Safety Data Sheet
according to Globally Harmonized System (GHS)

Printing date 05.01.2018 Revision: 05.01.2018

1 Identification of the substance/mixture and of the company/undertaking

· **Product identifier**
· **Trade name: 31% Hydrogen Peroxide**
· **Applicable Models:** HPU31

· **Synonyms:** Hydrogen Peroxide, H_2O_2
· **CAS Number:** 7722-84-1

· **Relevant identified uses of the substance or mixture and uses advised against** :
· **Identified/Recommended uses:**
Etching
Equipment/Machinery Cleaning Agent
Metal Surface Treatment
Oxidant for semicnductor manufacturing

· **Details of the supplier of the safety data sheet**
· **Manufacturer/Supplier:**
Chang Chun Petrochemical Co. Ltd.
7th Fl., No. 301, SongJiang Rd.
Taipei City, 10483, TAIWAN
Tel: +886-2-2500-1800 Fax:+886-2-2501-8018
WWW.CCP.COM.TW

· **Further information obtainable from:** SDS-info@ccp.com.tw
· **Emergency telephone number:** During normal opening times: +886 2 2500 - 1800 (8:30-17:30; GMT+8)

2 Hazards identification

· **Classification of the substance or mixture:**

Acute Tox. 4	H302	Harmful if swallowed.
Acute Tox. 5	H333	May be harmful if inhaled.
Eye Dam. 1	H318	Causes serious eye damage.
Aquatic Chronic 4	H413	May cause long lasting harmful effects to aquatic life.

· **Label elements:**
· **Hazard pictograms:**

GHS05 GHS07

· **Signal word:** Danger

· **Hazard-determining components of labelling:**
hydrogen peroxide solution
· **Hazard statements:**
Harmful if swallowed.
May be harmful if inhaled.
Causes serious eye damage.
May cause long lasting harmful effects to aquatic life.
· **Precautionary statements:**
Wear eye protection / face protection.
IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell.
IF INHALED: Call a POISON CENTER/doctor if you feel unwell.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Immediately call a POISON CENTER/doctor.

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Dispose of contents/container in accordance with local/regional/national/international regulations.

3 Composition/information on ingredients

· **Chemical characterisation: Mixtures**
· **Description:** Mixture: consisting of the following components.

· **Dangerous Components:**		
7722-84-1	hydrogen peroxide solution Ox. Liq. 1, H271; Skin Corr. 1A, H314; Acute Tox. 4, H302; Acute Tox. 4, H332	30-32%

· **Non-Hazardous Component(s):**

Substance Name:	CAS No:	%
Water	7732-18-5	68-70%

· **Additional information:** For the wording of the listed hazard phrases refer to section 16.

4 First aid measures

· **Description of first aid measures**
· **General information:**
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
· **After skin contact:**
Immediately wash with water and soap and rinse thoroughly.
If skin irritation continues, consult a doctor.
· **After eye contact:**
Rinse immediately with plenty of water, also under the eyelids, for at least 20 minutes.
Call a doctor immediately.
· **After swallowing:** Do not induce vomiting; call for medical help immediately.
· **Most important symptoms and effects, both acute and delayed:**
Irritant effects
Burning sensation
Breathing difficulty
mucosal irritations
Nausea
Gastric or intestinal disorders
Respiratory arrest
· **Indication of any immediate medical attention and special treatment needed**
Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5 Firefighting measures

· **Extinguishing media**
· **Suitable extinguishing agents:**
Water
Use fire extinguishing methods suitable to surrounding conditions.
· **Special hazards arising from the substance or mixture**
Not combustible.
Has a fire-promoting effect due to release of oxygen.

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Can form explosive gas-air mixtures.
· **Advice for firefighters**
· **Protective equipment:**
Wear protective fire fighting clothing (including fire fighting helmet, coat, trousers, boots, and gloves).
· **Additional information**
Avoid contact with skin, eye, and clothing.
Collect contaminated fire fighting water separately. It must not enter the sewage system.

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures**
Wear protective equipment. Keep unprotected persons away.
Keep people at a distance and stay on the windward side.
· **Environmental precautions:**
Inform respective authorities in case of seepage into water course or sewage system.
Dilute with plenty of water.
Do not allow to enter sewers/ surface or ground water.
· **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Pick up mechanically.
Ventilate the area.
Dispose contaminated material as waste according to item 13.
· **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

· **Handling:**
· **Precautions for safe handling**
Do not handle until all safety precautions have been read and understood.
Do not refill residue into storage receptacles.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Use only clean and dry utensils.
Ensure that eyewash stations and safety showers are close to the workstation location.
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
Wear protective gloves/protective clothing/eye protection/face protection.
· **Information about fire - and explosion protection:**
Normal measures for preventive fire protection.
Keep ignition sources away - Do not smoke.
Protect from heat.
· **Storage:**
· **Requirements to be met by storerooms and receptacles:**
Provide ventilation for receptacles.
Close containers in such way to enable internal pressure to escape (e.g. excess pressure valve).
Suitable material for receptacles and pipes: Stainless steel.
Suitable material for receptacles and pipes: Aluminium.
Approved grades of HDPE
Store in a cool location.
· **Further information about storage conditions:**
Protect from contamination.
Regularly check the condition and temperature of the containers/receptacles.

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Keep container tightly sealed.

8 Exposure controls/personal protection

· **Additional information about design of technical facilities:**
Use local exhaust ventilation, or other engineering controls to maintain airborne levels below exposure limit requirements or guidelines.
Local exhaust ventilation may be necessary for some operations.
Technical measures and appropriate working operations should be given priority over the use of personal protective equipment.

· **Control parameters**

· **Ingredients with limit values that require monitoring at the workplace:**	
7722-84-1 hydrogen peroxide solution	
TLV (Korea)	Long-term value: 1.5 mg/m³, 1 ppm

· **Exposure controls**
· **Personal protective equipment:**
· **General protective and hygienic measures:**
Ensure that eyewash stations and safety showers are close to the workstation location.
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing
Wash hands before breaks and at the end of work.
Avoid contact with the eyes.
Be sure to clean skin thoroughly after work and before breaks.
Ensure that washing facilities are available at the work place.

· **Respiratory protection:**
Use suitable respiratory protective device in case of insufficient ventilation.
Required when vapours/aerosols are generated.
Short term filter device:
Filter A/P2
Filter B

· **Protection of hands:**
The selected protective gloves have to satisfy the specifications of standard EN 374 or its equivalent.
Replace gloves immediately when torn or any change in appearance (dimension, colour, flexibility etc) is noticed.
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
· **Material of gloves**
Nitrile rubber, NBR
PVC gloves
Neoprene gloves
Full Contact:
Recommended thickness of the material: ≥ 0,6 mm
Splash Contact:
Recommended thickness of the material: ≥ 0.11 mm
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.
· **Penetration time of glove material**
Full Contact:
Break through time: > 480 min

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Splash Contact:
Break through time: > 30 min
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

· **Eye protection:**
Face protection

Tightly sealed goggles

Safety glasses with side shields conforming to EN166, ANSI 87.1-2010, or equivalent.

· **Body protection:**
Acid resistant protective clothing
The type of protective equipment must be selected according to the concentration and amount of the dangerous substance at the specific workplace.

9 Physical and chemical properties

· **Information on basic physical and chemical properties**
· **General Information**
· **Appearance:**

Form:	Fluid
Colour:	Colourless
· **Odour:**	Pungent
· **Odour threshold:**	Not determined.
· **pH-value at 20 °C:**	<5
· **Change in condition**	
Melting point/freezing point:	-27 °C
Initial boiling point and boiling range:	108 °C
· **Flash point:**	Not applicable.
· **Flammability (solid, gas):**	Not applicable.
· **Decomposition temperature:**	Not determined.
· **Auto-ignition temperature:**	Product is not selfigniting.
· **Explosive properties:**	Product does not present an explosion hazard.
· **Explosion limits:**	
Lower:	Not applicable
Upper:	Not applicable
· **Vapour pressure at 30 °C:**	24 mm Hg
· **Density at 20 °C:**	1.11 g/cm³
· **Relative density**	Not determined.
· **Vapour density**	Not determined.
· **Evaporation rate**	Not determined.
· **Solubility in / Miscibility with water:**	Fully miscible.
· **Partition coefficient: n-octanol/water:**	Not determined.

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· **Viscosity:**
Dynamic: Not determined.
Kinematic: Not determined.

· **Solvent content:**
Organic solvents: 0.0 %
Water: 69 %
VOC (EC) 0,00 %

· **Other information** No further relevant information available.

10 Stability and reactivity

· **Reactivity:**
Vapour may form explosive mixture with air.
This product is a strong oxidizing agent and can be reactive.
When properly handled and stored, no dangerous reaction is known.

· **Chemical stability:**
Heat-sensitive
Sensitivity to light.
This product is stable under prescribed use and storage.

· **Thermal decomposition / conditions to be avoided:**
To avoid thermal decomposition do not overheat.
Exothermic thermal decomposition.

· **Possibility of hazardous reactions:**
Reacts with impurities.
Reacts with certain metals.
Photoreactive.

Risk of ignition or formation of flammable gases or vapours with:
&

Risk of explosion with:
Impurities
Decomposition catalysts
Metals
Metallic salts
Alkalis.
organic solvent
Concentrated sulfuric acid
Reducing agents.

· **Conditions to avoid:**
Heating
Contamination.
pH variations
Exposure to UV-rays

· **Incompatible materials:**
Oil, strong alkalis, hydrides, anhydride, impurities, decomposition catalyst, organic nitro compounds, acid, alkali salts, alkali hydroxide, reducing agents, powdered metals, heavy metals, combustible substances, activated charcoal, metallic salts, organic substances, hydrazine and derivatives, peroxi compounds, permanganates, alkali metals, acetaldehyde, phosphorous, metals, metal oxides, alcohols, aldehydes, strong oxidizing agents, acetic acid, ammonia, acetone, lead, nonmetals, potassium, iodides, alkaline earth metals, methanol, sodium, ether, oxides of phosphorus, organic solvent, concentrated sulfuric acid, nonmetallic oxides, brass, transition metal, anilines, oxygen

· **Hazardous decomposition products:**
Oxygen

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Steam

11 Toxicological information

· **Information on toxicological effects**

· **Acute toxicity**
Harmful if swallowed.
May be harmful if inhaled.
ATE (inhalation): 1.5 mg/L (estimated)
Component: 70% H2O2 (CAS No 7722-84-1)
LD50 (oral): 801- 872 mg/kg BW (US EPA Guideline PB82 -232984)
LC50 (inhalation) : >0,17 mg/L (US-EPA Vol 50 (§798,1150))
· **Skin corrosion/irritation:**
Not classified based on available data.
Concentration limit triggering irritation classification is at ≥35% and corrosion classification is at 50≥%.
· **Serious eye damage/eye irritation:**
Causes serious eye damage.
Cocentration limit triggering eye irritation is at ≥5% and serious eye damage is at ≥8%.
· **Respiratory or skin sensitization:** Not classified based on available data.
· **Germ Cell Mutagenicity:** Not classified based on available data.
· **Carcinogenicity:** Not classified based on available data.
· **Reproductive Toxicity:** Not classified based on available data.
· **Specific Target Organ Toxicity - Single Exposure (STOT SE):**
Not classified based on available data.
Concentration limit triggering respiratory irritation is at ≥35%.
· **Specific Target Organ Toxicity - Repeated Exposure (STOT RE):**
Not classified based on available data.
· **Aspiration Hazard:**
Not classified based on available data.
Based on physical properties, not likely to be an aspiration hazard.

· **Primary irritant effect:**
· **Skin corrosion/irritation** No irritating effect.
· **Serious eye damage/irritation** Strong irritant with the danger of severe eye injury.
· **Respiratory or skin sensitisation** Based on available data, the classification criteria are not met.
· **Additional toxicological information:**
Harmful
Irritant

12 Ecological information

· **Toxicity**
· **Aquatic toxicity:**
May cause long lasting harmful effects to aquatic life.
LC50 (96hr, freshwater fish): 16.4 mg/L (OECD N/A; USEPA Guideline; 50% H2O2)
EC50 (Daphnia Magna, 48hr): 2.4 mg/L (OECD N/A; USEPA Guideline; 50% H2O2)
NOEL (Daphnia Magna, 21d)=0,63 mg/L (OECD N/A; ASTM Designation E 1193-9)
ErC50 (alga, 72hr): 1.38 mg/L (OECD N/A; Paris Commiss. guideline)

· **Persistence and degradability**
Easily biodegradable
Degradation : >99% (30 min, OECD 209)

· **Bioaccumulative potential**
Bioaccumulation is unlikely.

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Partition coefficient, n-octanol/water (log Pow) : -1.57
Source: External (M)SDS

· **Mobility in soil** Henry's Law Constant (H) : 0.00075 Pa m³/mol
· **Additional ecological information:**
· **General notes:**
Water hazard class 1 (German Regulation) (Self-assessment): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· **Recommendation**
No mixing with other waste.
Contact waste processors for recycling information.
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
Any disposal method should also comply with national, regional, provincial, and local laws.

· **Uncleaned packaging:**
· **Recommendation:**
Empty contaminated packagings thoroughly. They may be recycled after thorough and proper cleaning.
Disposal must be made according to official regulations.
· **Recommended cleansing agents:** Water, if necessary together with cleansing agents.

14 Transport information

· **UN-Number**
· **ADR, IMDG, IATA** UN2014

· **UN proper shipping name**
· **ADR** 2014 HYDROGEN PEROXIDE, AQUEOUS SOLUTION
· **IMDG, IATA** HYDROGEN PEROXIDE, AQUEOUS SOLUTION

· **Transport hazard class(es)**

· **ADR**

· **Class** 5.1 Oxidising substances.
· **Label** 5.1+8

· **IMDG**

· **Class** 8 Corrosive substances.

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Trade name: 31% Hydrogen Peroxide

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· **Label** 5.1/8

· **IATA**

· **Class** 8 Corrosive substances.
· **Label** 5.1 (8)

· **Packing group**
· **ADR, IMDG, IATA** II

· **Environmental hazards:**
· **Marine pollutant:** No
· **Special precautions for user** Warning: Oxidising substances.
· **Danger code (Kemler):** 58
· **EMS Number:** F-H,S-Q
· **Segregation groups** Peroxides
· **Stowage Category** D
· **Stowage Code** SW1 Protected from sources of heat.
· **Segregation Code** SG16 Stow "separated from" class 4.1
SG59 Stow "separated from" permanganates
SG72 See 7.2.6.3.2.

· **Transport/Additional information:**

· **ADR**
· **Limited quantities (LQ)** 1L
· **Excepted quantities (EQ)** Code: E2
Maximum net quantity per inner packaging: 30 ml
Maximum net quantity per outer packaging: 500 ml

· **IATA**
· **Remarks:** Forbidden for IATA when hydrogen peroxide concentration is greater than 40%
· **UN "Model Regulation":** UN 2014 HYDROGEN PEROXIDE, AQUEOUS SOLUTION, 5.1 (8), II

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**

· **Status of global inventories:**
All component(s) within this product is listed or exempted from the following country's chemical inventory:
USA – TSCA
Australia – AICS
Canada – DSL
China – IECSC
EU – EINECS/NLP
Japan – ENCS
Korea – KECI
New Zealand – NZIoC
Philippines – PICCS
Taiwan – TCSI

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· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

· **Abbreviations and acronyms:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European LIst of Notified Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
VOC: Volatile Organic Compounds (USA, EU)
Ox. Liq. 1: Oxidizing liquids – Category 1
Acute Tox. 4: Acute toxicity – Category 4
Acute Tox. 5: Acute toxicity – Category 5
Skin Corr. 1A: Skin corrosion/irritation – Category 1A
Eye Dam. 1: Serious eye damage/eye irritation – Category 1
Aquatic Chronic 4: Hazardous to the aquatic environment - long-term aquatic hazard – Category 4

· **Sources**
Most toxicological and eco-toxicological data are obtained from European Chemical Agency (ECHA)'s public dissemination website.
Registered Substance: https://echa.europa.eu/registration-dossier/-/registered-dossier/15701/1
EU Mandatory C&L Classification: https://echa.europa.eu/information-on-chemicals/cl-inventory-database/-/discli/details/53297
The European Chemical Industry Council (CEFIC)'s Peroxygens Sector Group on classification & labeling: http://www.cefic.org/Documents/Industry%20sectors/Peroxygen-SG/H2O2_classification%20and%20labelling.pdf

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