

TYPE APPROVAL CERTIFICATE

This is to certify:**That the Plastic Piping System, Thermoplastic**with type designation(s)
Sanfix-P

Issued to

Viega Technology GmbH & Co. KG
Attendorn, Germany

is found to comply with

DNV GL rules for classification – Ships**DNV GL class programme DNVGL-CP-0072 – Type approval – Thermoplastic piping systems**
ISO 21003-5:2008 "Multilayer piping systems for hot and cold water installations inside
buildings – Part 5: Fitness for purpose of the system"**Application :****Products approved by this certificate are accepted for installation on all vessels classed by**
DNV GL.Issued at **Hamburg** on **2020-06-29**This Certificate is valid until **2025-06-28**.for **DNV GL**DNV GL local station: **Essen**Approval Engineer: **Christian Kaemmer**

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.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV GL AS, its parent companies and subsidiaries as well as their officers, directors and employees ("DNV GL") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.



Product description

The Sanfix-P plastic piping system consists of:

Polyethylene multilayer pipes of type Sanfix Fosta-PE-Xc/Al/PE-Xc (coil / rigid)
Press fittings made of bronze red brass with fixed brass pressing sleeve
Pressing machines and tools released by VIEGA¹

Technical data

Pipe types	Sanfix Fosta-(PE-Xc/Al/PE-Xc)						
Nominal internal pressure	PN16					PN12,5	
Size range DN	DN12	DN15	DN20	DN25	DN32	DN40	DN50
Dimensions D x wall thck. (mm)	16x2,2	20x2,8	25x2,7	32x3,2	40x3,5	50x4,0	63x4,5

Press fitting	
Material body	Red brass
Types ¹	Couplings, T-pieces, Bends, Adapters/-bends and connecting fittings (press fitting - screwed connection), Socket plugs, Caps.
Nominal external pressure rating	Up to 3.30 bar
Joining techniques ¹	Press fittings
Temperature range according to ISO 21003	0°C up to 80°C ²

Notes

¹ Refer to the VIEGA "Sanfix-P Sortiment" and "Sanfix-P Gebrauchsanleitung".

² Refer to table "Permissible service pressure in bar and temperature limits" on page 2.

Permissible service pressure in bar and temperature limits

According to standard ISO 21003 series – Multilayer piping systems for hot and cold-water installations inside buildings.

Classes ¹	Class 1	Class 2	Class 4	Class 5
Sanfix-P	10	10	10	10

Notes

¹ Class 1 hot water supply 60°C - Class 2 hot water supply 70°C - Class 4 low temperature heating up to 60°C - Class 5 high temperature heating up to 80°C.

Job Id: **262.1-033246-1**
Certificate No: **TAK00001W8**

Production places

Pipes
Viega Supply Chain GmbH & Co. KG, D-94559 Niederwinkling- Germany Pipes O.D.: 16, 20, 25, 32
Becker Plastics GmbH, Am Bahnhof 3, D-45711 Datteln, Germany Pipes O.D.: 40-50-63
Fittings
Viega Supply Chain GmbH & Co. KG, D-57439 Ennest, Germany

Responsibility

Viega Technology GmbH & Co. KG, Attendorn takes the responsibility that design and production are in compliance with Rules, Standards and Regulations listed on page 1 of this Certificate.

Application/Limitation

The Sanfix-P piping system is type approved for application in piping systems as listed in DNVGL Rules Pt.4, Ch.6, Section 2 – 1.7 Plastic pipes "Table 1- Fire endurance requirements matrix".

Approved installation locations where "0" is specified, appropriate footnotes are to be observed.

Not approved for installation locations where "NA" or "X" is indicated and not approved for installation in gas hazardous area.

Reference heading to Table 1	Item	Piping system ¹
Freshwater	22	Non-essential systems: - Potable water generating and treatment systems - Potable hot and cold water, wash water systems (internal) - Cooling and heating system of air condition systems
Sanitary and drains and scuppers	24	Sanitary drains (internal): - Condensate from air conditioning systems
Miscellaneous	29	Service air (non-essential)

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 Sanfix-P piping system is not tested with respect to Fire Endurance characteristics.

Flame spread

Surface flame spread characteristics is confirmed by ASTM D635-06, class HB.

Smoke and toxicity

The Sanfix-P piping system 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 and list of released pressing tools specified in the VIEGA "Sanfix-P Gebrauchsanleitung" 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, Ch6, Section 9.

Bulkhead and Deck 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.

Marking of product

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Component	Scope	Example
Pipes (white colour)	- Manufacturer name and or trademark - Nominal outside diameter and wall thickness - Composition - Application class with design pressure - Manufacturer information	- Viega Sanfix-P - 16x2,2 - PE-Xc/Al/PE-Xc - Class 1,2,4,5/10bar - batch + gt → Viega or BPD → Becker
Fittings	- Manufacturer name - Nominal outside diameter - Manufacturer information	- Viega - 16 - batch number

Periodical assessment

For retention of the Type Approval, a DNV GL Surveyor shall perform periodical assessment after two years (+/- 90 days) and after 3.5 years (+/- 90 days) to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNVGL-CP-0338, Sec.4.