

Product Profile



**Total Solution Provider
for Shipboard Safety Equipment**



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GLOBAL TECHNOLOGY

Constantly Challenging Company, Recognized Company
as a Quality, Person-centered Company, TANKTECH.
TANKTECH are concentrating the whole power to reinforce
Plant and Ship Building Business continuously.



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**FAST
GOOD
COMPETITIVE**



TANK represents a storage vessel or tanker
which can convey or store liquid cargo.
TECH represents an abbreviation of Technology.
Therefore,
TANKTECH logo is the best factor with symbol 
of representing the image of company.

Management Motto

Being the world best company



R&D center

On the basis of our company philosophy of "Technology created". We are always seeking the customer's satisfaction" with qualified products & service.

Tanktech is taking its step forward to become the world's leading hidden champion.

Tanktech has an powerful 30 years legacy of partnership with our valuable customers in successfully applying technology-based solutions and resolving client's critical problems.

Major Products

Marine Equipment

Hull Piping

- High Velocity Pressure/Vacuum Valve
- Tank Cleaning Machine
- Portable Tank Measuring System
- Eductor
- Anti Heeling System
- Mobile Water Monitor & Lance
- Fixed Long Jet Monitor
- Water Spray System

Machinery Outfitting

- Water Mist Fire Fighting System

Hull Outfitting

- Emergency Towing Arrangement
- Towing & Mooring Fittings
- Rofesave Liner

LNGC Equipment

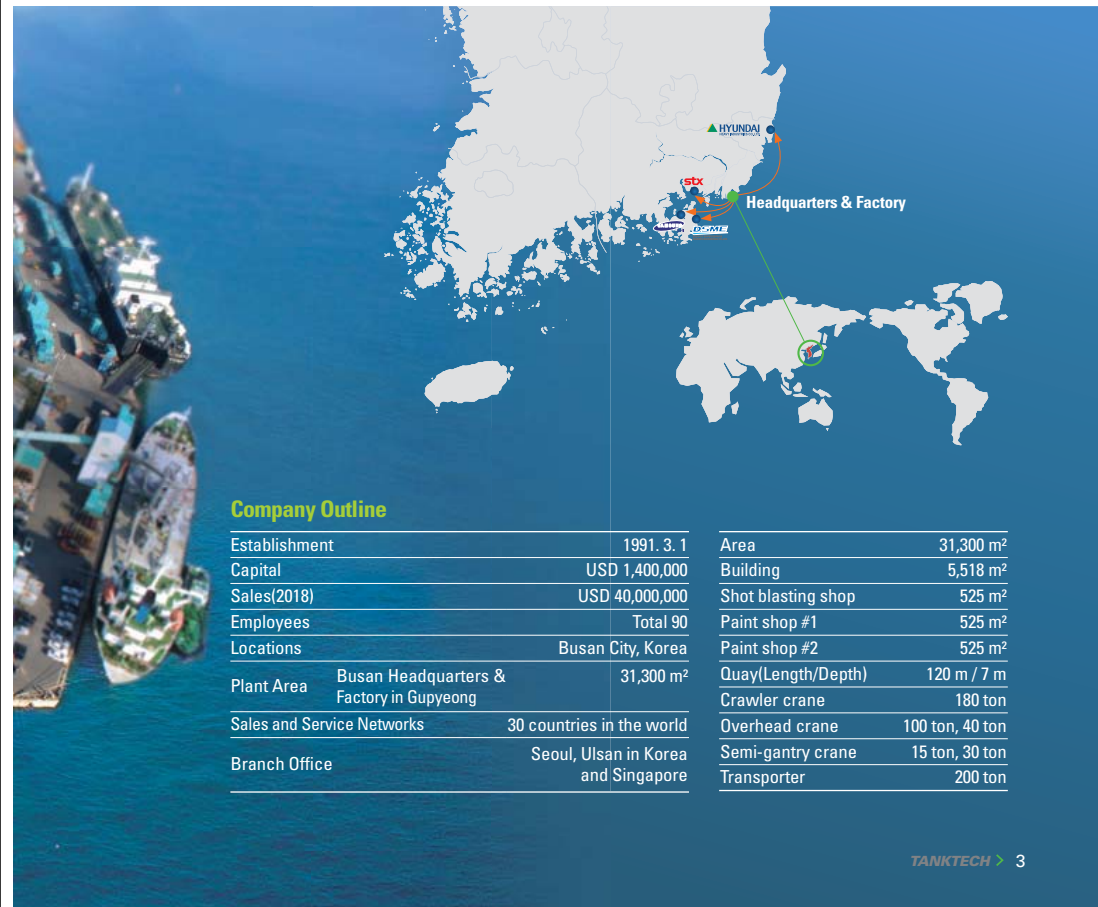
- Liquefied Gas Cargo Containment System
- Aluminum Wedges
- LNG Fuel Gas System

Security

- Anti-Piracy Solution Gun

Fabrication

- Large Steel Structure & Skid for LNG & Offshore
- Reference List for Large Steel Structure



Company Outline

Establishment	1991. 3. 1	Area	31,300 m ²
Capital	USD 1,400,000	Building	5,518 m ²
Sales(2018)	USD 40,000,000	Shot blasting shop	525 m ²
Employees	Total 90	Paint shop #1	525 m ²
Locations	Busan City, Korea	Paint shop #2	525 m ²
Plant Area	Busan Headquarters & Factory in Gupyeong	Quay(Length/Depth)	120 m / 7 m
Sales and Service Networks	30 countries in the world	Crawler crane	180 ton
Branch Office	Seoul, Ulsan in Korea and Singapore	Overhead crane	100 ton, 40 ton
		Semi-gantry crane	15 ton, 30 ton
		Transporter	200 ton

Company History

Despite the challenging industry environment, TANKTECH strives to be a Global Leader and has invested in the new capabilities to meet our customer needs and retains a high skilled and motivated workforce.

1991	1994	1996	1998	2000
				
Established KOREA STEEL POWER Co., Ltd.	Built Factory & Moved Head Office to Gimhae-City, Gyeongnam Province.	- Established R&D Institute - Certified for Factory Mutual Research	Certified for Quality Management Sys. ISO9001(ABS)	Changed Company Name to TANKTECH Co., Ltd.



2004	2011	2016	2018	2030
				
Built Factory & Moved Head Office to NokSan National Industrial Complex Changed Company C.I.	Moved Head Office to Gupyeong in Busan	Awarded "World Class 300 Company"	Certified for the health and safety management system	Global Leader

1991~2003

- 1991** Established Korea Steel Power Co., Ltd. at Hanam City, Gyeong-Ki Province.
Appointed as the Domestic-Product Development Enterprise for Tank Safety Valve.
- 1994** Moved Head Office & built new factory at Gimhae City, Gyeong-nam Province.
- 1996** Established a Research Institute of Technology.
Obtained FMRC factory acknowledgement.
- 1998** Obtained ISO9001 Certificate (ABS).
Selected to Enterprise for Venture by Small & Medium Business Administration.
- 1999** Awarded the first Gyeong-nam Best Trader by Gyeong-nam Province.
- 2000** Changed company name to TANKTECH CO., LTD.
- 2001** Obtained USCG Certification for NEW-ISO-HV SERIES from USCG that meets the latest requirement of RULE & REGULATION.
- 2002** Won Official Commendation from Minister of Ministry of Commerce, Industry and Energy (MOCIE).
- 2003** Developed Water Mist Fire fighting System (X-MIST).

2004~Present

- 2004** Moved Head Office & built new factory to NokSan National Industrial Complex in Busan.
Developed programmable Single Nozzle Tank Cleaning Machine.
- 2006** Developed Deluge Valve and Deluge Nozzle.
- 2007** Developed Anti Heeling System for Dry cargo vessel.
- 2008** Awarded the Best Exporter 2008 by Busan City Government.
Constructed steel structure production line in Gunsan.
- 2009** Water Mist System(X-mist) awarded "Korea World-class Product Award 2009".
- 2010** Awarded the Honor Enterprise by Prime Minister.
- 2011** Moved Head Office & built offshore system production line to Gupyeong in Busan.
Obtained ASTM Cert. Code "S" & "U".
- 2014** Obtained OHSAS 18001 Certificate by ABS.
- 2015** Awarded the prize of excellent capital goods enterprise by Prime Minister.
- 2016** Awarded "World Class 300 Company".
- 2017** Developed Liquefied Gas Cargo Containment System.
Developed Long Jet Monitor.
- 2018** Obtained ISO 14001:2015 Certificate by ABS.
- 2019** Developed Aluminum Wedges.
Developed BOG Recondensor.

[International patented]

High Velocity P/V Relief Valve (U-ISO-H/V/G Series)

Non-Hammering High Velocity Pressure/Vacuum Relief Valve (With Gas Free Cover)

Principle

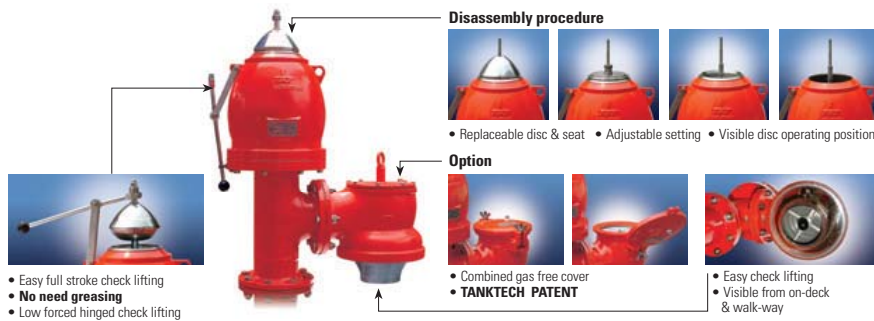
U-ISO-H/V/G series high velocity pressure/vacuum valve is designed to prevent the flame passage into cargo tanks and to relieve excessive over pressure or under vacuum of cargo tanks during cargo loading, discharging, ballasting and thermal variation.

U-ISO-H/V/G series of high velocity pressure/vacuum valve, which provide Non-hammering, Non-accumulation condensate vapor and Non-corrosion for marine cargo tanks, are very simple and advanced models. U-ISO-H/V/G series is designed to prevent the flame passage into cargo tank in compliance with IMO MSC/Circ. 677/1009, ISO 15364 and vapor control system of USCG (46 CFR.39-20.11 & 162.017)

Basic Rule Requirements

- IMO MSC/Circ.1009
- IMO MSC/Circ.450 Rev.1
- API 2000 - Flow test procedure
- IMO MSC/Circ.677
- IMO MSC/Circ.731
- ISO 16852
- IMO MSC/Circ.585
- International Standard 15364

Benefits for High Velocity P/V Relief Valve : Model U-ISO-H/V/G Series



Optimum Design & Arrangements



Optional Arrangement 1
MSC.1/Circ.1324 approved
High Velocity P/V Valve
(MESG 0.65mm for chemical cargo)



Optional Arrangement 2
Electric heating Type
High Velocity P/V Valve



Optional Arrangement 3
Steam Tracing type or Thermal oil
heating type High Velocity P/V Valve

[International patented]

High Velocity P/V Relief Valve (KSRP Series)

No Leakage Rupture pin Type High Velocity Pressure/Vacuum Valve



NEW APPROACH

An inveterate problem of leakage and corrosion on PV valves has completely been resolved by Tanktech No leakage Rupture pin type PV valve (KSRP Series)

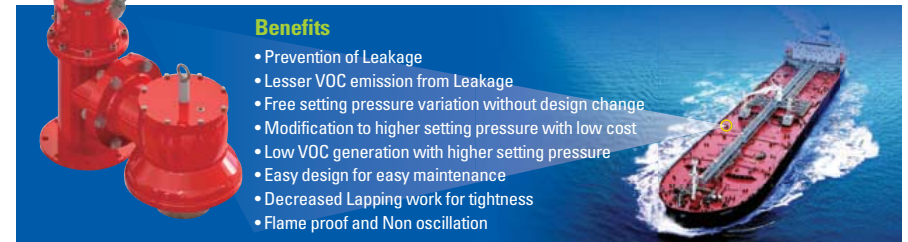
One of the most difficult issues for oil tankers is how to reduce VOCs.

The easiest and best solution is to increase the design pressure of the cargo tank high enough so that VOCs can be liquefied. By simply changing the rupture pin, the design pressure of the cargo tank can be easily adjusted without any design change.

The huge amount of VOC leakage is occurred from the metal-contact-type valves. To prevent the leakage, the soft seal is adopted in the this valve. Although soft seal is applied the performance for flashback is guaranteed on the basis of its special structure.

Basic Rule Requirements

- IMO MSC/Circ. 677/1009, ISO 15364, ISO 16852
- IMO MSC/Circ.450 Rev.1
- IMO MSC/Circ.585
- IMO MSC/Circ.731
- IMO MSC.1/Circ.1324
- API 2000 - Flow test procedure
- Vapor control system of USCG (46 CFR.39-20.11 & 162.017)



Advantage for Previous Model



No Leakage

Less Accumulation

Less Corrosion

No.	Conventional Design	New Design
1	 Metal to Metal	 Metal to Seal
2	 Weight Type	 Rupture Pin & Weight Type
3	Leakage build up the accumulation of VOC, and the accumulation cause the pitting. Oil accumulation on seat & disc should be controlled due to leakage, and heavy maintenance work should be carried out.	No leakage improve the corrosion resistance because it can prevent the built-up accumulation.

Tank Cleaning Machine (UPM Series)



Programmable Single Nozzle Tank Cleaning Machine



Introduction

CLEANMAX UPM-4050 and UPM-6580 are completely a programmable single nozzle Tank Cleaning Machine to be equipped on the mounted tank top or deck. It will allow adapting in crude oil and product/chemical tankers as well as industrial applications. TANKTECH can provide the COW(Crude Oil Washing) manual and the shadow diagram to be thoroughly complied with the latest IMO Assembly Resolution A.897(21). Optimized single nozzle unit of CLEANMAX will give much more advantages compared with twin nozzle unit deliberating on the savings in pumping, stripping and piping and more longer effective jet length.

Operation

CLEANMAX UPM series is the fluid-driven machines and their spiral motion for the single nozzle fully managed by the integrated turbine driven control unit. It can set up to control a vertical pitch of nozzle as like 1° and 3° so that it is able to adjust the cleaning time and cleaning frequency, injection density during washing operation. It is possible to vary the cleaning time by setting the speed adjustment knob under the same flow rate. Most of all, it is possible to set up any required washing range within -25° to 155° during single or multi-stage operations.

Advantages

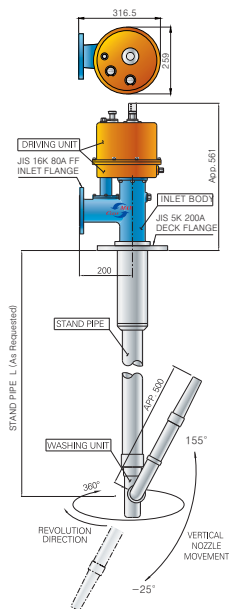
- Easy operation setting & all visible indication
- Compact design
- All setting can be adjusted during washing without stopping of cleaning agent supply.
- Infinite repeating cycle without stop of washing operation after setting of operation range
- No further requirement after setting of any required range
- Easy maintenance & inspection
- Operation of the machine is monitored by attaching the sensor, and the signal is transferred to AMS.

General Data

• Connection:	- Inlet :	JIS 16K 40A/50A/65A/80A/100A Other standard available
	- Deck :	JIS 5K 200A
• Weight	- Machine with 2.0m length of stand pipe :	87 kg
	- Per additional meter of stand pipe :	12 kg

Programmable Operation

- Horizontal revolution :	360°
- Vertical movement :	-25° ~ 155°
- Pitch for vertical movement :	1° and 3°
- Speed adjustment :	Low, High
- Single or multi stage operation at any desired angle range	



Tank Cleaning Machine (NPM Series)



Non-programmable Twin Nozzle Tank Cleaning Machine

Introduction

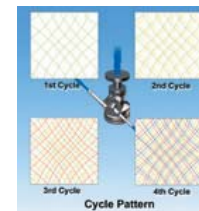
NPM-40 and NPM-50 can be used on all kind of chemical tanker as well as crude oil tanker. In order to select the specification of Tank Cleaning Machine, pump capacity, machine quantity operated simultaneously, related standard, the kind of cargo, etc, are required with general information of cargo tank such as dimension and shape. TANKTECH can provide crude oil washing manual and shadow diagram.

Operation

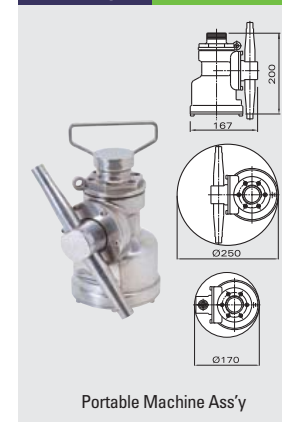
The body of NPM Series is rotated around the vertical axis by cleaning fluid. At the same time, the cleaning fluid spins the nozzles around the horizontal axis. As a result, the grid pattern traces are generated on the walls of tank. The tank cleaning operation by NPM Series consists of cycle patterns as followed figures. The whole part of cargo tank is covered by these 4 cycles.

Specifications

Materials	: Stainless Steel 316L, Teflon, Peek etc.
Operating Pressure Range	: 5 ~ 12 kg/cm ²
Maximum Operating Temperature	: 90°(194°F)
Lubrication & Cooling	: Both lubrication and cooling by cleaning fluid
Connection	: On request(Flange or Coupling)
Weight	: About 7kg

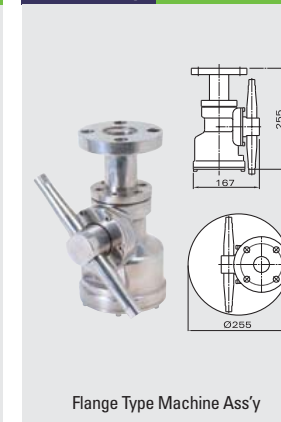


Portable Type Model : NPM-40P



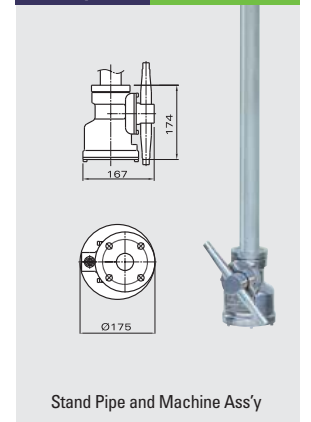
Portable Machine Assy

Submerged Type Model : NPM-40S



Flange Type Machine Assy

Fixed Type Model : NPM-40F



Stand Pipe and Machine Assy

Portable Tank Measuring System

Type approved by MED(BV), USCG, ABS, RRS, CCS, CANADA, Korean & Japanese Administration, ATEX-IECEx

T2015-TFC-02

GAS-TIGHT TYPE
PORTABLE OIL / WATER
INTERFACE DETECTOR



T2015-TFS-01

RESTRICTED TYPE
PORTABLE OIL / WATER
INTERFACE DETECTOR

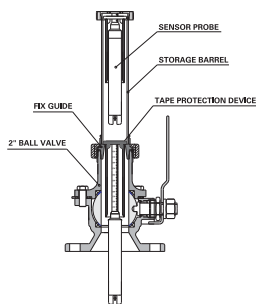


Portable Oil/Water Interface Detector for ullage, oil / water interface & temperature gauging

Accuracy of ullage, interface detection	± 2 mm
Indication of level divided by ullage and interface	Visible and Audible
Tape length	15 m / 30 m / 40 m
Tape graduation	Metric
Tape resolution	1 mm
Diameter of probe	34 mm
Minimum detectable level	8 mm
Ambient temperature range	-20 °C to 50 °C
Temperature sensor measurement range	-20 °C to 90 °C
Temperature measurement resolution	0.1 °C
Accuracy over calibration range	± 0.1 °C (0 °C to 60 °C)
Temperature reading mode	°C (Celsius) or °F
LCD display	4- 7 Segment
Top Coupling (Connection)	PF 2-1/4" TAP
Weight	TFC-02 7.4 kg / 15m TFS-01 6.4 kg / 30m
Overall dimensions (H X W X T)	TFC-02 APP. 585 X 346 X 150 mm TFS-01 APP. 607 X 297 X 140 mm
Battery	9 Volt (Model : MN1604)
Intrinsically safe type	Ex ia IIB T4

Advantages

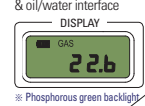
Model : T2015-TFC-02 Gas-Tight Type



- Tape protection device avoid from the cut by careless valve closing.
- Sensor probe will be inserted to the protection pipe during tape rewinding and this protection device will be completely protected by the tape.
- Tape and protection device are easy to separated.

Audible & distinguishable sound
of gas, oil & water

LCD display
Showing ullage, temperature
& oil/water interface



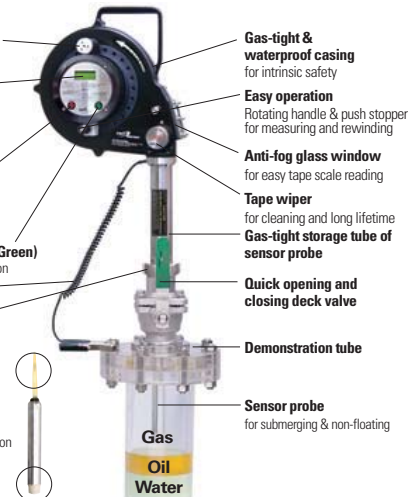
Light On/Off(Red), Power On/Off(Green)
(On / Off) for all measurement simulation

Grounding clamp
for static discharge

**Quick coupling
& convertible adaptor**
to other maker

Non-corrosive tape scale
coated by Tefzel® ETFE

Teflon sensor probe head
Protection of corrosion and tank explosion
from the spark.
Sensor probe is ultrasonic,
RTD temperature & conductivity sensor.



Gas-tight & waterproof casing
for intrinsic safety

Easy operation
Rotating handle & push stopper
for measuring and rewinding

Anti-fog glass window
for easy tape scale reading

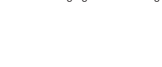
Tape wiper
for cleaning and long lifetime

**Gas-tight storage tube of
sensor probe**

**Quick opening and
closing deck valve**

Demonstration tube

Sensor probe
for submerging & non-floating



Gas
Oil
Water



T2000-TSS-01



T2000-TSS-02

Cargo Liquid Sampling Device for liquid sampling

Tape length	15 m / 30 m / 40 m
Tape graduation	Metric
Tape resolution	1 mm
Tape accuracy	± 3.2 mm / 30m
Top coupling (Connection)	PF 2-1/4" TAP
Weight	TSS-01 12.4 kg / 15m TSS-02 9.1kg / 30m
Overall dimensions (H X W X T)	TSS-01 APP. 1112 X 346 X 180 mm TSS-02 APP. 950 X 346 X 180 mm
Capacity of Sampling bottle	0.5 Liter

T2000-TLS-01



T2000-TOS-01



T2000-TPG-01



Tank Bottom Liquid and Sediments Checking Device for tank bottom dryness checking, etc.

Tape length	30 m / 40 m / 50 m
Tape graduation	Metric
Tape resolution	1 mm
Tape accuracy	± 3.2 mm / 30 m
Top coupling (Connection)	PF 2-1/4" TAP
Weight	5.0 kg / 30 m / 50 m
Overall dimensions (H X W X T)	APP. 850 X 310 X 75 mm

Inert Gas Sampling Hose & Adaptor for oxygen and flammable gas concentration measuring

Hose size	O.D 8 x I.D 6 mm
Hose length	20 m / 35 m / 45 m
Top coupling (Connection)	PF 2-1/4" TAP
Weight	3.5 kg / 35 m

Pressure Gauge for inert gas pressure

Pressure range	-1000 to 3000 mmH2O
Accuracy	1.5% of full scale
Top coupling (Connection)	PF 2-1/4" TAP
Weight	1.2 kg

Shut On / Off Valve (Vapor Control Valve) for tank gauging station



TVC-01

Top Conn. : PF 2-1/4" TAP
Flange Conn. : 25A JIS 5K FF
or 50A JIS 5K FF
Function :
Vapor Lock Installation of PMS
Bottom Dryness Checking, Etc.



TVC-02

Top Conn. : PF 2-1/4" TAP
Flange Conn. : 50A JIS 5K FF
or 80A JIS 5K FF
Function :
Vapor Lock Installation of PMS
Main Tank Gauging Station
(Ullage Gauging & Sampling)



TVC-04

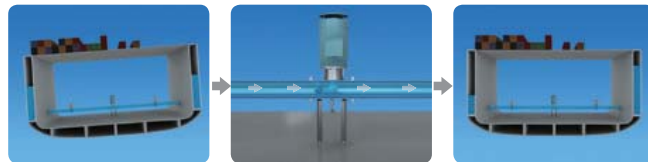
Top Conn. : PF 2-1/4" TAP
Flange Conn. : 100A JIS 5K FF
Function :
Vapor Lock Installation of PMS
Main Tank Gauging Station
(Ullage Gauging & Sampling)

Anti Heeling System



General

Anti heeling system is designed to automatically balance the vessel in upright position by pumping ballast water of ballast tank during loading and unloading. The main components of system are main control panel including inclinometer, pump starter panel, reversible propeller pump and pneumatic actuator valve.

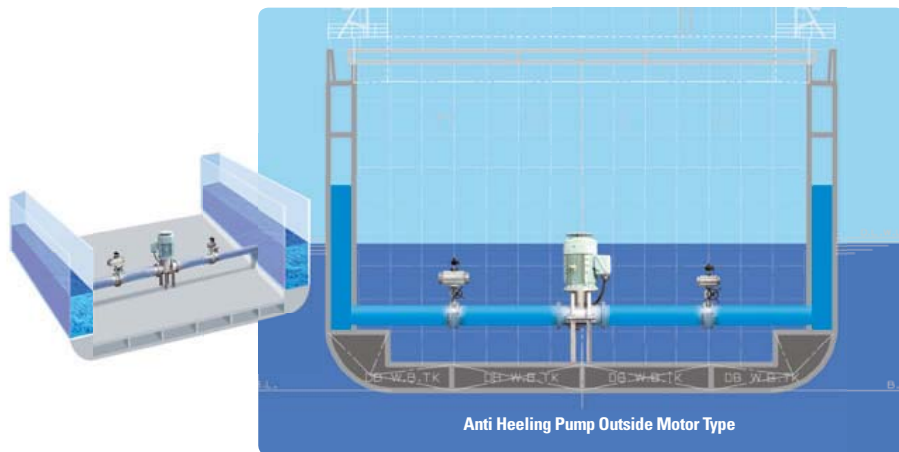


Anti Heeling Pump Outside Motor Type

Requirements

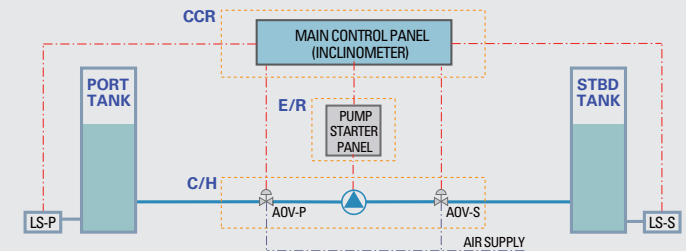
1. The inclination angle, fault signal and system status shall be centrally controlled and monitored.
2. The control console shall be provided with a manual emergency OFF switch for ships which are operated only under supervision.
3. Systems which are also operated without supervision shall be provided with a manual emergency OFF switch and an automatic stop device which shuts down the system independently of the control when the maximum permitted angle of inclination is reached.

Type of Anti Heeling System



Anti Heeling Pump Outside Motor Type

System Sequence



Main Components

1. Pump & Motor

- The type of pump is vertical reversible propeller pump. It is driven by electric motor and installed inline type.
- These pump & motor transmit water from port ballast tank to stbd ballast tank or in the opposite direction.
- Pump condition is indicated on main control panel.

2. Butterfly valve with pneumatic actuator

- The butterfly valve is operated by pneumatic actuator and normally installed between pump and ballast tank.
- Valve condition is indicated on main control panel.

3. Main control panel

- This system can be automatically and manually controlled by the panel.
- Because the relevant information of system is indicated and control buttons are installed on front panel, the crew easily controls the system and checks each component simultaneously.

4. Pump starter panel

- The pump starter panel should be designed to consider motor power.
- This system can be manually controlled by pump starter panel.

5. Level switch(Optional)

- In order to prevent damage of pump, the level switch could be installed at low level of each water ballast tank upon request.

Mobile Water Monitor & Lance

for the fire protection of on deck container stacks



General

- The X-Monitor® & X-Lance® is water discharge device of portable type for the fire protection of on deck container stacks in accordance with 2016 SOLAS regulation II-2/10.7.3.
- Ships constructed on or after 1 January 2016 designed to carry five or more tiers of containers on or above the weather deck shall carry at least two or four mobile water monitor.
- Ships constructed on or after 1 January 2016 designed to carry containers on or above the weather deck shall carry at least one water mist lance.

Benefits

- High-efficiency performance at the low flow rate and low pressure
- Three legs of hook type in order to install easily on the board
- Easy mobility and quick operation by one crew member

Applied Rule & Regulation

- 2016 SOLAS Ch. II-2, Reg. 10.7.3 • IMO MSC.1/Circ. 1472

Mobile Water Monitor

Item	X-Monitor
Model	WM65-A
Body Material	Aluminum alloy
Weight	12.5kg
Nozzle type	Dual-purpose (Jet/Spray)
Normal flow rate	61 m³/h
Normal pressure	4bar
Normal jet length	42m
Normal jet height	24m at pressure 4bar
Normal spray angle	65°
Rotation range	0° ~ 360°
Elevation range	-30° ~ 100°
Connection size	65A

Water Mist Lance

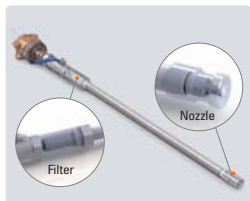
Item	X-Lance
Model	WML25-S
Body Material	SUS316L
Weight	3.2kg
Normal flow rate	20l/min
Normal pressure	4bar
Normal Spray angle	120°
Connection size	25A
Piercing method	Electric Drill / Manual Drill



Approved by
MED, DNV GL, ABS, NK



Approved by
DNV GL, ABS, NK



Fixed Long Jet Monitor

New Solution of Container ship Fire Accident

Background

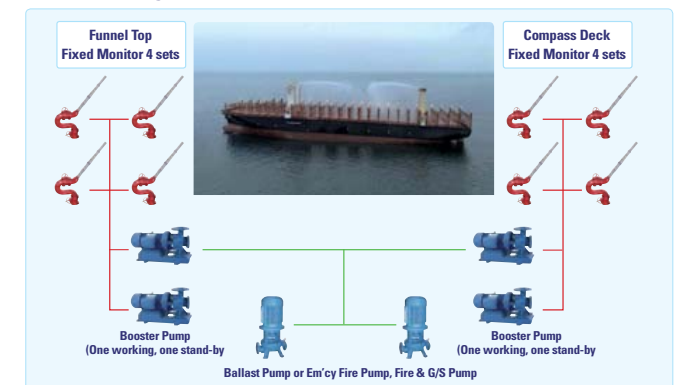


Fire accident of the container ship's cargo area is 31% of the entire ship fire, 59million dollars average property loss due to fire. Due to the increase in the size of the container vessel, the number of stacking containers increased and faced limits on fire suppression only existing fire hose. Fires involving the containers on deck, especially with the volume of cargo now being carried, can present a substantial risk to the safety of the crew and the vessel.

To solve this problem, TKT has developed a special device(as name Long Jet Water Monitor) that can shoot extinguishing water at a relatively low pressure and low flow rate.

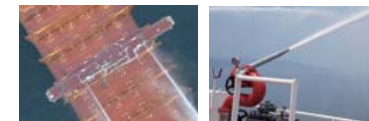
We, Tanktech have delivered 26 ships Long jet monitor system to Shipyard, and we are preparing to deliver long jet monitor system to 18 ships vessel, acco delivery date on contract. Even, 15 ships vessels are delivered to owner previously.

General Arrangement



Fixed Long Jet Monitor

Item	X-Monitor
Model	FWM-150S
Body Material	Carbon Steel
Nozzle Material	Stainless Steel 316
Nozzle type	Jet Type
Operation Method	Manual Reduction Gear Driving Type / Moter Driving Type
Weight	Abt. 130kg
Flow rate	250³/h
Pressure at water inlet	15.0 bar
Max. jet length	110m
Rotation range	0° ~ 360°
Elevation range	-50° ~ 90°
Connection size	JIS 20K 150A (DIN and ANSI are also available)
Monitor color	RED



Main purpose of the system

- To protect crew members
- To improve cooling effect
- To increase customer satisfaction

Water Spray System

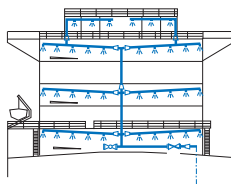
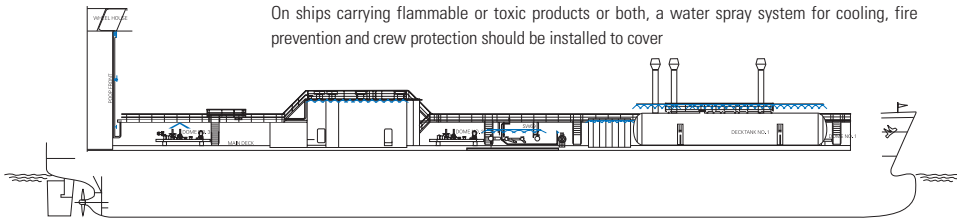


Applied Rule & Regulation

- IGC (International code for the construction and equipment of ships carrying liquefied gases in bulk) ch. 11.3 & 17.20.17
- Resolution A.123(V) ; Recommendation on fixed fire extinguishing systems for special category spaces
- 1998 SOLAS II-2 Reg. 37 ; Protection of special category spaces ch. 1.3
- 1998 SOLAS II-2 Reg. 53 ; Fire protection arrangements in cargo spaces ch.2 Ro/Ro cargo spaces
- 1998 SOLAS II-2 Reg. 54 ; Special requirements for ships carrying dangerous goods

Application

On ships carrying flammable or toxic products or both, a water spray system for cooling, fire prevention and crew protection should be installed to cover



- Escape route system
Persons onboard can safely and swiftly escape to the lifeboat and life craft embarkation
- Hatch cover of container ship carrying danger cargoes



Kind of Water Spray Nozzle

• CJ Nozzle

The prescriptive requirements of fixed fire-extinguishing systems for RO-RO spaces and special category space

MED & DNVType Approved.



• Hollow Cone Spray

Cone shaped spray jet with circular ring-shaped impingement area



• Full Cone Spray

Cone shaped spray jet with circular shaped impingement area



• Flat Fan Spray

Same as flat jet, spray pattern of a flat jet nozzle with slightly elliptical or straight line impingement area



Eductor (TSE Series)

General

Eductor, having no moving parts, lubricating and leaking parts, is widely used for marine system.

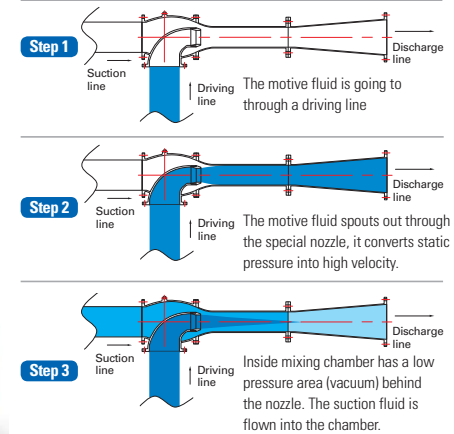
TANKTECH TSE series are made for more efficiency and more easily to handle for the all user.

Basic idea

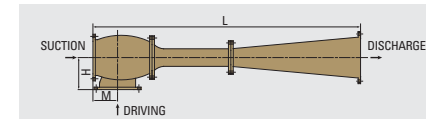
Motive fluid which has low velocity, it is spout out through the special nozzle, converting static pressure into high velocity. For this reason, inside mixing chamber has the low pressure area behind the nozzle. At this time the suction fluid is flown into the chamber.



GL Type Approved



Side Type (LP, HP series)



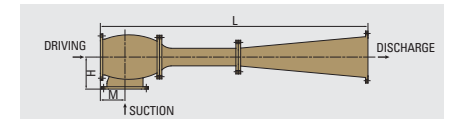
Low Pressure Eductor(TSE-LP series)

Size	Driving	Suction	Discharge	H(mm)	M(mm)	L(mm)
2-2-3	50A	50A	80A	120	120	680
3-3-4	80A	80A	100A	150	130	975
8-8-10	200A	200A	250A	230	175	1850
10-10-12	250A	250A	300A	260	200	2150
12-12-14	300A	300A	350A	295	225	2445
14-14-18	350A	350A	450A	330	255	2770

High Pressure Eductor(TSE-HP series)

Size	Driving	Suction	Discharge	H(mm)	M(mm)	L(mm)
1 1/2-2-2 1/2	40A	50A	65A	120	115	580
2-2 1/2-3	50A	65A	80A	120	115	680
2-3-3	50A	80A	80A	125	130	750
3-4-4	80A	100A	100A	150	105	840
4-5-5	100A	125A	125A	185	125	1010
4-5-6	100A	125A	150A	200	130	1165
4-6-6	100A	150A	150A	200	130	1165
5-6-8	125A	150A	200A	200	130	1700
6-6-8	150A	150A	200A	200	150	1680
6-8-8	150A	200A	200A	230	150	1700
6-8-10	150A	200A	250A	230	150	1800
8-10-12	200A	250A	300A	260	175	2100
10-12-14	250A	300A	350A	295	205	2410
12-14-16	300A	350A	400A	330	225	2750

In-Line Type (LPI, HPI series)



Low Pressure Eductor(TSE-LPI series)

Size	Driving	Suction	Discharge	H(mm)	M(mm)	L(mm)
2-2-3	50A	50A	80A	120	120	680
8-8-10	200A	200A	250A	230	175	1850
10-10-12	250A	250A	300A	260	200	2150
12-12-14	300A	300A	350A	295	225	2445

High Pressure Eductor(TSE-HPI series)

Size	Driving	Suction	Discharge	H(mm)	M(mm)	L(mm)
1 1/2-2-2 1/2	40A	50A	65A	120	115	580
2-2 1/2-3	50A	65A	80A	120	115	680
2-3-3	50A	80A	80A	125	130	750
3-4-4	80A	100A	100A	150	105	840
4-5-5	100A	125A	125A	185	125	1010
4-5-6	100A	150A	150A	200	130	1165
5-6-8	125A	150A	200A	200	130	1700
6-8-8	150A	200A	200A	230	150	1700
6-8-10	150A	200A	250A	230	150	1800
8-10-12	200A	250A	300A	260	175	2100
10-12-14	250A	300A	350A	295	205	2410

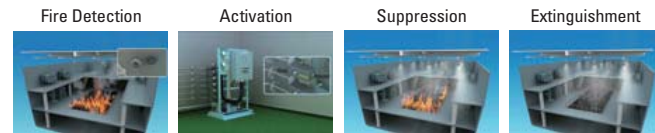
Water Mist Fire Fighting System



X-MIST® SYSTEM extinguishes or controls fires by cooling, oxygen displacement by water vapor and radiant heat attenuation. The exceptional cooling effect of water mist is a result of the division of water into very fine droplets, which increase the total surface area available to absorb heat and maximizes the evaporation rate of the water.

Local Water Mist Fire Fighting System for Machinery Space

System Sequence



Applied Rule & Regulation • 2000 SOLAS II-2 Reg. 10.5.6 • IMO MSC/Circ. 1387 • IMO MSC/Circ. 1165 Appendix A

Nozzle Specification



Type	Width(m)	Height (m)	Pressure (bar)	Flow (Lpm)	K-Factor
ELL	3.0	0.5-8.0	9-12	33-38	11.0
LL	3.0	1.5-4.0	7-10	15-18	5.6
HL	3.0	4.0-13.5	8-11	14-17	5.0

Major Component

Pump Unit (MOV type)

Supply water to each protected area.
Composed of pump/motor, MOV valve, motor starter panel.



Main Control Panel



Receive fire signal from alarm control panel.
Operate pump/motor and section valve.
Check an error of system.

Local Control Panel

The panel is installed at each section.
Manual release of water mist.



Smoke / Flame Detector



Addressable type

Alarm Control Panel



Receive fire data from detector consisted loop.

Fire Monitor (Repeat Panel)



Receive fire data from main control panel.
Display the state of fire at each section.

Benefits

- Motor operation valve with manual override
- No leakage while pump's running
- Easy maintenance

Total Water Mist Fire Fighting System for Machinery Space

- This system is fire extinguishing system to protect machinery space of category A and cargo pump room.
- In case of total flooding water mist system application onboard, the protected volume was limited by the same fire testing volume space and it restricted the application of total flooding water mist system onboard.
- For many years, the continued R&D efforts on water mist system to extend the protected volume has been carried out and finally, the new regulation (IMO MSC.1/Circ.1385) comes into effect since December 2010.
- Scientific methods on scaling of water mist fire testing volume are applied to the protected volume onboard.



Diesel oil in 4 m² tray



Flowing heptane from engine mock-up



Wood crib in 2 m² tray

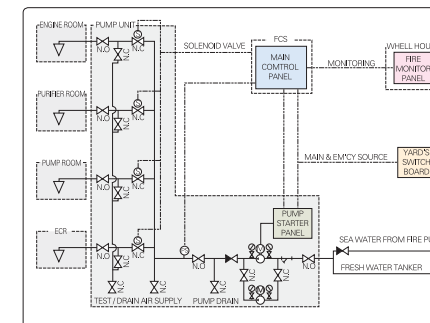
Applied Rule & Regulation • 2000 SOLAS II-2 Reg. 10.4.1 & 10.9.1 • IMO MSC/Circ. 1165 • IMO MSC/Circ. 1237
• IMO MSC/Circ. 1269 • IMO MSC.1/Circ. 1385

Nozzle Specification



Type	Horizontal spacing (m)	Longitudinal spacing (m)	Height (m)	Pressure (bar)	Flow rate (Lpm)	K-Factor
DC	4.0	3.0	13.5	10.0	22.5	7.1
DB	3.5	3.5	0.6-2.4	11.0	27.5	8.3

System Diagram



Benefits

- Friendly Environmental and Future Oriented Fire Extinguish System
- Secure Safety for Crew and Machinery
- The Latest high technology Fire Fighting System for Engine Room that can replace CO2 and Foam System.
- No need to recharging and inspection



Application

- Maximum ceiling height of protected space : 15.5m
- Maximum volume of protected space : 10,600m³

Emergency Towing Arrangement

TYPE APPROVAL PRODUCTS by LR, ABS, DNV, NK, BV, KR Etc.



Emergency Towing System(ETS) is the equipment designed to protect life and environment as making human can move or control heavy load when no available ship power is in the ship. And, also, ETS is not operated by itself when the ship enters the port so a connector between ETS and tug is supplied.

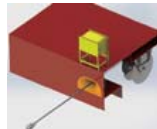
KETA- 40A & 20A : for AFT. of ship



On deck type



Under deck type



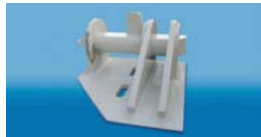
Full Under deck type

Installation :	For After of ship
Applied ship :	Over 20,000 DWT. of tankers
Safe working load (S.W.L) :	1000KN, 2000KN & 2500KN
Tested strength load :	2000KN, 4000KN & 5000KN

KETA- 45F & 43F : for Forward of ship



Bow Chain Stopper Type Common use as SPM
(S.W.L : 1000KN, 2000KN, 2500KN and 3500KN)

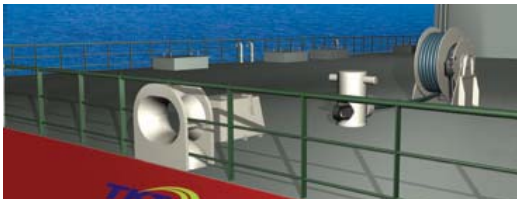


Smit Towing Bracket Type
(S.W.L : 1000KN, 2000KN, 2860KN and **7600KN**)
(MBL : **9500KN**)

Installation :	For Forward of ship
Applied ship :	Over 20,000 DWT. of tankers
Safe working load (S.W.L) :	1000KN and 2000KN
Tested strength load :	4000KN

Emergency Towing Arrangement with Escorting Pull Back System

KETSP - 20A & 40A



On deck type (Safe working load(S.W.L) : 1000KN and 2000KN)

KETSP- 20A & 40A is designed in compliance with IMO MSC. 35(63) and OCIMF "Recommendation for Ships' Fittings for use with Tugs" first Edition 2002.

Benefits

- Saving deck area for installation
- Saving Man-hour for installation
- Reduction of reinforce structure for under deck
- Easy Arrangement for AFT. mooring system



Emergency Towing System

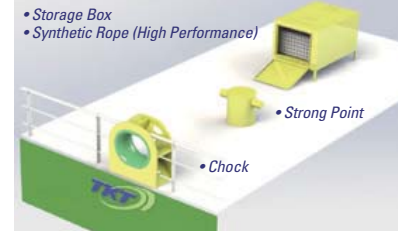
New Type of Emergency towing system for Stern



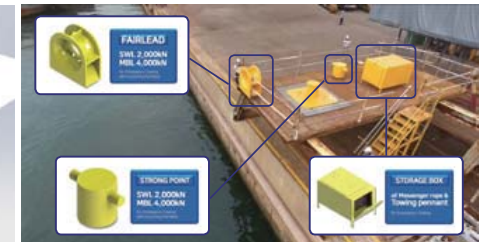
Background

- New System for Emergency Towing & Escorting Pullback has been tested in presence of Class Surveyor, and draft certificates are issued.
- The main function of Emergency Towing System is to save the dead ship without any power source.
- The system has the advantage for cost, installation area, maintenance free in comparison to the conventional type.
- In this system, the movable components (wearing component) is not existed, and crew save their time to repair the system.

KETPB-40A : For AFT. of ship



Deployment Test For New ETA



Main purpose of the system

- Combination of Emergency Towing & Escorting Pullback
- Lower Cost than Conventional Type
- Fewer Maintenance Point
- Smaller Area of Installation
- Easy Use
- Light Gross Weight



Towing & Mooring Fittings

TYPE APPROVAL PRODUCTS by LR, ABS, DNV, NK, BV, KR Etc.

Efforts of Low Temperature Service

The recent marine project is facing to extremely low temperature environmental service as like polar region, and all of material (metal, lubricant oil) & rotating part should be designed for enduring such low temperature to -60°C.

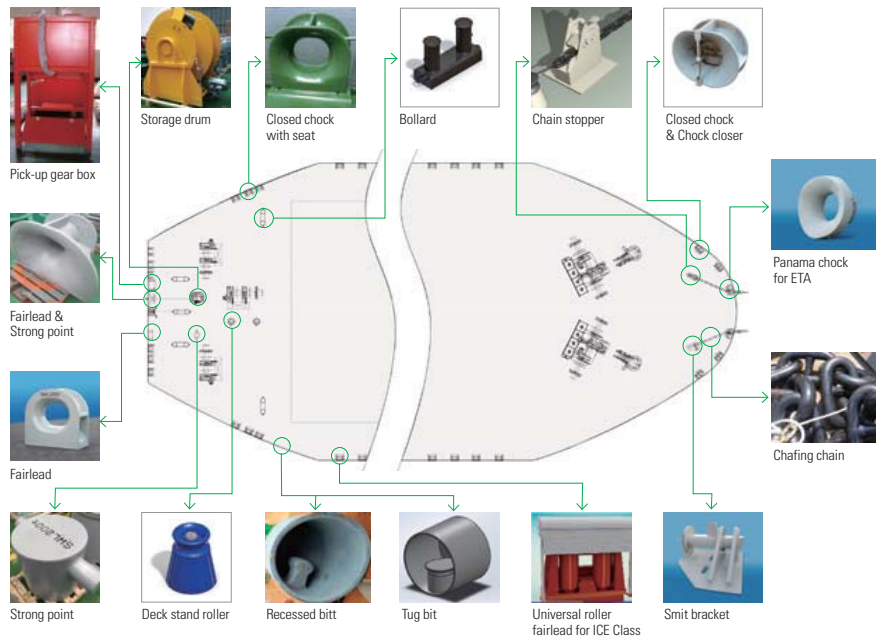


The material should be;

- Strong for impact
- Kept the viscosity at any temperature
- Kept their dimension or controlled its tolerance due to reduction

Big ICE test facility in TANKTECH enables the products to be tested at the service, and products of TANKTECH have been verified its performance in polar region.

Emergency towing sys. & Towing / mooring Fitting's Arrangement



[Korea Patented]

ROPESAVE® Liner

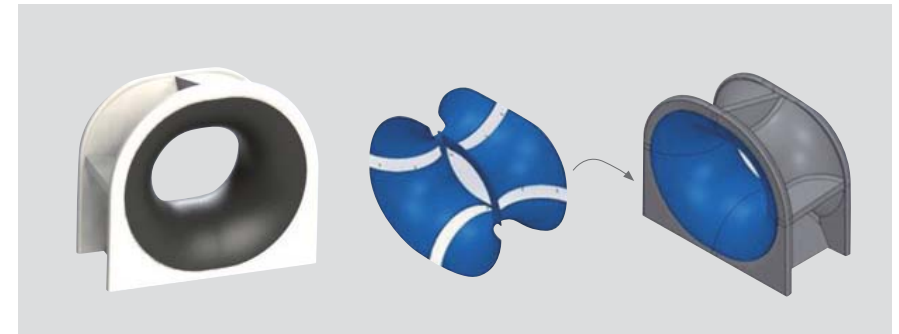
No longer worry about rop burn or chafing if with ROPESAVE® Liner

Background

HMSF(High Modulus Synthetic Fiber) lines has many benefits due to the high strength against to weight properties, light and easy handling. But the ropes can be affected by friction, cut resistance, temperature, UV degradation and etc.

Therefore, accordance with Mooring Equipment Guidelines(MEG4), its safe protection is recommended.

The ROPESAVE® Liner of Tanktech provides a solution for damage of the rope by friction and cut resistance. Its material was tested on the personal load bench, and the result was observed the life of the rope to which the Chock liner was applied was longer about 6 times than not applied..



Advantages of ROPESAVE® Liner

- 6 times Longer Life time of the rope
- Decline of rope friction
- Customized special material considering properties elastic and strong
- Low friction surface
- Light weight
- Easy installation, whenever and wherever, without crane



Proven performance test has been carried out with ISO/MEG4

[Patent pending]

Anti-Piracy Solution Gun



Model No.PSJ-1004
(Single-Nozzle Type)

Introduction

PSJ series is an innovative water-jet system which defends the vessel against forced boarding by the pirates. It consists of water jet nozzle mounted on the shipside, rotating 150 degrees and continuously shooting a high pressure stream of water. It can be installed on all kind of vessels and is especially suitable for oil, chemical, LPG and LNG ships as it is intrinsically safe.

PLUG
&
PLAY



Set up



Turn over



Connect



Water-jet

Advantage

- Non-Lethal Deterrent by High pressure Water JET
- No Extra Job and Equipment, Just PLUG & PLAY
- Insurance Benefit – Premium Discount by Marsh Ltd.
- Unmanned Operation and Maintenance-free Design
- Intrinsically Safe for ALL TYPE of Vessels
- Low Water Consumption with Maximum Power
 - 26 m³/hr at 8 bar with 38 meter length jet coverage(per unit)
- Proven Technologies from Programmable Tank Cleaning M/C
- Special Requirement also Available

Dimensions

- Flow: 26m³/hr @ 7 bar
- Jet pressure : 6 ~ 10bar
- Rotation speed : 9 ~ 15sec at 8bar
- Rotation angle : 150°
- Length : 748mm
- Weight : 19kg
- Connection type : flange or coupling

Material

Description	Material
Inlet body	AC4C
Nozzle	ALBC/SUS316
Quick coupling	On request
Supporting device	Carbon Steel

[Korea Patented]

Fuel Gas Supply System

Background

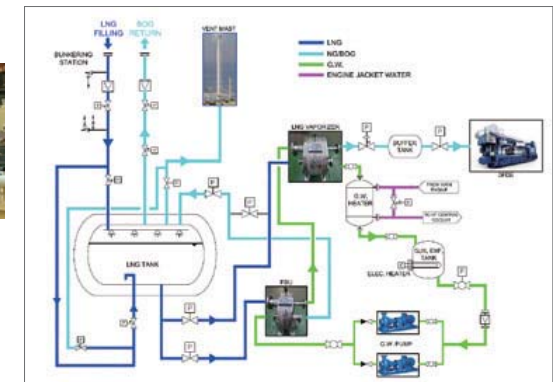
- The main factor of ocean's pollution is the exhaust gas from the engine with diesel fuel. There have been many trial to reduce SOx & NOx in order to protect the environment, such as FGSS, low sulfuric diesel, SCR, scrubbers.
- Korea government is also trying to join this kind of policy, and a solution, FGSS, is adapted to the water surface cleaning ship
- TANKTECH got a chance to supply FGSS with low pressure for 4 stroke dual fuel engine, and TANKTECH FGSS was supplied to the water surface cleaning ship for Incheon Regional Office of Oceans and Fisheries. The LNG tank is IMO C type with vacuum & perlite insulation.
- During sea trial, TANKTECH FGSS proved its capability and stability in the maximum engine load.
- Main components are designed by TANKTECH, such as heat exchanger, LNG tank, control system with AMS.

LNG Fuel Gas Supply System

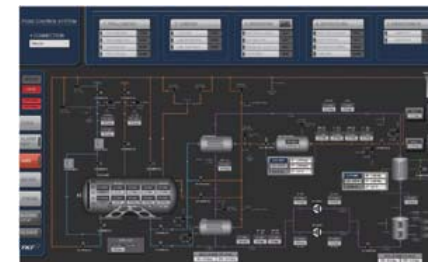


Main purpose of system

- Pressure Build-Up Control
- Supply Pressure of Fuel Gas Control
- Alarm Monitoring System

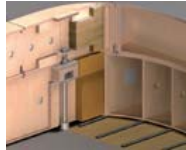


FGS control system & AMS of TANKTECH



Liquefied Gas Cargo Containment System

Approved by GTT



Picture from GTT Website

System Description

GTT NO96 type membrane cargo tank is described on left figure. Primary and secondary membranes made of invar is inside of inner hull of LNG carrier. Also, the insulation layers is between invar and inner hull. The primary and secondary membranes should be secured for load-bearing, and all of those are fixed by securing device. This system is one of most popular cargo containment system of LG.

Winterization

Inner Hull of GTT NO96 type membrane cargo tank is covered by winterization notation, and some location on that is under extreme low temperature service below -40 degrees. It means that coupler base socket should withstand such condition. Now, LTCS(Low Temperature Carbon Steel) for coupler is developed down to **-80 degrees** of test temperature.

Benefit

- **Alternative Material of Stainless Steel**
- **Low Cost**
- **No Filler Metal**
- **Available for Automatic Welding**



Coupler Base Socket Approval
(Type: Carbon Steel)

Key component of securing device



Collar Stud

Coupler Base Socket

Securing Device of TANKTECH

TANKTECH is finally granted to manufacture all components other than disc spring washer & self locked nut, and especially, following essential items were approved by GTT;

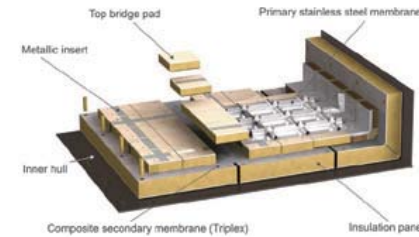
1. Collar Stud Standard (SUS304L)
2. Collar Stud Repair (SUS304L)
3. Collar Stud Special (SUS304L)
4. Coupler Base Socket (SUS304L)
5. Coupler Base Socket (LTCS)



TANKTECH is the only one company which has GTT approval for Collar Stud and Coupler Base Socket (LTCS) together.

Now, TANKTECH is ready for manufacturing Securing Device, and if NO96 is constructed at anywhere, TANKTECH can supply all components regardless of winterization.

Aluminum Wedges



System Description

The Mark III membrane system is a containment and insulation system, directly supported by the ship's hull structure. It is composed of a primary corrugated stainless steel membrane, positioned on top of prefabricated insulation panels, including a complete secondary membrane made of composite material.

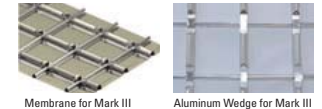
Aluminum Wedges

Aluminum Wedges are the supporting components for Membrane Sheet for Mark III type. Up to date, wooden wedges have been used for supporting membrane, but some tanks of LNG have to be reinforced against sloshing force of a internal liquefied natural gas. For this reason, Aluminum Wedge is promoted by GTT, and we are the joint venture with GTT for the wedges.

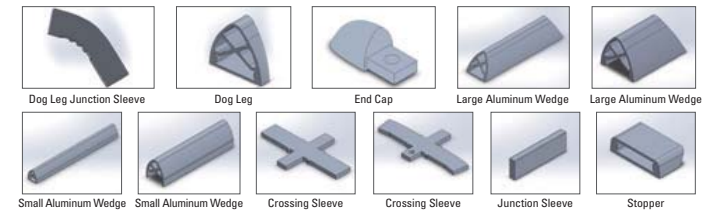
TANKTECH is a manufacturer of aluminum wedges, and all kinds of the wedges (Extrusion & Casting Components) can be supplied.

All of components have been tested under the cryogenic service temperature.

In future, the wedge is expected to be installed on LNG fuel tanks



Types of Aluminum Wedges



Application

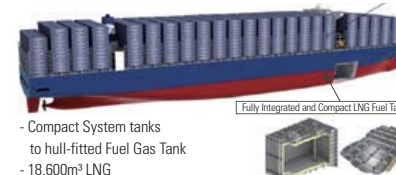
- Reinforcement elements destined for use in Mark III LNG Carrier
- Approval Level 1, and Approval test to be performed.
- Ambient Temperature : 23 ~ -163°C
- The element should be covered by GTT M3021 & M3000
- The wooden wedge is commonly used for Mark III type, but for more reinforcement, the aluminum wedge will be adapted.

Vision

In near future, the sales records of GTT will be increased, since the environmental protection is treated in the ocean, such as NOx, SOx. Such kind of pollution will be totally removed by LNG as a fuel.



- USCS(Ultra Large Container Ships)
- LNG bunker ship
- Cruise ship
- Container vessel(converted to LNG)



- Compact System tanks to hull-fitted Fuel Gas Tank
- 18,600m³ LNG

Reference List for Large Steel Structure

(Engineering, Fabrication & Machining)

KNARR FPSO PROJECT (MOONPOOL - N100 BLOCK)

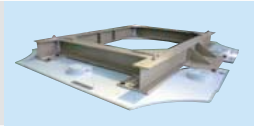
- Turret Lower Bearing
Supporting Plate



Gross Weight : 153 ton
Welding thickness : 25 ~ 130T
Grade : AH36 ~ EH36

BIG FOOT ETLP PROJECT

- Base Plate



Gross weight : 173 ton
Welding thickness : 20 ~ 52T
Grade : EH 36 ~ API 2W 60Z

JACKET LIFTING SYSTEM(JLS) PROJECT

- Upend/Derrick Skid Rail



Gross weight : 180 ton
Welding thickness : 50 ~ 220T
Grade : DH 36 ~ EH 36Z

SCF Sovcomflot LNG Carrier x 4 shipsets

- LNG Trunk Deck Unit
& Compressor, Room Unit



Gross weight : 300 ton/shipset
Welding thickness : Sch.10 ~ Sch.40
Grade : SUS316L (25A ~ 700A cargo piping)

12,000 CBM LEG CARRIER

- Upper Deck Unit
& Compressor, Room Unit



Gross weight : 256 ton
Welding thickness : 7.1 ~ 15.1 T
Grade : SS316L

SOUTH NEMBA AUXILIARY PROJECT

- Leg & Brace



Gross weight : 180 ton
Welding thickness : 20 ~ 57T Tubular pipe
Grade : DH 36 ~ EH 36

BIG FOOT ETLP PROJECT

- Rotating push & Steering frames



Gross weight : 19.7 ton
Grade : API - 5L PIPE
Push frame : 3 blocks
Steering frame : 2 blocks

ICHTHYS FPSO PROJECT

- Cargo Deck Unit



Gross weight : 118 ton
Welding thickness : 7.1 ~ 15.1 T
Grade : DUPLUX, SS316L

CAT-D DRILL SEMI-RIG x 2 SHIPS

- Pipe Duct Cable Unit



Gross weight : 192 ton/ship
Grade : SUS316L
PDC unit : - Column 4 Unit/ship,
- D/G Room 3 Unit/ship

155K LNG CARRIER PROJECT x 2 SHIPS

- LNG Pump Tower



Gross weight : 130 ton/ship
Welding thickness :
50A pipe(7.8mm) and 200A pipe(16.4mm)
Grade : SUS316L(JIS 50A ~ 200A CARGO PIPING)
Pump Tower : 4 units/ship

162K LNG CARRIER PROJECT

- LNG Pump Tower



Gross weight : 148 ton
Welding thickness : 65~400A
Grade : SUS316L

174K LNG CARRIER PROJECT

- LNG PUMP TOWER



Gross weight : 148 ton
Welding thickness : 65~400A
Material Grade : SUS316L



FPSO FAZFLOR

- Deluge Skid Fabrication,
incl. DnV FAT & Commissioning



Deluge skid : 43 units

FPSO KNARR PROJECT

- Bearing Node



Grade : EN S355G10+M

Q204 FPSO PROJECT

- Thruster Foundation



Size: 4000x4000x3 blocks
Grade : Carbon Steel with Inconel 625 Overlay

PRELUDE F-LNG PROJECT

- Platform Block



Gross weight : 700 ton
Welding thickness : 8 ~ 20T
Grade : AH 36 ~ EH 36

INPEX ICHTHYS FPSO

- Thruster Foundation



Gross weight : 50 ton
Welding thickness : 20 ~ 45T
Grade : EH 36 + Inconel overlay welding



www.tanktech.co.kr



Research & Development

Our management knows that Research & Development lead TANKTECH to a brighter future.

Under the Slogan of "There will be no future without Research & Development", our R & D staffs are striving to lead the technology. TANKTECH invests specific portion of its annual income to R & D and QC in order to develop more advanced technology, to commercialize the developed product, and to improve the safety and quality of the product.

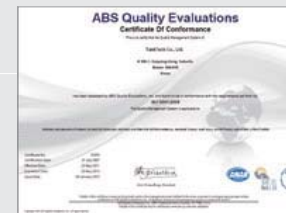
Project Management

TANKTECH has been developing high quality products by entering for many projects in domestic and abroad through Research & Development. TANKTECH is a company pursuing complete safety in performance of a project, and a prepared company with optimum total service network covering advanced service in planning as well for maintenance to be followed even after final delivery of the project.

Quality Control Activities

Standard Quality Control, Perfect Customer Service, and Reliability are the fact that are familiar to all of our staffs for the higher improved quality.

	OHSAS	18001
	ISO	9001:2015, 14001:2015, 45001:2018
	DNV	Welding shop approval
	USCG	Venting Device
	Marine Equipment	CE-MED, DNV, LRS, BV, RINA, RMRS, KR, NKK, GL and CCS



ISO 9001



ISO 14001



ISO 45001:2018



Welding Shop Approval



SHI Quality Certificate



DSME Quality Certificate



HHI Quality Certificate



Welding Shop Approval



QA Manager Certificate
by Korea Hydro & Nuclear Power Co



QA Manager Certificate
by Samsung Heavy Industry

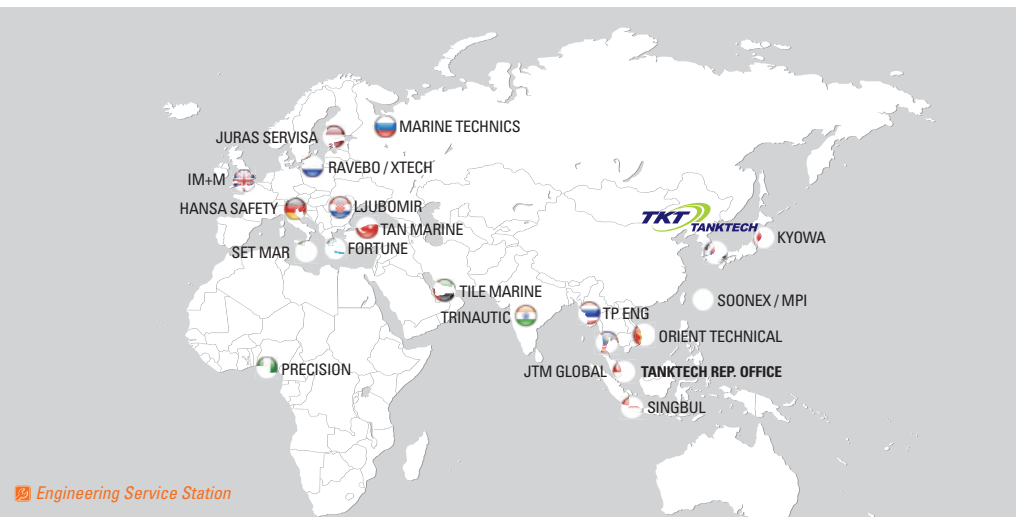


QA Manager Certificate
by Korea Standard Association



QA Manager Certificate
by Korea Atomic Institute Forum

TANKTECH Service Network



Engineering Service Station

EUROPE

TANMARINE DENİZCİLİK VE TİCARİET LTD ŞTİ. (Turkey)
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