TECHNICAL SPECIFICATION

CLIENT : TANK ONE
SPECIFICATION NO. : TONU 720045-8 RevA
DESCRIPTION : 22 000 LITRE 17.2 BAR UN PORTABLE TANK

1.0 Technical Characteristics

1.1 Design & Testing

Tank:	- in accordance with:	RID/ADR, IMDG & ASME VIII Div 1
	- Type:	T75 UN Portable Tank
Frame	- in accordance with:	ISO 1496/3
	- Type:	Collar Frame Design
Corner Castings		ISO 1161
Size and type code		22K7

1.2 Capacity

Nominal Capacity (± 1% Tolerance)	**22 000**	**L**

1.3 Frame Dimensions and Mass

MPGM	**36 000**	**kg**		
Tare Mass (± 3% Tolerance)	**7 500**	**kg**		
Length	6 058	mm	20	ft
Width	2 438	mm	8	ft
Height	2 591	mm	8 ft 6	in

1.4 Tank Dimensions

Inner Vessel

Inside Diameter	2 290	mm
Tan to Tan	4 600	mm
Corrosion Allowance	0	mm
Dished Ends – approximate 2: 1 ellipsoidal		

Outer Vessel

Inside Diameter	2 416	mm
Tan to Tan	5 368	mm
Corrosion Allowance	0	mm
Dished Ends – Torispherical		

1.5 Baffles

Two sets of stainless steel plate baffles (3mm thick) are fitted at 1/3 points.

1.6 Pressure & Temperature Rating

Inner Vessel

Maximum Allowable Working Pressure	17.2	bar	250 psi
Design Temperature Range	-196 to +50	°C	

Outer Vessel

Internal Design Pressure	-1,0	bar
External Design Pressure	1,0	bar
Design Temperature Range	-40 to +50	°C

1.7 Performance

Under standard conditions as defined in clause 3.3 of BS EN 12213-1999: Methods of Performance Evaluation of Thermal Insulation:

Product	Holding Time (days)	Payload (kg)	Initial/ Filling Pressure (barg)
LIN	74	12 706	0
LOX	108	19 320	0
LAR	86	23 517	0
LN2O	380	21 480	0

1.8 Insulation

Insulation type	Super insulation
Vacuum level warm	<7 microns
Vacuum level cold	<3.5 microns

1.9 Material of Construction

Framework	:	Hollow section	EN 10219 S355MH
		Plates	EN 10025 S355 K2 / EN 10149-2 S355MH
		Rolled section	EN 10025 S355 K2
Inner tank			SA 240 / EN 10028-7 1.4301 304L Stainless Steel
Baffles			SA 240 / EN 10028-7 1.4301 304L Stainless Steel
Outer tank			SA516 Gr70

1.10 NDE (Non-Destructive Examination)

TYPE	EXTENT	STAGE
Visual	100% All welds	Before & After Hydro.
Radiography	100% All long. & circ. butt welds	Before Hydro

2.0 Tank Fittings and Accessories

- Valve type Stainless Steel Cryogenic with extended spindle
- Anti-static jumpers fitted to in-line flange connections

2.1 Bottom Fill/ Liquid Line

- Valve Supplier Habonim
- Quantity 1 x 50 NB Firesafe Ball Valve
- Valve Supplier Herose
- Quantity 1 x 50 NB Globe + 1 x 15 NB Globe
- Line Size 50 NB (2")
- End Connection DN65 / DN50 PN40 Double drilled Flange + Blind Flange
- Gasket PTFE
- PG Supplier WIKA
- Specification 0-25 Bar

2.2 Top Fill/ Gas Line

- Valve Supplier Habonim
- Quantity 1 x 40 NB Firesafe Ball Valve
- Valve Supplier Herose
- Quantity 1 x 40 NB Globe + 1 x 15 NB Globe
- Line Size 40 NB (1.5")
- End Connection DN50 / DN40 PN40 Double drilled Flange + Blind Flange
- Gasket PTFE

2.3 Balance Line

- Valve Supplier Herose
- Quantity 1 x 40NB Globe
- Line Size 40 NB (1 ½ ")

2.4 Vent Line

- Valve Supplier Herose
- Quantity 1 x 40 NB Globe
- Line Size 40 NB (1 ½ ")
- End Connection Open at top of tank

2.5 Safety Relief Valve Assembly

- Valve Supplier Herose
- Quantity 4 x ¾" x 1" stainless steel safety relief valves
- Specification Set pressure 17.2 bar
- Valve Supplier Herose
- Quantity 1 x ¾" x 4 port 3 way divertor ball valve

2.6 Trycocks

- Valve Supplier Herose
- Quantity 3 x 15NB Globe – 71, 76 & 95% of gross volume
- Line Size 15 NB (½ ")

2.7 Sampling Lines

- Valve Supplier Tech TF
- Quantity 2 x 6 NB Needle valve
- End Connection ¼ " NPT + ¼" NPT Plug

2.8 Level Gauge

- Supplier WIKA
- Quantity One
- Specification Calibrated in mm H20 with conversion table decal on tank.
- Valve Supplier Generant
- Quantity 2 x 8 NB Needle valves– Liquid and Gas Isolation

2.9 Pressure Gauge

- Supplier WIKA
- Quantity One
- Specification 1 x indicating tank gas phase pressure in bar

2.10 Pressure Raising Circuit

- Valve Supplier Herose
- Quantity 1 x 25NB Globe + 1 x 40NB Globe
- Line Size Tank to Fins 25 NB (1 ")
- Line Size Fins to Tank 40 NB (1 ½ ")

Aluminium fins with stainless steel pipe reinforcement.

2.11 Vent Stack

All blow down and relief valves exhaust into a single vent stack to the top of the tank

2.12 Thermocouple

A Hastings DV6S thermocouple for vacuum measurement is fitted.

2.13 Pneumatic Control Panel

Bracket fitted as provision for Alphons Haar pneumatic valve fitment.

2.14 Pump and Flow Meter

Provision in valve circuit and cabinet for pump and flow meter fitment.

2.15 Earthing Connection

1-off stainless steel lug 60 x 50 x 2,5mm with a 20mm hole, is located at the rear of the tank frame.

2.16 Document Holder

1-off clear water-resistant PVC document holder is fitted to the frame.

2.17 Decals

Manufactured and applied by Gascon as per code requirements. White reflective tape to be added at tank ends.

2.18 Data Plates

One set of stainless steel data plates per tank as per code requirements.

2.19 Valve Cabinet

Stainless steel valve protection cabinets, complete with doors and swing door supports, house all valves and instrumentation.

2.20 GPS provision

Stainless steel tubing mounted within frame from transmitters to beacon mounting bracket at top rear of frame.

3.0 Finish

3.1 Internal

Internal Shell Surface	No 1 finish
Weld Seams	As welded

3.2 External

External Surface	Shotblasted to SA 2½ prior to painting
Weld Seams	As welded

3.3 Fittings

All fittings, including valves and pipe sections shall be degreased and then stored in clean sealed plastic bags until fitted to the tank. Cleaned for oxygen service, CGA4.1.

3.4 Cleaning

On completion of fabrication, the inner vessels internal surface shall be degreased, pickle and passivated. A cleaning certificate is to be provided in the document folder.

3.5 Leak Test and Nitrogen Purge

A helium mass-spectro meter leak test will be performed on inner and outer vessels. The vessel will be delivered in a Nitrogen purged condition. Dry nitrogen will be used (O2 < 1% residual oxygen, 1,0 bar pressure, Nitrogen dew point - 20°C).

3.6 Painting (Hempel)

The carbon steel frame components are shotblasted to SA 2½ and painted as follows:

First coat	Hempadur Zinc	(15360)	40 micron min DFT
Intermediate coat	Hempadur Primer	(15552)	40 micron min DFT
Final coat	Hempathane	(55210)	50 micron min DFT
	TOTAL		130 micron min DFT

Colour: Beams RAL 9010, Corner Castings RAL 2005

The carbon steel outer barrel is shotblasted to SA 2½ and painted as follows:

First coat	Hempadur Zinc	(15360)	40 micron min DFT
Intermediate coat	Hempadur Primer	(15552)	40 micron min DFT
Final coat	Hempathane	(55210)	50 micron min DFT
	TOTAL		130 micron min DFT

Colour: RAL9010

4.0 Test and Homologations

- These tank containers are constructed according to an approved design.
- Each production unit is subject to testing and non-destructive examination as required by ASME VIII Div 1, UIC and GasCon's own quality requirements. Each unit is inspected by the independent inspection authority Bureau Veritas.
- The container has been subjected to a stacking test load of 86400kg per corner post and is approved for 9-high stacking (8 x 24000kg).
- The UN Portable Tank fulfils the performance specification of the following International Organisation's regulations and recommendations and is supplied with their Approvals.

  IMDG - T75
  RID/ADR – T75
  Additional Approvals:
  TIR/Customs
  CSC
  UIC
  TC Impact Approved
  US DOT
  CE Marking (PED)

5.0 Documentation

The following documentation will be provided:
- Operation manual
- Certificate of cleaning (placed in the document holder).
- Initial Inspection Certificate for each tank.
- Name plate details.
- List of transportable products.

6.0 Products

UN1073 Oxygen, refrigerated liquid.
UN1951 Argon, refrigerated liquid.
UN1977 Nitrogen, refrigerated liquid.
UN2201 Nitrous Oxide, refrigerated liquid

7.0 General

- Internal piping stainless steel 304 / 304L
- Outer piping stainless steel 316 /316L
- Five years back to back guarantee on painting with Hempel Singapore.


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