

MATERIAL SAFETY DATA SHEET

DHC-200

Date of Issue: October, 27, 2013

Revision: 1.0

1. Product and company identification

1.1 Product Name: DHC-200

1.2 Recommended use of the chemical and restrictions on use:

Restrictions on use except for coating

1.3 Manufacturer / Supplier :

- Name: DNF Co., Ltd.
- Address: 142, Daehwa-ro 132beon-gil, Daedeok-gu, Daejeon 306-802, South Korea
- Telephone: 82-42-932-7939
- Fax: 82-42-932-7947

2. Hazards Identification

Emergency Overview

Appearance: Emitting the minimum of Hydrogen and ammonia gas in contact with water

Color: Colorless

Physical State: Liquid

Odor: Odour

2.1 GHS-Classification

- Flammable Liquids : GHS Category 3
- Skin Corrosion/Irritation : GHS Category 2
- Serious eye damage/eye irritation : GHS Category 2A
- Reproductive Toxicity : GHS Category 1B
- Specific Target Organ Toxicity - single exposure : GHS Category 1
- Specific Target Organ Toxicity - repeated exposure : GHS Category 1
- Specific Target Organ Toxicity - single exposure : GHS Category 3 (narcotic effects)
- Aspiration Hazard : GHS Category 1
- Hazardous to the Aquatic Environment(Chronic (long-term) aquatic hazard) : GHS Category 2

2.2 GHS-Labeling

-Symbol(s)



-Signal Word: Danger

-Hazard Statements

H226 Flammable liquid and vapour

H304 May be fatal if swallowed and enters airways

H315 Causes skin irritation

H319 Causes serious eye irritation

H336 May cause drowsiness or dizziness

H360 May damage fertility or the unborn child

H370 Causes damage to organs

H372 Causes damage to organs through prolonged or repeated exposure

H411 Toxic to aquatic life with long lasting effects

-Precautionary Statements

-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/lighting/.../ equipment.

P242 Use only non-sparking tools.

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 plenty of soap and water.

P303+P361+P353 IF ON SKIN (or hair): 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.

P307+P311 IF exposed: Call a POISON CENTER or doctor/physician.

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 ... 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.

P370+P378 In case of fire: Use ... for extinction.

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 ...

2.3 NFPA Level

Ingredient	Health	Flammability	Reactivity
Modified Silazane Polymer	2	3	0
Xylene mixture	2	3	0

3. Composition/Information on Ingredients

3.1 Description: Silazane Polymer in Solvent

3.2 Molecular formula: Mixture

3.3 Chemical Identity:

Ingredient	Percent	CAS No.	EU No.
Xylene mixture	97 %	1330-20-7	215-535-7
Modified Silazane Polymer	3%	90387-00-1-	-

4. First aid measures

4.1 Eyes: Flush with plenty of water or saline solution for removing the chemical.

Never introduce oil or ointment into the eyes without medical advice. If pain is present, refer the victim to an ophthalmologist for further treatment and follow up.

4.2 Skin: Flush with plenty of water and mild soap.

4.3 Ingestion: Call a physician immediately. Do not induce vomiting unless directed by a physician.

4.4 Inhalation: Move to fresh air. Immediately take to a physician for examination and treatment.

5. Fire-fighting measures

5.1 Extinguishing media:

Water, Dry chemical powder, Carbon Dioxide, or Foam.

5.2 Special firefighting procedures:

Wear self-contained breathing apparatus and protective clothing to prevent contact with skin and eyes. Use water spray or alcohol-type foam to cool fire-exposed containers.

Do not use straight stream.

5.3 Unusual fire and explosions hazards::

Container explosion may occur under fire conditions.

May emit toxic fumes under fire conditions.

6. Accidental release measures

6.1 For small spills:

Cover with an inorganic absorbent, like vermiculite, perlite, ground clay, or sand, sweep up, and dispose appropriately.

6.2 For large spills:

Dike to contain and pump into drums for use or disposal. If any material remains add inorganic absorbent(as above), sweep up, and dispose appropriately. Clean contaminated area with soap and water. In case of accidental spill or release, refer to Section 8, Personal Protective Equipment and General Hygiene Practices.

7. Handling and storage

7.1 Handling:

User Exposure: Avoid breathing vapor. Avoid contact with eyes, skin, and clothing. Avoid

prolonged or repeated exposure.

7.2 Storage:

Keep container closed. Flammable. Store in areas designated for flammable liquid storage(see NFPA requirements). Keep away from heat, sparks, and flame. Vent periodically to release head pressure.

7.3 Special request:

Store under inert gas. Store at 0°C~20°C

Highly reactive. React with water or alcohol to give ammonia, hydrogen gas or silanes.

8. Exposure controls/personal protection

8.1 Appropriate hygienic practices:

Avoid contact with eyes, skin, and clothing. Avoid breathing vapors, fumes and mists.

Avoid prolonged or repeated exposure. Wash thoroughly after handling, and before eating, drinking, or smoking.

8.2 Engineering controls:

Engineering controls should always be used when available as a first choice over personal protective equipment. Provide adequate ventilation. Use of fume hoods or closed booths recommended when product is used in a manner that may generate mist or aerosol.

8.3 Personal protective equipment:

Normal laboratory protective clothing recommended, i.e. lab coat and/or apron, impervious gloves and safety glasses. If mists or aerosols are generated during handling, and engineering controls are not present to prevent exposure, wear chemical safety goggles and a respirator equipped with an organic vapor cartridge.

8.4 Work practices:

Easily accessible eyewash fountains and safety showers recommended.

8.5 Protective measures during repair and maintenance

Completely isolate and thoroughly clean all equipments, piping or vessels with high flash non-polar solvents before beginning maintenance or repairs.

9. Physical and chemical properties

9.1 Physical state: Liquid

9.2 Physical properties:

Color: Colorless

Odor: Odour

Molecular weight: 5,000~25,000

Boiling Point: 139°C
Melting point: -48°C
Explosiveness: No data available
Oxidization: No data available
Vapor pressure: 8.29mmHg at 25°C
Specific Gravity(water=1) : 0.75~0.82
pH : No data available
Viscosity: 1.20~1.58 cP
Refractive index: Not Determined

Xylene mixture Flash point: 29°C
Autoignition point: 465°C
Flammable limits: Lower 1.1%, Upper 7.0%

10. Stability and reactivity

10.1 Chemical stability and possibility of hazardous reactions: Stable

10.2 Possibility of hazardous reactions:

Highly reactive. React with water or alcohol to give ammonia, hydrogen gas or silanes.
Caution should be taken when mixing this product with any of these materials.

10.3 Conditions to avoid (e.g. static discharge, shock or vibration, etc) Incompatible materials: Heat, flames and sparks. Extremes of temperature and direct sunlight. Exposure to moisture.

10.4 Incompatible materials: acids, Oxygen, Alcohols, Halogens, Oxidizing agents

10.5 Hazardous decomposition products:

Carbon monoxide, Carbon dioxide, Silicon dioxide

11. Toxicological information

11.1 Information on the likely routes of exposure

Not listed as a carcinogen by NTP(National toxicology Program); not regulated as a carcinogen by OSHA(Occupational Safety and Health Administration); not evaluated by IARC(International Agency for Research on Cancer).

11.2 Health hazards information

- **Acute toxic:**

Xylene

Oral: LD50 3500 mg/kg Rat

Dermal: LD50 ≥ 4350 mg/kg Rabbit

Inhalation: vapours LC50 6700 ppm 4 hr Rat

- **Skin corrosive/irritant:** severity irritant Rabbit
- **Serious eye damage/eye irritation:** severity irritant Rabbit
- **Respiratory sensitization:** No data available
- **Skin sensitization:** No data available
- **Carcinogenicity:**
 - ACGIH: A4 (Aluminum metal and Insoluble compounds)
 - IARC: 3
 - OSHA: No data available
 - ACGIH: A4
 - NTP: No data available
 - EU CLP: No data available
- **Germ Cell Mutagenicity :** Negative
- **Reproductive toxicity:** No data available
- **Aspiration hazard:** No data available
- **Animal Toxicity:** Oral LD50, rat: >1,000mg/kg. (Results for a structurally related compound)
Skin irritation, rabbit: severe erythema with signs of necrosis after 1-hour exposure.
- **Human Toxicity:** No human studies have been conducted with this material. The use of recommended protective equipment should prevent any adverse effects from workers handling this material.

12. Ecological information

12.1 Aquatic and terrestrial ecotoxicity:

Xylene

- Fish: LC50 3.3 mg/l 96 hr
- Crustacean: LC50 190 mg/l 96 hr
- Birds: No data available

12.2 Persistence and degradability:

- Persistence: 3.3~6
- Degradability: No data available

12.3 Bioaccumulative potential:

- Condensability: Mineral spirits BCF 130 ~ 159 (Jordanella floridae (Fish, fresh water), 1mg/l)
- Biodegradability: Xylene 39 (%)
Mineral spirits 4 (%) 28day

12.4 Mobility in soil: No data available

12.5 Other adverse effects: No data available

13. Disposal considerations

Do not mix this product with aqueous or other protic wastes streams. Incineration of combustible waste material in a permitted facility in accordance with the local, state, and federal regulations is the recommended disposal method.

14. Transport Information

14.1 UN number: 1993

14.2 UN proper shipping name: Flammable liquid, N.O.S.

14.3 Transport hazard class: 3

14.4 Packing group (if applicable): III

14.5 Marine pollution (yes/no): No data available

14.6 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-E

15. Regulatory Information

CERCLA 103 (40CFR302.4): This product does not contain any chemicals subject to reporting as a CERCLA Hazardous Substance under 40CFR302.4.

SARA 313 (40CFR372): This product does not contain any chemicals subject to reporting under Section 313 of Title III of the Superfund Amendments and Reauthorization Act and 40CFR372.

EU Labeling

C: Corrosive

F: Flammable

Xn: Harmful

EU Risk and Safety Phrases:

R10 Flammable

R22 Harmful if swallowed

R34 Causes severe skin burns

S16 Keep away from sources of ignition. No smoking.

S23 Do not breathe gas/fumes/vapor/spray.

S24/25/26 Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately

with plenty of water and seek medical advice.

S28 After contact with skin, wash immediately with plenty of water.

S37/39 Wear suitable gloves and eye/face protection.

16. Other Information

16.1 Information source and references

IUCLID Chemical Data Sheet, EC-ECB

ECB-ESIS(European chemical Substances Information System)(<http://ecb.jrc.it/esis>)

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

TOXNET, U.S. National Library of Medicine(<http://toxnet.nlm.nih.gov>)
(<http://ncis.nier.go.kr>)

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

International Chemical Safety Cards(ICSC)(<http://www.nihs.go.jp/ICSC>)

ECOTOX Database, EPA(<http://cfpub.epa.gov/ecotox>)
(<http://hazmat.nema.go.kr>)

16.2 Issuing date: October, 27, 2013

16.3 Revision number and date

- Revision number: 0

- Revision Date: October, 27, 2013

16.4 Others: No data available

Ensure operators understand the toxic nature of the product. Before using this product, it is recommended that a risk assessment and safety study be carried out. Further information on the use of this product can be obtained from the Technical Product Manager at the nearest DNF facility

DNF Co., Ltd

Address : 142, Daehwa-ro 132beon-gil, Daedeok-gu, Daejeon 306-802, South Korea

Tel : 82-42-932-7939

Fax : 82-42-932-7947

Homepage : www.dnfsolution.com