

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Plastic Pipes, Thermoplastic

with type designation(s)
Wavin SiTECH+

Issued to

Wavin GmbH
Twist, Germany

is found to comply with

DNV GL rules for classification – Ships

DNV GL class programme DNVGL-CP-0072 – Type approval – Thermoplastic piping systems

Application :

The Wavin SiTech+ piping system is type approved for application in sanitary discharge piping systems (internal).

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

This Certificate is valid until **2021-10-23**.

Issued at **Hamburg** on **2016-10-24**

DNV GL local station: **Leer**

Approval Engineer: **Hagen Markus**

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.

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.

Size range	DN 32 up to DN 160
Service temperature range	0 °C up to + 95°C*
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

* according type test standard DIN EN 1055 – Test method for resistance to elevated temperature cycling.

Materials

Pipes	PP-M three layers pipes with mineral modified core
Fittings	Solid wall Polypropylene (PP)
Sealings	SBR, acc. to DIN 4060, EN 681-1, colour black

Dimensions of Pipes

Nominal diameter DN	<i>Pipe Series S 16 according to DIN EN 1451-1- Table 3</i>
	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

Fittings

Elbows, bends, sockets, branches, reducers, coupler, socket plugs and caps.
Refer to the Wavin "Gebäudetechnik – Technisches Handbuch".

Joining technique

Spigot socket connection.

Job Id: **262.1-023526-2**
Certificate No: **TAK00000GU**

Manufactured by

Wavin Italia S.p.A.
Via Boccalara 24
45030 Santa Maria Maddalena
Italy

DNV GL local stations Italy

Station Venice
Via Bruno Maderna 7
Piano 5° - Torre Eva
30174 Mestre

Germany

Station Leer
Hafenstrasse 15
26789 Leer

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 sanitary discharge piping systems (internal).

Approved for unprotected installation in locations where "0" or "NA" is specified in Table 1- Fire endurance requirements matrix of DNVGL Rules Pt.4, Ch.6, Section 2.

Surface flame spread characteristics determined by ASTM D635:2006.

The range of application includes the combination of metallic drain pipe 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.

The piping system is not tested with respect to fire endurance, smoke and toxicity characteristics.

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" and the installation requirements specific to the ship as specified by the ship yard as well as IMO Res. 753 (18) are to be observed.

For applications where internal pressure rise may occur, each pipe connection is to be secured by a "LKS" securing clip.

When plastic pipes pass through watertight bulkheads or decks, the watertight integrity of the bulkhead or deck is to be maintained by fitting remotely operated shut-off valves at bulkhead and deck penetrations. These valves shall be operable from above the freeboard deck.

On passenger vessel where the watertight bulkhead is also a fire division the requirements of SOLAS Ch.II-1, Regulation 13.2.3. are to be observed.

Type Approval documentation

Type tests carried out

Dimensions, Leak tightness tests acc. to EN1277, Vicat Softening Temperature, External Load, Impact Resistance.

The piping system is not tested with respect to fire endurance, smoke and toxicity characteristics.

Marking of product

Pipes	WavinSiTech+, OD/DN, PP-M, ÜZ-42.1-539, manufacturing date: day/month/year
Fittings	WavinSiTech+, OD/DN, PP-M, ÜZ-42.1-539, manufacturing date: month/year
Colour	Black

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

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 Assessment to be performed after two and a half year (2.5 years, certificate retention) and prior to renewal after five (5 years, certificate renewal).

The objective of the periodical assessment is to verify that the design and production conditions for the hose assemblies covered by this 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 the type approval documentation and that this is still the basis for the production
- review of design changes , pre- material and performance of the product
- verification of the product marking

END OF CERTIFICATE