



Type Approval Certificate

[Centrifugal Submerged Cryogenic Pump]

Initial Approval 21 October 2024
Manufacturer NIKKISO ACD LLC
2321 S. Pullman Street Santa Ana, CA 92705 USA
Product Description Centrifugal Submerged Cryogenic Pumps and VFD Motor Assembly
Type : TC 34 Centrifugal pump

“ See Appendix 1 ”

Approval Condition

“ See Appendix 1 ”

THIS IS TO CERTIFY that the above-mentioned product has been approved in accordance with the relevant requirement of this Society's Rules and / or of the recognized standards as follows.

Pt. 7, Ch. 5, Sec. 5 & Pt. 5, Ch. 6 of the Rules for Classification of Steel Ship and Annex.1, Sec. 5 of Rules for the Classification of Ships Using Low-flashpoint Fuels.

This Certificate is valid until 20 October 2029

Issued at Busan, Korea on 21 October 2024



This certificate is signed electronically in accordance with IMO FAL.5/Circ.39/Rev.2. Validation and authentication of the certificate can be confirmed from "<http://e-cert.krs.co.kr>" by using the tracking No(ME24050700216) and certificate No.(LOX46451-PP001).



KOREAN REGISTER

*General Manager of
Marine & Ocean Equipment Team*

- Note :**
1. This certificate will be valid subject to complying with the approval conditions described on the certificate and/or on the Rules of this Society.
 2. This certificate will be invalid from the expiry date aforementioned unless the extension or renewal has been granted to the applicant or the manufacturer.
 3. Any significant modifications or changes in design or construction to the above product without approval from this Society will render this certificate invalid.
 4. Should the specified rules, regulations or standards be amended during the validity of this certificate, the product is to be re-approved by this Society in accordance with the requirements as amended.

Product Description and/or Approval Condition

Date of Issue : 21 October 2024

A. Product Description

1. Product Specification

- 1) Model : 54095, 54715, 59435, C10485, C10490, 68990
- 2) Liquid : Liquefied Natural Gas, Liquid Nitrogen
- 3) Flow Rate : 8 ~ 1510 lpm
- 4) NPSHR : 0.5 ~ 4 m
- 5) Differential Head : 15 ~ 488 m
- 6) Design Rating : 7.5 ~ 34 kW
- 7) Max. Speed : 1500 ~ 7200 rpm
- 8) Design Temp. : -40 ~ -196 °C
- 9) Design Pressure : 19 bar
- 10) Material of Main Components
 - a) Shaft : SS17-4 PH
 - b) Motor Housing : Alum 6061-T6, Bronze C93200*
 - c) Impeller : Alum A356-T6, Bronze C87500*
 - d) Inducer : Alum A356-T6, Bronze C92200* or C90300*

* The basic material of the product is aluminum. If the product material is bronze, separate approval from the flag Administration of specific ship is required.

2. Approved Drawings and Documents

- 1) Drawing No. 54095_Rev. B, 54715_Rev. B, 59435_Rev. B, C10485_Rev. B, C10490_Rev. B, 68990_Rev. B, 52364_Rev. B, 52365_Rev. D, 52366_Rev. B, 53798_Rev. D, 54056_Rev. B, 54057_Rev. B, 54059_Rev. B, 54063_Rev. B, 54064_Rev. B, 54073_Rev. B, 54078_Rev. B, 54079_Rev. B, 54773_Rev. B, 54782_Rev. B, 54787_Rev. B, 59436_Rev. B, 68978_Rev. B, 69004_Rev. B, 69030_Rev. B, 69035_Rev. B, 3500427_Rev. B, C10177_Rev. B, C10179_Rev. B, C10189_Rev. B, C10263_Rev. B, 52366_Rev. B, 54784_Rev. B

3. Test Reports, etc.

- 1) Type approval test was conducted on 10 ~ 11 July 2024.

B. Approval Condition

1. Application & Limitation

- 1) The materials used for main components are to be supplied by the approved manufacturers and is to be certified by the Society or to be satisfactory to the surveyor according to the relevant rule requirement.
- 2) The minimum average energy for Charpy V-notch impact test should be complied with the relevant requirements of the Rules, Pt. 7, Ch. 5, Sec. 6.
- 3) Pumps are to be of a non-sparking construction and prime movers for the pumps installed in Gas Hazardous Area are to be explosion-proof type approved by the Society.
- 4) All cable splices for junction box connections are to be type approved if applicable.

2. Individual Product Cert. and Drawing Approval Requirement

- 1) Individual Product Certification is required.

3. Marking

- 1) The product is to be marked with manufacturer's name or trademark, a date of manufacture and type designation number at least.

4. Others

- Nil

< End of Certificate >