.
- ACGIH; <https://www.acgih.org/>
- IARC; http://monographs.iarc.fr/ENG/Classification/latest_classif.php
- NTP; <http://ntp.niehs.nih.gov/index.cfm>
- OSHA; <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.119App>
- UN Recommendations on the Transport of Dangerous Goods-Model
Regulations Twenty-first edition; [https://www.unece.org/trans](https://www.unece.org/trans/danger/publi/unrec/rev21/21files_e.html)
[/danger/publi/unrec/rev21/21files_e.html](https://www.unece.org/trans/danger/publi/unrec/rev21/21files_e.html)
- (KOMDI); <https://www.komdi.or.kr/ukiwi/biz/info/ukiwiBizInfoMDGCodeList.do>
- Rules on the Occupational Safety and Health Act [Attached Table12]
- Enforcement rules of the Occupational Safety and Health Act [Attached Table21, 22, 23]
- Exposure criteria for chemicals and physical factors; Ministry of Employment and Labor
(2020-48)
- Enforcement rules of the Occupational Safety and Health Act [Attached Table19]
- Enforcement decree of the Occupational Safety and Health Act [Attached Table13]
- substances under observation and restricted substances which are designated and

announced[Attached Table2,]

- substances under observation and restricted substances which are designated and announced[Attached Table4]
- poisonous substances which are designated and announced [Attached Table] (Article 3 of the Enforcement Decree of the Hwapyeong Act and Article 2 of the Enforcement Decree of the Hwapyeong Act)
- Enforcement rules of the Chemicals Control Act [Attached Table10]
- WastesControlAct; <http://www.law.go.kr/LSW//lsInfoP.do?lsiSeq=212975&ancYd=20191231&ancNo=00843&efYd=20200701&nwJoYnInfo=N&efGubun=Y&chrClsCd=010202&ancYnChk=0#AJAX>
- (KFI); <http://hazmat.mpss.kfi.or.kr/material.do>
- Montreal Protocol ; <https://www.epa.gov/ozone-layer-protection/ozone-depleting-substances>
- Rotterdam Convention ; <http://www.pic.int/TheConvention/Chemicals/>
- Persistent Organic Pollutants Act; [Attached Table1]
- (OSHA); <https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910.119AppA>
- (CERCLA, EPCRA 302, EPCRA 304, EPCRA 313); https://www.epa.gov/sites/production/files/2015-03/documents/list_of_lists.pdf
- EU SVHC list; <https://echa.europa.eu/authorisation-list>
- EU Authorisation List; <https://echa.europa.eu/substances-restricted-under-reach>
- EU Restriction list; https://echa.europa.eu/information-on-chemicals/biocidal-active-substances?p_p_id=dissactivesubstances_WAR_dissactivesubstancesportlet&p_p_lifecycle=1&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_pos=2&p_p_col_count=3&dissactivesubstances_WAR_dissactivesubstancesportlet_javax.portlet.action=dissActiveSubstancesAction
- KOSHA Guidance; Development of Guidelines for Selection of Respirators for Workers Exposed to Chemical Substances
- NCIS; <http://ncis.nier.go.kr/>
- ECHA; <https://echa.europa.eu/information-on-chemicals/registered-substances>
- HSDB; <https://pubchem.ncbi.nlm.nih.gov/>
- Epa; <https://comptox.epa.gov/dashboard/>
- EU SVHC list : https://echa.europa.eu/de/candidate-list-table?p_p_id=disslists_WAR_disslistsportlet&p_p_lifecycle=1&p_p_state=normal&p_p_mode=view&p_p_col_id=column-1&p_p_col_pos=2&p_p_col_count=3&disslists_WAR_disslistsportlet_javax.portlet.action=searchDissLists

B. Issuing date

- May 7th 2010

C. Revision number and date

Revision number : 6

Date of the latest revision Others : Oct 25th 2023

D. Others

- This SDS is prepared based on GHS classification in accordance with 29 CFR 1910.1200.
- The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose
- This SDS is written for assisting buyers, handlers or the third party to manage materials. No express warranty, or implied warranty of merchantability or fitness for a particular purpose is made with respect to the product or the information contained herein. The recipient of our products is responsible for observing any laws and guidelines applicable.
- The content contained in this SDS may vary by country and region, and may not be consistent with the content of the actual relevant regulations. Buyer and handlers are responsible for identifying and complying with the relevant government and local regulations