MATERIAL SAFETY DATA SHEET

DEAHEUNG CHEMICAL CO., LTD. www.dhcbond.co.kr

Product Name	D-1100

1. Product and Company Identification

A. Product Name: D-1100

B. Recommended use of the chemical and restrictions on use

- Recommended use of the chemical: Bond the ALC, PC plate, Building interior material / Sealing
- Restrictions on use of the product: Do not use for purposes other than adhesive.

C. Manufacturer/Supplier/Distributor Information

- Name: DAEHEUNG CHEMICAL CO., LTD.
- Address: 68, Sandan-ro 64beon-gil, Pyeongtaek-si, Gyeonggi-do, Korea
- Emergency phone number: 82-31-668-1424

2. Hazards identification

A. Hazard·Risk Classification

Flammable Liquid : Category 2

Skin corrosion/skin irritation : Category 2

Serous Eyes Damage/Eye Irritation : Category 2

Specific target organ toxicity following single exposure : Category 3 (Respiratory tract irritation)

Specific target organ toxicity following single exposure : Category 3 (Narcotic effects)

Specific target organ toxicity following repeated exposure : Category 2

Aspiration Harzard : Category 1

B. Label elements including precautionary statements

- Symbol

- Signal Word: Danger
- Hazard·Risk Statement

H225 Highly flammable liquid and vapour Causes severe skin burns and eye damage

H304 May be fatal if swallowed and enters airways

H315 Causes skin irritation

H319 Causes serious eye irritation

H335 May cause respiratory irritation

H336 May cause drowsiness or dizziness

H373 May cause damage to organs through prolonged or repeated exposure

- Precautionary Statement

Prevention

P210 Keep away from heat/sparks/open flames/hot surfaces - No smoking

P233 Keep container tightly closed

P240 Ground/bond container and receiving equipment

P241 Use explosion-proof electrical/ventilating/light/…/equipment

P242 Use only non-sparking tool

Prevention	P243 Take precautionary measures against static discharge
	P260 Do not breathe dust/fume/gas/mist/vapours/spray
	P261 Avoid breathing dust/fume/gas/mist/vapours/spray
	P264 Wash thoroughly after handling
	P271 Use only outdoors or in a well-ventilated area
	P280 Wear protective gloves/protective clothing/eye protection/face protection
Response	P301+P310 IF SWALLOWED : Immediately call a POISON CENTER or doctor/physician
	P302+P352 IF ON SKIN : Wash with soap and water
	P303+P361+P353 IF ON SKIN (or hair) : Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower
	P304+P340 IF INHALED : Remove victim to fresh air and keep at rest in a position 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
	P312 Call a POISON CENTER or doctor/physician if you feel unwell
	P314 Get Medical advice/attention if you feel unwell
	P321 Specific treatment (see 4 on this label).
	P331 Do NOT induce vomiting
	P332+P313 If skin irritation occurs : Get medical advice/attention
	P337+P313 If eye irritation persists get medical advice/attention
	P362+P364 Take off contaminated clothing and wash it before reuse.
	P370+P378 In case of fire: Use water spray, foam, dry powder to extinguish.
Storage	P403+P233 Store in a well ventilated place. Keep container tightly closed
	P403+P235 Store in a well ventilated place. Keep cool.
	P405 Store locked up
Disposal	P501 Dispose of contents/container to in accordance with local/regional/national/international regulation.

C. Other Hazard·Risk which are not included in the classification criteria (e.g. dust explosion hazard)

Health	1
Fire	3
Reactivity	0

3. Composition/Information on ingredients

Chemical Name	Other name	CAS number	Content(%)
XYLENE	Xylene, o,m,p-isomers	1330-20-7	20~30
CALCIUM CARBONATE	CARBONIC ACID, CALCIUM SALT	471-34-1	50~60
PETROLEUM HYDROCARBON RESIN	EXTRACT, RESIDUUM RESINS	64742-16-1	1~10
ISOBUTYLENE-ISOPRENE COPOLYMER	1,3-BUTADIENE	9010-85-9	5~15
ADDITIVE	TRADE SECRET	-	1~5

4. First aid measures

A. Eye contact	IF IN EYES: Wash carefully with water for several minutes. Remove contact lenses, if possible. Easy to do.
	If eye irritation persists, Consult a physician if irritation persists.

B. Skin contact	Skin (or hair): Take off immediately all contaminated clothing or remove the Keep. Rinse skin with water / shower.
	If skin irritation occurs, obtain medical advice Keep
	Wash skin with soap and water
C. Inhalation	Excessive dust, or fumes when exposed to clean air removed by coughing or other symptoms and Seek medical attention if you have.
D. Ingestion	Do not induce vomiting. If swallowed, rinse mouth with water (only if the person is conscious).
D. Ingestion	Seek immediate medical advice.
E. Indication of immediate medical attention and notes for physician	Medical personnel are aware of the material and to take precautions to protect.

5. Fire-Fighting measures

A. Suitable (and unsuitable) extinguishing media

Water spray, Foam, Dry powder

When to do Fire-Fighting, use dry sand or earth.

B. hazards arising from the chemical (e.g. nature of any hazardous combustion products)

Highly flammable liquid and vapor.

Vapors may form explosive mixtures with air.

The steam explosion hazard at Indoor, outdoor, drain.

C. Special protective equipment and precautions for fire-fighters

In case of fire: Wear self-contained breathing apparatus.

Cool tanks/drums with water spray/remove them into safety.

6. Accidental release measures

A. Personal precautions, protective equipment and emergency procedures

Use water spray/stream to protect personnel and to cool endangered containers.

Remove product from area of fire.

Wear suitable protective clothing, gloves and eye/face protection.

Stop leak if safe to do so. Remove all sources of ignition.

In case of fire: Wear selfcontained breathing apparatus.

Evacuate unnecessary personnel. Remove all sources of ignition. Stop leak if safe to do so. Eliminate leaks immediately.

B. Environmental precautions and protective procedures

Avoid release to the environment

Waterways, sewers, basements, and Prevent entry into confined spaces.

C. Methods and materials for containment and cleaning up

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

Collect in closed containers for disposal.

Dispose of this material and its container to hazardous or special waste collection point.

7. Handling and storage

A. Precautions for safe handling	Do not handle until all safety precautions Read and understand all safety precautions.
	Wear suitable chemical resistant gloves, safety goggles, dust mask and other protective clothing.
	Use in the well-ventilated areas. Prevent build-up electrostatic charge(by grounding).

	Shower and eye bath. Keep away from acidic material.
	Be careful to high temperatures.
B. Conditions for safe storage (including any incompatibilities)	Store in its original container in a cool environment, keep away from heat, spark, and open flame. Ground containers during storage and transfer operations to avoid static spark.
	Ideal storage temp. range fore ease of handling is 10 ~ 27℃
	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.

8. Exposure controls & personal protection

A. Control parameters (e.g. occupational exposure limit values, biological limit values)

- Occupational exposure limit values

XYLENE	TWA - 100ppm STEL - 150ppm
CALCIUM CARBONATE	TWA - 10mg/m^3
PETROLEUM HYDROCARBON RESIN	No data available
ISOBUTYLENE-ISOPRENE COPOLYMER	No data available

- ACGIH limit values

XYLENE	TWA 100 ppm
	STEL 150 ppm
CALCIUM CARBONATE	No data available
PETROLEUM HYDROCARBON RESIN	No data available
ISOBUTYLENE-ISOPRENE COPOLYMER	No data available

- Biological limit values

XYLENE	No data available
CALCIUM CARBONATE	No data available
PETROLEUM HYDROCARBON RESIN	No data available
ISOBUTYLENE-ISOPRENE COPOLYMER	No data available

B. Appropriate engineering controls	Emergency eye wash fountains and safety showers should be available in the immediate vicinity of any potential exposure. Provide adequate ventilation.

C. Personal protective equipment

- Respiratory protection	The filter class must be suitable for the maximum contaminant concentration(gas/vapour/aerosol/particulates) that may arise when handling the product.
	If the concentration is exceeded, closed-circuit breathing apparatus must be used!.
	In case of fire: Wear self contained breathing apparatus.
- Eye protection	Wear eye protection/face protection.
- Hands protection	Wear proper chemical resistant gloves.
- Body protection	Wear proper Protective clothing.

9. Physical and chemical properties

A. Appearance

Physical state	PASTE
Color	GRAY
B. Odour	Solvent
C. Odour threshold	No data available
D. pH	No data available
E. Melting point/freezing point	-48~13 ℃
F. Initial boiling point and boiling range	138~144 ℃
G. Flashing point	15 ℃

H. Evaporation rate	No data available
I. Flammability(solid, gas)	No data available
J. Upper/lower flammability or explosive limits	7.10 % / 1.20 %
K. Vapor pressure	7~9 mmHg
L. Solubility	Insoluble in water
M. Vapor density	>3
N. Relative density	1.3~1.4
O Partition coefficient:n-octanol/water	No data available
P. Auto-ignition temperature	480 ℃
Q. Decomposition temperature	No data available
R. Viscosity	140,000~160,000 cps
S. Formula mass	No data available

10. Stability and reactivity

A. Chemical stability and possibility of hazardous reactions	Highly flammable liquid and vapor
	Vigorous polymerization may cause fire and explosion.
	May form explosive mixture at or above flash point
	Container may explode on heating
	Highly flammable: easily ignited by heat, spark, flame
	Leaks are a fire / explosion hazard.
	Vapors may explode indoors, outdoors, and in drains
	Vapors may form explosive mixtures with air
	Vapors may cause dizziness or suffocation without knowledge.
	Inhalation and contact may irritate or burn the skin and eyes.
	May be toxic when inhaled and skin absorbed
	Stable at normal temperature and pressure
	Inhalation of the substance may be harmful
	Can decompose at high temperature to produce toxic gas
	May cause irritating, corrosive and toxic gases in case of fire
B. Conditions to avoid (e.g. static discharge, shock or vibration, etc)	Keep away from heat/sparks/open flames/hot surfaces – No smoking.
C. Incompatible materials	Irritant, toxic gas
	Flammable materials
D. Hazardous decomposition products	Fire may produce irritating, corrosive and/or toxic gases.

11. Toxicological information

A. Information on the likely routes of exposure

No data available

B. Health hazards information

- Acute toxic

Oral

XYLENE	LD50 3523 ㎎/㎏ Rat (EU Method B1)
CALCIUM CARBONATE	LD50 6450 ㎎/㎏ Rat
PETROLEUM HYDROCARBON RESIN	LD50 7000 ㎎/㎏
ISOBUTYLENE-ISOPRENE COPOLYMER	No data available

Inhalation

XYLENE	Vapor LC50 5922 ppm 4 hr Rat (25.713 mg/LEPA OPP 81-3, GLP)
CALCIUM CARBONATE	No data available

PETROLEUM HYDROCARBON RESIN | No data available
ISOBUTYLENE-ISOPRENE COPOLYMER | No data available

Dermal

XYLENE | LD50 12126 ㎎/㎏ Rabbit (m-xylene)
CALCIUM CARBONATE | No data available
PETROLEUM HYDROCARBON RESIN | No data available
ISOBUTYLENE-ISOPRENE COPOLYMER | No data available

- Skin corrosive/irritant

XYLENE | Based on the description in the report on the rabbit skin irritation test (CERI-NITE Hazard Assessment No.62, 2004): "moderate irritant".
CALCIUM CARBONATE | No data available
PETROLEUM HYDROCARBON RESIN | No data available
ISOBUTYLENE-ISOPRENE COPOLYMER | No data available

- Serious eye damage/eye irritation

XYLENE | Based on the description in the report on the rabbit eye irritation test (CERI-NITE Hazard Assessment No.62, 2004): "moderate irritant".
CALCIUM CARBONATE | No data available
PETROLEUM HYDROCARBON RESIN | No data available
ISOBUTYLENE-ISOPRENE COPOLYMER | No data available

- Respiratory sensitization

XYLENE | No data available
CALCIUM CARBONATE | No data available
PETROLEUM HYDROCARBON RESIN | No data available
ISOBUTYLENE-ISOPRENE COPOLYMER | No data available

- Skin sensitization

XYLENE | No data available
CALCIUM CARBONATE | No data available
PETROLEUM HYDROCARBON RESIN | No data available
ISOBUTYLENE-ISOPRENE COPOLYMER | No data available

- Carcinogenicity

IARC

XYLENE | 3
CALCIUM CARBONATE | No data available
PETROLEUM HYDROCARBON RESIN | No data available
ISOBUTYLENE-ISOPRENE COPOLYMER | No data available

OSHA

XYLENE | No data available
CALCIUM CARBONATE | No data available
PETROLEUM HYDROCARBON RESIN | No data available
ISOBUTYLENE-ISOPRENE COPOLYMER | No data available

ACGIH

XYLENE | A4
CALCIUM CARBONATE | No data available
PETROLEUM HYDROCARBON RESIN | No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

NTP

XYLENE No data available

CALCIUM CARBONATE No data available

PETROLEUM HYDROCARBON RESIN No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

EU CLP

XYLENE No data available

CALCIUM CARBONATE No data available

PETROLEUM HYDROCARBON RESIN No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

- Germ Cell Mutagenicity

XYLENE Based on the negative data on human multi-generation epidemiological studies and somatic cell mutagenicity tests in vivo (micronucleus/chromosome tests) and the absence of data on heritable mutagenicity tests, germ cell mutagenicity tests in vivo and germ cell genotoxicity tests in vivo, described in CERI-NITE Hazard Assessment No.62 (2004), CaPSAR (1993), IARC (1999) and NTP DB (Access on [illegible])

CALCIUM CARBONATE No data available

PETROLEUM HYDROCARBON RESIN No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

- Reproductive toxicity

XYLENE Based on the evidence of weight reduction and hydrocephalus in foetuses at dosing levels not toxic to parent animals in mouse developmental toxicity tests, described in CERI-NITE Hazard Assessment (No. 62, 2004), EHC 190 (1997) and

CALCIUM CARBONATE No data available

PETROLEUM HYDROCARBON RESIN No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

- Specific target organ toxicity (single exposure):

XYLENE Based on the human evidence including "throat irritation, severe pulmonary congestion, alveolar hemorrhage, pulmonary edema, congestion accompanying hepatomegaly, centrilobular vacuolation of hepatocytes, nerve cell damage associated with dot hemorrhage, swelling and disappearance of Nissl bodies, limb cyanosis, a transient increase in serum transaminase activity, an increase in the blood level of urea, a decrease in endogenous creatinine clearance in the urine, liver damage, severe kidney damage, amnesia, coma" (CERI-NITE Hazard Assessment No.62, 2004) and "pulmonary congestion, pulmonary edema, focal alveolar hemorrhage" (MOE Risk Assessment Vol.1, 2002) and the evidence from animal studies including "strong narcotic effect (EHC 190, 1997). The basis for the classification includes data on xylene with unknown composition or containing other substances (ethyl benzene, toluene, etc.).

CALCIUM CARBONATE No data available

PETROLEUM HYDROCARBON RESIN No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

- Specific target organ toxicity (repeated exposure)

XYLENE Based on the human evidence including "eye/nose irritation, thirst" (DFGOT Vol. 15, 2001) and "chronic headache, chest pain, abnormal electroencephalogram, dyspnea, cyanosis of the hands, fever, a decrease in WBC count, discomfort, impairment of pulmonary function, a decrease in working capacity, physical/mental disorders" (CERI-NITE Hazard Assessment No.62, 2004). The basis for the classification includes data on xylene with unknown composition or containing other substances (ethyl benzene, toluene, etc.).

CALCIUM CARBONATE No data available

PETROLEUM HYDROCARBON RESIN No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

- Aspiration hazard

XYLENE Based on the description in ICSC(J)(2002) regarding o-xylene, m-xylene and p-xylene: "May cause aspiration and chemical pneumonia if swallowed".

CALCIUM CARBONATE No data available

PETROLEUM HYDROCARBON RESIN No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

12. Ecological information

A. Aquatic and terrestrial ecotoxicity

- Fish

XYLENE LC50 2.6 ㎎/ℓ 96 hr (OECD TG 203)

CALCIUM CARBONATE LC50 > 56000 ㎎/ℓ 96 hr

PETROLEUM HYDROCARBON RESIN No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

- Shellfish

XYLENE LC50 3.6 ㎎/ℓ 24 hr (OECD TG202)

CALCIUM CARBONATE No data available

PETROLEUM HYDROCARBON RESIN No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

- Bird

XYLENE ErC50 4.06 ㎎/ℓ 73 hr (OECD TG201, GLP)

CALCIUM CARBONATE EC50 22000 ㎎/ℓ 96 hr

PETROLEUM HYDROCARBON RESIN No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

B. Persistence and degradability

- Persistence

XYLENE log Kow 3.15

CALCIUM CARBONATE No data available

PETROLEUM HYDROCARBON RESIN No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

- Degradability

XYLENE No data available

CALCIUM CARBONATE No data available

PETROLEUM HYDROCARBON RESIN No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

C. Bioaccumulative potential

- Bioaccumulative

XYLENE (Oncorhynchus mykiss)

CALCIUM CARBONATE BCF 3.162

PETROLEUM HYDROCARBON RESIN No data available

ISOBUTYLENE-ISOPRENE COPOLYMER No data available

- Biodegradable

XYLENE	90 01 28 day
CALCIUM CARBONATE	No data available
PETROLEUM HYDROCARBON RESIN	No data available
ISOBUTYLENE-ISOPRENE COPOLYMER	No data available

D. Mobility in soil

XYLENE	log Koc=2.73
CALCIUM CARBONATE	No data available
PETROLEUM HYDROCARBON RESIN	No data available
ISOBUTYLENE-ISOPRENE COPOLYMER	No data available

E. Other adverse effects

XYLENE	Bio-accumulation potential was low (log Kow=3.16(PHYSPROP Database, 2005)), since there was no rapidly degrading (the decomposition by BOD: 39%(CERI Hazard Data, 2005))
CALCIUM CARBONATE	No data available
PETROLEUM HYDROCARBON RESIN	No data available
ISOBUTYLENE-ISOPRENE COPOLYMER	No data available

13. Disposal considerations

A. Disposal method	Destroy the product by incineration
B. Disposal precaution	Destroy the product by incineration

14. Transport information

A. UN number	1133
B. UN proper shipping name	ADHESIVES containing flammable liquid
C. Transport hazard class	3
D. Packing group (if applicable)	II
E. Marin pollution (yes/no)	Yes

F. Special precaution which a user to be aware of or needs to comply with in connection with transport or conveyance either within or outside their premises

F-E, S-D

15. Regulatory information

A. Industrial Safety and Health Act

XYLENE	PSM material Management harmful agents Working environment measurement target material Special medical examination the substance Exposure limits set material
CALCIUM CARBONATE	Working environment measurement target material Special medical examination the substance Exposure limits set material
PETROLEUM HYDROCARBON RESIN	No data available
ISOBUTYLENE-ISOPRENE COPOLYMER	No data available

B. Toxic Chemical Control Act Not applicable

C. Dangerous Material Safety Control Act The 4th type, the 1st petroleum type 200ℓ

D. Wastes Management Act Designated Wastes

E. Other requirements in domestic and other countries

- Domestic

XYLENE	Not applicable
CALCIUM CARBONATE	Not applicable
PETROLEUM HYDROCARBON RESIN	Not applicable
ISOBUTYLENE-ISOPRENE COPOLYMER	Not applicable

- Other countries

USA(OSHA)

XYLENE	Not applicable
CALCIUM CARBONATE	Not applicable
PETROLEUM HYDROCARBON RESIN	Not applicable
ISOBUTYLENE-ISOPRENE COPOLYMER	Not applicable

USA(CERCLA)

XYLENE	45.3599 kg 100 lb
CALCIUM CARBONATE	Not applicable
PETROLEUM HYDROCARBON RESIN	Not applicable
ISOBUTYLENE-ISOPRENE COPOLYMER	Not applicable

USA(EPCRA 302)

XYLENE	Not applicable
CALCIUM CARBONATE	Not applicable
PETROLEUM HYDROCARBON RESIN	Not applicable
ISOBUTYLENE-ISOPRENE COPOLYMER	Not applicable

USA(EPCRA 304)

XYLENE	Not applicable
CALCIUM CARBONATE	Not applicable
PETROLEUM HYDROCARBON RESIN	Not applicable
ISOBUTYLENE-ISOPRENE COPOLYMER	Not applicable

USA(EPCRA 313)

XYLENE	Not applicable
CALCIUM CARBONATE	Not applicable
PETROLEUM HYDROCARBON RESIN	Not applicable
ISOBUTYLENE-ISOPRENE COPOLYMER	Not applicable

USA (Rotterdam Convention material)

XYLENE	Not applicable
CALCIUM CARBONATE	Not applicable
PETROLEUM HYDROCARBON RESIN	Not applicable
ISOBUTYLENE-ISOPRENE COPOLYMER	Not applicable

USA (Stockholm Convention material)

XYLENE	Not applicable
CALCIUM CARBONATE	Not applicable
PETROLEUM HYDROCARBON RESIN	Not applicable

ISOBUTYLENE-ISOPRENE COPOLYMER	Not applicable
USA (Substance Montreal Protocol)	
XYLENE	Not applicable
CALCIUM CARBONATE	Not applicable
PETROLEUM HYDROCARBON RESIN	Not applicable
ISOBUTYLENE-ISOPRENE COPOLYMER	Not applicable
EU (Classification)	
XYLENE	Flam. Liq. 3Acute Tox. 4 *Acute Tox. 4 *Skin Irrit. 2
CALCIUM CARBONATE	Not applicable
PETROLEUM HYDROCARBON RESIN	Not applicable
ISOBUTYLENE-ISOPRENE COPOLYMER	Not applicable
EU (Risk Phrases)	
XYLENE	H226H332H312H315
CALCIUM CARBONATE	Not applicable
PETROLEUM HYDROCARBON RESIN	Not applicable
ISOBUTYLENE-ISOPRENE COPOLYMER	Not applicable
EU (Safety Phrases)	
XYLENE	S2, S25
CALCIUM CARBONATE	Not applicable
PETROLEUM HYDROCARBON RESIN	Not applicable
ISOBUTYLENE-ISOPRENE COPOLYMER	Not applicable

16. Other information

A. Information source and references

Source of data : Korea Occupational Safety and Health Agency (KOSHA)>

ECHA,HSDB, IPCS,ICSC

International Uniform ChemicaL Information Database(IUCLID)(http://ecb.jrc.it/esis)

National Library of Medicine/Chemical Carcinogenesis Research Information System (NLM/CCRIS)(http://toxnet.nlm.nih.gov/cgi-bin/sis/htmlgen?CCRIS)

ECOTOX

Ecological Structure Activity Relationships(ECOSAR)

Quantitative Structure Activity Relation(QSAR)

The Chemical Database, The Department of Chemistry at the University of Akron(http://ull.chemistry.uakron.edu/erd)

Corporate Solution From Thomson Micromedex(http://csi.micromedex.com)

B. Issuing date November 24, 2017

C. Revision number and date

D. Others