RAKtherm®

Ultimate Piping Solutions

ADVANCED GERMAN TECHNOLOGY

ENGINEERED
Piping Systems

We exist to be a leader in everything we do!

Pioneered
PP-R&PEX Systems

With
Widest range of PPR system valves suitable for all plumbing requirements

P.O.Box 30739, Al Jazira, Al-Hamra, Ras Al-Khaima, United Arab Emirates
Tel: +971 7 2447128 | Fax: +971 7 2447129 | Toll Free: 800 RAKTHERM (72584376)
Email: sales@raktherm.com | info@raktherm.com | Website: www.raktherm.com

" Commit to deliver
THE ULTIMATE
PIPING
SOLUTIONS
with the LATEST
INNOVATION
TECHNOLOGY
TO BE PRIDE
OF THE INDUSTRY
FROM
RAKTHERM
to Worldwide. "

Welcome to

RAKtherm®

Gulf Plastic and Converting Industries (Tahweel ™), is a multifaceted manufacturing company based in the United Arab Emirates, supplying various engineering systems for the construction sector.

With over 50 years of experience in plastic pipe and fitting manufacturing in Saudi Arabia, Egypt and Jordan, Tahweel™ has launched it's first integrated PP-R and PE-X pipes & fittings system for servicing a booming construction sector worldwide and in the Middle East in particular under the trade name of RAKtherm® with 40,000 m manufacturing complex based in Ras Al Khaimah and sales branch office based in Sharjah, Tahweel™ is well on its way to become the regional leader in water supply and drainage systems.

RAKtherm is a versatile, and comprehensive system for delivery of water and other fluids, used in applications of pressurized hot and cold water delivery as well as under floor heating in all modern residential, commercial, and industrial buildings.

RAKtherm® offers the widest range of PP-R and it's complimentary PE-X piping systems in the Middle East and North Africa, including Multilayer oxygen barrier pipes and Aluminum composite pipes in addition to the conventional piping systems.

We believe the quality of products and the support services provided at RAKthem® are our main advantages. This is translated in a very wide range of products that are produced with state-of-the-art machinery from the most reputed sources, and a very high-tech quality control system which ensures that this quality is always maintained in addition to well trained and highly motivated staff on all levels of the company that are always committed to premium service at any time.

Ali Hashim

Hashim Industry Group President

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RAKtherm®
Ultimate Piping Solutions

PIONEER IN PP-R AND PE-X PIPING SYSTEM

German Technology, with the widest range of PP-R piping system using the latest innovation technique .

INTRODUCTION

RAKtherm..a versatile, and comprehensive system for water and other fluid delivery, is used in applications of pressurized warm or cold water in all modern residential, commercial, and industrial applications. The creative solutions provided by RAKtherm in its product base renders it a leader in the construction industry.

RAKTHERM PIPING SYSTEMS ARE USED IN:

- Potable installations inside houses, high rise buildings, hotels, hospitals and virtually all types of commercial and residential buildings.
- Factories with high-pressure water and compressed air circuits.
- Rain drainage and collection systems.
- Indoor and outdoor swimming pools, gyms and their water filtration circuits and water installations.
- Piping networks for all types of irrigation and agriculture applications and pressurized networks.
- Piping networks for all types for industrial applications for the delivery of aggressive chemicals including many acidic, alkaline and other reactive and corrosive chemicals.
- Piping networks for all types of chilled water application and cooling systems networks.
- Piping networks for heating installations from the boiler outlets or water heating unit up to the individual radiators or heat exchangers.

RAKTHERM PIPING SYSTEMS ARE ALSO USED IN:

- Connections from municipality mains to the tanks and reservoirs.
- Boilers and radiator connections and networks.
- Risers for water delivery, ventilation, and pressure relief.
- Water transport from pumps to upper tanks and distribution points.
- Connections through meters, and distributor manifolds.
- Distributions inside flats, apartments, houses etc...
- Underfloor network distribution and underfloor heating networks.

LEADER & SPECIALIST IN PIPING SOLUTIONS

INNOVATOR OF THE INDUSTRY

RAKtherm®
Ultimate Piping Solutions

ENGINEERED PIPING

SYSTEM FOR YOUR
PLUMBING CHALLENGES

RAKTHERM MATERIALS

RAKtherm pipes and fittings are made with a material called polypropylene which is used extensively in food and medical industries because of its safe properties.

A random copolymer grade of polypropylene called PP-R was especially developed for engineering applications with certain stringent requirements. PP-R is characterized by excellent physical and chemical properties even at elevated temperatures. Compression strength, elasticity, corrosion, chemical and heat resistance are just some of these properties. RAKtherm PP-R system has proven its high resilience even at the most extreme conditions. These factors and more, make RAKtherm PP-R the ideal material for the delivery of potable hot and cold water in your home, office, or factory.

RAKTHERM PP-R...AN IDEAL SOLUTION

RAKtherm pipes and fittings are designed to withstand constant temperatures up to 70 °C. The service life expectancy depends on the installed system pressure and pressure changes. Even though the service life expectancy of the pipes is more than 50 years, a permanent temperature rise from 70 to 90 °C will accordingly reduce the operational life of the pipe. However, a temperature rise up to 100 °C in short time frames is usually unproblematic. (See

TABLE 1.1

SERVICE LIFE AGAINST HOT WATER APPLICATION

UNDER CONSTANT PERIOD (SERVICE CONDITION)

PERMISSIBLE WORKING PRESSURES (BARS)/1.25 SAFETY FACTOR)

		RAKtherm Standard Pipe SDR 11 ISO S5	RAKtherm Standard Pipe SDR 7.4 ISO S3.2 Nominal Pressure Class	RAKtherm Stabi Pipe RAKtherm standard pipe SDR 6 (ISO S2.5)	RAKtherm Stabi Pipe RAKtherm standard pipe SDR 5 (ISO S2)
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	31.6	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	13.7	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

TABLE 1.1

SERVICE LIFE AGAINST HOT WATER APPLICATION

UNDER CONSTANT PERIOD (SERVICE CONDITION)

PERMISSIBLE WORKING PRESSURES (BARS)/1.25 SAFETY FACTOR)

		RAKtherm Standard Pipe SDR 11 ISO S5	RAKtherm Standard Pipe SDR 7.4 ISO S3.2 Nominal Pressure Class	RAKtherm Stabi Pipe RAKtherm standard pipe SDR 6 (ISO S2.5)	RAKtherm Stabi Pipe RAKtherm standard pipe SDR 5 (ISO S2)
Years of Service	**Temperature**	**PN10**	**PN16**	**PN20**	**PN25**
25 Years	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	NIA	NIA	NIA	NIA
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	NIA	NIA	NIA	NIA
	70°C	NIA	NIA	NIA	NIA
	80 °C	NIA	NIA	NIA	NIA

TABLE 1.2

SERVICE LIFE AGAINST HOT WATER APPLICATION

UNDER CONSTANT PERIOD (SERVICE CONDITION)
PERMISSIBLE WORKING PRESSURES (BARS)/1.25 SAFETY FACTOR)

			RAKtherm Standard Pipe SDR 7.4 ISO S3.2	RAKtherm Stabi Pipe RAKtherm standard pipe SDR 6 (ISO S2.5) Nominal Pressure Class	RAKtherm Stabi Pipe RAKtherm standard pipe SDR 5 (ISO S2)
Service Condition	**Temperature**	**Years of Service**	**PN16**	**PN20**	**PN25**
Constant service Temperature 70 °C incl. 30 days per year at...	75°C	5	11.33	14.27	17.07
		10	10.95	13.79	15.20
		25	9.32	11.74	15.00
		45	8.08	10.18	14.40
	80°C	5	10.72	13.50	13.86
		10	10.16	12.80	13.06
		25	8.84	11.14	13.72
		42.5	7.77	9.79	10.17
	85°C	5	9.85	12.45	13.32
		10	9.42	11.87	12.22
		25	8.05	10.14	11.06
		37.5	7.29	9.18	9.88
	90°C	5	9.04	11.39	11.74
		10	8.69	10.94	12.12
		25	7.03	8.86v	9.91
		35	6.48	8.16	8.86
Constant service Temperature 70 °C incl. 60 days per year at...	75°C	5	11.20	14.11	15.90
		10	10.77	13.57	14.50
		25	9.19	10.05	13.70
		45	7.97	11.58	12.80
	80°C	5	10.14	10.05	15.80
		10	9.96	13.12	15.40
		25	8.38	10.56	13.20
		40	7.47	9.41	11.60
	85°C	5	9.55	12.03	15.78
		10	9.14	11.52	15.30
		25	7.31	9.22	13.30
		35	6.73	8.48	11.20
	90°C	5	8.76	11.04	14.90
		10	7.75	9.76	12.90
		25	6.20	7.81	10.48
		30	5.92	7.46	8.45

TABLE 1.2

SERVICE LIFE AGAINST HOT WATER APPLICATION

UNDER CONSTANT PERIOD (SERVICE CONDITION)
PERMISSIBLE WORKING PRESSURES (BARS)/1.25 SAFETY FACTOR)

			RAKtherm Standard Pipe SDR 7.4 ISO S3.2 Nominal Pressure Class	RAKtherm Stabi Pipe RAKtherm standard pipe SDR 6 (ISO S2.5)	RAKtherm Stabi Pipe RAKtherm standard pipe SDR 5 (ISO S2)
Service Condition	**Temperature**	**Years of Service**	**PN16**	**PN20**	**PN25**
Constant service Temperature 70 °C incl. 90 days per year at...	75 °C	5	11.12	14.02	14.73
		10	10.62	13.38	13.80
		25	8.99	11.33	12.40
		45	7.80	9.82	11.20
	80 °C	5	10.23	12.90	16.10
		10	9.80	12.35	15.50
		25	7.97	10.05	12.71
		37.5	7.21	9.09	11.52
	85°C	5	9.37	11.81	15.15
		10	8.51	10.72	14.20
		25	6.81	8.58	12.16
		32.5	6.37	8.03	11.40
	90 °C	5	8.41	10.59	11.30
		10	7.11	8.96	10.45
		25	5.69	7.17	9.22

ANTI-CORROSIVE AND CHEMICAL RESISTANCE

Anti – corrosive and high chemical resistance properties ensuring durability avoiding rapid breakage and expensive maintenance.

AN INVESTMENT FOR YOUR FAMILY'S HEALTH

At the highest level of RAKtherm's priorities is maintaining the quality of water that reaches your family , PP-R as a material, is inert by nature and does not, in any way, react or affect potable water, as compared with other materials used in conventional piping systems that can corrode, react chemically, or seep certain contaminants into the water system, affecting the health and safety of the potable water. This ensures continuous hygienic potable water for you and your family.

RAKTHERM, YOUR ENVIRONMENT FRIENDLY CHOICE

Heavy metals such as nickel and chrome negatively impact the environment, plated metal inserts, previously used in fittings, no longer find their way into the RAKtherm product line (consistant with BS 6920). In addition,RAKtherm pipe and fitting materials can be 100% recycled, and used again in other products (consistant with DVGW working sheet W270). These are just a few of the many ways that RAKtherm contributes to the welfare of our environment.

CORROSION & CHEMICAL RESISTANCE

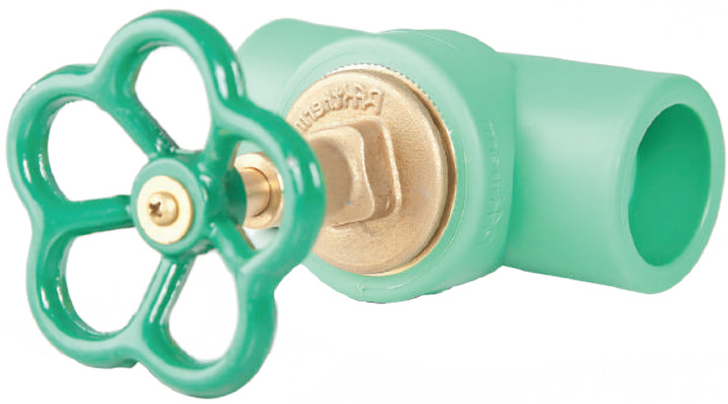
PP-R used in all RAKtherm piping systems, has high corrosion resistance properties in addition to impressive resistance to the common chemicals used in virtually all household detergents and disinfectants. This advantage for surpasses traditional piping systems, thus ensuring a longer working life, less prone to premature failures and expensive maintenance.

Refer to CHEMICAL RESISTANCE TABLE in RAKtherm Technical Manual

RAKTHERM IS ENGINEERED FOR HIGHER LEVEL OF PIPING SERVICE PERFORMANCE

RAKtherm®
Ultimate Piping Solutions

RAKTHERM MECHANICAL AND THERMAL PROPERTIES



In accordance with its areas of application, RAKtherm piping systems is designed for continuous temperatures of 0°C to 90^0 C, and short-term peak temperatures of up to 100° C and a service life of a minimum of 50 years. Therefore RAKtherm piping system is suitable for all types of chilled and heating water networks. More precise details are summarized in table (1.1 & 1.2)

RAKTHERM ALUMINIUM COMPOSITE PIPE TECHNOLOGY

RAKtherm Stabi pipes integrated with aluminium layer are developed for exposed hot & cold water installations. RAKtherm Stabi composite pipes are convenient and reliable due to its superior charachteristics in low linear expansion rate (nearly identical to metallic pipes) and higher flow rates with same external diameter and lower wall thickness.

For exposed and open air installations under direct sunlight or UV radiation, RAKtherm remains physically stable through a specially developed external black layer (UV resistant), in adherence with the aluminium layer.

RAKTHERM STABI COMPOSITE PIPE

installations are applied from building connection points or distribution station to the very last endpoints of the installation.

SYSTEM OVERVIEW

For heating installations RAKtherm Stabi composite pipes are installed starting from the boiler outlets or water-heating unit, up to the individual radiators or heat exchangers.

In hot water application the use of RAKtherm Stabi-Pipe is always advisable due to reduced longitudinal expansion during heat load.

RAKTHERM STABI COMPOSITE PIPES AREAS OF APPLICATION:

- Potable water pipe networks for cold and hot water installations, in residential buildings, hotels, hospitals, shipbuilding and other buildings.
- Pipe networks for compressed air plants
- Pipe networks for swimming pool facilities
- Pipe networks for solar plants
- Pipe networks in agriculture
- Pipe networks for industry and applications where transport of aggressive fluids is required

ADVANTAGES:

- Length extension reduced by at least 80% compared with standard pipes.
- Higher flow rate increased by 20% with the same external diameter and wider flow area insde the pipe.
- Impact rate higher then the standard pipe.
- Excellent internal pressure resistance even at h ight temperatures.
- Supports intervals can be increased wiht less of mounting clips are used compared with plastic pipes.
- Superior UV-resistance, long service life.
- No oxygen infiltration with superior hygiene properties.

EASY, RELIABLE INSTALLATION

RAKtherm system components are joined by simple-to-use fusion-welding techniques. Pure and consistent resins of the highest quality, used in the manufacture of our components, ensure reliable and repeatable welding over and over again. No matter where or when, each junction can be joined in merely a few seconds.

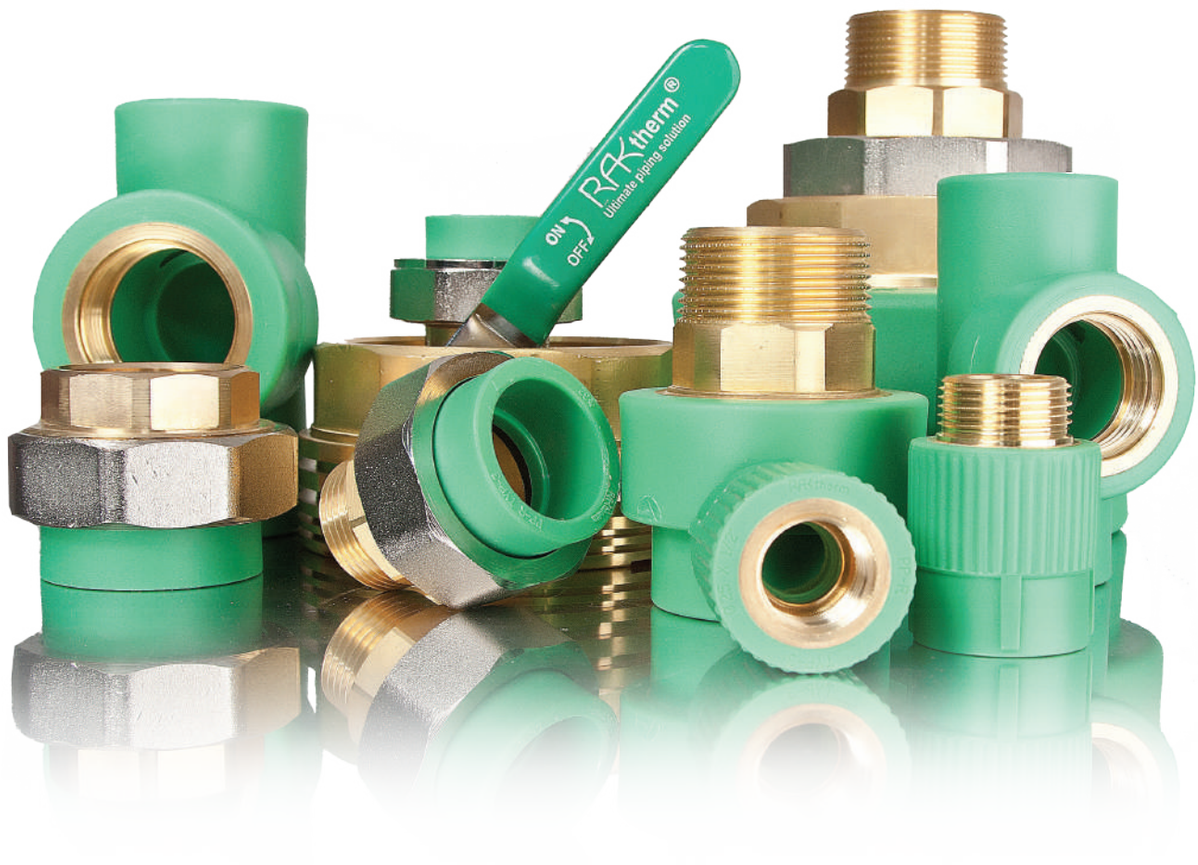
HIGH-END QUALITY FOR INTENSIFIED

BRAND INTEGRITY

RAKtherm®
Ultimate Piping Solutions

THROUGH, SIMPLE TO USE INSTRUCTIONS

Our manuals provide the highest degree step-by-step instructions guiding you to easily build up an impressive and complex network of efficient piping systems, no matter what your application is.



SERVICE & SUPPORT

Our support team is available around the clock for your technical queries, providing you with the expertise to ensure your continuous success in the design and installation of your network.

RAKtherm®
Ultimate Piping Solutions

MAINTAINS THE HIGHEST STANDARD OF QUALITY

Maintains comprehensive quality control system from designing the required specifications, sourcing the highest quality raw materials to manufacture the product, careful packing and proper storage up to shipping to the customer

It is our mission at RAKtherm to maintain the highest levels of quality through clear operating procedures, work instructions, forms and records throughout the company. Statistical quality control and sound documentation ensures traceability is maintained anytime in the future. This means that all corporate and plant functions within RAKtherm, whether commercial, or operational, are required to be clearly stated and documented, ensuring that the quality of your product is never compromised or been left to chance.

STANDARDS & REGULATIONS

RAKtherm Pipes and fittings are produced with the following standards and regulations:

DIN 1988 DVGW	Code of Practice (Drinking water supply systems; materials, components, appliances, design and installation).
DIN 8076	Standard for testing metal threaded joints.
DIN 8077	Polypropylene (PP) pipe dimensions.
DIN 8078	Polypropylene (PP) pipes; general quality requirements testing & chemical resistance of pipes and fittings.
DIN 2999	Standards for fittings with threaded metallic inserts.
DIN 169621Ptl	Pipe joint assemblies and fittings for type 1 & 2 polypropylene (PP) pressure pipes; bends produced by segment inserts for buff welding dimensions.
DIN 16928	Installation, pipe and fitting connections.
DIN 4109	Noise control in buildings.
DIN 4140	Insulation of service installations.

DVS 2207	Welding of thermoplastic pipes and fittings.
DVS 2208	Welding machines & devices for thermoplastic pipes and fittings.
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.
DIN 16836	Multilayer Pipes-General Requirement and Testing
DVGW W544	General Requirements and Testing of plastic pipes
ISO 9001 -2008	Quality Management system.
OHSAS 1 8001	British standard for Health and safety management system.

QUALITY GUARANTEE

RAKtherm always maintains the highest standards of quality for its users. To support this, RAKtherm warrants a 15-year guarantee for all its piping network components from the date of purchase. (Please ask your local representative for details)

MAINTAINING A HIGH LEVEL OF QUALITY

RAKtherm maintains a comprehensive quality control system beginning from designing the required specifications, to control of incoming raw materials processing of the product, packing, storage, shipping to the customer, and finally continuous servicing and support to guarantee that complete total quality is achieved. This is accomplished parallel to the Quality Assurance Program with the objective to ensure that total quality, and not only localized quality is maintained as required. The overall quality system operated and documented by RAKtherm is implemented throughout the plant. The overall system has been designed to exceed requirements stated by national and international authorities and institutions. Regular checks are done by neutral bodies,to further eliminate any chance of quality deviation. This is yet another quality assurance for our customer.

QUALITY ASSURANCE

A well-designed manufacturing process includes establishing the required specifications, and strictly adhering to them throughout the manufacturing process.

This is assured by precise machinery, well trained staff, and continuously updated and modernized equipment. Ultrasonic measurement and in-process data recording on the production lines, identify real-time changes in the process and assure that any deviations on the quality of the product to the set standard is avoided.

RAKtherm is fully equipped with quality control laboratories that include state-of-the-art measurement and performance evaluation instrumentation to aid in controlling and achieving specification compliance. Our engineers utilize these ultra-modern high-tech equipment to run dimensional, physical and chemical property tests. For example, accelerated hydrostatic testing on samples taken from production runs, using technically advanced equipment, is just one of many tests that is conducted on a continuous basis to simulate the aging of piping systems under working conditions.

We also strongly believe and always nourish the environment of continuous quality improvement in every aspect of our business and the enhancement of our employee knowledge and skills to achieve their best in individual performance and teamwork. This is just a glimpse of the meaning of quality at RAKtherm, which is committed to your complete satisfaction through consistently exceeding your expectations through the understanding of your needs and requirements.

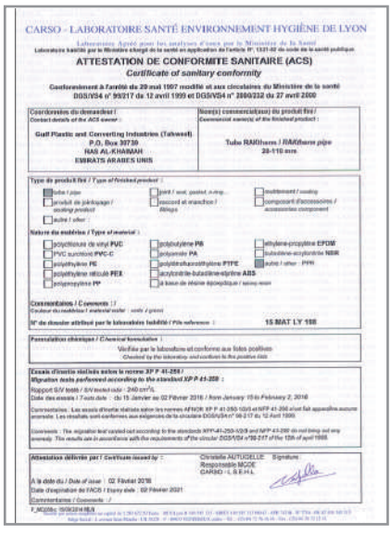
Management Quality Systems

Rigorously completed the manufacturing process conformed and certified by DVGW, CSTB, SKZ, HY, and TUV acquiring the highest standard of piping systems.

RAKtherm®
Ultimate Piping Solutions

INTELLIGENT QUALITY MANAGEMENT SYSTEMS

FOR PRODUCT COMPETENCY



CARSO - LABORATOIRE SANTÉ ENVIRONNEMENT HYGIÈNE DE LYON

ATTESTATION DE CONFORMITE SANITAIRE (ACS)

Certificate of sanitary conformity

Hygiene-Institut des Ruhrgebiets

TEST CERTIFICATE

CERTIFICATE

The Certification Body of TÜV SÜD Management Service GmbH certifies that

Gulf Plastic and Converting Industries (Tahweel)
P.O.Box:30739
Ras Al - Khaima
United Arab Emirates

has established and applies a Quality Management System for

Manufacture and Supply of Plastic pipes, Pipe Fittings and Plumbing System Components.

An audit was performed, Report No. 70120082
Proof has been furnished that the requirements according to

ISO 9001: 2008

are fulfilled. The certificate is valid until 2012-05-19
Certificate Registration No. 12 100 25568 TMS

ZERTIFIKAT ◆ CERTIFICATE ◆ CERTIFICADO ◆ CERTIFICAT

DVGW-Baumusterprüfzertifikat

DVGW type examination certificate

DW-8317BS0309

CSTB

CERTIFICAT

Systèmes de canalisations de distribution d'eau
Chauffage et distribution sanitaire

RAKtherm

ZERTIFIKAT — SKZ

Certificate

SKZ - TeCenA GmbH awards the following company

GULF PLASTIC & CONVERTING INDUSTRIES
RAKtherm
Al-Jazira Al-Hamra
30739 Ras Al-Khaimah
United Arab Emirates

the right to use the SKZ - testing and inspection mark

A 451

for the following plastic products

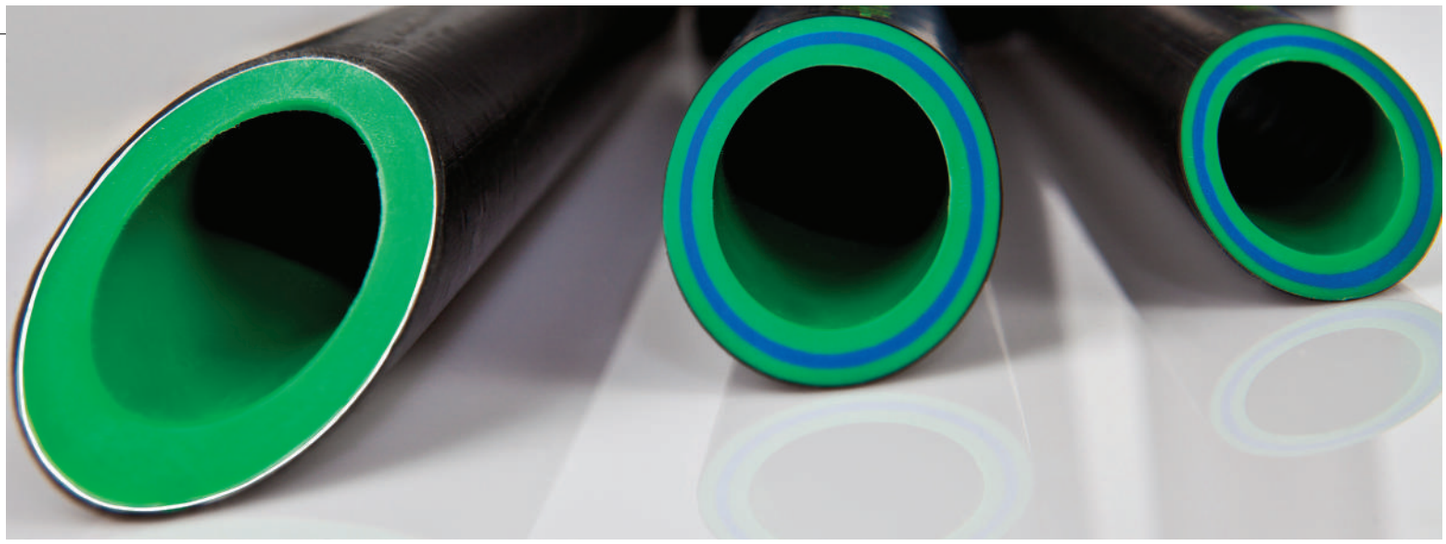
Pressure pipes made of polypropylene PP-R

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

Date of expiry: 10 December 2012

Würzburg, 11 December 2007

Certification body



GROUNDBREAKING PIPING

APPROACH THROUGH INNOVATION

RAKtherm Pipe SDR 11 PP-R PN 10 Pipe Series 4 According To DIN 8077/78

Art-.No.	Dimension	Packing Unit	Outer Diameter (OD)mm	Wall Thickness (S)	Intrernal Diameter (ID)mm	Water content l/mt	Kg / mt
P10-20	20 mm	100 mts	20	1.9	16.2	0.206	0.107
P10-25	25 mm	100 mts	25	2.3	20.4	0.327	0.164
P10-32	32 mm	40 mts	32	2.9	26.2	0.531	0.261
P10-40	40 mm	40 mts	40	3.7	32.6	0.834	0.412
P10-50	50 mm	20 mts	50	4.6	40.8	1.307	0.638
P10-63	63 mm	20 mts	63	5.8	51.4	2.075	1.010
P10-75	75 mm	20 mts	75	6.8	61.4	2.941	1.410
P10-90	90 mm	12 mts	90	8.2	73.6	4.254	2.030
P10-110	110 mm	8 mts	110	10	90	6.362	3.010

RAKtherm Pipe SDR 7.4 PP-R PN 16 Pipe Series 5 According To DIN 8077/78

Art-.No.	Dimension	Packing Unit	Outer Diameter (OD)mm	Wall Thickness (S)	Intrernal Diameter (ID)mm	Water content l/mt	Kg / mt
P16-20	20 mm	100 mts	20	2.8	14.4	0.163	0.148
P16-25	25 mm	100 mts	25	3.5	18	0.254	0.230
P16-32	32 mm	40 mts	32	4.4	23.2	0.415	0.370
P16-40	40 mm	40 mts	40	5.5	29	0.651	0.575
P16-50	50 mm	20 mts	50	6.9	36.2	1.029	0.896
P16-63	63 mm	20 mts	63	8.6	45.8	1.633	1.410
P16-75	75 mm	20 mts	75	10.3	54.4	2.307	2.010
P16-90	90 mm	12 mts	90	12.3	65.4	3.318	2.870
P16-110	110 mm	8 mts	110	15.1	79.8	5.674	4.300

RAKtherm®
Ultimate Piping Solutions

RAKtherm Pipe SDR 6 PP-R PN 20 Pipe Series 6 According To DIN 8077/78

Art-.No.	Dimension	Packing Unit	Outer Diameter (OD)mm	Wall Thickness (S)	Intrernal Diameter (ID)mm	Water content l/mt	Kg / mt
P20-20	20 mm	100 mts	20	3.4	13.2	0.137	0.172
P20-25	25 mm	100 mts	25	4.2	16.6	0.216	0.266
P20-32	32 mm	40 mts	32	5.4	21.2	0.353	0.434
P20-40	40 mm	40 mts	40	6.7	26.6	0.556	0.671
P20-50	50 mm	20 mts	50	8.3	33.4	0.866	1.040
P20-63	63 mm	20 mts	63	10.5	42	1.385	1.650
P20-75	75 mm	20 mts	75	12.5	50	1.963	2.340
P20-90	90 mm	12 mts	90	15	60	2.827	3.360
P20-110	110 mm	8 mts	110	18.3	73.4	4.208	5.010

RAKtherm Pipe SDR 5 PP-R PN 25 Pipe Series 2 According To DIN 8077/78

Art-.No.	Dimension	Packing Unit	Outer Diameter (OD)mm	Wall Thickness (S)	Intrernal Diameter (ID)mm	Water content l/mt	Kg / mt
P25-20	20 mm	100 mts	20	4.1	11.8	0.111	0.198
P25-25	25 mm	100 mts	25	5.1	14.8	0.178	0.307
P25-32	32 mm	40 mts	32	6.5	19	0.291	0.498
P25-40	40 mm	40 mts	40	8.1	23.8	0.461	0.775
P25-50	50 mm	20 mts	50	10.1	29.8	0.703	1.210
P25-63	63 mm	20 mts	63	12.7	37.6	1.137	1.910
P25-75	75 mm	20 mts	75	15.1	44.8	1.619	2.700
P25-90	90 mm	12 mts	90	18.1	53.8	2.336	3.880
P25-110	110 mm	8 mts	110	22.1	65.8	2.742	5.780

RAKtherm Stabi Composite Pipe PP-R PN 20 With Aluminium Thicknes 0.2 mm According To DIN 8077/78

Art-.No.	Dimension	Packing Unit	Outer Diameter (OD)mm	Wall Thickness (S)	Intrernal Diameter (ID)mm	Water content l/mt	Kg / mt
PS20-20	20 mm	100 mts	20	2.8	14.4	0.163	0.220
PS20-25	25 mm	100 mts	25	3.5	18	0.254	0.320
PS20-32	32 mm	40 mts	32	4.4	23.2	0.415	0.470
PS20-40	40 mm	40 mts	40	5.5	29	0.651	0.720
PS20-50	50 mm	20 mts	50	6.9	36.2	1.029	1.060
PS20-63	63 mm	20 mts	63	8.6	45.8	1.633	1.650
PS20-75	75 mm	20 mts	75	10.3	54.4	2.307	2.280
PS20-90	90 mm	12 mts	90	12.3	65.4	3.318	3.200
PS20-110	110 mm	8 mts	110	15.1	79.8	5.674	4.600

PRODUCT RANGE

RAKtherm Stabi Composite Pipe PP-R PN 25 With Aluminium Thicknes 0.2 mm According To DIN 8077/78

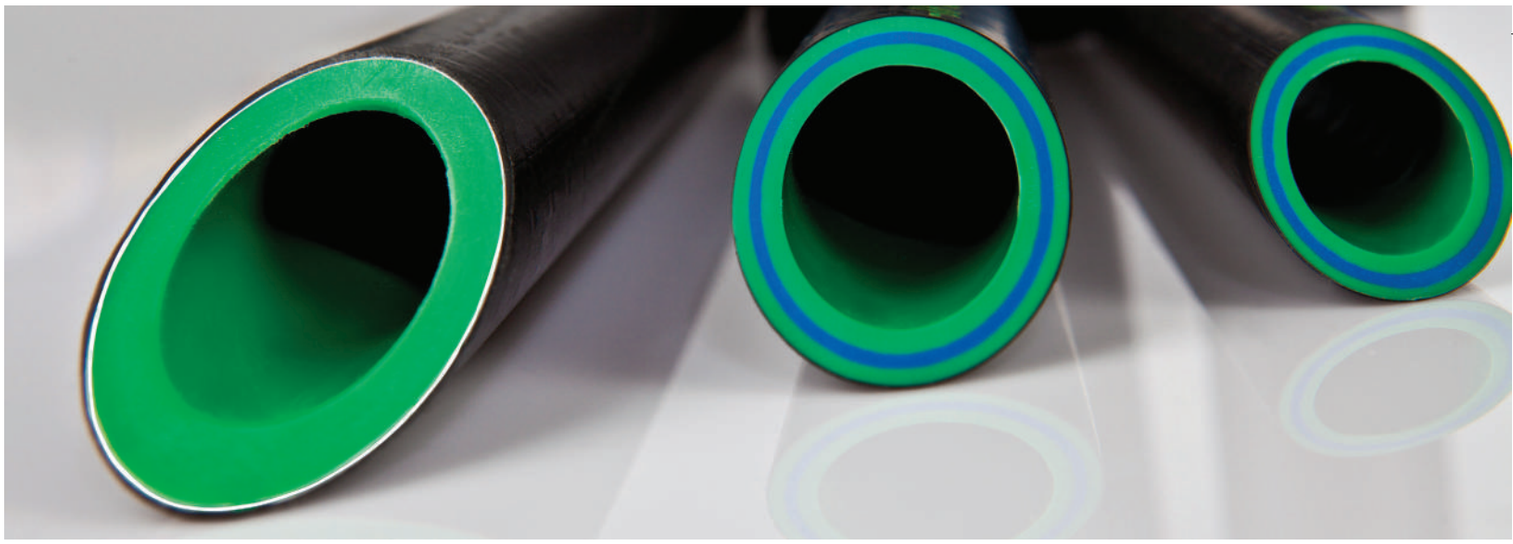
Art-.No.	Dimension	Packing Unit	Outer Diameter (OD)mm	Wall Thickness (S)	Intrernal Diameter (ID)mm	Water content I/mt	Kg / mt
PS25-20	20 mm	100 mts	20	3.4	13.2	0.137	0.241
PS25-25	25 mm	100 mts	25	4.2	16.6	0.216	0.350
PS25-32	32 mm	40 mts	32	5.4	21.2	0.353	0.542
PS25-40	40 mm	40 mts	40	6.7	26.6	0.556	0.805
PS25-50	50 mm	20 mts	50	8.3	33.4	0.866	1.217
PS25-63	63 mm	20 mts	63	10.5	42	1.385	1.860
PS25-75	75 mm	20 mts	75	12.5	50	1.963	2.586
PS25-90	90 mm	12 mts	90	15	60	2.827	3.656
PS25-110	110 mm	8 mts	110	18.3	73.4	4.208	5.372

RAKtherm Stabi Composite Pipe PP-R PN 20 With Aluminium Thicknes 0.2 mm According To DIN 8077/78 Special technology with black layer (UV resistant) for out door and external installations under sunlight

Art-.No.	Dimension	Packing Unit	Outer Diameter (OD)mm	Wall Thickness (S)	Intrernal Diameter (ID)mm	Water content I/mt	Kg / mt
PSUV20-20	20 mm	100 mts	20	2.8	14.4	0.163	0.220
PSUV20-25	25 mm	100 mts	25	3.5	18	0.254	0.320
PSUV20-32	32 mm	40 mts	32	4.4	23.2	0.415	0.470
PSUV20-40	40 mm	40 mts	40	5.5	29	0.651	0.720
PSUV20-50	50 mm	20 mts	50	6.9	36.2	1.029	1.060
PSUV20-63	63 mm	20 mts	63	8.6	45.8	1.633	1.650
PSUV20-75	75 mm	20 mts	75	10.3	54.4	2.307	2.280
PSUV20-90	90 mm	12 mts	90	12.3	65.4	3.318	3.200
PSUV20-110	110 mm	8 mts	110	15.1	79.8	5.674	4.600

RAKtherm Stabi Composite Pipe PP-R PN 25 With Aluminium Thicknes 0.2 mm According To DIN 8077/78 Special technology with black layer (UV resistant) for out door and external installations under sunlight

Art-.No.	Dimension	Packing Unit	Outer Diameter (OD)mm	Wall Thickness (S)	Intrernal Diameter (ID)mm	Water content I/mt	Kg / mt
PSUV25-20	20 mm	100 mts	20	3.4	13.2	0.137	0.241
PSUV25-25	25 mm	100 mts	25	4.2	16.6	0.216	0.350
PSUV25-32	32 mm	40 mts	32	5.4	21.2	0.353	0.542
PSUV25-40	40 mm	40 mts	40	6.7	26.6	0.556	0.805
PSUV25-50	50 mm	20 mts	50	8.3	33.4	0.866	1.217
PSUV25-63	63 mm	20 mts	63	10.5	42	1.385	1.860
PSUV25-75	75 mm	20 mts	75	12.5	50	1.963	2.586
PSUV25-90	90 mm	12 mts	90	15	60	2.827	3.656
PSUV25-110	110 mm	8 mts	110	18.3	73.4	4.208	5.372



LARGER PIPE SIZES

NOW AVAILABLE

Raktherm Reinforced Pipe PP-R Pipe PN 16

Art-.No.	Dimension	Packing Unit	Outer Diameter (OD)mm	Wall Thickness (S)	Intrernal Diameter (ID)mm	Kg / mt
P-P16-125	125 mm	4	125 mm	14.0	97.0	4.480
P-P16-160	160 mm	4	160 mm	14.6	130.8	6.755
P-P16-200	200 mm	4	200 mm	18.2	163.6	10.640
P-P16-250	250 mm	4	250 mm	22.7	204.6	16.160

Design and Versatility

Raktherm's piping systems undergoes careful planning designed with versatility to ensure high reliability performance along with safe and fast installation.

Socket

Art-.No.	Dimension	Packing Unit	Kg / Piece
S1-20	20 mm	10 pcs	0.010
S1-25	25 mm	10 pcs	0.015
S1-32	32 mm	5 pcs	0.025
S1-40	40 mm	5 pcs	0.042
S1-50	50 mm	5 pcs	0.081
S1-63	63 mm	1 pc	0.141
S1-75	75 mm	1 pc	0.200
S1-90	90 mm	1 pc	0.318
S1-110	110 mm	1 pc	0.563

Reducer Socket

Art-.No.	Dimension	Packing Unit	Kg / Piece
R1-2520	25/20 mm	10 pcs	0.012
R1-3220	32/20 mm	5 pcs	0.015
R1-3225	32/25 mm	5 pcs	0.020
R1-4020	40/20 mm	5 pcs	0.025
R1-4025	40/25 mm	5 pcs	0.029
R1-4032	40/32 mm	5 pcs	0.034
R1-5020	50/20 mm	5 pcs	0.044
R1-5025	50/25 mm	5 pcs	0.045
R1-5032	50/32 mm	5 pcs	0.050
R1-5040	50/40 mm	5 pcs	0.056
R1-6320	63/20 mm	1 pc	0.071
R1-6325	63/25 mm	1 pc	0.073

DESIGNED WITH VERSATILITY FOR

VARIETY OF NETWORK APPLICATIONS

PRODUCT RANGE

Reducer Socket

Art-.No.	Dimension	Packing Unit	Kg / Piece
R1-6332	63/32 mm	1 pc	0.091
R1-6340	63/40 mm	1 pc	0.092
R1-6350	63/50 mm	1 pc	0.105
R1-7540	75/40 mm	1 pc	0.130
R1-7550	75/50 mm	1 pc	0.135
R1-7563	75/63 mm	1 pc	0.158
R1-9050	90/50 mm	1 pc	0.196
R1-9063	90/63 mm	1 pc	0.220
R1-9075	90/75 mm	1 pc	0.265
R1-11063	110/63 mm	1 pc	0.350
R1-11075	110/75 mm	1 pc	0.390
R1-11090	110/90 mm	1 pc	0.468

Elbow 90^0

Art-.No.	Dimension	Packing Unit	Kg / Piece
E1-20	20 mm	10 pcs	0.016
E1-25	25 mm	10 pcs	0.024
E1-32	32 mm	5 pcs	0.039
E1-40	40 mm	5 pcs	0.072
E1-50	50 mm	5 pcs	0.162
E1-63	63 mm	1 pc	0.262
E1-75	75 mm	1 pc	0.454
E1-90	90 mm	1 pc	0.727
E1-110	110 mm	1 pc	1.200

Elbow 45^0

Art-.No.	Dimension	Packing Unit	Kg / Piece
E3-20	20 mm	10 pcs	0.014
E3-25	25 mm	10 pcs	0.019
E3-32	32 mm	5 pcs	0.032
E3-40	40 mm	5 pcs	0.053
E3-50	50 mm	5 pcs	0.120
E3-63	63 mm	1 pc	0.208
E3-75	75 mm	1 pc	0.316
E3-90	90 mm	1 pc	0.516
E3-110	110 mm	1 pc	0.990

Elbow Reducer

Art-.No.	Dimension	Packing Unit	Kg / Piece
RE1-2520	25/20 mm	10 pcs	0.021
RE1-3225	32/25 mm	5 pcs	0.0355
RE1-4032	40/32 mm	5 pcs	0.062

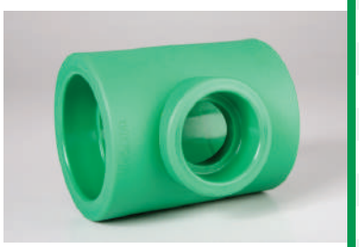
Spigot Elbow 90°

Art-.No.	Dimension	Packing Unit	Kg / Piece
SE1-25	25 mm	10 pcs	0.027
SE1-32	32 mm	5 pcs	0.053

Equal Tee

Art-.No.	Dimension	Packing Unit	Kg / Piece
T1-20	20 mm	10 pcs	0.021
T1-25	25 mm	10 pcs	0.031
T1-32	32 mm	5 pcs	0.051
T1-40	40 mm	5 pcs	0.090
T1-50	50 mm	5 pcs	0.200
T1-63	63 mm	1 pc	0.348
T1-75	75 mm	1 pc	0.523
T1-90	90 mm	1 pc	0.850
T1-110	110 mm	1 pc	1.425

Reducing Tee



Art-.No.	Dimension	Packing Unit	Kg / Piece
T2-202520	20 x 25 x 20 mm	10 pcs	0.039
T2-252020	25 x 20 x 20 mm	10 pcs	0.036
T2-252025	25 x 20 x 25 mm	10 pcs	0.034
T2-253225	25 x 32 x 25 mm	5 pcs	0.066
T2-322032	32 x 20 x 32 mm	5 pcs	0.048
T2-322525	32 x 25 x 25 mm	5 pcs	0.063
T2-323225	32 x 32 x 25 mm	5 pcs	0.056
T2-322532	32 x 25 x 32 mm	5 pcs	0.058
T2-402040	40 x 20 x 40 mm	5 pcs	0.088
T2-402540	40 x 25 x 40 mm	5 pcs	0.083
T2-403240	40 x 32 x 40 mm	5 pcs	0.099
T2-502050	50 x 20 x 50 mm	5 pcs	0.184
T2-502550	50 x 25 x 50 mm	5 pcs	0.190
T2-503250	50 x 32 x 50 mm	5 pcs	0.185
T2-504050	50 x 40 x 50 mm	5 pcs	0.222
T2-632063	63 x 20 x 63 mm	1 pc	0.324
T2-632563	63 x 25 x 63 mm	1 pc	0.322
T2-633263	63 x 32 x 63 mm	1 pc	0.331
T2-634063	63 x 40 x 63 mm	1 pc	0.322
T2-635063	63 x 50 x 63 mm	1 pc	0.379
T2-753275	75 x 32 x 75 mm	1 pc	0.498
T2-754075	75 x 40 x 75 mm	1 pc	0.502
T2-755075	75 x 50 x 75 mm	1 pc	0.531
T2-756375	75 x 63 x 75 mm	1 pc	0.497
T2-904090	90 x 40 x 90 mm	1 pc	0.812
T2-905090	90 x 50 x 90 mm	1 pc	0.809
T2-906390	90 x 63 x 90 mm	1 pc	0.812
T2-907590	90 x 75 x 90 mm	1 pc	0.920
T2-11050110	110 x 50 x 110 mm	1 pc	1.360
T2-11063110	110 x 63 x 110 mm	1 pc	1.360
T2-11075110	110 x 75 x 110 mm	1 pc	1.380
T2-11090110	110 x 90 x 110 mm	1 pc	1.420

PRODUCT RANGE

End Cap

Art-.No.	Dimension	Packing Unit	Kg / Piece
C-20	20 mm	10 pcs	0.009
C-25	25 mm	10 pcs	0.011
C-32	32 mm	5 pcs	0.019
C-40	40 mm	5 pcs	0.037
C-50	50 mm	5 pcs	0.066
C-63	63 mm	1 pc	0.131
C-75	75 mm	1 pc	0.180
C-90	90 mm	1 pc	0.281
C-110	110 mm	1 pc	0.576

Cross Tee

Art-.No.	Dimension	Packing Unit	Kg / Piece
X-20	20 mm	10 pcs	0.024
X-25	25 mm	10 pcs	0.035
X-32	32 mm	5 pcs	0.059

Female Union both ends welding

Art-.No.	Dimension	Packing Unit	Kg / Piece
UF2-20	20 mm	10 pcs	0.052
UF2-25	25 mm	10 pcs	0.061
UF2-32	32 mm	5 pcs	0.126

Saddle Socket

Art-.No.	Dimension	Packing Unit	Kg / Piece
SDS1-5025	50/25mm	5 pcs	0.029
SDS1-5032	50/32mm	5 pcs	0.034
SDS1-5040	50/40mm		
SDS1-6320	63 x 20 mm	5 pcs	0.031
SDS1-6325	63 x 25 mm	5 pcs	0.032
SDS1-6332	63 x 32 mm	5 pcs	0.038
SDS1-7520	75 x 20 mm	5 pcs	0.034
SDS1-7525	75 x 25 mm	5 pcs	0.041
SDS1-7532	75 x 32 mm	5 pcs	0.038
SDS1-9020	90 x 20 mm	5 pcs	0.035
SDS1-9025	90 x 25 mm	5 pcs	0.036
SDS1-9032	90 x 32 mm	5 pcs	0.042
SDS1-11020	110 x 20 mm	5 pcs	0.035
SDS1-11025	110 x 25 mm	5 pcs	0.036
SDS1-11032	110 x 32 mm	5 pcs	0.042

RAK therm®
Ultimate Piping Solutions

Flanges Adaptor

Art-.No.	Dimension	Packing Unit	Kg / Piece
F-75	75 mm (ppr socket)	1 pc	0.084
P-FS-75	75 mm (steel flang)	1 pc	1.855
P-FG-75	75 mm (gasket)	1 pc	0.048
F-90	90 mm (ppr socket)	1 pc	0.135
P-FS-90	90 mm (steel flang)	1 pc	1.565
P-FG-90	90 mm (gasket)	1 pc	0.074
F-110	110 mm (ppr socket)	1 pc	0.201
P-FS-110	110 mm (steel flang)	1 pc	1.920
P-FG-110	110 mm (gasket)	1 pc	0.106

End Plug

Art-.No.	Dimension	Packing Unit	Kg / Piece
C2-1/2	1/2"	10 pcs	0.026
C2-3/4	3/4"	10 pcs	0.029
C2-1	1"	50 pcs	0.017

Over Bridge Bow

Art-.No.	Dimension	Packing Unit	Kg / Piece
B-20	20 mm	10 pcs	0.063
B-25	25 mm	10 pcs	0.098
B-32	32 mm	5 pcs	0.165

(Smart) Over Bridge Bow

Art-.No.	Dimension	Packing Unit	Kg / Piece
OBB-20	20 mm	10 pcs	0.033
OBB-25	25 mm	10 pcs	0.0475

Bracket For Pipe

Art-.No.	Dimension	Packing Unit	Kg / Piece
BT-20	20 mm	200 pcs	0.006
BT-25	25 mm	200 pcs	0.008
BT-32	32 mm	100 pcs	0.010
BT-40	40 mm	100 pcs	0.013

PRODUCT RANGE

Bracket with Clamp

Art-.No.	Dimension	Packing Unit	Kg / Piece
BTC – 25	25 mm	1500 pcs	0.01
BTC – 32	25 mm	1000 pcs	0.013

Clamp For Pipe

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-CL-20	20 mm	50 pcs	0.042
P-CL-25	25 mm	50 pcs	0.053
P-CL-32	32 mm	50 pcs	0.060
P-CL-40	40 mm	50 pcs	0.067
P-CL-50	50 mm	50 pcs	0.077
P-CL-63	63 mm	25 pcs	0.082

Bend

Art-.No.	Dimension	Packing Unit	Kg / Piece
BE-25	25 mm	10 pcs	0.044
BE-32	32 mm	5 pcs	0.075
BE-40	40 mm	5 pcs	0.125

PPR Manifold

Art-.No.	Dimension	Packing Unit	Kg / Piece
MNF-2W-3225	32/25 mm (Two way)	200 pcs	0.105
MNF-2W-4032	40/32 mm (Two way)	120 pcs	0.177
MNF-3W-3225	32/25 mm (Three way)	150 pcs	0.155
MNF-3W-4032	40/32 mm (Three way)	75 pcs	0.261
MNF-4W-3225	32/25 mm (Four way)	100 pcs	0.206
MNF-4W-4032	40/32 mm (Four way)	60 pcs	0.362
MNF-4W-5025	50/25 mm (Four Way)	40 pcs	0.605
MNF-4W-5032	50/32mm (Four Way)	40 pcs	0.585
MNF-4W-6325	63/25 mm (Four Way)	20 pcs	1.065
MNF-4W-6332	63/32mm (Four Way)	20 pcs	1.03

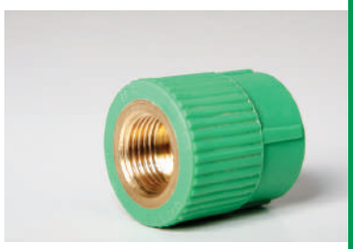
PPR Ball Valve

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-PBV-25	25mm	1 Pc	0.131
P-PBV-32	32mm	1 Pc	0.212

SPECIALLY DEVELOPED BRASS INSERTS

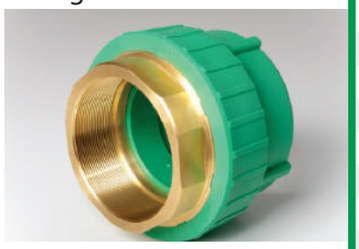
Innovative brass inserts specially designed to provide better brass connections to ensure modified strength to withstand higher tightening torque without breakage or deformation.

Transition Piece Round-Female



Art-.No.	Dimension	Packing Unit	Kg / Piece
AF-201/2	20 mm x 1/2"	10 pcs	0.058
AF-203/4	20 mm x 3/4"	10 pcs	0.072
AF-251/2	25 mm x 1/2"	10 pcs	0.059
AF-253/4	25 mm x 3/4"	10 pcs	0.073
AF-323/4	32 mm x 3/4"	5 pcs	0.078

Transition Piece Round-Female With Hexagon Socket



Art-.No.	Dimension	Packing Unit	Kg / Piece
AF1-321	32 mm x 1"	5 pcs	0.236
AF1-401	40 mm x 1"	5 pcs	0.240
AF1-4011/4	40 mm x 1.1/4"	5 pcs	0.367
AF1-5011/2	50 mm x 1.1/2"	1 pc	0.435
AF1-632	63 mm x 2"	1 pc	0.586
AF1-7521/2	75 mm x 2.1/2"	1 pc	1.061
AF1-903	90 mm x 3"	1 pc	1.635
AF1-1104	110 mm x 4"	1 pc	3.310

Transition Piece Round-Male

Art-.No.	Dimension	Packing Unit	Kg / Piece
AM-201/2	20 mm x 1/2"	10 pcs	0.068
AM-203/4	20 mm x 3/4"	10 pcs	0.081
AM-251/2	25 mm x 1/2"	10 pcs	0.069
AM-253/4	25 mm x 3/4"	10 pcs	0.081
AM-323/4	32 mm x 3/4"	5 pcs	0.086

RE-INNOVATIVE BRASS INSERTS THAT

GUARANTEE MODIFIED NETWORK CONNECTIONS

Transition PPR Male Union Brass with Ribs

Art-.No.	Dimension	Packing Unit	Kg / Piece
TUM3-321	32 mm x 1"	5 pcs	0.221
TUM3-253/4	25mm x 3/4"	10 pcs	0.162

Transition PPR Female Union Brass with Ribs

Art-.No.	Dimension	Packing Unit	Kg / Piece
TUF3-321	32 mm x 1"	5 pcs	0.184
TUF3-253/4	25 mm x 3/4"	10 pcs	0.151

Transition PPR Male Union

Art-.No.	Dimension	Packing Unit	Kg / Piece
TUM2-201/2	20 mm x 1/2"	10 pcs	0.121
TUM2-253/4	25 mm x 3/4"	10 pcs	0.186
TUM2-321	32 mm x 1"	5 pcs	0.264
TUM2-4011/4	40 mm x 1.1/4"	5 pcs	0.400
TUM2-5011/2	50 mm x 1.1/2"	1 pc	0.626
TUM2-632	63 mm x 2"	1 pc	1.030

Transition PPR Female Union

Art-.No.	Dimension	Packing Unit	Kg / Piece
TUF2-201/2	20 mm x 1/2"	10 pcs	0.108
TUF2-253/4	25 mm x 3/4"	10 pcs	0.176
TUF2-321	32 mm x 1"	5 pcs	0.212
TUF2-4011/4	40 mm x 1.1/4"	5 pcs	0.322
TUF2-5011/2	50 mm x 1.1/2"	1 pc	0.530
TUF2-632	63 mm x 2"	1 pc	0.930

FITTINGS & ACCESSORIES

Transition Piece Round-Male With Hexagon Socket

Art-.No.	Dimension	Packing Unit	Kg / Piece
AM1-321	32 mm x 1"	5 pcs	0.227
AM1-401	40 mm x 1"	5 pcs	0.231
AM1-4011/4	40 mm x 1.1/4"	5 pcs	0.381
AM1-5011/2	50 mm x 1.1/2"	1 pc	0.430
AM1-632	63 mm x 2"	1 pc	0.688
AM1-7521/2	75 mm x 2.1/2"	1 pc	1.000
AM1-903	90 mm x 3"	1 pc	1.500
AM1-1104	110 mm x 4"	1 pc	4.890

Tank Connector

Art-.No.	Dimension	Packing Unit	Kg / Piece
TCM-321	32mm x 1 3/4	5 pcs	0.289

Transition Female Tee

Art-.No.	Dimension	Packing Unit	Kg / Piece
T3-201/2	20 mm x 1/2"	10 pcs	0.074
T3-203/4	20 mm x 3/4"	10 pcs	0.088
T3-251/2	25 mm x 1/2"	10 pcs	0.081
T3-253/4	25 mm x 3/4"	10 pcs	0.098
T3-321/2	32 mm x 1/2"	5 pcs	0.089
T3-323/4	32 mm x 3/4"	5 pcs	0.102
T3-321	32 mm x 1"	5 pcs	0.268

Valve Body

Art-.No.	Dimension	Packing Unit	Kg / Piece
V4-203/4	20 mm x 3/4"	1 pc	0.087
V4-253/4	25 mm x 3/4"	1 pc	0.096
V4-321	32 mm x 1"	1 pc	0.141
V4-4011/4	40 mm x 1.1/4"	1 pc	0.254

PRODUCT RANGE

Transition Elbow Female

Art-.No.	Dimension	Packing Unit	Kg / Piece
E6-201/2	20 mm x 1/2"	10 pcs	0.068
E6-203/4	20 mm x 3/4"	10 pcs	0.080
E6-251/2	25 mm x 1/2"	10 pcs	0.073
E6-253/4	25 mm x 3/4"	10 pcs	0.092
E6-321/2	32 mm x 1/2"	5 pcs	0.081
E6-323/4	32 mm x 3/4"	5 pcs	0.093
E6-321	32 mm x 1"	5 pcs	0.260

Wall Mount Elbow

Art-.No.	Dimension	Packing Unit	Kg / Piece
E5-201/2	20 mm x 1/2"	10 pcs	0.072
E5-251/2	25 mm x 1/2"	10 pcs	0.079

Transition Elbow Male

Art-.No.	Dimension	Packing Unit	Kg / Piece
E7-201/2	20 mm x 1/2"	10 pcs	0.078
E7-203/4	20 mm x 3/4"	10 pcs	0.091
E7-251/2	25 mm x 1/2"	10 pcs	0.087
E7-253/4	25 mm x 3/4"	10 pcs	0.099
E7-323/4	32 mm x 3/4"	5 pcs	0.111
E7-321	32 mm x 1"	5 pcs	0.333

PRODUCT RANGE

Horizontal Wall Mount Group

Art-.No.	Dimension	Packing Unit	Kg / Piece
WM-20	20 mm x 1/2”	1 set	0.220
WM-25	25 mm x 1/2”	1 set	0.283

Vertical Wall Mount Group

Art-.No.	Dimension	Packing Unit	Kg / Piece
WM1-25	25 x 1/2"	2 pcs	0.183

Female Socket with Loose Nut

Art-.No.	Dimension	Packing Unit	Kg / Piece
AFN-201/2	20 x 1/2"	10 pcs	0.049
AFN-251/2	25 x 1/2"	10 pcs	0.051
AFN-253/4	25 x 3/4"	10 pcs	0.080
AFN-321	32 x 1"	5 pcs	0.180

Female Elbow with Loose Nut

Art-.No.	Dimension	Packing Unit	Kg / Piece
E6N-201/2	20 x 1/2"	10 pcs	0.0585
E6N-251/2	25 x 1/2"	10 pcs	0.064
E6N-253/4	25 x 3/4"	10 pcs	0.096
E6N-321	32 x 1"	5 pcs	0.209

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Concealed Ball Valve

Art-.No.	Dimension	Packing Unit	Kg / Piece
V9-25	25mm	1 pc	0.628
V9-32	32mm	1 pc	-

Stop Globe Valve

Art-.No.	Dimension	Packing Unit	Kg / Piece
V1-20	20 mm x 3/4"	1 pc	0.198
V1-25	25 mm x 3/4"	1 pc	0.207
V1-32	32 mm x 1"	1 pc	0.295
V1-40	40 mm x 1.1/4"	1 pc	0.549

Y Globe Valve

Art-.No.	Dimension	Packing Unit	Kg / Piece
SV-32	32mm	50	0.288

German Concealed Valve

Art-.No.	Dimension	Packing Unit	Kg / Piece
SF-32	32mm	75	0.16
SV-32	32mm	50	0.288

PRODUCT RANGE

Concealed Valve

Art-.No.	Dimension	Packing Unit	Kg / Piece
V2-20	20 mm x 3/4"	1 pc	0.410
V2-25	25 mm x 3/4"	1 pc	0.419
V2-32	32 mm x 1"	1 pc	0.433

German Concealed Valve

Art-.No.	Dimension	Packing Unit	Kg / Piece
V3-20	20 mm	1 pc	0.401
V3-25	25 mm	1 pc	0.411

Hidden Concealed Valve

Art-.No.	Dimension	Packing Unit	Kg / Piece
V7-20	20 mm	1 pc	0.297
V7-25	25 mm	1 pc	0.307
V7-32	32 mm	1 pc	0.378

Ball Valve

Art-.No.	Dimension	Packing Unit	Kg / Piece
BV-20	20 mm	1 pc	0.350
BV-25	25 mm	1 pc	0.500
BV-32	32 mm	1 pc	0.655
BV-40	40 mm	1 pc	0.900
BV-50	50 mm	1 pc	1.313
BV-63	63 mm	1 pc	2.530

PRODUCT RANGE

New Ball Valve

Art-.No.	Dimension	Packing Unit	Kg / Piece
BV1-25	25 mm	1 pc	0.575
BV1-32	32 mm	1 pc	0.583

Check Valve

Art-.No.	Dimension	Packing Unit	Kg / Piece
CV-25	25 mm	1 pc	0.645
CV-32	32 mm	1 pc	0.6505

Assembly PPR Non return Valve

Art-.No.	Dimension	Packing Unit	Kg / Piece
CVU-25	25 mm	50	0.493
CVU-32	32 mm	40	0.684

Concealed Valve Extension

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-V2-EXT		1 pc	0.099

PRODUCT RANGE

Brass Nipple Extenstion

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-EN10-1/2	10 mm X 1/2"	100 pcs	0.027
P-EN15-1/2	15 mm X 1/2"	100 pcs	0.034
P-EN20-1/2	20 mm X 1/2"	100 pcs	0.041
P-EN25-1/2	25 mm X 1/2"	100 pcs	0.048
P-EN30-1/2	30 mm X 1/2"	100 pcs	0.053
P-EN40-1/2	40 mm X 1/2"	100 pcs	0.079
P-EN50-1/2	50 mm X 1/2"	100 pcs	0.095

Angle Valve V8

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-V8-1/2	1/2" x 1/2"	1 pc	0.207

Angle Valve V5

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-V5-1/2	1/2" x 1/2"	1 pc	0.170

Angle Valve V6

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-V6-1/2	1/2" x 1/2"	1 pc	0.186

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RAKtherm Italian Shower Mixer

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-CSM1-2WAY	2 Way	1 pc	0.160
P-CSM2-1WAY	1 Way	1 pc	0.665
P-CSM2-2WAY	2 Way	1 pc	1.142

RAKtherm Italian Shat-taf

Art-.No.	Packing Unit	Kg / Piece
P-SHS-IT	1 pc	0.343

Brass Bib Cock 1/2"

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-BBC1-1/2	1/2"	1 pc	0.213

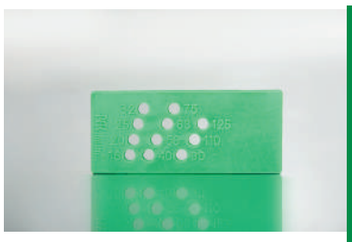
Brass Bib Cock 1/2" (Nickel Plated)

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-NBBC1-1/2	1/2"	1 pc	0.212

WE UNDERSTAND YOUR PLUMBING NEEDS

Proven technology tested and used by plumbers, widely accepted in various offices, hospitals, schools, hotels, residential, commercial applications , and industrial facilities.

Marking Tool



Art-.No.	Dimension	Packing Unit	Kg / Piece
WDT-20:110	20 - 110 mm	100 pcs	0.005

Welding Device

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-WD2-2063	20 - 63 mm	1 pc	6.090
P-WD2-110	75 - 110 mm	1 pc	7.000

Welding Tools

Art-.No.	Dimension	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

WELDING ACCESSORIES

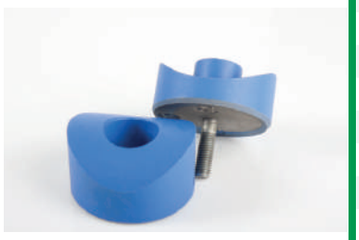
Electric Type Peeling Tools

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-WT3-25	25 mm	50 pcs	0.158
P-WT3-32	32 mm	50 pcs	0.234

Peeling Tools

Art-.No.	Dimension	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.	Dimension	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

Repair Pin

Art-.No.	Dimension	Packing Unit	Kg / Piece
RP-7:11	7 - 11 mm	1 pc	0.250

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Professional Pipe Cutter

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-PC-042	0 - 42 mm	1 pc	0.447

Pipe Cutter

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-PC1-042	0 - 42 mm	1 pc	0.420

Pipe Cutter

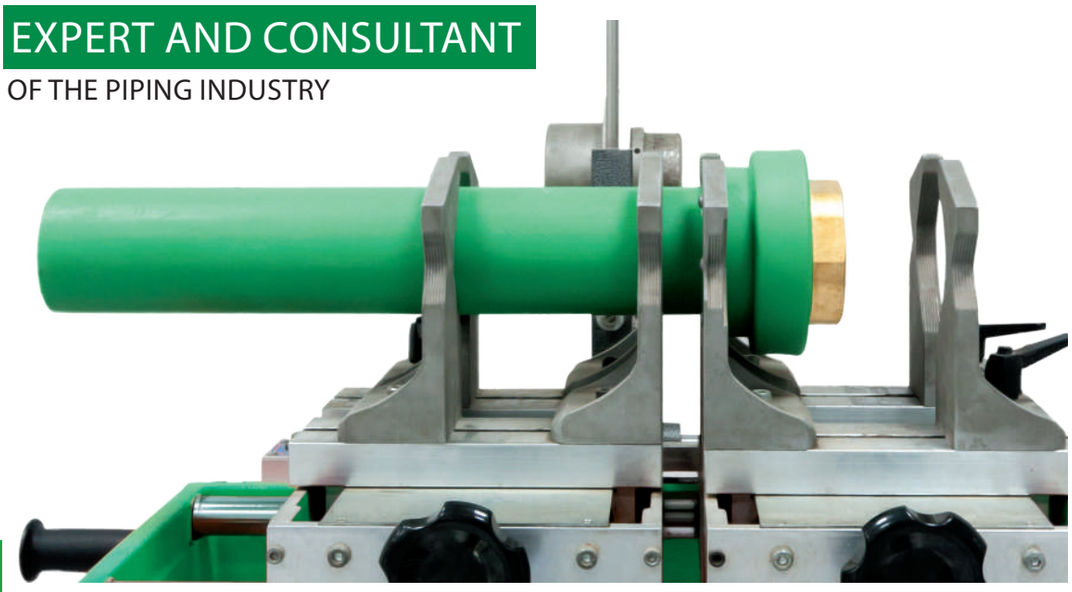
Art-.No.	Dimension	Packing Unit	Kg / Piece
P-PC-075	0 - 75 mm	1 pc	1.670

Pipe Cutter

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-PC2-50125	50 -125 mm	1 pc	1.600

EXPERT AND CONSULTANT

OF THE PIPING INDUSTRY



RAKTHERM UV SYSTEM

THE FIRST PPR PIPING SYSTEM INTEGRATED WITH ANTI-UV TECHNOLOGY

RAKtherm is versatile and comprehensive piping systems for water and other fluid delivery applications used for pressurized hot and cold water in modern residential, commercial, and industrial piping installations.

The creative solutions delivered by RAKtherm towards its' products makes them the global leader in the construction industry.

RAKtherm has proven its' high resilience even at the most extreme conditions; these factors and more makes RAKtherm as the ideal system for delivery of potable hot and cold water.

RAKtherm pipes and fittings are extensively used in food and medical industries owing to its' harmless and safe properties.

We came up to the new generation pipes to serve the continuous development and meet the demand of the construction industry.

PRODUCT RANGE

RAKTHERM IS A SPECIALIST IN HIGH-QUALITY PERFORMANCE DRIVEN PRODUCTS THAT COMPRISES A PRODUCT RANGE OF:

RAKtherm PPR (Polypropylene) Piping Systems:

- PPR pipes – PN10, PN16, PN20, and PN25
- Sizes from 20mm up to 110mm
- With widest range of brass fittings in sizes from 20mm up to 110mm
- Various accessories for PPR piping systems.

RAKtherm PEX (Cross linked Polyethylene) Piping Systems:

- PEX pipes, sizes from 16mm to 32mm
- PEX Aluminum Composite pipes, sizes from 16mm to 32mm
- With widest range of brass fittings for PEX, from sizes 16mm to 32mm
- Various accessories for PEX systems

The New Generation REINFORCED Piping Systems by RAKtherm

- RAKtherm Reinforced Fiber piping systems
- RAKtherm Reinforced Fiber-UV piping systems

RAKtherm Anti-UV Piping Systems:

- RAKtherm anti-UV pipes – PN20 and PN25. Sizes from 20mm up to 110mm
- RAKtherm anti-UV fittings – sizes from 20mm up to 110mm

FEATURES

THE CREATION OF RAKTHERM ANTI-UV FITTINGS WILL COMPLETE THE ENTIRE SELECTION OF ANTI-UV PIPING SYSTEMS!

With our expertise, we have mastered the pipe network analysis through comprehensive research and development to bring modern piping approach through innovation.

RAKtherm is a client-focused industry, and knowing the requirements of customers is imperative for us.

Modernization and technological globalization have redefined the piping industry; and RAKtherm utilizes its' technical expertise to provide a more comprehensive and knowledge dominant piping solutions giving a great contribution on the technological development in the piping history.

The creation of RAKtherm anti-UV fittings came up to supply the demand for outdoor piping applications; this will complete the entire selection of anti-UV piping systems of the industry.

And now, RAKtherm has introduced one of the very first integrated full systems with anti-UV protection for fittings. It will administer a full network of anti-UV pipes integrated with anti-UV fittings for maximum outdoor piping performance.

Our influential approach which redefined the piping service performance has initiated towards new level of excellence setting the highest standard of credibility and authenticity.

The Safest and Longest Lasting Piping Solution for Outdoor Applications

We have carefully blended and formulated our own PP-R resins (polypropylene-random), integrated with special technology of black anti-UV layer for higher resistance against UV sunlight. Absolutely free from heavy metals and toxic chemicals; proven to be non-toxic and chemically stable even at elevated temperature. This is the safest piping solution in the market excellent for outdoor applications of hot and cold water applications.

PP-R engineered with black anti-UV layer, is a material with excellent chemical resistance which does not react to most chemicals, with non-corrosive properties, proven to be physiologically and microbiologically harmless.

ENGINEERED FOR HIGHER LEVEL OF PIPING SOLUTION

RAKtherm anti-UV pipes and fittings is an ideal solution!

PP-R 80 is engineered with black anti-UV component were developed to withstand hot and cold water applications under extreme temperatures of 0°C to 90°C at service life of minimum 50 years. Therefore, RAKtherm anti-UV system is a superior piping solution for hot and cold water outdoor installations. The anti-UV black technology for lower linear expansion rate and contraction, that remains physically stable under controlled expansion.

FEATURES

RAKtherm anti-UV Pipes and Fittings are Engineered for:

- The reinforcement of special technology of aluminum black layer on pipes for anti-UV resistance properties excellent for outdoor applications.
- The revolutionary black component reduces expansion and contraction for longer piping service performance.
- To be mechanically stable even under extreme temperature conditions.
- A fully integrated piping network designed for maximum anti-UV resistance caused by the bad effects of UV sunlight.
- The longest-lasting piping solution with anti-UV properties available in the global piping market.

Features of RAKtherm anti-UV Pipes:

- 75% decreased linear expansion compared with the traditional piping systems.
- 20% increased higher flow rate for extra performance.
- Superior performance even at extreme applications.
- Ultimate impact strength for all installation conditions.
- Exceptional UV resistance for diverse water applications.
- Zero oxygen infiltration.

Features of RAKtherm anti-UV Fittings:

- No weak area of the piping applications will be affected by sunlight.
- The welding process is easy, the same with the normal PPR fittings.
- Protection life for more than 15 years.
- Tested, conformed, approved, and certified by German laboratory testing agencies.
- RAKtherm is the very first and the only manufacturer of anti-UV fittings that has been registered in German laboratory.

WELDING

RAKtherm's Welding Devices and Tools

Our welding devices and tools are equipped to establish proper fusion of pipes and fittings and get the benefit of full service warranty.

Assembly of the RAKtherm system is easily done by electric heating tools (threaded inserts), mounted on the RAKtherm welding device...a process called fusion welding.

Fusion Welding requires the heating of the pipe and its respective fitting socket simultaneously to the right fusion temperature. A homogeneous melt between two parts occurs and a uniform layer is formed. These parts are thereafter joined easily by inserting the male part into the female part. This combination is held in place till the parts cool down to ambient temperature and become one. This process is repeated throughout the network of pipes and fittings at the construction site and combined with other units until a closed efficient water delivery system is formed.

This technique permits joining to be carried out with simple equipment supplied by your local RAKtherm agent or representative. Needless to say, parts to be welded must have the same properties, and therefore, to avoid failures in the network and guarantee a long and trouble-free service life, never mix RAKtherm pipes or fittings with other brands.

It is widely acknowledged that, in order to establish a consistent and structurally sound joint, it is necessary to follow RAKtherm fusion welding preparation procedure. If the appropriate procedures are followed, contamination and disturbance effects that might weaken the fusion mechanism will be avoided.

RAKTHERM'S WELDING DEVICES EQUIPPED FOR PERFECT

FUSION OF PIPES & FITTINGS

RAKtherm®
Ultimate Piping Solutions

USING RAKTHERM WELDING DEVICE & TOOLS

- Only use original RAKtherm welding devices and welding tools to ensure proper fusion of pipes and fittings.
- Take out the device and other required equipment from the portable storage box.
- Before heating up the device, mount and fi nger tighten the threaded inserts so as to hold the tools firmly.
- Never install a tool in a location on the device which makes it extend outside the edge of the tongue of the device! Always place the larger size diameter tools on the inner positions of the welding device. This is especially true for diameters over 40 mm
- Plug in and switch on welding device. At this point,both thermostat and control lamps will light up. Adjust the thermostat to the correct fusion temperature at 26cFC. The thermo-stat lamp goes off when the temperature reaches the set temperature. Depending on the ambient temperature, the heating-up process should take between 5 to 25 minutes. Allow a few more minutes in extreme cold cases.
- Note that DVS-Welding Guidelines state that the temperature of the welding device has to be checked at its application area before starting the welding process or whenever a new tool is to be changed. It is recommended that this is done through the use of RAKtherm temp-pen or another qualified surface thermometer.
- Use an Allen Key to tighten up the tools. Do not use pliers or any other tools for this job. This can scratch or damage the stick-free coating on the device and insert.
- After finishing the welding process and the device has been switched off, wait until it has cooled down before reusing or storing it away.

WELDING GUIDELINES

Instruction set for installation of RAKtherm pipes and fittings

- Always keep the device in a dry and clean place. The device need to be used when completely dry.
- To avoid shock hazards, never use a device that has been exposed to water or other fluids or in rain. Moreover, never clean the device with water or handle the device with wet hands.
- Never use water to cool down the device temperature, even after it has been unplugged. This could damage the thermostat.
- It is necessary to maintain the device clean at all times, especially in the locations where the threaded inserts (tools) are mounted. Failure to do so may result in improper contact between the inserts and device, and a resulting ineffi cient heating of the inserts and inadequate welding thereof. Cleaning should be done with a paper or non fibrous cloth and alcohol.
- Durable and proper joining with the device can only be guaranteed when the tools and the tongue are assured of perfectly good condition. It is recommended to replace any defective device or tool.
- Never attempt to open a defective device. Let the expert hands of RAKtherm's engineers help in assessment of the device's qualification and if possible make the necessary repairs.
- Procedure for the application of temp-pen see in RAKtherm Technical Manual

HEATING OF RAKTHERM PIPES & FITTINGS

The following table depicts the general guidelines for heating of pipes and fittings for the purpose of welding according to DVS 2207 part 11.

LEARN THE WELDING TECHNIQUES

FROM THE EXPERTS!

TABLE 4.1: WELDING OF PP-R PIPES

Pipe External mm	Welding Depth mm	Heating Time sec.DVS	Welding Time Sec.	Cooling Time min.
20	14	5	4	2
25	15	7	4	2
32	16.5	8	6	4
40	18	12	6	4
50	20	18	6	4
63	24	24	8	6
75	26	30	8	8
90	29	40	8	8
110	32	50	10	8
125	40	60	10	8

When the outdoor temperature is below 5°C, the heating time according to DVS 2207 part 11 should be increased by 50%.

INSTRUCTIONS FOR WELDING OF RAKTHERM PIPES & FITTINGS

The welding machine is heated up to 260 °C (described in "Using RAKtherm Welding Device &Tools").

1. Use RAKtherm pipe cutter to cut the pipe. Make sure that a straight and clean pipe end results and not at a skewed angle. This is to ensure that the welding adheres to the right conditions.

   The joining process during RAKtherm fusion welding can be divided into three stages:

   Stage I: Initial heating and fitting expansion.

   Stage II: Heat soaking to create the joint.

   Stage III: Joint cooling.

   Note: Stages I and II are commonly termed 'fusion time'.

   For successful joining of pipes, at least three preparation stages must be followed:

   - Firstly, pipe ends must have properly fi nished squared ends as apposed to having a chamfered or broken edge. This ensures that the central cold zones come in full contact with the welding tools and proper heat conduction will accordingly be achieved. Before welding Stabi composite pipes peel-off the aluminum polypropylene layer completely.
   - Secondly, the pipe surfaces to be joined must be properly cleaned to remove contaminants and foreign material. Otherwise, any contamination on the pipe surface is retained at the joint interface, which can significantly reduce the strength of the joint.
   - Finally, the pipe and fitting should be clamped during welding to eliminate relative movement. This ensures that the molten polymer is allowed to fuse fully at the fusion interface, developing a strong joint.

2. Mark the welding depth with a pencil and measurement plate which are provided with the RAKtherm welding kit.

3. Enter the end of the pipe into the tool upto the marked depth without twisting it and simultaneously and also without twisting, push the fitting onto the heating tool,observing the general guidelines for heating up times outlined in table 4.1.

   Timing for heating should not start until the pipe and fitting reaches to the marked welding depth. Both fitting and pipe should be heated for a set time, known as the heating time. When heating time is complete, the pipe and fitting should be removed from the heating tool, and pressed together to the marked welding depth for a few seconds without twisting a homogeneous structure of the same material is thereupon formed.

   The major alignment should be done before insertion of the pipe and fitting. Use fusion time for minor alignment before fusion is complete and the assembled parts have cooled. Never mechanically stress the welding joint before cooling time.

   A cross-section of a properly welded RAKtherm joint will normally show a smooth transition between the two initial parts. This is because the components have uniformly melted and fused into each other to form one single piece.

   RAKtherm Electro Fusion coupling welding procedure please see in Technical Manual

INSTALLATION & INSTRUCTION FOR THE WELDING SADDLES
Use of RAKtherm welding saddles:

- Subsequent extension of existing pipe systems.
- Alternative use to tees, especially in maintenance and alteration jobs.
- Direct branching of a service line to a supply line

Preparation for welding

Mount the RAKtherm saddle welding tool to the welding machine. Once the tool is positioned, check that the surface temperature is in the range of 260 degree C (described in “Using RAKtherm welding Device & Tools”). Make sure that the surface to be welded is clean and dry.

Drill out the pipe at the welding point with a spiral drill bit. If necessary, clean the hole from any burrs. Caution is to be taken in drilling the correct depth and diameter see table 4.2. When drilling, make sure that the opposite pipe wall is not reached, otherwise, the pipe will be damaged.

After drilling, remove the remaining aluminum at the entrance of the hole with a chamfering device.

Heat up the pipe with the tool for 30 seconds. Subsequently, heat the saddle along with the external surface of the pipe for another 20 seconds, total of 50 sec for the pipe. Make a light pressure with the saddle on the tools. Make sure that the entire surface is in contact with the heating tool.

After finishing the heating phase, remove the welding unit and insert the welding saddle nozzle into the heated drilled pipe hole. Fix under light pressure, avoiding rotation for an additional 30 sec.

For RAKtherm Stabi pipe

The system may be exposed to full load after 15 minutes of welding.

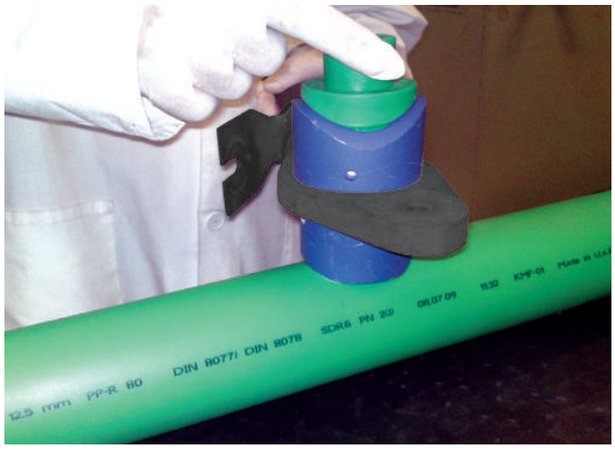


TABLE 4.2:

Saddle Art No.	Heating Time Pipe (sec.)	Heating Time Saddle (sec.)	Saddle Holding Holding Time (sec.)	Cooling Time (sec.)	Hole Diameter
SDS1-6325	30	20	20	30	20
SDS1-6332	30	20	20	30	25
SDS1-7525	30	20	20	30	20
SDS1-7532	30	20	20	30	25
SDS1-9025	30	20	20	30	20
SDS1-9032	30	20	20	30	25

INSTALLATION GUIDE

Complete installation guide with photo illustration for engineers and plumbers that leads through the easiest process of installation.

INTRODUCTION

Water service lines are connections that lead from the water mains to the building plumbing network. The service line consists of all pipes, valves, and fittings between the main water cabinet through the meter, and ending at the individual outlets or endpoints.

DIN 1988 Parts 1 &3 apply to drinking water supply systems inside buildings and their networks. It specifies requirements for design, installation, operation and maintenance of such systems in addition to alterations to these systems. It also gives particular attention to materials, components and appliances installed to supply a building with potable water. Designers and installers should make sure that only such required equipment and appliances are installed ensuring proper economic and technically qualified functioning of the system is maintained.

When installation is executed, RAKtherm instructions should be strictly followed. Additionally, the following must be readily available:

- A building site plan; engineering drawing of each floor including cellars (plan view), with simplified pipe work diagram and sectional drawings;
- Pipe sizing calculation in accordance with DIN 1988 part 3;
- A detailed pipe network diagram showing length of pipe runs,pipe nominal sizes, bore diameters, material, draw-off points (type, number and sizes or bore diameter), minimum flow pressure required, and the fitting group as defi ned in the of DIN 4109 series of standards, where necessary.

RAKTHERM PIPE JOINT ASSEMBLES

Pipes and pipe joint assemblies are designed for a minimum service life of 50 years, taking into account operating conditions (temperature, pressure and frequency of use) given in table 5.1. The system is operated at working temperatures and pressures higher than that given in the table; appropriate provisions should be made..

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& EASY INSTALLATIONS

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Ultimate Piping Solutions

TABLE 5.1
OPERATING CONDITIONS FOR PIPES & PIPE JOINT ASSEMBLIES

	Rnage of Working Pressure (fluctuating) in bar	Temperature in ^{0}C	Frequency of use (hours per year)
Cold water pipes	0 to 10	Up to 25*	8760
Hot water pipes	0 to 10	Up to 60*	8710

*Reference temperature for creep rupture strength: 20^{0}C.

PIPE JOINTS WITH THREADED FITTINGS

RAKtherm Pipe joint assemblies are designed to resist axial tension when properly supported. If such joints occur in buried pipe work, properly sized supports should be located at bends and branches to counter the hydraulic forces acting on these joints. Care should be taken to ensure that the designed system has unobstructed flow at joints and where changes of direction occurs. The streamlined design of RAKtherm threaded fittings, in compliance with DIN 2999 part 1, ensures that this is met.

GENERAL GUIDELINES FOR THE INSTALLATION OF PIPE WORK INSIDE BUILDINGS

- No pipe should be secured to another pipe or used as a support for other pipes.
- The arrangement of pipes should facilitate their identification. Mounting plates should be used where required.
- Pipes should be laid so as to prevent the formation of air locks. Where pipes are likely to suffer from frost damage,drainage fittings should be provided at the lowest points of the system.
- Where pipes are laid above one another, exposed cold water pipes should be on the lowest level in order to minimize the risk of condensation.
- Where a system provides water to two or more buildings, a riser should be installed in each building.
- Where draw-off points on a storey require backflow prevention but are not individually isolated (DIN 1988 part 4), the main branch pipe should branch off from the riser not less than 300 mm above the maximum possible water level on the storey.

TECHNICAL DEPARTMENT

Raktherm's highly competent technical department are ready to resolve all your sanitary problems 24/7.

LINEAR EXPANSION

Linear expansion of pipes is directly proportional to the heat subjected to the pipe material. Hence, cold water pipes have practically no linear expansion and could be neglected in the installation design. On the other hand, expansion of pipes is significant in warm water and heating installations and in extreme temperature varying environments, and therefore needs to be considered.

FORMULA FOR CALCULATION OF LINEAR EXPANSION

The linear expansion ΔL is calculated according to following formula:

$\Delta L = \alpha \bullet L \bullet \Delta T$

Where:

ΔL Expanded length (mm)

α Coeffi cient of linear expansion (mm/mK)

L Length of segment in (mm)

ΔL Temperature difference between working and installation

LINEAR EXPANSION CALCULATION EXAMPLE:

Assuming you need to calculate the expansion (ΔL) of a standard RAKtherm pipe segment (L) of 1.6 meters at a maximum working temperature of 70°C. You know that the RAKtherm standard pipe has a coeffi cient of linear expansion of (α = 0.15). You know that the installation was executed at the typical ambient temperature of 25°C.

$\Delta L = \alpha \bullet L \bullet \Delta L$ or $\Delta L = 0.15 * 1.6 * (70°C - 25°C) = 10.8$ mm

That means you can expect a linear expansion of 10.8 mm for this segment of pipe if the

temperature difference is respected.

Alternatively, you can quickly obtain the result from the following table for different

types of pipe:

LEARN FROM THE TEAM OF EXPERTS AT RAKTHERM'S

TECHNICAL DEPARTMENT

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TABLE 5.2: STANDARD PIPE LINEAR EXPANSION CHART (METERS)

ΔT(⁰X)**

	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
0.1	0.15	0.23	0.30	0.38	0.45	0.53	0.60	0.68	0.75	0.83	0.90	0.98	1.05	1.13	1.20
0.2	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25	2.40
0.3	0.45	0.68	0.90	1.13	1.35	1.58	1.80	2.03	2.25	2.48	2.70	2.93	3.15	3.38	3.50
0.4	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.30	3.60	3.90	4.20	4.50	4.80
0.5	0.75	1.13	1.50	1.88	2.25	2.63	3.00	3.38	3.75	4.13	4.50	4.88	5.25	5.63	6.00
0.6	0.90	1.35	1.80	2.25	2.70	3.15	3.60	4.05	4.50	4.95	5.40	5.85	6.30	6.75	7.20
0.7	1.05	1.58	2.10	2.63	3.15	3.68	4.20	4.73	5.25	5.78	6.30	6.83	7.35	7.88	8.40
0.8	1.20	1.80	2.40	3.00	3.60	4.20	4.80	5.40	6.00	6.60	7.20	7.80	8.40	9.00	9.60
0.9	1.35	2.03	2.70	3.38	4.05	4.73	5.40	6.08	6.75	7.43	8.10	8.78	9.45	10.13	10.80
1.0	1.50	2.25	3.00	3.75	4.50	5.25	6.00	6.75	7.50	8.25	9.00	9.75	10.50	11.25	12.00
2.0	3.00	4.50	6.00	7.50	9.00	10.50	12.00	13.50	15.00	16.50	18.00	19.50	21.00	22.50	24.00
3.0	4.50	6.75	9.00	11.25	13.50	15.75	18.00	20.25	22.50	24.75	27.00	29.25	31.50	33.75	36.00
4.0	6.00	9.00	12.00	15.00	18.00	21.00	24.00	27.00	30.00	33.00	36.00	39.00	42.00	45.00	48.00
5.0	7.50	11.25	15.00	18.75	22.50	26.25	30.00	33.75	37.50	41.25	45.00	48.75	52.50	56.25	60.00
6.0	9.00	13.50	18.00	22.50	27.00	31.50	36.00	40.50	45.00	49.50	54.00	58.50	63.00	67.50	72.00
7.0	10.50	15.75	21.00	26.25	31.50	36.75	42.00	47.25	52.50	57.75	63.00	68.25	73.50	78.75	84.00
8.0	12.00	18.00	24.00	30.00	36.00	42.00	48.00	54.00	60.00	66.00	72.00	78.00	84.00	90.00	96.00
9.0	13.50	20.25	27.00	33.75	40.50	47.25	54.00	60.75	67.50	74.25	81.00	87.75	94.50	101.30	108.00
10.0	15.00	22.50	30.00	37.50	45.00	52.50	60.00	67.50	75.00	82.50	90.00	97.50	105.00	112.50	120.00

**Difference between installation and working temperature (⁰C)

GRAPH 5.1 LINEAR EXPANSION CAUSED BY TEMPERATURE FOR RAKTHERM STANDARD PIPES

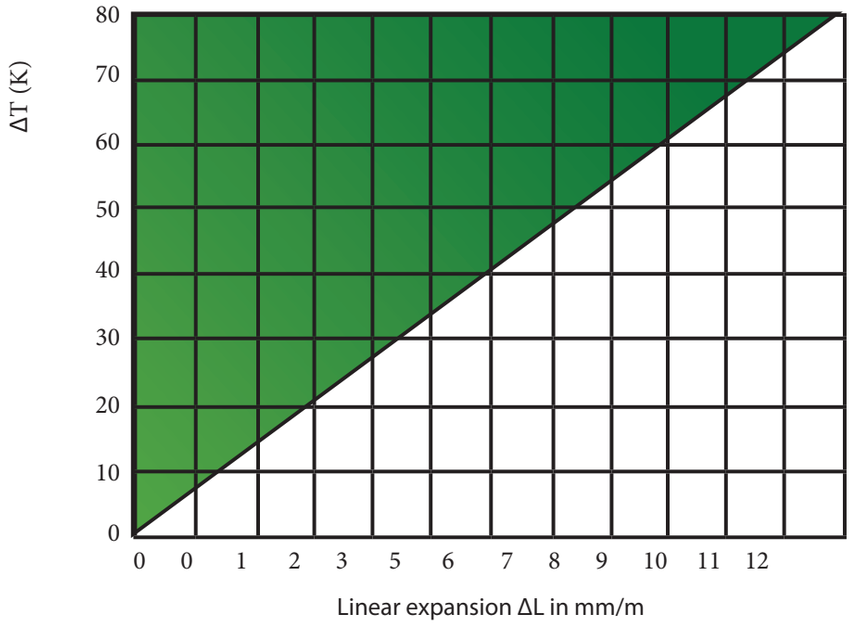


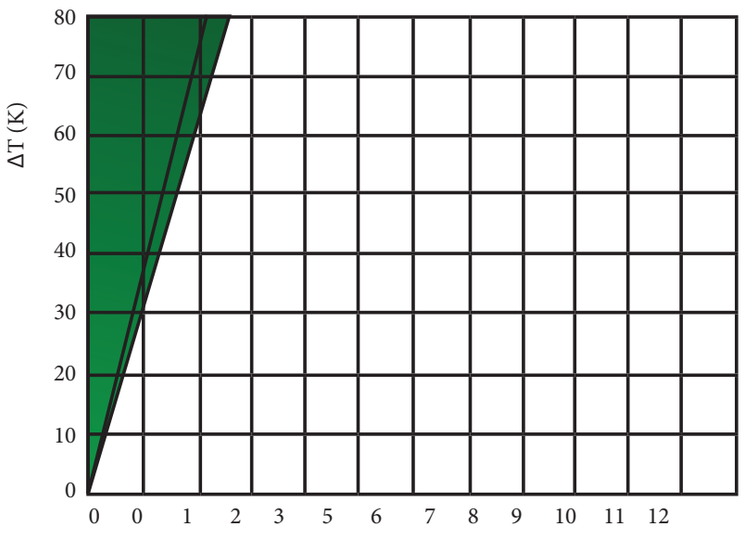
TABLE 5.3: STANDARD PIPE LINEAR EXPANSION CHART (METERS)

ΔT(⁰X)**

Length of segment (meters)	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
0.1	0.03	0.05	0.06	0.08	0.09	0.11	0.12	0.14	0.15	0.17	0.18	0.20	0.21	0.23	0.24
0.2	0.06	0.09	0.12	0.15	0.18	0.21	0.24	0.27	0.30	0.33	0.36	0.39	0.42	0.45	0.48
0.3	0.09	0.14	0.18	0.23	0.27	0.32	0.36	0.41	0.45	0.50	0.54	0.59	0.63	0.68	0.72
0.4	0.12	0.18	0.24	0.30	0.36	0.42	0.48	0.54	0.60	0.66	0.72	0.78	0.84	0.90	0.96
0.5	0.15	0.23	0.30	0.38	0.45	0.53	0.60	0.68	0.75	0.83	0.90	0.98	1.05	1.13	1.20
0.6	0.18	0.27	0.36	0.45	0.54	0.63	0.72	0.81	0.90	0.99	1.08	1.17	1.26	1.35	1.44
0.7	0.21	0.32	0.42	0.53	0.63	0.74	0.84	0.95	1.05	1.16	1.26	1.37	1.47	1.58	1.68
0.8	0.24	0.36	0.48	0.60	0.72	0.84	0.96	1.08	1.20	1.32	1.44	1.56	1.68	1.80	1.92
0.9	0.27	0.41	0.54	0.68	0.81	0.95	1.08	1.22	1.35	1.49	1.62	1.76	1.89	2.03	2.16
1.0	0.30	0.45	0.60	0.75	0.90	1.05	1.20	1.35	1.50	1.65	1.80	1.95	2.10	2.25	2.40
2.0	0.60	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00	3.30	3.60	3.90	4.20	4.50	4.80
3.0	0.90	1.35	1.80	2.25	2.70	3.15	6.30	4.05	4.50	4.95	5.40	5.85	6.30	6.75	7.20
4.0	1.20	1.80	2.40	3.00	3.60	4.20	4.80	5.40	6.00	6.60	7.20	7.80	8.40	9.00	9.60
5.0	1.50	2.25	3.00	3.75	4.50	5.25	6.00	6.75	7.50	8.25	9.00	9.75	10.50	11.25	12.00
6.0	1.80	2.70	3.60	4.50	5.40	6.30	7.20	8.10	9.00	9.00	10.80	11.70	12.60	13.50	14.40
7.0	2.10	3.15	4.20	5.25	6.30	7.35	8.40	9.45	10.50	11.55	12.60	13.65	14.70	15.75	16.80
8.0	2.40	3.60	4.80	6.00	7.20	8.40	9.60	10.80	12.00	13.20	14.40	15.60	16.80	18.00	19.20
9.0	2.70	4.05	5.40	6.75	8.10	9.45	10.80	12.15	13.50	14.85	16.20	17.55	18.90	20.25	21.30
10.0	3.00	4.50	6.00	7.50	9.00	10.50	12.00	13.50	15.00	16.50	18.00	19.50	21.00	22.50	24.00

**Difference between installation and working temperature (⁰C)

GRAPH 5.1 LINEAR EXPANSION CAUSED BY TEMPERATURE FOR RAKTHERM STANDARD PIPES



Please see the details of Linear expansion and Installation Types in RAKtherm Technical Manual

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INSULATION OF RAKTHERM PIPES

A major advantage of the use of polypropylene pipes is its low coefficient of conductivity. In other words, PP-R systems, in comparison to steel piping systems, offer superior insulating properties, and require much less insulation, if further heat loss is to be prevented.

insulating material should ensure that the water is maintained at the designed operating temperature. Legal and other obligations (in building regulations) should also be complied to.

The insulating effect is mainly a function of the thickness of insulation and its thermal conductivity. It increases in direct proportion to the temperature. Moisture can impair the performance of insulating material. Hence open cell and fibrous insulating materials should be supplemented with a vapor barrier attached to the outer surface of the insulation.

Condensation can form on any insulating material if the pipe carrying cold water is inadequately lagged. Furthermore, it can lead towards moisture penetrating to the pipe in case of using unsuitable materials. Obviously, closed cell material with a high moisture resistance should be used to insulate cold water pipes. All butt joints, cuts, and ends should be properly sealed.

Considering the areas where frost damage is common, even insulation would prove insufficient in preventing the freezing if the system is out of service. Pipes should hence be drained or protected.

INSULATION OF RAKTHERM PIPES FOR COLD WATER APPLICATIONS

For cold water, and according to the requirements of DIN 1988 part 2, insulation of pipes should be designed to adequately protect against condensation and moisture (See table 5.4).

TABLE 5.4: RAKTHERM RECOMMENDES MINIMUM INSULATION THICKNESS FOR COLD WATER PIPES.

Pipes Location	Insulation Thickness in mm, for = 0,040 W/(mk)*
Exposed pipes, in unheated room (eg. Cellar)	4
Exposed pipes, inheated room	9
Ducted pipes (cold water only)	4
Ducted pipes (cold & hot water)	13
Pipes in wall recess, next to hot pipes	13
Pipes on concrete floor	4

*For other values of the thickness is to be obtained by conversion, on the basis of pipe diameter of 20mm

Under required circumstances, cold water pipework should be adequately protected against condensation and sources of heat. The installation of cold water pipes should be done avoiding heat sources (hot pipes, chimneys, boilers), unless the pipes are equipped with proper insulation so as to retain the water temperature.

For residential applications, assuming normal service conditions, the insulation thickness specified in table 5.4 should be used. However, insulation will not provide permanent protection of the water against warmth.

The specifications of Technical Manual table 5.10 are also applicable where the protection against condensation on the outer surface of the insulation is concerned, assuming that the water temperature is 10 °C.

PROTECTION OF RAKTHERM HOT WATER PIPES AGAINST HEAT LOSS

The minimum requirements specified (Heating System Regulation) should be complied with for restricting the heat loss of hot water pipes.

RAKtherm pipes and fittings have to be protected by insulation to prevent heat loss. Pipes and fittings made of PP-R have heat conductivity constant of 0.15 W/mK. This indicates a significantly higher degree of self-insulation compared to metal pipes, meaning that in terms of heat transfer RAKtherm pipes and fittings offer superior natural insulating properties.

RAKTHERM PRESSURE TEST

RAKtherm pipes due to their material properties expand when subject to pressure, which influences the test result, this may also be affected by differences in temperature of pipe and test medium resulting from a high thermal expansion coefficient of the pipe material, a change of 0.5 to 1 bar. Thus, the test medium should be kept at constant temperature throughout the test acc to DIN 1988 TRWI the pressure test must be performed 1.5 times of the operating pressure. Using cold water, the pipe system should be filled slowly and bled completely using calibrated measuring instruments that indicate pressure changes of 0.1 bar wherever possible. Measurements should be taken at the lowest point of the pipe system.

Where pipes and fittings have been welded, the pressure test should not be performed before two hours have elapsed after the last welding operation.

THE PRESSURE TEST CONSISTS OF TWO STAGES:

For the first stage, a test pressure equal to the permissible working pressure plus 5 bar should be applied twice within 30 minutes at 10 minute intervals. Then the pressure should be checked. In case more than a 0.6 bar drop occurs over a period of 30 minutes at a rate of 0.1 bar/min, then a leakage is reported.

The second stage should follow the first stage without interval and should last minimum of 2 hours. Then the Pressure drop should be checked. If the pressure drop is more than 0.2 bar and the pipe work shows signs of leakage, then the network should be corrected and the test must be repeated.

TRANSPORT & STORAGE

During transportation and storage, RAKtherm piping system components could be exposed to open air at any temperature for short period of time provided that it is kept in the shade protected from direct sunlight. However, at temperature below 0°C, the material becomes more susceptible to damage if hard blows are delivered. Hence, at low temperature, the material has to be treated with more caution. It is not recommeded that RAKtherm pipes and fitting be stored in open air for long period of time.

Additionally, a solid base is recommended to avoid any deformation of pipes during transportation and storage. Even though RAKtherm pipes are extremely robust it is recommended to treat the material with care.

RAKTHERM PEX PIPING SYSTEM

Raktherm PEX Piping A wide range of plumbing and under floor-heating systems have been developed and produced by RAKTherm

INTRODUCTION

A wide range of plumbing and under - floor heating systems have been developed and produced by Gulf Plastics and Converting Industries (Tahweel) under the brand name of RAKtherm.

RAKTHERM PEX PIPING SYSTEMS ARE USED FOR:

- Domestic hot and cold water installations.
- Under - floor heating.
- Central heating.
- Air-conditioning systems.
- District heating.
- Automotive and ship-building.
- Transport of industrial gases, compressed air and fluids (Including fuel oil, gases, acids and alkalis)
- Process engineering and other specialized applications.
- Natural gas supply in extreme or ambient conditions.

CROSS-LINKED POLYETHYLENE (PE-X):

PE-X which stands for cross-linked (X) Polyethylene (PE), is a modified and condensed structure of the polyethylene molecule developed especially to improve its physical properties. PE-X systems can be used independently or can complement the equally wide range of PP-R system, produced and supplied by RAKtherm portfolio for sanitary product.

PEX PIPING SYSTEMS HIGHLY

DEVELOPED BY RAKTHERM

Cross linked polyethylene (PE-X) results from chemically adjoining polyethylene molecules in order to improve their properties especially at high temperatures. This results in a structure that does not soften when high temperature is applied, thus raising the thermal stability of the material under load, which greatly increases the environmental stress crack resistance and the resistance to slow crack growth due to deterioration of the material under continuous temperature use. The Molecule Structure of Polyethylene and Cross linked Polyethylene.

YOUR UNPARALLELED ADVANTAGE

When builders, contractors and homeowners choose RAKtherm PEX piping system, they are comforted to know that their plumbing system will last. The RAKtherm PEX piping system includes the highest quality raw materials and processing, and a strong, reliable fitting system, offering the following integrated advantages:

- Increased maximum operating temperature.
- Reduced deformation under load (creep).
- Outstanding resistance to slow-crack growth.
- Improved aging resistance.
- Improved chemical resistance.
- Increased abrasion resistance.
- Improved impact strength Reducing Raid Crack Propagation (RCP), even at low temperatures.
- No corrosion in the system, especially through the use of Multilayer and Aluminum Composite RAKtherm PEX piping system.

RESISTANCE TO TEMPERATURE

RAKtherm PEX piping system Cross linking polyethylene changes the polymer from a thermoplastic to a thermo setting polymer. Once it is fully cross linked, polyethylene tends not to melt but merely to become more flexible at higher temperatures. Low density polyethylene film grades which have been designed for medical applications.

For example, have been autoclaved at 130°C without losing their properties.Although high temperature resistance of RAKtherm PEX piping system makes it particularly suitable for hot and cold interior plumbing applications, it also makes an excellent underground water service piping.

The maximum continuous application temperature is 95°C. The permanent operating pressure is 10 bars at 70°C, which far exceeds any water delivery application.

In rare instances during the lifetime of the piping system and due to malfunctioning under abnormal circumstances in the installation, the highest temperature that can be withstood in the piping system for a short time during operation is 110 degrees celsius. This can be sustained for a maximum of 100 hours per 50 years.

RAKtherm PEX piping system piping system is designed for indoor and buried applications only and is not recommended for outdoor aboveground use. Short exposures to sunlight not to exceed 30 - 45 days are however permissible when storing RAKtherm PEX piping system. However, it is recommended that the pipes if stored outside be shielded from direct sunlight.

RAKTHERM PEX PIPING SYSTEM FEATURES

RESISTANCE TO CHEMICALS

The basic cross linked structure physically is resistant to the attack of aggressive chemicals. The material is thus rendered more resistant to permeation and softening by these chemicals.

RESISTANCE TO PRESSURE

RAKtherm PEX piping system cross linking improves the resistance to pressure at room temperature reducing tendency to creep. At high temperatures this is achieved by reducing relative molecular movement.

At elevated temperatures cross linking allows the properties of the original base polyethylene to be preserved. Moreover cross linked high density polyethylene which has closer packing of the chains and an intrinsically higher pressure resistance is used for higher pressure applications than cross linked low density polyethylene.

According to DIN 16892 standards and in order to meet the pressure regulations for flexible under floor heating pipes a minimum density of 0.935 to 0.940 is necessary.

As for hot sanitary water pipes which have to meet more stringent requirements, a minimum density of 0.945 to 0.950 is required. All RAKtherm PEX piping system cross linked polyethylene pipes have a density in excess of 0.95, and therefore meet or exceed DIN 16892 standards.

The following diagram shows the service life expectancy which depends on the installed system pressure and pressure changes. Under normal circumstances, however the service life expectancy of the pipes is more than 50 years.

RAKTHERM PEX PIPING SYSTEM

Technical Specification

Working Temperature (°C)	0-95
Peak Temperature at (°C)*	110
Max. Working Pressure (bar)	10
Coeff. of Thermal Expansion (mm/m°C)	0.026
Internal texture (in mm)	0.007
Thermal Conductivity (W/m°K)	0.340

RAKtherm pex Piping System for sanitary and heating systems, and floor radiating panel system.

(Max working temperature: 95°C)

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PEX Monolayer Pipes

Art-.No.	External Diameter (mm)	Wall Thickness (mm)	Internal Diameter (mm)
PX-1620	16 mm	2.0	12
PX-1622	16 mm	2.2	11.5
PX-2020	20 mm	2.0	16
PX-2022	20 mm	2.25	15.5
PX-2525	25 mm	2.5	20
PX-3230	32 mm	3	26

PEX Aluminum Composite Multilayer Pipes

Art-.No.	External Diameter (mm)	Wall Thickness (mm)	Internal Diameter (mm)
PML1-1620	16 mm	2.0	12
PML1-1622	16 mm	2.2	11.5
PML1-2020	20 mm	2.0	16
PML1-2022	20 mm	2.25	15.5
PML1-2525	25 mm	2.5	20
PML1-3230	32 mm	3	26

Pex EVOH Multilayer Pipe

Art-.No.	External Diameter (mm)	Wall Thickness (mm)	Internal Diameter (mm)
PXO-1620	16 mm	2.0	12
PXO-1622	16 mm	2.2	11.5
PXO-2020	20 mm	2.0	16
PXO-2022	20 mm	2.25	15.5
PXO-2525	25 mm	2.5	20
PXO-3230	32 mm	3	26

Pex Blue/Red Protective Sleeve

Blue		Red	
Art-.No.	Internal Diameter(mm)	Art-.No.	Internal Diameter(mm)
CP1-25	25	CP2-25	25
CP1-32	32	CP2-32	32
CP1-40	40	CP2-40	40

ADAPTERS

Manifold

Art-.No.	Dimension	Outlets
MF1/2-3/41/2	3/4" x 1/2"	2 Way
MF1/3-3/41/2	3/4" x 1/2"	3 Way
MF1/4-3/41/2	3/4" x 1/2"	4 Way
MF1/5-3/41/2	3/4" x 1/2"	5 Way
MF1/6-3/41/2	3/4" x 1/2"	6 Way

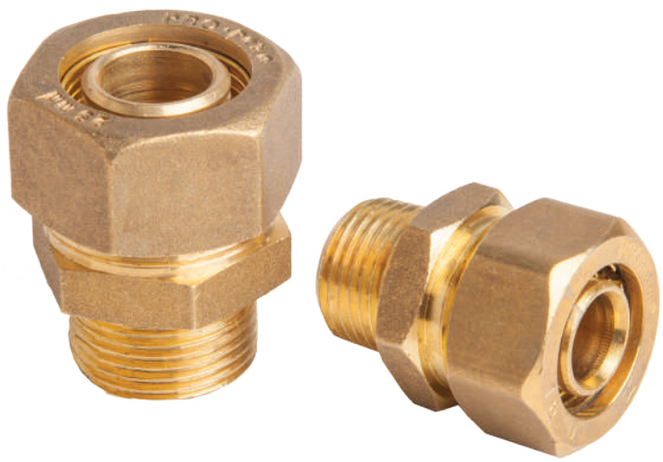
Art-.No.	Dimension	Outlets
MF2/2-11/2	1" x 1/2"	2 Way
MF2/3-11/2	1" x 1/2"	3 Way
MF2/4-11/2	1" x 1/2"	4 Way
MF2/5-11/2	1" x 1/2"	5 Way
MF2/6-11/2	1" x 1/2"	6 Way

Art-.No.	Dimension	Outlets
MF3/2-13/4	1" x 3/4"	2 Way
MF3/3-13/4	1" x 3/4"	3 Way
MF3/4-13/4	1" x 3/4"	4 Way
MF3/5-13/4	1" x 3/4"	5 Way
MF3/6-13/4	1" x 3/4"	6 Way

Art-.No.	Dimension	Outlets
MF4/2-11/43/4	1 1/4" x 3/4"	2 Way
MF4/3-11/43/4	1 1/4" x 3/4"	3 Way
MF4/4-11/43/4	1 1/4" x 3/4"	4 Way
MF4/5-11/43/4	1 1/4" x 3/4"	5 Way
MF4/6-11/43/4	1 1/4" x 3/4"	6 Way

PRODUCT RANGE

PEX Piping System designed to offer a very long service life, made under very strict quality control conditions, superior in mechanical and thermal performance showing very good resistance to crack propagation, notching, scratching, during stage, transport, and pipe installation.



RAKtherm®
Ultimate Piping Solutions

Male Adaptor

Art-.No.	Dimension
AMP1-161/2	16mm x 1/2"
AMP1-201/2	20mm x 1/2"
AMP1-253/4	25mm x 3/4"
AMP1-321	32mm x 1"

Female Adaptor

Art-.No.	Dimension
AFP1-161/2	16 mm x ½"
AFP1-201/2	20mm x 1/2"
AFP1-253/4	25mm x 3/4"
AFP1-321	32mm x 1"

Male Elbow

Art-.No.	Dimension
EM1-201/2	20mm x 1/2 "
EM1-253/4	25mm x 3/4 "
EM1-321	32mm x 1"

Male Coupling

Art-.No.	Dimension
MMC1-1/2	1/2"
MMC1-3/4	3/4"
MMC1-3/41/2	3/4"x1/2"
MMC1-1	1"
MMC1-11/4	11/4"

Pex union

Art-.No.	Dimension
P-PU2-161/2	16mm x 1/2

PRODUCT RANGE

Pex Female Adaptor

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-AFP2-161/2	16 x 1/2" x 2.2 mm	pc 300	0.072

Air Release Valve

Art-.No.	Dimension
ARV1-1/2	1/2"

END Plug

Art-.No.	Dimension
EP1- 1/2	1/2"
EP1- 3/4	3/4"
EP1-1	1"
EP1-11/4	11/4"

Female Elbow

Art-.No.	Dimension
EF2-201/2	20mm x 1/2 "
EF2-253/4	25mm x 3/4 "
EF2-321	32mm x 1"

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Pex Ball Valve with Union (Red)

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-V3-3/4R	3/4" x 3/4"	pc 48	0.332

Pex Ball Valve with Union (Blue)

Art-.No.	Dimension	Packing Unit	Kg / Piece
P-V3-3/4B	3/4" x 3/4"	pc 48	0.332

Ball Valve (Red/Blue)

Art-.No.	Dimension
RBV1-3/4	3/4"
RBV1-1	1"
RBV1-11/4	11/4"
RBV2-1/2	1/2"

Female Elbow with Box

Art-.No.	Dimension
EF1-161/2	16mm x 1/2"
EF1-201/2	20mm x 1/2"

NOTES :

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We exist to be a leader in everything we do!

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P.O.Box 30739, Al Jazira, Al-Hamra, Ras Al-Khaima, United Arab Emirates
Tel: +971 7 2447128 | Fax: +971 7 2447129 | Toll Free: 800 RAKTHERM (72584376)
Email: sales@raktherm.com | info@raktherm.com | Website: www.raktherm.com