

Purchase Guidance for ECS consumable chemicals

Revision date : 01thSEP, 2023 (Ver2.5)

1. Purpose

In order to operate ECS (Electro-Clean™ System), there are 4 chemical consumables required. This guidance is to make you easier to purchase required consumables.

2. Required Chemicals

- (1-1) CLX Reagent (for TRO Sensor, Chlorine monitor)
- (1-2) DTS Reagent (for DPD TRO Sensor)
- (2) Purified water or Distilled water (to dilute normal type CLX reagent and DTS reagent)
- (3) Sodium Thiosulfate Pentahydrate (: Neutralizing agent)
- (4) Citric acid (: cleaning agent for EM Washing Unit)

3. What's the purpose of these chemical and how to purchase?

(1-1) CLX Reagent

This re-agent is used to measure TRO (Total Residual Oxidant) produced from ECS. TRO Sensor maker is called HF Scientific based in USA. There are two types of CLX-Reagent. One is for Explosion proof type equipment, the other one is for normal type.

<CLX : Normal type, HF 20040T>



Part No. → <HF 09952> : 1 month consumption per CLX. →

Replaced every month.

<EX-CLX : Explosion-Proof type, HF 28034>



<HF 09991> : 1 year consumption per EX-CLX.

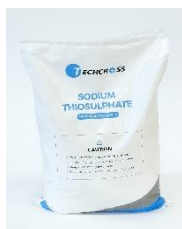
Replaced every 3 months.

Techcross recommends to purchase 12 month supply at minimum purchase quantity.

(3) Sodium Thiosulfate Pentahydrate (: Neutralizing agent)

CAS#	10102-17-7	Sodium Thiosulfate, Pentahydrate ($\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$)
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This sodium thiosulfate pentahydrate is used to neutralize produced TRO (Total Residual Oxidant) during de-ballasting.



Please use product which is provided from TECHCROSS.

If any problem due to not using the product which is provided from TECHCROSS, TECHCROSS cannot ensure about the malfunction.

Shelf Life : about 5 years

As neutralizer for ballast water treatment system. Consumption of sodium thiosulfate differs from its voyage time.

Neutralizing Agent ($\text{Na}_2\text{S}_2\text{O}_3 \cdot 5\text{H}_2\text{O}$) Consumption to TRO degradation

ECS Target TRO concentration : 7.5mg/L at Normal Condition

Discharging TRO concentration : <0.1mg/L (USA EPA Standard)

Days after Treat	ECS Target TRO with 7.5ppm	
	TRO (mg/L)	$\text{Na}_2\text{S}_2\text{O}_3$ Consumption (kg/1,000m ³)
0	7.5	50.38
1	2.7	18.14
2	1.5	10.08
3	1.53	10.28
4	1.12	7.52
5	0.71	4.77
6	0.68	4.57
7	0.31	2.08
8	0.41	2.75
9	0.06	0.40
10	0.05	0.34

* Note : The consumption of neutralizer have been calculated based on TRO degradation rate at annual average sea water condition and the actual consumption may be lower or higher in relation to seawater condition such as temperature, TSS and POC, and others.

(4) Citric acid, Anhydrous

CAS#	77-92-9	Citric acid, anhydrous
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This Citric acid is used to clean Electro Chamber unit after usage of 100 hours. Since the Citric acid is international common consumable part, you can purchase this citric acid from local chemical company. If the purity is more than 95%, It is okay to use the 'CAS# '77-92-9', as cleaning agent of EM washing unit.

< Consumption of Citric Acid >

(Unit : Liter)

Model	Amount of Fresh Water (Liter)	Amount of Cleaning agent (Kg)	Dilution ratio (%)
ECS 150	100	10	The mixing ratio is 10 : 1 (Freshwater : Cleaning reagent)
ECS 300	150	15	
ECS 450	185	18.5	
ECS 600	220	22	
ECS 1000	300	30	

Techcross tries to expand its distributor to worldwide and try to contact more distributors for easy purchase. We will update you more if there are any more distributors available.

*For procurement of spare parts and consumable items, send email to parts-sales@techcross.com

*For AS Service (AS Claim, Service work request, Troubleshooting, Crew training), send email to "as@techcross.com"

For general RFQ for BWMS consumable parts, please refer to following 'suppler list' contact point for your information.