MATERIAL SAFETY DATA SHEET

1 IDENTIFICATION

Product name	:TH-78
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	:Not available
Acute toxicity - dermal	:Not identified
Acute toxicity - inhalation (air)	:Not identified
Acute toxicity - inhalation (vapors)	:Category 5
Acute toxicity - inhalation (dust, mist)	:Not available
Skin corrosion/irritation	:Not available
Eye damage/irritation	: Category 1
Sensitization - respiratory	: Not identified
Sensitization - skin	: Not identified
Germ cell mutagenicity	: Category 1
Carcinogenicity	: Not available
Toxic to reproduction	: Category 1
Effects on or via lactation	: Not identified
Specific target organ systemic toxicity	: (Single exposure) Category 2 Respiratory system Category 3 Respiratory system,anesthetizing action :(Repeated exposure) Category 1 Liver Category 2 Blood Category 2 Respiratory system Category 2 Nervous :
Aspiration toxicity	: Not identified
Hazardous to the aquatic environment	
-Acute hazard	: Category 3
-Chronic hazard	: Not available

GHS label elements

Hazard symbols:

Signal word: Danger

Hazard statement and precautionary statement:

- Highly flammable liquid and vapour
- May be harmful if inhaled
- Causes skin irritation
- May cause damage to respiratory system-single exposure
- May cause respiratory irritation, drowsiness or dizziness-single exposure
- Causes damage to liver through prolonged or repeated exposure
- May cause damage to organs 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_2, water splay (fog) or form 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.
- 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
Ethanol	90-100	64-17-5
Ammonia	1-10	1336-21-6
Acetone	1-10	67-64-1

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 neatest medial 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 son 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 medial attention.

5 Fire-fighting measures

Suitable extinguishing media;
Use dry chemical, CO_2, water splay (fog) or form.

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.

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)

Ethanol	:1000
Ammonia	:25
Acetone	:500(skin)

ACGIH STEL(ppm)

Ethanol	:No data
Ammonia	:35
Acetone	:750(skin)

9 Physical and chemical properties

Appearance	
Physical state	:Liquid
Color	:Clear
Odor	:Solvent odor
Boiling point	:78℃
Flash point	:15.0℃ (closed cup)
Upper/lower flammability or explosive limits	:Lower 3.3 vol%、Upper 19 vol%
Vapor pressure	:5.9kPa (20℃)
Vapor density (Air＝1)	:None known
Relative density	:0.80(20℃)
Solubility (Water)	:None known
Partition coefficient: n-octanol/water	:None known
Auto-ignition temperature	:422℃
Decomposition temperature	:No data

10 Stability and reactivity

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;
Ethanol
TDLo(orl,man): 700mg/kg(NTOTDY 8,77,1986)
LD50(orl,rat): 9000mg/kg(VCVGK* -, 93, 1984)
LC50(ihl,rat): 20000ppm/10H(NPIRI* 1,44,1974
TCLo(ihl,human): 2500mg/m3/20M(VCVGK* -, 93,1984)
Ammonia
LDLo(orl,human): 43mg/kg(34ZIAG -,95,1969)
TCLo(ihl,human): 408ppm(JISMAB 61,271,1971)
LD50(orl,rat): 350mg/kg(JIHTAB 23,259,1941)
Acetone
TDLo(orl,man): 2857mg/kg (RTECS)
LD50(orl,rat): 5800mg/kg (RTECS)
TCLo(ihl,man): 10mg/m3/6H (RTECS)
LC50(ihl,mouse): 44gm/m3/4H (RTECS)

Skin corrosion/irritation;
Ethanol
Skin; rabbit; 20mg/24H; Moderate(85JCAE -, 189, 1986)
Ammonia
Not available
Acetone
Skin; rabbit; 500mg/24H; Mild(85JCAE -,280,1986)

Serious eye damage/irritation;
Ethanol
rabbit; 100mg/4S; Moderate(FCTOD7 20,573,1982)
Ammonia
rabbit; ; Moderate(EU-RAR No.30, 2003)
Acetone
Eye; rabbit; 20mg; Severe(AJOPAA 29,1363,1946) Eye; rabbit; 20mg/24H; Severe(85JCAE -,280,1986)

Respiratory or skin sensitization;
Ethanol

Ammonia
Not available
Acetone
Not available

Germ cell mutagenicity;
Ethanol
DNA damage; S.cerevisiae; 850mmol/L(MUREAV 326,165,1995)
Mutation in microorganisms; S.typhimurium; 11pph(ENVRAL 52, 225, 1990)
Cytogenetic analysis; human; lymphocyte; 2.5pph/24H(MUREAV 537, 117, 2003)
Ammonia
Not available
Acetone
Cytogenetic analysis; hamster; fibroblast; 40gm/l(FCTOD7 22,623,1984)

Carcinogenicity;
Ethanol
TDLo(orl,mouse): 320mg/kg/50W-I(CALEDQ 13,345,1981)
Ammonia
Not available
Acetone
Not listed as carcinogen on NTP, IARC, OSHA, ACGIH. Negative results on EHC, SIDS.

Reproductive toxicity;
Ethanol
TDLo(orl,woman): 250mg/kg(37 W preg); Effects on Embryo or Fetus - other effects to embryo(AJOGAH 145,251,1983)
TDLo(orl,rat): 22.5gm/kg(female 11-20 D preg); Specific Dveropmental Abnormalities - Central Nervous Systems(NETEEC 24, 719, 2002)
Ammonia
Not available
Acetone
TDLo(orl,rat): 273gm/kg(13 W male)(NTIS** PB91-185975)
TCLo(ihl,mammal): 31500µg/m3/24H(1-13D preg); (GTPZAB 26(6),24,1982)

STOST-single exposure;
Ethanol
Human ihl, 5000ppm(9,4mg/L), respiratory tract irritation and confusion(ACGIH 2001)
Ammonia
Not available
Acetone
Human, irritation of throat 12000ppm(ACGIH, 2001) ; Human irritation of throat, nose and trachea 1190mg/m3/6h(EHC 207, 1998); Human, irritation of throat 1000ppm/4h(EHC 207, 1998)

STOST-repeated exposure;
Ethanol
Not available
Ammonia
Not available
Acetone
The increase of white blood cell and eosinophile leukocyte(ACGIH, 2001)

Aspiration hazard.
Ethanol
Not available
Ammonia
Not available
Acetone
Classified into Category 2 due to be the ketone of under C13.

12 Ecological information

Toxicity:
Ethanol
TDLo(orl,man): 700mg/kg(NTOTDY 8,77,1986)
LD50(orl,rat): 9000mg/kg(VCVGK* -, 93, 1984)

LC50(ihl,rat): 20000ppm/10H(NPIRI* 1,44,1974
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LD50(orl,rat): 5800mg/kg (RTECS)
TCLo(ihl,man): 10mg/m3/6H (RTECS)
LC50(ihl,mouse): 44gm/m3/4H (RTECS)

Persistence and degradability:
Ethanol
This material is biodegradable.
Ammonia
Not available
Acetone
This material is biodegradable

Bioaccumulative potential:
Ethanol
Not available
Ammonia
Not available
Acetone
Not available

Mobility in soil:
Ethanol
Not available
Ammonia
Not available
Acetone
Not available

13 Disposal considerations
Scrap materials may be disposed by licensed contractor or burn in an approved incinerator.
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	: **II**
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