





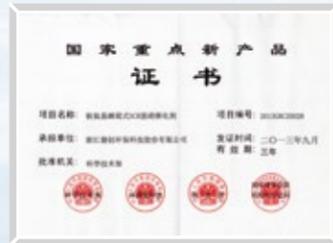
— COMPANY PROFILE

Tuna Marine, wholly owned by Zhejiang Tuna Environmental Science & Technology Co., Ltd. (**Stock symbol:603177**), is a high technology company specializing in marine environmental equipment developing and manufacturing.

For Sulphur oxides (SOX) emission in marine exhaust gas, Tuna Marine developed marine Exhaust Gas Cleaning System (TM-EGCS), using sea water (Open loop) and/or dosing caustic soda / magnesium oxide (close loop). For Nitrogen oxides (NOX) emission in marine exhaust gas, Tuna marine developed marine catalyst for marine Selective catalytic reduction (SCR) system.

Tuna Marine continuously provides various services to our clients, product supplier, EPC contractor etc.

COMPANY HONOR



PRODUCTS

EXHAUST GAS CLEANING SYSTEM (EGCS)

Application Background

With the development of international ocean shipping industries, the exhaust gas from ships has become the main pollution source in coastal areas, especially in ports areas. The air pollution caused by SOx in the exhaust gas from ships has attracted extensive attention of the international community. At present, there are four main technologies for desulfurization of exhaust gas from ocean ships, which are low sulfur fuel technology, LNG fuel technology, dry flue gas desulfurization technology and wet flue gas desulfurization(FGD) technology. At present, wet FGD technology has become the mainstream.

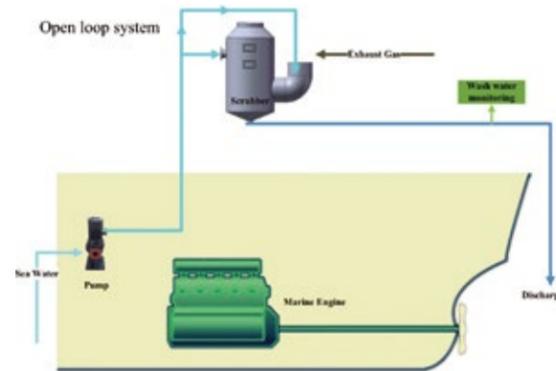
Product Overview

TUNA Corporation has more than 20 years of experience supplying scrubbers to power plants. The TM-EGCS developed by shanghai TUNA marine gives both environmental and economical advantages. Within the TM-EGCS, 3.5% Sulphur content HFO can be used instead of expensive low-Sulphur MGO, while still meeting the strict International Maritime Organization (IMO) regulations regarding Sulphur oxide emissions

Process Selection

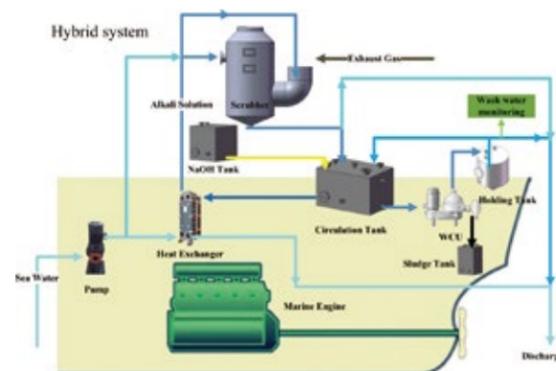
Open Loop System

In open loop system, ship flue gas passes through the scrubber tower and is directly washed by seawater for desulfurization. After desulfurization, the clean flue gas is discharged through the chimney, and the washed water is discharged after simple treatment in accordance with standard.



Hybrid System

The hybrid system integrates both open and close loop system and has the flexibility to operate seamlessly in either in low alkaline waters as well as the open ocean. Without the loss of efficiency and well within the IMO regulations for emission Air and Sea.

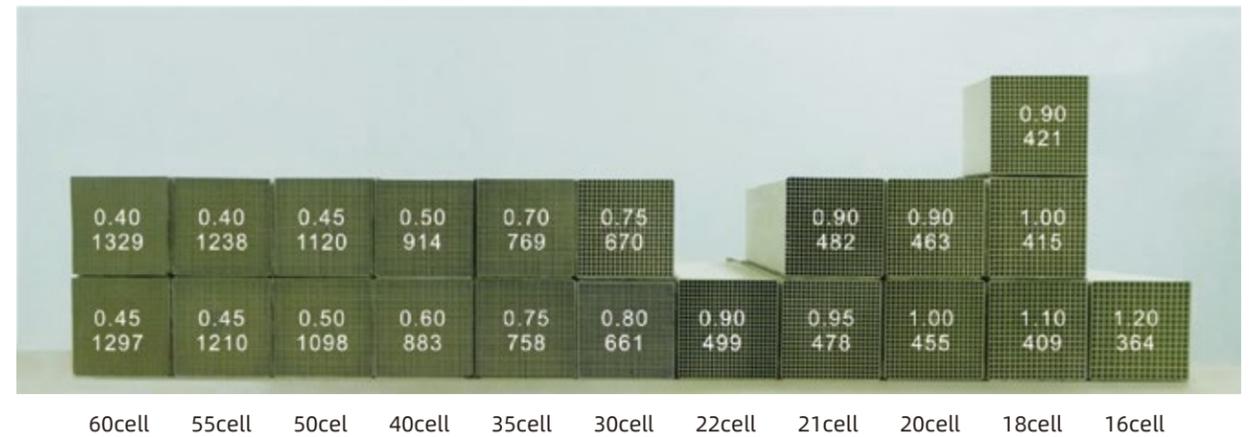


Emission control of marine NOx

Product Overview

Selective Catalytic Reduction (SCR) denitrification technology has become one of the main denitrification technologies for its high efficiency of denitration and stable performance and has been widely used in fields of electricity, coking and steel. The principle of SCR technology is taking ammonia as reductant to reduce NOx into N2 and H2O under the action of the catalyst. The core of SCR technology lies in the catalyst.

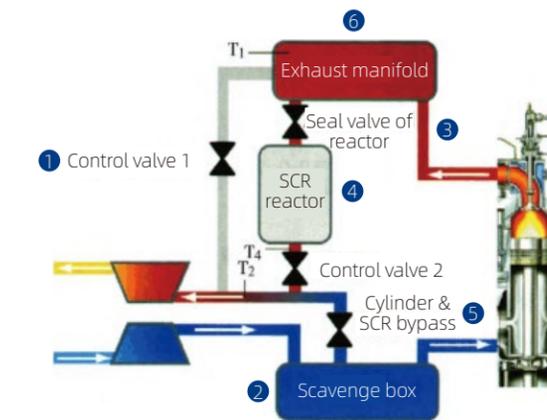
TUNA Marine SCR Catalyst - Product Picture - Catalyst Module



Note: The commonly used honeycomb-type catalyst are 25*25 cells, 30*30 cells, 35*35 cells, 40*40 cells, 45*45 cells, 50*50 cells, 60*60 cells. common layout of the catalyst modules are 1*2, 2*2, 3*3.

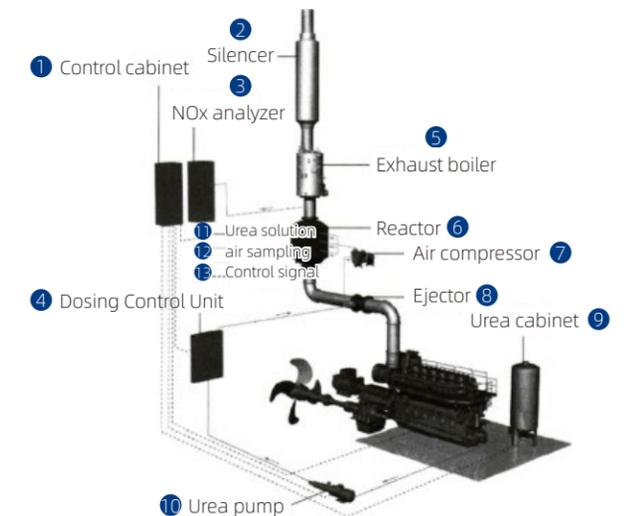
Catalyst Placement

Position of Two Stroke Diesel Engine SCR Reactor



- 1 Control valve 1
- 2 Scavenge box
- 3 Seal valve of reactor
- 4 SCR reactor
- 5 Cylinder & SCR bypass
- 6 Exhaust manifold

Position of the Four-Stroke Diesel Engine SCR Reactor



- 1 Control cabinet
- 2 Silencer
- 3 NOx analyzer
- 4 Dosing Control Unit
- 5 Exhaust boiler
- 6 Reactor
- 7 Air compressor
- 8 Ejector
- 9 Urea cabinet
- 10 Urea pump
- 11 Urea solution
- 12 air sampling
- 13 Control signal

GLOBAL SERVICES

In the United States, Italy, Russia, India, Thailand, Indonesia, Vietnam, Korea, Shanghai, Beijing, Hangzhou, China has set up subsidiaries and offices. And provide guaranteed after-sales service with authorized cooperative agents.



Head Office:

South of Sanjiang Road, Paojiang New Zone, Shaoxing, Zhejiang Province, China

Shanghai Tuna Marine:

Room 702, Block D, Luneng International Center, 209 Guoyao Road, Pudong New Area, Shanghai, China

Branch Office (Beijing):

No. 413, Building B, Huaxia Xingfu Innovation Center, West Road, Fengtai District Automobile Museum, Beijing

Branch Office (HangZhou):

3t Floor, HuaChuang Building, JianYe Road, Binjiang District, Hangzhou, Zhejiang

Korea Company:

NANO -TUNA Engineering Co., Ltd.:60 Magonggongdan-ro, Cheongni-myeon, Sangju-si, Gyeongsangbuk-do, 37257 Republic of Korea

TUNA Indonesia Representative Office:

17th Floor, Graha Mandiri Building, Suite 9 Jl. Imam Bonjol No. 61, Jakarta Pusat 10330, Indonesia

India Company:

TUNA Envirotech Private Limited: 405, Global Foyer, Golf course Road, Sector 43, Gurugram, Haryana 122002

TUNA Thailand Representative Office:

216 Sol Raminfra 64 Sub-district Khannayao, District Khannayao, Bangkok, Thailand 10230

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