SAFETY DATA SHEET

1 IDENTIFICATION

Product name	:JP-W89
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	: Category 2
Eye damage/irritation	: Category 2
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 1 Central nervous system Category 2 Kidney Category 3 Respiratory tract irritation :(Repeated exposure) Category 1 Liver Category 1 Central nervous system Category 1 Organum auditus Category 1 Lungs 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

GHS label elements

Hazard symbols:

Signal word: Danger

Hazard statement and precautionary statement:

- Highly flammable liquid and vapor
- May be harmful if swallowed
- May be harmful if inhaled
- Causes skin irritation
- Causes serious eye irritation
- May cause genetic defects
- May damage fertility or the unborn child
- Causes damage to central nervous system-single exposure
- May cause damage to kidney-single exposure
- May cause damage to airway irritant
- Causes damage to liver, central nervous system, organum auditus, lungs or peripheral nervous system through prolonged or repeated exposure
- May cause damage to nervous system through prolonged or repeated exposure
- May be harmful if swallowed and enters airways

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
2-butanone	40-50	78-93-3
Titanium oxide	10-20	13463-67-7
Ethanol	1-10	64-17-5
1-butanol	1-3	71-36-3
2-butanol	<1	78-92-2
Methanol	<1	67-56-1

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 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_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)

2-butanone	:200
Titanium oxide	:10mg/㎥
Ethanol	:1000
1-butanol	:20(skin)
2-butanol	:100
Methanol	:200(skin)

ACGIH STEL(ppm)

2-butanone	:300
Titanium oxide	:None known
Ethanol	:No data
1-butanol	:None known
2-butanol	:None known
Methanol	:250(skin)

9 Physical and chemical properties

Appearance	
Physical state	:Liquid
Color	:White
Odor	:Solvent odor
Boiling point[2)]	:80℃（2-butanone)

Flash point	:-8.1℃（closed cup）
Upper/lower flammability or explosive limits[2)]	:Lower 1.8 vol%、Upper 11.5 vol%（2-butanone）
Vapor pressure[2)]	:10.5kPa (20℃)（2-butanone）
Vapor density (Air＝1)[2)]	:2.41（2-butanone）
Relative density	:0.95(20℃)
Solubility（Water）[2)]	:29g/100mL (20℃)（2-butanone）
Partition coefficient: n-octanol/water[2)]	:0.29（2-butanone）
Auto-ignition temperature[2)]	:505℃（2-butanone）
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:

2-butanone
LD50(orl,rat): 2737mg/kg(TXAPA9 19, 699, 1971)
LCLo(ihl,rat): 23500mg/m³/8h(AIHAAP 20, 364, 1959)
LD50(skin,rabbit): 6480mg/kg(SHELL* MSDS-5390-4)
TCLo(ihl,human): 1000mg/m³(VCVGK* -, 417, 1994)
LDLo(orl,human): 714.3mg/kg(VCVGK* -, 417, 1994)

Titanium oxide
None known

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)

1-butanol
TCLo(ihl,human): 25ppm(JIHTAB 25,282,1943)
LD50(orl,rat): 790mg/kg(SAMJAF 43,795,1969)
LC50(ihl,rat): 8000ppm/4h(NPIRI* 1,10,1974)
LD50(skin,rabbit): 3400mg/kg(NPIRI* 1,10,1974)
LD50(orl,rat): 1227mg/kg(Calculate)
LD50(skin,rabbit): 3636mg/kg(Calculate)
LD50(ihl,rat): 24.2mg/L/4h(Calculate)

2-butanol
None known

Methanol
LD50(orl,rat): 5628mg/kg(GTPZAB 19(11),27,1975)
LC50(ihl,rat): 64000ppm/4h(NPIRI* 1,74,1974)
TDLo(orl,man): 9450µL/kg(AJEMEN 16,538,1998)
TCLo(ihl,human): 300ppm(NPIRI* 1,74,1974)

Skin corrosion/irritation:

2-butanone

Skin; rabbit; 402mg/24h; Mild(TXAPA9 19, 276, 1971)
Titanium oxide
None known
Ethanol
Skin; rabbit; 20mg/24h; Moderate(85JCAE -, 189, 1986)
1-butanol
Skin; rabbit; 20mg/24h; Moderate(85JCAE -,193,1986)
2-butanol
None known
Methanol
Skin; rabbit; 20mg/24h; Moderate(85JCAE -,187,1986)

Serious eye damage/irritation:
2-butanone
Eye; rabbit; 80mg(TXAPA9 19, 276, 1971)
Titanium oxide
None known
Ethanol
rabbit; 100mg/4S; Moderate(FCTOD7 20,573,1982)
1-butanol
Eye; rabbit; 2mg/24h; Severe(85JCAE -,193,1986)
2-butanol
None known
Methanol
Eye; rabbit; 100mg/24h; Moderate(85JCAE -,187,1986)

Respiratory or skin sensitization:
2-butanone
Not available
Titanium oxide
None known
Ethanol
Not available
1-butanol
Not available
2-butanol
None known
Methanol
Allergic dermatitis; human, skin(PATTY 4th,1994)
No skin sensitization ;Magnusson-Kligman maximization test, guinea pig(EHC 196,1997: DFGOT vol. 16,2001)

Germ cell mutagenicity:
2-butanone
Reverse mutation assay in S.typhimuriun and E.coli; Negative
Sex chromosome loss and nondisjunction; S.cerevisiae; 33800ppm(MUREAV 149, 339, 1985)
Titanium oxide
None known
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)

1-butanol
Sex chromosome loss and nondisjunction; hamster; lung; 100mmol/L(MUREAV 182,135,1987)
2-butanol
None known
Methanol
Mutation in microorganisms; mouse; lymphocyte; 7900mg/L(ENMUDM 7(Suppl 3),10,1985)

Carcinogenicity:
2-butanone
Not available
Titanium oxide
None known
Ethanol
TDLo(orl,mouse): 320mg/kg/50W-I(CALEDQ 13,345,1981)
1-butanol
Not available
2-butanol
None known
Methanol
Not available

Reproductive toxicity:
2-butanone
TCLo(ihl,rat): 2900mg/m³(female 6-10 D preg); Specific Developmental Abnormalities - craniofacial(VCVGK* -, 418, 1994)
Titanium oxide
None known
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): 22.5mg/kg(female 11-20 D preg); Specific Developmental Abnormalities - Central Nervous Systems(NETEEC 24, 719, 2002)
1-butanol
TDLo(orl,rat): 35295mg/kg(1-15 D preg)(ONGZAC 22(1),71,1991)
TCLo(ihl,rat): 6000ppm/7h(1-19 D preg)(FAATDF 12,469,1989)
2-butanol
None known
Methanol
TCLo(ihl,rat): 10000ppm/7h(7-15 D preg)(FAATDF 5,727,1985)
TDLo(orl,rat): 5200µL/kg(10 D preg)(REPTED 11,503,1997)

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 kidny, 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)
Titanium oxide
None known
Ethanol

Human ihl, 5000ppm(9,4mg/L), respiratory tract irritation and confusion(ACGIH 2001)
1-butanol
Human; ihl, Mild in throat(DFGOT vol 19, 2003
Animal; anesthesia, bridle of central nervous system(SIDS, 2004, EHC 65, 1987, ACGIH, 2002, DFGOT vol 19, 2003, PATTY 4th, 1994)
2-butanol
None known
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)

STOST-repeated exposure:
2-butanone
The sensory paralysis of hand and arm, human(EHC 143, 1992; DFGOT vol 12, 1999; IRIS 2003)
The damage of central nervous system, human(DFGOT vol 12, 1999; IRIS 2003)
Titanium oxide
None known
Ethanol
Not available
1-butanol
Human; exposure, giddiness and headache(EHC 65, 1987, ACGIH, 2002, DFGOT vol 19, 2003, PATTY 4th, 1994)
Human; exposure, audiometric hearing loss(EHC 65, 1987, ACGIH, 2002, DFGOT vol 19, 2003, PATTY 4th, 1994)
2-butanol
None known
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)

Aspiration hazard:
2-butanone
Not available
Titanium oxide
None known
Ethanol
Not available
1-butanol
Not available
2-butanol
None known
Methanol
Not available

12 Ecological information

Ecotoxicity[1)] :

2-butanone
mosquito fish(96h-LC50(mg/L)):5600
daphnids(48h-LC50(g/L)):>1000
Titanium oxide
None known
Ethanol
daphnids(48h-LC50(g/L)):5463.9(ECETOC TR91 2003)
1-butanol
orange-red killifish(96h-LC50(mg/L)):>100
daphnids(48h-EC50(mg/L)):>1000
2-butanol
None known
Methanol
Not available

Persistence and degradability:
2-butanone
Not available
Titanium oxide
None known
Ethanol
This material is biodegradable.
1-butanol
This material is biodegradable.
2-butanol
None known
Methanol
This material is biodegradable.

Bioaccumulative potential:
2-butanone
Not available
Titanium oxide
None known
Ethanol
Not available
1-butanol
Not available
2-butanol
None known
Methanol
Not available

Mobility in soil:
2-butanone
Not available
Titanium oxide
None known
Ethanol
Not available
1-butanol
Not available

2-butanol
None known
Methanol
Not available

13 Disposal considerations

Scrap materials may be disposed by licensed contractor or burned 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) Results of Eco-toxicity tests of chemicals conducted by Ministry of the Environment in Japan
2) International Chemical Safety Cards