Material Safety Data Sheet

1. Identification Of The Substance / Preparation And Company / Undertaking

Material Name	:	**Stabilis AF 100 Light Brown**– Single pack solvent base self-polishing Tin-free Anti Fouling
Product Type	:	Solvent-base Coating
Supplier Name	:	**ANS Surface Technology Pte. Ltd.**
Address	:	4 Penjuru Place # 01-18, 2-8 Penjuru Tech Hub Singapore 608782
Telephone	:	65-6898 2314
Fax	:	65-6898 2421
Recommended Usage	:	As self polishing tin-free anti fouling paint for ship bottom, vertical hull, floating platform, FPSO and off-shore marine structures, etc.

2. Hazard Identification

GHS CLASSIFICATION :

Physical Hazard

Flammable Liquid	:	Category 3

Health Hazards

Serious eye damage / eye irritation	:	Category 2
Skin sensitizers	:	Category 1
Acute toxicity / oral	:	Category 4
Acute toxicity/Inhalation (dust and mists)	:	Category 4
Respiratory sensitizers	:	Category 1
Reproductive toxicity	:	Category 1
Carcinogenicity	:	organ
Specific target organ / systemic toxicity (single exposure)	:	Category 2 (respiratory organs, systemic toxicity, liver, central nervous system,)
	:	Category 3 (respiratory tract irritation)
Specific target organ / systemic toxicity (repeated exposure)	:	Category 2 (repiratory organ, nervous system,)

Environmental Hazards

Aquatic environment hazard/acute	:	Category 1
Aquatic environment hazard/long term	:	Category 1

GHS LABEL ELEMENTS

Pictograms

Signal Word

Danger

HAZARD INFORMATION :

- H351 : Suspected of causing cancer
- H226 : Flammable liquid
- H319 : Caused serious eye irritation
- H360 : May damage fertility or the unborn child
- H302 : Harmful if swallowed
- H317 : May cause allergic skin reaction
- H332 : Harmful if inhaled
- H334 : May cause allergy or asthma symptoms or breathing difficulties if inhaled
- H370 : Causes damage to respiratory organs, liver, central nervous system, kidney, anesthetic action, respiratory tract irritation through inhalation.
- H373 : May causes damage to respiratory organs, nervous system, central nervous system, peripheral nervous system by prolong or repeated exposure
- H400 : Very toxic to aquatic life
- H410 : Very toxic to aquatic life with long lasting effects

PRECAUTIONARY STATEMENTS

Preventive Measures

- P210 : Keep away from ignition sources such as heat / sparks / open flames – No Smoking.
- P243 : Take precautionary measures against static discharge
- P242 : Use only non-sparking tools
- P241 : Use explosion-proof electrical / ventilating / lighting / equipment by the manufacturer / supplier or the competent authority.
- P272 : Contaminated work clothing should not be allowed out of the workplace
- P271 : Use only outdoors or in a well-ventilated area
- P233 : Keep container tightly closed
- P260 : Do not breathe dust / fume / gas / mist / vapours / spray.
- P273 : Avoid release to the environment
- P264 + P280 : Wash hands and exposed body thoroughly after handling
- P281 : Wear protective gloves, glasses and respirator.

First Aid Measures

- **P304 + P340 :** IF INHALED : Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a doctor / physician.
- **P301 + P312 :** IF SWALLOWED : Immediately call a doctor / physician. Rinse mouth. DO NOT induce vomiting.
- **P305 + P351 + P338 :** IF IN EYES : Rinse cautiously with water for minutes. Remove contact lenses if present and easy to do. Continue rinsing. If eye irritation persists, get medical advice / attention.
- **P302 + P361 + P352 :** IF OIN SKIN(OR HAIR) : Remove / take off immediately all contaminated clothing. Wash with plenty of soap and water.
- **P305 + P351 + :** If on skin and skin irritation or rash occurs, get medical advice /

P338 attention.
- ❖ **P363** : Wash / Decontaminate removed clothing before reuse
- ❖ **P314** : Get medical advice / attention if you feel unwell
- ❖ Refer to section 5 : Fire-Fighting Measures

Storage
- ❖ **P235 + P410 +P403** : Store in cool / covered / well-ventilated place

Disposal
- ❖ **P501** : Paint ingredients, incinerated ash and used container should be disposed by recognized companies which are licensed as industrial waste disposal by respective authority.

Other Hazard Information
- ❖ It is a flammable liquid and explosive if a steam piles up
- ❖ It may possibly cause intoxication of organic-solvent.

3. Composition Information

Specific of chemical material : Mixture

Hazard Component

Ingredient Name	Content	CAS No.
Cuprous oxide	30-40	1317-39-1
Copper (II) oxide	1 - 5	1317-38-0
4,5-Dichloro-2-n-octyl-4-isothiazolin-3-one	1-3	64359-81-5
Silicon dioxide	1-5	7631-86-9
Xylene	5-10	1330-20-7
Ethylbenzene	5-10	100-41-4
Tricresyl phosphate	1-5	1330-78-5
MIBK	1-5	108-10-1
Gum Rosin	5-10	8050-09-7

4. First-Aid Measures

Eye Contact
- ❖ Rinse eyes and eyelids for 15 minutes or more with pure running water immediately.
- ❖ Consult a doctor if symptoms persist.

Skin Contact
- ❖ Remove immediately contaminants with clothes etc.
- ❖ Wash skin thoroughly with fresh water, soap or skin detergent. Do not use solvents and thinners.
- ❖ Receive diagnosis of a doctor, when there is visual changes or when painful.

Inhalation
- ❖ If inhaled large quantity of a steam, gas and a like, move the victim to the fresh air immediately and keep him warm and quiet. If breathing is irregular or stopped, respire

artificially. If rapid recovery does not occur, get medical attention.
- If inhaled a steam, gas and a like or feel worse, remove the victim to fresh air and consult a doctor immediately.

Ingestion
- If swallowed accidentally, do not induce vomiting, move the victim in a quiet place and consult a doctor immediately. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.

5. Fire Fighting Measures

Clear fire area of all non-emergency personnel.

Specific Hazards	:	Carbon monoxide may be evolved if incomplete combustion occurs. The vapours is heavier than air, spreads along the ground and distant ignition is possible.
Extinguishing Media	:	Carbon dioxide fire extinguisher, foam, dry chemical powder, sand may be used for small fires only. Do not discharge extinguishing waters into the aquatic environment.
Unsuitable Extinguishing Media	:	Do not use water in a jet
Protective Equipment for firefighters	:	Wear full protective clothing and self-contained breathing apparatus.
Extinguishing Methods	:	Removes any inflammable things promptly from the circumference. Use the adequate fire extinguisher Fight the fire from the windy side Cool off closed container exposed at high temperature with water mist

6. Accident Release Measures

Observe all relevant local and international regulations
- Avoid contact with spilled or released material.
- Remove all contaminated clothing immediately
- Wear appropriate protective equipments (glove, protective mask, apron and goggles)
- Clear away all sources of ignition, heat and inflammable materials immediately.
- Collect spills with the appropriate tools which are equipped to prevent sparks caused by impact and static electricity.
- Absorb spills with non combustible materials such as dry sand and soil and collect in closed container. For extensive spillage, prevent outflow with land elevation.
- Provide a suitable fire extinguisher for a precaution of a fire.
- Do not let spills to drains, rivers and sea. Special care must be taken for environmental protection.

7. Handling and Storage

Handling
- Do not overturn, knock or drag the container and handle with care.

- Handle carefully in a well ventilated place.
- Wear appropriate protective equipments (glove, protective mask, apron and goggles)
- Avoid contact with skin, eye and clothing
- Keep container tightly closed.
- Absorb spills with absorbent materials such as cloth and wool and collect in closed container. For extensive spillage, prevent outflow with land elevation.
- Provide earthing leads and an explosion-prevention for electrical equipments and installations.
- Absorb spills with non combustible materials such as dry sand and soil and collect in closed container. For extensive spillage, prevent outflow with land elevation.
- Provide a suitable fire extinguisher for a precaution of a fire.
- Do not let spills to drains, rivers and sea. Special care must be taken for environmental protection.

Storage

- Avoid direct sun light
- Keep away from heat, open fire and ignition sources etc.
- Store in a well ventilated place.
- Store containers against descent and fall in earthquake etc.
- Keep away from reach of children, water , food and feed stocks.

8. Exposure Controls and Personal Protection

Not contain restricted occupational exposure material

Ingredient Name	Exposure Limit	ACGIH (TLV)
Cuprous oxide	-	-
Copper (II) oxide	-	-
4,5-Dichloro-2-n-octyl-4-isothiazolin-3-one	-	-
Silicon dioxide	-	-
Xylene	50ppm	100ppm
Ethylbenzene	20ppm	100ppm
Tricresyl phosphate	-	-
MIBK	20ppm	20ppm
Gum Rosin	-	-

Equipment Requirement

- Install the equipment of the explosion-proof type.
- Install the ventilation to control airborne concentrations below the exposure limits.
- Provide earthing leads to equipments for transportation, loading / unloading and stirring of a liquid.
- When working in the confined space, provide a local ventilation to circulate the air sufficiently.
- Provide eye washes and showers for emergency use. Showed the location of the installation.

Protection

Respiratory Protection

- Wear the gas mask for organic vapours for short term or lower exposure level.
- Under emergency of high level of exposure , use self-contained breathing

apparatus(SCBA) or use suitable respiratory protection meeting NIOSH or relevant legislation.

Eye Protection

- Wear chemical splash goggles. Under possible chemical splash circumstances, wear chemical splash eye shield. Normal goggles can not provide adequate protection.

Hand and Skin Protection

- Wear the appropriate gloves which are not permeable with the organic solvent or chemicals.
- Wear cloths that impermeable with chemicals including rubber apron which do not expose skin directly
- Wear safety shoes and boots that is chemical resistant.
- Contaminated gloves or clothing should be replaced

Other Protection

- Monitoring the PPE periodically. During work, no smoking and eating. After work, should wash the body thoroughly.
- During working for electrostatic coating, wear appropriate antistatic shoes.

9. Physical and Chemical Properties

Apperance	:	Colored liquid
Odour	:	Solvent odour
Colour	:	Light Brown
Boiling Point	:	117.0 ~ 144.4 ^{0} C
Flash Point	:	23.0^0 C (close cup)
Explosion Limits	:	(lower limit) 1.1% (upper limit) 8.0 %
Vapour Pressure	:	2133 Pa (20^{0}C)
Density	:	1.85 ~ 1.95
pH	:	Not applicable
Auto-ignition Point	:	432 ^{0} C

10. Stability and Reactivity

Stability	:	Stable under normal conditions of use. Reacts with strong oxidizing agent and strong acids.
Hazardous Decomposition Products	:	Generate smoke, carbon dioxide, carbon monoxide and other toxic gases.
Other reactivity information	:	No reaction is generated in particular
Conditions to avoid	:	Avoid heat, sparks, open flames and other ignition sources.
Material to avoid	:	Strong oxidizing agents, strong acids

11. Toxicological Information

Material categorized as “Not Classified” or “Classification not Possible” by GHS are not described.

Silicon Dioxide

Acute toxicity : No data available

Cuprous Oxide
Acute toxicity LD50 (oral) : 470 mg/kg

Serious eye damage / irritation : Category 2
Specific target organ/systemic toxicity(single exposure) : Category 1 (systemic toxicity)
Specific target organ/systemic toxicity(single exposure) : Category 3 (respiratory tract irritation)

Copper (II) oxide
Acute toxicity : No data available

4,5-Dichloro-2-n-octyl-4-isothiazolin-3-one
Acute toxicity
LD 50 (oral) : 4400 mg/kg
LD 50 (Dermal) : 2000 mg/kg
LD 50 (oral) : 1.04mg/L (1 hour)

Xylene
Acute toxicity
LD 50 (oral) : 3500 mg/kg
LC 50 (Inhalation) : 29.08mg/L (41 hours)

Serious eye damage / irritation : Category 2A
Skin corrosion / irritation : Category 2
Reproductive toxicity : Category 1B
Specific target organ/systemic toxicity(single exposure) : Category 1 (respiratory organs, central nervous system, kidney)
Specific target organ/systemic toxicity(single exposure) : Category 3 (anesthetic action)
Specific target organ/systemic toxicity(repeated exposure) : Category 1 (respiratory organs, nervous system)

Ethylbenzene
Acute toxicity Oral (LD50) : 3500mgkg
Inhalation(LC50) : 17.2mg/L (4 hours)

Serious eye damage / irritation : Category 2B
Carcinogenicity : Category 2
Reproductive toxicity : Category 1B
Specific target organ/systemic toxicity(single exposure) : Category 1 (central nervous system)
Specific target organ/systemic toxicity(single exposure) : Category 3 (respiratory tract irritation,)
Aspiration hazards : Category 1

Tricresyl Phosphate
Acute toxicity : No data available

Reproductive toxicity : Category 1B
Specific target organ/systemic toxicity(single exposure) : Category 1 (central nervous system)
Specific target organ/systemic toxicity(repeated exposure) : Category 2 (adrenal)
Specific target organ/systemic toxicity(repeated exposure) : Category 1 (nervous system)

Methyl Isobutyl Ketone
Acute toxicity Oral (LD50) : 2500mgkg
Inhalation(LC50) : 8.2mg/L (4 hours)

Serious eye damage / irritation : Category 2B
Carcinogenicity : Category 2
Specific target organ/systemic toxicity(single exposure) : Category 3 (respiratory tract irritation, anesthetic action)
Specific target organ/systemic toxicity(repeated exposure) : Category 1 (nervous system)

Gum rosin
Acute toxicity
Dermal (LD50) : 2500mgkg
Inhalation(LC50) : 2.3 mg/L (4 hours)

Serious eye damage / irritation : Category 2B
Respiratory sensitizers : Category 1
Skin sensitizers : Category 1

12. Ecological Information

*Pay careful attention to leakage and waste disposal as it may seriously influence to the environment.
*No data available for the mixture
Harmful Information On Substance

12.1 Toxicity

Cuprous oxide	Fish (cyprinodont variegates/LC50/>25.4mg/L / 96hr Algae / EC50 / 440mg/L / 72hr
Copper (II) oxide	Fish (Oncorhynchus Mykiss/LC50/>0.17mg/L / 96hr Daphnia Magna / EC50 / 0.011-0.039 mg/L / 48hr
4,5-Dichloro-2-n-octyl-4-isothiazolin-3-one	Fish (Oncorhynchus Mykiss /LC50/>0.0027mg/L / 96hr Algae / EC50 / 0.022mg/L / 72hr
Silicon dioxide	Fish (Brachydanio Rerio/LC50/ 5000mg/L / 96hr Algae / EC50 / 440mg/L / 72hr
Xylene	Fish (Roccus Saxatilis/LC50/>2mg/L / 96hr Algae / EC50 / 3.2mg/L / 72hr
Tricresyl phosphate	Fish (Oncorhynchus Mykiss /LC50/0.56mg/L / 96hr Algae / EC50 / 0.4042mg/L / 72hr
MIBK	Fish (Fathhead Minnow/LC50/505mg/L / 96hr Algae / EC50 / 980mg/L / 72hr
Gum Rosin	Fish (Damio Rerio/LC50/100mg/L / 96hr Algae / EC50 / 100mg/L / 72hr

12.2 Persistance and Degradability

Cuprous oxide	Not readily biodegradable BOD : No data / COD : No data
Copper (II) oxide	Not readily biodegradable BOD : No data / COD : No data
4,5-Dichloro-2-n-octyl-4-isothiazolin-3-one	Readily Biodegradable BOD : No data / COD : No data
Silicon dioxide	Not readily biodegradable BOD : No data / COD : No data
Xylene	Biodegration (88%) – 28 days Readily Biodegradable BOD : No data / COD : No data
Tricresyl phosphate	Biodegration (82%) – 28 days Readily Biodegradable BOD : No data / COD : No data
MIBK	Biodegration (84%) – 14days Readily Biodegradable BOD : 2.06mg/g / COD : 2.16 mg/g
Gum Rosin	No data available

12.3 Bioaccumulation Potential

Cuprous oxide	No data available
Copper (II) oxide	No data available
4,5-Dichloro-2-n-octyl-4-isothiazolin-3-one	Log Pow : 6.4 / BCF : No data Potential : high
Silicon dioxide	No data available
Xylene	Log Pow : 3.12 / BCF : 8.1 – 25.9 Potential : low
Tricresyl phosphate	Log Pow : 4.63 / BCF : 144 Potential : high
MIBK	Log Pow : < 34 / BCF : 2 - 5 Potential : low
Gum Rosin	No data available

12.4 Mobility in soil

Cuprous oxide	No data available
Copper (II) oxide	No data available
4,5-Dichloro-2-n-octyl-4-isothiazolin-3-one	No data available
Silicon dioxide	No data available
Xylene	It will be highly mobile and may contaminate ground water. Floats on water
Tricresyl phosphate	No data available
MIBK	It will be highly mobile and may contaminate ground water. Floats on water
Gum Rosin	No data available

12.5 PBT & vPvB Assessment

* not available

13. Disposal Information

Disposal Property : Hazardous Waste
Disposal Method :

- Paint ingredient, incinerated ash and used container should be disposed by recognized companies which are licensed as industrial waste disposal collector by relevant authority.
- Do not dispose the sewage to the ground and drains after washed a container, instrument and a like.
- Incineration waste and waste water should be disposed in accordance with the regulations and legislation for waste disposal.
- Paint and wastes should be disposed and to have absorbed with diatomite thru open type incinerator. (the incinerator should be installed with necessary equipments against dioxin)

14. Transport Information

Make sure there are no damage, corrode and leak on the product container. Products should be also prevented from falling, loosening or tumbling during transit. Packing, labeling and transportation should be carried out in accordance to local related regulation.

UN No	:	1263
UN Proper shipping name	:	Paint
UN Class	:	Flammable Liquid (class 3)
Packing Group	:	III
Marine Pollutant (yes/no)	:	Yes
Emergency response guide no.	:	128
Precaution for Transportation	:	Carry personal protective equipment and fire extinguisher

Container may damage, dented , leaked and spilled during loading/unloading and transportation. Avoid direct sunlight and transit in high temperature.

15. Regulation Information

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

- Environmental Public Health (toxic Industrial Waste) Regulation 1988
- Workplace Safety and Health , Protection and Management Act
- Fire Safety Act (Chapter 109A)
- Environmental Protection and Management Act
- SS 586: Part 1 – Transport and storage of dangerous good
- SS 586 : Part 2 – Globally harmonized system of classification and labeling of chemicals – Singapore's adaptations.
- SS 586 : Part 3 – Preparation of Safety Data Sheets.
- IMO GHS purple guide book
- Japan Paint Manufacturers Association "Chemical Data Base for MSDS (paints)
- Database of National Institute of Technology and Evaluation (NITE).
- Raw Materials makers' " Material Safety Data Sheet".
- Sewage and Drainage Act (Chapter 294).

16. Other Information

Supporting Information Comply with AFS/CONF/26.

" This product does not contain organotin compounds acting as biocides and complies with the International Convention on the control of harmful anti-fouling systems on ships as adopted by IMO in 2001. (AFS/CONF/26)"

Type of antifouling system : Self Polishing Tin-free Anti Fouling paint
Name of Manufacturer : ANS Surface Technology Pte. Ltd.
Name of Paint : STABILIS AF 100 LIGHT BROWN
Color : Light Brown

Note : This name is shown on the product container. All products produce/distribute by distributors/factories authorized by ANS Surface Technology Pte. Ltd. carrying this product name complies with the IMO convention. (AFS/CONF/26)

Active Ingredients :	CAS No
Cuprous Oxide	1317-39-1
4,5-Dichloro-2-N-Octyl-4-isothiazolin-3-one	64359-81-5

Disclaimer
This information is based on our current knowledge and is intended to describe the product for the purpose of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product. We do not assume any liability whatsoever for the accuracy or completeness of the information contained herein. Health and safety precautions in this data sheet may not be adequate for all individuals and/or situations. It is the user's obligation to evaluate and use this product safely and to comply to all applicable national laws and regulations. This MSDS may be amended in the newly acquired knowledge.

Abbreviations and Acronyms

* CAS	:	Chemical Abstracts Service
* ACGIH	:	American Conference of Governmental Industrial Hygienists
* TLV	:	Threshold Limit value
* ppm	:	Part per million
* LEL	:	Lower Explosive limit
* UEL	:	Upper Explosive limit
* LD 50	:	Lethal Dose, 50% or Median Lethal Dose
* LC 50	:	Lethal Concentration, 50% or Median Lethal Concentration
* EC 50	:	Half Mamximal Effective Concentration
* BOD	:	Biological Oxygen Demand
* COD	:	Chemical Oxygen Demand
* Log Pow	:	Octanol-Water Partition Coefficient
* BCF	:	Bio Concentration Factors