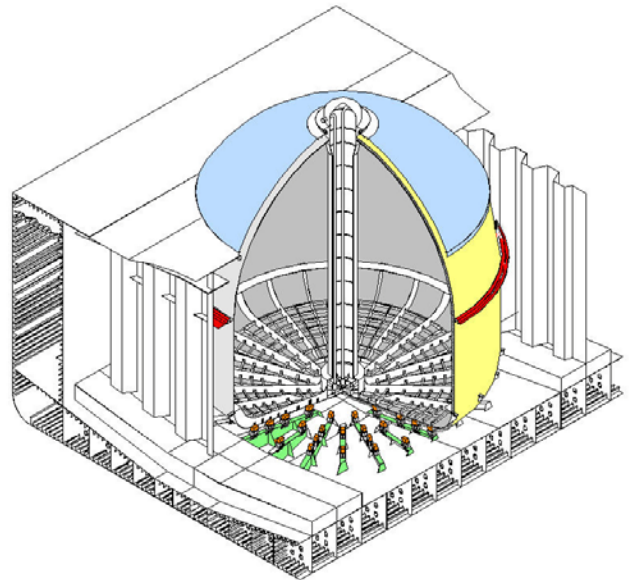




INO LNG

Containment System



New patented LNG containment system of IMO Type-B, developed by Inocean for application in LNG carriers and LNG production and storage units. The aim has been to develop a simple construction with minimum stiffening while maintaining the advantages of an all welded solid steel construction. A hemispherical top, a cylindrical mid part and a tori-conical bottom part is applied for best possible utilization of the floater hull.

9% Ni steel has been chosen to minimize the shell scantlings of the tank. The material has low thermal conductivity and low thermal expansion.

Sloshing of partly filled tanks is minimized by the geometry of the tank structure as well as damped by the bottom stiffening. The favorable sloshing characteristics of the tank has been verified by CFD analysis (DNV).

The INO LNG Containment System design has special emphasis on:

- simple all welded steel construction
- minimum interference with hull deformations
- sloshing safe
- all other systems (insulation, cargo handling, secondary barrier) known technology

MAIN PARTICULARS:

Tank type:	IMO Type-B independent cargo tank for LNG
Design temperature:	-163° C
Design cargo density:	0,50 t/m ³
Size:	46.000 m ³
Breadth (diameter):	42.000 m
Height:	43,463 m (tower dome excluded)
Material:	9% Nickel steel (primary barrier)
Secondary barrier:	Spray shield / drip pan
External design pressure:	5 kPa
Internal design pressure:	25 kPa (MARVS setting)
Design Life:	40 years
Design wave environment:	Hs =10 m

CURRENT STATUS OF DEVELOPMENT:

- Basic design for 45.000 m³ tank;
- Basic design drawing package completed.
 - LNG containment system specification and Material specification completed.
 - Main scantling calculation completed and verified by class (DNV).
 - Fatigue calculations performed, documentation pending.
 - Sloshing calculations (CFD) completed.
 - Material testing of 9% Ni-steel completed.
 - Steady state temperature calculation completed.
- Outstanding work to receive full class approval;
- Documentation of fatigue calculations.
 - Crack propagation and leak rate calculation.
 - Sloshing model test – depending on chosen design conditions for tank. Application in benign area will probably not require further testing.