ZPU MIĘDZYRZECZ SP. Z O.O. SYSTEM PREINSULATED PIPES FOR LOW TEMPERATURE UTILITIES FLEXIBLE PIPE SYSTEMS

M-Pex®

ZAKŁAD PRODUKCYJNO USŁUGOWY
Międzyrzecz
POLSKIE RURY PREIZOLOWANE
Sp. z o.o.

PL 66-300 Międzyrzecz, ul. Zakaszewskiego 4
phone: +48 95 741 25 26; 742 33 00; 742 00 93
fax: +48 95 742 18 36;742 33 01; 742 33 02
email: zpu@zpum.pl
web: http://www.zpum.pl

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1. GENERAL INFORMATIONS ON M-Pex® FLEXIBLE PREINSULATED PIPE SYSTEMS

M-Pex® flexible preinsulated pipes are used in the transmission of heating media and hot tap water from the source of their generation up to a reception point.

M-Pex® preinsulated pipes are capable to transmit media of a maximal working temperature of up to 90ºC and maximal working pressure of 1 MPa.

M-Pex® preinsulated pipes are manufactured within a range of Dz 25 and Dz 125 mm diameters of carrier pipes, in sections up to 360 m long. Sections longer than 12 m are coiled.

Flexible M-Pex® preinsulated pipes are a complex structure built up from one or two carrier pipes placed within a jacket pipe. The carrier pipe is made from high density polyethylene crosslinked after the Engel type A method. The thermal insulation which fills the space between the carrier pipe and the jacket pipe (or two carrier pipes) is made from semiflexible polyurethane foam, which permanently fixes the carrier pipe(s) to the jacket pipe. Semiflexible polyurethane foam used in M-Pex® pipes is foamed with cyclopentane. The jacket pipe is made from polyethylene of low or medium density prone to deformation.

The M-Pex® preinsulated pipe system is manufactured in two types. Type One has a flexible preinsulated pipe with a carrier pipe placed axially within a jacket pipe; Type Two has two carrier pipes placed within a single jacket pipe. Types One and Two are to be used in the transmission of both a heating medium and hot tap water. The diameters of carrier pipes in Type Two can be similar: to transmit a heating medium, or of different diameters: to transmit hot water where the return pipe is of a smaller diameter than the delivery pipe. The external diameter of the flexible carrier pipe which transmits a heating medium in central heating systems is covered with an anti-diffusion layer (EVAL) being a barrier stopping oxygen.

When being assembled, a M-Pex® system pipe is connected by means of collets for diameters not exceeding 50 mm; higher diameter pipes are connected by means of screwed metal unions. Unions are made from stainless materials. Metal unions are also used in laterals. Insulation and sealing of collets and screwed connections between straight sections or other components of the M-Pex® system is by means of NT type heat shrinkable unions, double-sealed, subsequently poured over with foaming agents in situ. Covered Y-piece laterals from high density polyethylene are used to insulate and seal lateral connections. Disarrangements in the polyurethane insulation are filled in by pouring in foaming agents on site.

2. MATERIALS USED IN THE MANUFACTURING OF M-Pex® SYSTEM

Carrier Pipe

The carrier pipe as used in the flexible system is made from high density polyethylene crosslinked after the Engel type A method, manufactured in compliance with the Standard PN-EN ISO 15875 – 1,2 and 5. The carrier pipe used to transmit a hot medium in central heating systems is additionally covered with an anti-diffusion (EVAL) layer compliant with DIN 4726.

Carrier pipes are to be used:

- to transmit hot water used for heating purposes or other media are pipes of a maximal working temperature of 90°C and maximal working pressure of 0.6 MPa;
- to transmit tap hot water are pipes of a maximal working temperature of 60°C and maximal working pressure of 0.6 MPa and 1.0 MPa;
- to transmit tap cold water are pipes of a maximal working temperature of 20°C and maximal working pressure of 1.0 MPa.

Pressures and temperatures for M-Pex® system preinsulated pipes in Series 1 (PN6) and Series 2 (PN10), including PEX pipe parameters applicable in various systems and accounting for temperature and work time distribution over a 50 year work time for a utility are presented in the table below.

M-Pex® Flexible preinsulated pipe working parameters							
Type of utility/PEX pipe series	max working pressure	Working temperature and time		Max temperature and time		Admissible failure temperature and working time	
	[bar]	T rob [ºC]	years	T max [ºC]	years	T awar[2)] [ºC]	h
Central heating utilities PEX pipes, Series 1 (PN6) – 6 bar	6	20 60 80[1)]	14 plus 25 plus 10	90	1	100	100
Central tap water utilities PEX pipes Series 2 (PN10) – 10 bar	10	60[1)]	49	80	1	95	100
Cold water systems PEX pipes, Series 2 (PN10) – 10 bar	10	20[1)]	50	---	---	---	---

- [1)] – temperatures assumed as calculated design values;
- [2)] – one-off continuous operation in failure mode should not exceed 3 hours;
- Working pressure:
  - central heating systems - ≤ 6 bar in accordance with "Wytyczne projektowania instalacji centralnego ogrzewania" [English: Guidelines on central heating installation designs]. Technical specifications by COBRTI INSTAL, Vol. 2, issued 08.2001
  - central heating systems - 10 ≤ bar, provided maximal pressure condition at collection points is observed ≤ 6 bar in compliance with PN-B-01706:1999/Az1
  - and compliant with "Warunki Techniczne Wykonania i Odbioru Sieci Wodociągowych" [English: Technical Conditions for Assembly and Acceptance of Water Systems]. Technical specifications by COBRTI INSTAL, Vol. 3, issued September 2001

Irrespective of the data presented in Technical Approval AT-15-7974/2015 the manufacturer declares that M-Pex® pipes meet the temperature requirements set out by standard DIN 16893. Permissible operating pressures for water flows; safety coefficient SF = 1.25

Temperature [°C]	Operating time [years]	Pipe series [S]			
		6,3	5	4	3,2
		Dimension series [SDR]			
		13,6	11	9	7,4
		Permissible operating pressure[2] [bar]			
10	1	14,2	17,9	22,5	28,3
	5	13,9	17,5	22,1	27,8
	10	13,8	17,4	21,9	27,6
	25	13,7	17,2	21,7	27,3
	50	13,6	17,1	21,5	27,1
	100	13,5	17,0	21,4	25,9
20	1	12,6	15,8	19,9	25,1
	5	12,3	15,5	19,6	24,6
	10	12,2	15,4	19,4	24,4
	25	12,1	15,2	19,2	24,2
	50	12,0	15,1	19,1	24,0
	100	11,9	15,0	18,9	23,8
30	1	11,1	14,0	17,7	22,3
	5	10,9	13,8	17,3	21,9
	10	10,8	13,7	17,2	21,7
	25	10,7	13,5	17,0	21,4
	50	10,6	13,4	16,9	21,3
	100	10,6	13,3	16,8	21,1
40	1	9,9	12,5	15,7	19,8
	5	9,7	12,2	15,4	19,4
	10	9,6	12,1	15,3	19,3
	25	9,5	12,0	15,1	19,1
	50	9,4	11,9	15,0	18,9
	100	9,4	11,8	14,9	18,7
50	1	8,8	11,1	14,0	17,7
	5	8,7	10,9	13,7	17,3
	10	8,6	10,8	13,6	17,2
	25	8,5	10,7	13,5	17,0
	50	8,4	10,6	13,4	16,8
	100	8,3	10,5	13,2	16,7
60	1	7,9	9,9	12,5	15,8
	5	7,7	9,7	12,3	15,5
	10	7,7	9,7	12,2	15,3
	25	7,6	9,5	12,0	15,2
	50	7,5	9,5	11,9	15,0
70	1	7,1	8,9	11,2	14,1
	5	6,9	8,7	11,0	13,8
	10	6,8	8,6	10,9	13,7
	25	6,8	8,5	10,8	13,6
	50	6,7	8,5	10,7	13,4
80	1	6,3	8,0	10,0	12,7
	5	6,2	7,8	9,8	12,4
	10	6,1	7,7	9,8	12,3
	25	6,1	7,6	9,6	12,1
90	1	5,7	7,2	9,0	11,4
	5	5,6	7,0	8,8	11,1
	10	5,5	6,9	8,8	11,0
	(15)[1]	(5,5)[1]	(6,9)[1]	(8,7)[1]	(11,0)[1]
95	1	5,4	6,8	8,6	10,8
	5	5,3	6,6	8,4	10,6
	(10)[1]	(5,2)[1]	(6,6)[1]	(8,3)[1]	(10,5)[1]

[1] Values in brackets are true for tests at 110°C lasting for more than one year
[2] The calculations account for two significant digits after the decimal point; the second being not rounded off, the remaining dropped

Permissible operating pressures for water flows; safety coefficient SF = 1.5

Temperature [°C]	Operating time [years]	Pipe series [S]			
		6,3			6,3
		Dimension series [SDR]			
		13,6			13,6
		Permissible operating pressure[2] [bar]			
10	1	11,8	14,9	18,7	23,6
	5	11,6	14,6	18,4	23,2
	10	11,5	14,5	18,3	23,0
	25	11,4	14,4	18,1	22,8
	50	11,3	14,2	17,9	22,6
	100	11,2	14,1	17,8	22,4
20	1	10,5	13,2	16,6	20,9
	5	10,3	12,9	16,3	20,5
	10	10,2	12,8	16,2	20,4
	25	10,1	12,7	16,0	20,1
	50	10,0	12,6	15,9	20,0
	100	9,9	12,5	15,7	19,8
30	1	9,3	11,7	14,7	18,5
	5	9,1	11,5	14,4	18,2
	10	9,0	11,4	14,3	18,1
	25	8,9	11,3	14,2	17,9
	50	8,9	11,2	14,1	17,7
	100	8,8	11,1	14,0	17,6
40	1	8,2	10,4	13,1	16,5
	5	8,1	10,2	12,8	16,2
	10	8,0	10,1	12,7	16,1
	25	7,9	10,0	12,6	15,9
	50	7,9	9,9	12,5	15,7
	100	7,8	9,8	12,4	15,6
50	1	7,3	9,3	11,7	14,7
	5	7,2	9,1	11,4	14,4
	10	7,1	9,0	11,3	14,3
	25	7,1	8,9	11,2	14,1
	50	7,0	8,8	11,1	14,0
	100	6,9	8,8	11,0	13,9
60	1	6,6	8,3	10,4	13,1
	5	6,4	8,1	10,2	12,9
	10	6,4	8,0	10,1	12,8
	25	6,3	7,9	10,0	12,6
	50	6,2	7,9	9,9	12,5
70	1	5,9	7,4	9,3	11,8
	5	5,7	7,3	9,1	11,5
	10	5,7	7,2	9,1	11,4
	25	5,6	7,1	9,0	11,3
	50	5,6	7,0	8,9	11,2
80	1	5,3	6,6	8,4	10,5
	5	5,2	6,5	8,2	10,3
	10	5,1	6,4	8,1	10,2
	25	5,0	6,4	8,0	10,1
90	1	4,7	6,0	7,5	9,5
	5	4,6	5,8	7,4	9,3
	10	4,6	5,8	7,3	9,2
	(15)[1]	(4,6)[1]	(5,7)[1]	(7,3)[1]	(9,1)[1]
95	1	4,5	5,7	7,1	9,0
	5	4,4	5,5	7,0	8,8
	(10)[1]	(4,3)[1]	(5,5)[1]	(6,9)[1]	(8,7)[1]

[1] Values in brackets are true for tests at 110°C lasting for more than one year
[2] The calculations account for two significant digits after the decimal point; the second being not rounded off, the remaining dropped

Specifications PEX pipe material to be used in the M-Pex® system.

Table No. 1

Quality	Unit	Value
Density	kg/m^3	930
Tensile strength 20°C 80°C 140°C	%	 ≥ 400 ≥ 400 ≥ 250
Thermal expansion coefficient 20°C 100°C	K^{-1}	 $1,4 \times 10^{-4}$ $2,0 \times 10^{-4}$

Thermal insulation

The thermal insulation which fills the space between the carrier pipe(s) and the jacket pipe is made from semiflexible polyurethane foam. Semiflexible polyurethane foam used in M-Pex® pipes is foamed with cyclopentane. M-Pex® pipe thermal insulation requirements are presented below.

Table No. 2

foaming agent		cyclopentane
thermal conductivity coefficient density compression strength	λ_{50} [W/mK] [kg/m^3] [MPa]	max 0,029 min. 50 min. 0,1
thermal resistance	[°C]	> 130
water absorbing power	[%]	< 10
closed cell content	[%]	> 88

Jacket pipe (casing pipe)

The jacket pipe is made from polyethylene of the density no lower than 915 kg/m3 and the flow rate coefficient (MFR) not exceeding 1.4 g/10 min (190°C – 5 kg).

Inside the jacket has an antidifussion layer which counteracts unfavourable exchange of gases within the insulation foam layer.

3. SELECTION OF PIPELINES DIAMETERS.

Thermal loads for carrier pipe diameters.

Medium flow speed not exceeding 1 m/s. For speeds 2 m/s double the values.

External diameter Dz	25	32	40	50	63	75	90	110
ΔT = 20°C (90°C - 70°C) at speed v=1 m/s								
kW	25	44	69	110	173	246	356	533
ΔT = 25°C (90°C - 65°C) at speed v=1 m/s								
kW	31	56	87	137	217	308	445	666
ΔT = 30°C (90°C - 60°C) at speed v=1 m/s								
kW	38	67	104	165	260	370	534	800
ΔT = 35°C (90°C - 55°C) at speed v=1 m/s								
kW	44	78	121	193	303	432	623	933
ΔT = 40°C (90°C - 50°C) at speed v=1 m/s								
kW	50	89	140	220	346	494	712	1066

4. M-Pex® PIPE LAYING GENERAL PRINCIPLES

M-Pex® pipes are to be laid down directly in ground on a sand bedding layer and sand surround. The thickness of bedding and surround layers and sand grade should be as specified by the current "Manual of Assembly Take-over and Acceptance" for buried preinsulated utilities made from ZPU Międzyrzecz Sp. z o.o. system components.

M-Pex® utilities are routed, designed and assembled virtually without compensators due to the materials used. Neither natural bends are required to make up for thermal elongation within straight sections, nor bellow compensators are necessary. Sections of a utility have to be routed in straight lines providing that the so called sine compensation is maintained, at least in horizontal planes.

The minimal bending radii for the whole range of diameters are between 0.7 and 1.4 m depending on the diameter of the carrier pipe.

5. CARRIER AND JACKET PIPE CROSS SECTIONS.

The following carrier and jacket pipes are used in the manufacturing of M-Pex® *ZPU Międzyrzecz Sp. z o.o.* system pipes and fittings.

Table No. 3

PEX Carrier Pipe (per DIN 16892/93)				PE Casing Pipe (per PN-EN 253)	
PN 6/90°C		PN 10/60°C			
Dz	g	Dz	g	Dzp	g
mm	mm	mm	mm	mm	mm
25 +0,3	2,3 +0,4	25 +0,3	3,5 +0,5	75 $^{-1,5}/_{+1,5}$	2,0 $^{+0,7}$
32 +0,3	2,9 +0,4	32 +0,3	4,4 +0,6	75 $^{-1,5}/_{+1,5}$	2,0 $^{+0,7}$
40 +0,4	3,7 +0,5	40 +0,4	5,5 +0,7	90 $^{-1,8}/_{+1,8}$	2,0 $^{+0,7}$
50 +0,5	4,6 +0,6	50 +0,5	6,9 +0,8	110 $^{-2,2}/_{+2,2}$	2,2 $^{+0,7}$
63 +0,6	5,8 +0,7	63 +0,6	8,6 +1,0	125 $^{-2,5}/_{+2,5}$	2,2 $^{+0,7}$
75 +0,7	6,8 +0,8	75 +0,7	10,3 +1,2	140 $^{-2,8}/_{+2,8}$	2,5 $^{+0,8}$
90 + 0,9	8,2 +1,0	90 + 0,9	12,3 +1,4	160 $^{-3,2}/_{+3,2}$	2,5 $^{+0,8}$
110 +1,0	10,0 +1,1	110 +1,0	15,1 +1,7	180 $^{-3,6}/_{+3,6}$	2,5 $^{+0,8}$
125 +1,2	11,4 +1,3	125 +1,2	17,1 +1,9	180 $^{-3,6}/_{+3,6}$	2,5 $^{+0,8}$

Dz, Dzp – external diameters
g – wall thickness

Carrier and jacket (casing) pipes are collated in tables 4, 5, 6 and 7.

6. QUALITY ASSURANCE SYSTEM.

ZPU Międzyrzecz Sp. z o.o. system materials and preinsulated products are manufactured in accordance with the Quality*Environment management system implemented and compliant with standard **PN-EN ISO 9001:2009** and **PN-EN ISO 14001:2005.**

The quality management system entails: designing, developmental works, manufacturing processes, supplies and assembly of ZPU Międzyrzecz Sp. z o.o. system pipes and fittings.

ZPU Międzyrzecz Sp. z o.o. was awarded **Certificate of Quality*Environment Management System No. JS – 124/5/2013**, recognising the compatibility of the Integrated Quality Management System Quality*Environment used in our Company and the requirements of **PN-EN ISO 9001:2009** and **PN-EN ISO 14001:2005.**

7. INFORMATION ON OTHER PRODUCTS.

The manufacturing offer ZPU Międzyrzecz Sp. z o.o. also comprises:

- polyethylene pipes class **PE100** – dark blue to be used in water mains available in diameters between 20 and 1200 mm, in the following SDR dimension series: SDR 7.4; SDR9; SDR11; SDR13.6; SDR17; SDR17.6; SDR21; SDR26; SDR27.6; SDR33 and SDR41, supplied in straight sections 12 m long (for diameters between Ø 75 mm ÷ Ø 1200 mm), and coiled up in lengths of up to 200 m (pipes of diameters between Ø 25 mm ÷ Ø 110 mm), or in other lengths as agreed with the customer;
- polyethylene pipes class **PE100** – black to be used in sewer systems available in diameters between 32 and 1200 mm, in the following SDR dimension series: SDR 7.4; SDR9; SDR11; SDR13.6; SDR17; SDR17.6; SDR21; SDR26; SDR27.6; SDR33 and SDR41, supplied in straight sections 12 m long (for diameters between Ø 75 mm ÷ Ø 1200 mm), and coiled up in lengths of up to 200 m (pipes of diameters between Ø 25 mm ÷ Ø 110 mm) or in other lengths as agreed with the customer;
- culvert polyethylene pipes, available in diameters between Ø 50 mm up to Ø 1000 mm, supplied in straight sections 12 m long or as agreed with the customer;
- casing pipes available in diameters between Ø 75 mm up to Ø 1200 mm;
- pipes, fittings and preinsulated fixtures to be used in buried thermal utilities as specified in the Preinsulated Product Catalogue;
- standard slip-on sleeves in diameters between Ø 83 and Ø 472 mm;
- heat shrinkable slip-on sleeves and DX-type electrically welded joints to be used in thermally insulated joints;
- preinsulated pipes with polyethylene carrier pipes (diameters agreed with the customer);
- **SPIRO-type** preinsulated pipes and fittings (as specified in the SPIRO Pipe Catalogue);
- preinsulated pipes to be used in water steam delivery lines.

8. FLEXIBLE PREINSULATES PIPES.

8.1. Single M-Pex® MR-6/I-type pipes

PN6/90° C to transmit a heating medium (central heating or hot tap water)

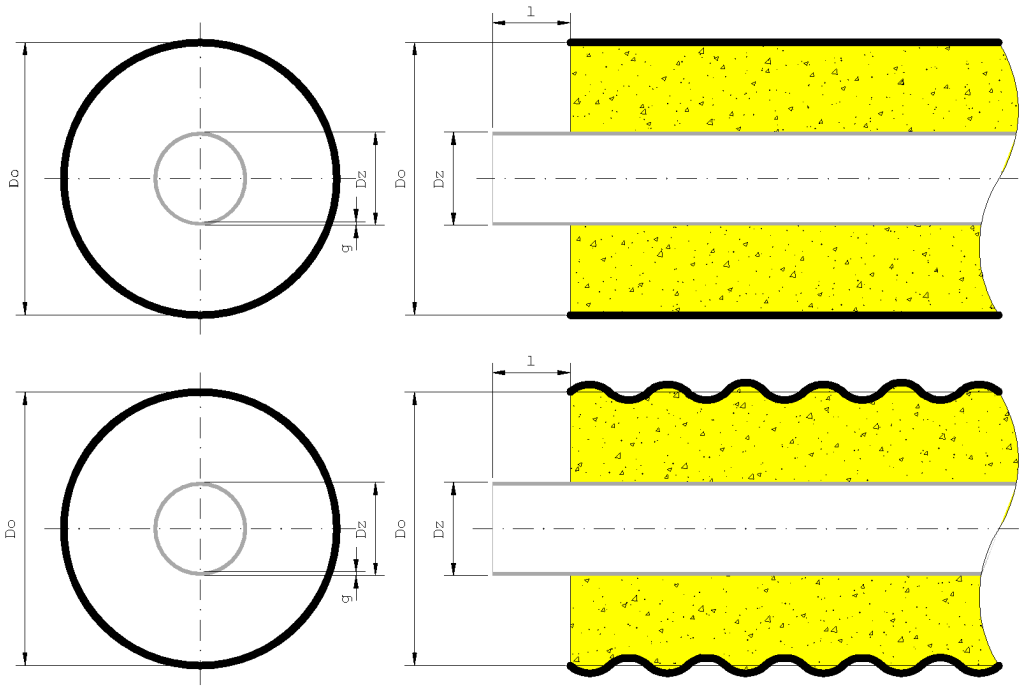


Table No. 4

Dimensions			Maximal lenght coiled	Minimal bending radius „r"	Weight without water	**Catalogue reference number**
Internal pipe [SDR 11 S 5]		External pipe				
ø Dz	Wall thickness [g]	ø Do				
mm	*mm*	*mm*	*m*	*m*	*kg/m*	
25	2,3	75	360	0,7	0,95	**MR-6/I-25**
32	2,9	75	360	0,7	1,05	**MR-6/I-32**
40	3,7	90	250	0,8	1,40	**MR-6/I-40**
50	4,6	110	150	0,95	2,10	**MR-6/I-50**
63	5,8	125	100	1,05	2,75	**MR-6/I-63**
75	6,8	140	100	1,15	3,60	**MR-6/I-75**
90	8,2	160	80	1,3	4,70	**MR-6/I-90**
110	10,0	180	70	1,4	6,25	**MR-6/I-110**
125	11,4	180	50	1,4	6,75	**MR-6/I-125**
Alternatively – pipes with diameters Dz 90, 110 and 125 in corrugated casing pipe						
90	8,2	160	80	1,3	4,70	**MRK-6/I-90**
110	10,0	180	70	1,4	6,25	**MRK-6/I-110**
125	11,4	180	50	1,4	6,75	**MRK-6/I-125**

8.2. M-Pex® MR-6/II-type Double pipes

PN 6/90°C to transmit a heating medium (central heating or hot tap water)

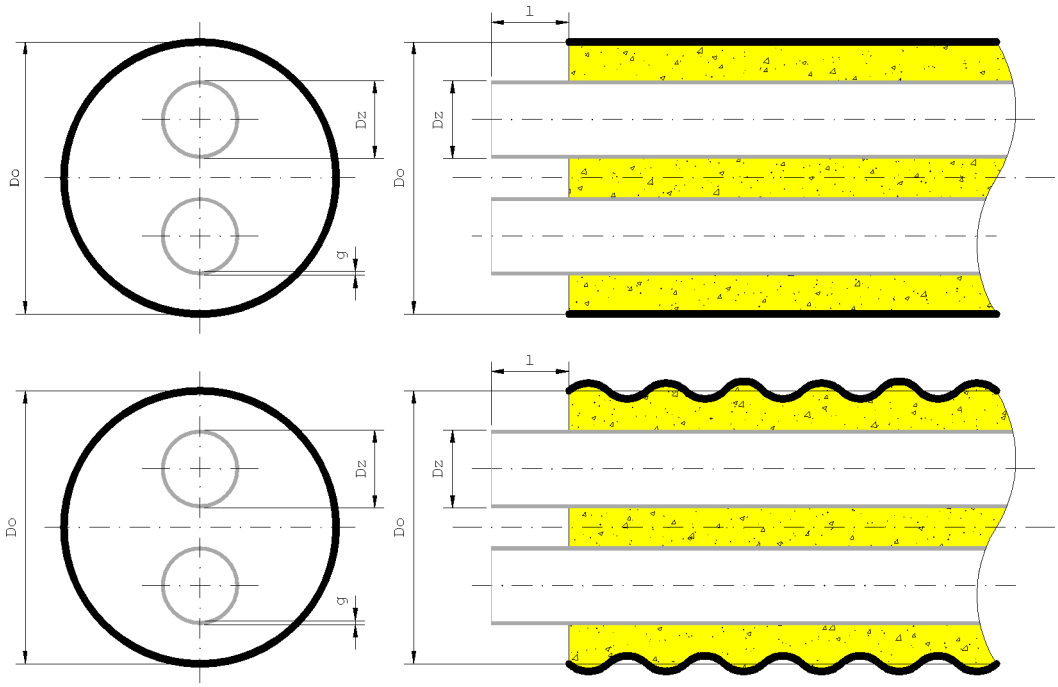


Table No. 5

Dimensions			Maximal lenght coiled	Minimal bending radius „r"	Weight without water	**Catalogue reference number**
Internal pipe [SDR 11 S 5]		External pipe				
ø Dz	Wall thickness [g]	ø Do				
mm	*mm*	*mm*	*m*	*m*	*kg/m*	
2x25	2,3	90	250	0,8	1,35	**MR-6/II-25+25**
2x32	2,9	110	150	0,95	2,00	**MR-6/II-32+32**
2x40	3,7	125	100	1,05	2,60	**MR-6/II-40+40**
2x50	4,6	160	80	1,3	4,10	**MR-6/II-50+50**
2x63	5,8	180	70	1,4	5,40	**MR-6/II-63+63**
Alternatively – pipes with diameters Dz 2x50 and 2x63 in corrugated casing pipe						
2x50	4,6	160	80	1,3	4,10	**MRK-6/II-50+50**
2x63	5,8	180	70	1,4	5,40	**MRK-6/II-63+63**

8.3. M-Pex MR-10/I-Type Single pipe

PN 10/60°C to transmit cold and hot tap water

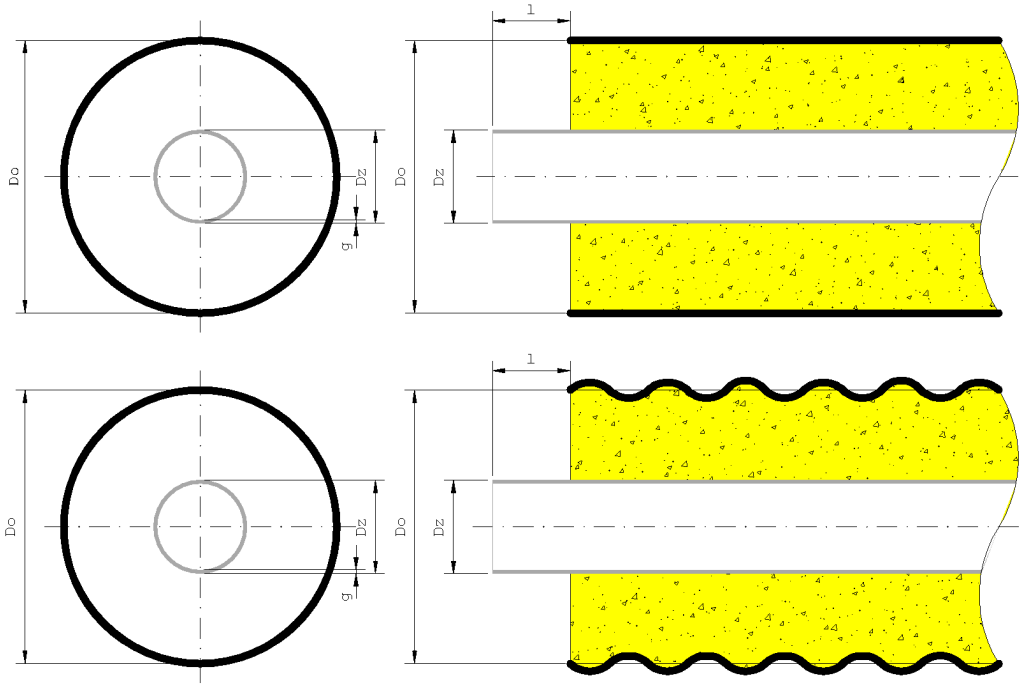


Table No.6

Dimensions			Maximal lenght coiled	Minimal bending radius „r"	Weight without water	**Catalogue reference number**
Internal pipe [SDR 7,4 S 3,2]		External pipe				
ø Dz	Wall thickness [g]	ø Do				
mm	*mm*	*mm*	*m*	*m*	*kg/m*	
25	3,5	75	360	0,7	0,95	**MR-10/I-25**
32	4,4	75	360	0,7	1,05	**MR-10/I-32**
40	5,5	90	250	0,8	1,40	**MR-10/I-40**
50	6,9	110	150	0,95	2,10	**MR-10/I-50**
63	8,6	125	100	1,05	2,75	**MR-10/I-63**
75	10,3	140	100	1,15	3,91	**MR-10/I-75**
90	12,3	160	80	1,3	5,39	**MR-10/I-90**
110	15,1	180	70	1,4	6,86	**MR-10/I-110**
125	17,1	180	12	1,4	7,15	**MR-10/I-125**
Alternatively – pipes with diameters Dz 90, 110 and 125 in corrugated casing pipe						
90	12,3	160	80	1,3	5,39	**MRK-10/I-90**
110	15,1	180	70	1,4	6,86	**MRK-10/I-110**
125	17,1	180	50	1,4	7,15	**MRK-10/I-125**

8.4. M-Pex MR-10/II-type Double Pipes - Version 1

PN 10/60°C to transmit hot tap water or to be used in central heating systems

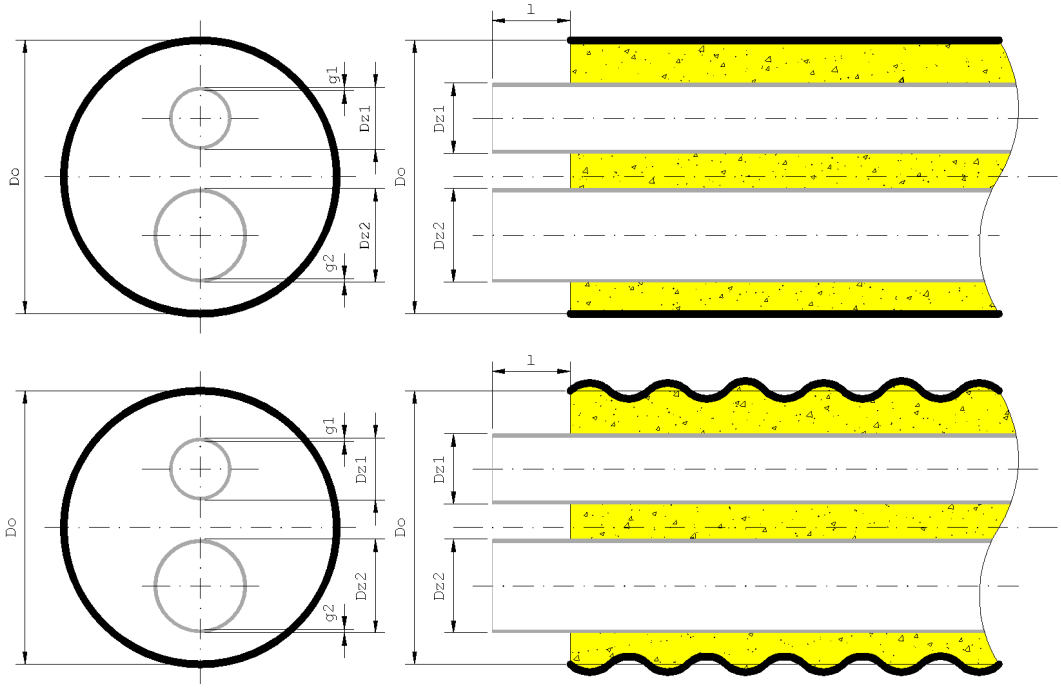


Table No.7

Dimensions					Maximal lenght coiled	Minimal bendig radius „r"	Weight without water	**Catalogue reference number**
Internal pipes [SDR 7,4 S 3,2]				External pipes				
ø Dz2	ø Dz1	Wall thickness		ø Do				
		g2	g1					
mm		*mm*		*mm*	*m*	*m*	*kg/m*	
25	20	3,5	2,8	90	250	0,8	1,40	**MR-10/II-25+20**
32	20	4,4	2,8	110	150	0,95	2,00	**MR-10/II-32+20**
40	25	5,5	3,5	125	100	1,05	2,60	**MR-10/II-40+25**
50	32	6,9	4,4	140	100	1,15	3,50	**MR-10/II-50+32**
63	32	8,6	4,4	160	80	1,3	4,50	**MR-10/II-63+32**
Alternatively – pipes with diameters Dz 63 + 32 in corrugated casing pipe								
63	32	8,6	4,4	160	80	1,3	4,50	**MRK-10/II-63+32**

8.5. M-Pex MR-10/II-type Double Pipes - Version 2

PN 10/60°C to transmit hot tap water

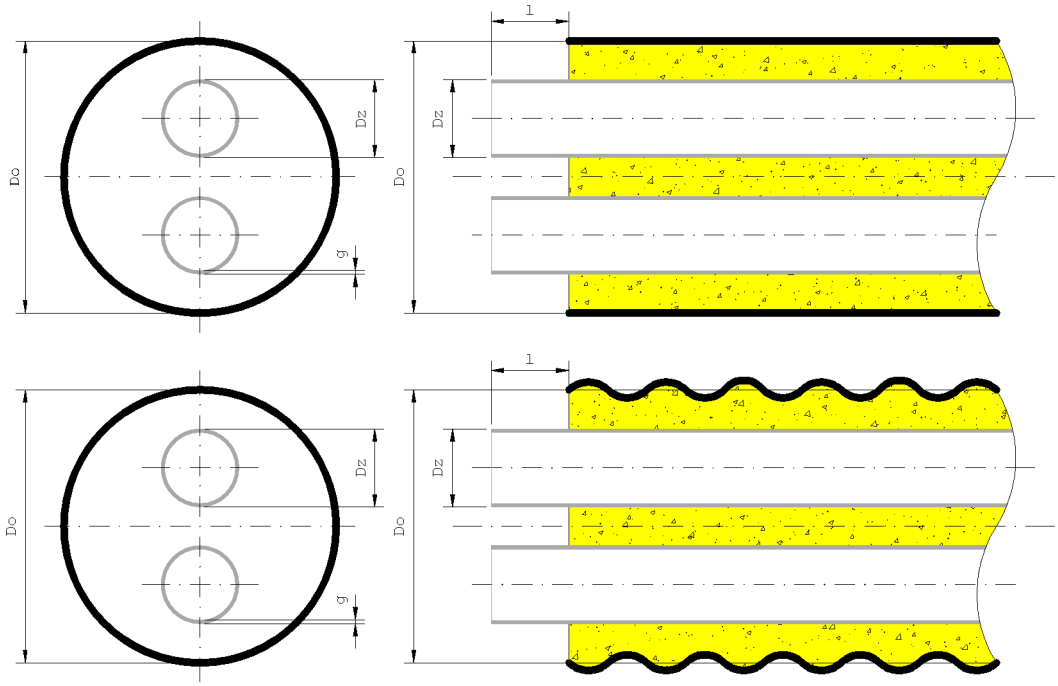


Table No.8

Dimensions			Maximal lenght coiled	Minimal bending radius „r"	Weight without water	**Catalogue reference number**
Internal pipe [SDR 7,4 S 3,2]		External pipe				
ø Dz	Wall thickness [g]	ø Do				
mm	*mm*	*mm*	*m*	*m*	*kg/m*	
2x25	3,5	90	250	0,8	1,35	**MR-10/II-25+25**
2x32	4,4	110	150	0,95	2,00	**MR-10/II-32+32**
2x40	5,5	125	100	1,05	2,60	**MR-10/II-40+40**
2x50	6,9	160	80	1,15	4,10	**MR-10/II-50+50**
2x63	8,6	180	70	1,3	5,40	**MR-10/II-63+63**
Alternatively – pipes with diameters DN 2x50 and 2x63 in corrugated casing pipe						
2x50	6,9	160	80	1,15	4,10	**MRK-10/II-50+50**
2x63	8,6	180	70	1,3	5,40	**MRK-10/II-63+63**

9. M-Pex® SYSTEM PREINSULATED FITTINGS.

9.1. Transition fitting "Y"-type PN 6/90°C

Table No.9

Single pipes		Double pipe		**Catalogue reference number**
[SDR 11 S 5]				
Carrier pipe external diameter	Jacket pipe external diameter	Carrier pipes external diameters	Jacket pipe external diametere	
mm	*mm*	*mm*	*mm*	
25	75	2x25	90	**MY-6/2x25**
32	75	2x32	110	**MY-6/2x32**
40	90	2x40	125	**MY-6/2x40**
50	110	2x50	160	**MY-6/2x50**
63	125	2x63	180	**MY-6/2x63**

End use – a double M-Pex® to a single flexible pipe transition fitting.

Standard length of 1 m PEX pipe or unalloyed seamless steel pipe compliant with Standard EN 10216 – 1 / EN 10216 - 2 used in central heating systems.

Connected to a pipe by means of screwed transition unions or welded union (depending on the type of the carrier pipe).

When ordering Y-fittings, please state the medium, diameter of the carrier pipe and pressure.

The connecting joint should be sealed with a heat shrinkable sleeve (NT-P type) and subsequently sealed with foam.

9.1.1. Transition fitting “Y”-type PN 10/60°C

Table No.10

Single pipes		Double pipe		**Catalogue reference number**
[SDR 7,4 S 3,2]				
Carrier pipe external diameter	Jacket pipe external diameter	Carrier pipes external diameters	Jacket pipe external diametere	
mm	*mm*	*mm*	*mm*	
25	75	2x25	90	**MY-10/2x25**
32	75	2x32	110	**MY-10/2x32**
40	90	2x40	125	**MY-10/2x40**
50	110	2x50	160	**MY-10/2x50**
63	125	2x63	180	**MY-10/2x63**

End use – a double M-Pex® to a single flexible pipe transition fitting.

Standard length of 1 m PEX pipe or unalloyed seamless steel pipe compliant with Standard EN 10216 – 1 / EN 10216 - 2 used in central heating systems.

Connected to a pipe by means of screwed transition unions or welded union (depending on the type of the carrier pipe).

When ordering Y-fittings, please state the medium, diameter of the carrier pipe and pressure.

The connecting joint should be sealed with a heat shrinkable sleeve (NT-P type) and subsequently sealed with foam.

9.2.1. P90° Elbow - PN 6/90°C

Elbow and PEX carrier pipe PN 6/90ºC

Table No.11

Carrier pipe [SDR 11 S5]		Jacket pipe		Arm A	Arm B	**Catalogue reference number**
Pipe diameter	Wall thickness	Pipe diameter	Wall thickness			
mm	*mm*	*mm*	*mm*	*mm*	*mm*	
Single pipes PN 6/90ºC						
25	2,3	75	2,2	1000	2000	**MK-6/25-P**
32	2,9	75	2,2	1000	2000	**MK-6/32-P**
40	3,7	90	2,2	1000	2000	**MK-6/40-P**
50	4,6	110	2,5	1000	2000	**MK-6/50-P**
63	5,7	125	3,0	1000	2000	**MK-6/63-P**
75	6,8	140	3,0	1000	2000	**MK-6/75-P**
90	8,2	160	3,0	1000	2000	**MK-6/90-P**
110	10,0	180	3,0	1000	2000	**MK-6/110-P**
125	11,4	180	3,0	1000	2000	**MK-6/125-P**
Double pipes PN 6/90ºC						
2x25	2,3	90	2,2	1000	2000	**MK-6/2x25-P**
2x32	2,9	110	2,5	1000	2000	**MK-6/2x32-P**
2x40	3,7	125	2,5	1000	2000	**MK-6/2x40-P**
2x50	4,6	160	3,0	1000	2000	**MK-6/2x50-P**
2x63	5,7	180	3,0	1000	2000	**MK-6/2x63-P**

M-Pex® pipe connections by means of straight unions or transition unions, which can be assembled to elbows at the factory at a customer's request.

9.2.2. P90° Elbow - PN 10/60°C

Elbow and PEX carrier pipe PN 10/60ºC

Table No.12

Carrier pipe [SDR 7,4 S 3,2]		Jacket pipe		Arm A	Arm B	**Catalogue reference number**
Pipe diameter	Wall thickness	Pipe diameter	Wall thickness			
mm	*mm*	*mm*	*mm*	*mm*	*mm*	
Single pipes PN 10/60ºC						
25	3,5	75	2,0	1000	2000	**MK-10/25-P**
32	4,4	75	2,0	1000	2000	**MK-10/32-P**
40	5,5	90	2,0	1000	2000	**MK-10/40-P**
50	6,9	110	2,2	1000	2000	**MK-10/50-P**
63	8,6	125	2,2	1000	2000	**MK-10/63-P**
75	10,3	140	2,5	1000	2000	**MK-10/75-P**
90	12,3	160	2,5	1000	2000	**MK-10/90-P**
110	15,1	180	2,5	1000	2000	**MK-10/110-P**
125	17,1	180	2,5	1000	2000	**MK-10/125-P**
Double pipes PN 10/60ºC						
25/20	3,5/2,8	90	2,0	1000	2000	**MK-10/25+20-P**
32/20	4,4/2,8	110	2,2	1000	2000	**MK-10/32+20-P**
40/25	5,5/3,5	125	2,2	1000	2000	**MK-10/40+25-P**
50/32	6,9/4,4	160	2,5	1000	2000	**MK-10/50+32-P**
63/32	8,6/4,4	180	2,5	1000	2000	**MK-10/63+32-P**

M-Pex® pipe connections by means of straight unions or transition unions, which can be assembled to elbows at the factory at a customer's request.

9.3. Elevated T-piece PN 6/90°C and PN 10/60°C

T-piece with a PEX carrier pipe

Table No.13

Main pipe		Lateral		**Catalogue reference number**
Carrier pipe external diameter	Jacket pipe diameter	Carrier pipe external diameter	Jacket pipe diameter	
Dz	Dzp	Dz odg.	Dzp odg.	
Pipes PN 6/90ºC [SDR 11 S 5]				
25	75	25	75	**MTW-6-25/25**
32	75	25	75	**MTW-6-32/25**
32	75	32	75	**MTW-6-32/32**
40	90	25	75	**MTW-6-40/25**
40	90	32	75	**MTW-6-40/32**
40	90	40	90	**MTW-6-40/40**
50	110	32	75	**MTW-6-50/32**
50	110	40	90	**MTW-6-50/40**
50	110	50	110	**MTW-6-50/50**
63	125	40	90	**MTW-6-63/40**
63	125	50	110	**MTW-6-63/50**
63	125	63	125	**MTW-6-63/63**
75	140	50	110	**MTW-6-75/50**
75	140	63	125	**MTW-6-75/63**
75	140	75	140	**MTW-6-75/75**
90	160	63	125	**MTW-6-90/63**
90	160	75	140	**MTW-6-90/75**
90	160	90	160	**MTW-6-90/90**
110	180	75	140	**MTW-6-110/75**
110	180	90	160	**MTW-6-110/90**
110	180	110	180	**MTW-6-110/110**

Main pipe		Lateral		**Catalogue reference number**
Carrier pipe external diameter	Jacket pipe diameter	Carrier pipe external diameter	Jacket pipe diameter	
Dz	Dzp	Dz odg.	Dzp odg.	
125	180	90	160	**MTW-6-125/90**
125	180	110	180	**MTW-6-125/110**
125	180	125	180	**MTW-6-125/125**
Pipes PN 10/60ºC [SDR 7,4 S 3,2]				
25	75	25	75	**MTW-10-25/25**
32	75	25	75	**MTW-10-32/25**
32	75	32	75	**MTW-10-32/32**
40	90	25	75	**MTW-10-40/25**
40	90	32	75	**MTW-10-40/32**
40	90	40	90	**MTW-10-40/40**
50	110	32	75	**MTW-10-50/32**
50	110	40	90	**MTW-10-50/40**
50	110	50	110	**MTW-10-50/50**
63	125	40	90	**MTW-10-63/40**
63	125	50	110	**MTW-10-63/50**
63	125	63	125	**MTW-10-63/63**
75	140	50	110	**MTW-10-75/50**
75	140	63	125	**MTW-10-75/63**
75	140	75	140	**MTW-10-75/75**
90	160	63	125	**MTW-10-90/63**
90	160	75	140	**MTW-10-90/75**
90	160	90	160	**MTW-10-90/90**
110	180	75	140	**MTW-10-110/75**
110	180	90	160	**MTW-10-110/90**
110	180	110	180	**MTW-10-110/110**
125	180	90	160	**MTW-10-125/90**
125	180	110	180	**MTW-10-125/110**
125	180	125	180	**MTW-10-125/125**

Manufactured as prefabs of a standard length of L=1200 mm and within the nominal diameters of carrier pipes between Dz 25 and Dz 125 mm.

Such T-pieces can be manufactured in any diameters, reductions, passage and discharge ends.

M-Pex® pipe connections by means of straight unions or screwed transition unions.

9.4. Flat T-piece PN 6/90°C and PN 10/60°C

With a PEX carrier pipe

Table No.14

Main pipe		Lateral		**Catalogue reference number**
Carrier pipe external diameter	Jacket pipe diameter	Carrier pipe external diameter	Jacket pipe diameter	
Dz	Dzp	Dz odg.	Dzp odg.	
Pipes PN 6/90ºC [SDR 11 S 5]				
25	75	25	75	**MTP-6-25/25**
32	75	25	75	**MTP-6-32/25**
32	75	32	75	**MTP-6-32/32**
40	90	25	75	**MTP-6-40/25**
40	90	32	75	**MTP-6-40/32**
40	90	40	90	**MTP-6-40/40**
50	110	32	75	**MTP-6-50/32**
50	110	40	90	**MTP-6-50/40**
50	110	50	110	**MTP-6-50/50**
63	125	40	90	**MTP-6-63/40**
63	125	50	110	**MTP-6-63/50**
63	125	63	125	**MTP-6-63/63**
75	140	50	110	**MTP-6-75/50**
75	140	63	125	**MTP-6-75/63**
75	140	75	140	**MTP-6-75/75**
90	160	63	125	**MTP-6-90/63**
90	160	75	140	**MTP-6-90/75**
90	160	90	160	**MTP-6-90/90**
110	180	75	140	**MTP-6-110/75**
110	180	90	160	**MTP-6-110/90**
110	180	110	180	**MTP-6-110/110**

Main pipe		Lateral		**Catalogue reference number**
Carrier pipe external diameter	Jacket pipe diameter	Carrier pipe external diameter	Jacket pipe diameter	
Dz	Dzp	Dz odg.	Dzp odg.	
125	180	90	160	**MTW-6-125/90**
125	180	110	180	**MTW-6-125/110**
125	180	125	180	**MTW-6-125/125**
Pipes PN 10/60ºC [SDR 7,4 S 3,2]				
25	75	25	75	**MTP-10-25/25**
32	75	25	75	**MTP-10-32/25**
32	75	32	75	**MTP-10-32/32**
40	90	25	75	**MTP-10-40/25**
40	90	32	75	**MTP-10-40/32**
40	90	40	90	**MTP-10-40/40**
50	110	32	75	**MTP-10-50/32**
50	110	40	90	**MTP-10-50/40**
50	110	50	110	**MTP-10-50/50**
63	125	40	90	**MTP-10-63/40**
63	125	50	110	**MTP-10-63/50**
63	125	63	125	**MTP-10-63/63**
75	140	50	110	**MTP-10-75/50**
75	140	63	125	**MTP-10-75/63**
75	140	75	140	**MTP-10-75/75**
90	160	63	125	**MTP-10-90/63**
90	160	75	140	**MTP-10-90/75**
90	160	90	160	**MTP-10-90/90**
110	180	75	140	**MTP-10-110/75**
110	180	90	160	**MTP-10-110/90**
110	180	110	180	**MTP-10-110/110**
125	180	90	160	**MTP-10-125/90**
125	180	110	180	**MTP-10-125/110**
125	180	125	180	**MTP-10-125/125**

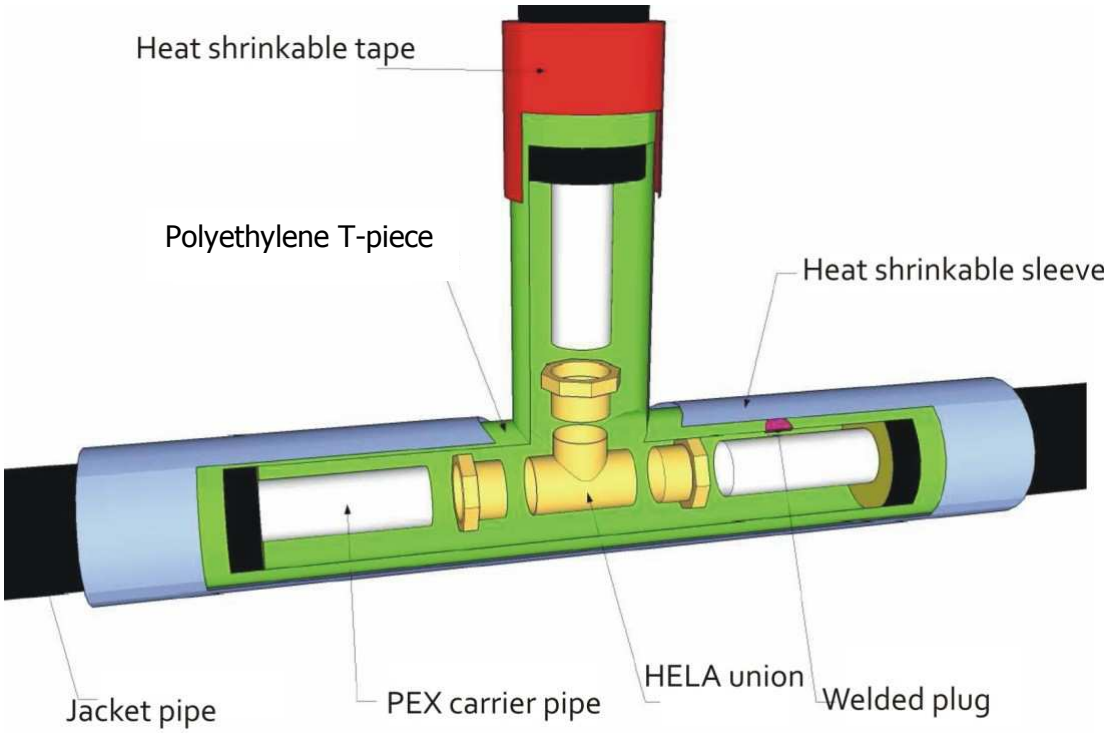
Manufactured as prefabs of a standard length of L=1200 mm and within the nominal diameters of carrier pipes between Dz 25 and Dz 125.

Such T-pieces can be manufactured in any diameters, reductions, passage and discharge ends.

M-Pex® pipe connections by means of straight unions or screwed transition unions.

9.5. Insulated T-piece joint.

An insulating set comprises: a polyethylene T-piece, heat shrinkable tape, closing tape, heat shrinkable sleeve, welded plug, PUR foam components. HELA unions to make T-piece connections are selected in accordance with the external diameter and wall thickness of the PEX carrier pipe on which such a joint is to be made.



A schematic diagram of a T-piece insulated joint

An insulating polyethylene kit to seal T-piece joints (Catalogue Reference items 13.1.3, p 34) sealed with foaming material poured in.

The table below presents examples of diameter configurations for a Y-piece insulated joint.

Main pipe jacket diameter	Lateral carrier jacket	Heat shrinkable tape	Closing tape	Components	Heat shrinkable band	Welded plug	**Catalogue reference number**
Dzp	Dzp1			A+B			
mm	*mm*	*mm*	*mm*	*kpl.*	*szt.*	*kpl.*	
90	75	440	600	1	1	1	**ZT-90/75/90**
110	90	510	600	1	1	1	**ZT-110/90/110**
125	110	560	600	1	1	1	**ZT-125/110/125**
140	125	610	600	1	1	1	**ZT-140/125/140**
160	140	680	600	1	1	1	**ZT-160/140/160**
180	160	740	600	1	1	1	**ZT-180/160/180**

T-piece insulated joints are made in any configuration of the main carrier pipe and lateral pipe.

9.6. Connecting union - heat shrinkable slip-on sleeve and heat shrinkable bands.

Table No.15

External diameter	Jacket pipe diameter	Internal sleeve diameter	Sleeve lenght	Components		Heat shrinkable band	Welded plug (optional FOPS sealing patch)	**Catalogue reference number**
Dz	Do	Dwn	L	A	B			
mm	*mm*	*mm*	*mm*	*g*	*g*	*szt.*	*kpl.*	
Single pipes pressure up to PN 6/90ºC								
25	75	83	600	62,8	31,4	2	2 (+2)	**NT-P/75-25**
32	75	83	600	57,8	28,9	2	2 (+2)	**NT-P/75-32**
40	90	107	600	81,7	40,8	2	2 (+2)	**NT-P/90-40**
50	110	129	600	120,6	60,3	2	2 (+2)	**NT-P/110-50**
63	125	143	600	146,5	73,2	2	2 (+2)	**NT-P/125-63**
75	140	156	600	175,6	87,8	2	2 (+2)	**NT-P/140-75**
90	160	178	600	219,9	110,0	2	2 (+2)	**NT-P/160-90**
110	180	200	600	255,1	127,5	2	2 (+2)	**NT-P/180-110**
125	180	200	600	178,6	89,3	2	2 (+2)	**NT-P/180-125**
Double pipes pressure up to PN 6/90ºC								
2x25	90	107	600	86,1	43,0	2	2 (+2)	**NT-P/90-25**
2x32	110	129	600	126,3	63,2	2	2 (+2)	**NT-P/110-32**
2x40	125	143	600	156,1	78,1	2	2 (+2)	**NT-P/125-40**
2x50	160	178	600	258,9	129,4	2	2 (+2)	**NT-P/160-50**
2x63	180	200	600	307,4	153,7	2	2 (+2)	**NT-P/180-63**
Single pipes pressure up to PN 10/60ºC								
25	75	83	600	62,8	31,4	2	2 (+2)	**NT-P/75-25**
32	75	83	600	57,8	28,9	2	2 (+2)	**NT-P/75-32**
40	90	107	600	81,7	40,8	2	2 (+2)	**NT-P/90-40**
50	110	129	600	120,6	60,3	2	2 (+2)	**NT-P/110-50**
63	125	143	600	146,5	73,2	2	2 (+2)	**NT-P/125-63**
75	140	156	600	172,7	86,3	2	2 (+2)	**NT-P/140-75**
90	160	178	600	219,0	109,1	2	2 (+2)	**NT-P/160-90**
110	180	200	600	254,0	126,4	2	2 (+2)	**NT-P/180-110**
125	180	200	600	177,8	88,5	2	2 (+2)	**NT-P/180-125**

External diameter	Jacket pipe diameter	Internal sleeve diameter	Sleeve lenght	Components		Heat shrinkable band	Welded plug (optional FOPS sealing patch)	**Catalogue reference number**
Dz	Do	Dwn	L	A	B			
mm	*mm*	*mm*	*mm*	*g*	*g*	*szt.*	*kpl.*	
Double pipes pressure up to PN 10/60ºC								
25+20	90	107	600	88,9	44,5	2	2 (+2)	**NT-P/90-2520**
32+20	110	129	600	134,2	67,1	2	2 (+2)	**NT-P/110-3220**
40+25	125	143	600	168,4	84,2	2	2 (+2)	**NT-P/125-4025**
50+32	140	156	600	202,0	101,0	2	2 (+2)	**NT-P/140-5032**
63+32	160	178	600	259,0	129,5	2	2 (+2)	**NT-P/160-6332**

M-Pex® flexible pipes can be assembled by applying suitable heat shrinkable joints and then poured over with properly composed A and B components to seal the joint thermally.

The sleeve is lined with a viscoelastic sealant. When shrinking the adhesive melts providing a tight connec-tion between the carrier pipe and sleeve.

10. INSULATION AND LINE TERMINATION.

10.1. Line termination - end slip-on sleeve

Table No.16

External diameter	Jacket pipe diameter	Internal sleeve diameter	Components		Heat shrinkable band	Welded plug (optional FOPS sealing patch)	**Catalogue reference number**
Dz	Do	Dwn	A	B			
mm	*mm*	*mm*	*g*	*g*	*szt.*	*kpl.*	
Single pipes pressure up to PN 6/90ºC							
25	75	83	31,4	15,7	1	2 (+2)	**NK-P/75-25**
32	75	83	28,9	14,4	1	2 (+2)	**NK-P/75-32**
40	90	107	40,8	20,4	1	2 (+2)	**NK-P/90-40**
50	110	129	60,3	30,2	1	2 (+2)	**NK-P/110-50**
63	125	143	73,2	36,6	1	2 (+2)	**NK-P/125-63**
75	140	156	87,8	43,9	1	2 (+2)	**NK-P/140-75**
90	160	178	109,9	55,1	1	2 (+2)	**NK-P/160-90**
110	180	200	127,5	63,7	1	2 (+2)	**NK-P/180-110**
125	180	200	89,3	44,6	1	2 (+2)	**NK-P/180-125**
Double pipes pressure up to PN 6/90ºC							
2x25	90	107	43,1	21,5	1	2 (+2)	**NK-P/90-25**
2x32	110	129	63,2	31,6	1	2 (+2)	**NK-P/110-32**
2x40	125	143	78,0	39,0	1	2 (+2)	**NK-P/125-40**
2x50	160	178	129,4	64,7	1	2 (+2)	**NK-P/160-50**
2x63	180	200	153,7	76,8	1	2 (+2)	**NK-P/180-63**
Single pipes pressure up to PN 10/60ºC							
25	75	83	31,4	15,7	1	2 (+2)	**NK-P/75-25**
32	75	83	28,9	14,5	1	2 (+2)	**NK-P/75-32**
40	90	107	40,8	20,4	1	2 (+2)	**NK-P/90-40**
50	110	129	60,3	30,1	1	2 (+2)	**NK-P/110-50**
63	125	143	73,2	36,6	1	2 (+2)	**NK-P/125-63**
75	140	156	86,3	43,1	1	2 (+2)	**NK-P/140-75**
90	160	178	109,5	54,4	1	2 (+2)	**NK-P/160-90**
110	180	200	127,0	63,2	1	2 (+2)	**NK-P/180-110**
125	180	200	89,0	44,3	1	2 (+2)	**NK-P/180-125**

External diameter	Jacket pipe diameter	Internal sleeve diameter	Components		Heat shrinkable band	Welded plug (optional FOPS sealing patch)	**Catalogue reference number**
Dz	Do	Dwn	A	B			
mm	*mm*	*mm*	*g*	*g*	*szt.*	*kpl.*	
Double pipes pressure up to PN 10/60ºC							
25+20	90	107	44,4	22,2	1	2 (+2)	**NK-P/90-2520**
32+20	110	129	67,1	33,5	1	2 (+2)	**NK-P/110-3220**
40+25	125	143	84,2	42,1	1	2 (+2)	**NK-P/125-4025**
50+32	140	156	101,0	50,5	1	2 (+2)	**NK-P/140-5032**
63+32	160	178	129,5	64,7	1	2 (+2)	**NK-P/160-6332**

10.2. Insulation termination - heat shrinkable End Cap

Table No.17

Jacket pipe nominal diameter Do [mm]	**Catalogue reference number**	
	Single pipes	Double pipes
90	**E – 90**	**E – 90/2**
110	**E – 110**	**E – 110/2**
125	**E – 125**	**E – 125/2**
140	**E – 140**	**E – 140/2**
160	**E – 160**	**E – 160/2**
180	**E – 180**	**E – 180/2**

End Cap terminals are heat shrinkable moulded products. End Caps are set up on pipe ends, preventing the insulation between both pipes from getting damp with water. Depending on a flexible pipe, available in single and double makes.

The product is lined with elastomer adhesive specially formulated for high temperature applications, thus providing good sealing to carrier and jacket pipe ends.

11. WALL TRANSITIONS.

11.1. Rubber ring - damper

Table No.18

Jacket pipe nominal diameter Do [mm]	**Catalogue reference number**
75	**P – 75**
90	**P – 90**
110	**P – 110**
125	**P – 125**
140	**P – 140**
160	**P – 160**
180	**P – 180**

Sealing rings protect against possible water leaks through inspection chamber or building transitions.

11.2. Lateral protective tube - adaptor

Table No.19

Jacket pipe nominal diameter Do [mm]	**Catalogue reference number**
75	**A – 75**
90	**A – 90**
110	**A – 110**
125	**A – 125**
140	**A – 140**
160	**A – 160**
180	**A – 180**

12. WARNING TAPE WITH METAL INSERT.

Warning tape is laid above the line. It is supplied in 100 m multiples. It reads:

„UWAGA! RURY CIEPŁOWNICZE” and the ZPU Międzyrzecz Sp. z o.o. logo. **„WARNING! HOT PIPES”**

Table No.20

	Color	Width mm	**Catalogue reference number**
Warning tape	yellow	150	**T - 150**

13. CONNECTING SYSTEM.

13.1. M-Pex® preinsulated pipes union.

This specification shows HELA unions, used to assemble installations where pipes are of large diameters, e.g. hot and cold tap water service droppers and horizontal branches in the construction industry, in industrial facilities and in thermal utilities.

The advantage of the HELA connection system is its modular structure which means that the unions can be configured in various ways in a full range of diameters extremely easy to assemble.

The core of any connection joint is based on H transition unions which allow to connect pipes and various fittings, e.g. T-type Y-piece.

The unions are distributed in two type series: PN6 and PN10 bar.

The assembly of fittings is very simple and does not require that specialist tools should be used. A T-type transition union has a special screw to expand the clamp ring hence there is no need to use a spreader. The only tool require is a pipe cutter, a knife to bevel the edges, a set of flat or hydraulic wrenches.

The unions are made from bronze resistant to dezincification. HELA unions are compliant with standard PN-EN 1254-3/4. All threads are compliant with PN-EN 10225-1.

13.1.1. HELA H, PN6 Transition union

25-32 mm

40-110 mm

Table No.21

Identification	Pipe diameter Dz and wall thickness s	R thread	Catalogue reference number
	mm	inch	
H 20 20-6	20 x 2,0	¾"	606 020 001
H 25 25-6	25 x 2,3	1"	606 025 001
H 32 25-6	32 x 2,9	1"	606 032 001
H 32 32-6	32 x 2,9	1 ¼"	606 032 114
H 40 32-6	40 x 3,7	1 ¼"	606 040 114
H 50 32-6	50 x 4,6	1 ¼"	606 050 114
H 63 50-6	63 x 5,8	2"	606 063 002
H 75 65-6	75 x 6,8	2 ½" / 2" Rp	606 075 212
H 90 80-6	90 x 8,2	3" / 2 ½" Rp	606 090 003
H 110 100-6	110 x 10,0	4" / 3 ½" Rp	606 110 004
H 125 125-6	125 x 11,4	5" / 4" Rp	606 125 005

13.1.2. HELA H, PN10 Transition union

25-32 mm

40-110 mm

Table No.22

Identification	Pipe diameter Dz and wall thickness s	R thread	Catalogue reference number
	mm	inch	
H 20 20-10	20 x 2,8	¾″	610 020 001
H 25 20-10	25 x 3,5	¾″	610 025 001
H 32 25-10	32 x 4,4	1″	610 032 001
H 32 32-10	32 x 4,4	1 ¼″	610 032 114
H 40 32-10	40 x 5,5	1 ¼″	610 040 114
H 50 32-10	50 x 6,9	1 ¼″	610 050 114
H 63 50-10	63 x 8,6	2″	610 063 002
H 75 50-10	75 x 10,3	2″	610 075 002
H 90 80-10	90 x 12,3	3″	610 090 003
H 110 100-10	110 x 15,1	4″	610 110 004

13.1.3. HELA C, PN6, reduction Y-piece with H-type clamp rings on inlet and outlet

Table No.23

Identification	Pipe diameter Dz and wall thickness s	Rp thread	Catalogue reference number
	mm	inch	
C 40 25-6	40 x 3,7	1″	616 040 114
C 50 32-6	50 x 4,6	1 ¼″	616 050 114
C 63 32-6	63 x 5,8	1 ¼″	616 063 002

13.1.4. HELA S, PN6, reduction Y-piece with H-type clamp rings on inlet and outlet

Table No.24

Identification	Pipe diameter Dz and wall thickness s	Catalogue reference number
	mm	
S 40-6	40 x 3,7	626 040 114
S 50-6	50 x 4,6	626 050 114
S 63-6	63 x 5,8	626 063 002

13.1.5. HELA T straight T

Table No.25

Identification	Rp thread inch	Catalogue reference number
T 20	¾″	611 020 001
T 25	1″	611 025 001
T 32	1 ¼″	611 032 114
T 50	2″	611 050 002
T 65	2 ½″	611 065 212
T 80	3″	611 080 003
T 100	4″	611 100 004

13.1.6. HELA V elbow

Table No.26

Identification	Rp thread inch	Catalogue reference number
V 20	¾″	612 020 001
V 25	1″	612 025 001
V 32	1 ¼″	612 032 114
V 50	2″	612 050 002
V 65	2 ½″	612 065 212
V 80	3″	612 080 003
V 100	4″	612 100 004

13.1.7. HELA B male-female reduction union

Table No.27

Identification	External R thread inch	Internal R thread inch	Catalogue reference number
B 25 20	1″	¾″	613 025 020
B 32 25	1 ¼″	1″	613 032 025
B 50 25	2″	1″	613 050 025
B 50 32	2″	1 ¼″	613 050 032
B 65 50	2 ½″	2″	613 065 050
B 80 50	3″	2″	613 080 050
B 80 65	3″	2 ½″	613 080 065
B 100 50	4″	2″	613 100 050
B 100 80	4″	3″	613 100 080

13.1.8. HELA M straight female thread union

Table No.28

Identification	Internal type Rp thread inch	Catalogue reference number
M 20	¾″	618 020 020
M 25	1″	618 025 025
M 32	1 ¼″	618 032 032
M 50	2″	618 050 050
M 65	2 ½″	618 065 065
M 80	3″	618 080 080
M 100	4″	618 100 100

13.1.9. HELA D straight male thread union

Table No.29

Identification	External R thread	Internal R thread	Catalogue reference number
	inch	inch	
D 20 20	¾″	¾″	614 020 020
D 25 20	1″	¾″	614 025 020
D 25 25	1″	1″	614 025 025
D 32 25	1 ¼″	1″	614 032 025
D 32 32	1 ¼″	1 ¼″	614 032 032
D 50 32	2″	1 ¼″	614 050 032
D 50 50	2″	2″	614 050 050
D 80 50	3″	2″	614 080 050
D 80 80	3″	3″	614 080 080
D 100 80	4″	3″	614 100 080
D 100 100	4″	4″	614 100 100

13.1.10. HELA P, PN6 straight union with weldable terminal

Table No.30

Identification	Pipe diameter Dz and wall thickness s	Pipe diameter Du	Lenght H	Catalogue reference number
	mm	mm	mml	
P 32-6	32 x 2,9	25	63	706 033 001
P 40-6	40 x 3,7	32	75	706 042 001
P 50-6	50 x 4,6	40	84	706 045 001
P 63-6	63 x 5,8	50	80	706 057 001
P 75-6	75 x 6,8	65	98	706 076 001
P 90-6	90 x 8,2	80	108	706 089 001
P 100-6	100 x 10,0	100	114	706 110 001

13.1.11. HELA F internal thread flange

Table No.31

Identification	Internal type Rp thread	Catalogue reference number
	inch	
F 25	1″	619 000 025
F 32	1 ¼″	619 000 032
F 50	2″	619 000 050
F 80	3″	619 000 080
F 100	4″	619 000 100

13.1.12. HELA G Clamp Y-piece with internal thread flange

Table No.32

Identification	Pipe diameter Dz	Internal type Rp thread	Catalogue reference number
	mm	inch	
G 63 32	63	1 ¼″	620 063 032
G 63 50	63	2″	620 063 050
G 75 50	75	2″	620 075 050
G 90 50	90	2″	620 090 050
G 110 50	110	2″	620 110 050

14. COMMERCIAL INFORMATIONS.

Manufacturer and Supplier:

ZAKŁAD PRODUKCYJNO USŁUGOWY
MIĘDZYRZECZ
POLSKIE RURY PREIZOLOWANE
Sp. z o.o.
ul. Zakaszewskiego 4
PL 66 – 300 Międzyrzecz

Phones:

fax:	+48 95 742-33-01; 742-33-02
secretary:	+48 95 742-33-00; 741-25-26; 742-00-93;
trade office:	+48 95 742-33-23; 742-33-38
supplies:	+48 95 742-33-11; 742-33-56
email:	zpu@zpum.pl

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