

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Plastic Pipes, Thermoplastic**with type designation(s)
PVC-C Marine Grade PN16 Pipes, Fittings and Valves

Issued to

Georg Fischer Piping Systems Ltd.
Schaffhausen, SH, Switzerland

is found to comply with

DNV GL rules for classification – Ships**DNV GL class programme DNVGL-CP-0072 – Type approval – Thermoplastic piping systems****Application :****Products approved by this certificate are accepted for installation on all vessels classed by DNV GL.**Issued at **Hamburg** on **2018-08-31**This Certificate is valid until **2023-08-30**.DNV GL local station: **Augsburg**for **DNV GL**Approval Engineer: **Hagen Markus**

Olaf Drews
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.



Product description

PVC-C metric Marine Grade plastic piping system made of Polyvinylchloride.

For further details refer to the following GF product specifications:

GF Piping Systems "Marine Product Range", Edition GFDO_8906_4 (10.15)

GF Piping Systems "Planning Fundamentals", Edition GMST 5989/4 (09.06)

Overview

Nominal size range	DN16 up to DN160											
Pipes¹												
Outer diameter (mm)	16	20	25	32	40	50	63	75	90	110	160	
Wall thickness (mm)	1.8	2.3	2.8	2.4	3.0	3.7	4.7	5.6	6.7	8.2	11.9	
Fitting types¹	Elbows, bends, sockets, branches, reducers, coupler, socket plugs and caps											
Valves^{1,2}	- 2-Way Ball Valve, Type 546 Size range / PN: DN16 up to DN100 / PN16 - 2- Way Ball Valve, Type 546 sanipex MT Size range / PN: DN16 up to DN32 / PN16 DN40 up to DN63 / PN13											
Service temperature range	0°C to 80°C											
Nominal internal pressure	PN16											
Nominal external pressure	10 bar											
Joining techniques²	Solvent jointed											

Notes

¹ GF Piping Systems "Marine Product Range", Edition GFDO_8906_4 (10.15)

² GF Piping Systems "Planning Fundamentals", Edition GMST 5989/4 (09.06)

Permissible service pressure and temperature limits ¹

Temperature	0°C up to 20°C	30°C	40°C	50°C	60°C	70°C	80°C
Maximum allowable working pressure (bar)	16	14.5	12	10	7.5	5	3.5

Notes

¹ Refer to GF Piping Systems specification "Cemented System"

Production places

Pipes	DNV GL Station
GF Deka Dautphetal-Mornhausen , Kreuzstrasse 11, D 35232	Essen, Germany
Fittings	
Georg Fischer TPA S.r.l, Via Seminela, 50/M , 8200 Busalla (GE), Italy	Milan, Italy
Valves	
Georg Fischer Kunststoffarmaturen AG , Löslweg 26, 7212 Seewis-Pardisla, Switzerland	Augsburg, Germany

Responsibility

The Georg Fischer Piping Systems Ltd., Schaffhausen, Switzerland takes the responsibility that both design and production are in compliance with Rules, Standards and/or Regulations listed on page 1 of this certificate.

Application/Limitation

The **PVC-C Marine Grade PN16 Pipes, Fittings and Valves** plastic piping system is type approved for application in piping systems as listed in "Table 1- Fire endurance requirements matrix" of DNVGL Rules Pt.4, Ch.6, Section 2. as follows:

Approved installation locations where "0" is specified in "Table 1 - Fire endurance requirements matrix". Appropriate footnotes are to be observed.

Reference to Table 1	Item	Piping system
Freshwater		
Non-essential systems	22	Potable hot and cold water and bunkerlines Potable water treatment systems (Osmosis and Evaporation) Chilled water and cooling water of air condition systems
Sanitary and drains and scuppers		
Sanitary drains internal	24	Black and grey water including waste water treatment and discharge lines to shore
Sea water		
Non- essential systems	19	Piping systems of Ballast Water Management Systems (BWMS). ¹
Essential systems	16	Ballast water systems
Miscellaneous	32	Central vacuum cleaner

Notes

¹ For installation location where "L3 and higher levels" is required, metallic isolation valves are to be fitted at the boundary to the ballast piping system of the ship.

The isolation valves shall be remotely controlled valves from outside the space, e.g. fire control station and the valve shall be a fail-safe-closing type valve.

Extent of Type Tests applicable to piping system dependent on application

Fire endurance Level

The PVC-C Marine Grade PN16 piping system is not tested with respect to Fire Endurance characteristics.

Flame spread

Surface flame spread characteristics is confirmed by IMO FTP Code, Part 5 Annex 1.

Smoke and toxicity

The PVC-C Marine Grade PN16 piping systems is considered as material not generating excessive quantities of smoke nor toxic products in fire as defined in IMO FTP Code, Annex 2 - 2.2.

Electrical conductivity

Not applicable.

Passenger vessels

For application on passenger vessels additional requirements specified in the Rules and Regulations of the appropriate flag state authority may have to be observed.

Installation

For designing and installation of the piping system the instructions specified in the Georg Fischer (GF) "Planning Fundamentals For Industrial Piping Systems" are to be observed.
In addition the installation requirements specific to the ship as specified by the ship yard as well as DNVGL Rules Pt.4, Ch.6, Section 9 are to be observed.

The PVC-C Marine Grade PN16 piping system is not approved for installation in gas hazardous area.

Bulkhead penetration

Pipe penetration through watertight bulkheads or decks as well as through fire divisions shall be type approved unless the penetration pipe is welded into the bulkhead/deck.

When plastic pipes pass through watertight bulkheads or decks which are also a fire division and a fire may cause flooding of watertight compartments, the watertight integrity of the bulkhead or deck is to be maintained by a metallic shut-off valve fitted at the bulkhead or deck. The operation of this valve shall be provided from above the freeboard deck. Refer to DNV GL Rules Pt.4, Ch.6 Section 3 – 1.4 Fittings on watertight bulkheads.

On passenger vessels, where the watertight bulkhead is also a fire division, the requirements of the SOLAS Chapter II - 1, Regulation 13.2.3. are to be observed.

Type Approval documentation

Tests carried out

Production Testing

Each batch of pipes and fittings shall be subjected to product tests as specified in DNVGL CP-0072 - Table 1 Requirements for manufacturers quality control.
Appropriate works certificate 2.2 acc. to EN 10204 to be issued.

Marking of product

The marking is to be carried out in such a way that it is visible, legible and indelible. The marking of the products product is to enable traceability to this Type Approval Certificate.

Product	Scope	Example
Pipes and fittings	Brand	+GF+
	Material	PVC-C Marine Grade
	Dimension OD	d 63
	Production date	Production batch number
	Colour	Grey

Job Id: **262.1-005886-6**
Certificate No: **TAK0000125**

Periodical assessment

For retention of the type approval certificate periodical assessments shall be carried out at production places by DNVGL surveyor.

The objective of the periodical assessment is to verify that the design and production conditions for the type approval have not been altered.

Main scope of the assessment:

- verification of the production and quality control system
- review of quality control documentation of recent deliveries
- review of drawings in production to verify any design changes which may have an impact on data specified in the type approval certificate, performance and range of application
- verification of the product marking

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.

End of certificate