

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Plastic Pipes, Thermoplastic**

with type designation(s)

PP-H PN 10 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 :****Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV GL.**Issued at **Hamburg** on **2018-10-18**This Certificate is valid until **2023-10-17**.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.



Job Id: **262.1-005886-9**
Certificate No: **TAK00001B0**

Product description

PP-H, PN10 Pipes and Fittings and Valves.

Joining technique

Butt fusion (d16 to d315)

Socket fusion (d16 to d110)

Detailed dimensions of components, design and installation requirements as per +GF+ Piping Systems documents:

“Marine Product Range”, Edition GFDO_89064 (10.15)

“Planning Fundamentals for industrial piping systems”, Edition GMST 5989/4 (09.06)

“System Specification for PROGREF Standard Piping Systems in Polypropylene (PP), June 18”

Pipes

PN10 - Series S10 SDR21

Outside diameters and minimum wall thickness													
OD [mm]	16	20	25	32	40	50	63	75	90	110	125	140	160
t [mm]	1.8	1.9	2.3	3.0	3.7	4.6	5.8	6.9	8.2	10.0	11.4	12.8	14.6

Outside diameters and minimum wall thickness						
OD [mm]	180	200	225	250	280	315
t [mm]	16.4	18.2	20.5	22.8	25.5	28.7

Fittings

Caps, Tees, Elbows 45°, 90°, Sockets and Flange Adaptors.

Two – way ball valves

Type 546
d20 (DN15) up to d110 (DN100)
PN10

Service parameter

Service temperature range	0°C up to + 80°C
Nominal external pressure rating	1,67bar

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Permissible service pressure and temperature limits ¹

Temperature	0°C up to 20°C	30°C	40°C	50°C	60°C	80°C
Maximum allowable working pressure (bar)	10	8.7	7.5	6.2	5.0	2.5

Notes

¹ Refer to +GF+ Piping Systems documents:

- Systems Specification for PROGREF Standard Piping Systems in Polypropylene (PP), June 18
- Planning Fundamentals for industrial piping systems", Edition GMST 5989/4 (09.06)

Production places

Pipes	DNV GL Station
Georg Fischer DEKA GmbH, Kreuzstraße 22, 35232 Dautphetal, Germany	Essen, Germany
Fittings	
Georg Fischer Piping Systems Ltd., Ebnatstrasse 111, 8201 Schaffhausen, Switzerland	Augsburg, Germany
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 PP-H, PN10 Pipes, Fittings and Valves are 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

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 PP-H piping system and valves are not tested with respect to Fire Endurance characteristics.

Flame spread

Surface flame spread characteristics for pipes and fittings is confirmed by ASTM D635 : HB

Smoke and toxicity

The PP-H PN10 piping system and valves are not tested with respect to smoke or toxic products generation in case of 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 PP-H 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

Type Testing carried out in accordance with Type Approval documentation.

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 name	+GF+
	Material grade	PP-H
	Design standard	ISO 15494, EN ISO 1452-3
	Dimension OD / unit system	d 63 / metric
	Pressure rating SDR	SDR11
	Production date	Production batch number
	Type of fitting	Elbow / PROGREF Standard
	Colour	Grey
	Traceability code	Bar code
	Country of Origin	Switzerland / Germany
Valves	Brand name	+GF+
	Valve type	546
	Pipe O.D. / DN	d63/50
	Material	PP-H
	Nominal pressure	PN16
	Production batch number	xxxxxxxxxxx

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