

Purchase Guidance for ECS consumable chemicals

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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) CLX Reagent (for TRO Sensor, Chlorine monitor)
- (2) Purified water or Distilled water (to dilute normal type CLX 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) 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
Replaced every month.

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



Part No. → <HF 09991> : 1 year consumption per EX-CLX.
Replaced every 3 months.

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

(2) Purified water (or Distilled water)

In order to dilute CLX reagent (: Normal type = Non-Ex type), you can use 'Purified water' or 'Distilled water'. To dilute 12kit (=1set) of CLX Reagent, 12 bottles of Purified water (or Distilled water) are required. Since these chemicals are international common consumable parts, you can get this item at drugstore easily in the world.

(3) Sodium Thiosulfate Pentahydrate (: Neutralizing agent)

CAS#	10102-17-7	Sodium Thiosulfate, Pentahydrate (Na ₂ S ₂ O ₃ · 5H ₂ O)
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This sodium thiosulfate pentahydrate is used to neutralize produced TRO (Total Residual Oxidant) during de-ballasting. This is very common chemical available at any chemical companies.



Please make sure to use powder type sodium thiosulfate.

Not Liquid type.

Shelf Life : about 5 years

* Please note that CAS no. 7772-98-7 cannot be used as neutralizing agent for ECS.

If the purity is more than 95%, It is okay to use 'CAS# 10102-17-7' as neutralizer for ballast water treatment system. Consumption of sodium thiosulfate differs from its voyage time.

Neutralizing Agent (Na₂S₂O₃ · 5H₂O) 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)	Na ₂ S ₂ O ₃ Consumption (kg/1,000m ³)
0	7.5	54.8
1	2.6	22.0
2	1.8	16.3
3	1.4	13.8
4	1.0	11.0
5	0.6	8.6
6	0.6	8.4
7	0.3	6.8
8	0.2	6.1
9	0.0	4.7
10	0.0	4.5

* 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 100-200hours. 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	Space volume	Amount of Fresh Water (Liter)	Amount of Cleaning agent (Kg)	Dilution ratio (%)
ECS 150	60	80	8	10
ECS 300	80	100	10	10
ECS 450	110	130	13	10
ECS 600	140	160	16	10
ECS 1000	250	270	27	10

*Mixing ratio of fresh water and cleaning agent : 5 ~ 15%

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"](mailto:as@techcross.com)**

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