



Industrial Circulating Water and Waste Water  
Germicide and Algicide

New Generation Germicide and Algicide  
**Rosun Disinfectant Powder ICW-01**

— Potassium Monopersulfate Compound Powder (PMPS)

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water

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## Company Profile

Chengdu Rosun Disinfection Pharmaceutical Co., Ltd., established in 2002, is a large high-tech enterprise that focuses on R&D, production and application of high-end environmental germicide, algicide and water treatment products, also specialized in water treatment engineering design, operation and management.

Our company has got ISO9001, ISO14001 & OHSAS18001 certificates, and established 26 service offices in the major capital cities of China. Marketing network is all over the world, our products have been exported to more than 20 countries and regions in Asia, Africa, Europe, America, Oceania, etc.

Rosun disinfectant powder ICW-01, exclusive active oxygen germicide and algicide, green and ecofriendly, will greatly improve the treatment efficiency of industrial waste water and industrial circulating cooling water, reduce traditional disinfectant risk in the process of production, transportation and use, and can avoid the harm to the environment and human body effectively which traditional chlorine disinfectant caused.

We take the business philosophy "focus, concentration, profession". Rosun and Rosun people will continue to protect millions of people's health well as always!



## Product Introduction

The main ingredient of Rosun disinfectant powder ICW-01 is potassium monopersulfate compound powder (PMPS). Processed through the balance system, PMPS continuously release active oxygen by the chain reaction in the water, and further produce potassium sulfate and a variety of active ingredients, such as hypochlorous acid, sulfate free radical, hydrogen peroxide free radical, hydroxyl free radical, etc. Those free radicals have strong oxidation ability, exceeding that of the chloride, potassium permanganate, hydrogen peroxide, can attack and degrade organic pollutants at any time, kill bacteria and algae, and no harmful substances produced. Its strong sterilization capability reflects in less dosage and hence lower the cost.

Rosun disinfectant powder ICW-01 is applicable to the industrial circulating water and waste water for sterilization and algae removal, and it can replace non-oxidation fungicide like isothiazolinone and quaternary ammonium salt partly even fully. Moreover, it can avoid the COD increasing and secondary pollution of circulating water. This product has good compatibility with common corrosion scale inhibitor and does not affect its performance.



## Physical Characters

**Main ingredient:** Potassium monopersulphate compound salt, sodium chloride

**Activity:** Total active oxygen [O]: 7.0% ~9.0%

**Form:** White powder

**Solubleness:** Soluble in water

**Bulk density:** 0.9g/cm<sup>3</sup>

**Period of validity:** 24 months in room temperature storage

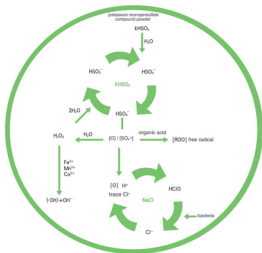


## Direction for Use

- ★ **Scope of application:** Applicable to the industrial circulating water and waste water for sterilization and algae removal in the realm of petrochemical industry, electric power industry, metallurgy, fertilizer, oil exploitation, etc
- ★ **Dosage:** 8-15g/m<sup>3</sup>(for normal water quality), 30g/m<sup>3</sup>(for material leakage)
- ★ **Dosing method:** Directly add into the water inlet of the pool or circulating water pump
- ★ **Material to avoid:** reductant,acids,inflammable,organics,heavy metallic salt,cyanide,halide

## Product Mechanism

PMPS elicit cycle dynamic chain reaction after soluble in water under the synergy of the best match raw materials, decompose of a large number of active oxygen[O]and obtain a variety of active ingredients, such as the hydroxyl free radical[-OH], hydrogen peroxide free radical [ $H_2O_2$ ], hypochlorous acid HClO, etc. Sterilize and kill algae cooperatively.



Cycle Dynamic Chain Reaction



## Mechanism of Action

- Rosun disinfectant powder ICW-01 produces high energy & high active ingredients ,such as $[O]$ ,  $[SO_2^-]$ , $[-OH]$ ,which can oxidize and chlorinate the pathogen,and kill breeding bacteria.
- The active oxygen ion and chloride penetrate the cell wall and cell membrane into cell nucleus and kill the bacteria rapidly. It also can produce hydroxyl free radical to destroy genetic system.
- It can increase the permeability of cell membrane, causing pathogen cell enzymes and nutrients lose,and protein denaturation, and thus kill the pathogen.

# Product Features

## ★ High efficiency broad - spectrum

The unprecedented high concentration active ingredient can kill harmful microorganisms quickly and completely. Many kinds of bactericidal ingredients ([O], [H<sub>2</sub>O<sub>2</sub>], [-OH] and HClO) make this product have super broad-spectrum sterilization effect, the antibacterial spectrum includes bacteria, viruses, fungi, bacteria spores, protozoa, algae spores, etc., especially for the microorganisms formed slime. And it is capable of stripping the slime and algal layer. The sterilizing rate is over 99.99% generally, efficacy maintains more than 72 hours.

## ★ Environmental protection

Rosun disinfectant powder ICW-01 is a kind of active oxygen disinfectant, will not combine with the carcinogenic precursors such as the element of humic acid which exist in the water, thus can reduce and prevent the production of harmful substances that may lead to carcinogenesis, teratogenesis and mutagenesis, such as organic chloride, THMS and chloroform. This product is no harm to human body, and is a real green germicide and algicide.

## ★ Safety

This product is a power disinfectant, so there is no danger exists during the production, transportation, storage and application which liquid chlorine causes.

## ★ Easy operation

Add the powder directly, do not need extra equipment and specialized technical personnel.



**★ Synergistic effect**

It has synergistic effect when used with common corrosion inhibitor, reduces the dosage of no oxidizing biocide, dosing frequency and the pressure of environmental discharge, also lowers the corrosion of equipment and prolongs the service life, and also can reduce the dosage of the corrosion inhibitor at the same time.

**★ Cost-effective**

The sterilizing effect of this product is significantly higher than traditional disinfectant products containing "chlorine", and only need the dosage of 30%-40% of traditional oxidizing biocides such as sodium dichloroisocyanurate, chlorine buttocks, etc. So it can lower costs to the factories and save social resources as well.

**★ Stable**

Under different cooling water quality and operating conditions, and in a wide range of PH and temperature, it is still effective without decomposition.



# Comparisons

## 1.Characteristic comparison

Liquid chlorine	Sodium dichloroisocyanurate	Chlorine dioxide	Chlorine tablet	Rosun disinfectant power ICW-01
<ul style="list-style-type: none"> <li>• Low -cost</li> <li>• Long history, experienced</li> <li>• High toxicity</li> <li>• Easy to leak out</li> <li>• Cause secondary pollution</li> </ul>	<ul style="list-style-type: none"> <li>• Easy to use</li> <li>• Easy to transport</li> <li>• Low toxicity</li> <li>• Instability in water</li> </ul>	<ul style="list-style-type: none"> <li>• Good disinfection effect</li> <li>• Small dosage</li> <li>• Strong corrosion</li> <li>• Hydrochloric acid leak</li> <li>• Solubility is greatly influenced by temperature</li> </ul>	<ul style="list-style-type: none"> <li>• Restrain the breed of bacterium</li> <li>• Cause COD increasing</li> <li>• Chlorine exceeded</li> </ul>	<ul style="list-style-type: none"> <li>• Safety and environmental protection</li> <li>• Small dosage, only 30%~40% of other chloride products</li> <li>• Easy to transport</li> <li>• Easy to use</li> <li>• Low cost</li> <li>• Strong oxidizing</li> <li>• Stripping effect to slime and other impurities</li> </ul>

## 2. Effect comparison

Disinfectant	Normal water quality			Material leakage		
	Dosage(g/m <sup>3</sup> )	Dosing intervals	Effect	Dosage(g/m <sup>3</sup> )	Dosing intervals	Effect
Rosun ICW-01	8-15	2-3 days	99.99%	30	2 days	99.99%
Sodium dichloroisocyanurate	25	1 day	Qualified	50	1 day	Unqualified
TCCA	25	1 day	Qualified	100	1 day	Unqualified
Kathon CG	100	2 weeks	Qualified	200	2 weeks	Unqualified
Quaternary ammonium salt	100	2 weeks	Qualified	250	2 weeks	Unqualified



### 3. Dosage comparison

Circulating water plant with retained water 10000 tons/hour.						
	Normal water quality			Material leakage		
Disinfectant	Dosage(g/m <sup>3</sup> )	Dosing intervals	Annual consumption (kg)	Dosage(g/m <sup>3</sup> )	Dosing intervals	Annual consumption (kg)
Rosun ICW-01	10	2-3 days	18250	30	2 days	54750
Sodium dichloroisocyanurate	25	1 day	91250	100	1 day	365000
TCCA	25	1 day	91250	50	1 day	182500
Kathon CG	100	2 weeks	24000	200	2 weeks	48000
Quaternary ammonium salt	100	2 weeks	24000	250	2 weeks	60000

Remark: Concentration factor calculated by 5, temperature calculated at 8 °C , evaporation loss calculated by 0.15% according to summer.

$$M = E(\text{evaporation loss}) + D(\text{windage loss}) + B(\text{blow-off water}) + F(\text{leakage loss}) = 360 + 60 + 30 = 450$$

$$E = e(t_1 - t_2) / (R - 8) = 0.15 / 100 \times 8 \times (30000 - 8) = 360$$

$$D = 0.2\%R = 0.2 / 100 \times 30000 = 60$$

$$B = [E / (5 - 1)] - D = 30$$


## Test Reports

### 1. Toxicological Test

(1)Testing institution: SICHUAN CENTER FOR DISEASE CONTROL AND PREVENTION

(2)Test category: Toxicological test

(3)Test result:

a. The disinfectant powder LD50 value of the acute oral toxicity on rat is 3409.6mg/kg, and 95% trust range is 2742.3mg/kg-4239.4mg/kg. Based on chemical materials' toxicities grading, it belongs to low toxicity.

b. After gavage feeding of the disinfectant to animals for 28 days, no obviously influence of the animal weight and weight organ ratio, the results of hematology regular test and the end biochemical index test have no obviously influence compared with negative control group, and histopathology examination results is negative.



## 2. Microbiology Test

(1) Testing institution: SICHUAN CENTER FOR DISEASE CONTROL AND PREVENTION

(2) Test category: Microbiology test

(3) Test result:

- a. The disinfectant average value of potassium monopersulfate content is 23.3%.
- b. Use 1% sodium thiosulfate + 1% Tween-80 0.03mol/L pH 7.2 PBS as neutralizer, can effectively neutralize the disinfectant solution (which potassium monopersulfate content is 3.7g/L) killing efficacy for spores of bacillus subtilis var niger and the disinfectant solution (which potassium monopersulfate content is 70mg/L) killing efficacy for candida albicans, the neutralizer and the product of neutralization have no influence to culture medium and the growth of spores of bacillus subtilis var niger and candida albicans.
- c. The disinfectant solution which potassium monopersulfate content is 3.7g/L, affected for 5min, the average killing logarithm value for spores of bacillus subtilis var niger >5.00.
- d. The disinfectant solution which potassium monopersulfate content is 100mg/L, affected for 10min, the average killing logarithm value for staphylococcus aureus >5.00.
- e. The disinfectant solution which potassium monopersulfate content is 100mg/L, affected for 10min, the average killing logarithm value for escherichia coli >5.00.
- f. The disinfectant solution which potassium monopersulfate content is 70mg/L, affected for 5min, the average killing logarithm value for candida albicans >4.00.
- g. In about 60 m<sup>3</sup> Laboratory, The disinfectant solution which potassium monopersulfate content is 4000mg/L, spray disinfection for 60min, the average killing rate for natural bacteria is 95.72%, meet qualified disinfection requirements.

### 3. Bactericidal capability test

(1) Testing institution: PetroChina Dushanzi Petrochemical Company

(2) Test category: Bactericidal capability test

(3) Test result:

Name	Concentration (mg/l)	Reaction time(h)	Viable bacteria (MPN/ml)	Control bacteria (MPN/ml)	Sterilizing rate (%)
Rosun disinfectant power ICW-01	15	4	100	$1.5 \times 10^5$	100
	15	8	30		100
	15	12	80		100
	15	24	0		100
	15	48	150		100
	15	72	$2.9 \times 10^3$		99.98



#### 4. Bactericidal capability test

(1)Testing institution:Yanshan petrochemical company

(2)Test Category:Bactericidal capability test

(3)Test result:

Name	Reaction time(h)	Concentration (mg/l)	Sterilizing rate (%)	Concentration (mg/l)	Sterilizing rate (%)
Rosun disinfectant power ICW-01	4	10	99.99	30	99.99
	24	10	99.99	30	99.99
	48	10	99.99	30	99.99
	72	10	99.99	30	99.99

Remark: original bacterial population:  $2.2 \times 10^7$  MPN/ml

5. This product has been written into Chinese book "Design Manual for Building Water Supply and Drainage 2<sup>nd</sup> Edition".





## Application Examples



China Oil And Gas Guangan Co., LTD



Huaneng Thermal Power Plant In Changchun



Xinjiang Markor Chemical Industry Co., LTD



Sichuan Hebang Corporation Limited.

PetroChina Dushanzi Petrochemical Company

Chengdu Weifu Industrial Co., LTD

Sihuan Pharmaceutical Co., LTD

Yanshan Petrochemical Company

and so on.



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