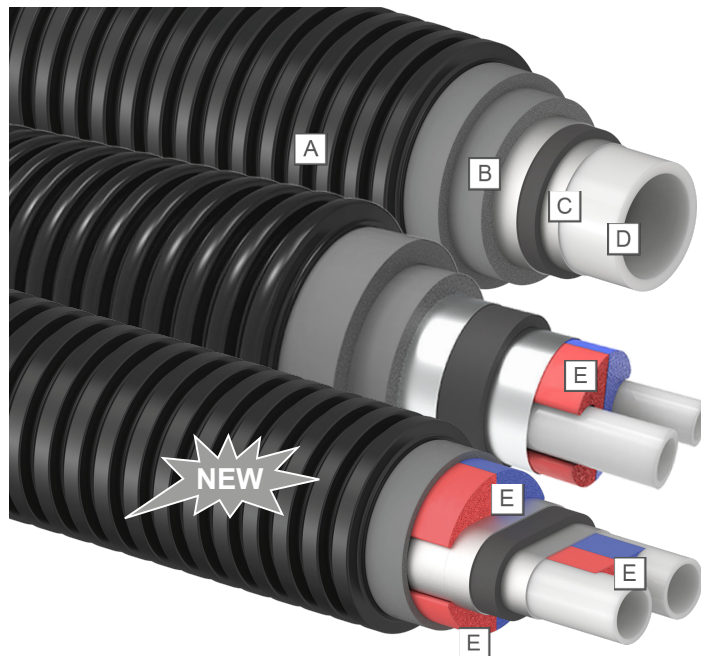


Uponor Ecoflex VIP Thermo and VIP Aqua



System description



RD0000390

Item	Description
A	Jacket pipe Corrugated polyethylene (PE-HD) Ring stiffness SN4 (4 kN/m ²) EN ISO 9969.
B	Insulation material Closed-cell, cross-linked polyethylen (PE-X) foam Thermal conductivity: $\lambda_{50} = 0,041$ W/mK.
C	Insulation material VIP "Vacuum Insulation Panel" Thermal conductivity: $\lambda_{50} = 0,004$ W/mK.
D	Medium pipe Cross-linked polyethylene (PE-Xa) pipes based on EN 15875 - Pipes for heating and cooling with EVOH layer
E	Coloured centering profile (only Twin version)

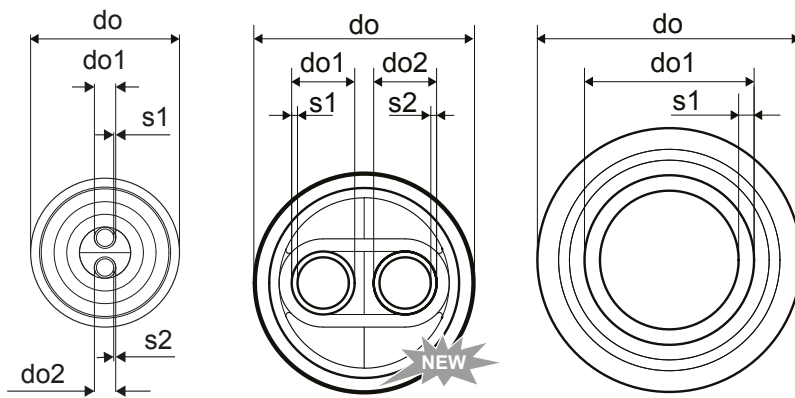
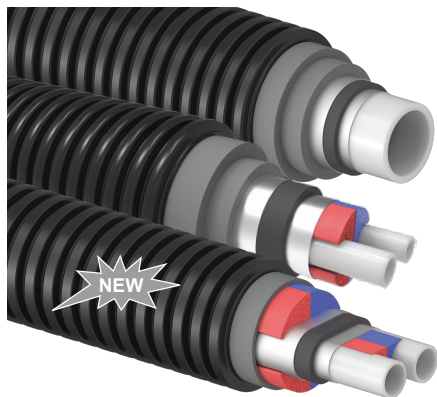
The Uponor Ecoflex VIP Thermo and VIP Aqua (VIP = Vacuum Insulation Panel) are part of Uponor's Ecoflex range of flexible, pre-insulated piping. The flexibility of the material, the convenient connecting methods and the well-attested service life contribute to projects being completed quickly, economically and reliably. Features like the corrugated jacket and the layer of cross-linked PE foam together with the VIP insulation material provide an optimal solution for energy efficient distribution networks. The system has a great variety of applications from an extensive supply network to a single connection for one building. Hot water, warm tap water or cooling water are transported as reliably as many other liquid media in industrial settings.

Uponor Ecoflex VIP Thermo and VIP Aqua are designed and manufactured in accordance with the requirements of EN 15632-1 and -3.

Uponor Ecoflex VIP Thermo Single/Twin, PN6 (SDR 11)

Uponor Ecoflex VIP Thermo pipes, produced based on European Standard EN 15632 and EN 17414, are for heating and cooling applications. Single pipes are for projects with large flow requirements. VIP Thermo Twin offers supply and return pipes in one jacket. The pipes have extremely good insulation performance and flexibility.

- Transport of heating and cooling water for buried installations.
- Operating temperature up to 80 °C based on EN 15632.
- Maximum load temperature / pressure: 95 °C / 6 bar.
- Static verification for heavy traffic load of 60 tons.



RP0000391

Uponor Ecoflex VIP Thermo Single, PN6 (SDR 11)

Status	Type	Medium pipe do1 x s1 [mm]	Jacket pipe do [mm]	Bending radius [m]	Weight empty [kg/m]	Volume Medium pipe [l/m]	Coil length [m]	U-Value- [W/mK]
	40/140	40 x 3,7	140	0,35	1,67	0,83	200	0,098
	50/140	50 x 4,6	140	0,40	1,93	1,31	200	0,115
	63/140	63 x 5,8	140	0,50	2,35	2,07	200	0,138
	75/140	75 x 6,8	140	0,60	2,73	2,96	200	0,163
NEW	90/175	90 x 8,2	175	0,70	4,11	4,25	150	0,146
NEW	110/175	110 x 10,0	175	0,90	5,20	6,36	150	0,179
	125/200	125 x 11,4	200	1,30	6,65	8,20	120	0,215
NEW	140/200	140 x 12,7	200	1,70	8,52	10,31	95	0,253

Maximum load temperature / pressure: 95 °C / 6 bar

Operating temperature: 80 °C based on EN 15632

Uponor Ecoflex VIP Thermo Twin, PN6 (SDR 11)

Status	Type	Medium pipe, do1 x s1 [mm]	Medium pipe, do2 x s2 [mm]	Jacket pipe do [mm]	Bending radius [m]	Weight [kg/m]	Volume medium pipe [l/m]	Coil length [m]	U-Value- [W/mK]
	2x 25/140	25 x 2,3	25 x 2,3	140	0,40	1,70	2x 0,33	200	0,122
	2x 32/140	32 x 2,9	32 x 2,9	140	0,50	1,91	2x 0,54	200	0,145
NEW	2x 40/140	40 x 3,7	40 x 3,7	140	0,80	2,28	2x 0,83	200	0,152
NEW	2x 50/175	50 x 4,6	50 x 4,6	175	0,90	3,53	2x 1,31	200	0,150
NEW	2x 63/200	63 x 5,8	63 x 5,8	200	1,20	4,99	2x 2,07	100	0,169
NEW	2x 75/250	75 x 6,8	75 x 6,8	250	1,40	6,74	2x 2,96	100	0,212

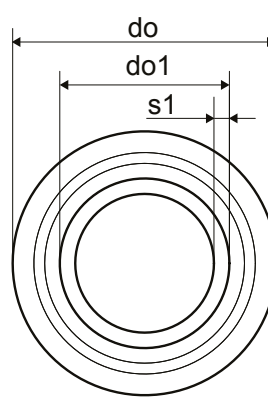
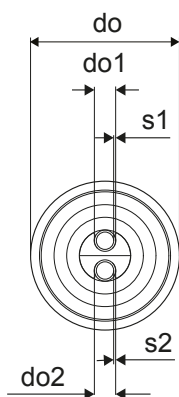
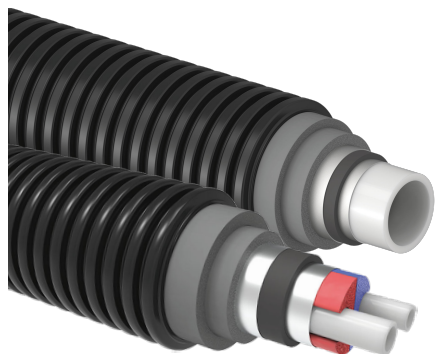
Maximum load temperature / pressure: 95 °C / 6 bar

Operating temperature: 80 °C based on EN 15632

Uponor Ecoflex VIP Aqua Single/Twin, PN10 (SDR 7,4)

Uponor Ecoflex VIP Aqua pipes are a reliable choice for hygienic and energy-efficient distribution of warm tap water in buried installations. VIP Aqua pipes come in two versions: single pipe for large flow capacity or when one supply line is sufficient; twin pipe with supply and circulating pipe in the same jacket. The pipes have extremely good insulation performance and flexibility. Available in long coils or in requested length.

- Transport of warm tap water for buried installations.
- Operating temperature: 70 °C based on EN ISO 15875
- Maximum load temperature / pressure: 95 °C / 10 bar.
- Static verification for heavy traffic load of 60 tons.



RP0000392

Uponor Ecoflex VIP Aqua Single, PN10 (SDR 7,4)

Status	Type	Medium pipe do1 x s1 [mm]	Jacket pipe do [mm]	Bending radius [m]	Weight empty [kg/m]	Volume Medium pipe [l/m]	Coil length [m]	U-Value- [W/mK]
	40/140	40 x 5,5	140	0,40	1,84	0,66	200	0,098
	50/140	50 x 6,9	140	0,45	2,19	1,03	200	0,115
	63/140	63 x 8,6	140	0,55	2,76	1,65	200	0,137
	75/140	75 x 10,3	140	0,70	3,33	2,32	100	0,161
NEW	90/175	90 x 12,3	175	0,80	4,99	3,36	150	0,146
NEW	110/175	110 x 15,1	175	1,00	6,45	5,00	150	0,179

Maximum load temperature / pressure: 95 °C / 10 bar

Operating temperature: 70 °C based on DIN EN 15875

Uponor Ecoflex VIP Aqua Twin PN10 (SDR 7,4)

Type	Medium pipe do1 x s1 [mm]	Medium pipe do2 x s2 [mm]	Jacket pipe do [mm]	Bending radius [m]	Weight empty [kg/m]	Volume Medium pipe [l/m]	Coil length [m]	U-Value- [W/mK]
25-20/140	25 x 3,5	20 x 2,8	140	0,45	1,74	0,25+0,16	200	0,118
32-20/140	32 x 4,4	20 x 2,8	140	0,55	1,88	0,42+0,16	200	0,125
40-25/140	40 x 5,5	25 x 3,5	140	0,70	2,18	0,66+0,25	200	0,148
50-32/175	50 x 6,9	32 x 4,4	175	0,80	3,36	1,03+0,42	200	0,158
63-40/175	63 x 8,6	40 x 5,5	200	0,90	4,83	1,65 + 0,66	100	0,171

Maximum load temperature / pressure: 95 °C / 10 bar

Operating temperature: 70 °C based on DIN EN 15875

Heat loss tables

The heat loss figures in the following tables have been calculated using CFD (Computational Fluid Dynamics) simulation with the conditions and parameters given in EN 15632-1 and EN 13941-1.

For single pipes the tables show the heat loss of one pipe. To get the total heat loss combine the flow and the return heat losses.

For the Uponor Ecoflex Twin pipes the tables show the heat loss of the complete pipe (flow and return).

Calculation conditions

Pipe installation, Single pipes	2-Pipe
Pipe distance, Single pipes (A)	0,1 m
Pipe installation, Twin and Quattro pipes	1-Pipe
Depth of cover (H)	0,8 m
Heat conductivity, soil λ_{soil}	1,0 W/mK
Heat conductivity, VIP ($\lambda_{so,COP}$)	0,0042 W/mK
Heat conductivity, PE-x foam (λ_{so})	0,0410 W/mK
Heat conductivity, PE-x pipe	0,4000 W/mK
Heat conductivity, PE jacket pipe	0,4000 W/mK

Heat loss calculation symbols

- q = Heat loss [W/m]
- U = Heat loss coefficient [W/mK]
- $\Delta\vartheta$ = Temperature difference between average operating temperature and ground [K]
- ϑ_{av} = Average operating temperature [°C]
- ϑ_f = Flow pipe temperature [°C]
- ϑ_r = Return pipe temperature [°C]
- ϑ_g = Ground temperature [°C]

Heat loss calculation

$q = U \cdot \Delta\vartheta$ [W/m], where

$\Delta\vartheta = \vartheta_{av} - \vartheta_g$ [K]

$\vartheta_{av} = \frac{1}{2} \cdot (\vartheta_f + \vartheta_r)$ [°C]

For Uponor Ecoflex Quattro pipes ϑ_{av} is calculated as average of all four service pipes for heating and warm tap water.

Example heat loss table reading

Flow temperature: $\vartheta_f = 80$ °C

Return temperature: $\vartheta_r = 60$ °C

Ground temperature: $\vartheta_g = 10$ °C

$\vartheta_{av} = \frac{1}{2} \cdot (80$ °C + 60 °C) = 70 °C

$\Delta\vartheta = \vartheta_{av} - \vartheta_g = 70$ °C - 10 °C = 60 K

2 pipe installation – example Uponor Ecoflex VIP Thermo Single 63/140

Heat loss for one pipe:

$q = 8,3$ W/m (from the table)

Heat loss for flow and return:

$q = 2 \times 8,3$ W/m = $16,6$ W/m

Twin pipe installation – example Uponor Ecoflex VIP Thermo Twin 63/200

Heat loss for flow and return:

$q = 10,14$ W/m (from the table)

Ecoflex VIP Thermo Single PN 6

Type	Heat loss q [W/m] for corresponding temperature difference $\Delta\vartheta$ [K]					
	30	40	50	60	70	80
40/140	3,0	3,9	4,9	5,9	6,9	7,9
50/140	3,5	4,6	5,8	6,9	8,1	9,2
63/140	4,1	5,5	6,9	8,3	9,7	11,1
75/140	4,9	6,5	8,1	9,8	11,4	13,0
90/175	4,4	5,8	7,3	8,8	10,2	11,7
110/175	5,4	7,1	8,9	10,7	12,5	14,3
125/200	6,4	8,6	10,7	12,9	15,0	17,2
140/200	7,6	10,1	12,7	15,2	17,7	20,3

Ecoflex VIP Thermo Twin PN 6

Type	Heat loss q [W/m] for corresponding temperature difference $\Delta\vartheta$ [K]					
	30	40	50	60	70	80
2x 25/140	3,7	4,9	6,1	7,3	8,5	9,8
2x 32/140	4,4	5,8	7,3	8,7	10,2	11,6
2x 40/175	4,6	6,1	7,6	9,1	10,7	12,2
2x 50/175	4,5	6,0	7,5	9,0	10,5	12,0
2x 63/200	5,1	6,8	8,4	10,1	11,8	13,5
2x 75/250	6,3	8,5	10,6	12,7	14,8	16,9

Ecoflex VIP Aqua Single PN 10

Type	Heat loss q [W/m] for corresponding temperature difference $\Delta\vartheta$ [K]					
	30	40	50	60	70	80
40/140	2,9	3,9	4,9	5,9	6,9	7,8
50/140	3,4	4,6	5,7	6,9	8,0	9,2
63/140	4,1	5,5	6,9	8,2	9,6	11,0
75/140	4,8	6,5	8,1	9,7	11,3	12,9
90/175	4,3	5,8	7,3	8,7	10,2	11,6
110/175	5,4	7,2	8,9	10,7	12,5	14,3

Ecoflex VIP Aqua Twin PN 10

Type	Heat loss q [W/m] for corresponding temperature difference $\Delta\vartheta$ [K]					
	30	40	50	60	70	80
25-20/140	3,5	4,7	5,9	7,1	8,3	9,5
32-20/140	3,7	5,0	6,2	7,5	8,7	10,0
40-25/140	4,4	5,9	7,4	8,9	10,3	11,8
50-32/175	4,7	6,3	7,9	9,5	11,0	12,6
63-40/200	5,1	6,8	8,5	10,3	12,0	13,7

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Uponor reserves the right to make changes, without prior notification,
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