

The Marine Service LNG Fuel Tank Container



LNG

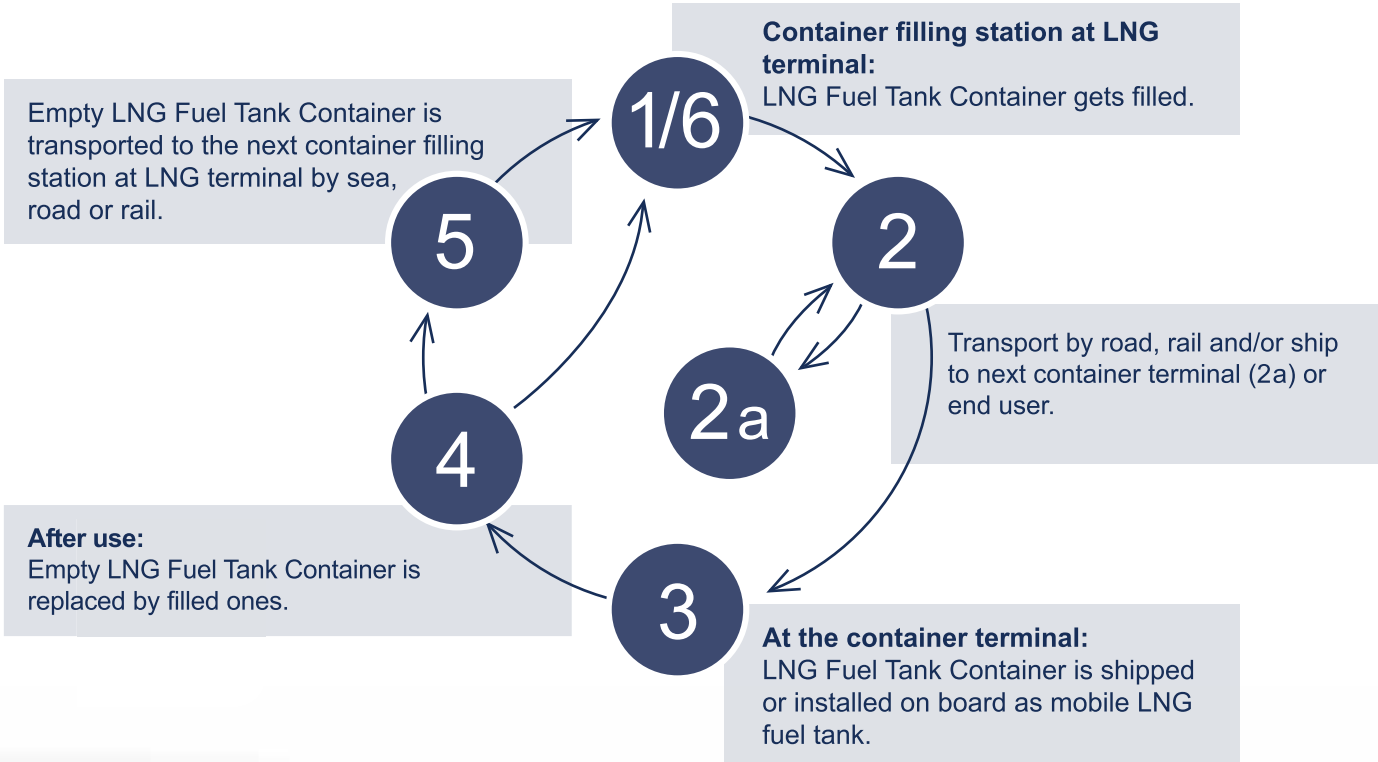
LNG FUEL TANK CONTAINER FOR SHIPS





Marine Service GmbH

The Marine Service LNG Fuel Tank Container





Marine Service GmbH

LNG as Marine Fuel

LNG Fuel Tank Container

the Alternative to conventional LNG bunkering infrastructure

40' ISO LNG Fuel Tank Container:

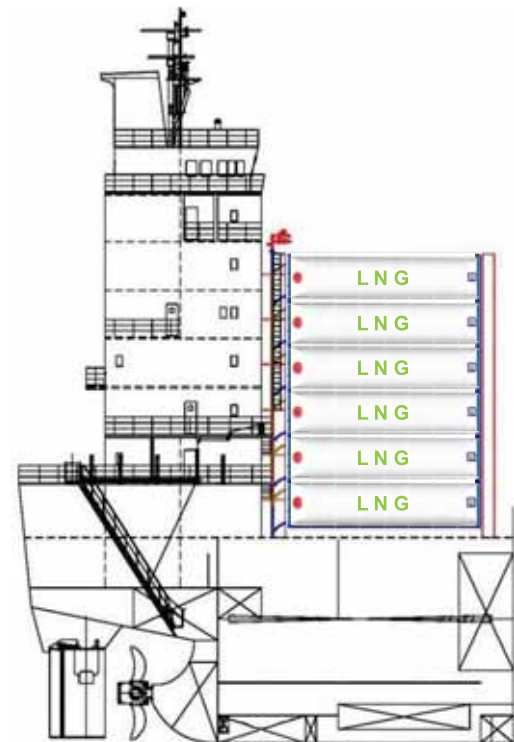
- Suitable for newbuildings and retrofits
- For Container Feeder vessels, Ro-Ro & Ro-Pax vessels, Ferries, Cruise Liners
- Eliminates need for LNG Power Barges

MS LNG Fuel Tank Container:

- Class approved Type C LNG Bunker Tank
- German TÜV certified IMDG Container
- 31 tons fully loaded, 33 m³ LNG capacity
- Fail safe dry quick coupling connection
- Approved for loading in stack 6 layers high

Containerized LNG:

- Stainless steel double-walled tank
- Vacuum insulated
- Use of existing multi-modal container distribution infrastructure
- Up to 80 days unattended holding time



No LNG transfer, no spillage risk



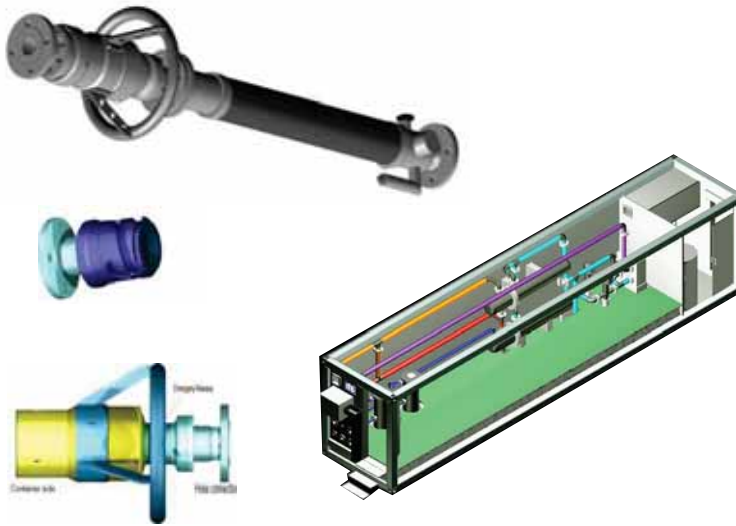


Marine Service GmbH

Turn-Key Marine LNG as Marine Fuel Solution

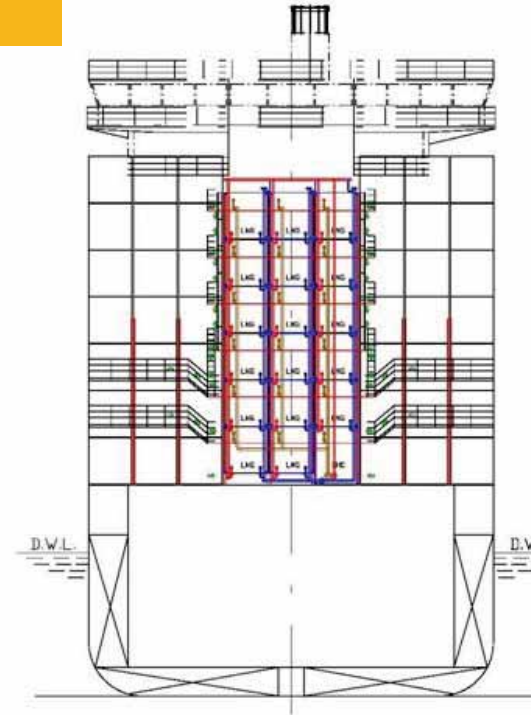
Optimized for quick and safe handling:

- Dry quick couplings with LNG hose leak detection including break-away safety connections
- All connections in protected aft location
- Double walled hose connection with leakage detection



Onboard Gas Handling System:

- Feed gas pressure and temperature control for lean gas and dual fuel engine supply
- Containerized or skid-mounted
- Part of MS turn-key scope of supply



LNG Fuel Gas Solution:

- Containerized Transport & Storage
- Fixed Tanks
- Gas Handling Units
– containerized or skid mounted
- Turn-key Project Management





Marine Service GmbH

Data Sheet LNG Fuel Tank Container

1. General Data (TYPE: Z+B/MS_14300156)

TYPE OF PRODUCT:	ISO tank container, LNG fuel tank for ships
SIZE:	40 ft
APPROVED FLUIDS:	LNG
GROSS CAPACITIES:	100% filling 40 460 l 82% filling 33 200 l
MAX. GROSS WEIGHT:	30 800 kg
TARE WEIGHT:	13 300 kg (max. tolerance: 3%)
MAX. PAYLOAD:	17 500 kg
DESIGN CODES - DANGEROUS GOODS:	EN13530 / EN14025 / ISO1496 / ADR / IMDG / RID
DESIGN CODES - SHIPS:	IMO / IGC code & MSC.285 / BV rules Nr529
POSITION EQUIPMENT / FLANGES:	front side for easy connection and accessibility of valves
NOTIFIED BODY:	BAM / BUREAU VERITAS
APPROVAL AGENCIES:	TÜV SÜD / BUREAU VERITAS

2. INTERNAL PRESSURE VESSEL:

MATERIAL:	Stainless steel 304 / 1.4301
DESIGN TEMPERATURE:	-196°C TO +50°C
DESIGN PRESSURES:	MAWP: 152,3 psi / 10,5 bar
SURGE PLATES:	5 transversal surge plates for partial filling operation
FILLING PRESSURE:	0.0 ... 0.3 bar (g)

3. EXTERNAL PRESSURE VESSEL:

MATERIAL:	Stainless steel 304 / 1.4301
DESIGN TEMPERATURE:	-196°C TO +50°C
DESIGN PRESSURES:	MAWP: 116 psi / 8.0 bar
MAEWP:	-14.5 psi / -1.0 bar

4. INSULATION:

TYPE OF INSULATION:	Vacuum with multi-layer insulation reflection foil
HEAT INPUT:	Max. 255 W
HOLDING TIME ON SHIP:	80 days at 82% filling (15 000 kg)
HOLDING TIME TANK:	90 days at 82% filling (15 000 kg)

5. FRAME STRUCTURE:

SIZE:	40 ft ISO container
DIMENSIONS (L x W x H):	12 192 X 2 438 X 2 591 mm
MATERIALS:	Stainless steel 304 / 1.4301 Carbon steel
STACKING LOAD:	5x TC on top (summary: 6x TC)

6. EQUIPMENT:

PIPING MATERIAL:	Stainless steel
VALVE TYPES :	Globe type operation valves Vacuum gate valve
TYPE OF CONNECTIONS:	Dry quick coupling with dry emergency release type: TCCV DN40

Marine Service GmbH

Mattentwiete 1

D-20457 Hamburg

Phone +49 40 36 90 30

Fax +49 40 36 90 32 64

Email ms@ms-de.eu

www.ms-de.eu



Marine Service GmbH

From Hamburg... to the World

Hamburg based Marine Service GmbH is part of the family owned Dr. Karl-Heinz Krämer GmbH. Founded in 1958 as a marine engineering company for the development, design, plan approval and construction-supervision of seagoing vessels, Marine Service is today also specialized in energy transportation, offshore wind power transformer and converter platforms and develops sophisticated technical and economical solutions for its

customers. Marine Service is pioneering in the development of alternative fuel and propulsion technologies and is a leading contributor in facilitating the implementation of offshore wind power projects and complex ships like carriers for LNG / LPG / LEG or chemicals, special vessels, ferries or yachts.



Dipl. Ing. Michael Kraack,

Managing Director, Marine Service:

Hamburg is the gate to the world and we are proud to call it home nevertheless we will be with you wherever you need us to be.

Global Business

● **US East Coast:**
3 LNG carriers
Plan approval supervision

● **US Great Lakes:**
FEED study LNG conversion

● **Mexico:**
Molten sulphur carrier
Plan approval supervision

● **Trinidad and Tobago:**
LPG carrier
Plan approval supervision

● **Venezuela:**
Dredger refurbishment
Consultancy

● **Argentina:**
Design of hydrographic
research control

● **Algeria:**
LNG carriers
Plan approval supervision

● **Finland:**
4 LNG carriers
Plan approval supervision

● **Germany:**
LPG carriers
Plan approval & supervision
Plan approval for North Sea
AC/DC converter platforms

● **Italy:**
LNG FSRU
Plan approval supervision
Project management

● **North Russia:**
LNG transport study

● **Russia, St Petersburg:**
Consultancy LNG

● **India:**
Petronet, 3 LNG carriers
Plan approval supervision

● **Abu Dhabi:**
8 LNG carriers
Plan approval supervision

● **Kuwait:**
Livestock carrier
Plan approval supervision

● **China:**
Design assistance to
Chinese shipyard for LNG carriers

● **Singapore:**
Tugs supervision
Plan approval supervision

● **Korea:**
Supervision for LNG carriers,
LPG carriers and chemical tankers

● **Japan:**
Supervision for LNG carriers

● **Indonesia:**
Plan approval for LNGC

