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Register court Amtsgericht Dresden | HRB 5995
Tax identification number DE 155293995

Test Report

„Type test (TT) PP-R pipe“

Short title:
„Type test (TT) PP-R pipe“

Deutsche Akkreditierungsstelle D-PL-13119-02-00

Test Report No.: V241/20-3

Order No.: 402300098

Issued by Department Pipe Systems

Laboratory for Pipe System Testing

Recognised test laboratory of DVGW, DIN CERTCO and DIBt
The recognitions are valid for the test methods stated in the attachments of certificates of approval DVGW LW-BU0023, DIN CERTCO PL121 and DIBt SAC 08

Test Report

Type test (TT) PP-R pipe

Test Report No.: V241/20-3

Test Location:	Am Lagerplatz 4 / 01099 Dresden GERMANY
Test Specimen:	PP-R Pipe in dimensions d20, d25, d32, d40, d50, d63
Customer:	Dizayn Teknik Boru ve Ekipmanlari San. Tic. A.S. Atatürk Mah. Inönü Cad. No. 6 34522 Kirac,Esenyurt / Istanbu TURKEY
Order no. of the Customer:	-
Test Laboratory:	IMA Materialforschung und Anwendungstechnik GmbH Laboratory for Pipe System Testing Wilhelmine-Reichard-Ring 4 01109 Dresden GERMANY
Sampling:	10.07.2019
Test Specimen received on:	08.11.2019
Test Period:	05.08.2020 – 26.11.2020
Test Result:	see page 5 to 7
In Charge:	Dipl.-Ing. Jule Isabel Isleif
Distribution List:	1 x Customer 1 x IMA Dresden

Authorized
Dresden, 15.12.2020
IMA Materialforschung und
Anwendungstechnik GmbH

Dipl.-Ing. Heiko Below
Head of Department Pipe Systems

Table of content

Table of tables

1 Task definition

The customer Dizayn Teknik commissioned the IMA Dresden with the execution of type tests on pressure pipes. The tests were carried out according to the requirements of the DVGW Worksheet W 544 (May 2007).

2 Requirements

- DVGW Worksheet W 544 (May 2007) Annex A Requirements and Tests
- DVGW Worksheet W 544 (May 2007) Annex C Polypropylene (PP-R) Pipes

Table 1: Requirements according to DVGW W 544

Characteristics	Requirements and testing according to section
Hygiene test	-
Assembly and installation instructions	DVGW W 544, 4.2
Marking	DVGW W 544, 4.3
Delivery condition	DVGW W 544, 6.1.2
Appearance	DVGW W 544, 6.1.3
Dimensions and tolerances	DVGW W 544, 6.1.4
Longitudinal reversion	DVGW W 544, 6.1.5
Melt mass flow rate (MFR)	DVGW W 544, 6.1.6

Characteristics	Requirements and testing according to section
Resistance to impact test	DVGW W 544, 6.1.7
Resistance to internal pressure	DVGW W 544, 6.1.8
Thermal stability by hydrostatic pressure testing	DVGW W 544, 6.1.8
Homogeneity of the pipe material	DVGW W 544, 6.1.9

3 Test specimen

- Manufacturer: Dizayn Technik Plastic Pipes & Fittings Co
  Velimese Beldesi Kazan ve Sanayi Top. Is Kooperatifi 5 Ada 4 Parsel
  Corlu/ Tekirdag
  TURKEY
- Material: Borealis RA 130E
- Dimensions: see table 2
- Marking: see table 2

Table 2: Test specimens, dimensions and marking

Dimension	Marking
d 20 x 3,4 mm	DIZAYN PP-R 20x3,4mm TS EN ISO 15874-2 A TYPE (Class 1-10 Bar) (PN 25/20°C 50 Years) <TSE> DVGW DW-8317BU0174 LOT NO:Borealis-62180938 01.07.2019 22:26 LINE A9 4mt MADE IN TÜRKEY
d 25 x 4,2 mm	DIZAYN PP-R 25x4,2mm TS EN ISO 15874-2 A TYPE (Class 1-10 Bar) (PN 25/20°C 50 Years) <TSE> DVGW DW-8317BU0174 LOT NO:Borealis-62180938 01.07.2019 21:30 LINE A9 4mt MADE IN TÜRKEY
d 32 x 5,4 mm	DIZAYN PP-R 32x5,4mm TS EN ISO 15874-2 A TYPE (Class 1-10 Bar) (PN 25/20°C 50 Years) <TSE> DVGW DW-8317BU0174 LOT NO:Borealis-62180938 01.07.2019 19:16 LINE A9 4mt MADE IN TÜRKEY
d 40 x 6,7 mm	DIZAYN PP-R 40x6,7mm TS EN ISO 15874-2 A TYPE (Class 1-10 Bar) (PN 25/20°C 50 Years) <TSE> DVGW DW-8317BU0174 LOT NO:Borealis-62180938 01.07.2019 15:31 LINE A9 4mt MADE IN TÜRKEY
d 50 x 8,3 mm	DIZAYN PP-R 50x8,3mm TS EN ISO 15874-2 A TYPE (Class 1-10 Bar) (PN 25/20°C 50 Years) <TSE> DVGW DW-8317BU0174 LOT NO:Borealis-62180938 01.07.2019 14:00 LINE A9 4mt MADE IN TÜRKEY
d 63 x 10,5 mm	DIZAYN PP-R 63x10,5mm TS EN ISO 15874-2 A TYPE (Class 1-10 Bar) (PN 25/20°C 50 Years) <TSE> DVGW DW-8317BU0174 LOT NO:Borealis-62180938 01.07.2019 11:22 LINE A9 4mt MADE IN TÜRKEY

4 Results

4.1 Test results

Table 3: Tested dimension 20 x 3,4 mm; SDR 6; PN 25

Characteristics	Test equipment / ID-No./ Person in charge	Test result	Evaluation
Hygiene test	/	No test execution	n.a.
Assembly and installation instructions	J. Isleif	Corresponds to the demands.	+
Marking	M. Lasch	Corresponds to the demands.	+
Delivery condition	M. Lasch	Pipes are free of sharp edges, striations and inhomogeneity´s. The color is continuously equal.	+
Appearance	M. Lasch	Pipes have smooth inner and external surfaces and are evenly white.	+
Dimensions and tolerances	WDM – IMA 9024887 / UFM 2017/3244 IPT / M. Lasch	Test according to DIN EN ISO 3126:2005-03 Characteristic: Mean outside diameter; $d_{1\,min}$ [mm]; Set value: 20,0 to 20,3; Actual value: 20,3 Characteristic: Maximum ovality; ovality $_{max}$ [mm]; Set value: ≤ 1,2; Actual value: 0,2 Characteristic: Minimal wall thickness; $s_{1\,min}$ [mm]; Set value: 3,4 to 4,0; Actual value: 3,4	+
Longitudinal reversion	Circulating air oven UT6200/ Digital caliper Mitutoyo / 1600912 / M. Lasch	Test according to DIN EN ISO 2505:2005-08 Arithmetic average of relative elongation: Set value: ≤ 2% Actual value: 0,3%	+
Melt mass flow rate (MFR)	CEAST MMF 7026 / M. Lasch	Test according to DIN EN ISO 1133-1:2012-03 Temperature: 230°C Nominal load: 2,16 kg Actual value granulate: 0,235 g/10min[1)] Actual value pipe: 0,265 g/10min Set value change: ≤ 20% Actual value change: 13%	+

Characteristics	Test equipment / ID-No./ Person in charge	Test result	Evaluation
Resistance to impact test	Pendulum impact tester 401/55 / balance Sartorius BL1500 / cold cabinet with regulator / M. Lasch	Test according to DIN EN ISO 179-1:2010-11 Test piece type: Type 2 Test temperature: 0 °C (±2 °C) Number of specimens: 10 Set value: TIR ≤ 10 % Actual value: TIR = 0 %	+
Resistance to internal pressure 165 h	Pressure stations 095/2, 095/3, 095/4 / IPT B211 / D. Juhrs	Test according to DIN EN ISO 1167-1/-2:2006-05 / Water-in-water Set value: 95,0°C / 3,8 MPa / ≥ 165 h Actual value: 95,0°C / 3,8 MPa / > 165 h	+
Resistance to internal pressure 1.000 h	Pressure stations 095/2, 095/3, 095/4 / IPT B211 / D. Juhrs	Test according to DIN EN ISO 1167-1/-2:2006-05 / Water-in-water Set value: 95,0°C / 3,5 MPa / ≥ 1.000 h Actual value: 95,0°C / 3,5 MPa / > 1.000 h	+
Thermal stability by hydrostatic pressure testing	Test Report TYPE.2018-42, 11.09.2017 by DIZAYN Groupe	Test according to DVGW W 534, 6.1.8 and DIN EN ISO 1167-1/-2:2006-05 Set value: 110°C / 1,9 MPa / ≥ 8.760 h Actual value: 110°C / 1,9 MPa / 8.760 h	+
Homogeneity	Measuring microscope MM1-200 / M. Lasch	Test according to DVGW W 544 section 5.1.8 Set value: Inhomogeneity ≤ 0,02 mm^2 Actual value: no inhomogeneity's	+

[1)]: Value determined by customer

+: Correspond to the requirement

Reference note: The used measuring devices and their registration are listed through a test card (PMK) or ID-No. to ensure the traceability of the results. An overview of the test cards is part of the specific information of the laboratory for pipe system testing (LSA No. V-1 in the quality management handbook of IMA Dresden).

Table 4: Tested dimension 63 x 10,5 mm; SDR 6; PN 25

Characteristics	Test equipment / ID-No./ Technician	Test result	Evaluation
Hygiene test	/	No test execution	n.a.
Assembly and installation instructions	J. Isleif	Corresponds to the demands.	+
Marking	M. Lasch	Corresponds to the demands.	+
Delivery condition	M. Lasch	Pipes are free of sharp edges, striations and inhomogeneity´s. The color is continuously equal.	+
Appearance	M. Lasch	Pipes have smooth inner and external surfaces and are evenly white.	+
Dimensions and tolerances	WDM – IMA 369137 / UFM 2017/3244 IPT / M. Lasch	Test according to DIN EN ISO 3126:2005-03 Characteristic: Mean outside diameter ($d_{1\,min}$ [mm]) – Set value: 63,0 to 63,6 – Actual value: 63,3 Maximum ovality (ovality $_{max}$ [mm]) – Set value: ≤ 1,6 – Actual value: 0,8 Minimal wall thickness ($s_{1\,min}$ [mm]) – Set value: 10,5 to 11,8 – Actual value: 10,5	+
Longitudinal reversion	Circulating air oven UT6200/ Digital caliper Mitutoyo / 1600912 / M. Lasch	Test according to DIN EN ISO 2505:2005-08 Arithmetic average of relative elongation: Set value: ≤ 2% Actual value: 0,3%	+
Melt mass flow rate (MFR)	CEAST MMF 7026 / M. Lasch	Test according to DIN EN ISO 1133-1:2012-03 Temperature: 230°C Nominal load: 2,16 kg Actual value granulate: 0,235 g/10min[1)] Actual value pipe: 0,263 g/10min Set value change: ≤ 20% Actual value change: 12%	+

Characteristics	Test equipment / ID-No./ Technician	Test result	Evalua -tion
Resistance to impact test	Pendulum impact tester 401/55 / balance Sartorius BL1500 / cold cabinet with regulator / M. Lasch	Test according to DIN EN ISO 179-1:2010-11 Test piece type: Type 2 Test temperature: 0 °C (±2 °C) Number of specimens: 10 Set value: TIR ≤ 10 % Actual value: TIR = 0 %	+
Resistance to internal pressure 165 h	Pressure stations 095/2, 095/3, 095/4 / IPT B211 / D. Juhrs	Test according to DIN EN ISO 1167-1/-2:2006-05 / Water-in-water Set value: 95,0°C / 3,8 MPa / ≥ 165 h Actual value: 95,0°C / 3,8 MPa / > 165 h	+
Resistance to internal pressure 1.000 h	Pressure stations 095/2, 095/3, 095/4 / IPT B211 / D. Juhrs	Test according to DIN EN ISO 1167-1/-2:2006-05 / Water-in-water Set value: 95,0°C / 3,5 MPa / ≥ 1.000 h Actual value: 95,0°C / 3,5 MPa / > 1.000 h	+
Homogeneity	Measuring microscope MM1-200 / M. Lasch	Test according to DVGW W 544 section 5.1.8 Set value: Inhomogeneity ≤ 0,02 mm^2 Actual value: no inhomogeneity's	+

[1)]: Value determined by customer
+: Correspond to the requirement

Reference note: The used measuring devices and their registration are listed through a test card (PMK) or ID-No. to ensure the traceability of the results. An overview of the test cards is part of the specific information of the laboratory for pipe system testing (LSA No. V-1 in the quality management handbook of IMA Dresden).

4.2 Proof of self-monitoring

The customer possesses all test equipment to perform the required tests for internal production control and the personnel is qualified and trained to perform and evaluate these tests.

5 Summary

The requirements according to DVGW Worksheet W 544 are fulfilled.
Hygienic tests were not considered. The thermal stability by hydrostatic pressure testing was carried out by the customer.

Reviewed
Hartmut Rönsch
Department Pipe Systems

Created
Dipl.-Ing. Jule Isabel Isleif
Person in Charge