DNV·GL

Certificate No:
TAK00000WG

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Plastic Pipes, Thermoplastic

with type designation(s)
INSTAFLEX Polybutylen (PB) - PN10 - Pipes, Fittings and Valves

Issued to
Georg Fischer JRG AG
Sissach BL, 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 **2017-09-11**
This Certificate is valid until **2022-09-10**.
DNV GL local station: **Augsburg**

Approval Engineer: **Peter Gierhan**

for **DNV GL**

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.

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Job Id: **262.1-000446-5**
Certificate No: **TAK00000WG**

Product description

The INSTAFLEX plastic piping installation system consisting of pipes, fittings and valves made of Polybutylene (PB) and brass fittings.

Overview

Size range DN	DN 16 up to DN 225												
Outer diameter (mm)	16	20	25	32	40	50	63	75	90	110	125	160	225
Wall thickness (mm)	2,2	2,8	2,3	2,9	3,7	4,6	5,8	6,8	8,2	10,0	11	15	21
Fitting types[1]	Elbows, bends, sockets, branches, reducers, coupler, socket plugs and caps												
Valves	- BTV 2 spigot G1/4" in HWS and HMS - INSTAFLEX stop valve with joints in electrofusion and socket fusion.												
Service temperature range	0ºC to 70ºC (short interval up to 95°C)												
Maximum internal service pressure	10bar												
External pressure rating	None												
Joining techniques	Electrofusion, socket fusion, butt fusion, compression joint												

Notes

[1] Refer to the Georg Fischer "Gebäudetechnik – Technisches Handbuch".

Production places

Pipes	**DNV GL Station**
HakaGerodur AG, Giessenstrasse 3, 8717 Benken, Switzerland Product: Polybutylene (PB) PN10 Pipes – OD 16mm up to OD 110mm	Augsburg, Germany Rotterdam, The Netherlands
Thermaflex Nederland BV, Veerweg 1, Postbus 531, 5140 AM Waalwijk, The Netherlands Product: Polybutylene (PB) PN10 Pipes – OD 125mm up to OD 225mm	
Fittings	
Georg Fischer Fittings, Ebnatstrasse 111, 8200 Schaffhausen, Switzerland Product: Plastic fittings (PB) – OD 16mm up to 110mm	Augsburg, Germany
Georg Fischer JRG AG Hauptstrasse 130, 4450 Sissach, Switzerland Product: Metal fittings – For pipes OD 16mm up to OD 110mm	
Georg Fischer Wavin AG Industriestrasse 24, 4553 Subingen, Switzerland Product: Plastic fittings (PB) – For pipes OD 125mm up to OD 225mm	
Georg Fischer PFCI S.r.l Via degli Imprenditori 24/26 37067 Valeggio Sul Mincio (VR), Italy Product: Metal fittings – For pipes OD 16mm up to OD 110mm	Augsburg, Germany Milan, Italy
Valves	
Georg Fischer Kunststoffarmaturen AG Lösliweg 26, 7212 Seewis-Pardisla, Switzerland Product: Valves made of PB	Augsburg, Germany

Responsibility
The Georg Fischer JRG AG 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 INSTAFLEX 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:

Reference to Table 1	Piping system[1]
Sanitary and Drains and Scuppers	Potable hot and cold water and bunkerlines, black and grey water including waste water discharge lines to shore, Potable water treatment systems (Osmosis and Evaporation)
Freshwater, Non-essential systems	Chilled water and cooling water of air condition systems
Miscellaneous	Brine

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

Extent of Type Tests applicable to piping system dependent on application
Fire endurance Level
The INSTAFLEX piping system is not tested with respect to Fire Endurance characteristics.

Flame spread
Surface flame spread characteristics is confirmed by ASTM D635.

Smoke and toxicity
The INSTAFLEX piping systems is not tested with respect to smoke and toxicity characteristics.

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 installation of the piping system the instructions specified in the Georg Fischer (GF) "Gebäudetechnik – Technisches Handbuch" and the installation requirements specific to the ship as specified by the ship yard as well as DNVGL Rules Pt.4, Ch6, Section 9 are to be observed.

The INSTAFLEX piping systems are not approved for installation:
- within tanks and vacuum applications (service pressure below - 0.1bar gauge).
- in gas hazardous area.

Bulkhead penetration

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 Requierements for manufacturers quality control.

Marking of product

Pipes	GF + OD/DN, PB, manufacturing date: day/month/year
Fittings	GF + OD/DN, PB, manufacturing date: month/year
Colour	Grey

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

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.