

Type approval of valves for gas

November 2023

ClassNK Machinery Department

■ Type approval

- ✓ Subject: Valves* (**used temperature below -55°C**) for gas to be installed in liquid gas carriers / gas fuelled vessels

Valves for gas that are designed based on **neither JIS nor recognized standards** that are deemed appropriate by the Society.

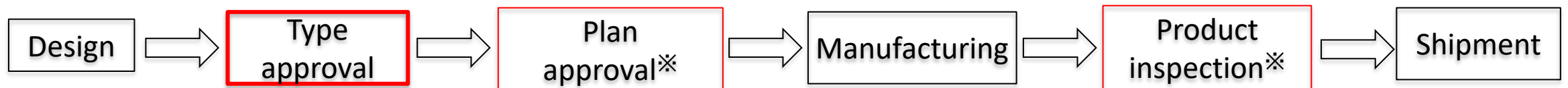
* Valve: Closure component other than relief valve (e.g. stop valve, emergency shutdown valve, check valve)

- ✓ NK Rules: Chapter 2, Part 6 of “Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use” (Hereinafter referred as “Guidance”),
Annex 1, Part N/GF of “Guidance for the Survey and Construction of Steel Ships”
(Hereinafter referred as “ANNEX”)

- ✓ Validity: 5 years

■ Times

- ✓ Before manufacturing valves for the first time to be installed in NK Classed vessels



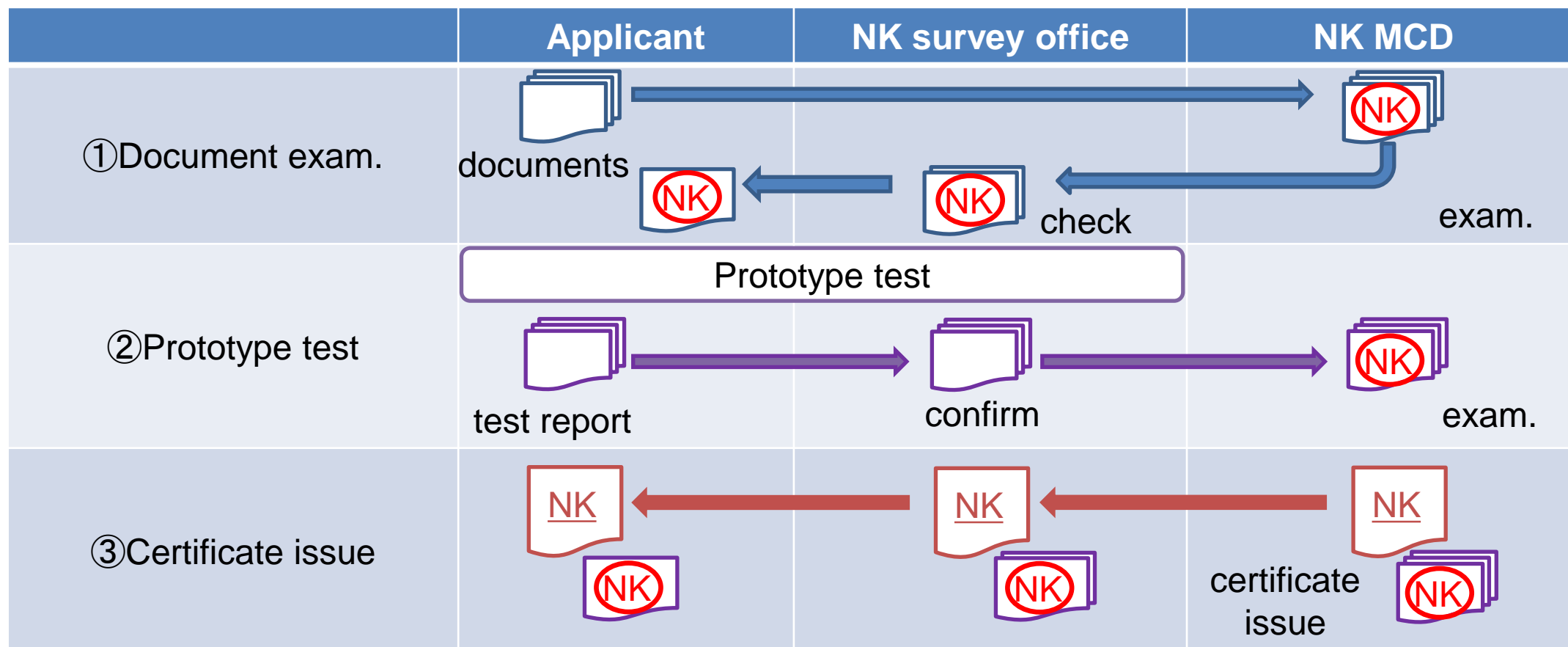
※ required whether type approval is required or not. (p13, 14)

Approval process

■ Department in charge

- ✓ Document examination / certificate issue : Machinery Department (MCD, head office)
- ✓ Prototype test : nearest NK survey office of the factory (reference : [Directory | ClassNK – English](#))

2~3month*



*When the document examination and prototype test are conducted smoothly

[2.2.2, Part 6 of Guidance and 1.2, ch.1 of ANNEX]

■ Application (Form 6-2)

✓ Please download from our website.
(URL: [Application Forms | ClassNK – English](#))

■ Introduction of the manufacturing plant (e.g. brochure of the company)

■ Technical information on the valves (e.g. brochure of the products)

■ Information on the manufacture and quality control of the valves

■ Records of manufacture and delivery of the valves

■ Details of welding specifications (include test inspection, when welding is performed)

■ Drawings for approval (please refer to p5)

■ Prototype test plan for approval (please refer to pp.6-8)

 Please submit the documents above to ClassNK Machinery Department (mcd@classnk.or.jp)

■ Request

- ✓ Materials, design pressure, minimum temperature for use and fluid to be specified
- ✓ Drawings for all sizes applying for type approval to be submitted
- ✓ If the design is in accordance with recognized standards (e.g. JIS), the standard to be specified in the drawings.

■ Material

- ✓ Suitable material for design temperature to be used [6.4, Part N of NK Rules / 7.4, Part GF of NK Rules]
- ✓ Materials of principal pressure-bearing parts (e.g. Body and Bonnet) are to be in accordance with Part K of NK Rules.

■ Connections

- ✓ In accordance with 5.8, Part N of NK Rule / 7.3.6-4, Part GF of NK Rule

■ Required tests

- ✓ Material test
- ✓ Pressure test
- ✓ Airtightness test
- ✓ Leakage verification test
- ✓ Operating test at low temperature
- ✓ Open up inspection
- ✓ Flow or capacity test
- ✓ Fire test (For emergency shutdown valves, with materials having melting temperatures lower than 925°C)
- ✓ Other tests and inspection as deemed necessary by the Society depending on the type of valve.

■ Material test

- ✓ In accordance with relevant rules of Part K and 6.4, Part N / 7.4, Part GF of NK Rules

■ Pressure test

- ✓ Tests are to be conducted at a pressure 1.5 times the design pressure at room temperature.

■ Airtightness test

- ✓ Tests are to be conducted after assembly at 1.1 times the design pressure at room temperature.

Prototype test [5.3.1, ch.5 of ANNEX]

■ Leakage verification test

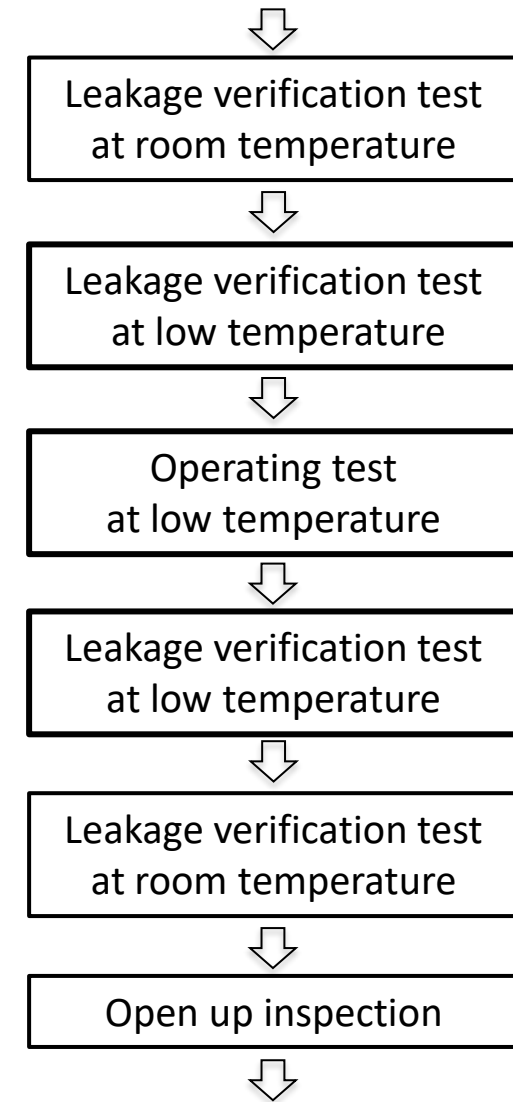
- ✓ Before conducting the operating test
- ✓ At room temperature and low temperature
- ✓ At over entire range of working pressure, raised in increments as given in Table 5.1
- ✓ Valves which are capable of sealing in both directions, tests are to be conducted for both directions
- ✓ Acceptability level

At room temperature : no leakage in principle

At low temperature : level deemed appropriate by the Society

Table 5.1

Design pressure (MPa)	Increment ⁽¹⁾ (MPa)
2.0 and below	0.35
5.0 and below	0.75
6.4 and below	1.0
10.0 and below	2.0



Example of tests

■ Operating test at low temperature

- ✓ at a temperature not more than the lowest design temperature
- ✓ At least 20 times of opening and closing operation
- ✓ After that, leakage verification test (at low temperature) to be conducted
- ✓ After that, leakage verification test (at room temperature) to be conducted
- ✓ After above tests, open up inspection to be conducted

Example of type approval certificate



NIPPON KAIJI KYOKAI

TYPE APPROVAL CERTIFICATE

Certificate No. TAxxxxxM

This is to certify that the undernoted product(s) has been approved in accordance with the relevant requirements of "Rules for the Survey and Construction of Steel Ships", "Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use" as specified below, and that the product(s) is found to comply with "International Code for the Construction and Equipment of Ships Carrying Liquefied Gases in Bulk (IGC Code)" as amended by Res.MSC.370(93) and "International Code of Safety for Ship Using Gases or Other Low-flashpoint Fuels (IGF Code)" as adopted by Res.MSC.391(95).

This certificate is issued to:

Manufacturer **XXXXXXXX Co., Ltd.**
Product description **Valves for Low Temperature Service of Liquefied Gas**
Type designation(s) **XXXXXX**
Applied requirements • Chapter 5 Part N Annex 1, Guidance for the Survey and Construction of Steel Ships
 • Chapter 5 Part GF Annex 1, Guidance for the Survey and Construction of Steel Ships
 • Part 6, Chapter 2, Guidance for the Approval and Type Approval of Materials and Equipment for Marine Use
Approval No. **00LA000B**

This certificate is valid until dd mm 202y

Issued at Tokyo on dd mm 202y

The details are described in the attached sheet(s).

 (X. Xxxx)
 General Manager of
 Machinery Department

NIPPON KAIJI KYOKAI

Attached sheet to the Certificate No.TAxxxxxM (1/1)

1. Particulars

Type	DWG No.	Nominal Dia.	Design Pressure (MPa)	Design Temp. (°C)	Fluid

- Compatibility with intended fluid is to be confirmed by the Society.
- Approval conditions
Materials of pressure parts (body) are to be in accordance with the relevant requirements of Part K and N/GF of NK Rules.
- Production inspection is required for each product in the presence of the Society's surveyor.

- The End -

Publication of the approval information

■ Publication of the approval information

- ✓ After approval, copy of certificate and approval information can be uploaded on our website.
(Your request is asked in the type approval issued for the first time)

Example

The screenshot shows the ClassNK website interface. At the top, there is a navigation bar with links for HOME, AboutNK, Products & Services, Certification Services, Information Services, and Research. Below this, a breadcrumb trail reads: HOME > Products & Services > Classification Services > Approval Lists > LIST OF APPROVED MATERIALS AND EQUIPMENT. A left sidebar menu lists various services under 'Classification Services' and 'Approval Lists'. The main content area features a search box with the text 'LIST OF APPROVED MATERIALS AND EQUIPMENT' and a description: 'This page provide the keyword search service for approved materials and equipment. You can enter multiple keywords separated using the spacebar. It is recommended to enter multiple keywords in order to obtain a more accurate search result.' Below the search box is an 'Advanced Search On/Off' section with several dropdown and input fields: Product Area, Product Line, Product, Type/Brand/Grade, Company, and Country. There are also 'Search' and 'Reset' buttons.

The screenshot shows a form titled 'APPROVED MATERIALS AND EQUIPMENT'. It contains several input fields for user information: Company, Address, Country, TEL, FAX, E-mail, and URL. Below these fields are two columns of information. The first column is labeled 'Product Line' and the second is 'Use of Machinery'. Each column has a 'Certificate' field. A note at the bottom right states: 'Note: The image shown here is not a true copy of the certificate. However, the content is identical.' There is also a link that says 'Open the Certificate'.

[Approval Lists | ClassNK - English](#)

■ Documents to be submitted for approval

- ✓ Application ([Form6-2](#))
- ✓ Production / delivery records for the last five years

■ Process of renewal

- ✓ Document examination

Alteration of type approval

■ Examples of application

- ✓ Add types for approval
- ✓ Change the material of products or the design of components
- ✓ Change the company name

■ Application

- ✓ The application form ([Form6-2](#)) and revised documents that are changed since the last approval to be submitted to Machinery Department (Head office)

■ Process of alteration

- ✓ Document examination + prototype test

■ Attention

- ✓ Validity will not be extended

※ Plan approval is required whether type approval is required or not.

■ Plan approval

- ✓ The drawings to be submitted after the intended vessel is determined (Please refer Machinery-Related FAQ Q2 of our website ([Machinery-Related FAQ | ClassNK - English](#)) for submission method)
- ✓ Drawings and documents
 - General specification (include design pressure, minimum designed temperature and fluid)
 - Drawings of sectional view (include material and welding specification)
 - Information of the installed vessels (shipyard, hull number, ship name, IMO number etc.)
 - Type approval number (if type approval is required)

✘ Product inspection is required whether type approval is required or not.

■ Product inspection

- ✓ Material test
- ✓ Hydraulic test
- ✓ Airtightness test
- ✓ Leakage verification test for valve seat (refer to below table)

	Subject	Temperature	Pressure
Test at room temperature	All the number of valves	Room temperature	1.1 times the design pressure
Test at low temperature * 1	At least 10% of the total number of valves * 2	Not lower than the minimum design temperature	Not less than 1.1 times the design pressure

* 1 When the use temperature is below -55°C

* 2 When part of this sampling test failed, test for part or the whole of the valves not sampled at the temperature not more than the minimum design temperature will be requested.

⇒After inspection, a certificate will be issued. Please deliver the valves to the shipyard with the certificate.

【General】

Q: How much is approval fee?

A: Please contact to ClassNK Machinery Department (mcd@classnk.or.jp). If prototype test is required, please show the probability of prototype test time. In addition, the invoice will be issued after the type approval certificate is issued.

Q: Is it possible to type approval the products that will not be installed for ships?

A: Yes. Please submit the drawings and documents for all sizes applying.

【Prototype test at the time of alteration of approval】

Q: Is prototype test required if only the operation mechanism of valves (e.g. handle specification, driving method) is changed?

A: If the parts in contact with gas (e.g. body, bonnet) are not changed, prototype test is not required.

Q: Is prototype test required when the approval range of size is expanded?

A: If the valves whose size is larger than the approved range is applied, prototype test of the largest size valve is required.