



TYPE APPROVAL CERTIFICATE

Certificate No:
TAK000007J
Revision No:
1

This is to certify:

That the Plastic Piping System, Thermoplastic

with type designation(s)
SeaCor™ Thermoplastic CPVC Schedule 80 Pipes & Fittings

Issued to

Georg Fischer Harvel LLC
Little Rock, AR, USA

is found to comply with

DNV GL class programme DNVGL-CP-0072 – Type approval – Thermoplastic piping systems
DNV GL rules for classification – Ships

Application :

For use in systems for water and sea water up to 16 bar. Service temperature 0°C to 80°C. For installation in accordance with DNV Rules and Manufacturer's recommendations. The piping system is approved to Low Flame Spread in accordance with IMO Resolution A.653(16)/IMO FTP Code, Part 5, Annex 1. The piping system is not tested w.r.t. Fire Endurance characteristics.

Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Høvik** on **2021-03-22**

This Certificate is valid until **2026-03-21**.

DNV local station: **Houston**

for **DNV**

Approval Engineer: **Gisle Hersvik**

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Gustav Heiberg
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 AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") 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

SeaCor™ Thermoplastic CPVC Schedule 80 Pipes & Fittings Pipes - 20 ft lengths

- Internal pressure ratings at 73°F (23°C) vary with the pipe size. See below table for pipe sizes versus maximum allowable pressure.
- Maximum vacuum pressure rating (valid for all sizes) at 73°F (23°C): 3.5 bar.

Pipes:

Dimensions and maximum pressure ratings for Schedule 80 SeaCor™ CPVC Pipe at 73 °F (23 °C):

Dimensions [inch]	Wall thickness, min. [inch]	Pressure rating, max. [psi]	Pressure rating, max. [bar]
½	0.147	848	57.7
¾	0.154	688	46.8
1	0.179	630	42.9
1¼	0.191	520	35.4
1½	0.200	471	32.0
2	0.218	404	27.5
2½	0.276	425	28.9
3	0.300	375	25.5
4	0.337	324	22.0
6	0.432	279	19.0
8	0.500	246	16.7
10	0.593	234	15.9
12	0.687	228	15.5

Fittings:

Elbows, Tees, Couplings, End caps.

Valves:

- Ball valves Type 546, 375
- Check valves Type 360
- Diaphragm valves Type 514, 517
- Butterfly valves Type 567

Joining technique:

Solvent-cemented joints

Manufactured by

Georg Fischer Harvel LLC, 7777 Sloane Drive, Little Rock, Arkansas 72206, USA

DNV local station: Houston

Responsibility

The Company (stated on the front page of this Certificate) 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

For installation according to DNV Rules and Manufacturer's recommendations.

+GF+ requires that all installers are certified to ASME B31.3 Bonder certification. +GF+'s Lead Free SeaCor Cement to be used.

The plastic piping system is type approved for application in piping systems as listed in "Table 1- Fire endurance requirements matrix" of DNV GL Rules Pt.4, Ch.6, Sec.2 as follows:

Item	Piping system ¹⁾	
Seawater		
19	Non-essential systems	- Ballast and bilge water management systems ²⁾
Freshwater		
22	Non-essential systems	- Potable hot and cold water and bunkerlines - Potable water treatment systems (Osmosis and Evaporation) - Chilled water and cooling water of air condition systems
Sanitary drains and scuppers		
24	Sanitary drains (internal)	- Black and grey water including waste water treatment and discharge lines to shore
Miscellaneous		
29	Service air (non-essential)	
30	Brine	

Notes

- ¹⁾ Approved installation locations where “0” is specified in “Table 1 - Fire endurance requirements matrix”. Appropriate footnotes are to be observed.
- ²⁾ 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.

Maximum service pressure 16 bar.
 Service temperature range 0°C to 80°C.

Fire Endurance

The piping system is not tested with respect to Fire Endurance characteristics.

Low Flame Spread

The piping system is tested with respect to Low Flame Spread performance in accordance with IMO Resolution A.653(16)/IMO FPT Code, Part 5, Annex 1.

Smoke and toxicity

Because the total heat release (Q_t) is less than 0.2 MJ, and the peak heat release rate (q_p) is less than 0.1 kW, the material will not need further testing to comply with the smoke and toxicity requirements of Part 2 of Annex 1 of the IMO FTP Code.

Electrical conductivity

The piping system is non-conductive, not for installation in gas hazardous area.

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.

Bulkhead and Deck Penetration

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

When plastic pipes pass through watertight bulkheads or decks, 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 Sec.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.

Other standards

The products are listed as NSF compliant, ref. NSF Standard 14 and NSF Standard 61. United States Coast Guard (USCG) Certificate of Approval No. 164.141/36/0 of 2014-11-12.

Type Approval documentation

Tests carried out



Job Id: **262.1-020904-2**
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Type Testing carried out in accordance with **Type Approval documentation**.

Marking of product

Product/package shall be marked with *manufacturer's name*; **Georg Fischer Harvel LLC**, *place of production* and *type designation, pressure rating and temperature rating*.

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 Type Approval Certificate.

Periodical assessment

The scope of the Periodical Assessment is to verify that the conditions stipulated for the Type Approval is complied with and that no alterations are made to the product design or choice of materials.

Periodical assessments (for Certificate Retention and Certificate Renewal) shall be performed according to DNVGL-CP-0338.

This certificate is only valid if required Periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in <https://approvalfinder.dnvgl.com>

END OF CERTIFICATE