

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Pumps

with type designation(s)
SM series, SMR series

Issued to

Shinko Ind. Ltd.
Hiroshima City, Hiroshima Pref., Japan

is found to comply with

DNV rules for classification – Ships Pt.5 Ch.7 Liquefied gas tankers
DNV class programme DNV-CP-0505 – Type approval – Pumping units

Application :

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Type: Max. working press.: Operating media: Temperature range:
SM series (see next page)
SMR series (see next page)

Issued at **Høvik** on **2022-06-01**

This Certificate is valid until **2027-05-31**.

for **DNV**

DNV local station: **Kobe**

Approval Engineer: **Chi-wan Bang**

Monika Johannessen
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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

Submerged liquefied gas cargo pumps, centrifugal type with the specifications as follows:

SM Series - submerged

SMR Series - intank removable pumps

Model	Draw.no. (DATA SHEET)	Specified Capacity [m ³ /h]	Total head [m]	Design temp. [°C]	Speed [rpm]	Casing material	Impeller material	Shaft, fluid wetted parts
SM50	SM-KP50102	10 ~ 30	90 ~ 165	-163	3600	Al.Alloy Casting (AC4C- T6)	Al.Alloy Casting (AC4C- T6)	ASTM A522/ JIS G4303 9% nickel steel/ Stainless steel (SUS304)
SM50-2	SM-EP50202	10 ~ 30	90 ~ 245		3600			
SM50-4	SM-BV50402	10 ~ 30	190 ~ 500		3600			
SM65	SM-VE65102	30 ~ 60	90 ~ 165		3600			
SM65-2	SM-HD65202	30 ~ 60	90 ~ 260		3600			
SM65-4	SM-T65402	30 ~ 60	145 ~ 510		3600			
SM100	SM-BN10102	60 ~ 136	90 ~ 170		3600			
SM100-2	SM-V10202	60 ~ 135	150 ~ 300		3600			
SM150	SM-AQ15102	135 ~ 300	90 ~ 170		3600			
SM200	SM-DJ20102	200 ~ 600	90 ~ 170		1800			
SM202	SM-AB22102	300 ~ 600	130 ~ 210		3600			
SM202-2	SM-E22202	300 ~ 600	230 ~ 330		3600			
SM250	SM-BT25102	600 ~ 1000	90 ~ 170		1800			
SM300	SM-HN30102	1000 ~ 1550	90 ~ 170		1800			
SM300H	SM-HP30102	1000 ~ 1550	90 ~ 195		1800			
SM350	SM-ZR35102	1500 ~ 2100	90 ~ 200		1800			
SMR80	SMR-R80102	38 ~ 80	50 ~ 110		3600			
SMR100	SMR-AD10102	80 ~ 180	80 ~ 155		3600			
SMR150	SMR-CG15102	150 ~ 350	80 ~ 180		3600			
SMR200	SMR-WM20102	350 ~ 600	80 ~ 240		3600			
SMR250	SMR-EA25102	600 ~ 1000	80 ~ 240		3600			
SMR300	SMR-AP30102	1000 ~ 1500	80 ~ 170		1800			
SMR350	SMR-AF35102	1500 ~ 2000	80 ~ 170		1800			

Performance- and technical data see manufacturers data sheet & capacity curves

Application/Limitation

- Each pump shall be delivered with Society's product certificate in accordance with Pt.5 Ch.7 Sec.1 [5.2] Table 7.

Type Approval documentation

Tests carried out

Satisfactory in-service experience of the existing pumps is submitted by the manufacturer in lieu of prototype testing.



Job Id: **262.1-037128-1**
Certificate No: **TAP00002HB**

Marking of product

Each equipment shall be permanently marked according to DNV-CP-0505 Sec.7.

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the approval are complied with. Reference is made to DNVGL-CP-0338, Sec.4.

END OF CERTIFICATE