

SAFETY DATA SHEET**THMR-iP3600 HP D****1. PRODUCT AND COMPANY IDENTIFICATION**

PRODUCT NAME: THMR-iP3600 HP D

RECOMMEND USE: Photoresist

MSDS PREPARED BY: Safety & Environment Control Section, TOK

JAPAN

SUPPLIER: TOKYO OHKA KOGYO CO., LTD.

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2. HAZARDS IDENTIFICATION**Emergency Overview:**

GHS CATEGORY	Category
Flammable liquids	Category 3
Acute toxicity (oral)	Category 4
Skin corrosion/irritation	Category 2
Serious eye damage/eye irritation	Category 2B
Specific target organ systemic toxicity following single exposure	Category 3

GHS LABEL ELEMENTS

Precautionary pictograms:



Signal word: Warning

Hazard Statement:

- H226 Flammable liquid and vapour
- H302 Harmful if swallowed
- H315 Causes skin irritation
- H320 Causes eye irritation
- H335+H336 May cause respiratory irritation ;or May cause drowsiness or dizziness

Precautionary Statements:

- 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/lighting equipment etc..
 - P242 Use only non-sparking tools.
 - P243 Take precautionary measures against static discharge.
 - P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
 - P264 Wash hands thoroughly after handling.
 - P270 Do not eat, drink or smoke when using this product.
 - P271 Use only outdoors or in a well-ventilated area.
 - P280 Wear protective gloves/protective clothing/eye protection/face protection.

- Response
- P301+P312 IF SWALLOWED:Call a POISON CENTER or doctor/physician if you feel unwell.
 - P302+P352 IF ON SKIN:Wash with plenty of soap and water.
 - 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.
 - P330 Rinse mouth.
 - P332+P313 If skin irritation occurs : Get medical advice/attention.
 - P337+P313 If eye irritation persists : Get medical advice/attention.
 - P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing.Rinse skin with water/shower.
 - P362 Take off contaminated clothing and wash before reuse.
 - P370+P378 In case of fire: Use dry sand,foam,carbon dioxide,or dry chemical powder extinguisher for extinction.

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

P405 Store locked up.

Disposal P501 Dispose of contents/container in accordance with all national and local regulations.

OSHA Regulatory State:

This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

Potential health effects:

Skin contact causes irritation. Prolonged skin contact may cause cracking or other damages on skin (such as dermatitis).

Eye contact causes irritation.

Inhalation causes irritation of the nose or the respiratory tract, and may cause headache, nausea, vomit, dizziness, or unconsciousness. It may also decrease the central nervous system function.

Potential environmental effects:

See Section 12:ECOLOGICAL INFORMATION

3. COMPOSITION / INFORMATION ON INGREDIENTS

SUBSTANCE/MIXTURE: Mixture

CHEMICAL NAME (GENERIC NAME): -----

SYNONYM (S): -----

INGREDIENT AND COMPOSITION:

INGREDIENTS	wt%	CHEMICAL FORMULA	CAS NO.
2-Heptanone	95~45	CH ₃ CO(CH ₂) ₄ CH ₃	110-43-0
1,4-Dioxane	<1	C ₄ H ₈ O ₂	123-91-1
Novolak resin	40~5	Trade Secret	Trade Secret
Photoactive compound	15~1	Trade Secret	Trade Secret

4. FIRST AID MEASURES

First aid statements

First aid for exposure to eyes:

Immediately rinse the eyes with running water to wash off the chemical completely.

Immediately take the patient to a physician for examination and treatment.

First aid for exposure to skin:

Wash the affected part with plenty of running water and mild soap.

If irritation continues, immediately take the patient to a physician for examination and treatment.

First aid for inhalation:

Move the patient at once to fresh air.

Immediately take the patient to a physician for examination and treatment.

First aid for ingestion:

Rinse mouth, give plenty of water to dilute the substance. Never give anything by mouth to an unconscious person.

Immediately take the patient to a physician for examination and treatment.

Most important symptoms/effects, acute and delayed:

Skin contact causes irritation. Prolonged skin contact may cause cracking or other damages on skin (such as dermatitis).

Eye contact causes irritation.

Inhalation causes irritation of the nose or the respiratory tract, and may cause headache, nausea, vomit, dizziness, or unconsciousness. It may also decrease the central nervous system function.

Note to physicians

See Section 3: COMPOSITION / INFORMATION ON INGREDIENTS

5. FIRE FIGHTING MEASURES

Extinguishing media:

Dry sand, foam, carbon dioxide, or dry chemical powder extinguisher.

Specific hazards arising from the chemical:

Hazardous polymerisation does not occur.

It may decompose upon combustion or in high temperatures, forming carbon oxides, sulphur oxides.

Fire fighting instructions:

Shut off fuel as much as possible.

Dry chemical or carbon dioxide should be used for small fires.

Evacuate unnecessary personnel to safe area.

Foam should be effective for large fires.

When sprayed, water should be effective for cooling and protection of the fire fighters. However, use of water may expand the fire.

Protection of firefighters:

Fire fighters wear proper protective clothing and respiratory protection(SCBA).

Fight fire from protected location or safe distance.

Consider the use of unmanned hose holders or monitor nozzles.

Keep upwind of fire.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:

Evacuate the leeward personnel.

Ventilate the area.

Quickly shut off all ignition sources.

Equip extinguishers in case of ignition.

Wear proper protective clothings.

Environmental precautions:

Prevent spilt solution from entering sewers, watercourses, rivers, or fields.

Methods and materials for containment and cleaning up:

When the leak is small, wipe it with cloths. Leave the cloth in the draft, and burn it off after solvent

has evaporated.

When the leak is large, try to stop the flow with cloths, and collect the spilt solution in an empty container as much as possible.

7. HANDLING AND STORAGE

Handling:

Be careful in handling the container, and protect it from damages.

Wear proper protective clothings.

Use only in the well-ventilated area.

Seal the container after handling.

Avoid contact with oxidizing agents or reductants.

Shut off all sources of ignition.

The electric facility should be explosion proof.

Ground.

When moving the solution through pipings, ground the metallic part of the apparatuses, pipings and containers to prevent generation of electrostatic charges.

Pay attention to ventilation. This vapor is heavier than air, and easily stays at low position.

Do not expose to UV light. Use under tungsten or yellow light.

Solution should not remain in pipings when it is not used.

Water facility should be installed at every place where the solution is used. It should facilitate measures in case of adhesion or contact with eyes.

Do not bring contaminated protective tools, such as gloves, to the lounge.

Be careful of personal health after handling.

Storage:

Keep the container sealed, and store in a dark place.

Keep away all sources of ignition.

Do not heat.

Do not let it evaporate without a reason.

Store in well-ventilated area.

OTHERS:

Follow all national and local regulations.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE GUIDELINES:

INGREDIENTS	ACGIH TLV	OSHA PEL
2-Heptanone	TWA 50 ppm (233 mg/m ³)	TWA 100 ppm (465 mg/m ³)
1,4-Dioxane	TWA 20ppm (72mg/m ³)(skin)	TWA 100ppm (360mg/m ³)(skin)

Engineering controls:

When handling, try to use closed apparatuses, equipment or partial ventilator.

Personal protective equipment (PPE):

Eye/face protection: Chemical goggles, Face shield

Skin protection: Gloves, Apron, Boots, Whole bodysuits etc.

Respiratory protection: Chemical cartridge respirator with cartridge to protect against the organic vapor.

Airline respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical State:	Liquid
Color:	Red
Odor:	Characteristic odor
Odor threshold:	No data available
pH:	No data available
Melting point/freezing point:	<-10 °C
Initial boiling point and boiling range:	No data available
Flash point:	39 °C
Evaporation rate:	No data available
Flammability(solid, gas):	No data available
Upper/lower flammability or explosive limits:	No data available
Vapour pressure:	No data available
Vapour density:	3.9 (air=1)
Relative density:	No data available
Solubility:	water: Insoluble.
Partition coefficient; n-octanol/water:	No data available
Auto-ignition temperature:	No data available
Decomposition temperature:	No data available
Viscosity:	No data available

10. STABILITY AND REACTIVITY

Reactivity:	No dangerous reaction known under conditions of normal use.
Possibility of hazardous reactions:	Polymerization will not occur.
Chemical stability:	Reactive to UV light. Use under tungsten or yellow light.
Conditions to avoid:	High temperature, naked flame, and spark and other sources of ignition.. Keep separated from incompatible substances.
Incompatible materials:	Oxidizing agents and reducing agents.
Hazardous decomposition products:	Emit carbon monoxide when burned with insufficient oxygen.

11. TOXICOLOGICAL INFORMATION (Only data for each component is available.)

2-Heptanone

Acute toxicity (oral):	LD50: 1600~2407 mg/kg[rat]
Acute toxicity (dermal):	LD50: 10300 mg/kg[rabbit]
Acute toxicity (inhalation):	LC50: > 2000 ppm[rat], LC50: < 4000 ppm[rat], LC50: < 23.8 mg/L[rat]
Skin corrosion/irritation:	Moderate [rabbit]
Serious eye damage/irritation:	Mild [rabbit]
Respiratory sensitization :	No relevant information found.
Skin sensitization:	None [human]
Germ cell mutagenicity:	No relevant information found.
Carcinogenicity:	No carcinogenic effects were noted in OSHA, EPA, EU, NTP, IARC, and ACGIH.
Reproductive toxicity:	No relevant information found.
STOST-single exposure:	Caterory;3 (anesthetic action, respiratory tract irritation)
STOST-repeated exposure:	No relevant information found.
Aspiration hazard:	Caterory;2

1,4-dioxane

Acute toxicity (oral):	LD50: 4200~7339 mg/kg[rat]
Acute toxicity (dermal):	LD50: 2100 mg/kg[rat]
Acute toxicity (inhalation):	LC50: 9158~14236 ppm[rat]
Skin corrosion/irritation:	Moderate[rabbit]
Serious eye damage/irritation:	Severe, Effect on person : positive
Respiratory sensitization :	No relevant information found.
Skin sensitization:	No relevant information found.
Germ cell mutagenicity:	No relevant information found.
Carcinogenicity:	IARC - Group 2B; Possibly carcinogenic to humans. EPA - B2; indicates sufficient evidence in animals and inadequate or no evidence in humans. EU - Cat.3; Substances which cause concern for man owing to possible carcinogenic effects but in respect of which the available information is not adequate for making a satisfactory assessment. NTP – R; Reasonably anticipated to be human carcinogens. ACGIH – A3; Animal carcinogen. No carcinogenic effects were noted in OSHA.
Reproductive toxicity:	No relevant information found.
STOST-single exposure:	Category 1(central nerve system)

Category 3(respiratory irritation, drowsiness or dizziness)

STOST-repeated exposure: Category 1(liver, central nerve system, kidney)

Category 2(respiratory apparatus)

Aspiration hazard: No relevant information found.

12. ECOLOGICAL INFORMATION (Only data for each component is available.)

2-Heptanone

Ecotoxicity

Fish acute toxicity:	96hrLC50: 131 mg/L[Pimephales promelas]
Persistence and degradability:	No relevant information found.
Bioaccumulative potential:	No relevant information found.
Mobility in soil :	No relevant information found.

1,4-dioxane

Ecotoxicity

Fish acute toxicity:	96hrLC50: 6155 mg/L[Ictalurus punctatus], 96hrLC50: > 100 mg/L[Oryzias latipes], 14dayLC50: > 100 mg/L[Oryzias latipes], 21dayLC50: > 100 mg/L[Oryzias latipes]
Daphnia acute toxicity:	48hrEC50: > 1000 mg/L[Daphnia magna], 21dayEC50: > 1000 mg/L[Daphnia magna]
Algae growth inhibition(acute):	72hrErC50: > 1000 mg/L[Selenastrum], 72hrEC50: > 1000 mg/L[Selenastrum]
Fish chronic toxicity:	21dayNOEC: \geq 100 mg/L[Oryzias latipes], 21dayNOEC: 100 mg/L[Oryzias latipes]
Daphnia chronic toxicity:	21dayNOEC: 1000 mg/L[Daphnia magna], 7dayNOEC: 625 mg/L[Ceriodaphnia quadrangular]
Algae growth inhibition(chronic):	72hrNOEC: 1000 mg/L[Selenastrum], 72hrNOEC: 580 mg/L[Selenastrum]
Persistence and degradability:	BOD:0% (Not biodegradable) No hydrolysis. No direct photolysis in the lower atmosphere. Photo-oxidation in air with DT50 of 29 hours .
Bioaccumulative potential:	No bioaccumulation (log Kow of -0.32)
Mobility in soil :	No relevant information found.

13. DISPOSAL CONSIDERATIONS

RCRA Hazardous waste ID: #D001

All excess material must be collected and transferred to a professional waste disposal company for incineration.



Carefully review information in - **7.HANDLING & STORAGE**.

Comply with all national and local regulations.

14. TRANSPORT INFORMATION

U.S. Department of Transportation (DOT):

PROPER SHIPPING NAME: Resin solution

HAZARD CLASS: 3 (Flammable Liquids)

IDENTIFICATION NUMBER: UN1866

PACKING GROUP: III

Keep away from incompatibilities and all sources of ignition.

Follow all national and local regulations.

15. REGULATORY INFORMATION

<U.S. REGULATION>**TSCA (Toxic Substances Control Act):**

One or more components under Low Volume Exemption (LVE), all others TSCA registered.

Section 4(e) - ITC Priority Testing List: Not regulated

Section 5(a)(2) - Chemicals with Significant New Use Rules (SNURs): Not regulated

Section 6 - Restricted Substances: Not regulated

Section 8(d) - Health and Safety Reporting: Not regulated

Section 12(b) - Export Notification: Not regulated

CERCLA(Comprehensive Environmental Response Compensation and Liability Act)

Hazardous Substances and Reportable Quantities: 1,4-dioxane (100 LBS RQ)

SARA Title III (Superfund Amendments and Reauthorization Act):

302 Extreme Hazardous Substances (EHS) : Not regulated

311/312 Hazard Categories:

Acute Health: Yes

Chronic Health: No

Fire: Yes

Pressure: No

Reactive: No

313 Toxic Chemical (TC) : 1,4-dioxane

DEA (Drug Enforcement Administration): Not regulated

DHS (Department of Homeland Security): Not regulated

<STATE REGULATIONS>

CALIFORNIA PROPOSITION 65: This product contains 1,4-dioxane etc, chemicals known to the State of California to cause Cancer, Female, Male & Developmental.

16. OTHER INFORMATION



NFPA RATINGS:

HEALTH=1, FIRE=2, REACTIVITY=0 (SCALE 0-4)

REFERENCE:

1. HSDB
2. RTECS
3. The Dictionary of Substance and Their Effects (The Royal Society of Chemistry)
4. Material Safety Data Sheet (of the raw material manufacturer)
5. Poisonous and Deleterious Substances Control Law: Not Applicable

CREATION DATE: August 1, 2014

REVISION DATE:

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