



# DET NORSKE VERITAS

## TYPE APPROVAL CERTIFICATE

CERTIFICATE NO. K-5457

Holder of Certificate  
**Uponor GmbH**  
Hassfurt, Germany

This is to certify that the  
**Plastic Pipes, Thermoplastic**

with type designation(s)  
**UPONOR MLC PE-RT TYPE II / AI / PE-RT TYPE II System**

is found to comply with  
Det Norske Veritas' Type Approval Programme 1-501.2, 2011, Thermoplastic Pipes  
Det Norske Veritas' Rules for Classification of Ships

### Application

**Non-essential systems for hot and cold fresh and sea water and for heating applications up to 10 bar and 70°C, 95°C max. for short-term conditions. The piping system is not tested with respect to Fire Endurance and Flame Spread characteristics.**

Høvik, 2013-03-11  
for Det Norske Veritas AS

Rikard Törnqvist  
Head of Section



DNV local office:  
Essen CMC Southern Germany

This Certificate is valid until  
**2016-06-30**

Gisle Hersvik  
Surveyor

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.



Certificate No.: K-5457  
File No.: 332.31  
Job Id.: 262.1-012546-1

## Product description

### Multi-layered UPONOR MLC PE-RT TYPE II / AI / PE-RT TYPE II System

Polyethylene inner and outer liner, continuously overlapped aluminium core pipe. The different layers are adhesively bonded to each other.

#### Legends:

PE-RT: Polyethylene - Temperature Resistant

AI: Aluminium

#### Fittings/Couplings:

Pipes to be joined with UPONOR's tin-plated brass screw and press fittings, or PPSU fittings.

CF-III Fittings:	OD 16, 20, 25 [mm]
M-Fittings:	OD 16, 18, 20, 25, 32, 40, 50 [mm]
PPSU-II Fittings:	OD 16, 20, 25, 32, 40, 50 [mm]
Modular Fittings:	OD 63, 75, 90, 110 [mm]
RTM-Fittings (brass):	OD 16, 20, 25, 32 [mm]
RTM-Fittings (PPSU):	OD 16, 20, 25 [mm]

#### Remark:

Fittings are manufactured by **Uponor GmbH, Hassfurt, Germany** (press/screw type), **Uponor Suomi Oy Proplast, Nastola, Finland** (PPSU-II type fittings) and **Cocomech/Higashio Mech. Co., Ltd., Osaka, Japan** (RTM-Fittings).

#### Dimensions:

Diameters, wall thicknesses and maximum service temperature/pressure:

Type	OD [mm]	Wall thickness [mm]	PN [bar]	Maximum working pressure [bar]
				95°C
UPONOR MLC PE-RT TYPE II / AI / PE-RT TYPE II	16	2,0	10	10,0
	18	2,0	10	10,0
	20	2,25	10	10,0
	25	2,5	10	8,5
	32	3,0	10	8,5
	40	4,0	10	8,0
	50	4,5	10	9,5
	63	6,0	10	9,5
	75	7,5	10	9,5
	90	8,5	10	8,0
110	10,0	10	8,0	

Note: The maximum long-term working pressure for temperatures between 70°C and 95°C have been determined based on the long-term internal tests carried out. A safety factor > 1,5 has been applied w.r.t. the 97.5% fractile, for establishing the tabulated values.

## Manufactured by

Uponor GmbH, Am Köhlersgehäu 17, D-98544 Zella-Mehlis, Germany

DNV local office: Essen

## Responsibility

The Holder of Certificate takes the responsibility that both design and production are in compliance with Rules, Standards and Regulations listed on page 1 of this Certificate.



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## Application/Limitation

Non-essential sanitary and drainage systems for hot and cold fresh and sea water up to 10 bar and 70°C. Also for heating applications. The temperature limit may be extended (from 70°C) up to 95°C for shorter periods at 10 bar, however, the long-term working pressure shall be as per above table.

The piping system is non-conductive, not for installation in gas hazardous area.

The installation and application of the pipes shall be in accordance with the Manufacturer's recommendations.

The Fire Endurance and Low Flame Spread characteristic of the piping system have not been determined.

The pipes and fittings are not to be used in submerged condition.

## Type Approval documentation

1. Previous Type Approval Certificates No. K-3145.
2. Renewal Survey Report from DNV Essen of 2012-11-06/2012-11-27.
3. Application for Type Approval of 2011-09-28, SKZ Reports, etc.

## Tests carried out

Type Testing carried out according to **Type Approval documentation**.

## Marking of product

The piping shall be marked with:

- Trade name
- Maximum working temperature ( $T_{max}=70^{\circ}\text{C}$  in DNV classified objects)
- Maximum working pressure
- Dimensions, outer diameter and wall thickness
- Material designation
- Production code

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 Type Approval Certificate.

## Certificate Retention/Renewal Survey

The scope of the Retention/Renewal Survey 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.

Survey to be performed after two (2) years (Certificate Retention Survey) and at renewal after four (4) years (Certificate Renewal Survey).

The main elements of the survey are:

- Ensure that **Type Approval documentation** is available.
- Review design, materials, production process, and performance with respect to possible changes, in order to ensure compliance with **Type Approval documentation** and/or referenced material specifications.
- Ensure traceability between manufacturer's product marking and the DNV Type Approval Certificate.

END OF CERTIFICATE