

# MATERIAL SAFETY DATA SHEET

## 1 IDENTIFICATION

Product name :TH-101  
 Name of company :Hitachi Industrial Equipment Systems Co., Ltd  
 Address :1-1,Higashitaga-cho 1-chome, Hitachi-shi, Ibaraki-ken, Japan  
 Tel :+81-294-36-8682  
 Fax :+81-294-36-8975  
 Recommended use of the chemical  
 and restrictions on use :Printing Ink for industrial Marking

## 2 HAZARDS IDENTIFICATION

Physico-chemical endpoints :Flammable liquid Category 2  
 Acute toxicity - oral :Category 5  
 Acute toxicity - dermal :Not available  
 Acute toxicity - inhalation (air) :Not identified  
 Acute toxicity - inhalation (vapors) :Category 5  
 Acute toxicity - inhalation (dust, mist) :Not identified  
 Skin corrosion/irritation :Not available  
 Eye damage/irritation : Category 2  
 Sensitization - respiratory : Not identified  
 Sensitization - skin : Not identified  
 Germ cell mutagenicity : Category 1  
 Carcinogenicity : Category 2  
 Toxic to reproduction : Category 1  
 Effects on or via lactation : Not identified  
 Specific target organ systemic toxicity : (Single exposure)  
 Category 1 Sensory system  
 Category 1 Systemic toxicity  
 Category 1 Central nervous system  
 Category 2 Kidney  
 Category 3 airway irritant  
 :(Repeated exposure)  
 Category 1 Liver  
 Category 1 Sensory system  
 Category 1 Central nervous system  
 Category 1 Peripheral nervous system  
 Category 2 Nervous system  
 Aspiration toxicity : Category 2  
 Hazardous to the aquatic environment  
 -Acute hazard : Not available  
 -Chronic hazard : Not available

To the best of our knowledge, the information contained here in is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

**GHS label elements**

Hazard symbols:

**Signal word:** Danger**Hazard statement and precautionary statement:**

- Highly flammable liquid and vapour
- May be harmful if swallowed
- May be harmful if inhaled
- Causes skin irritation
- Causes damage to Sensory system, systemic toxicity and central nervous system-single exposure
- May cause damage to kidney-single exposure
- May cause damage to airway irritant-single exposure
- Causes damage to liver, sensory system, central nervous system and peripheral nervous system through prolonged or repeated exposure
- May cause damage to nervous system through prolonged or repeated exposure

**Precautionary statements:**

- Keep out of reach of children. Read label before use. If medical advice is needed: Have product container or label at hand.

**Prevention**

- Keep away from ignition sources such as heat/sparks/open flame– No smoking.
- Take precautionary measures against static discharge.
- Wear protective gloves and eye/face protection as specified by the competent authority.
- Do not breathe dust/mist/vapors.
- Use only in a well-ventilated area. Call a doctor/physician if you feel unwell.
- Do not eat, drink or smoke when using this product.
- Avoid contact during pregnancy/while nursing.
- Wash hands thoroughly after handling.

**Response**

- In case of fire, use dry chemical, CO<sub>2</sub>, water splay (fog) or foam for extinction.
- IF SWALLOWED: Call a doctor/physician if you feel unwell. Rinse mouth.
- IF ON SKIN: Gently wash with plenty of soap and water.
- Wash/Decontaminate removed clothing before reuse.
- If skin irritation occurs, seek medical advice/attention.
- IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
- IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a doctor/physician.
- Collect spillage.

**Storage**

- Store in cool/well-ventilated place. Store locked up.

---

To the best of our knowledge, the information contained here in is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

- Call a doctor/physician if exposed or you feel unwell.

**Disposal**

- Waste must be disposed of according to applicable regulations.

### 3 Composition/information on ingredients

**Substance or mixture;** mixture

**Composition;**

Chemical name	concentration (%)	CAS number
2-butanone	40-49	78-93-3
Methanol	10-20	67-56-1
Acetone	<1	67-64-1
Cyclohexanone	<1	108-94-1

### 4 First-aid measures

**Inhalation;**

Remove the victim from the contamination immediately to fresh air. Keep the victim warm and quiet and arrange for transport to the nearest medical facility for examination and treatment by a physician as soon as possible.

**Skin contact;**

Remove all contaminated clothing, shoes and socks from the affected areas as quickly as possible. Wash the affected area under running water using a mild soap. If irritation persists, arrange for transport to the nearest medical facility for examination and treatment by a physician as soon as possible.

**Eye contact;**

Gently rinse the affected eyes with clean water for at least 15 minutes. Remove contact lenses if easily possible. and refer for medical attention.

**Ingestion;**

Never give anything by mouth to someone who is unconscious or convulsing. If the victim is responsive, give him one or two glasses of water. And refer for medical attention.

### 5 Fire-fighting measures

**Suitable extinguishing media;**

Use dry chemical, CO<sub>2</sub>, water spray (fog) or foam.

**Fire fighting procedures;**

Use water spray to cool fire-exposed surfaces and to protect personnel. Shut off "fuel" to fire. If a leak or spill has not ignited, use water spray to disperse the vapors.

Avoid spraying water directly into storage containers due to danger of boil over.

**Unusual fire/explosion hazard;**

Flammable liquid, can release vapors that form flammable mixtures at temperatures at or above the flashpoint.

**Special protective equipment and precautions for fire fighters;**

Fire fighters should wear boots, overalls, gloves, eye and face protection and breathing apparatus.

---

To the best of our knowledge, the information contained here in is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

## 6 Accidental release measures

Shut off all sources of ignition; No smoking or flames in area. Absorb spill with inert material (e.g., dry sand or earth), then place in closed containers using non-sparking tools. Flush residual spill (area) with copious amounts of water.

## 7 Handling and storage

### Handling;

Use only in the well-ventilated areas.  
Make available in the work area emergency shower and eyes wash.  
Avoid contact with skin or eyes.

### Storage;

Close up the container and keep it in dark cool(0~20 ) place.  
Keep away from combustible materials and sources of ignition.

## 8 Exposure controls/personal protection

### Exposure guidelines;

ACGIH TLV-TWA (ppm)	
2-butanone	:200
Methanol	:200(skin)
Acetone	:500(skin)
Cyclohexanone	:25(skin)
ACGIH STEL(ppm)	
2-butanone	:300
Methanol	:250(skin)
Acetone	:750(skin)
Cyclohexanone	:None known

## 9 Physical and chemical properties

Appearance	
Physical state	:Liquid
Color	:Clear
Odor	:Solvent odor
Boiling point	:78 to 80
Flash point	:-5.0 (closed cup)
Upper/lower flammability or explosive limits	:Lower 1.8 vol%, Upper 19 vol%
Vapor pressure	:8.9kPa(20 )
Vapor density (Air = 1)	:None known
Relative density	:0.81(20 )
Solubility (Water)	:None known
Partition coefficient: n-octanol/water	:None known
Auto-ignition temperature	:422 to 450
Decomposition temperature	:No data

## 10 Stability and reactivity

To the best of our knowledge, the information contained here in is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Stability: The product is stable.

Conditions and materials to avoid: Not available

Hazardous decomposition products: These products are carbon oxides

## 11 Toxicological information

### Acute toxicity;

#### 2-butanone

LD50(ori,rat): 2737mg/kg(TXAPA9 19, 699, 1971)

LCLo(ihl,rat): 23500mg/m<sup>3</sup>/8H(AIHAAP 20, 364, 1959)

LD50(skin,rabbit): 6480mg/kg(SHELL\* MSDS-5390-4)

TCLo(ihl,human): 1000mg/m<sup>3</sup>(VCVGK\* -, 417, 1994)

LDLo(ori,human): 714.3mg/kg(VCVGK\* -, 417, 1994)

#### Methanol

LD50(ori,rat): 5628mg/kg(GTPZAB 19(11),27,1975)

LC50(ihl,rat): 64000ppm/4H(NPIRI\* 1,74,1974)

TDLo(ori,man): 9450µL/kg(AJEMEN 16,538,1998)

TCLo(ihl,human): 300ppm(NPIRI\* 1,74,1974)

#### Acetone

TDLo(ori,man): 2857mg/kg (RTECS)

LD50(ori,rat): 5800mg/kg (RTECS)

TCLo(ihl,man): 10mg/m<sup>3</sup>/6H (RTECS)

LC50(ihl,mouse): 44gm/m<sup>3</sup>/4H (RTECS)

#### Cyclohexanone

LD50(ori,rat): 1800mg/kg(VCVGK\* -, 455, 1994)

LC50(ihl,rat): 19000mg/m<sup>3</sup>(VCVGK\* -, 455, 1994)

LD50(skin,rabbit): 1mL/kg(AIHAAP 30, 470, 1969)

LDLo(ori,human): 714.3mg/kg(VCVGK\* -, 455, 1994)

TCLo(ihl,human): 0.09mg/m<sup>3</sup>(VCVGK\* -, 455, 1994)

### Skin corrosion/irritation;

#### 2-butanone

Skin; rabbit; 402mg/24H; Mild(TXAPA9 19, 276, 1971)

#### Methanol

Skin; rabbit; 20mg/24H; Moderate(85JCAE -,187,1986)

#### Acetone

Skin; rabbit; 500mg/24H; Mild(85JCAE -,280,1986)

#### Cyclohexanone

Skin; rabbit; 500mg; Mild; Open(UCDS\*\*)

Skin; human; 50%/48H; Mild(ADVEA4 27, 189, 1992)

### Serious eye damage/irritation;

#### 2-butanone

Eye; rabbit; 80mg(TXAPA9 19, 276, 1971)

#### Methanol

Eye; rabbit; 100mg/24H; Moderate(85JCAE -,187,1986)

#### Acetone

Eye; rabbit; 20mg; Severe(AJOPAA 29,1363,1946) Eye; rabbit; 20mg/24H; Severe(85JCAE -,280,1986)

#### Cyclohexanone

Eye; rabbit; 250µg/24H; Severe(85JCAE -,289,1986)

---

To the best of our knowledge, the information contained here in is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

**Respiratory or skin sensitization;**

2-butanone

Methanol

Allergic dermatitis; human, skin(PATTY 4th,1994)

No skin sensitization ;Magnusson-Kligman maximization test, guinea pig(EHC 196,1997: DFGOT vol. 16,2001)

Acetone

Not available

Cyclohexanone

Skin; rabbit; 500mg; Mild; Open(UCDS\*\*)

Skin; human; 50%/48H; Mild(ADVEA4 27, 189, 1992)

**Germ cell mutagenicity;**

2-butanone

Reverse mutation assay in *S.typhimuriun* and *E.coli*; NegativeSex chromosome loss and nondisjunction; *S.cerevisiae*; 33800ppm(MUREAV 149, 339, 1985)

Methanol

Mutation in microorganisms; mouse; lymphocyte; 7900mg/L(ENMUDM 7(Suppl 3),10,1985)

Acetone

Cytogenetic analysis; hamster; fibroblast; 40gm/l(FCTOD7 22,623,1984)

Cyclohexanone

Mutation in microorganisms; *S.typhimurium*; cells; 20µL/L(EJMBA2 18,213,1983)

Cytogenetic analysis; human; lymphocyte; 5µg/L(GISAAA 46(5), 76, 1981)

Mutation in mammalian somatic cells; hamster; ovary; 7500µL/L(ENMUDM 7(Suppl 3), 60, 1985)

**Carcinogenicity;**

2-butanone

Not available

Methanol

Not available

Acetone

Not listed as carcinogen on NTP, IARC, OSHA, ACGIH. Negative results on EHC, SIDS.

Cyclohexanone

Not available

**Reproductive toxicity;**

2-butanone

TCLo(ihl, rat): 2900mg/m<sup>3</sup>(female 6-10 D preg); Specific Developmental Abnormalities - craniofacial(VCVGK\* -, 418, 1994)

Methanol

TCLo(ihl, rat): 10000ppm/7H(7-15 D preg)(FAATDF 5,727,1985)

TDLo(ori, rat): 5200µL/kg(10 D preg)(REPTED 11,503,1997)

Acetone

TDLo(ori, rat): 273gm/kg(13 W male)(NTIS\*\* PB91-185975)

TCLo(ihl, mammal): 31500µg/m<sup>3</sup>/24H(1-13D preg); (GTPZAB 26(6),24,1982)

Cyclohexanone

TCLo(ihl, rat): 105mg/m<sup>3</sup>/4H(1-20 D preg); Fertility - pre - implantation mortality(TPKVAL 14,26,1975)

TDLo(ori, mouse): 11mg/kg(8-12 D preg); Effects on Newborn - growth statistics(TCMUD8 6,361,1986)

To the best of our knowledge, the information contained here in is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

**STOST-single exposure;**

## 2-butanone

The influence of the central nervous system, rat/mouse(EHC 143, 1992; PATTY 4th, 1994; IRIS 2003)

The influence of kidney, oral, rat(DFGOT vol 12,1999; IRIS 2003; ATSDR 1992)

The respiratory tract irritation, human (ACGIH 7th, 2001; DFGOT vol 12,1999; PATTY 4th, 1994; ATSDR 1992)

## Methanol

The restraint of central nervous system and damage of the visual organ, human, oral or ihl(EHC 196,1997; ACGIH, 7th,2001; DFGOT vol.16, 2001),

The respiratory tract irritation, rat,(EHC 196,1997; PATTY 4th,1994),

Anesthesia, rat , mouse and rhesus monkey(EHC 196,1997;PATTY 4th,1994)

## Acetone

Human, irritation of throat 12000ppm(ACGIH, 2001) ; Human irritation of throat, nose and trachea 1190mg/m<sup>3</sup>/6h(EHC 207, 1998); Human, irritation of throat 1000ppm/4h(EHC 207, 1998)

## Cyclohexanone

None known

**STOST-repeated exposure;**

## 2-butanone

The sensory paralysis of hand and arm, human(EHC 143, 1992; DFGOT vol 12, 1999; IRIS 2003)

The dmade of central nervous system, human(DFGOT vol 12, 1999; IRIS 2003)

## Methanol

The restraint of central nervous system and damage of the visual organ, human, oral or ihl(EHC 196,1997; ACGIH, 7th,2001; DFGOT vol.16, 2001),

The respiratory tract irritation, rat,(EHC 196,1997; PATTY 4th,1994),

Anesthesia, rat , mouse and rhesus monkey(EHC 196,1997;PATTY 4th,1994)

## Acetone

The increase of white blood cell and eosinophile leukocyte(ACGIH, 2001)

## Cyclohexanone

None known

**Aspiration hazard.**

## 2-butanone

Not available

## Methanol

Not available

## Acetone

Classified into Category 2 due to be the ketone of under C13.

## Cyclohexanone

None known

**12 Ecological information****Toxicity:**

## 2-butanone

LD50(oral,rat): 2737mg/kg(TXAPA9 19, 699, 1971)

LCLo(ihl,rat): 23500mg/m<sup>3</sup>/8H(AIHAAP 20, 364, 1959)

LD50(skin,rabbit): 6480mg/kg(SHELL\* MSDS-5390-4)

TCLo(ihl,human): 1000mg/m<sup>3</sup>(VCV GK\* -, 417, 1994)

To the best of our knowledge, the information contained here in is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

LDLo(ori, human): 714.3mg/kg(VCVGK\* -, 417, 1994)

**Methanol**

LD50(ori, rat): 5628mg/kg(GTPZAB 19(11),27,1975)

LC50(ihl, rat): 6400ppm/4H(NPIRI\* 1,74,1974)

TDLo(ori, man): 9450µL/kg(AJEMEN 16,538,1998)

TCLo(ihl, human): 300ppm(NPIRI\* 1,74,1974)

**Acetone**

TDLo(ori, man): 2857mg/kg (RTECS)

LD50(ori, rat): 5800mg/kg (RTECS)

TCLo(ihl, man): 10mg/m<sup>3</sup>/6H (RTECS)

LC50(ihl, mouse): 44gm/m<sup>3</sup>/4H (RTECS)

**Cyclohexanone**

LD50(ori, rat): 1800mg/kg(VCVGK\* -, 455, 1994)

LC50(ihl, rat): 19000mg/m<sup>3</sup>(VCVGK\* -, 455, 1994)

LD50(skin, rabbit): 1mL/kg(AIHAAP 30, 470, 1969)

LDLo(ori, human): 714.3mg/kg(VCVGK\* -, 455, 1994)

TCLo(ihl, human): 0.09mg/m<sup>3</sup>(VCVGK\* -, 455, 1994)

**Persistence and degradability:**

2-butanone

Not available

Methanol

This material is biodegradable.

Acetone

This material is biodegradable

Cyclohexanone

This material is biodegradable.

**Bioaccumulative potential:**

2-butanone

Not available

Methanol

Not available

Acetone

Not available

Cyclohexanone

Not available

**Mobility in soil:**

2-butanone

Not available

Methanol

Not available

Acetone

Not available

Cyclohexanone

None known

### 13 Disposal considerations

Scrap materials may be disposed by licensed contractor or burn in an approved incinerator.

To the best of our knowledge, the information contained here in is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.

Do not dump into sewer, on the ground or into any body of water.  
Follow national and local regulations.

#### 14 Transport information

Follow all regulations in your country.

UN Number	:1210
UN Proper Shipping Name	:Printing ink, flammable
Transport hazard class	:Class 3(Flammable liquid)
Packing Group	:
Environmental hazards	:No

#### 15 Regulatory information

Follow all regulations in your country.

Content of RoHS Directive material Cd<100ppm Pb, Hg, Hexavalent Cr, PBB, PBDE<1000ppm

#### 16 References

- 1) Solvent, dye MSDS
- 2) Results of Eco-toxicity tests of chemicals conducted by Ministry of the Environment in Japan (-2006)
- 3) International Chemical Safety Cards

---

To the best of our knowledge, the information contained here in is accurate. However, neither the above named supplier nor any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.