

LLOYD'S REGISTER TYPE APPROVAL – DESIGN APPRAISAL DOCUMENT

Issued by: Hamburg Technical Support Office (HPC 1761053)

Issued to VIEGA GMBH & CO. KG

For: RAXOFIX MULTILAYER PIPE SYSTEM

The undernoted documents have been reviewed for compliance with the requirements of the Lloyd's Register Type Approval System Procedure TA14 Version 04 (September 2020) and this Design Appraisal Document forms part of the Certificate.

APPROVAL DOCUMENTATION

Form 2571	Application for Type Approval	05.01.2022
12/20022(E1)-02	Previous Type Approval Certificate	24.02.2021
DW-8803CT0643	Certificate for DVGW test mark	08.06.2020
W 1.494	ÖVGW-Certificate for potable water domestic installations of Raxofix system of grey multilayer pipes M made of PE-Xc / Al / PE-Xc and pipes PE-RT Type II/AL/PE-RT Type II	01.04.2019
535734 QM15	Certificate DIN ISO 9001:2015 by DQS Frankfurt am Main	22.10.2020
520078_Raxofix	Instruction for use Raxofix Pipes	21.09.2020
L3 DE_112114	Raxofix Pipe system catalogue	Nov. 2020

TEST REPORTS

-	Production Quality Assessment at Viega Attendorn-Ennest	29.07.2021
-	Production Quality Assessment at Viega Niederwinkling	16.07.2021
-	Production Quality Assessment at Becker Plastics Datteln	13.07.2021
122170/16	Testing of flame spread according ASTM 635-06 (class HB) for Viega Raxofix at SKZ-Testing GmbH in Würzburg	21.09.2017
VA KU 26405/4-E	Prototype test according ÖNORM EN ISO 21003-1 for Raxofix consisting of multilayer pipes PE-Xc / Al / PE-Xc dimensions \varnothing 40 to 63 mm by tgm / Federal Institute of Technology Plastics Technology and Environmental Engineering in Wien	07.09.2017
V310/20.3	Test of thermal stability acc. ISO 21003-2 for inner and outer layer on PE-RT/AL/PE/RT Type II in different colour variations pipes at IMA Dresden	26.11.2020

LC 17868	Determination of resistance to (long-time) internal pressure at constant temperature acc. ISO 22391-2 for PE-RT type II pipes (compound: Basel 4731B) at KIWA Apeldoorn / Netherlands	06.01.2021
LC 17865	Determination of resistance to (long-time) internal pressure at constant temperature acc. ISO 15875-2 for PE-RT type II pipes (compound Borealis HE2590) at KIWA Apeldoorn / Netherlands	06.01.2021
191101052-1, vers. 2	Initial Type Testing Report for Raxofix PE-RT/AL/PE-RT pipes acc. EN ISO 21003 at KIWA in AB Rijswijk / Netherlands	08.01.2021
213035/20-III	Type Testing for Raxofix PE-RT/AL/PE-RT pipes acc. IMO Resolution A.753(18) and IACS UR P4.7 containing dimensions, resistance to external blows, hydrostatic pressure, vicat softening, tensile test, temperature of deflection under load, flame spread, buckling pressure, resistance to short term pressure at test laboratory SKZ Würzburg / Germany	17.01.2021
131102423-2, 131102423-1	ISO 21003-2 / DVGW W542 initial type testing report Viega – PE-Xc multilayer pipes by Kiwa Netherlands B.V.	14.07.2017 17.06.2015
120004554-2, 120004554-1	Supplement tests for compression pipe system Raxofix according DIN EN ISO 21003-5 and DVGW W 542:2009-08 at laboratory Viega Attendorn witnessed by MPA NRW Dortmund	19.08.2015 11.06.2015
120401044-2, 120401044-1	ISO 21003-2 / DVGW W542 – initial type testing report Viega – PE-Xc multilayer pipes 25 x 2,7 by Kiwa Netherlands B.V.	28.05.2015, 12.11.2013
120004093-1, 120004093-2	ISO 21003-5 / DVGW 534 tests for Raxofix fittings and PE-Xc multilayer pipe by MPA NRW Dortmund	27.11.2013
DTM1270565	LR-Visit Report Inspection and surveillance of production facilities (Viega in Großheringen)	28.02.2012
DTM1110705	LR-Visit Report Inspection and surveillance of production facilities (Viega in Attendorn)	01.02.2012
DTM1110565	LR-Visit Report Inspection and surveillance of production facilities (Becker Plastics in Datteln)	03.11.2011
STU11084470	LR-Visit Report Inspection and surveillance of production facilities (Viega in Niederwinkling)	28.09.2011
-	Report of in-house audit and tests (tightness test and burst pressure test) third party witnessed	20.04.2011
VA KU 23711	Extended tests of multilayer pipes M with PE-Xc/Al/PE-Xc 16x2,2; 20x2,8; 25x2,7; 32x3,2; 40x3,5; 50x4,0; 63x4,5 mm according ÖNORM EN ISO	25.05.2011

	21003-1 at tgm / Federal Institute of Technology Plastics Technology and Environmental Engineering in Wien	
TGM-VA KU 23142/1	Prototype test for Raxofix consisting of black PE-Xc pipes with dimensions 16 x 2,2 mm and 20 x 2,8 mm with press fittings of bronze and PPSU supporting sleeve according ÖVGW directive PW 302 (July 2009) for potable water domestic systems (including homogeneity test; 1000 hours pressure test at about 15 bar at 95°C) at tgm / Federal Institute of Technology Plastics Technology and Environmental Engineering in Wien	02.03.2010
TGM-VA KU 23142	Prototype test for Raxofix consisting of black PE-Xc pipes with dimensions 16 x 2,2 mm and 20 x 2,8 mm with press fittings of bronze and PPSU supporting sleeve according ÖNORM EN ISO 15875-1, -2, -3 and -5, issue 01.03.2008 for hot and cold water installations including potable water (including stability test for size 20 mm at 95°C with test tension 4,7 MPa, for min. 20 (477) hours and 4,4 Mpa for min. 1000 (2500) hours; tensile / pressure test for sizes 16 and 20 mm at 20 / 95°C, for 1, 22, 165 and 1000 hours and test tensions 12 to 4,4 Mpa; thermal stability test with test tension 2,5 Mpa for size 20 mm at 110°C for min. 8760 hours; temperature alteration test; pressure alteration test; vacuum test) at tgm / Federal Institute of Technology Plastics Technology and Environmental Engineering in Wien	02.03.2010
TGM-VA KU 22962	Prototype test for Raxofix consisting of grey multilayer pipes M consisting of layers PE-Xc / Al / PE-Xc with dimensions 16 x 2,2; 20 x 2,8; 25 x 2,7; 32 x 3,2; 40 x 3,5; 50 x 4,0; 63 x 4,5 mm with press fittings of bronze and PPSU supporting sleeve according ÖNORM EN ISO 21003 – 1, -2, -3 and -5 for potable water domestic systems (including homogeneity test; 1000 hours pressure test at 95°C for sizes 16 and 20 at 24,9 bar and for sizes 25 to 50 at 14,3 bar; thermal stability test with test tension 2,5 Mpa, at 110°C for min. 8760 hours; weld seam strength test; bending test 5 x Do; temperature alteration test 20 / 95°C, 5000 cycles, duration of cycle 15 minutes at 10 bar, minimum flow 0,5 m/s; pressure alteration test at RT, 0,5 / 15 bar, 10000 cycles with 30 cycles per minute; vacuum test -0,8 bar, 1 hour at 23°C) at tgm / Federal Institute of Technology Plastics Technology and Environmental Engineering in Wien	29.01.2010
120003447-4	Supplement test compression pipe system Raxofix sizes 16, 20, 25, 32, 40, 50 and 63 mm with bronze fittings according DIN EN ISO 21003-5, class 5, (including tensile strength test at 95 / 23°C, each 1 hour; temperature alteration test 20 / 95°C, 1000 cycles, duration of cycle 15 minutes at 10 bar, min. flow 0,5 m/s; pressure alteration test 0,5 / 15 bar, 10000 cycles with 30 cycles per minute) at MPA NRW in Dortmund	18.01.2010
120003447-3	Supplement test for compression pipe system Raxofix sizes 16 and 20 mm according DIN ISO 15875-5 class 2 with PE-Xc pipes and bronze fittings	18.01.2010

	(including tensile strength test at 95 / 23°C, each 1 hour; temperature alteration test 20 / 95°C, 1000 cycles, duration of cycle 15 minutes at 10 bar, min. flow 0,5 m/s; pressure alteration test 0,5 / 25 bar, 10000 cycles at 23°C) at MPA NRW in Dortmund	
120003447-2	Supplement test for compression pipe system RX 09 with SC feature sizes 16 to 63 mm according DVGW working sheet W 534, issue May 2004, type M-MV with PE-Xc / Al / PE-Xc pipes and bronze fittings (including impulse pressure test 1 to 25 bar, 10000 cycles at 0,5 Hz; temperature alteration test 20 / 93°C, 1000 cycles, duration of cycle 15 minutes at 10 bar; flexure test with \pm 10 mm elongation, 333 cycles at 15 Hz, 15 bar; tensile strength test at 20 / 93°C) at test laboratory MPA NRW Dortmund	18.01.2010
120003447-1	Supplement test for compression pipe system Raxofix sizes 16 and 20 mm according DVGW working sheet W 534, issue May 2004, type M-MK with PE-Xc pipes and bronze fittings (including impulse pressure test 1 to 25 bar, 10000 cycles at 0,5 Hz; temperature alteration test 20 / 93°C, 1000 cycles, duration of cycle 15 minutes at 10 bar; flexure test with \pm 10 mm elongation, 333 cycles at 15 Hz, 15 bar; tensile strength test at 20 / 93°C) at test laboratory MPA NRW Dortmund	18.01.2010
120003292-4	Test compression pipe system Raxofix according DVGW working sheet W 542, (from pipe supplier gabo system technic for sizes 16 and 20 mm and Becker Plastics for sizes 25 to 63 mm) sizes 16, 20, 25, 32, 40, 50 and 63 mm with bronze fittings according DIN EN ISO 21003-5, class 5, (including 1000 hours pressure test at 95°C with pressures 30 to 13 bar for size 16 to 63 mm; bending test 8 x Do at RT, at 15 bar for 1 hour; tensile strength test at 95 / 23°C, each 1 hour; temperature alteration test 20 / 95°C, 5000 cycles, duration of cycle 15 minutes at 10 bar, min. flow 0,5 m/s; pressure alteration test 0,5 / 15 bar, 10000 cycles with 30 cycles per minute) at MPA NRW in Dortmund	02.06.2009
120003292-3	Test for compression pipe system Raxofix sizes 16 and 20 mm according DIN ISO 15875-5 class 2 with PE-Xc pipes and bronze fittings (including 1000 hours pressure test at 95°C / 15 bar, tensile strength test at 95 / 23°C, each 1 hour; temperature alteration test 20 / 95°C, 5000 cycles, duration of cycle 15 minutes at 10 bar, min. flow 0,5 m/s; pressure alteration test 0,5 / 25 bar, 10000 cycles at 23°C) at MPA NRW in Dortmund	03.05.2009
120003292-2	Prototype test for compression pipe system RX 09 with SC feature sizes 16 to 63 mm according DVGW working sheet W 534, issue May 2004, type M-MV with PE-Xc / Al / PE-Xc pipes and bronze fittings: (including 1 hour low pressure test -0,8 bar at 20°C; impulse pressure test at RT, 1 to 25 bar, 10000 cycles at 0,5 Hz; temperature alteration test 20 / 93°C, 5000 cycles, duration of cycle 15 minutes at 10 bar; flexure test with \pm 10 mm elongation, 333	24.04.2009



	cycles at 15 Hz, 15 bar; 22 / 165 / 1000 hours pressure test at 95°C; tensile strength test at 20 / 93°C; bending test 8 x Do at 15 bar; leakage visibility test at un-pressed connections) at test laboratory MPA NRW Dortmund	
120003292-1	Prototype test for compression pipe system Raxofix with SC feature sizes 16 and 20 mm according DVGW working sheet W 534, issue May 2004, type M-MK with PE-Xc pipes and bronze fittings: (including 1 hour low pressure test -0,8 bar at 20°C; impulse pressure test 1 to 25 bar, 10000 cycles at 0,5 Hz; temperature alteration test 20 / 93°C, 5000 cycles, duration of cycle 15 minutes at 10 bar; flexure test with \pm 10 mm elongation, 333 cycles at 15 Hz, 15 bar; 22 / 165 / 1000 hours pressure test at 95°C; tensile strength test at 20 / 93°C; bending test 8 x Do at 15 bar; leakage visibility test at un-pressed connections) at test laboratory MPA NRW Dortmund	24.04.2009
B212/08.1	Prototype test multilayer pipes PE-Xc / Al 0,2 / PE-Xc size 20 x 2,8 mm according DVGW working sheet W 542, issue August 2009 (including pressure duration behaviour, temperature alteration test) at IMA in Dresden	16.12.2010
B212/08	Prototype test multilayer pipes PE-Xc / Al / PE-Xc sizes 16 x 2,2 and 20 x 2,8 mm according DVGW working sheet W 542, issue April 1997 (including pressure duration behaviour, temperature alteration test) at IMA in Dresden	24.07.2009

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Supplementary Type Approval Terms and Conditions

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Type Approval is based on the understanding that the manufacturer's recommendations and instructions and any relevant requirements of the Rules and Regulations are complied with.

Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations. Lloyd's Register EMEA reserves the right to cancel or withdraw this Type Approval Certificate in accordance with the Lloyd's Register Type Approval System Procedure.