



TYPE APPROVAL CERTIFICATE

Certificate No:
TAK00000GU
Revision No:
1

This is to certify:

That the Plastic Piping System, Thermoplastic

with type designation(s)
Wavin SiTECH+

Issued to
Wavin GmbH
Twist, Germany

is found to comply with
DNV rules for classification – Ships Pt.4 Ch.6 Piping systems
DNV class programme DNV-CP-0072 – Type approval – Thermoplastic piping systems

Application :

Product approved by this certificate is accepted for installation on all vessels classed by DNV.

Issued at **Hamburg** on **2021-12-16**

This Certificate is valid until **2026-12-15**.

DNV local station: **Leer**

for **DNV**

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.

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

The Wavin SiTech+ piping system consist of three layers pipes with mineral modified core (PP-M) and fittings made of solid wall Polypropylene (PP).
 Design of the pipes and fittings in accordance with DIN EN 1451-1.

Reference: Wavin "Gebäudetechnik – Technisches Handbuch – Hausabflussrohrsysteme Wavin AS, Wavin SiTech+, Wavin PE".

Size range	DN32 up to DN160
Service temperature range	0°C up to +95°C ¹
Internal test pressure (tightness of connection at overpressure with fixation clamps of type LKS)	- 0.3 bar(g) up to 0.5 bar(g)
External pressure rating	None
Joining technique	Spigot socket connection Wavin LKS clamps

Note

¹ According type test standard DIN EN ISO 13257 – Thermoplastics piping systems for non-pressure applications - Test method for resistance to elevated temperature cycling

Materials

Pipes	PP-M - three layers pipes with mineral modified core
Fittings	Solid wall Polypropylene (PP) Elbows, bends, sockets, branches, reducers, coupler, socket plugs and caps
Sealings	SBR, acc. to DIN 4060, EN 681-1, colour black

Dimensions of Pipes

Pipe Series S 16 according to DIN EN 1451-1- Table 3

Nominal diameter DN ¹	Min. wall thickness mm
32	1.8
40	1.8
50	1.8
75	2.6
90	3.1
110	3.4
125	3.9
160	4.9

Notes

¹ Dimension Do1, Ds2 see Wavin "Gebäudetechnik – Technisches Handbuch – Hausabflussrohrsysteme Wavin AS, Wavin SiTech+, Wavin PE".

Production places

Wavin Italia S.p.A., Via Boccalara 24, 45030 Santa Maria Maddalena, Italy
Production scope: Pipes and fittings complete size range
Wavin GmbH, Twist Germany
Production scope: Pipes of size range DN50 up to DN160

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

The Wavin SiTech+ piping system is type approved for application in piping systems as listed in the table below. Reference DNV 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
Sanitary drains, Deck drains (internal)	24	Black and grey water, rainwater, condensate from air conditioning systems

The range of application includes the combination of metallic drainpipe systems according to DIN-EN 1124-2.

The piping system is not approved:

- for installation within tanks and vacuum applications (service pressure below - 0.1bar gauge).
- for installation in gas hazardous area.

Extent of Type Tests applicable to piping system dependent on application
Fire endurance Level

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

Flame spread

Surface flame spread characteristics is confirmed by to ASTM D 635 - HB.

Smoke and toxicity

The Wavin SiTech+ piping system 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.

Installations

For installation of the piping system the instructions specified in the Wavin “Gebäudetechnik – Technisches Handbuch” are to be observed.

In addition, the DNV Rules Pt.4 Ch.6 Section 10 – 4 Joining of plastic pipes

Fittings installed in areas of flow direction changes are to be additional secured with LKS clamps to avoid slip out of the fittings.

Bulkhead penetration

The Wavin SiTech+ piping system is not tested with respect to external pressure resistance. Accordingly, pipes shall not be accepted for penetrating watertight subdivisions, unless:

a) a steel spool piece of 900 mm in length, preferable 450 mm on each side, with thickness according to DNV-RU-SHIP Pt.4 Ch.6. Sec.9 [1.2.1] is arranged at the watertight penetration. A remote operated emergency shut off valve shall be arranged between the steel spool piece and the pipe on one side.

This valve shall be of safe to close type, or else the control including hydraulic piping and electric cables must be routed inboard of B/5, but preferably to CL, before being routed longitudinally. On the opposite side should the pipe be flanged or similar to the steel spool piece, or

b) two manual valves, one on each side of the steel spool piece in a) are arranged, under the provision that these valves are easily accessible.

Type Approval documentation

Type tests carried out

Test scope according to DNV CP-072:

Leak tightness EN 1277 (vacuum -0,3bar, pressure 0,5bar), Vicat softening temperature (VST), External load, Impact resistance (EN744), Flame spread test (ASTM D635).

Type tests acc. to industrial standards EN ISO 1451-1, EN ISO 3126, EN ISO 2505, EN728, EN ISO 1183, ISO 8361, EN 1053, EN 1054, EN 1055, Accoustic performance acc. to EN14366, DIN 52219

Marking of product

Component	Scope	Example
Pipes	Manufacturer, Type, Size DN/OD, Material grade, Production reference	WAVIN/T SiTech+DN/OD 110x3,4 PP-M, Time Barcode
Fittings	Manufacturer, Type, Size DN/Specific Detail, Material grade	Wavin SiTech+ DN50/45° PP-M B
Pipes and fittings	Colour	Inside: white, outside: black

Periodical assessment

For retention of the Type Approval, a DNV Surveyor shall perform periodical assessment to verify that the conditions for the Type Approval are complied with. Refer to the Class Programme DNV-CP-0338, Sec.4.

To check the validity of this certificate, please look it up in <https://approvalfinder.dnv.com>