Safety Data Sheet

According to Globally Harmonized System Of Classification And Labelling Of Chemicals (GHS)

SECTION 1: Identification of the substance/mixture and of the supplier

GHS product identifier

Product name: HARTDUR 118
Chemical family: Isocyanate
Chemical name: TODI

Recommended use of the chemical and restrictions on use

Relevant identified uses: Hardener for adhesive.
Uses advised against: No information available.

Details of the supplier of the product

Company name: Johnson Fine Chemical Co., Ltd.
Address: No. 14, 33 Rd., Taichung Industrial Park, Taichung, Taiwan (Zip code: 407021)
E-mail: jfchem@johnson-fine.com
Telephone: +886-4-23502588
Fax: +886-4-23598551

Emergency telephone number

+886-4-23502588

SECTION 2: Hazards identification

GHS classification of the chemical

Acute inhalation toxicity (dust), Category 4; H332
Respiratory sensitisation, Category 1; H334
Skin sensitisation, Category 1; H317
Hazardous to the aquatic environment, Acute category 1; H400
Hazardous to the aquatic environment, Chronic category 1; H410

GHS label elements

Hazard pictogram(s):



Signal word: Danger
Hazard statements: H332: Harmful if inhaled (dust).
H334: May cause allergy or asthmatic symptoms or breathing difficulties if inhaled.
H317: May cause an allergic skin reaction.
H410: Very toxic to aquatic life with long lasting effects.

Precautionary statements:
Prevention: P261: Avoid breathing dust.
P273: Avoid release to the environment.
P280: Wear protective gloves, respiratory protection.
Response: P304 + P340: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

P312: Call a POISON CENTER or doctor/physician if you feel unwell.
P302 + P352: IF ON SKIN: Wash with plenty of soap and water.

Other hazards

No information available.

SECTION 3: Composition/information on ingredients

Ingredients information

Substance name:	3,3'-dimethylbiphenyl-4,4'-diyl diisocyanate
Synonyms:	4,4'-diisocyanato-3,3'-dimethyl-1,1'-biphenyl
CAS No.:	91-97-4
EC No.:	202-112-7
Purity:	100%
Molecular formula:	$C_{16}H_{12}N_2O_2$

SECTION 4: First aid measures

Description of first aid measures

Inhalation:	Remove victim to fresh air and keep at rest in a position comfortable for breathing. Call a physician if you feel unwell.
Skin contact:	Wash with plenty of soap and water. If skin irritation or rash occurs: Get medical advice. Wash contaminated clothing before reuse.
Eye contact:	Immediately flush eyes with plenty of water for 15 minutes at least. Call a physician if irritation persists.
Ingestion:	Wash out mouth with water, give copious water and induce vomiting. Call a physician. Do not give unconscious victim anything to drink.

Most important symptoms/effects, acute and delayed

Cough, shortness of breath, headache, nausea, vomiting.

Immediate medical attention and special treatment

No information available.

SECTION 5: Fire-fighting measures

Extinguishing media

Suitable extinguishing media: Carbon dioxide, dry chemical powder.
Unsuitable extinguishing media: No information available.

Special hazards arising from the chemical

Thermal decomposition or combustion may produce carbon monoxide, carbon dioxide and nitrogen oxide.

Special protective actions for fire-fighters

Wear appropriate protective clothing with self-contained breathing apparatus. Move containers away from fire areas if it can be done without risk. If impossible to remove containers from fire zone, cool them with

water spray.

SECTION 6: Accidental release measures

Personal precautions, protective equipment and emergency procedures

Refer to Section 8 for personal protective equipment. Prevention of skin and eye contact. Ensure adequate ventilation. Remove all sources of ignition. Evacuate personnel to safe areas.

Environmental precautions

Used general or local exhaust ventilation. Provide safety showers and eyewashes. Prevent form entering into drains, ditches or rivers. Obey Federal, State or local regulations for health and environment protection to discharge treated water to sea, river or lake etc.

Methods and material for containment and cleaning up

Sweep up, place in a container and hold for waste disposal. Ventilate area, treat spill site with aqueous ammonium hydroxide or alcohol and wash with plenty of water.

Reference to other sections

See Section 7 for information on safe handling.
See section 8 for information on personal protection equipment.
See Section 13 for information on disposal.

SECTION 7: Handling and storage

Precautions for safe handling

Avoid contact with eyes, skin and clothing. Avoid breathing dust. Use only in a well ventilated areas, or chemical fume hood. Refer to Section 8 for personal protective equipment.

Conditions for safe storage

Store in a cool dry place without direct sunshine. Keep container tightly. Moisture or water contamination may result in dangerous.

SECTION 8 : Exposure controls/personal protection

Control parameters

Occupational exposure limit values: No limit values established.
Biological limit values: No limit values established.

Appropriate engineering controls

Used general and/or local exhaust ventilation. Provide safety showers and eyewashes.

Individual protection measures - personal protective equipment

Respiratory protection:	Filter respirator for dust.
Hand protection:	Protective gloves (e.g. vinyl chloride resin for outside; cotton, rayon for inside).
Eye/face protection:	Safety goggles.
Skin protection:	Suitable working clothes, hand protection and boots.

Environmental exposure controls

Do not discharge into waterway or sewer systems unless permission has been obtained by the local authority and suitable dilution has been established. Contaminated empty containers must be disposed of as chemical waste. Observe all Federal, State and local laws concerning health and pollution.

SECTION 9: Physical and chemical properties

Appearance:	Solid (flakes)
Colour:	White
Odour:	Odourless
pH:	No data available.
Melting point:	71.7°C
Boiling point:	195 - 197°C
Relative density:	1.331 g/cm3 at 20°C
Vapour pressure:	No data available.
Partition coefficient:	Log Pow = 6.05 at 25°C (n-octanol/water)
Solubility(ies) in water:	Insoluble in water, and hydrolysis is fast in water.
Flash point:	218°C (Cleveland open cup)
Flammability:	Non flammable.
Auto-ignition temperature:	No data available.
Explosive properties:	Not predicted to be explosive.
Oxidising properties:	Not predicted to have oxidising properties.

SECTION 10: Stability and reactivity

Reactivity:

Stable under recommended storage and handling conditions (see section 7, handling and storage).

Chemical stability:

Stable under normal conditions.

Possibility of hazardous reactions:

None hazardous reactions known.

Conditions to avoid:

In combustion or heating.

Incompatible materials:

Water, alcohol and strong bases.

Hazardous decomposition products:

Carbon oxides, nitrogen oxides, benzene, hydrogen cyanide, acetaldehyde and acetone.

SECTION 11: Toxicological information

Acute toxicity:

Acute oral toxicity: $LD_{50} \geq 2000$ mg/kg (rat);
Acute inhalation toxicity: $LC_{50} = 4.44$ mg/l (male rat), 2.06 mg/l (female rat);
Acute dermal toxicity: $LD_{50} > 2000$ mg/kg (rat);

Skin corrosion/irritation:
Non-irritant to rabbit's skin. No corrosive effects were noted.

Serious eye damage/irritation:
May cause mild eye irritating.

Respiratory or skin sensitization:
May cause allergy or asthmatic symptoms or breathing difficulties if inhaled.
May cause an allergic skin reaction.

CMR effects (Carcinogenicity, germ cell mutagenicity and reproductive toxicity):
The substance is not considered to be CMR substance.

STOT-single exposure/repeated exposure:
No information available.

Aspiration hazard:
No information available.

SECTION 12: Ecological information

Ecotoxicity

Toxicity to fish: $LC_{50} = 1$ mg/L/96h (*Oncorhynchus mykiss*) (Nominal);
$LC_{50} = 0.25$ mg/L/96h (*Oncorhynchus mykiss*) (TWA);
Toxicity to daphnia: No data available.
Toxicity to Algal: No data available.

Persistence and degradability

Under the test conditions the percentage biodegradation of TODI reached a mean of -4.8 % after 28 days. Therefore it can be considered to be not ready biodegradable.

Bioaccumulative potential

TODI was found insoluble in water and its hydrolysis was found to be very fast. Based on hydrolysis of TODI and the calculated BCF value (4569 L/kg wet-wt), bio-accumulation can be assumed to be very low or negligible.

Mobility in soil

The corresponding log Koc values are 5.25 to 5.63, and 5.48 for the average. The Koc values for TODI are only of theoretical interest as it is hydrolytically unstable.

Other adverse effects

Very toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

Disposal methods

Mix the material with combustible solvent and burn in a chemical incinerator equipped with an afterburner and scrubber. Do not discharge into waterway or sewer systems unless permission has been obtained by

the local authority and suitable dilution has been established. Contaminated empty containers must be disposed of as chemical waste. Observe all Federal, State and local laws concerning health and pollution.

SECTION 14: Transport information

Land transport

UN-No.:	3077
Proper Shipping Name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (3,3'-dimethylbiphenyl-4,4'-diyl diisocyanate)
Class:	9
Packing group:	III
Hazard label:	9

Sea transport

UN-No.:	3077
Proper Shipping Name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (3,3'-dimethylbiphenyl-4,4'-diyl diisocyanate)
Class:	9
Packing group:	III
EmS No.:	F-A, S-F
Marine pollutant:	Yes

Air transport

UN-No.:	3077
Proper Shipping Name:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (3,3'-dimethylbiphenyl-4,4'-diyl diisocyanate)
Class:	9
Packing group:	III

Additional information

Mark(s) for transport:

SECTION 15: Regulatory information

Safety, health and environmental regulations specific for the product in question

EU-EINECS/ELINCS:	This substance (91-97-4) is listed in the EINECS inventory.
USA - TSCA:	This substance (91-97-4) is listed in the inventory.
Canada - DSL/NDSL:	This substance (91-97-4) is listed in the DSL inventory.
Australia - AICS:	This substance (91-97-4) is listed in the inventory.
Korea - ECL:	This substance (91-97-4) is listed in the inventory.
Japan - ENCS:	This substance (91-97-4) is listed in the inventory.
China - IECSC:	This substance (91-97-4) is not listed in the inventory.

SECTION 16: Other information

Revision Information

Date of the previous revision: Not applicable. Date of this revision: 27/04/2016
Revision summary: The first new SDS

Abbreviations and acronyms

GHS	Globally Harmonized System of Classification and Labelling of Chemicals.
CAS:	Chemical Abstracts Service (division of the American Chemical Society).
EINECS:	European Inventory of Existing Commercial Chemical Substances.
ELINCS:	European List of Notified Chemical Substances.
TSCA:	Toxic Substances Control Act, The American chemical inventory.
DSL:	Domestic Substances List, The Canadian chemical inventory.
NDSL:	Non-Domestic Substances List, The Canadian chemical inventory.
AICS:	The Australian Inventory of Chemical Substances.
ECL:	Existing Chemicals List, the Korean chemical inventory.
ENCS:	Japanese Existing and New Chemical Substances
IECSC:	Inventory of existing chemical substances in China.

Key literature references and sources for data

ESIS Dataset: European chemical Substances Information System.
ECHA's public database with information on registered substances.

Declare to reader

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---------- End of the SDS ----------