Certificate No:
TAK0000222

TYPE APPROVAL CERTIFICATE

This is to certify:

That the Plastic Piping System, Thermoplastic

with type designation(s)
PE 100, PE 100RC

Issued to
Simona AG
Kirn, **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 :

External pressure rating see page 2.
Product(s) approved by this certificate is/are accepted for installation on all vessels classed by DNV.

Issued at **Hamburg** on **2022-02-14**
This Certificate is valid until **2027-02-13**.
DNV local station: **Augsburg**

Approval Engineer: **Hagen Markus**

for **DNV**

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

Plastic piping system made of Polyethylene grades PE 100 and PE 100 RC (resistant to crack).
Design standard EN 12201, EN 1555, DIN EN ISO 15494.
Pressure classes ISO S8 / SDR17 (PN10/PN9) and ISO S5/SDR11 (PN13).
Nominal pressure values PN are based on Internal Pressure Short Term Tests on pipe spools with safety factor of 4.

For further details refer to the following Simona product specifications:
"Technisches Datenblatt PE 100 schwarz"
"Technisches Datenblatt PE 100 RC schwarz"
"Technisches Handbuch für Rohrleitungssysteme tech.info"

Outside diameters and minimum wall thickness

Pipes ISO S8 / SDR17 (PN10)

OD [mm]	20	32	40	50	63	75	90	110	125	140	160	180	200	225	250
t [mm]	1.8	1.8	2.4	3.0	3.8	4.5	5.4	6.6	7.4	8.3	9.5	10.7	11.9	13.4	14.8

OD [mm]	280	315	355	400	450	500
t [mm]	16.6	18.7	21.1	23.7	26.7	29,7

Pipes ISO S5/SDR11 (PN13)

OD [mm]	20	25	32	40	50	63	75	90	110	125	140	160
t [mm]	2	2.3	3.0	3.7	4.6	5.8	6.8	8.2	10.0	11.4	12.7	14.6

OD [mm]	180	200	225	250	280	315	355	400	450	500
t [mm]	16.4	18.2	20.5	22.7	25.4	28.6	32.2	36.3	40.9	45.4

Fittings

Size range	
SDR11, PN13	d20 up to d500
SDR17, PN10	d20 up to d250
SDR17, PN9	d315 up to d500

Fitting types
Bend 90°, Elbow 90°, 45°, Seamless bends 90°, 60°, 45°, 30°, 22°, 11°, Tee 90°, 45° (equal and reduced), Coupler, Reducer, End cap, Flange adaptor, Backing flanges PP-Steel Flanges

Joining techniques
Heating element butt welding, Heating element socket welding and Electrofusion welding according to published DVS Standards.

External pressure rating

SDR/PN	Size range	P_{ext}
11/13	Up to d110	6bar
17/10	Up to 315	1,63bar
11/13		

Long-term permissible maximum allowable working pressure (M.A.W.P) based on 25 years lifetime
Non-essential systems[1]

SDR	Media temperature			
	20°C	**30°C**	**40°C**	**45°C**
SDR17	10bar	8.6bar	7.4bar	6.9bar
SDR11	16bar	13.8bar	11.9bar	11.0bar

Essential systems[2]

SDR	Media temperature			
	20°C[3]	**30°C**	**40°C**	**45°C**
SDR17	5.0bar	4.3bar	3.7bar	3.5bar
SDR11	8.0bar	6.9bar	6.0bar	5.5bar

Notes
[1] SF 1.25 acc. to DIN 8074, DIN EN ISO 15494
[2] SF 2.5/25years acc. to DNV CP-0072
[3] For media temperatures below 20°C same pressure applies.

Production places

Pipes and fittings
SIMONA Produktion Ringsheim GmbH&Co.KG, Gewerbestraße 1-2, 77975 Ringsheim, Germany

Responsibility
The SIMONA AG, Kirn 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 piping system is type approved for application in piping systems as listed in the table below.
Reference DNV 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 to Table 1	Item	Piping system
Freshwater		
Non-essential systems	22	Potable hot and cold water and bunkerlines Potable water treatment systems (Osmosis and Evaporation) Chilled water and cooling water of air condition systems
Sanitary and drains and scuppers		
Sanitary drains internal	24	Black and grey water including wastewater treatment and discharge lines to shore
Sea water		
Non-essential systems	19	Piping systems of Ballast Water Management Systems (BWMS).[1]
Essential system	16	Ballast water systems
Miscellaneous	30	Brine

Notes
[1] For installation location where “L3 and higher levels” are required, metallic shut-off valves are to be fitted at the boundary to the ballast piping system of the ship. The 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.

Extent of Type Tests applicable to piping system dependent on application

Fire endurance level
The piping system as specified in this certificate is not tested with respect to Fire Endurance characteristics.

Flame spread
Surface flame spread characteristics is confirmed by ASTM D635, Classification HB.

Smoke and toxicity
The piping system is not tested with respect to capability of producing excessive quantities of smoke and toxic products as defined in IMO FTP Code, Annex 1: Part 2.

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 designing and installation of the piping system the instructions specified in the Simona “Technisches Handbuch für Rohrleitungssysteme tech.info” are to be observed.

Plastic piping systems for essential service systems as described in Pt.4 Ch.6 Sec.2 [1.7.5]. Shall always be tested after installation on board to 1.5 × design pressure. Minimum 4 bar. Minimum duration 1 hour

In addition the DNV Rules Pt.4 Ch6, Section 10 Para. 4 Joining of plastic pipes are to be observed.

Bulkhead 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

- Internal pressure short term on pipe spools
- Internal pressure long term test at elevated temperatures
- External pressure
- Impact resistance
- Vicat temperature
- Flame spread test acc. to ASTM D 635-06

Production Testing

Each batch of pipes and fittings shall be subjected to product tests as specified in DNV CP-0072 - Table 1 Requierements for manufacturers quality control.
Appropriate works certificate 2.2 acc. to EN 10204 to be issued.

Marking of product

For traceability to this type approval certificate pipes and fittings are to be marked at least as follows:

Product	Scope	Example
Pipes	Brand	SIMONA
	Material grade	PE 100
	Standard	DIN-(EN-) Numberr 8074/75 (12201)
	Dimension outer diameter DA x wall thickness	110x10,0
	Pressure rating SDR	11
	Production date	090101X (X=work shift)
	Colour	Black
	Traceability code: VK-Nr./Maschinennummer	70012458/36

Fittings	Brand	SIMONA
	Material grade	PE 100
	Standards	DIN EN 1555, 12201, EN ISO 15494
	Dimension outer diameter DA	110
	SDR/PN	11,00 / 16,0
	Charge no.	VK21000825
	Traceability code	“Barcode”

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

End of certificate