Main Business
LNG CCS & CHS Design, Consultancy and Engineering

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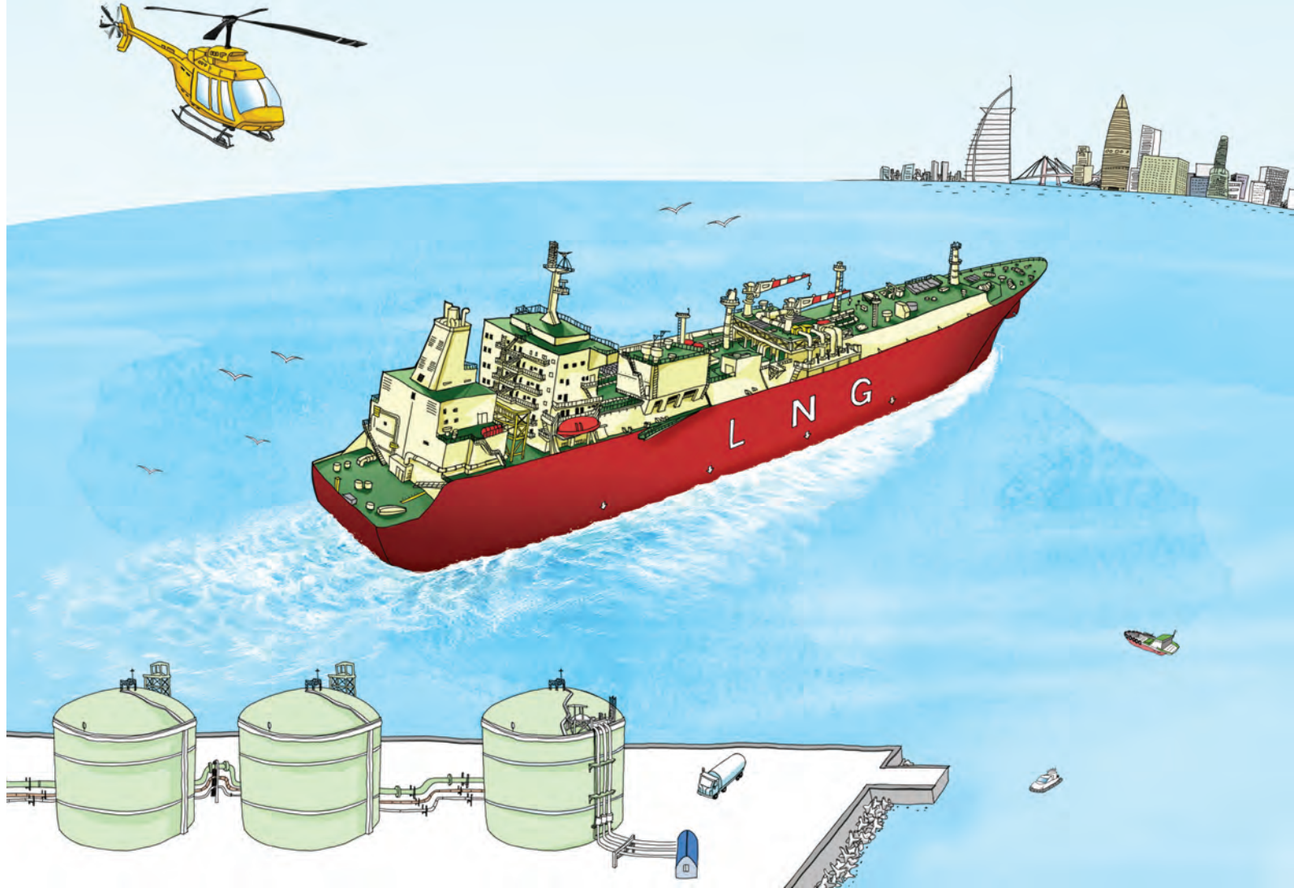
GOOD MAKES GOODS!
KC LNG TECH

GOOD MAKES GOODS



Outstanding Safety, Durability

Removing Defects from Technology

The strength of the KC-1 cargo containment system is that it has two metal barriers. Both the primary and secondary membranes consist of the same stainless steel with 1.5 mm thickness, so the system is designed to withstand all forces and fatigue which may occur during ship operation.
In addition, KC-1 has an advantage when it comes to liquid and gas tightness. This ensures excellent safety and durability of the membrane storage tank.

The Best **Technology**

KC-1 is a membrane- type LNG cargo containment system
that was developed by Korean proprietary
KOGAS LNG storage tank technology for in-land use.

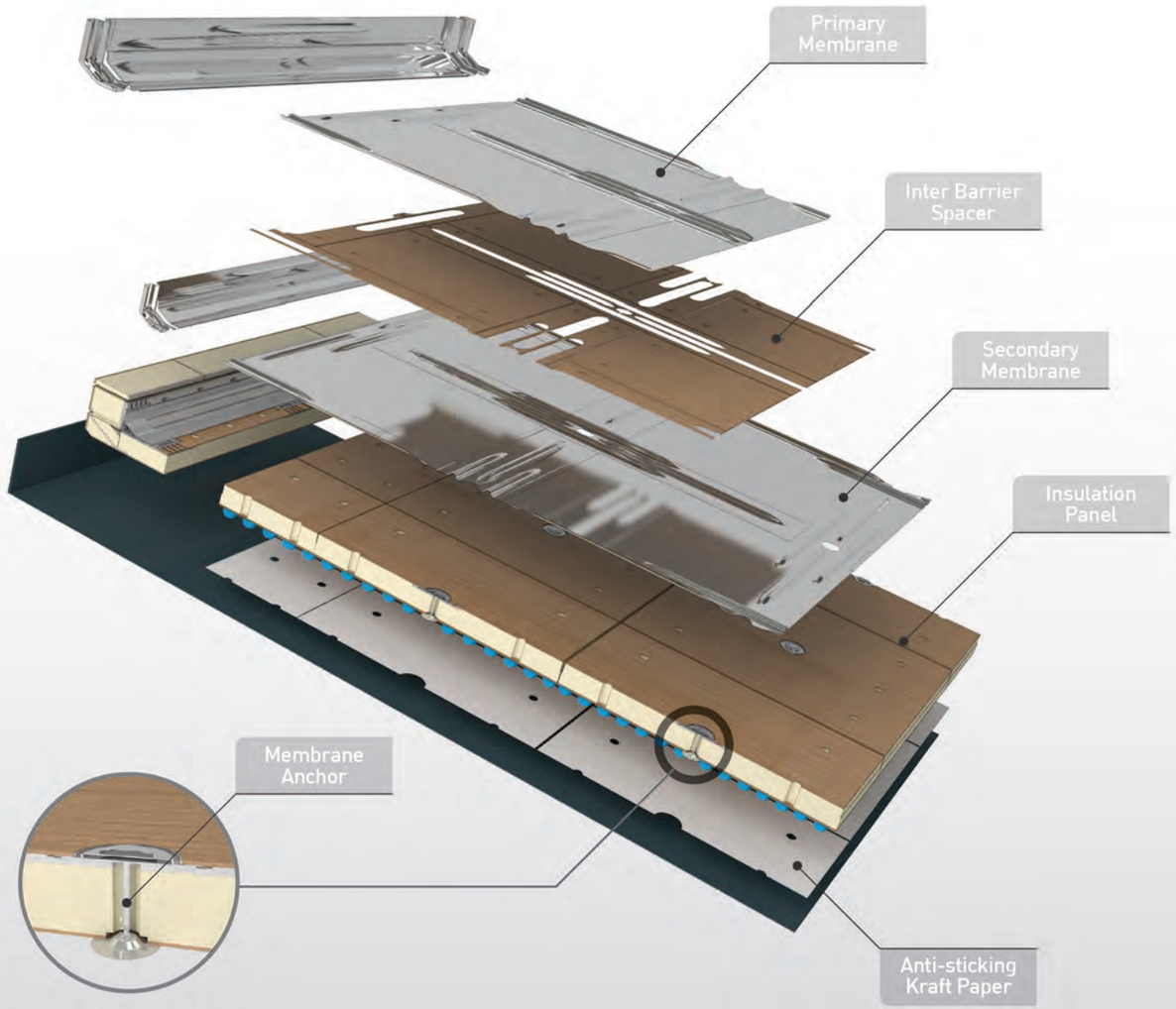


Best Technology
for the World

LNG Carrier / FLNG / FSRU
LNG Bunkering Vessel / Onshore Storage Tank / LNG Fuel Tank

Cargo Containment System
KC-1

KC-1 cargo containment system has double metal barriers.
These are welded to the membrane anchor which is specially
designed to secure membrane panels safely and enhance fatigue life.
They are also supported by the prefabricated single layered insulation panel.



Primary Stainless Steel Membrane

The primary membrane is made of discontinuous, corrugated AISI 304L with 1.5 mm thickness. It has arch-shaped end corrugations with 3 lanes.

Secondary Stainless Steel Membrane

The secondary barrier is made of non-continuous, corrugated AISI 304L with 1.5 mm thickness- the same as the primary barrier.
Secondary membrane has identical thickness and corrugation structure but a slightly different size and shape in order to ensure a certain amount of space between them.

Insulation System

The insulation system is a bonded sandwich structure with single layer including back plywood, rigid closed cell foam panel and top plywood. The insulation panels are made of polyurethane foam and fixed to the inner hull by means of stud bolts. Mastic attached to the inner hull serves only load bearing from cargo tanks because of anti-sticking paper between mastic and inner hull

Reliability

The KC-1 system has been approved by all the major classification societies and US Coast Guard. The double metallic barrier of the KC-1 system has improved the gas tightness of LNG cargo containment system's barriers.

Safety

The insulation spaces and inter-barrier spaces are continuously flushed with nitrogen gas to create an inert environment. The integrity of membranes is permanently monitored by the detection of hydrocarbon in the nitrogen. The KC-1 system has an additional LNG leakage detection system based on the temperature sensors in insulation panels.

Robustness

KC-1 membrane is thicker and has a lower profile of corrugation height. The corrugation pattern enables the membrane to accommodate any thermal or hull deflection stresses.

Easy to Manufacture

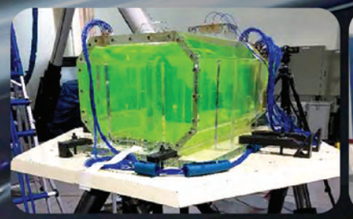
The insulation system has a single layer insulation panel, and there is no welding of the membrane corrugation on site. Only straight line welding is applied to the KC-1 membrane panel.

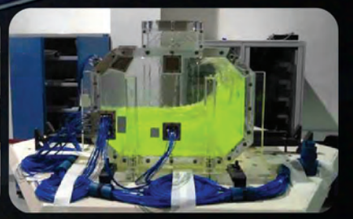
Reliability

Automatic welding, no welding along the corrugation and minimization of welding on site enables increased quality of welding and reduces human error.

Research and **Development**

Best Technology for the World





Technology Development

· Strength and Fatigue Analysis (Membrane and Insulation System)
· Testing-based Structural Analysis and Fatigue Life Estimation Research
· Seakeeping and Hydrodynamic-force Research
· Sloshing and CFD-based Flow-Analysis Research
· Advanced Insulation Performance Design
· Membrane Securing System Improvement
· Pump Tower Design
· Cargo Handling System
· Gas and Safety Research





Jeju Project

7.5K LNG Carrier & LNG Bunkering Vessel / Onshore LNG Terminal

| Operator
Korea Line Corporation (KLC)

| Shipbuilding
Samsung Heavy Industries (SHI)

| Ship Type
7,500 m^3 LNG Carrier / LNG Bunkering Vessel

| Operator
KOGAS

| Construction
POSCOENC

| Type
Above Ground Type, 45,000 kℓ x 2 tanks

Reference List

Ship In Operation /On Order

Ship name	Type of vessel	Delivery	Cargo volume
SK SERENITY	LNG carrier	09-02-2018	174,000m^3
SK SPICA	LNG carrier	09-03-2018	174,000m^3
K1001	LNG carrier	31-05-2019	7,500m^3
K1001	LNG Bunkering Ship	31-12-2019	7,500m^3

Land Storage Tank Under Construction

Project number	Type	Construction Completion	Cargo volume
K1002	Onshore LNG Storage Tank	31-08-2019	45,000 kℓ
K1002		31-08-2019	45,000 kℓ