Safety Data Sheet

(SDS)

Enacted data : 1993/7/12
Revised date : 2023/10/5

1. Product and Corporate Information

Reference number	5G-001
Product name	FULLON MASK MA-1
Company name	FURUTO INDUSTRIAL Co., LTD
Address	12-1 YOSHIMA INDUSTRIAL PARK, IWAKI City, FUKUSHIMA Prefecture 970-1144 JAPAN
Charge section	Sales Planning Department or Sales Department
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2. Hazards Identification

【GHS classification】

Physical and Chemical Hazards	Category2	Toluene, MEK, MIBK(Flammable liquids)
Health Hazards		
Acute toxicity(inhalation:steam)	Category4	Toluene, MEK
	Category3	MIBK
Skin corrosion/irritation	Category2	Toluene, MEK
Serious eye damage/eye irritation	Category2B	Toluene, MIBK
	Category2A	MEK
Carcinogenicity	Category2	MEK
Reproductive toxicity・Effects on or via lactation	Category1A	Toluene
Specific target organ (single exposure)	Category1A	Toluene (central nervous system)
	Category3	Toluene, MEK, MIBK(respiratory tract irritation/ anesthetic action)
	Category2	MEK (kidney)
Specific target organ (repeated exposure)	Category1	Toluene, MEK (central nervous system/ kidney)
	Category1	MIBK (central nervous system)
Aspiration hazards	Category1	Toluene
Invironmental Hazards		
Aquatic environmental hazards (acute)	Category 2	Toluen
Aquatic environmental hazards (chronic)	Category 3	Toluen
Hazards for ozone layer	Not classified	

Note) Hazard items that are not classified in the above GHS classification are specified in the guidance document for the government. Corresponds to "Not applicable", "Out of category" or "cannot be classified". For health hazards, see item 11 below.

【GHS label element】

Pictorial indication:

Signal word :DANGER

Hazards statement :Harmful if inhaled
:Skin irritation
:Serious eye irritation
:Suspected of causing cancer
:May cause fertility or the unborn child
:May cause harm to breast-fed children
:Cause damage to central nervous system
:May cause damage to the kidneys
:May cause drowsiness or dizziness (airway irritation, anesthetic action)
:May cause respiratory irritation (airway irritation, anesthetic action)
:Cause damage to nervous system, respiratory system and kidneys through prolonged or repeated exposure (central nervous system, kidney)

Precautionary statement

【Prevention】
:Obtain special instructions before use
:Do not handle until all safety precautions have been read and understood.
:Do not breathe dust / fume / gas / mist /vapors / spray
:Keep away from heat / sparks / naked flame / high temprature objects. No smoking.
:Keep the container closed well.
:Grand the container
:Use explosion-proof electrical equipment / ventilation equipment / lighting equipment.
:Use tools that do not generate sparks.
:Take precautionary measures against electrostatic discharge.
:Avoid contact during pregnancy / nursing.
:Wash your hands often after handling.
:Do not eat, drink or smoke when using this product.
:Use only outdoors or in a well-ventilated area.
:Avoid release to the environment.
:Wear protective gloves / protective clothing / protective glasses / protective surface.

3. Composition / information on ingredients

Mixture / Substance selection :Mixture

Chemical name /general name (Another name) :None

Ingredient and concentration

Ingredient name	CAS No.	Content(%)	Remarks
Toluene	108-88-3	18～24	
Methyl-ethyl-ketone	78-93-3	44～49	Alias: MEK
Methyl-isobutyl-ketone	108-10-1	5.5～8.5	Alias: MIBK

4. First aid measures

If in eyes :Rinse cautiously with water for several minutes.
Remove contact lenses, remove it out if easy. And rinse, continue.
:If eye irritation persists, get medical advice / attention.

If on skin :If it gets on your skin (or hair), immediately remove all contaminated clothing and wash with plenty of running water / shower.
:If skin irritation or exanthema occurs, get medical advice / attention.

If inhaled :Remove person to fresh air and keep comfortable for breathing. If feel unwell, contact the doctor and get medical advice / attention.

If swallowed :Do not force to vomit.
:If feel unwell, contact the doctor and get medical advice / attention.
:Don't give anything by mouth to unconscious victims.

In case of fire :Use the appropriate fire extinguishing agent to extinguish the fire.

5. Fire-fighting measures

Extinguishing media	: By water spray, powder medicine, carbon dioxide, dry sand, fire foam
Prohibited from use	: Avoid sticky water discharge.
Specific hazard	: The container may explode due to heating : Extremely flammable and easily ignited by heat, sparks and flames. : After extinguishing the fire, it may reignite. : May generate irritating, corrosive and toxic gases in the event of a fire.
Specific fire fighting method	: If not dangerous, move the container out of the fire area. However, do not move the container when it is exposed to heat. : If safe, remove the source of ignition. : Fire-fighting work should be carried out with appropriate protective equipment from windward to avoid contact with harmful gases (hydrochloric acid gas etc.). : In the case of a large-scale fire in the vicinity, use water spray, foam medicine, etc. to spray the surroundings from a distance.
Protection of fire extinguishers	: Wear appropriate air respirators and protective clothing (heat resistance).

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6. Accidental release measures : In the case of a small amount, adsorb with sawdust, earth and sand, adsorption mat, etc. and collect in an empty container.
: If there is a large amount of leaked material, enclose the leaked area with soil, sandbags, etc., collect in an empty drum, etc., and make sure that the leaked material is not discharged into rivers or the like.
: Be careful because the spilled place is slippery.
: If there is an open flame or a source of high temperature ignition, remove it immediately.
: After recovery measures, if the surface is slippery, wash with detergent and wipe with a rag.
: If it leaks indoors, ventilate the spilled area and recover.

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7. Handling and storage

Handling	: Handle with the suitable protector (glasses and impermeability graves) and in a well-ventilated area. : Do not leak, spill, or allow the vapor to escape. : The tip of the hose piping etc. should be enough to drain and control so that there is no dripping. : Transfer is performed after substitution with an inert gas such as nitrogen. : Avoid hot matter, sparks, and flames and overheat.
Storage	: Store in a well-ventilated cool and dark place away from direct sunlight and water. : Make sure that the container is free of leaks and ensure that it does not tip over, fall, or collapse. : Do not store in the same place as acid or alkali. : Do not place near open heat sources such as boilers or high temperature heat sources. : Keep container tightly closed to prevent the generation of steam. : Oxidizing substances and peroxides should not be stored at the same place.

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8. Exposure control / personal protection

Control parameters

(The data of this product is not set. Component data are shown for reference.)

Ingredient name	Adopted value(ppm)
Toluene	20
Methyl-ethyl-ketone	200
Methyl-isobutyl-ketone	50

Occupational Exposure Limits

(The data of this product is not set. Component data are shown for reference.)

Ingredient	ACGIH		Japanese Society of Occupational Health	
	TWA(ppm)	TWA(mg/m^3)	(ppm)	(mg/m^3)
Toluene	50	188	50	188
Methyl ethyl ketone	200 300 (U.L.)	590 858 (U.L.)	200	590
Methyl isobutyl ketone	20 75 (U.L.)	205 307 (U.L.)	50	200

Engineering controls : Caution: No fire
: It's desirable to install local exhaust ventilation system and/or general ventilation systems
: Equipment for eye washing and body washing will be installed near the handling area.

Personal protection : Respirator: Use a gas mask (for organic gases) and, if the concentration is high, use a respirator mask.
: Eye and face protection: Use protective glasses or a protective surface (disaster prevention surface).
: General protective equipment: Use oil resistant (impervious) gloves, boots and apron (for static protection).

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9. Physical and chemical properties

Appearance	: Viscous red liquid
Flash point	: 1.0℃ (Tag closed cup)
Fire point	: 480℃ (ref:Toluene)
Explosion limit	: 1.2～7.1% (ref:Toluene)
Boiling point	: 110℃ (ref:Toluene)
Solubility	: Very small amount
Melting point	: −95℃ (ref:Tluene)
Specific gravity	: 0.87 (ref:Toluene)

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10. Stability and Reactivity

Stability	: Stable under normal storage / handling condition,
Reaction of danger or harmful	: The mixture of vapor and air is explosive.
Condition of avoid	: Avoid heating as much as possible as it easily volatilizes.
Danger of contact	: Reacts violently with strong oxidizing agents and strong reducing agents.
Product of danger or harmful	: No knowledge

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11. Toxicological information

Acute toxicity(inhalation : steam)

: Toluen
There are 6 data as the LC50 value due to the 4-hour exposure of rat. Both (EU-RAR (2003)) and (PATTY 5th, 2001) classified to Category 4.

: MEK
Based on report of LC50 value (4 hours) of rat, (PATTY (6th, 2012),IRIS TR (2003), EHC 143(1993), and ATSDR (1992), classified Category 4.

: MIBK
Because there are reports of Category 3 (NTP TR 538 (2007), DFGOT vol. 13 (1999), EHC 117 (1990)) and Category 4 (SIDS (2011)) in the LC50 value (4 hours) of the rat, classified to Category 3 on the safe side.

Skin corrosion/irritation

: Toluen
As a result of a 4-hour semi-occlusion application test (Annex V, method B2) with 7 rabbits, all of them showed slight to severe erythema and mild edema by 72 hours after application. On the 7th day all rabbits showed clear to severe erythema and mild edema was observed in 5 rabbits. Therefore, it was classified as Category 2 based on the evaluation of moderately irritating (EU-RAR (2003)).

: MEK
As a result of a skin test of rabbits, it was reported that there was mild to moderate

irritation (SIDS (2011), EHC 143 (1993), DFGOT vol. 12 (1999)). Also reported mild irritation (EHC 143 (1993)), DFGOT vol. 12 (1999), PATTY (6th, 2012), ATSDR (1992)). Therefore it was classified as Category 2.

Serious eye damage/eye irritation

:Toluen

Conjunctival redness, edema, and excretion were observed in all of rabbits 1 hour after application in a study of 6 rabbits with 0.1 mL (OECD TG 405, GLP). Symptoms persisted after 24 and 48 hours, but then diminished, only redness after 72 hours, all disappeared on day 7, and it was concluded that they were mildly irritating (slight eye irritation) (EU-RAR 2003). Therefore, it was classified as Category 2B.

:MEK

Rabbit eye tests showed severe irritation (SIDS (2011), EHC 143 (1993), DFGOT vol. 12 (1999)), corneal damage and scleral bleeding, eyelid edema, chemical burns (EHC 143, 1993). The average score after 24 hours was 2.5 for corneal opacity and 2 for conjunctival redness, but it was reported that it almost recovered within 7 days (ECETOC TR48 (1992).Since there are reports of mild irritation (EHC 143 (1992), DFGOT vol.12 (1999), PATTY (6th, 2012), ATSDR (1992) it was classified as Category 2A based on "severe irritation".

:MIBK

As a result of applying 0.1 mL of the undiluted solution of this substance using a rabbit, corneal opacity, redness of the conjunctiva and conjunctivitis were observed, but it was reported that they recovered within 7 days (ECETOC TR48 (1992)).
In another study, irritation was observed within 10 minutes after application, and symptoms recovered 60 hours later (SIDS (2011), NTP TR 538 (2007), EHC117 (1990)). It was set to 2B.

Carcinogenicity

:MIBK

In animal studies, inhalation exposure to rats or mice for 2 years showed an increase in the total frequencyof renal tubular adenomas and adenomas and cancers in male rats. Mesenchymal malignancies of the kidney were found in 2/50 cases (IARC 101 (2012)) in female rats.Increased frequency of hepatocellular adenoma and total frequency of hepatocellular adenoma and cancer were observed in both males and females in mice (IARC 101 (2012)).The results in laboratory animals could not be ruled out as not applicable to humans, and IARC designated it as "Group 2B" (IARC 101 (2012)).

Reproductive toxicity; category for effects on or via lactation

:Toluen

In the case of human beings, pregnant women with high or long-term inhalation of toluen reported premature birth, small head in infants, low-set ears, nose, maxilla, palpebral fissure, etc. (NITE Initial Risk Evaluation Report 87 (2006), IARC 71 (1999))
An epidemiological study of 300 malformations in Canada between 1982 and 1982 showed a high risk of increased congenital malformations among women with occupational exposure to aromatic solvents, especially toluene (ACGIH (2007)).
The odds ratio of spontaneous abortion increased in women who were exposed to toluene at least three times a week, indicating the risk of toluene exposure (IARC 71 (1999)). It was set to 1A.In addition, from the description that "toluene easily passes through the placenta and is secreted into breast milk" (SIDS (J) (Access on Apr. 2012)) it was defined as "additional category: effect on or through breastfeeding".

Specific target organ (single exposure)

:Toluen

In the case of human, 750 mg / m3 / 8 hours of inhalation exposure led to muscle weakness, confusion,coordination disorder, mydriasis, severe fatigue at 3000 ppm, significant nausea, confusion,and even more severe exposure to coma. (IARC 47 (1989))
In the case of a 51-year-old man who died 30 minutes after accidentally swallowing thinner containing toluene severe central nervous system depression was reported to be the cause of death (IRIS tox. Review (2005)). Many effects of this substance on the central nervous system have been reported, and it was classified as Category 1 (central nervous system).
This substance easily causes anesthetic action at high concentrations of acute exposure, and there are many cases of unconscious workers. Animals studies also have reported anesthetic action after inhalation exposure with mouse or rat (IARC 47(1989)). Classified as Category 3 (anesthetic effect). It was reported that volunteers due to low concentration (200 ppm) exposure showed transient mild upper respiratory tract irritation (PATTY (5th, 2001)), and it was classified as Category 3 (airway irritation).

:MEK

This substance has airway irritation and anesthetic action (Ministry of the Environment Risk Evaluation Vol. 6 (2008), ACGIH (7th, 2001) ATSDR (1992)). Inhaled exposure causes headache, dizziness, nausea, vomiting, ataxia, blurred vision, light-headedness, hyperventilation, dizziness, drowsiness, central nervous system depression, metabolic acidosis, unconsciousness, and loss of consciousness when taken orally Report (PATTY (6th, 2012), Ministry of the Environment Risk Assessment Volume 6 (2008), HSDB (Access on September 2014), ACGIH (7th, 2001), ATSDR (1992), EHC 143 (1993), IRIS TR (2003))). In experimental animals, mild renal tubular necrosis was observed in the kidney after anesthetic action and oral administration of rat (1,080 mg / kg) (ACGIH (7th, 2001), ATSDR (1992), EHC 143 (1993), PATTY (6th, 2012), IRIS TR (2003), HSDB (Access on September 2014)).This substance is considered to have effects on the kidneys, as well as airway irritation and anesthetic effects.Based on the above, it was classified into Category 2 (kidney) and Category 3 (airway irritation, anesthetic action).

:MIBK

This substance is airway irritant (Ministry of the Environment Risk Evaluation Vol. 6 (2008), Proposal Reasons for Allowable Concentrations of the Society of Industry and Defense (1984), ACGIH (7th, 2010), SIDS (2011), EHC 117 (1990) , IRIS Tox. Review (2003), DFGOT vol. 13 (1999), ECETOC JACC (1987), PATTY (6th, 2012)). Cough, headache, sore throat, dizziness, anesthetic action, central nervous system depression, nausea, vomiting diarrhea, weakness, loss of appetite, loss of consciousness, abdominal pain in addition to these symptoms when inhaled. (Ministry of the Environment Risk Evaluation Vol. 6 (2008), Proposal Reasons for Proposed Concentration Allowable Concentration by the Society of Industry and Defense (1984), SIDS (2011), EHC 117 (1990), IRIS Tox. Review (2003), DFGOT vol. 13 (1999), ECETOC JACC (1987), PATTY (6th, 2012)、ACGIH (7th, 2010)).

In laboratory animals, inhaled exposure to mouse and guinea pig (high dose) has an anesthetic effect and other studies on rats have reported central nervous system depression, ataxia, and collapse (ACGIH (7th, 2010), ECETOC JACC. (1987), PATTY (6th, 2012)). This substance has airway irritation and anesthetic action, classified category 3 (airway irritation, anesthetic action).

Specific target organ (repeated exposure)

:Toluen

Printing workers who have been exposed for a long time have significantly more fatigue, memory loss, difficulty concentrating, emotional instability, and nervous breakdown. In addition, ataxia, synkinesis disorder, limb tremor, cerebral /cerebellum, and diffuse atrophy of the brain stem were observed in toluene addicts. Blurring of the difference between gray matter and white matter in the entire central nervous system was observed (Industrial Medicine Vol. 36 (1994)). It has been reported that high-concentration exposure causes morphological changes such as brain atrophy and changes in white matter of the brain as well as dysfunction of the central nervous system.It is classified category 1 (central nervous system), (Industrial Medicine Vol. 36 (1994)).

The case 19-year-old man who had been inhaling a solvent containing toluene due to his addiction and had interstitial nephritis on a renal biopsy and showed renal damage (Industrial Medicine Vol. 36 (1994)).The case 26-year-old man who was drinking a solvent containing toluene was considered to have nephrotoxicity of toluene (Industrial Medicine Vol. 36 (1994)). In addition, a 17-year-old woman who inhaled toluene due to addiction and was hospitalized for quadriplegia, but quadriplegia was attributed to renal tubular damage due to toluene poisoning (Industrial Medicine Vol. 36 (1994)). From the above, classified category 1 (kidney).

:MEK

There have been reports of decreased nerve conduction velocity and examples of factory workers complaining of numbness in the fingers and arms (EHC 143 (1993), vol. 12 (1999)). Based on the findings of these occupational exposure cases, there is concern about the occurrence of nervous system disorders in humans as a repetitive exposure effect of this substance, and central and peripheral exposure to this substance alone or in combination with other solvents in humans. Since the concern that harmful effects on the nervous system may not be resolved, it was classified into Category 1 (nervous system).

:MIBK

In an epidemiological survey of 19 workers who were exposed to this substance daily for 20 to 30 minutes in Italy, headache, loss of appetite, weakness, stomach pain, nausea, vomiting, insomnia, drowsiness, chest pain, etc has reported as subjective symptoms other than acute irritation to the eyes, nose, and throat. In a follow-up study five years later, some of the remaining individuals reported persistent CNS and gastrointestinal symptoms (ACGIH (7th, 2010)). In animal experiments using rats and mice, there were

no toxic findings that could identify the target organ up to 1,000 ppm, and the NOAEL was reported to be 1,000 ppm (SIDS (2011), ACGIH (7th, 2010)). Although it is difficult to identify the target organ from the findings of laboratory animals, it was considered appropriate to classify this section as Category 1 (central nervous system) from the results of human epidemiological studies.

Aspiration hazards

:Toluen

It is a hydrocarbon and has a kinematic viscosity of 0.86 mm2 / s (40° C) (calculated as CRC (91st, 2010))). (calculated value: viscosity 0.727 mPa · s (Renzo (1986)) density 0.8483 g / mL Therefore, it was classified as Category 1.
There is also a statement that direct contact of liquid toluene with lung tissue causes severe irritation, in other words "chemical pneumonia" (DFGMAK-Doc.7 (1996)).

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12. Environmental impact information

Aquatic environmental hazards (acute)

:Toluen

Crustacean (Ceriodaphnia dubia) 48 hours EC50 = 3.78 mg / L (NITE initial risk evaluation report, 2006) classified as Category 2.

Aquatic environmental hazards (chronic)

:Toluen

It has good decomposition (decomposition by BOD in 2 weeks: 123%, inspected 1980)
7day NOEC of Crustaceans (Ceriodaphnia dubia)= 0.74 mg/L(NITE Initial Risk Evaluation Report, 2006)Classified as Categoly 3 as it is presumed to have low bioaccumulation.

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13. Disposal considerations

:When burned, harmful gases such as hydrogen chloride are generated, so incinerate with an incinerator equipped with an exhaust gas treatment device.

:When treating waste water containing this product, after conducting toxicity tests on activated sludge, etc., waste water is treated with activated sludge or the like.

:In addition to the precautions described in section, observe the general precautions for highly flammable hazardous liquid.

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14 Transport information

UN No. and UN class

UN class	:Class 3 : flammable liquid P.G2
UN No.	:1993 (Medium flash point flammable liquid with no other hazards)
Product name	:Not applicable

Special safety measures

:Make sure that the container is free of leaks during transport, and load it up so that it does not fall, fall, or damage, and ensure prevention of load collapse.

:In addition to the precautions described in section, observe the general precautions for highly flammable hazardous liquid.

:Avoid to carry this with peroxides and oxidants.

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15 Regulatory information

Fire Service Act	
:Category IV : inflammable liquids : (ii) Class I petroleums	Toluen, MEK, MIBK
Poisonous and Deleterious Substances Control Act	
:Not applicable	
Industrial Safety and Health Act	
:Dangerous Substance (Flammable)	Toluen, MEK, MIBK
:Containing substances subject to labeling and notification	Toluen, MEK, MIBK
:Specified Chemical Substances (Group-2 Substances) special organic solvents	MIBK
Organic Solvent Poisoning Prevention Regulations	
:Second-class organic solvents	Toluen, MEK
Law concerning Pollutant Release and Transfer Register (PRTR Law)	
:Contains the relevant substance	Toluen, MIBK

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16. Other information

i The ″Safety Data Sheet″ is a brief summary of the precautions for safe use of our products, and assumes normal handling.

ii The ″safety data sheet″ is based on the findings up to the present and does not guarantee the completeness of the information, and may be revised as needed. Please be aware in advance.

iii The information contained in the ″Safety Data Sheet″ does not guarantee the product specification or quality.
Please refer to the ″Safety Data Sheet″ etc. for the conditions under which this product is used and consider at the user's responsibility.