DNV·GL

Certificate No:
TAS000012K

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Portable Tank

with type designation(s)
40ft ISO Container Model #12K-114-IMO
40ft ISO Container Model #12K-121-ISO

Issued to
Cryogenic Vessel Alternatives, L.L.C.
Baytown TX, United States

is found to comply with
International Convention for Safe Containers, 1972 (CSC)
ISO 1496, Part 3: Tank Containers for Liquids, Gases and Pressurized Dry Bulk
International Maritime Dangerous Goods Code (IMDG)
European Agreement Concerning the International Carriage of Dangerous Goods by Road (ADR)
Regulations Concerning the International Carriage of Dangerous Goods by Rail (RID)
Code of Federal Regulations 49

Application :

UN Portable Tank, Tank Instructions T75

Type	Max. gross mass	Max. payload	Tank cap.	MAWP/test pr.	Eq. shell thk.
Model #12K-114-IMO	**34000 kg 76956 lbs**	**21927 kg 48340 lbs**	**46033 L 12162 gal**	**7.86/11.66 bar 114/169 psi**	**8.81 mm 0.35 in**
Model #12K-121-ISO	**34000 kg 74956 lbs**	**21927 kg 48340 lbs**	**46033 L 12162 gal**	**8.34 /12.34 bar 121/179 psi**	**8.81 mm 0.35 in**

Issued at **Høvik** on **2017-07-12**
This Certificate is valid until **2021-07-11**.
DNV GL local station: **Houston**

for **DNV GL**

Approval Engineer: **Igor Antonijevic**

Inger-Helene Hals
Head of Section

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

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Manufactured by

DNV GL id number 1218821

Product description

This Type Approval Certificate replaces certificate S-7655.

Type	Model #12K-114-IMO	Model #12K-121-ISO
Max. external dimensions (LxWxH)	12192 x 2438 x 2591 mm (40′ x 8′ x 8.5′)	
Tare mass[1]	12073 kg (26617 lbs)	
ISO designation	1AA	
Size code	42	
Type code	K7	
Tank diameter (internal)	2305 mm (90.75 in)	
Thickness, inner vessel, shell	6.35 mm (0.25 in)	
Thickness, inner vessel, heads	9.52 mm (0.375 in)	
Tank material, inner vessel, shell	ASME SA-240 Gr 201-2	
Tank material, inner vessel, heads	ASME SA-240 Gr 304	
Tank material, outer jacket, shell	ASME SA 240 Gr 304	
Tank material, outer jacket, heads	ASME SA 240 Gr 304	
Pressure vessel code, tank	ASME VIII Div. 1	

1) tare mass is to be confirmed by weighing. The sum of the tare mass and the payload shall never exceed the Max. gross mass as it is stated on the front page of this certificate.

Insulation: Vacuum insulation (vacuum reading max 4 microns) + Multi-layer insulation on inner tank shell.

Application/Limitation

Designs approved according to IMDG Code, Edition 2016 Amdt. 38-16.

Type	Model #12K-114-IMO	Model #12K-121-ISO
IMDG/ADR/RID/ design approval refrence number	N-NV/473/12/11	
CSC/US DOT Approval reference number	US/SI-002/10[2)]	
Pressure vessel design approval number	N/A	17-OSL-ST-6008
Design pressure, inner vessel	8.96 bar (130 psi)	9.35 bar (135.7 psi)
Setting of relief valve	7.86 bar (114 psi)	8.34 bar (121 psi)
Design vacuum	1 bar (14.7 psi)	1 bar (14.7 psi)
Metallurgical design temperature for inner tank	-196°C to +38°C (-320°F to +100°F)	
Allowable stacking weight for 1,8g	192000 kg	
Racking test load value	15240 kg	
Effectiveness of the insulation system (heat influx)	220W (for NATURAL GAS, REFRIGERATED LIQUID)	

2) issued by Silver/Cims

Dangerous goods that can be transported:

UN No.	Class or division	Proper shipping name (PSN)	Holding time (@ 30°C)	
			Model #12K-114-IMO	Model #12K-121-ISO
			0.34 to 7.86 bar (5 to 114 psi)	0.34 to 8.34 bar (5 to 121 psi)
UN1972	2.1	NATURAL GAS, REFRIGERATED LIQUID	95 days 16479 kg (36331 lbs)	95 days 16492 kg (36359 lbs)
UN1038	2.1	ETHYLENE, REFRIGERATED LIQUID	-	205 days 22052 kg (48616 lbs)
UN1961	2.1	ETHANE, REFRIGERATED LIQUID	-	270 days 21169 kg (46670 lbs)

DNV GL surveyor has to witness important production and test events and issue Form no. 49.04x/a "Certificate for Tank Container or Portable Tank"
Each tank should be subjected to a hydraulic pressure test to test pressure.

Type Approval documentation

Tests carried out

Prototype tested according to the requirements.

Marking of product

Each container to be marked with:

- Data plate for UN tanks according to Ch. 6.7.4.15 requirements in IMDG Code, ADR and RID. Design approval number according to Application/Limitation above.
- Data plate according to DOT and CSC requirements including Allowable stacking load of 192000 kg.
- External marking according to CSC, IMDG/ADR/RID and DOT requirements
- DNV GL decal for freight containers
- mark to be hard stamped on frame
- Marking in accordance with other applicable codes

Periodical assessment

For retention of Type Approval, a DNV GL surveyor shall perform an assessment every 2nd year and before the expiry date of this certificate to verify that the type approval is complied with.

END OF CERTIFICATE