PRESSURE PIPING
SYSTEMS

T-MECH PP-R

T-MECH PP-R PIPES & FITTINGS

member of THOMSUN group

www.thomsun.com


THOMSUN
METAL & PIPES MANUFACTURING L.L.C

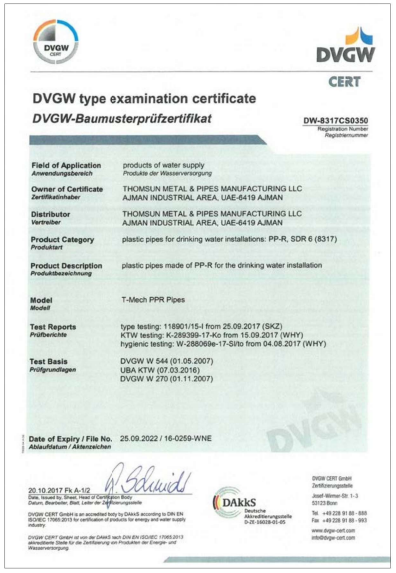
Introduction

THOMSUN was established in the year 1976 in Dubai by directors Mr. K. V. Thomas, Mr. V. T. John and Mr. P. Srinivas. The vision and work ethic etched out over the years with the foresight to diversify into new disciplines at the right times have seen the activities of the group grow to become the multi-faceted and diversified entity it is today. With a strong history and credibility, Thomsun over the years has business interests in various core industries in the Gulf and Indian subcontinent.

Steered by visionary professionals and powered by the intelligent use of technology, the Thomsun group, a 3000 strong work force, has marked many entrepreneurial built on strong fundamentals, the Thomsun Group has emerged as a market leader in the sectors it functions in through its focused approach, strong market intelligence, attention to details, sound deployment of modern technology and a commitment to quality.

- Electromechanical
- Professional & Consumer Electronics
- Audio visual & consulting
- Music Education
- Printing & Packaging
- Pre-Press & Digital Printing
- Display Solution
- Logistics & Distribution
- Food Processing & Supplies
- Supermarket & Bakeries
- Furniture
- Lighting
- Sea food Processing & Trading
- Meat & Vegetable Processing & Trading

Certifications



DVGW CERT

DVGW type examination certificate

DVGW-Baumusterprüfzertifikat

DW-8317CS0350
Registration Number
Registriernummer

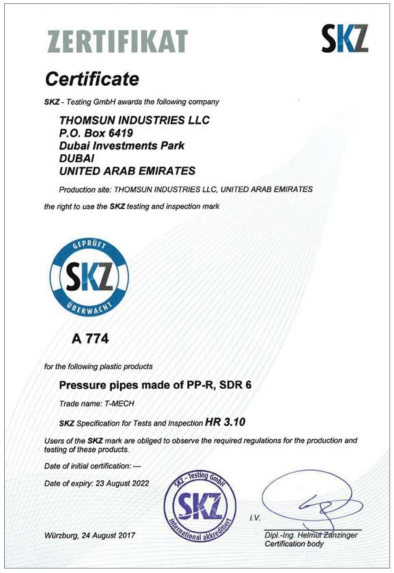
Field of Application *Anwendungsbereich*	products of water supply *Produkte der Wasserversorgung*
Owner of Certificate *Zertifikatinhaber*	THOMSUN METAL & PIPES MANUFACTURING LLC AJMAN INDUSTRIAL AREA, UAE-6419 AJMAN
Distributor *Vertreiber*	THOMSUN METAL & PIPES MANUFACTURING LLC AJMAN INDUSTRIAL AREA, UAE-6419 AJMAN
Product Category *Produktart*	plastic pipes for drinking water installations: PP-R, SDR 6 (8317)
Product Description *Produktbezeichnung*	plastic pipes made of PP-R for the drinking water installation
Model *Model*	T-Mech PPR Pipes
Test Reports *Prüfberichte*	type testing: 118901/15-I from 25.09.2017 (SKZ) KTW testing: K-289399-17-Ko from 15.09.2017 (WHY) hygienic testing: W-288069e-17-SI/to from 04.08.2017 (WHY)
Test Basis *Prüfgrundlagen*	DVGW W 544 (01.05.2007) UBA KTW (07.03.2016) DVGW W 270 (01.11.2007)

Date of Expiry / File No. 25.09.2022 / 16-0259-WNE
Ablaufdatum / Aktenzeichen

20.10.2017 Fk A-1/2

DAkkS Deutsche Akkreditierungsstelle D-ZE-16028-01-05

DVGW CERT GmbH
Zertifizierungsstelle
Josef-Wimmer-Str. 1-3
53123 Bonn



ZERTIFIKAT SKZ

Certificate

SKZ - Testing GmbH awards the following company

THOMSUN INDUSTRIES LLC
P.O. Box 6419
Dubai Investments Park
DUBAI
UNITED ARAB EMIRATES

Production site: THOMSUN INDUSTRIES LLC, UNITED ARAB EMIRATES

the right to use the ***SKZ*** *testing and inspection mark*

GEPRÜFT SKZ ÜBERWACHT

A 774

for the following plastic products

Pressure pipes made of PP-R, SDR 6

Trade name: T-MECH

SKZ *Specification for Tests and Inspection* **HR 3.10**

Users of the ***SKZ*** *mark are obliged to observe the required regulations for the production and testing of these products.*

Date of initial certification: —

Date of expiry: **23 August 2022**

SKZ Testing GmbH Institutional Member

Würzburg, **24 August 2017**

i.V.
Dipl.-Ing. Helmut Zanzinger
Certification body

Hygiene-Institut des Ruhrgebiets
Institut für Umwelthygiene und Toxikologie
Direktor: Prof. Dr. rer. nat. I. Buhmann
Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V.

THOMSUN INDUSTRIES LLC
PO Box 6419
DUBAI
UAE

TEST CERTIFICATE

Enhancement of Microbial Growth on Materials to Come into Contact with Drinking water
Test pursuant to DVGW Technical Standard W 270, November 2007

Client: THOMSUN INDUSTRIES LLC
PO Box 6419
DUBAI
UAE

Test material: **PP-R 80, Borouge RA140E**

Test method: Material test

According to test report **W-288069e-17-SI/to** of **04.08.2017**, the pipe-material **PP-R 80, Borouge RA140E** is conform to the requirements for the use in the area of drinking water systems pursuant to DVGW Technical Standard W 270. Details regarding testing procedure and test results are itemized in the test report.
This test certificate is valid from the date of issue and, given that the conditions and requirements remain unaltered, expires on **04.08.2022**. Upon request of the client, the validity may be extended up to another 5 year term provided that the specifications of Technical Standard W 270 are met.

The Director of the Institute
p.p.
Dr. rer. nat. Schell
Head of the Department of Water, Hygiene and Environmental Microbiology

Hygiene-Institut des Ruhrgebiets
Institut für Umwelthygiene und Toxikologie
Direktor: Prof. Dr. rer. nat. I. Buhmann
Träger: Verein zur Bekämpfung der Volkskrankheiten im Ruhrkohlengebiet e.V.

Thomsun Industries LLC
Dubai Investment Park 1
PO Box 6419
DUBAI
UNITED ARAB EMIRATES

TEST CERTIFICATE
according to the KTW Guideline

Product: **PPR-80 pipe**

Test specimen: pipe segments (PPR-80, RA140E), green,
outer diameter 20 mm, inner diameter 13.2 mm, (manufacturer's information)

The above mentioned product was tested according to the Guideline on the hygienic assessment of organic materials in contact with drinking water of the German Environment Agency. Pursuant to the test report/-no.: **K-289399-17-Ko** dated **15.09.2017** the product meets the requirements for the product group:

pipes with DN < 80 mm in contact with cold water (23°C) and warm water (60°C).

All product groups for which the requirements are met are summarised on the back side.

The certificate is valid providing that the requirements, laid down in the Guideline regarding the testing of the microbial growth are fulfilled. This can be verified for the product i.e. with a valid test certificate according to the DVGW technical rule W 270.

This test certificate is valid beginning with the date of issue and is ending by **15.09.2022**. The test certificate may be extended for further five years, provided that the formulation, the relevant evaluation criteria (restrictions in the positive lists), the production process and the production place of the product have not changed.

The Director of the Hygiene-Institute
on behalf of

Dr. rer. nat. Andreas Koch
Head of the Dept.for water
hygienic material testing

NSF INTERNATIONAL LABORATORIES

TEST REPORT

Client:	Thomsun Metal & Pipes Manufacturing LLC
Product:	T-MECH, PPR Pipe (Green)
Tests Undertaken:	BS 6920 Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water
Report Number:	MAT/LAB 795A
Date of Report:	26th February 2018

UKAS TESTING 0626

NSF Wales Ltd
Unit 10 Parc Trefechan Industrial Estate
Pontycafnan Industrial Estate
Cwmbran, Gwent, NP11 3EH, UK
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WORK/MAT 012. Revision No. 10, 15/12/16 Page 1 of 13

WRAS APPROVED MATERIAL

Approval Number: 1802532
Test Report: MAT/LAB 795A

Water Regulations Advisory Scheme Ltd.
Unit 10,
Willow Road,
Pen y Fan Industrial Estate,
Crumlin,
Gwent,
NP11 4EG

26th March 2018

Thomsun Metal & Pipes Manufacturing LLC
PO Box 6419,
Ajman Industrial Area,
Ajman,
UAE

WATER REGULATIONS ADVISORY SCHEME LTD. (WRAS)
MATERIAL APPROVAL

The material referred to in this letter is suitable for contact with wholesome water for domestic purposes having met the requirements of BS6920+1:2000 and/or 2014 'Suitability of non-metallic products for use in contact with water intended for human consumption with regard to their effect on the quality of the water'.

The reference relates solely to its effect on the quality of the water with which it may come into contact and does not signify the approval of its mechanical or physical properties for any use.

POLYPROPYLENE - COMPONENTS. **5200**

T-MECH. Green coloured, extruded PP-R Pipe. For use with water up to 85°C.

APPROVAL NUMBER: 1802532
APPROVAL HOLDER: THOMSUN METAL & PIPES MANUFACTURING LLC

The Scheme reserves the right to review approval.
Approval 1802532 is valid between February 2018 and February 2023

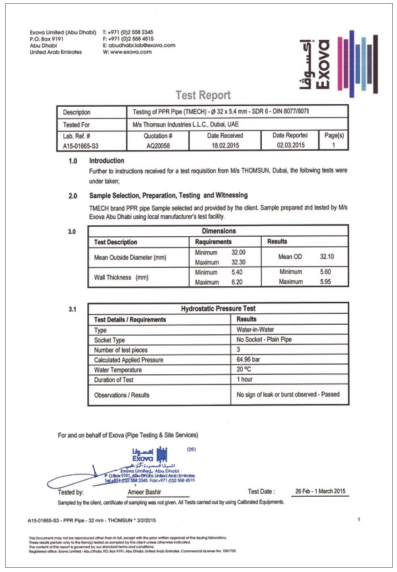
An entry, as above, will accordingly be included in the Water Fittings Directory on-line under the section headed, 'Materials which have passed full tests of effect on water quality'.

The Directory may be found at: www.wras.co.uk/directory

Yours faithfully

Jason Farrow
Approvals & Enquiries Manager
Water Regulations Advisory Scheme

The Water Regulations Advisory Scheme Ltd. Registered in England No. 09665008. Registered office: 63 Lincoln Close, Hazel Grove, Stockport, SK7 5GD
Tel: +44 (0)161 427 1626 Fax: +44(0) 845 345 0144 E-mail: info@wras.co.uk website:www.wras.co.uk



Exova Limited (Abu Dhabi)
P.O. Box 9181
Abu Dhabi
United Arab Emirates

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E: cbudhabi.labs@exova.com
W: www.exova.com

Exova

Test Report

Description	Testing of PPR Pipe (TMECH) - Ø 32 x 5.4 mm - SDR 6 - DIN 8077/8078			
Tested For	M/s Thomsun Industries L.L.C., Dubai, UAE			
Lab. Ref. #	Quotation #	Date Received	Date Reported	Page(s)
A15-01665-53	AQ20558	18.02.2015	02.03.2015	1

1.0 Introduction
Further to instructions received for a test requisition from M/s THOMSUN, Dubai, the following tests were under taken:

2.0 Sample Selection, Preparation, Testing and Witnessing
TMECH brand PPR pipe Sample selected and provided by the client. Sample prepared and tested by M/s Exova Abu Dhabi using local manufacturer's test facility.

3.0

Dimensions				
Test Description	Requirements		Results	
Mean Outside Diameter (mm)	Minimum	32.00	Mean OD	32.10
	Maximum	32.30		
Wall Thickness (mm)	Minimum	5.40	Minimum	5.60
	Maximum	6.20	Maximum	5.95

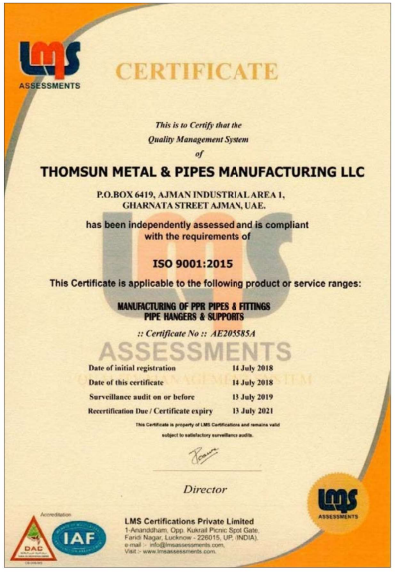
3.1

Hydrostatic Pressure Test	
Test Details / Requirements	Results
Type	Water-in-Water
Socket Type	No Socket - Plain Pipe
Number of test pieces	3
Calculated Applied Pressure	64.96 bar
Water Temperature	20 °C
Duration of Test	1 hour
Observations / Results	No sign of leak or burst observed - Passed

For and on behalf of Exova (Pipe Testing & Site Services)

Tested by: Anwer Bashir
Test Date : 26 Feb - 1 March 2015
Sampled by the client, certificate of sampling was not given. All Tests carried out by using Calibrated Equipments.

A15-01665-53 - PPR Pipe - 32 mm - THOMSUN * 3/3/2015



LMS ASSESSMENTS

CERTIFICATE

This is to Certify that the Quality Management System of

THOMSUN METAL & PIPES MANUFACTURING LLC

P.O.BOX 6419, AJMAN INDUSTRIAL AREA 1, GHARNATA STREET AJMAN, UAE.

has been independently assessed and is compliant with the requirements of

ISO 9001:2015

This Certificate is applicable to the following product or service ranges:

MANUFACTURING OF PPR PIPES & FITTINGS
PIPE HANGERS & SUPPORTS

:: Certificate No :: AE205585A

ASSESSMENTS

Date of initial registration	14 July 2018
Date of this certificate	14 July 2018
Surveillance audit on or before	13 July 2019
Recertification Due / Certificate expiry	13 July 2021

This Certificate is property of LMS Certifications and remains valid subject to satisfactory surveillance audits.

Director

Accreditation DAC IAF

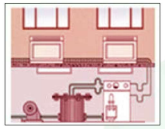
LMS Certifications Private Limited
1-Anandham, Opp. Kukrail Picnic Spot Gate,
Farid Nagar, Lucknow - 226015, UP, INDIA.
e-mail :- info@lmsassessments.com,
Visit :- www.lmsassessments.com.

Application

Application of PPR Pipe and Fittings

- Pipe networks for rainwater utilization System, swimming pool facilities
- Pipe network for agricultural and Horticultural use
- Industrial use for transport of pressurized air and aggressive fluids (acids, etc.)
- Heating pipe for residential building

Potable water supply in residential buildings, hospitals, hotels etc.



HVAC and compressed air system.

Pipe networks for rainwater utilization System, swimming pool facilities, agriculture and horticulture, industry, i.e. transport of aggressive fluids (acids, etc.)
Industrial use for transport of pressurized air and aggressive fluids (acids, etc.). Heating pipe for residential building

Advantages

Advantages of PPR Piping Systems

- High impact Strength, Flexibility and Durability
- Ability to perform over a wide temperature range, from very low to high temperature
- Environment-friendly (Outlined by DVGW [W270])
- Fast, simple, fusion-welding of pipes and joints which produces a uniform weld to generate absolute tightness of connections with a strength equal, or even exceeding the pipe itself
- Very long lifetime with a guaranteed service life of over 50 years
- Damped vibrations and sounds are absorbed resulting to noise reduction
- Excellent flow performance properties
- Resistant to a wide array of chemicals
- Resistant to corrosion as compared to metal products
- Can be connected to any other materials used in existing installations

- ✔ T-MECH piping system : Corrosion resistance
- ✔ T-MECH piping system : Non toxic
- ✔ T-MECH piping system : Low thermal conductivity
- ✔ T-MECH piping system : High impact strength

SERVICE LIFE AGAINST HOT WATER APPLICATION

PERMISSIBLE WORKING PRESSURES (BARS) / 1.25 SAFETY FACTOR

Years of Service	Temperature	PN10	PN16	PN20	PN25
1 Year	10°C	21.1	33.4	42.0	52.9
	20°C	18.1	28.6	36.0	45.3
	30°C	15.3	24.3	30.6	38.5
	40°C	12.9	20.5	25.8	32.5
	50°C	11.0	17.5	22.0	27.7
	60°C	9.3	14.7	18.5	23.3
	70°C	7.8	12.4	15.6	19.6
	80°C	6.5	10.4	13.1	16.4
	95°C	4.6	7.3	9.2	11.6
5 Years	10°C	20.0	33.4	39.8	50A
	20°C	16.9	26.8	33.8	42.2
	30°C	14.4	22.8	28.7	36.1
	40°C	12.1	19.2	24.2	30.5
	50°C	10.2	16.2	20.4	25.7
	60°C	8.6	33.0	17.2	21.7
	70°C	7.2	11.4	14.3	18.0
	80°C	5.7	9.1	11.5	14.4
	95°C	3.0	4.8	6.1	7.6
10 Years	10°C	19.3	30.6	38.5	48.5
	20°C	16.4	26.1	32.8	41.3
	30°C	13.9	22.0	27.7	34.9
	40°C	11.8	18.7	23.6	29.7
	50°C	9.9	15.7	19.7	24.9
	60°C	8.3	13.2	16.6	20.8
	70°C	7.0	11.1	14.0	17.6
	80°C	4.8	7.6	9.6	12.0
	95°C	2.6	4.0	5.1	6.4

SERVICE LIFE AGAINST HOT WATER APPLICATION

PERMISSIBLE WORKING PRESSURES (BARS) / 1.25 SAFETY FACTOR

Years of Service	Temperature	PN10	PN16	PN20	PN25
25 Year	10°C	18.7	29.6	37.3	46.9
	20°C	16.0	25.3	31.8	40.1
	30°C	13.4	21.3	26.8	33.7
	40°C	11.3	18.0	22.6	28.5
	50°C	9.6	15.2	19.1	24.1
	60°C	8.0	12.6	15.9	20.0
	70°C	6.1	9.6	12.1	15.2
	80°C	3.8	6.1	7.6	9.6
50 Years	10°C	18.2	28.8	36.3	45.7
	20°C	15.5	24.5	30.9	38.9
	30°C	13.1	20.7	26.1	32.9
	40°C	11.0	17.5	22.0	27.7
	50°C	9.3	14.7	18.5	23.3
	60°C	7.7	12.1	15.3	19.2
	70°C	5.1	8.1	10.2	12.8
	80°C	NA	NA	NA	NA
75 Years	10°C	17.7	28.1	35.4	44.5
	20°C	15.0	23.8	29.3	37.7
	30°C	12.8	20.2	25.5	32.1
	40°C	21.3	16.9	21.3	26.9
	50°C	8.9	14.2	17.8	22.5
	60°C	NA	NA	NA	NA
	70°C	NA	NA	NA	NA
	80°C	NA	NA	NA	NA

Features

SAFE AND CONVENIENT CONNECTION
T-MECH Pipes and Fittings are easy to install and assemble, with their excellent properties of lightness, ease of handling, workability and weldability.

OPAQUENESS
The light transmittance of the pipe is much lower than 0.2%. This effectively prevents the algae and bacteria from growing and ensures the safety of the drinking water.

SOUND INSULATION
The sound insulation of our pipe is better than the metal pipe. The T-MECH ppr pipes and fittings reduces the vibration of the water flow and noise to no impact by the PPR high sound insulation and flexibility features. Such features also protect the system from any water hammering.

THERMAL INSULATION
The thermal conductivity of PPR is only 1/200 of that of metal. Hence it does not require insulation to prevent heat loss.

UV RESISTANCE
In all applications subjected to UV radiation and the exposure to direct sunlight is required, T-MECH offers an external UV protective layer to the pipes.

PRESSURE -LOSS
The T-MECH pipes and pipe fittings internal surface are uniform and free of roughness, which allows liquids to flow easily without formation of deposits and allow to reduce pressure losses to a minimum.

QUALITY ASSURANCE
T-MECH maintains a high level of quality control system exceeding requirements stated by National and International Authorities and Institutions.
T-MECH PPR is conformed and certified by SKZ, HY and DVGW.
T-MECH pipes and fittings are designed to withstand constant temperature upto 70˚C.
The quality plan requires that inspections and tests are carried out on all finished products. The results are documented in tests reports. Finished products are only released to stock when all tests and inspections conform to the prescribed procedures and specifications.

The final inspection and test covers the following test procedures

- Dimensional control
- Surface finish
- Impact bending test
- Hydrostatic Pressure tests – Short term and Long term
- Heat reversion test
- Homogeneity of the material
- Measurement of the melt flow index

Properties

Physical properties	Test method	Value Unit
Density at +23°C	ISO 1183	0,897g/cm^3
Melt mass-flow rate (MFR)	ISO 1133	
190°C/5.0kg		0,55g/10min
230°C/2.16kg		0,30g/10min
230°C/5.0kg		1,30g/10min
Mechanical properties	**Test method**	**Value Unit**
Tensile modulus	ISO 527-2/1	850MPa
Tensile stress	ISO 527-2/50	24,0MPa
Tensile strain at yield to 50mm/ min1,30g/10min	ISO 527-2/50	10%
Impact	**Test method**	**Value Unit**
Charpy notched impact	ISO 179	
-30°C		2,50 kJ/m^2
0°C		4,00 kJ/m^2
23°C		22,00 kJ/m^2
Charpy - Un notched impact	ISO 179	
-30°C		43,00 kJ/m^2
0°C		no break kJ/m^2
23°C		no break kJ/m^2
Hardness	**Test method**	**Value Unit**
Shore hardness D	ISO 868	65
Ball indentation hardness	ISO 2039-1	48,0N/mm^2
Thermal properties	**Test method**	**Value Unit**
Melting temperature	ISO 3146	147°C
Thermal conductivity at 20°C	DIN 52612	0,24 W/mk
Coefficient of linear temperature	DIN 53752	1.5 10-4 K
Vicat softening temperature		
(A50(50°C/h, 10N))	ISO 306/A50	132°C
(B50(50°C/h, 50N))	ISO 306/B50	69,0°C

Standards

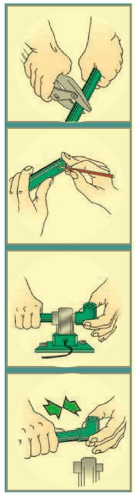
The T-MECH System complies with the following standards

DIN 8077	Polypropylene pipes. Dimensions
DIN 8078	Polypropylene pipes type 3 Quality- tests requirements
DIN 8076	Metallic joints for PE pipelines, tests
DIN 16962	Joints and fittings for polypropylene pipes. Dimensions
DIN 4109	Soundproofing in buildings Soundproofing for water pipelines
DVGW 544	General requirements and testing of plastic pipes
DIN 16928	Connections for pipes and fittings and installation
DVS 2210/1	Plastic piping for industrial applications
DVS 2208	Machines and devices for welding of plastic pipes
DIN 4109	Sound insulation in building construction
DIN 1988	Code of practice for drinking water installations
ISO 9001-2008	Quality management system

Welding

The effectiveness and durability of the system is majorly dependant on the welding technique of the system

- Cut the pipe to desired length using appropriate cutter
- Mark the welding depth as per the table following corresponding dimension
- Set the temperature of welding device to 260°C
- Insert the pipes and fittings to the marked depth
- Heat the pipes and fittings and join without twisting
- After the cooling time, the fused joints are ready for use



BELOW TABLE TO BE REFERED FOR HEATING AND WELDING

PIPE SIZE	WELDING DEPTH	HEATING TIME	WELDING TIME	COOLING TIME
MM	MM	SEC	SEC	MIN
20	14	6	4	2
25	15	7	4	2
32	16	8	4	2
40	18	12	6	4
50	20	18	8	4
63	24	24	8	4
75	26	30	8	6
90	29	40	10	8
110	32	50	10	8

Quality System

PRESSURE TEST

After a drinking water system has been installed but before it is commissioned, it must be tested for tightness whereby this should be done while the system is still visible. Polypropylene expands under the influence of heat and pressure. For this reason, it is necessary that the test medium (as a rule water) and the pipework material are at the same temperature. Attention should, therefore, be paid to the fact that the test medium has a temperature that is as constant as possible. The pressure test is divided into three parts, namely the initial, the main and the final test.

INITIAL TEST

The highest possible operating pressure is increased by a factor of 1.5. This test pressure must be restored twice at intervals of in each case 10 minutes within a period of 30 minutes. After the pressure has been restored again a second time, the test pressure may not fall by more than 0.6 bar within the next 30 minutes. In addition, no leakage may occur.

MAIN TEST

The main test commences immediately after the completion of the initial test and lasts two hours. During this period the pressure may not fall by more than 0.2 bar relative to the pressure at the end of the initial test.

FINAL TEST

Test pressures of 10 bar and 1 bar are applied alternately at intervals of at least 5 minutes. After each application of pressure, the pipe network is to be depressurized. Leakage may not occur at any point in the network being tested.

MEASURING DEVICES

The pressure measuring device used must permit accurate readings to the nearest 0.1 bar. Where possible the pressure is to be determined at the lowest point of the network.

TEST MEMORANDUM

The test as carried out is to be documented in a memorandum which must be signed by the client and contractor with the statement of the place and date of signing.

FLUSHING OUT OF PIPEWORK SYSTEMS

The sense and purpose of flushing out pipework systems: Ensuring the quality of drinking water, avoidance of corrosion damage, avoidance of damage to fittings and equipment, cleaning of the inner surface of the pipes. Regardless of the material of the pipes, all pipework systems carrying drinking water are to be flushed out. Suitable processes are 1. Flushing out with water 2. Flushing out with a mixture of air and water Flushing out process 1, namely flushing out with water, is sufficient in the case of drinking water systems which are composed exclusively of T-Mech pipes and fittings. The appropriate flushing out process should be selected on the basis of the experience of the installing firm and of the client.

TRANSPORT AND STORAGE

Due to the properties of the material from which T-Mech pipe systems are manufactured, the pipes and fittings can fundamentally be stored at all temperatures without any problems. The storage place should, however, be selected in accordance with the following conditions:

1. The pipes should be supported along their full length.
2. Bending of the pipes is to be avoided.
3. The material becomes sensitive to impact at low temperatures and in particular at temperatures below zero °C. For this reason, knocks and similar impacts are to be avoided under these conditions.

T-Mech pipes and fittings should not be installed without protection were subject to UV radiation. T-Mech pipes and fittings are UV protected with the external packaging upon delivery. The protective package should not be removed until installation is commenced.

PPR System Linear Expansion

Calculation example for longitudinal expansion in Milimeter
Longitudinal expansion of T-Mech PPR Pipe; α = 0,15 mm/m · K

Pipe length in metres (m)	Temperature difference Δ_t (K)							
	10	20	30	40	50	60	70	80
0,1	0,15	0,30	0,45	0,60	0,75	0,90	1,05	1,10
0,2	0,30	0,60	0,90	1,20	1,50	1,80	2,10	2,40
0,3	0,45	0,90	1,35	1,80	2,25	2,70	3,15	3,60
0,4	0,60	1,20	1,80	2,40	3,00	3,60	4,20	4,80
0,5	0,75	1,50	2,25	3,00	3,75	4,50	5,25	6,00
0,6	0,90	1,80	2,70	3,60	4,50	5,40	6,30	7,20
0,7	1,05	2,10	3,15	4,20	5,25	6,30	7,35	8,40
0,8	1,20	2,40	3,60	4,80	6,00	7,20	8,40	9,60
0,9	1,35	2,70	4,05	5,40	6,75	8,10	9,45	10,80
1,0	1,50	3,00	4,50	6,00	7,50	9,00	10,50	12,00
2,0	3,00	6,00	9,00	12,00	15,00	18,00	21,00	24,00
3,0	4,50	9,00	13,50	18,00	22,50	27,00	31,50	36,00
4,0	6,00	12,00	18,00	24,00	30,00	36,00	42,00	48,00
5,0	7,50	15,00	22,50	30,00	37,50	45,00	52,50	60,00
6,0	9,00	18,00	27,00	36,00	45,00	54,00	63,00	72,00
7,0	10,50	21,00	31,50	42,00	52,50	63,00	73,50	84,00
8,0	12,00	24,00	36,00	48,00	60,00	72,00	84,00	96,00
9,0	13,50	27,00	40,50	54,00	67,50	81,00	94,50	108,00
10,0	15,00	30,00	45,00	60,00	75,00	90,00	105,00	120,00

Longitudinal expansion of T-Mech Glass Fiber Pipe; α= 0,035 mm/m · K

Pipe length in metres (m)	Temperature difference Δ_t (K)							
	10	20	30	40	50	60	70	80
0,1	0,04	0,07	0,11	0,14	0,18	0,21	0,25	0,28
0,2	0,07	0,14	0,21	0,28	0,35	0,42	0,49	0,56
0,3	0,11	0,21	0,32	0,42	0,53	0,63	0,74	0,84
0,4	0,14	0,28	0,42	0,56	0,70	0,84	0,98	1,12
0,5	0,18	0,35	0,53	0,70	0,88	1,05	1,23	1,40
0,6	0,21	0,42	0,63	0,84	1,05	1,26	1,47	1,68
0,7	0,25	0,49	0,74	0,98	1,23	1,47	1,72	1,96
0,8	0,28	0,56	0,84	1,12	1,40	1,68	1,96	2,24
0,9	0,32	0,63	0,95	1,26	1,58	1,89	2,21	2,52
1,0	0,35	0,70	1,05	1,40	1,75	2,10	2,45	2,80
2,0	0,70	1,40	2,10	2,80	3,50	4,20	4,90	5,60
3,0	1,05	2,10	3,15	4,20	5,25	6,30	7,35	8,40
4,0	1,40	2,80	4,20	5,60	7,00	8,40	9,80	11,20
5,0	1,75	3,50	5,25	7,00	8,75	10,50	12,25	14,00
6,0	2,10	4,20	6,30	8,40	10,50	12,60	14,70	16,80
7,0	2,45	4,90	7,35	9,80	12,25	14,70	17,15	19,60
8,0	2,80	5,60	8,40	11,20	14,00	16,80	19,60	22,40
9,0	3,15	6,30	9,45	12,60	15,75	18,90	22,05	25,20
10,0	3,50	7,00	10,50	14,00	17,50	21,00	24,50	28,00

PPR Pipes

PPR Pipe SDR11/PN10

Part no	Dimension	Wall Thickness	Inner diameter	Packing unit	Kg/Mtr.
TMP1020	20	2	16	100mtrs	0.107
TMP1025	25	2.3	20.4	100mtrs	0.164
TMP1032	32	2.9	26.2	40mtrs	0.261
TMP1040	40	3.7	32.6	40mtrs	0.412
TMP1050	50	4.6	40.8	20mtrs	0.638
TMP1063	63	5.8	51.4	20mtrs	1.01
TMP1075	75	6.8	61.4	16mtrs	1.41
TMP1090	90	8.2	73.6	12mtrs	2.03
TMP10110	110	10	90	8mtrs	3.01
TMP10125	125	11.4	102.2	4mtrs	4.12
TMP10160	160	14.6	130.8	4mtrs	6.73

PPR Pipe SDR7.4/PN16

Part no	Dimension	Wall Thickness	Inner diameter	Packing unit	Kg/Mtr.
TMP1620	20	2.8	14.4	100mtrs	0.148
TMP1625	25	3.5	18	100mtrs	0.23
TMP1632	32	4.4	23.3	40mtrs	0.37
TMP1640	40	5.5	29	40mtrs	0.575
TMP1650	50	6.9	36.2	20mtrs	0.896
TMP1663	63	8.6	45.6	20mtrs	1.41
TMP1675	75	10.3	54.4	16mtrs	2.01
TMP1690	90	12.3	65.4	12mtrs	2.87
TMP16110	110	15.1	79.8	8mtrs	4.3
TMP16125	125	17.1	90.8	4mtrs	6.21
TMP16160	160	21.9	116.2	4mtrs	9.725

PPR Pipe SDR6/PN20

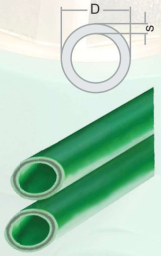
Part no	Dimension	Wall Thickness	Inner diameter	Packing unit	Kg/Mtr.
TMP2020	20	3.4	13.2	100mtrs	0.172
TMP2025	25	4.2	16.6	100mtrs	0.266
TMP2032	32	5.4	21.2	40mtrs	0.434
TMP2040	40	6.7	26.6	40mtrs	0.671
TMP2050	50	8.3	33.4	20mtrs	1.04
TMP2063	63	10.5	42	20mtrs	1.65
TMP2075	75	12.5	50	16mtrs	2.34
TMP2090	90	15	60	12mtrs	3.36
TMP20110	110	18.3	73.4	8mtrs	5.01
TMP20125	125	20.8	83.4	4mtrs	9.31
TMP20160					

PPR Pipes

PPR Pipe SDR5/PN25

Part no	Dimension	Wall Thickness	Inner diameter	Packing unit	Kg/Mtr.
TMP2520	20	4.1	11.8	100mtrs	0.198
TMP2525	25	5.1	14.8	100mtrs	0.307
TMP2532	32	6.5	19	40mtrs	0.498
TMP2540	40	8.1	23.8	40mtrs	0.775
TMP2550	50	10.1	29.8	20mtrs	1.210
TMP2563	63	12.7	37.6	20mtrs	1.910
TMP2575	75	15.1	44.8	16mtrs	2.700
TMP2590	90	18.1	53.8	12mtrs	3.880
TMP25110	110	22.1	65.8	8mtrs	5.780

PPR Glass fiber Pipe SDR7.4/PN20



Part no	Dimension	Wall Thickness	Inner diameter	Packing unit	Kg/Mtr.
TMPG2020	20	2.8	14.4	100mtrs	0.220
TMPG2025	25	3.5	18	100mtrs	0.320
TMPG2032	32	4.4	23.2	240mtrs	0.470
TMPG2040	40	5.5	29	40mtrs	0.720
TMPG2050	50	6.9	36.2	20mtrs	1.060
TMPG2063	63	8.6	45.8	20mtr	1.650
TMPG2075	75	10.3	54.4	16mtrs	2.280
TMPG2090	90	12.3	65.4	12mtrs	3.200
TMPG20110	110	15.1	79.8	8mtrs	4.600
TMPG20125	125	17.1	90.8	4mtrs	6.21
TMPG20160	160	21.9	116.2	4mtrs	9.75

PPR Glass fiber Pipe SDR6/PN25

Part no	Dimension	Wall Thickness	Inner diameter	Packing unit	Kg/Mtr.
TMPG2520	20	3.4	13.2	100mtrs	0.19
TMPG2525	25	4.2	16.6	100mtrs	0.28
TMPG2532	32	5.4	21.2	240mtrs	0.45
TMPG2540	40	6.7	26.6	40mtrs	0.69
TMPG2550	50	8.3	33.4	20mtrs	1.07
TMPG2563	63	10.5	42	20mtr	1.74
TMPG2575	75	12.5	50	16mtrs	2.41
TMPG2590	90	15	60	12mtrs	3.47
TMPG25110	110	18.3	73.4	8mtrs	5.17
TMPG25125	125	20.8	83.4	4mtrs	9.31
TMPG25160					

Note: For External Installations requiring resistance to sunlight exposure, black coloured UV Pipes and Fittings are recommended

Fittings

Socket

Part no	Dimension / mm	Packing unit
TMFS20	20	10
TMFS25	25	10
TMFS32	32	5
TMFS40	40	5
TMFS50	50	5
TMFS63	63	1
TMFS75	75	1
TMFS90	90	1
TMFS110	110	1
TMFS125	125	1
TMFS160	160	1

Elbow 90

Part no	Dimension / mm	Packing unit
TMFE9020	20	10
TMFE9025	25	10
TMFE9032	32	5
TMFE9040	40	5
TMFE9050	50	5
TMFE9063	63	1
TMFE9075	75	1
TMFE9090	90	1
TMFE90110	110	1
TMFE90125	125	1
TMFE90160	160	1

Elbow 45

Part no	Dimension / mm	Packing unit
TMFE4520	20	10
TMFE4525	25	10
TMFE4532	32	5
TMFE4540	40	5
TMFE4550	50	5
TMFE4563	63	1
TMFE4575	75	1
TMFE4590	90	1
TMFE45110	110	1
TMFE45125	125	1
TMFE45160	160	1

Fittings

Tee

Part no	Dimension / mm	Packing unit
TMFT20	20	10
TMFT25	25	10
TMFT32	32	5
TMFT40	40	5
TMFT50	50	5
TMFT63	63	1
TMFT75	75	1
TMFT90	90	1
TMFT110	110	1
TMFT125	125	1
TMFT160	160	1

Reducing Socket

Part no	Dimension / mm	Packing unit
TMFRS2520	25X20	10
TMFRS3220	32X20	5
TMFRS3225	32X25	5
TMFRS4020	40X20	5
TMFRS4025	40X25	5
TMFRS4032	40X32	5
TMFRS5020	50X20	5
TMFRS5025	50X25	5
TMFRS5032	50X32	5
TMFRS5040	50X40	5
TMFRS6320	63X20	1
TMFRS6325	63X25	1
TMFRS6332	63X32	1
TMFRS6340	63X40	1
TMFRS6350	63X50	1
TMFRS7540	75X40	1
TMFRS7550	75X50	1
TMFRS7563	75X63	1
TMFRS9050	90X50	1
TMFRS9063	90X63	1
TMFRS9075	90X75	1
TMFRS11063	110X63	1
TMFRS11075	110X75	1
TMFRS11090	110X90	1

Fittings

Reducing Tee

Part no	Dimension / mm	Packing unit
TMFRT2520	25X20	10
TMFRT3220	32X20	5
TMFRT3225	32X25	5
TMFRT4020	40X20	5
TMFRT4025	40X20	5
TMFRT4032	40X32	5
TMFRT5020	50X20	5
TMFRT5025	50X25	5
TMFRT5032	50X32	5
TMFRT5040	50X40	5
TMFRT6320	63X20	1
TMFRT6325	63X25	1
TMFRT6332	63X32	1
TMFRT6340	63X40	1
TMFRT6350	63X50	1
TMFRT7540	75X40	1
TMFRT7550	75X50	1
TMFRT7563	75X63	1
TMFRT9050	90X50	1
TMFRT9063	90X63	1
TMFRT9075	90X75	1
TMFRT11063	110X63	1
TMFRT11075	110X75	1
TMFRT11090	110X90	1

End Cap

Part no	Dimension / mm	Packing unit
TMFEC20	20	25
TMFEC25	25	25
TMFEC32	32	10
TMFEC40	40	10
TMFEC50	50	5
TMFEC63	63	5
TMFEC75	75	4
TMFEC90	90	3
TMFEC110	110	2

Cross Tee

Part no	Dimension / mm	Packing unit
TMFCT20	20	10
TMFCT25	25	10
TMFCT32	32	5

Pipe Clamp

Part no	Dimension / mm	Packing unit
TMFPC20	20	200
TMFPC25	25	200
TMFPC32	32	100

End Plug

Part no	Dimension / mm	Packing unit
TMFEP12	½″	100
TMFEP34	¾″	100
TMFEP1	1″	100

Cross Over

Part no	Dimension / mm	Packing unit
TMFCO20	20	10
TMFCO25	25	10
TMFCO32	32	5

PPR Union

Part no	Dimension / mm	Packing unit
TMFU20	20	10
TMFU25	25	10
TMFU32	32	5
TMFU40	40	5
TMFU50	50	5

Fittings

Female Socket

Part no	Dimension / mm	Packing unit
TMTS2012	20 X ½″	10
TMTS2034	20 X ¾″	10
TMTS2512	25 X ½″	10
TMTS2534	25 X ¾″	10
TMTS3234	32 X ¾″	5
TMTS321	32 X 1″	5
TMTS401	40 X 1″	5
TMTS40114	40 X 1 ¼″	5
TMTS50112	50 X 1 ½″	1
TMTS632	63 X 2″	1
TMTS75212	75 X 2 ½″	1
TMTS903	90 X 3″	1
TMTS1104	110 X 4″	1

Male Socket

Part no	Dimension / mm	Packing unit
TMTSM2012	20 X ½″	10
TMTSM2034	20 X ¾″	10
TMTSM2512	25 X ½″	10
TMTSM2534	25 X ¾″	10
TMTSM3234	32 X ¾″	5
TMTSM321	32 X 1″	5
TMTSM401	40 X 1″	5
TMTSM40114	40 X 1 ¼″	5
TMTSM50112	50 X 1 ½″	1
TMTSM632	63 X 2″	1
TMTSM75212	75 X 2 ½″	1
TMTSM903	90 X 3″	1
TMTSM1104	110 X 4″	1

Wall Mount Elbow

Part no	Dimension / mm	Packing unit
TMTWM20	20 X ½″	10
TMTWM25	25 X ½″	10

Fittings

Female Elbow

Part no	Dimension / mm	Packing unit
TMTE2012	20 X ½″	10
TMTE2034	20 X ¾″	10
TMTE2512	25 X ½″	10
TMTE2534	25 X ¾″	10
TMTE3212	32 X ½″	5
TMTE3234	32 X ¾″	5
TMTE321	32 X 1″	5

Male Elbow

Part no	Dimension / mm	Packing unit
TMTEM2012	20 X ½″	10
TMTEM2034	20 X ¾″	10
TMTEM2512	25 X ½″	10
TMTEM2534	25 X ¾″	10
TMTEM3212	32 X ½″	5
TMTEM3234	32 X ¾″	5
TMTEM321	32 X 1″	5

Female Tee

Part no	Dimension / mm	Packing unit
TMTT2012	20 X ½″	10
TMTT2034	20 X ¾″	10
TMTT2512	25 X ½″	10
TMTT2534	25 X ¾″	10
TMTT3212	32 X ½″	5
TMTT3234	32 X ¾″	5
TMTT321	32 X 1″	5

Male Tee

Part no	Dimension / mm	Packing unit
TMTTM2012	20 X ½″	10
TMTTM2512	25 X ½″	10

Fittings

Stop Valve

Part no	Dimension / mm	Packing unit
TMTSV20	20 X ¾″	1
TMTSV25	25 X ¾″	1
TMTSV32	32 X 1″	1

Concealed Valve

Part no	Dimension / mm	Packing unit
TMTCV20	20 X ¾″	1
TMTCV25	25 X ¾″	1
TMTCV32	32 X 1″	1

Female Union

Part no	Dimension / mm	Packing unit
TMTFU2012	20 X ½″	10
TMTFU2534	25 X ¾″	10
TMTFU321	32 X 1″	10
TMTFU40114	40 X 1 ¼″	5
TMTFU50112	50 X 1 ½″	5
TMTFU632	63 X 2″	5

Male Union

Part no	Dimension / mm	Packing unit
TMTMU2012	20 X ½″	10
TMTMU2534	25 X ¾″	10
TMTMU321	32 X 1″	10
TMTMU40114	40 X 1 ¼″	5
TMTMU50112	50 X 1 ½″	5
TMTMU632	63 X 2″	5

Angle Valve

Part no	Dimension / mm	Packing unit
TMAV12	½″	1

Flange Adapter with Seal

Part no	Dimension / mm	Packing unit
TMTFA40	40	1
TMTFA50	50	1
TMTFA63	63	1
TMTFA75	75	1
TMTFA90	90	1
TMTFA110	110	1
TMTFA125	125	1
TMTFA160	160	1

Brass PPR Ball Valve

Part no	Dimension / mm	Packing unit
TMTBV20	20	1
TMTBV25	25	1
TMTBV32	32	1
TMTBV40	40	1
TMTBV50	50	1
TMTBV63	63	1

PPR Ball Valve

Part no	Dimension / mm	Packing unit
TMFBV20	20	1
TMFBV25	25	1
TMFBV32	32	1
TMFBV40	40	1
TMFBV50	50	1
TMFBV63	63	1

Clamps

Part no	Size Inches	D/ mm	Packing unit
TMSC15	3/8″	16	15-19
TMSC22	1/2″	20	20-25
TMSC28	3/4″	25	26-30
TMSC35	1″	32	32-36
TMSC42	1.1/4″	40	38-43
TMSC48	1.1/2″	50	47-51
TMSC60	2″	63	60-64
TMSC75	2.1/2″	75	74-80
TMSC90	3″	90	87-92
TMSC110	4	110	107-112

Accessories

Pipe Cutter

Part no	Dimension / mm	Packing unit
TMAPC075	0 - 75 mm	1 pc

Pipe Cutter

Part no	Dimension / mm	Packing unit
TMAPC50125	50 -125 mm	1 pc

Pipe Cutter

Part no	Dimension / mm	Packing unit
TMAPC042	0 - 42 mm	1 pc

Professional Pipe Cutter

Part no	Dimension / mm	Packing unit
TMAPC042A	0 - 42 mm	1 pc

Repair Pin

Part no	Dimension / mm	Packing unit
TMARP-7:11	7 - 11 mm	1 pc

Accessories

Welding Tools

Art no	D/mm	Packing unit	Kg / Piece
P-WT1-20	20 mm	1 pc	0.112
P-WT1-25	25 mm	1 pc	0.142
P-WT1-32	32 mm	1 pc	0.185
P-WT1-40	40 mm	1 pc	0.260
P-WT1-50	50 mm	1 pc	0.395
P-WT1-63	63 mm	1 pc	0.618
P-WT1-75	75 mm	1 pc	0.790
P-WT1-90	90 mm	1 pc	1.170
P-WT1-110	110 mm	1 pc	1.750

Peeling Tools

Art no	D/mm	Packing unit	Kg / Piece
P-WT2-2025	20 - 25 mm	1 pc	0.340
P-WT2-3240	32 - 40 mm	1 pc	0.470
P-WT2-5063	50 - 63 mm	1 pc	1.060
P-WT2-7590	75 - 90 mm	1 pc	1.160
P-WT2-110	110 mm	1 pc	1.660

Welding Tools for Saddle

Art no	D/mm	Packing unit	Kg / Piece
P-WT1-6320	63/20 mm	1 pc	0.380
P-WT1-6325	63/25 mm	1 pc	0.365
P-WT1-6332	63/32 mm	1 pc	0.335
P-WT1-7520	75/20 mm	1 pc	0.377
P-WT1-7525	75/25 mm	1 pc	0.357
P-WT1-7532	75/32 mm	1 pc	0.337
P-WT1-9020	90/20 mm	1 pc	0.382
P-WT1-9025	90/25 mm	1 pc	0.362
P-WT1-9032	90/32 mm	1 pc	0.342
P-WT1-11020	110/20 mm	1 pc	0.386
P-WT1-11025	110/25 mm	1 pc	0.366
P-WT1-11032	110/32 mm	1 pc	0.346

Welding Device

Art no	D/mm	Packing unit	Kg / Piece
P-WT1-6320	63/20 mm	1 pc	0.380
P-WT1-6325	63/25 mm	1 pc	0.365
P-WT1-11032	110/32 mm	1 pc	0.346

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Notes

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