MATERIAL SAFETY DATA SHEET

DEAHEUNG CHEMICAL CO., LTD. www.dhcbond.com

PGM

Product Name	D-5250NF(SP)

1. Product and Company Identification

A. Product Name: D-5250NF(SP)

B. Recommended use of the chemical and restrictions on use

- Recommended use of the chemical: Bond the Metal, wood, rubber, HPM, plastics etc.
- 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

Acute toxicity(Inhalation: vapors) : Category 4

Skin corrosion/skin irritation : Category 2

Serous Eyes Damage/Eye Irritation : Category 2

Carcinogenicity : Category 1B

Reproductive Toxicology : Category 2

Specific target organ toxicity following single exposure : Category 1

Specific target organ toxicity following repeated exposure : Category 1

Aspiration Harzard : Category 1

Acute hazards to the aquatic environment : 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 Suspected of damaging fertility or the unborn child

H315 Causes skin irritation

H319 Causes serious eye irritation

H332 Harmful if inhaled

H335 May cause respiratory irritation

H336 May cause drowsiness or dizziness

H350 May cause cancer

H361 Suspected of damaging fertility or the unborn child

H370 Causes damage to organs

H372 Causes damage to organs through prolonged or repeated exposure

H400 Very toxic to aquatic life

H412 Harmful to aquatic life with long lasting effects

- Precautionary Statement

Prevention	P201 Obtain special instructions before use
	P202 Do not handle until all safety precautions have been read and understood
	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
	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
	P270 Do not eat, drink or smoke when using this product
	P271 Use only outdoors or in a well-ventilated area
	P273 Avoid release to the environment
	P280 Wear protective gloves/protective clothing/eye protection/face protection
	P281 Use personal protective equipment as required
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
	P308+P311 If exposed or concerned: Call a POISON CENTER/ doctor/…
	P308+P313 IF exposed or concerned : Get medical advice/attention
	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 Take off contaminated clothing and wash before reuse
	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.
	P391 Collect spillage
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 …

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

ANTIMONY TRIOXIDE	
Health	No data available
Fire	No data available
Reactivity	No data available
TOLUENE	
Health	2
Fire	3
Reactivity	0

CYCLO-HEXANE	
Health	1
Fire	3
Reactivity	0
N-HEXANE	
Health	No data available
Fire	3
Reactivity	0
ACETONE	
Health	1
Fire	3
Reactivity	0
PARA-TERTIARY-BUTYLPHENOL-FORMALDEHYDE …	
Health	1
Fire	1
Reactivity	0
NEOPRENE	
Health	1
Fire	1
Reactivity	0

3. Composition/Information on ingredients

Chemical Name	Other name	CAS number	Content(%)
TOLUENE	METHYLBENZENE	108-88-3	20~30
CYCLO-HEXANE	HEXAHYDROBENZENE	110-82-7	20~30
N-HEXANE	HEXANE	110-54-3	5~15
ACETONE	2-PROPANONE	67-64-1	5~10
PARA-TERTIARY-BUTYLPHENOL-FORMALDEHYDE …	PHENOL, P-tert-BUTYL-,	25085-50-1	5~15
NEOPRENE	SYNTHETIC RUBBER;	9010-98-4	15~25
ANTIMONY TRIOXIDE	ANTIMONY OXIDE	1309-64-4	5~15

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

ANTIMONY TRIOXIDE	TWA - 0.5mg/m^3
TOLUENE	TWA - 50ppm 188mg/m^3 STEL - 150ppm 560mg/m^3

CYCLO-HEXANE	TWA - 200ppm 700mg/m^3
N-HEXANE	TWA - 50ppm 180mg/m^3
ACETONE	TWA - 500ppm 1188mg/m^3 STEL - 750ppm 1782mg/m^3
- ACGIH limit values	
ANTIMONY TRIOXIDE	Keep exposure levels as low as possible.
TOLUENE	TWA 20 ppm 75 ㎎/㎥
CYCLO-HEXANE	TWA 100 ppm
N-HEXANE	TWA 50 ppm
ACETONE	TWA 500 ppm
	STEL 750 ppm
- Biological limit values	Toluene
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	viscous liquid
Color	Yellowish
B. Odour	Solvent
C. Odour threshold	No data available
D. pH	Not Applicable
E. Melting point/freezing point	Not Applicable
F. Initial boiling point and boiling range	83.6 ℃ (56~111 ℃)
G. Flashing point	-14.35 ℃ (-20~4 ℃)
H. Evaporation rate	No data available
I. Flammability(solid, gas)	No data available
J. Upper/lower flammability or explosive limits	8.29(7.1~13) % / 1.24(1.2~2.5) %
K. Vapor pressure	79.95 mmHg (20 ℃)
L. Solubility	Not soluble in water
M. Vapor density	2.9
N. Relative density	0.85 ± 0.05
O Partition coefficient:n-octanol/water	No data available
P. Auto-ignition temperature	326.9 ℃ (245~480 ℃)
Q. Decomposition temperature	No data available
R. Viscosity	200~2,000cps (20 ℃)
S. Formula mass	No data available

10. Stability and reactivity

A.Chemical stability and possibility of hazardous reactions	Stable under normal conditions
	Highly flammable liquid and vapor
B. Conditions to avoid	Avoid the fire, spark, flame, and other ignition sources
	The fume has an explosive characteristic.
	Avoid the overheating of container.
C. Incompatible materials	flammable material
D. Hazardous decomposition products	CO, CO_2, nitrogen compounds

11. Toxicological information

A. Information on the likely routes of exposure	No data available
B. Health hazards information	
– Acute toxic	
Oral	
ANTIMONY TRIOXIDE	LD50 > 34600 ㎎/㎏ Rat
TOLUENE	LD50 2600 ㎎/㎏ Rat
CYCLO-HEXANE	LD50 12705 ㎎/㎏
N-HEXANE	LD50 25000 ㎎/㎏ Rat
ACETONE	LD50 5280 ㎎/㎏ Rat (EHC(1990), SIDS(1997))
NEOPRENE	LD50 40000 ㎎/㎏ Rat
Inhalation	
TOLUENE	LC50 12.5 ㎎/ℓ 4 hr Rat
CYCLO-HEXANE	LC50 70 ㎎/ℓ
N-HEXANE	LC50 77000 ppm 1 hr
ACETONE	LC50 32000 ppm Rat
Dermal	
TOLUENE	LD50 120000 ㎎/㎏ Rat
CYCLO-HEXANE	LD50 > 2000 ㎎/㎏ Rabbit
ACETONE	LD50 12870 ㎎/㎏ Rabbit (EHC(1990), PATTY(1994), SIDS(1997))
– Skin corrosive/irritant	
ANTIMONY TRIOXIDE	Rabbit – Weak skin irritation
TOLUENE	moderate skin irritation in rabbit primary skin irritation test.
CYCLO-HEXANE	Skin – rabbit – skin irritation
N-HEXANE	Skin – skin irritation
ACETONE	Rabbit – No skin irritation
NEOPRENE	Can cause weak irritation
– Serious eye damage/eye irritation	
ANTIMONY TRIOXIDE	Rabbit – Weak skin irritation
TOLUENE	caused mild eye irritation and the subjects recovered from the damage within 7 days in rabbit eye irritation test.
CYCLO-HEXANE	Eyes – rabbit – No eye irritation
N-HEXANE	Eyes – No Eye irritation
ACETONE	Can cause weak irritation
NEOPRENE	Can cause weak irritation
– Respiratory sensitization	No data available
– Skin sensitization	Negative (Guinea Pigs)
– Carcinogenicity	
IARC	Group 3 : Not classifiable as to carcinogenicity to humans

ACGIH	A4 ; Not Classifiable as a Human Carcinogen

- Germ Cell Mutagenicity

TOLUENE	- Dominant lethal tests: negative - Micronucleus test: positive - Chromosome aberration test: positive

- Reproductive toxicity

TOLUENE	Increased incidence of natural abortion in human; abnormal development and malformation of newborns caused by prenatal toluene abuse;

- Specific target organ toxicity (single exposure):

TOLUENE	Causes fatigue, sleepiness, dizziness and mild respiratory irritation
CYCLO-HEXANE	May cause drowsiness or dizziness.

- Specific target organ toxicity (repeated exposure)

TOLUENE	Causes chronic central nervous system damage including restricted vision, headache associated with nystagmus and hearing loss, tremor, ataxia and amnesia.

- Aspiration hazard

CYCLO-HEXANE	May be fatal if swallowed and enters airways.

12. Ecological information

A. Aquatic and terrestrial ecotoxicity

- Fish

TOLUENE	LC50 24 ㎎/ℓ 96 hr Oncorhynchus mykiss
ACETONE	LC50 > 100 ㎎/ℓ 96 hr

- Shellfish

TOLUENE	EC50 11.5 ㎎/ℓ 48 hr Daphnia magna
CYCLO-HEXANE	EC50 0.9 ㎎/ℓ 48 hr
N-HEXANE	LC50 3.88 ㎎/ℓ 4 hr

B. Persistence and degradability

- Persistence

TOLUENE	log Kow 2.73
N-HEXANE	log Kow 3.9

C. Bioaccumulative potential

- Accumulation

CYCLO-HEXANE	BCF 129

- Biodegradable

TOLUENE	86 (%) 20 day
CYCLO-HEXANE	77 (%) 28 day
N-HEXANE	100 (%)

D. Mobility in soil	No data available
E. Other adverse effects	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	Article 39 (Management, etc. of Harmful Agents) Article 41 (Preparation, Keeping, etc. of Material Safety Data Sheet)
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	Not Applicable.
- Other countries	
CERCLA	
TOLUENE	453.599 kg 1000 lb
CYCLO-HEXANE	453.599 kg 1000 lb
N-HEXANE	2267.995 kg 5000 lb
ACETONE	2267.995 kg 5000 lb
EU regulations	
TOLUENE	F; R11Repr.Cat.3; R63Xn; R48/20-65Xi; R38R67
CYCLO-HEXANE	F; R11Xn; R65Xi; R38R67N; R50-53
N-HEXANE	F; R11 Repr. Cat. 3; R62 Xn; R48/20-65 Xi; R38 R67 N; R51-53
ACETONE	F; R11Xi; R36R66R67
EU regulations	
TOLUENE	R11, R38, R48/20, R63, R65, R67
CYCLO-HEXANE	R11, R38, R65, R67, R50/53
N-HEXANE	R11, R38, R48/20, R62, R65, R67, R51/53
ACETONE	R11, R36, R66, R67
EU regulations	
TOLUENE	S2, S36/37, S46, S62
CYCLO-HEXANE	S2, S9, S16, S25, S33, S51, S60, S61, S62
N-HEXANE	S2, S9, S16, S29, S33, S36/37, S61, S62
ACETONE	S2, S9, S16, S26, S46

16. Other information

A. Information source and references

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

B. Issuing date	May 8, 2014
C. Revision number and date	1 / November 23, 2016

D. others