Confirmation of Product Type Approval

Company Name: AQUATHERM GMBH

Address: BIGGEN 5, ATTENDORN, Germany, D-57439

Product: Thermoplastic Pipe, Fittings and Joints

Model(s): Aquatherm blue pipe SDR11 MF; SDR11 S; SDR7,4 MF; SDR17,6 MF Aquatherm green pipe SDR11 S; SDR9 MF-RP; SDR7,4 MS; SDR7,4 MF;SDR7,4 S; SDR6 S Aquatherm green pipe fittings Aquatherm red pipe SDR7,4 MF-HI

Endorsements:

Certificate Type	Certificate Number	Issue Date	Expiry Date
Product Design Assessment (PDA)	21-2086756-PDA	03-FEB-2021	02-FEB-2026
Manufacturing Assessment (MA)	20-HN4089276	15-JAN-2020	04-JAN-2025
Product Quality Assurance (PQA)	NA	NA	NA

Tier
3 - Type Approved, unit certification not required

Intended Service
Potable water, sanitary water, grey and black water, sanitary drains (internal), water-heating piping systems, ballast piping (only inside ballast water tanks, cofferdams, void spaces, pipe tunnels, ducts) and non-essential systems for the installation locations subject to compliance with requirements of 4-6-3/Table 1, Table 2 and Table 3 of ABS Rules for Building and Classing Marine Vessels 2021.

Description
Thermoplastic pipes and fittings, material: PP-R.

Type 'stabi composite': multi layer composite PP pipes with intermediate aluminum foils.

Type 'faser composite': composite PP-R pipes with inner fibre layer.

Types:

aquatherm blue pipe SDR 17,6 MF-RP

aquatherm blue pipe SDR 11 MF-RP

aquatherm blue pipe SDR 11 S

aquatherm green pipe SDR 11 S

aquatherm green pipe SDR 9 MF-RP

aquatherm green pipe SDR 7.4 MS

aquatherm green pipe SDR 7.4 MF

aquatherm green pipe SDR 7.4 S

aquatherm blue pipe SDR 7.4 MF

aquatherm green pipe SDR 6 S

aquatherm green pipe fittings

aquatherm red pipe SDR 7,4 MF-HI

Ratings
PN10 (SDR 17,6 & SDR 11), PN15 (SDR 9 MF-RP), PN16 (SDR 7,4) and PN20 (SDR 6 S & SDR 7,4 MF-HI) at ambient temperature (20°C) - For higher temperatures, maximum working pressure to be reduced as per the manufacturer's catalogue. Continuous temperature not to exceed 70°C. Instantaneous temperature not to exceed 95°C.

Service Restrictions
1. If the manufacturer does not have a certified quality system in accordance with 1-1-A3/5.3 and 1-1-A3/5.5 or ISO 9001 (or equivalent), then the production testing is to be witnessed by the Surveyor.

2. Unit Certification is not required for this product. If the manufacturer or purchaser request an ABS Certificate for compliance with a specification or standard, the specification or standards, including inspection standards and tolerance, must clearly defined.

3. The pipes are neither to be installed in spaces where a fire endurance test is required in the Fire Endurance Matrix, 4-6-3/Table 1 of the Marine Vessel Rules or Mobile Offshore Units Rules 4-2-2/Table 2, nor where a low flame spread test, according to IMO Res. A.653(16), is required.

4. However, fusiotherm/stabi composite type pipes have been tested according to ASTM D635-77(RINA 96DG706TO) and faser composite type pipe material has been tested according to ASTM D635-98(RINA 2005CS01347/1). These alternative flame spread tests for pipes' installation in areas, requiring low flame spread characteristics, are acceptable unless otherwise the relevant flag state Administration requires.

5. Further, these pipes are not to be installed in hazardous areas. The smoke generation and toxicity tests by 4-6-3/Table 3 of Marine Vessel Rules are not required based on IMO MSC/Circ. 1120 unless the relevant flag state Administration requires specifically.

6. Not to be used in fire main.

7. This material has not been tested for Fire Endurance and therefore can only be used in Services/Locations indicated as "0" (no Fire Endurance testing required) in Marine Vessels Rules 4-6-3/Table 1 or Mobile Offshore Units Rules 4-2-2/Table 2.

8. This material is not considered electrically conductive and therefore cannot be used in hazardous areas, or with non-conductive fluids in accordance with Marine Vessels Rules 4-6-3/5.15 and Mobile Offshore Units Rules 4-4-2/5.8.

9. This approval is not valid for US registered units, (USCG).

10. This approval is not to be misconstrued as an approval on behalf of a Maritime Administration.

Comments
1. The Manufacturer has provided a declaration about the control of, or the lack of Asbestos in this product.

2. The installation of the piping systems is to be carried out by qualified personnel in accordance with the manufacturer's specifications and instructions. Each particular application and installation is to be specifically ABS approved in conjunction with the relevant piping system.

3. Joining techniques are to be in accordance with the manufacturer's installation guidelines.

4. Permanent marking for pipes and fittings are to be in accordance with Marine Vessel Rules 4-6-3/5.17.

5. Where plastic pipes are to be utilized for any installation within tanks or other locations which may be subject to a vacuum condition inside the pipe or a head of liquid on the outside of the pipe, or any pipe installation required to remain operational in case of flooding damage or to any pipe that would allow progressive flooding to other compartments through damaged pipe or through open ended pipes in the compartment the external pressure is to be considered. The pipe is to be designed for an external pressure of not less than the sum of the pressure imposed by the maximum potential head of liquid outside the pipe plus full vacuum of 14.5 psi (1 bar) inside the pipe. The maximum external pressure for a pipe is to be determined by dividing the collapse test pressure by a safety factor of three (3). This collapse pressure may be verified experimentally or determined by a combination of testing and calculation methods. These details are to be submitted to ABS before installation of the pipe, for ABS approval on a case by case basis as per 4-6-3/5.3 of Marine Vessels Rules.

6. Piping systems are to be subjected to a hydrostatic test pressure on board after installation of not less than 1.5 times the design pressure to the satisfaction of the Surveyor as per 4-6-3/21 of Marine Vessels Rules.

Notes, Drawings and Documentation
Aquatherm blue pipe, catalogue_2020_E10050,

Aquatherm green pipe, catalogue_2020_E10101,

Aquatherm red pipe, catalogue_2017_E40000,

201371/I19-II, Type test reports, SKZ, dated 2019-07-22:

SDR11 blue pipe: 32x2.9; 75x6.8, 250x22.7

SDR 9 blue pipe: 32x3.6

SDR 17.6 blue pipe: 125x7.1, 315x17.9

SDR 7.4 green pipe: MF 315x42.6

SDR 9 MF-RP green pipe: 63x7.1, 125x14.0, 250x27.9

SDR 11S green pipe: 355x32.2

SDR 11MF blue pipe: 400x36.3

SDR 17.6 MF blue pipe: 315x17.9

SDR 7.4 MF red pipe: 125x17.1

SDR 7.4 MF blue pipe: 32x4.4

2020CS011405/1/ Test Laboratory of RINA Spa in 16128 Genova/ASTM D635/18 SDR 11S

2020CS011405/2/ Test Laboratory of RINA Spa in 16128 Genova/ASTM D635/18 SDR 7.4 MF & SDR 9 MF RP

2020CS011405/3/ Test Laboratory of RINA Spa in 16128 Genova/ASTM D635/18 SDR 11 MF RP

2020CS011405/4/ Test Laboratory of RINA Spa in 16128 Genova/ASTM D635/18 SDR 7.4 MF HI

Term of Validity
This Product Design Assessment (PDA) Certificate remains valid until 02/Feb/2026 or until the Rules and/or Standards used in the assessment are revised or until there is a design modification warranting

design reassessment (whichever occurs first).

Acceptance of product is limited to the "Intended Service" details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or previous to the effective date of the ABS Rules and standards applied at the time of PDA issuance. Use of the Product for non-ABS units is subject to agreement between the manufacturer and intended client.

ABS Rules
Rules for Building and Classing Marine Vessels (2021): 1-1-4/7.7, 1-1-A3 & 1-1-A4, 4-6-3/5, 4-6-3/5.13

Rules for Building and Classing Mobile Offshore Units (2021): 1-1-4/9.7, 1-1-A2 & 1-1-A3, 4-2-2/7.5, 4-2-2/7.5.2

International Standards
ISO 15874-1 (2013).

EU-MED Standards
NA

National Standards
DVGW-Arbeitsblätter W542 (2009)/W534 (2015), ASTM F2389 (2015) and CSA B137.11 (2009).

Government Standards
NA

Other Standards
NA

Corporate ABS Programs
American Bureau of Shipping
Print Date and Time: 04-Feb-2021 5:43

ABS has used due diligence in the preparation of this certificate, and it represents the information on the product in the ABS Records as of the date and time the certificate is printed.

If the Rules and/or standards used in the PDA evaluation are revised or if there is a design modification (whichever occurs first), a PDA revalidation may be necessary.

The continued validity of the MA is dependent on completion of satisfactory audits as required by the ABS Rules. The validity of both PDA and MA entitles the product to receive a **Confirmation of Product Type Approval**.

Acceptance of product is limited to the “Intended Service” details prescribed in the certificate and as per applicable Rules and Standards.

This Certificate is valid for installation of the listed product on ABS units which exist or are under contract for construction on or prior to the effective date of the ABS Rules and standards applied at the time of PDA issuance. ABS makes no representations regarding Type Approval of the Product for use on vessels, MODUs or facilities built after the date of the ABS Rules used for this evaluation.

Type Approval requires Drawing Assessment, Prototype Testing and assessment of the manufacturer's quality assurance and

quality control arrangements. The manufacturer is responsible to maintain compliance with all specifications applicable to the product design assessment. Unless specifically indicated in the description of the product, certification under type approval does not waive requirements for witnessed inspection or additional survey for product use on a vessel, MODU or facility intended to be ABS classed or that is presently in class with ABS.

Due to wide variety of specifications used in the products ABS has evaluated for Type Approval, it is part of our contract that; whether the standard is an ABS Rule or a non-ABS Rule, the Client has full responsibility for continued compliance with the standard.

Questions regarding the validity of ABS Rules or the need for supplemental testing or inspection of such products should, in all cases, be addressed to ABS.