



**TYPE APPROVAL CERTIFICATE**  
**No. MAC017019XG/001**

**This is to certify that the product identified below is in compliance with the regulations herewith specified.**

<i>Description</i>	<b>Plastic pipes and fittings</b>
<i>Type</i>	<b>Aquatherm Green Pipe SDR11 S, SDR7.4 S &amp; SDR6 S</b>
<i>Applicant</i>	<b>AQUATHERM GMBH Biggen 5 D-57439 Attendorn GERMANY</b>
<i>Manufacturer</i>	<b>AQUATHERM GMBH</b>
<i>Place of manufacture</i>	<b>Biggen 5 D-57439 Attendorn GERMANY</b>
<i>Reference standards</i>	<b>Part C, Chapter 1 Appendix 3 of RINA Rules</b>

*Issued in* **HAMBURG** on **February 28, 2019**. *This Certificate is valid until* **February 27, 2024**

  
\_\_\_\_\_  
**RINA Services S.p.A.**  
**Giuseppe Russo**

This certificate consists of this page and 2 enclosures.



## TYPE APPROVAL CERTIFICATE

No. MAC017019XG/001

Enclosure - Page 1 of 2

### Aquatherm Green Pipe SDR11 S, SDR7.4 S & SDR6 S

#### Reference documents:

- Aquatherm products catalogue E10101
- RINA Flame Spread Test Reports no. 96DG706TO and no. 2005CS01347/1
- RINA DWG: HMMC6047 , HMMC 6049 issued on 21-9-2015.

#### Materials/Components:

- Polypropylene PP-R
- Pipes joined with Aquatherm green pipe fittings: coupling joint, transition piece, angle 45° / 90°, tee, cross, reducer and end cap.

#### Technical characteristics:

Design standards for pipes: DIN 8077 + 78.

Maximum allowable working pressure at 20 °C and pipe dimensions in compliance with the table:

External diameter (mm)	Thickness (mm)		
	PN 10 (SDR 11 S)	PN 16 (SDR 7.4 S)	PN 20 (SDR 6 S)
16	-	2.2	2.7
20	1.9	2.8	3.4
25	2.3	3.5	4.2
32	2.9	4.4	5.4
40	3.7	5.5	6.7
50	4.6	6.9	8.3
63	5.8	8.6	10.5
75	6.8	10.3	12.5
90	8.2	12.3	15.0
110	10.0	15.1	18.3
125	11.4	-	-
160	14.6	-	-
200	18.2	-	-
250	22.7	-	-
315	28.6	-	-
355	32.2	-	-
400	36.3	-	-
450	40.9	-	-

For working temperatures higher than 20 °C the maximum working pressure must be reduced as per the manufacturer's instructions.



**TYPE APPROVAL CERTIFICATE**

No. **MAC017019XG/001**

Enclosure - Page 2 of 2

**Aquatherm Green Pipe SDR11 S, SDR7.4 S & SDR6 S**

**Fields of application:**

Non-essential systems such as sanitary, black and grey waters, potable water, hot water heating, cooling (air condition) systems.

**Acceptance Conditions:**

Pipes are acceptable on open decks, within tanks, cofferdam, pipe tunnels, ducts and further location where flame spread is required and area where fire endurance is not required in accordance with Table 1 of Part C, Chapter 1, Appendix 3 of RINA Rules.

**Remarks:**

The installation of the piping system is to be carried out in accordance with the instructions of the manufacturer and of the RINA Rules as applicable.

Where pipes pass through "A" and "B" class divisions, arrangements are to be made to ensure that fire endurance is not impaired. These arrangements are to be tested in accordance with "Recommendations for Fire Test Procedures for "A" and "B" and "F" Bulkheads" (IMO Resolution A.754(18) as amended).

When the piping pierces watertight bulkhead or decks, the watertight integrity of the bulkhead or deck is to be maintained. If the bulkhead or deck is also a fire division and destruction by fire of plastic pipes may cause the inflow of liquid from tanks, a metallic shut-off valve operable from above the freeboard deck is to be fitted at the bulkhead or deck.

For systems connected to the hull requirements of para. 3.7.2 of above mentioned Appendix 3 are to be complied with.

Joining techniques are to be in accordance with Manufacturer's installation guidelines.

Pipes and fittings are to be permanently marked in compliance with para. 2.1.2 of above mentioned Appendix 3.

Before installation on board pipes and fittings are to be tested by the manufacturer as per para. 4.2 and after installation on board according to para. 4.3 of the same Appendix 3.

The installation on board ships built according to the "Rules for the construction and Classification of high speed crafts" of RINA is subject to the satisfactory outcome of tests foreseen by IMO Resolution A.753(18).

*This certificate replaces the previous one no. MAC156215XG/001.*

**HAMBURG February 28, 2019**



A handwritten signature in blue ink, consisting of a series of loops and curves, positioned to the right of the RINA logo.






**TYPE APPROVAL CERTIFICATE**  
**No. MAC017019XG/002**

**This is to certify that the product identified below is in compliance with the regulations herewith specified.**

<i>Description</i>	<b>Plastic pipes and fittings</b>
<i>Type</i>	<b>Aquatherm Green Pipe SDR7.4 MF</b>
<i>Applicant</i>	<b>AQUATHERM GMBH Biggen 5 D-57439 Attendorn GERMANY</b>
<i>Manufacturer</i>	<b>AQUATHERM GMBH</b>
<i>Place of manufacture</i>	<b>Biggen 5 D-57439 Attendorn GERMANY</b>
<i>Reference standards</i>	<b>Part C, Chapter 1 Appendix 3 of RINA Rules</b>

*Issued in* **HAMBURG** on **February 28, 2019**. *This Certificate is valid until* **February 27, 2024**

  
\_\_\_\_\_  
**RINA Services S.p.A.**  
**Giuseppe Russo**

This certificate consists of this page and 2 enclosures.





## TYPE APPROVAL CERTIFICATE

No. MAC017019XG/002

Enclosure - Page 1 of 2

Aquatherm Green Pipe SDR7.4 MF

### Reference documents:

- Aquatherm catalogue E10101
- RINA Flame Spread Test Reports no. 96DG706TO and no. 2005CS01347/1
- RINA DWG: HMMC6047 , HMMC 6049 issued on 21-9-2015.

### Materials/Components:

- Polypropylene PP-R with internal aluminium sheet
- Pipes joined with Aquatherm green pipe fittings: coupling joint, transition piece, angle 45° / 90°, tee, cross, reducer and end cap.

### Technical characteristics:

Design standards for pipes: SKZ HR 3.28

Maximum allowable working pressure at 20 °C and pipe dimensions in compliance with the table:

External diameter (mm)	Thickness (mm)
	PN 16 (SDR 7.4 MF)
20	2.8
25	3.5
32	4.4
40	5.5
50	6.9
63	8.6
75	10.3
90	12.3
110	15.1
125	17.1
160	21.9
200	27.4
250	34.2
315	42.6
355	48

For working temperatures higher than 20 °C the maximum working pressure must be reduced as per the manufacturer's instructions.

**TYPE APPROVAL CERTIFICATE**  
No. **MAC017019XG/002**  
Enclosure - Page 2 of 2  
**Aquatherm Green Pipe SDR7.4 MF**

**Fields of application:**

Non-essential systems such as sanitary, black and grey waters, potable water, hot water heating, cooling (air condition) systems.

**Acceptance Conditions:**

Pipes are acceptable on open decks, within tanks, cofferdam, pipe tunnels, ducts and further location where flame spread is required and area where fire endurance is not required in accordance with Table 1 of Part C, Chapter 1, Appendix 3 of RINA Rules.

**Remarks:**

The installation of the piping system is to be carried out in accordance with the instructions of the manufacturer and of the RINA Rules as applicable.

Where pipes pass through "A" and "B" class divisions, arrangements are to be made to ensure that fire endurance is not impaired. These arrangements are to be tested in accordance with "Recommendations for Fire Test Procedures for "A" and "B" and "F" Bulkheads" (IMO Resolution A.754(18) as amended).

When the piping pierces watertight bulkhead or decks, the watertight integrity of the bulkhead or deck is to be maintained. If the bulkhead or deck is also a fire division and destruction by fire of plastic pipes may cause the inflow of liquid from tanks, a metallic shut-off valve operable from above the freeboard deck is to be fitted at the bulkhead or deck.

For systems connected to the hull requirements of para. 3.7.2 of above mentioned Appendix 3 are to be complied with.

Joining techniques are to be in accordance with Manufacturer's installation guidelines.

Pipes and fittings are to be permanently marked in compliance with para. 2.1.2 of above mentioned Appendix 3.

Before installation on board pipes and fittings are to be tested by the manufacturer as per para. 4.2 and after installation on board according to para. 4.3 of the same Appendix 3.

The installation on board ships built according to the "Rules for the construction and Classification of high speed crafts" of RINA is subject to the satisfactory outcome of tests foreseen by IMO Resolution A.753(18).

*This certificate replaces the previous one no. MAC156215XG/002.*

**HAMBURG February 28, 2019**



A handwritten signature in blue ink, appearing to be "J. M.", is written over the RINA logo.





**TYPE APPROVAL CERTIFICATE**  
**No. MAC017019XG/003**

**This is to certify that the product identified below is in compliance with the regulations herewith specified.**

<i>Description</i>	<b>Plastic pipes and fittings</b>
<i>Type</i>	<b>Aquatherm Blue Pipe SDR7.4 MF &amp; SDR11 MF</b>
<i>Applicant</i>	<b>AQUATHERM GMBH Biggen 5 D-57439 Attendorn GERMANY</b>
<i>Manufacturer</i>	<b>AQUATHERM GMBH</b>
<i>Place of manufacture</i>	<b>Biggen 5 D-57439 Attendorn GERMANY</b>
<i>Reference standards</i>	<b>Part C, Chapter 1 Appendix 3 of RINA Rules</b>

**Issued in HAMBURG on February 28, 2019. This Certificate is valid until February 27, 2024**

  
RINA Services S.p.A.  
**Giuseppe Russo**

This certificate consists of this page and 2 enclosures.



**TYPE APPROVAL CERTIFICATE**

No. MAC017019XG/003

Enclosure - Page 1 of 2

**Aquatherm Blue Pipe SDR7.4 MF & SDR11 MF**

**Reference documents:**

- Aquatherm catalogue E10101
- RINA Flame Spread Test Reports no. 96DG706TO and no. 2005CS01347/1
- RINA DWG: HMMC6047 , HMMC 6049 issued on 21-9-2015.

**Materials:**

- Polypropylene PP-R with internal aluminium sheet
- Pipes joined with Aquatherm green pipe fittings: coupling joint, transition piece, angle 45° / 90°, tee, cross, reducer and end cap.

**Technical characteristics:**

Design standards for pipes: SKZ HR 3.28

Maximum allowable working pressure at 20 °C and pipe dimensions in compliance with the table:

External diameter (mm)	Thickness (mm)	
	PN 10 (SDR 11)	PN 16 (SDR 7.4)
20	-	2.8
25	-	3.5
32	2.9	4.4
40	3.7	-
50	4.6	-
63	5.8	-
75	6.8	-
90	8.2	-
110	10.0	-
125	11.4	-
160	14.6	-
200	18.2	-
250	22.7	-
315	28.6	-
355	32.2	-
400	36.3	-
450	40.9	-

For working temperatures higher than 20 °C the maximum working pressure must be reduced as per the manufacturer's instructions.



**TYPE APPROVAL CERTIFICATE**

No. MAC017019XG/003

Enclosure - Page 2 of 2

**Aquatherm Blue Pipe SDR7.4 MF & SDR11 MF**

**Fields of application:**

Non-essential systems such as sanitary, black and grey waters, potable water, hot water heating, cooling (air condition) systems.

**Acceptance Conditions:**

Pipes are acceptable on open decks, within tanks, cofferdam, pipe tunnels, ducts and further location where flame spread is required and area where fire endurance is not required in accordance with Table 1 of Part C, Chapter 1, Appendix 3 of RINA Rules.

**Remarks:**

The installation of the piping system is to be carried out in accordance with the instructions of the manufacturer and of the RINA Rules as applicable.

Where pipes pass through "A" and "B" class divisions, arrangements are to be made to ensure that fire endurance is not impaired. These arrangements are to be tested in accordance with "Recommendations for Fire Test Procedures for "A" and "B" and "F" Bulkheads" (IMO Resolution A.754(18) as amended).

When the piping pierces watertight bulkhead or decks, the watertight integrity of the bulkhead or deck is to be maintained. If the bulkhead or deck is also a fire division and destruction by fire of plastic pipes may cause the inflow of liquid from tanks, a metallic shut-off valve operable from above the freeboard deck is to be fitted at the bulkhead or deck.

For systems connected to the hull requirements of para. 3.7.2 of above mentioned Appendix 3 are to be complied with.

Joining techniques are to be in accordance with Manufacturer's installation guidelines.

Pipes and fittings are to be permanently marked in compliance with para. 2.1.2 of above mentioned Appendix 3.

Before installation on board pipes and fittings are to be tested by the manufacturer as per para. 4.2 and after installation on board according to para. 4.3 of the same Appendix 3.

The installation on board ships built according to the "Rules for the construction and Classification of high speed crafts" of RINA is subject to the satisfactory outcome of tests foreseen by IMO Resolution A.753(18).

*This certificate replaces the previous one no. MAC156215XG/003.*

**HAMBURG February 28, 2019**



A handwritten signature in blue ink, consisting of a stylized 'M' followed by a flourish.



**TYPE APPROVAL CERTIFICATE**  
**No. MAC017019XG/004**

**This is to certify that the product identified below is in compliance with the regulations herewith specified.**

<i>Description</i>	<b>Plastic pipes and fittings</b>
<i>Type</i>	<b>Aquatherm Blue Pipe SDR17.6 MF</b>
<i>Applicant</i>	<b>AQUATHERM GMBH Biggen 5 D-57439 Attendorn GERMANY</b>
<i>Manufacturer</i>	<b>AQUATHERM GMBH</b>
<i>Place of manufacture</i>	<b>Biggen 5 D-57439 Attendorn GERMANY</b>
<i>Reference standards</i>	<b>Part C, Chapter 1 Appendix 3 of RINA Rules</b>

*Issued in* **HAMBURG** on **February 28, 2019**. *This Certificate is valid until* **February 27, 2024**

  
\_\_\_\_\_  
**RINA Services S.p.A.**  
**Giuseppe Russo**

This certificate consists of this page and 2 enclosures.





**TYPE APPROVAL CERTIFICATE**

No. MAC017019XG/004

Enclosure - Page 1 of 2

**Aquatherm Blue Pipe SDR17.6 MF**

**Reference documents:**

- Aquatherm catalogue E10101
- RINA Flame Spread Test Reports no. 96DG706TO and no. 2005CS01347/1
- RINA DWG: HMMC6047 , HMMC 6049 issued on 21-9-2015.

**Materials:**

- Polypropylene PP-R with internal aluminium sheet
- Pipes joined with Aquatherm blue pipe fittings: coupling joint, transition piece, angle 45° / 90°, tee, cross, reducer and end cap.

**Technical characteristics:**

Design standards for pipes: SKZ HR 3.28

Maximum allowable working pressure at 20°C and pipe dimensions in compliance with the table:

External diameter (mm)	Thickness (mm)
	( PN 8 ) SDR 17.6
160	9.1
200	11.4
250	14.2
315	17.9
355	20.1
400	22.7
450	25.5
500	28.4
560	31.7
630	35.7

For working temperatures higher than 20°C the maximum working pressure must be reduced as per the manufacturer's instructions.

**TYPE APPROVAL CERTIFICATE**  
**No. MAC017019XG/004**  
**Enclosure - Page 2 of 2**  
**Aquatherm Blue Pipe SDR17.6 MF**

**Fields of application:**

Non-essential systems such us sanitary, black and grey waters, potable water, hot water heating, cooling (air condition) systems.

**Acceptance Conditions:**

Pipes are acceptable on open decks, within tanks, cofferdam, pipe tunnels, ducts and further location where flame spread is required and area where fire endurance is not required in accordance with Table 1 of Part C, Chapter 1, Appendix 3 of RINA Rules.

**Remarks:**

The installation of the piping system is to be carried out in accordance with the instructions of the manufacturer and of the RINA Rules as applicable.

Where pipes pass through "A" and "B" class divisions, arrangements are to be made to ensure that fire endurance is not impaired. These arrangements are to be tested in accordance with "Recommendations for Fire Test Procedures for "A" and "B" and "F" Bulkheads" (IMO Resolution A.754(18) as amended).

When the piping pierces watertight bulkhead or decks, the watertight integrity of the bulkhead or deck is to be maintained. If the bulkhead or deck is also a fire division and destruction by fire of plastic pipes may cause the inflow of liquid from tanks, a metallic shut-off valve operable from above the freeboard deck is to be fitted at the bulkhead or deck.

For systems connected to the hull requirements of para. 3.7.2 of above mentioned Appendix 3 are to be complied with.

Joining techniques are to be in accordance with Manufacturer's installation guidelines.

Pipes and fittings are to be permanently marked in compliance with para. 2.1.2 of above mentioned Appendix 3.

Before installation on board pipes and fittings are to be tested by the manufacturer as per para. 4.2 and after installation on board according to para. 4.3 of the same Appendix 3.

The installation on board ships built according to the "Rules for the construction and Classification of high speed crafts" of RINA is subject to the satisfactory outcome of tests foreseen by IMO Resolution A.753(18).

*This certificate replaces the previous one no. MAC156215XG/004*

**HAMBURG February 28, 2019**



A handwritten signature in blue ink, appearing to be 'p. h.', is written over the RINA logo.





**TYPE APPROVAL CERTIFICATE**  
**No. MAC017019XG/005**

**This is to certify** that the product identified below is in compliance with the regulations herewith specified.

<i>Description</i>	<b>Plastic pipes and fittings</b>
<i>Type</i>	<b>Aquatherm Green Pipe SDR9 MF RP</b>
<i>Applicant</i>	<b>AQUATHERM GMBH Biggen 5 D-57439 Attendorn GERMANY</b>
<i>Manufacturer</i>	<b>AQUATHERM GMBH</b>
<i>Place of manufacture</i>	<b>Biggen 5 D-57439 Attendorn GERMANY</b>
<i>Reference standards</i>	<b>Part C, Chapter 1 Appendix 3 of RINA Rules</b>

*Issued in* **HAMBURG** on **February 28, 2019**. *This Certificate is valid until* **February 27, 2024**

  
RINA Services S.p.A.  
**Giuseppe Russo**

This certificate consists of this page and 2 enclosures.



## TYPE APPROVAL CERTIFICATE

No. MAC017019XG/005

Enclosure - Page 1 of 2

**Aquatherm Green Pipe SDR9 MF RP**

### Reference documents:

- Aquatherm catalogue E10101
- RINA Flame Spread Test Reports no. 96DG706TO and no. 2005CS01347/1
- RINA DWG: HMMC6047 , HMMC 6049 issued on 21-9-2015.

### Materials:

- Polypropylene PP-R with internal aluminium sheet
- Pipes joined with Aquatherm green pipe fittings: coupling joint, transition piece, angle 45° / 90°, tee, cross, reducer and end cap.

### Technical characteristics:

Design standards for pipes: SKZ HR 3.28

Maximum allowable working pressure at 20 °C and pipe dimensions in compliance with the table:

External diameter (mm)	Thickness (mm)
	( PN15 ) SDR 9
32	3.6
40	4.5
50	5.6
63	7.1
75	8.4
90	10.1
110	12.3
125	14
160	17.9
200	22.4
250	27.9
315	35,2
355	39.7

For working temperatures higher than 20 °C the maximum working pressure must be reduced as per the manufacturer's instructions.



**TYPE APPROVAL CERTIFICATE**

No. **MAC017019XG/005**

**Enclosure - Page 2 of 2**

**Aquatherm Green Pipe SDR9 MF RP**

**Fields of application:**

Non-essential systems such as sanitary, black and grey waters, potable water, hot water heating, cooling (air condition) systems.

**Acceptance Conditions:**

Pipes are acceptable on open decks, within tanks, cofferdam, pipe tunnels, ducts and further location where flame spread is required and area where fire endurance is not required in accordance with Table 1 of Part C, Chapter 1, Appendix 3 of RINA Rules.

**Remarks:**

The installation of the piping system is to be carried out in accordance with the instructions of the manufacturer and of the RINA Rules as applicable.

Where pipes pass through "A" and "B" class divisions, arrangements are to be made to ensure that fire endurance is not impaired. These arrangements are to be tested in accordance with "Recommendations for Fire Test Procedures for "A" and "B" and "F" Bulkheads" (IMO Resolution A.754(18) as amended).

When the piping pierces watertight bulkhead or decks, the watertight integrity of the bulkhead or deck is to be maintained. If the bulkhead or deck is also a fire division and destruction by fire of plastic pipes may cause the inflow of liquid from tanks, a metallic shut-off valve operable from above the freeboard deck is to be fitted at the bulkhead or deck.

For systems connected to the hull requirements of para. 3.7.2 of above mentioned Appendix 3 are to be complied with.

Joining techniques are to be in accordance with Manufacturer's installation guidelines.

Pipes and fittings are to be permanently marked in compliance with para. 2.1.2 of above mentioned Appendix 3.

Before installation on board pipes and fittings are to be tested by the manufacturer as per para. 4.2 and after installation on board according to para. 4.3 of the same Appendix 3.

The installation on board ships built according to the "Rules for the construction and Classification of high speed crafts" of RINA is subject to the satisfactory outcome of tests foreseen by IMO Resolution A.753(18).

*This certificate replaces the previous one no. MAC156215XG/005.*

**HAMBURG February 28, 2019**



A handwritten signature in blue ink, appearing to be 'P. H.', is written over the page.



**TYPE APPROVAL CERTIFICATE**  
No. MAC017019XG/006

**This is to certify** that the product identified below is in compliance with the regulations herewith specified.

<i>Description</i>	<b>Plastic pipes and fittings</b>
<i>Type</i>	<b>Aquatherm Red Pipe SDR 7.4 MF HI</b>
<i>Applicant</i>	<b>AQUATHERM GMBH Biggen 5 D-57439 Attendorn GERMANY</b>
<i>Manufacturer</i>	<b>AQUATHERM GMBH</b>
<i>Place of manufacture</i>	<b>Biggen 5 D-57439 Attendorn GERMANY</b>
<i>Reference standards</i>	<b>Part C, Chapter 1 Appendix 3 of RINA Rules</b>

*Issued in* **HAMBURG** on **February 28, 2019**. *This Certificate is valid until* **February 27, 2024**

  
\_\_\_\_\_  
**RINA Services S.p.A.**  
**Giuseppe Russo**

This certificate consists of this page and 2 enclosures.





## TYPE APPROVAL CERTIFICATE

No. MAC017019XG/006

Enclosure - Page 1 of 2

Aquatherm Red Pipe SDR 7.4 MF HI

### Reference documents:

- Aquatherm catalogue E10101
- RINA Flame Spread Test Reports no. 96DG706TO and no. 2005CS01347/1
- RINA DWG: HMMC6047 , HMMC 6049 issued on 21-9-2015.

### Materials:

- Polypropylene PP-R fibre reinforced.

### Technical characteristics:

Design standards for pipes: SKZ HR 3.28

Maximum allowable working pressure at 20 °C and pipe dimensions in compliance with the table:

External diameter (mm)	Thickness (mm)
	( PN20 ) SDR 7.4 MF HI
20	2.8
25	3.5
32	4.4
40	5.5
50	6.9
63	8.6
75	10,3
90	12.3
110	15.1
125	17.1
160	( PN 10) 14.6 (SDR11)

For working temperatures higher than 20 °C the maximum working pressure must be reduced as per the manufacturer's instructions.

**TYPE APPROVAL CERTIFICATE**  
**No. MAC017019XG/006**  
**Enclosure - Page 2 of 2**  
**Aquatherm Red Pipe SDR 7,4 MF HI**

**Fields of application:**

Non-essential systems such as sanitary, black and grey waters, potable water, hot water heating, cooling (air condition) systems.

**Acceptance Conditions:**

Pipes are acceptable on open decks, within tanks, cofferdam, pipe tunnels, ducts and further location where flame spread is required and area where fire endurance is not required in accordance with Table 1 of Part C, Chapter 1, Appendix 3 of RINA Rules.

**Remarks:**

The installation of the piping system is to be carried out in accordance with the instructions of the manufacturer and of the RINA Rules as applicable.

Where pipes pass through "A" and "B" class divisions, arrangements are to be made to ensure that fire endurance is not impaired. These arrangements are to be tested in accordance with "Recommendations for Fire Test Procedures for "A" and "B" and "F" Bulkheads" (IMO Resolution A.754(18) as amended).

When the piping pierces watertight bulkhead or decks, the watertight integrity of the bulkhead or deck is to be maintained. If the bulkhead or deck is also a fire division and destruction by fire of plastic pipes may cause the inflow of liquid from tanks, a metallic shut-off valve operable from above the freeboard deck is to be fitted at the bulkhead or deck.

For systems connected to the hull requirements of para. 3.7.2 of above mentioned Appendix 3 are to be complied with.

Joining techniques are to be in accordance with Manufacturer's installation guidelines.

Pipes and fittings are to be permanently marked in compliance with para. 2.1.2 of above mentioned Appendix 3.

Before installation on board pipes and fittings are to be tested by the manufacturer as per para. 4.2 and after installation on board according to para. 4.3 of the same Appendix 3.

The installation on board ships built according to the "Rules for the construction and Classification of high speed crafts" of RINA is subject to the satisfactory outcome of tests foreseen by IMO Resolution A.753(18).

*This certificate replaces the previous one no. MAC156215XG/006.*

**HAMBURG February 28, 2019**



A handwritten signature in blue ink, appearing to be "J. A.", is written over the page. The signature is cursive and somewhat stylized.

