

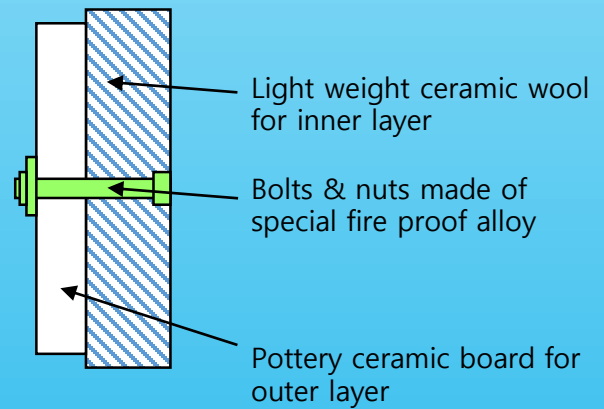
The Ceramic Board Refractory

-Patent Pending-



After 9 months

Two layers design



Save Maintenance Cost

	New Ceramic Board	Conventional Refractory
Partial Repair	⊙ Can be done easily by ship's staff	✗ Large area should be dug out
Repairing Time	⊙ Very short (Only 10 min./a piece)	✗ Very long (2 days for one side)
Weight	⊙ Very light weight (800g/a piece)	✗ Very heavy weight (25kg/a box)
Workmanship	⊙ Same standard can be kept	✗ Very poor quality depending on worker

This is an optional item for new building and retrofit.

Running cost comparison --- 1 year operation

From one monitoring vessel (VLCC)

	Plibrico	Ceramic Board
Material Cost	30 boxes of Plibrico were used JPY10,000 x 30 = JPY300,000	10 pieces of ceramic board is expected to replace JPY5,000 x 10 = JPY50,000
Freight Cost	JPY20,000 x 9 times = JPY180,000	From ship's spare = JPY0
Man Cost	JPY2,000 x 5 hours x 20 times = JPY200,000	JPY2,000 x 1 hour = JPY2,000
Yard Repairing Cost	Every dry docking JPY1,000,000 ÷ 2.5 year = JPY400,000	No need to repair = JPY0
Total Cost	JPY1,080,000	JPY52,000

--- Price List of Ceramic Board ---

2015/05/28

Unit: Japanese Yen

Incinerator Capacity (kW)	Type	Ceramic Board Retrofit Kit *1	Additional Cost for New-building *2
240	OSV-240SAI	800,000	750,000
360	OSV-360S(D)AI OSG-360SDA	800,000	750,000
600	OSV-600S(D)AI OSG-600SDA	950,000	900,000
900	OSV-900S(D)AI OSG-900SDA	1,100,000	1,050,000
1200	OSV-1200S(D)AI OSG-1200SDA	1,600,000	1,500,000
1500	OSV-1500S(D)AI OSG-1500SDA	1,800,000	1,700,000
2400	OSV-2400S(D)AI	2,600,000	2,400,000

- Note:
1. The ceramic board kit includes Ceramic Boards, Mounting Metals (THERPRO), Ceramic Wool and Plibrico for burner tile and charging door opening space. The flooring material is not included. If you need it we will make quotation separately.
 2. The ceramic board kit is to be preinstalled for the new-building incinerator.

Hourly Charges for Installation Works per one person

Unit: Japanese Yen

Normal Mon – Fri (8:00-17:00)	5,000 (7,000)	Overtime A Mon – Fri (17:00-24:00) Saturday (8:00-17:00)	7,500 (10,500)	Overtime B Mon – Fri (0:00-8:00) Saturday (17:00-24:00) Sunday & Public Holiday	10,000 (14,000)
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- Note:
1. The price in () is for supervisor.
 2. Hotel accommodation, air / sea land transportation will be charged separately.
 3. Traveling time will be charged at the Normal Tariff Rate.
 4. Stand by time / delays / waiting time not caused by us during works shall be charged at the Normal Tariff Rate.
 5. The welding machine, compress air and electricity will be used onboard facility.
 6. Disposal of rubbish will be done by owner.

Spare Parts Price:



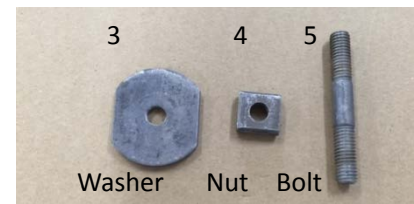


Unit: Japanese Yen

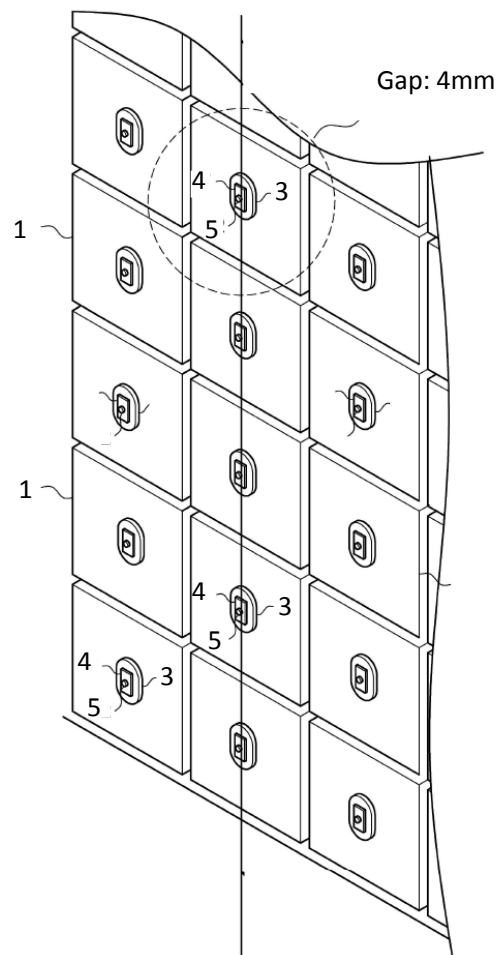
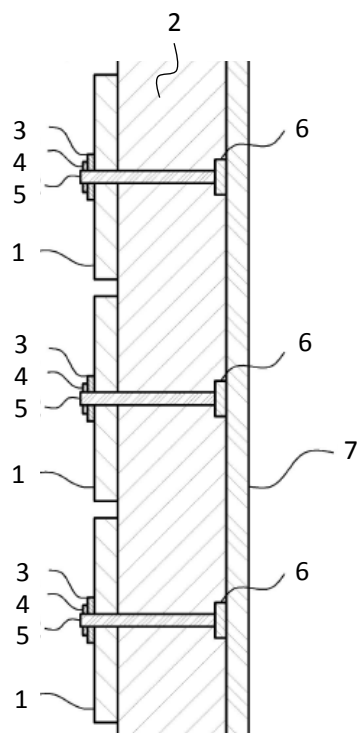
Ceramic Board 140x140x20mm	3,000	Mounting Metal (THERPRO) Bolt, Nut, Washer	2,000	Ceramic Wool 600x600x50mm	12,000
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Ceramic Tile Installation as Refractory

Components:

<p>Ceramic Tile 1</p> 	<p>Ceramic Wool Blanket 2</p> 	<p>Special Mounting Metal (THERPRO)</p>  <p>Washer 3 Nut 4 Bolt 5</p>
<p>Nut 6</p> 	<p>Base Plate 7</p> 	



Tile Size: 140 x 140 x 20 mm



Welding of base flanges except floor and around burner



Mounting bolts and installation of ceramic wool



Installation of ceramic board with special nut

Ceramic Board Reference List

No.		Vessel Name	Ship Builder	Hull No.	Vessel Type	Model	Shipment	Owner
1	Retrofitting	SUPER ZEARTH	IHI	3053	VLCC	OSV-52SA	2014/4/7	Idemitsu Tanker
2	Retrofitting	CRYSTAL MARINE	KAWASAKI	1518	LPG	OSV-900SAI	2014/5/1	Kumiai Navigation
3	Retrofitting	OCEAN ORCHID	KAWASAKI	1500	LPG	OSV-600SAI	2014/5/14	Kumiai Navigation
4	New Building	–	OSHIMA	10720	Bulk	OSV-600SAI	2014/9/11	ADM Harvest
5	New Building	–	mitsui	1894	Bulk	OSV-600SAI	2014/11/13	Niovis Shipping
6	New Building	–	Asakawa	595	Chem Tanker	OSV-360SAI	2014/12/4	Tachibanaya
7	Retrofitting	TSURUSAKI	IHI	3159	VLCC	OSG-900SDA	2014/12/18	NYK
8	New Building	–	OSHIMA	10721	Bulk	OSV-600SAI	2015/1/8	ADM Harvest
9	Retrofitting	BAHRI IRIS	DAEWOO	5256	PC	OSV-900SDAI	2015/1/15	Mideast Ship Management
10	New Building	–	mitsui	1909	Bulk	OSV-600SAI	2015/1/19	Niovis Shipping
11	New Building	–	mitsui	1881	Bulk	OSV-600SAI	2015/1/27	Niovis Shipping
12	Retrofitting	GIULIO VERNE	HHI	831	Other	OSG-600SDA	2015/2/19	V ship
13	Retrofitting	NORDIC RIVER	DAEWOO	2313	LPG	OSV-900SDAI	2015/2/24	K-LINE
14	Retrofitting	BAHRI JASMINE	DAEWOO	5257	PC	OSV-900SDAI	2015/2/25	Mideast Ship Management
15	Retrofitting	JP VERDURE	IMABARI	1427	Coal	OSV-600SAI	2015/4/26	NS marine
16	Retrofitting	VIKING RIVER	DAEWOO	2314	LPG	OSV-900SDAI	2015/5/2	K-LINE
17	Retrofitting	ASTOMOS EARTH	MHI	2283	LPG	OSV-900SAI	2015/5/16	Idemitsu Tanker
18	New Building	–	Asakawa	597	Chem Tanker	OSV-360SAI	2015/5/21	Tachibanaya
19	Retrofitting	BRITISH COUNCILLOR	MITSUBISHI	2209	LPG	OSV-600SDAI	2015/5/22	BP
20	Retrofitting	GAS DIANA	MITSUBISHI	2161	LPG	OSG1-50SDA	2015/6/26	NYK
21	Retrofitting	LAVENDER PASSAGE	MITSUBISHI	2107	LPG	OSV-900SAI	2015/6/30	NYK
22	Retrofitting	GLORIOUS FUJI	IMABARI	776	Bulk	OSV-600SAI	2015/7/4	World Marine
23	Retrofitting	GRACE RIVER	KAWASAKI	1519	LPG	OSV-600SAI	2015/7/15	K-LINE
24	New Building	–	mitsui	1882	Bulk	OSV-600SAI	2015/8/17	Niovis Shipping
25	New Building	–	OSHIMA	10771	Bulk	OSV-600SAI	2015/9/17	TAIWAN NAVIGATION
26	Retrofitting	BRITISH COURAGE	MITSUBISHI	2203	LPG	OSV-600SDAI	2015/10/15	BP
27	New Building	–	HHI SAMHO	S795	Tanker	OSV-1200SAI	2015/10/29	NEREUS SHIPPING S.A.
28	Retrofitting	CAPE DOVER	KAWASAKI	1582	Bulk	OSV-600SAI	2015/11/14	FML(HK)
29	Retrofitting	LINDEN PRIDE	MITSUBISHI	2164	LPG	OSG1-50SDA	2015/11/15	NYK
30	New Building	–	CSBC	1053	Tanker	OSV-360SAI	2016/1/15	CPC
31	New Building	–	CSBC	1054	Tanker	OSV-360SAI	2016/1/15	CPC
32	New Building	–	HHI SAMHO	S796	Tanker	OSV-1200SAI	2016/1/22	NEREUS SHIPPING S.A.
33	New Building	–	SHIN KASADO	105	Bulk	OSV-600SDAI	2016/1/24	PACC
34	New Building	–	SKDY	5901	Tanker	OSV-360SAI	2016/2/2	Tokyo marine
35	New Building	–	SHIN KASADO	75	Bulk	OSV-600SDAI	2016/3/5	PACC
36	New Building	–	OSHIMA	10772	Bulk	OSV-600SAI	2016/3/16	TAIWAN NAVIGATION
37	New Building	–	OSHIMA	10773	Bulk	OSV-600SAI	2016/6/13	TAIWAN NAVIGATION
38	New Building	–	HHI SAMHO	S797	Tanker	OSV-1200SAI	2016/6/14	NEREUS SHIPPING S.A.
39	New Building	–	KITANIHON	627	Tanker	OSV-240SAI	2016/9/4	Tokyo marine
40	New Building	–	HHI SAMHO	S798	Tanker	OSV-1200SAI	2016/9/16	NEREUS SHIPPING S.A.
41	New Building	–	SKDY	5900	Tanker	OSV-360SAI	2016/10/3	Tokyo marine
42	New Building	–	KITANIHON	630	Tanker	OSV-240SAI	2017/2/6	Tokyo marine
43	New Building	–	OSHIMA	10796	Bulk	OSV-600SAI	2017/4/1	TAIWAN NAVIGATION
44	New Building	–	OSHIMA	10797	Bulk	OSV-600SAI	2017/4/1	TAIWAN NAVIGATION
45	New Building	–	OSHIMA	10798	Bulk	OSV-600SAI	2017/4/1	TAIWAN NAVIGATION
46	New Building	–	OSHIMA	10799	Bulk	OSV-600SAI	2017/4/1	TAIWAN NAVIGATION
47	New Building	–	KITANIHON	622	Tanker	OSV-240SAI	2017/4/7	Tokyo marine
48	New Building	–	KITANIHON	626	Tanker	OSV-240SAI	2017/12/5	Tokyo marine

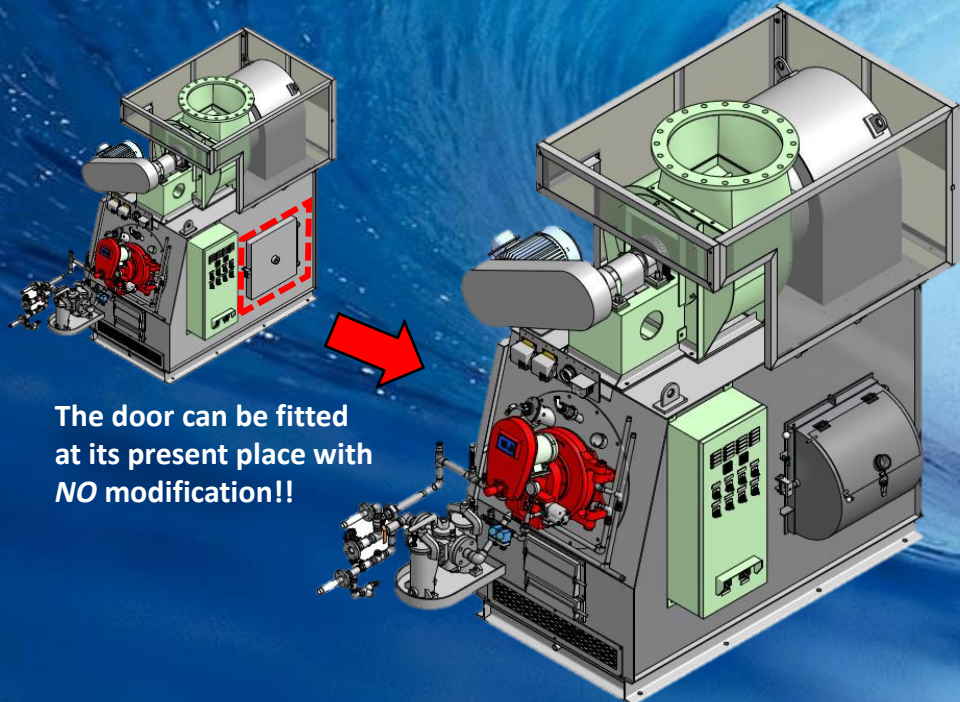
GARBAGE FEEDER

A new garbage managing system from Sunflame

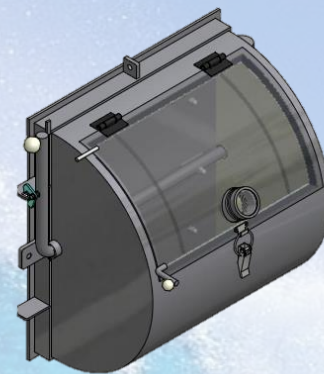
As the amendments to Annex V of MARPOL 73/78 was adopted on 15 July 2011 at MEPC.201(62) and has come into force from 1 January 2013, today the disposal of garbage on board vessels are strictly controlled, and more garbage needs to be managed onboard the vessel.

To keep up with this revision of the rule, Sunflame presents the GARBAGE FEEDER which can be replaced with the existing door with no modification.

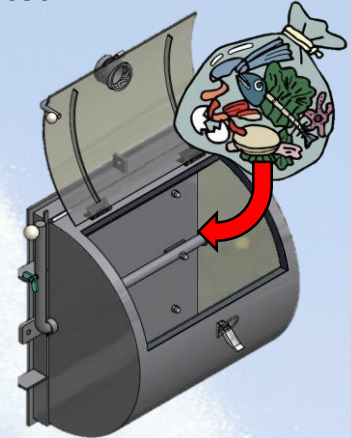
With this new garbage feeder, garbage can be thrown into the furnace whenever the incinerator is operating, and recording the garbage record book can be easily managed.



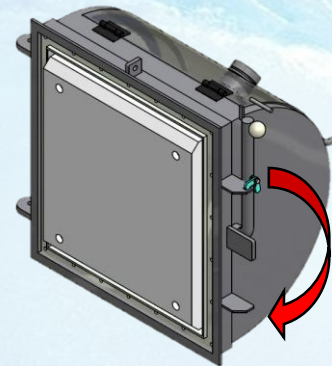
The door can be fitted at its present place with **NO** modification!!



- ① The feeder can be used when the furnace temperature is above 650°C.

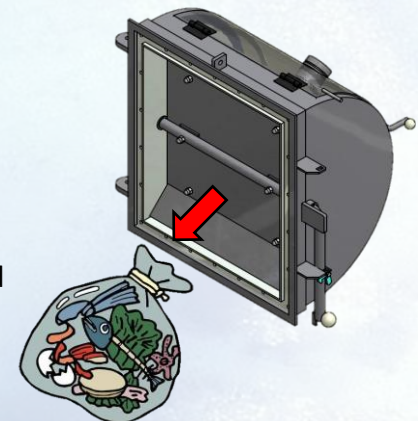


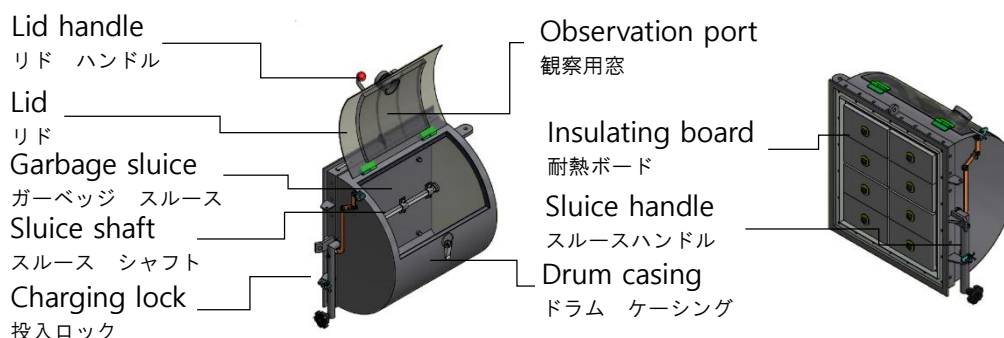
- ② Open the lid, and put in some garbage. (light wastes shall be collected in a plastic bag.)



- ③ Shut the lid and turn the sluice handle.

- ④ When the sluice handle is turned, the insulating board will also move, and the garbage will be forced into the furnace.





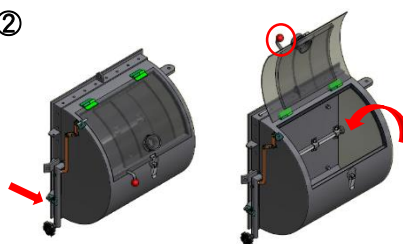
① Confirm if the temperature in the operating incinerator is over 650 deg. centigrade by the indication on the control panel.

Garbage is able to be charged only when the furnace temperature is over 650 deg. centigrade for preventing the generation of dioxins.



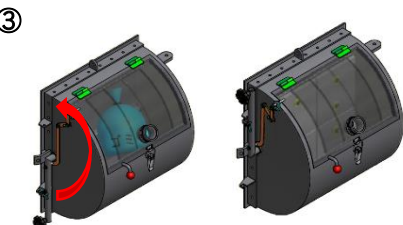
焼却炉が 650℃以上で運転されていることを制御盤で確認してください。
ダイオキシン発生防止のため、ゴミの投入は、焼却炉が 650℃以上で運転されているときのみ可能です。

② First, confirm if the Sluice handle is turned down and fixed at that position, and then open the Lid holding the Lid handle. Insert appropriate amount of garbage in the Drum casing.



スルースハンドルが下向きに固定されているのを確認の上、リドハンドルをつまみリドを開けてください。適量のゴミをドラムケーシング内部に挿入してください。

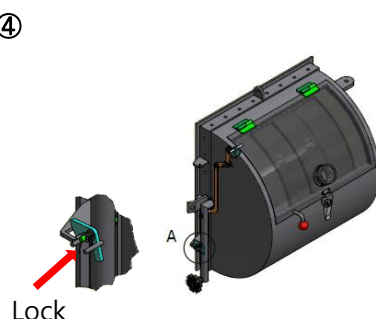
③ Close the Lid and pull up the Sluice handle upright. Confirm through the Observation port if all the garbage is charged in the furnace. Do NOT turn the sluice handle when the lid is opened as this may lead to serious fire accidents.



リドを閉じ、スルースハンドルをしっかり上まで引き上げてください。観察用窓からすべてのゴミが炉内に投入されているのを確認してください。
リドを開けたままスルースハンドルを上げないでください。重大な事故につながる恐れがあります。

④ Pull down the Sluice handle and fix the handle with the lock. Also confirm through the observation port if the Garbage sluice has returned to its proper starting position.

If the Sluice handle is left without fixing, the Garbage sluice and the Drum casing can be damaged, and this may lead to serious fire accidents.



スルースハンドルを下側に戻し、ロックで固定してください。ガーベッジスルースが正しい位置にあることを、観察用窓からも確認してください。
スルースハンドルが固定されていない場合、ガーベッジスルースとドラムケーシングが損傷を受け、火災につながる恐れがあります。

⑤ Please do not charge more solid waste than the disposal capacity of this incinerator. The Exhaust gas fan will be damaged by overheating.

この焼却炉の処理能力を超えて、ゴミを投入しないでください。排ガスファンが損傷を受ける可能性があります。