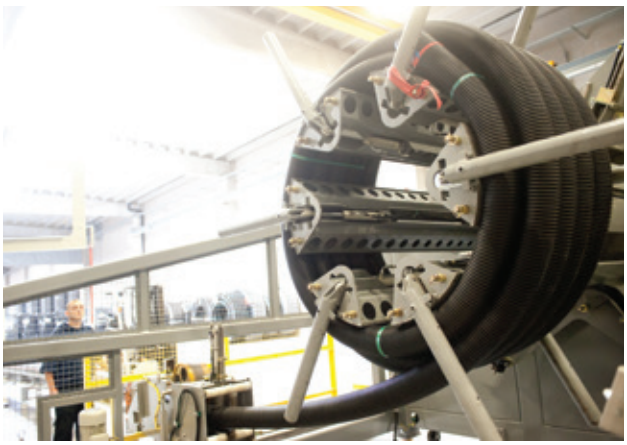
CATALOGUE

terrendis

Hyper Flexible

pre-insulated piping systems



The Terrendis production plant in Desteldonk (Belgium) is fully dedicated to the development, manufacturing and sales of a comprehensive range of hyper-flexible pre-insulated pipes and accessories for buried piping systems. Terrendis combines Elydan's core competencies and know-how with an extensive product, channel and application experience, and a long-term commitment to the sanitary and heating, infrastructure and renewable energy market.

Through Terrendis, which is very different from companies with a heavy corporate structure, and not being restricted by any bureaucratic inertia, we can respond to our customers' specific needs more quickly and easily, and with a sharper focus. We can work more closely with them, taking greater responsibility and carrying out more development, therefore building strong and successful alliances.

The central location in Europe of our brand new operation site, our innovative production method, together with our proximity distribution strategy, all guarantee the required flexibility and reactivity to best serve our end-customers.

As we fully appreciate and value the human aspect of our business relations, at Terrendis we are happy to share our expertise and to help you design, dimension and execute your pre-insulated piping network.

+ 35
countries

+ 100
km pipes in stock

+ 2.000.000
meters pipes insulated

terrendis

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CONTACT US FOR PROFESSIONAL ADVICE TAILORED TO YOUR NEEDS

Our technical department helps you to realise and optimise all your projects.

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terrendis

OUR ROOTS AND VALUES

PLASTICS

An experienced plastic pipe specialist

As part of the Elydan group, a leading plastic pipe manufacturer, Terrendis® can take advantage of recognised, long-term expertise in the design and manufacture of plastic piping solutions and related innovative products.

The possibilities of advanced vertical integration provide enhanced production flexibility with comprehensive quality control.

Being able to integrate ELIOT®, a proprietary RFID-based detection, 3D-location and identification system for buried assets, into our pre-insulated piping solutions, sets us apart as a technologically advanced partner in this field.

CUSTOMISATION

Partner in customised solutions

We provide expert support by offering network calculations and system optimisation, always focused on our customers' specific situations and requirements.

Our wide standard product range is designed to cover the majority of standard pre-insulated piping applications.

Our flexible production process allows a high degree of customisation, on-demand production of non-standard dimensional combinations and/or the integration of customer-supplied pipes and components.

PEOPLE

Valuing the human dimension

As we fully appreciate and value the human aspect of our business relations, at Terrendis® we are happy to share our expertise and to help our customers design, dimension and execute their pre-insulated piping projects.

Our unique position as a fully dedicated pre-insulated piping specialist makes it easier to work very closely with our customers, and form strong and successful alliances.

Our proximity strategy builds on the close cooperation between our centrally located operations and an extensive network of local, specialised distribution partners. These local experts support our end-customers in their native language, whilst providing direct access to local stocks of standard products.

SUSTAINABILITY

Sustainable products and solutions

Our pre-insulated pipes contribute to the decarbonization of our planet and are ideally combined with environmentally friendly, renewable energy powered heat sources such as biogas/biomass operated CHPs, heat pumps, wood pellet boilers, excess heat recovery plants, etc.

The carefully selected cross-linked PE insulation material guarantees a durable and constant insulation performance throughout the entire lifespan of the system.

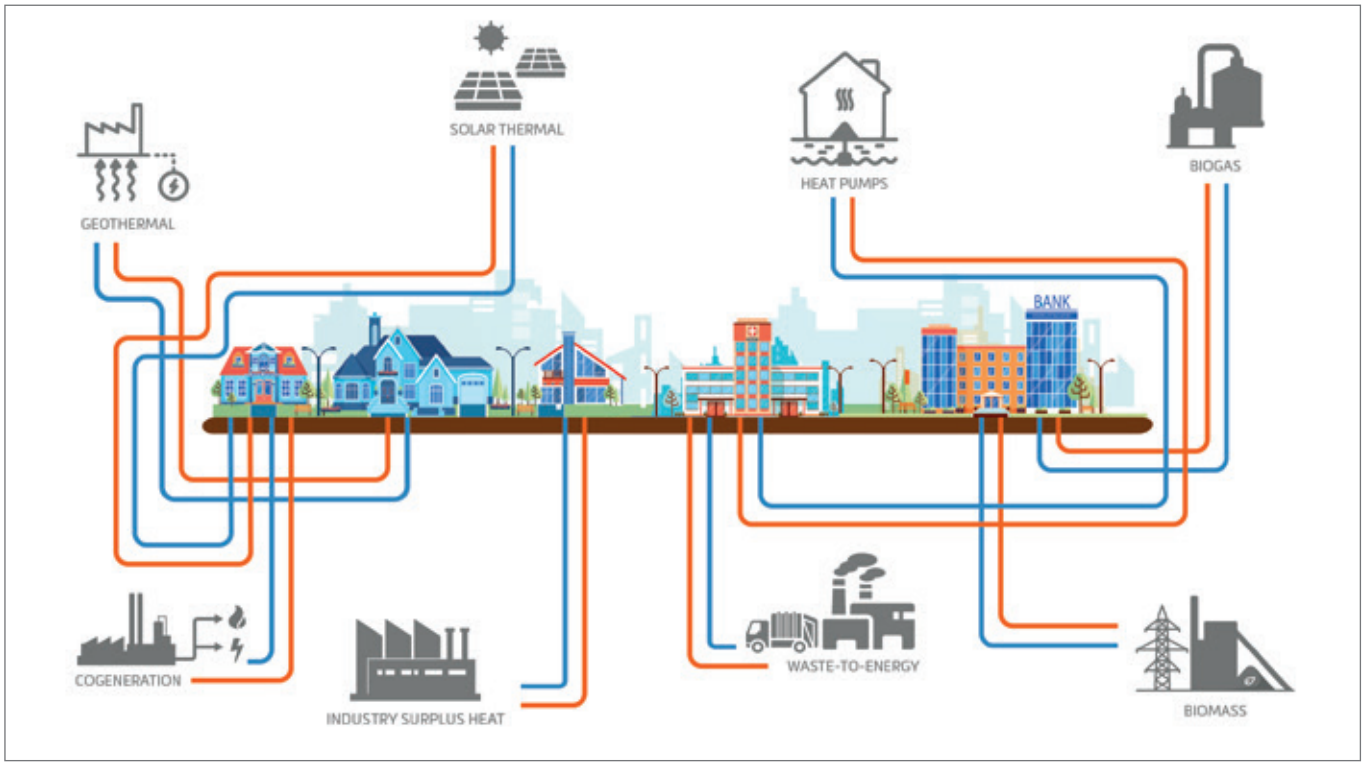
Responsible material selection and an environmentally considerate production process (CFC-free materials, low energy production technology, etc.) further add to the overall sustainable appeal of our products and solutions.

terrendis

PRODUCT SELECTION TABLE

PRODUCT	SINGLE	SINGLE + CABLE	DOUBLE	QUADRUPLE	HEAT PUMP
Heating	 H		 HD	 Q	 HP
Sanitary hot water	 S		 SD		
Cold (drinking) water and cooling	 C	 CW10	 On request		
Accessories	✓	✓	✓	✓	✓

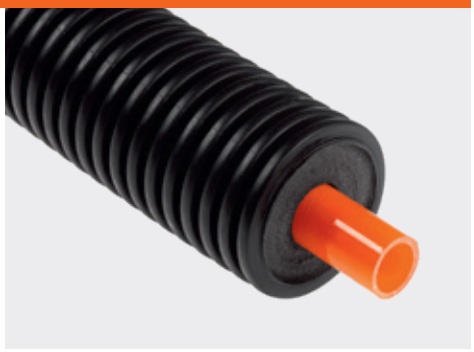
PRODUCT APPLICATION



01

HEATING

SINGLE HEATING



Hyper flexible, pre-insulated piping system with a single medium pipe, primarily intended for the transport of heating water in buried distribution networks.

The medium pipes are made from cross-linked polyethylene PE-Xa with an orange coloured oxygen-diffusion barrier.

The multilayer thermal insulation is made from cross-linked, microcellular polyethylene PE-X foam with a water-repellent closed cell structure, characterized by its durable, non-ageing insulation performance, and its permanent elasticity, maximizing and maintaining the thickness of the insulation layer, even after bending multiple times.

The high-grade, black coloured UV-resistant, double walled, corrugated HDPE jacket pipe shields the pre-insulated piping system against mechanical impacts and moisture, whilst maintaining maximum flexibility.

PIPES

SINGLE HEATING

	Jacket pipe	Medium pipe		Bending radius	Water content	Heating capacity		U-value	Weight
Art. No.	d_{out} [mm]	d_{out} x s [mm]	d_{in} [mm]	[m](1)	[l/m]	[kW](2)	m/s	[W/mK](3)	kg/m
H7525	75	25 x 2.3	20.4	0.20	0.327	10 - 30	0.5 - 1.1	0.199	0.7
H11025	110	25 x 2.3	20.4	0.30	0.327	10 - 30	0.5 - 1.1	0.145	1.2
H9032	90	32 x 2.9	26.2	0.25	0.539	30 - 60	0.6 - 1.3	0.204	1.0
H11032	110	32 x 2.9	26.2	0.30	0.539	30 - 60	0.6 - 1.3	0.172	1.3
H9040	90	40 x 3.7	32.6	0.30	0.835	40 - 100	0.6 - 1.5	0.255	1.1
H11040	110	40 x 3.7	32.6	0.30	0.835	40 - 100	0.6 - 1.5	0.207	1.5
H14040	140	40 x 3.7	32.6	0.35	0.835	40 - 100	0.6 - 1.5	0.170	2.0
H14050	140	50 x 4.6	40.8	0.40	1.307	70 - 180	0.6 - 1.7	0.204	2.2
H16050	160	50 x 4.6	40.8	0.45	1.307	70 - 180	0.6 - 1.7	0.184	2.4
H14063	140	63 x 5.8	51.4	0.50	2.075	100 - 350	0.6 - 2.0	0.258	2.6
H16063	160	63 x 5.8	51.4	0.55	2.075	100 - 350	0.6 - 2.0	0.227	2.8
H16075	160	75 x 6.8	61.4	0.75	2.961	200 - 500	0.8 - 2.0	0.275	3.1
H20075	200	75 x 6.8	61.4	0.80	2.961	200 - 500	0.8 - 2.0	0.219	4.0
H16090	160	90 x 8.2	73.6	1.00	4.254	275 - 700	0.8 - 2.0	0.353	3.7
H20090	200	90 x 8.2	73.6	1.10	4.254	275 - 700	0.8 - 2.0	0.265	4.6
H22590	225	90 x 8.2	73.6	1.10	4.254	275 - 700	0.8 - 2.0	0.227	4.9
H200110	200	110 x 10.0	90.0	1.20	6.362	400 - 1100	0.8 - 2.1	0.347	5.5
H225110	225	110 x 10.0	90.0	1.20	6.362	400 - 1100	0.8 - 2.1	0.285	5.8
H200125	200	125 x 11.4	102.2	1.40	8.203	500 - 1500	0.8 - 2.2	0.432	6.4
H225125	225	125 x 11.4	102.2	1.40	8.203	500 - 1500	0.8 - 2.2	0.340	6.5

(1) The indicated minimum bending radius can be applied permanently without affecting the system's quality or performance
(2) Heat capacity in kW for the carrier pipe (at T_{water} of 80°C and a ΔT of 20°C)
(3) The U-value enables easy heat loss calculation, as a function of the driving temperature difference

- Medium pipes: PE-Xa/SDR 11/PN 6
- EVOH oxygen barrier in accordance with ISO 17455
- Continuous operating temperature: 80°C
- Max. operating temperature: 95°C
- PE-X insulation foam: < 1% water absorption in accordance with ISO 2896
- Full coil length, all dimensions: 100 m
- Designed in accordance with European standard EN 15632-1&3
- CFC-free production process

CONNECTORS & ACCESSORIES





PE-X terminal connector		PE-X x PE-X connector	Dust end cap	Shrink end cap	Fix point	
	Thread					Thread M + F
Art. No.	[inch]	Art. No.	Art. No.	Art. No.	Art. No.	[inch]
HC25/0.75M	¾" M	HC25x25	DEC75/25	SEC/75	FP0.75	¾"
HC25/0.75M	¾" M	HC25x25	DEC110/25	SEC/110	FP0.75	¾"
HC32/1M	1" M	HC32x32	DEC90/32	SEC/90	FP1	1"
HC32/1M	1" M	HC32x32	DEC110/32	SEC/110	FP1	1"
HC40/1.25M	1 ¼" M	HC40x40	DEC90/40	SEC/90	FP1.25	1 ¼"
HC40/1.25M	1 ¼" M	HC40x40	DEC110/40	SEC/110	FP1.25	1 ¼"
HC40/1.25M	1 ¼" M	HC40x40	DEC140/40	SEC/140-S	FP1.25	1 ¼"
HC50/1.5M	1 ½" M	HC50x50	DEC140/50	SEC/140	FP1.5	1 ½"
HC50/1.5M	1 ½" M	HC50x50	DEC160/50	SEC/160-S	FP1.5	1 ½"
HC63/2M	2" M	HC63x63	DEC140/63	SEC/140	FP2	2"
HC63/2M	2" M	HC63x63	DEC160/63	SEC/160	FP2	2"
HC75/2.5M	2 ½" M	HC75x75	DEC160/75	SEC/160	FP2.5	2 ½"
HC75/2.5M	2 ½" M	HC75x75	DEC200/75	SEC/200-S	FP2.5	2 ½"
HC90/3M	3" M	HC90x90	DEC160/90	SEC/160	FP3	3"
HC90/3M	3" M	HC90x90	DEC200/90	SEC/200-S	FP3	3"
HC90/3M	3" M	HC90x90	DEC225/90	SEC/225	FP3	3"
HC110/4M	4" M	HC110x110	DEC200/110	SEC/200-S	FP4	4"
HC110/4M	4" M	HC110x110	DEC225/110	SEC/225	FP4	4"
HC125/4M	4" M	HC125x125	DEC200/125	SEC/200	FP4	4"
HC125/4M	4" M	HC125x125	DEC225/125	SEC/225	FP4	4"

The installation of adequately anchored fix points at the system's extremities (typically at wall penetrations) is mandatory. This to secure the connected plumbing against the potential impact of the system's dilatation forces (thermal expansion/retraction).

To prevent ingress of (ground) water, the EN 15632-3 standard prescribes the usage of shrink end caps to seal the extremities of the non-bonded piping system.

Failing to do so involves a genuine damage risk and automatically voids the system warranty.

DOUBLE HEATING

Hyper flexible, pre-insulated piping system, combining both the flow and the return medium pipes in the same jacket pipe, primarily intended for the transport of heating water in buried distribution networks.

The medium pipes are made from cross-linked polyethylene PE-Xa with an orange coloured oxygen-diffusion barrier for the flow line and a blue coloured one for the return. The colour code enables easy identification of flow and return during installation, even with mounted dust or shrink end caps.

The multilayer thermal insulation is made from cross-linked, microcellular polyethylene PE-X foam with a water-repellent closed cell structure, characterized by its durable, non-ageing insulation performance, and its permanent elasticity, maximizing and maintaining the thickness of the insulation layer, even after bending multiple times.

The high-grade, black coloured UV-resistant, double walled, corrugated HDPE jacket pipe shields the pre-insulated piping system against mechanical impacts and moisture, whilst maintaining maximum flexibility.

PIPES

DOUBLE HEATING

	Jacket pipe	Medium pipe		Bending radius	Water content	Heating capacity		U-value	Weight
Art. No.	d_{out} [mm]	d_{out} x s [mm]	d_{in} [mm]	[m](1)	[l/m]	[kW](2)	m/s	[W/mK](3)	kg/m
HD14025	140	25 x 2.3	20.4	0.35	0.654	10 - 30	0.5 - 1.1	0.211	1.9
HD16025	160	25 x 2.3	20.4	0.50	0.654	10 - 30	0.5 - 1.1	0.190	2.1
HD14032	140	32 x 2.9	26.2	0.40	1.078	30 - 60	0.6 - 1.3	0.262	2.1
HD16032	160	32 x 2.9	26.2	0.50	1.078	30 - 60	0.6 - 1.3	0.228	2.2
HD14040	140	40 x 3.7	32.6	0.60	1.670	40- 100	0.6 - 1.5	0.345	2.1
HD16040	160	40 x 3.7	32.6	0.60	1.670	40 - 100	0.6 - 1.5	0.286	2.6
HD16050	160	50 x 4.6	40.8	0.60	2.614	70 - 180	0.6 - 1.7	0.400	3.0
HD20050	200	50 x 4.6	40.8	0.80	2.614	70 - 180	0.6 - 1.7	0.278	3.9
HD20063	200	63 x 5.8	51.4	1.20	4.150	100 - 350	0.6 - 2.0	0.409	4.5
HD22563	225	63 x 5.8	51.4	1.20	4.150	100 - 350	0.6 - 2.0	0.312	4.8
HD22575	225	75 x 6.8	61.4	1.40	5.922	150 - 450	0.6 - 2.0	0.460	5.9

(1) The indicated minimum bending radius can be applied permanently without affecting the system's quality or performance
(2) Heat capacity in kW for the carrier pipe (at T_{water} of 80°C with a ΔT of 20°C)
(3) The U-value enables easy heat loss calculation, as a function of the driving temperature difference

- Medium pipes: PE-Xa/SDR 11/PN 6
- EVOH oxygen barrier in accordance with ISO 17455
- Continuous operating temperature: 80°C
- Max. operating temperature: 95°C
- PE-X insulation foam: < 1% water absorption in accordance with ISO 2896
- Full coil length, all dimensions: 100 m
- Designed in accordance with European standard EN 15632-1&3
- CFC-free production process

CONNECTORS & ACCESSORIES





PE-X terminal connector		PE-X x PE-X connector	Dust end cap	Shrink end cap	Fix point	
	Thread					Thread M + F
Art. No.	[inch]	Art. No.	Art. No.	Art. No.	Art. No.	[inch]
HC25/0.75M	¾" M	HC25x25	DECD140/25	SECD/140	FP0.75	¾"
HC25/0.75M	¾" M	HC25x25	DECD160/25	SECD/160	FP0.75	¾"
HC32/1M	1" M	HC32x32	DECD140/32	SECD/140	FP1	1"
HC32/1M	1" M	HC32x32	DECD160/32	SECD/160	FP1	1"
HC40/1.25M	1 ¼" M	HC40x40	DECD140/40	SECD/140	FP1.25	1 ¼"
HC40/1.25M	1 ¼" M	HC40x40	DECD160/40	SECD/160	FP1.25	1 ¼"
HC50/1.5M	1 ½" M	HC50x50	DECD160/50	SECD/160	FP1.5	1 ½"
HC50/1.5M	1 ½" M	HC50x50	DECD200/50	SECD/200-S	FP1.5	1 ½"
HC63/2M	2" M	HC63x63	DECD200/63	SECD/200	FP2	2"
HC63/2M	2" M	HC63x63	DECD225/63	SECD/225	FP2	2"
HC75/2.5M	2 ½" M	HC75x75	DECD225/75	SECD/225	FP2.5	2 ½"

The installation of adequately anchored fix points at the system's extremities (typically at wall penetrations) is mandatory. This to secure the connected plumbing against the potential impact of the system's dilatation forces (thermal expansion/retraction).

To prevent ingress of (ground) water, the EN 15632-3 standard prescribes the usage of shrink end caps to seal the extremities of the non-bonded piping system.

Failing to do so involves a genuine damage risk and automatically voids the system warranty.

02

SANITARY

SINGLE SANITARY

Hyper flexible, pre-insulated piping system with a single medium pipe, primarily intended for the transport of sanitary hot water in buried distribution networks.

The medium pipes are made from cross-linked polyethylene PE-Xa, whitish colour.

The multilayer thermal insulation is made from cross-linked, microcellular polyethylene PE-X foam with a water-repellent closed cell structure, characterized by its durable, non-ageing insulation performance, and its permanent elasticity, maximizing and maintaining the thickness of the insulation layer, even after bending multiple times.

The high-grade, black coloured UV-resistant, double walled, corrugated HDPE jacket pipe shields the pre-insulated piping system against mechanical impacts and moisture, whilst maintaining maximum flexibility.

PIPES

SINGLE SANITARY

	Jacket pipe	Medium pipe		Bending radius	Water content	Weight
Art. No.	d_{out} [mm]	d_{out} x s [mm]	d_{in} [mm]	[m](1)	[l/m]	kg/m
S7525	75	25 x 3.5	18.0	0.20	0.254	0.7
S9032	90	32 x 4.4	23.2	0.25	0.423	1.1
S14032	140	32 x 4.4	23.2	0.40	0.423	1.9
S16032	160	32 x 4.4	23.2	0.40	0.423	2.1
S9040	90	40 x 5.5	29.0	0.30	0.660	1.3
S14040	140	40 x 5.5	29.0	0.40	0.660	2.1
S16040	160	40 x 5.5	29.0	0.40	0.660	2.3
S14050	140	50 x 6.9	36.2	0.50	1.029	2.3
S16050	160	50 x 6.9	36.2	0.50	1.029	2.7
S14063	140	63 x 8.6	45.6	0.60	1.633	2.9
S16063	160	63 x 8.6	45.6	0.60	1.633	3.2
S16075	160	75 x 10.3	54.4	0.80	2.324	3.7
S20075	200	75 x 10.3	54.4	0.90	2.324	4.6
S16090	160	90 x 12.3	65.4	1.10	3.359	4.6
S20090	200	90 x 12.3	65.4	1.20	3.359	5.4
S200110	200	110 x 15.1	79.8	1.30	5.001	6.8

(1) The indicated minimum bending radius can be applied permanently without affecting the system's quality or performance

- Medium pipes: PE-Xa/SDR 7.4/PN 10
- Continuous operating temperature: 80°C
- Max. operating temperature: 95°C
- PE-X insulation foam: < 1% water absorption in accordance with ISO 2896
- Full coil length, all dimensions: 100 m
- CFC-free production process

CONNECTORS & ACCESSORIES





PE-X terminal connector		PE-X x PE-X connector	Dust end cap	Shrink end cap	Fix point	
	Thread					Thread M + F
Art. No.	[inch]	Art. No.	Art. No.	Art. No.	Art. No.	[inch]
SC25/0.75M	¾" M	SC25x25	DEC75/25	SEC/75	FP0.75	¾"
SC32/1M	1" M	SC32x32	DEC90/32	SEC/90	FP1	1"
SC32/1M	1" M	SC32x32	DEC140/32	SEC/140-S	FP1	1"
SC32/1M	1" M	SC32x32	DEC160/32	SEC/160-S	FP1	1"
SC40/1.25M	1 ¼" M	SC40x40	DEC90/40	SEC/90	FP1.25	1 ¼"
SC40/1.25M	1 ¼" M	SC40x40	DEC140/40	SEC/140-S	FP1.25	1 ¼"
SC40/1.25M	1 ¼" M	SC40x40	DEC160/40	SEC/160-S	FP1.25	1 ¼"
SC50/1.5M	1 ½" M	SC50x50	DEC140/50	SEC/140	FP1.5	1 ½"
SC50/1.5M	1 ½" M	SC50x50	DEC160/50	SEC/160-S	FP1.5	1 ½"
SC63/2M	2" M	SC63x63	DEC140/63	SEC/140	FP2	2"
SC63/2M	2" M	SC63x63	DEC160/63	SEC/160	FP2	2"
SC75/2.5M	2 ½" M	SC75x75	DEC160/75	SEC/160	FP2.5	2 ½"
SC75/2.5M	2 ½" M	SC75x75	DEC200/75	SEC/200-S	FP2.5	2 ½"
SC90/3M	3" M	SC90x90	DEC160/90	SEC/160	FP3	3"
SC90/3M	3" M	SC90x90	DEC200/90	SEC/200-S	FP3	3"
SC110/4M	4" M	SC110x110	DEC200/110	SEC/200-S	FP4	4"

The installation of adequately anchored fix points at the system's extremities (typically at wall penetrations) is mandatory. This to secure the connected plumbing against the potential impact of the system's dilatation forces (thermal expansion/retraction).

To prevent ingress of (ground) water, Terrendis prescribes the usage of shrink end caps to seal the extremities of the non-bonded piping system.

Failing to do so involves a genuine damage risk and automatically voids the system warranty.

DOUBLE SANITARY

Hyper flexible, pre-insulated piping system, combining both the flow and the loop medium pipes in the same jacket pipe, primarily intended for the transport of sanitary hot water in buried distribution networks.

The medium pipes are made from cross-linked polyethylene PE-Xa, whitish colour.

The multilayer thermal insulation is made from cross-linked, microcellular polyethylene PE-X foam with a water-repellent closed cell structure, characterized by its durable, non-ageing insulation performance, and its permanent elasticity, maximizing and maintaining the thickness of the insulation layer, even after bending multiple times.

The high-grade, black coloured UV-resistant, double walled, corrugated HDPE jacket pipe shields the pre-insulated piping system against mechanical impacts and moisture, whilst maintaining maximum flexibility.

PIPES

DOUBLE SANITARY

	Jacket pipe	Medium pipe		Bending radius	Water content	Weight
Art. No.	d_{out} [mm]	d_{out} x s [mm]	d_{in} [mm]	[m][1]	[l/m]	kg/m
SD1402520	140	25 x 3.5 20 x 2.8	18.0 14.4	0.35	0.417	1.9
SD16025	160	25 x 3.5 25 x 3.5	18.0 18.0	0.50	0.508	2.2
SD1403225	140	32 x 4.4 25 x 3.5	23.2 18.0	0.40	0.677	2.1
SD1603225	160	32 x 4.4 25 x 3.5	23.2 18.0	0.50	0.677	2.5
SD1604025	160	40 x 5.5 25 x 3.5	29.0 18.0	0.60	0.914	2.5
SD1605025	160	50 x 6.9 25 x 3.5	36.2 18.0	0.60	1.283	2.8
SD1605032	160	50 x 6.9 32 x 4.4	36.2 23.2	0.60	1.452	3.0

[1] The indicated minimum bending radius can be applied permanently without affecting the system's quality or performance

- Medium pipes: PE-Xa/SDR 7.4/PN 10
- Continuous operating temperature: 80°C
- Max. operating temperature: 95°C
- PE-X insulation foam: < 1% water absorption in accordance with ISO 2896
- Full coil length, all dimensions: 100 m
- CFC-free production process

CONNECTORS & ACCESSORIES





PE-X terminal connector		PE-X x PE-X connector	Dust end cap	Shrink end cap	Fix point	
	Thread					Thread M + F
Art. No.	[inch]	Art. No.	Art. No.	Art. No.	Art. No.	[inch]
SC25/0.75M SC20/0.75M	¾" M ¾" M	SC25x25 SC20x20	DECD140/2520	SECD/140	FP0.75 FP0.75	¾" ¾"
SC25/0.75M SC25/0.75M	¾" M ¾" M	SC25x25 SC25x25	DECD160/25	SECD/160	FP0.75	¾" ¾"
SC32/1M SC25/0.75M	1" M ¾" M	SC32x32 SC25x25	DECD140/3225	SECD/140	FP1 FP0.75	1" ¾"
SC32/1M SC25/0.75M	1" M ¾" M	SC32x32 SC25x25	DECD160/3225	SECD/160	FP1 FP0.75	1" ¾"
SC40/1.25M SC25/0.75M	1 ¼" M ¾" M	SC40x40 SC25x25	DECD160/4025	SECD/160	FP1.25 FP0.75	1 ¼" ¾"
SC50/1.5M SC25/0.75M	1 ½" M ¾" M	SC50x50 SC25x25	DECD160/5025	SECD/160	FP1.5 FP0.75	1 ½" ¾"
SC50/1.5M SC32/1M	1 ½" M 1" M	SC50x50 SC32x32	DECD160/5032	SECD/160	FP1.5 FP1	1 ½" 1"

The installation of adequately anchored fix points at the system's extremities (typically at wall penetrations) is mandatory. This to secure the connected plumbing against the potential impact of the system's dilatation forces (thermal expansion/retraction).

To prevent ingress of (ground) water, Terrendis prescribes the usage of shrink end caps to seal the extremities of the non-bonded piping system.

Failing to do so involves a genuine damage risk and automatically voids the system warranty.

03

HEATING + SANITARY

QUADRUPLE

Hyper flexible, pre-insulated piping system, combining two heating pipes and two sanitary pipes in the same jacket pipe, primarily intended for the transport of heating water and sanitary hot water in buried distribution network connecting the heat source with its points-of-use.

The medium pipes are made from cross-linked polyethylene PE-Xa with an orange coloured oxygen-diffusion barrier for the heating flow line and a blue coloured one for the heating return, the sanitary circulation lines are whitish.

The multilayer thermal insulation is made from cross-linked, microcellular polyethylene PE-X foam with a water-repellent closed cell structure, characterized by its durable, non-ageing insulation performance, and its permanent elasticity, maximizing and maintaining the thickness of the insulation layer, even after bending multiple times.

The high-grade, black coloured UV-resistant, double walled, corrugated HDPE jacket pipe shields the pre-insulated piping system against mechanical impacts and moisture, whilst maintaining maximum flexibility.

PIPES

QUADRUPLE

	Jacket pipe	Medium pipe		Bending radius	Water content		Heating capacity		Weight
Art. No.	d_{out} [mm]	d_{out} x s [mm]	d_{in} [mm]	[m](1)	Heating [l/m]	Sanitary [l/m]	[kW](2)	m/s	kg/m
Q160H25S2520	160	(2x) 25 x 2.3 25 x 3.5 20 x 2.8	2 x 20.4 18.0 14.4	0.60	0.654	0.417	10 - 30	0.5 - 1.1	2.5
Q160H32S2520	160	(2x) 32 x 2.9 25 x 3.5 20 x 2.8	2 x 26.2 18.0 14.4	0.60	1.078	0.417	30 - 60	0.6 - 1.3	2.6
Q160H32S3225	160	(2x) 32 x 2.9 32 x 4.4 25 x 3.5	2 x 26.2 23.2 18.0	0.60	1.078	0.677	30 - 60	0.6 - 1.3	2.8
Q200H40S4032	200	(2x) 40 x 3.7 40 x 5.5 32 x 4.4	2 x 32.6 29.0 23.2	0.80	1.670	1.083	40 - 100	0.6 - 1.5	3.5

(1) The indicated minimum bending radius can be applied permanently without affecting the system's quality or performance
(2) Heat capacity in kW for the carrier pipe (at T_{water} of 80°C and a ΔT of 20°C)

- Heating medium pipes: PE-Xa/SDR 11/PN 6
- EVOH Oxygen barrier in accordance with ISO 17455
- Sanitary medium pipes: PE-Xa/SDR 7.4/PN 10
- Continuous operating temperature: 80°C
- Max. operating temperature: 95°C
- PE-X insulation foam: < 1% water absorption in accordance with ISO 2896
- Full coil length, all dimensions: 100 m
- CFC-free production process

CONNECTORS & ACCESSORIES

PE-X terminal connector		Dust end cap	Shrink end cap	Fix point	
	Thread				Thread M + F
Art. No.	[inch]	Art. No.	Art. No.	Art. No.	[inch]
HC25/0.75M SC25/0.75M SC20/0.75M	¾" M ¾" M ¾" M	DECQ160/H25S2520	SECQ/10	FP0.75 FP0.75 FP0.75	¾" ¾" ¾"
HC32/1M SC25/0.75M SC20/0.75M	1" M ¾" M ¾" M	DECQ160/H32S2520	SECQ/10	FP1 FP0.75 FP0.75	1" ¾" ¾"
HC32/1M SC32/1M SC25/0.75M	1" M 1" M ¾" M	DECQ160/H32S3225	SECQ/10	FP1 FP1 FP0.75	1" 1" ¾"
HC40/1.25M SC40/1.25M SC32/1M	1 ¼" M 1 ¼" M 1" M	DECQ200/H40S4032	SECQ/10	FP1.25 FP1.25 FP1	1 ¼" 1 ¼" 1"

The installation of adequately anchored fix points at the system's extremities (typically at wall penetrations) is mandatory. This to secure the connected plumbing against the potential impact of the system's dilatation forces (thermal expansion/retraction).

To prevent ingress of (ground) water, Terrendis prescribes the usage of shrink end caps to seal the extremities of the non-bonded piping system.

Failing to do so involves a genuine damage risk and automatically voids the system warranty.

HEAT PUMP

Hyper flexible, pre-insulated piping system, combining two heating pipes and two cable sleeves for powered sensor cable in the same jacket pipe. The Terrendis HP pipe has been designed to connect air/water heat pumps with houses and residential buildings.

The medium pipes are made from cross-linked polyethylene PE-Xa with an orange coloured oxygen-diffusion barrier for the heating flow line and a blue coloured one for the heating return. The cable sleeve pipes are made from polypropylene.

The multilayer thermal insulation is made from cross-linked, microcellular polyethylene PE-X foam with a water-repellent closed cell structure, characterized by its durable, non-ageing insulation performance, and its permanent elasticity, maximizing and maintaining the thickness of the insulation layer, even after bending multiple times.

The high-grade, black coloured UV-resistant, double walled, corrugated HDPE jacket pipe shields the pre-insulated piping system against mechanical impacts and moisture, whilst maintaining maximum flexibility.

- Heating medium pipes: PE-Xa/SDR 11/PN 6
- EVOH oxygen barrier in accordance with ISO 17455
- Continuous operating temperature: 80°C
- Max. operating temperature: 95°C
- Cable sleeves in polypropylene class 3422
- PE-X insulation foam: < 1% water absorption in accordance with ISO 2896
- Full coil length: 100 m
- CFC-free production process

PIPES

HEAT PUMP

	Jacket pipe	Medium pipe		Bending radius	Water content	Heating capacity		Weight
Art. No.	d_{out} [mm]	d_{out} x s [mm]	d_{in} [mm]	[m][1]	[l/m]	[kW][2]	m/s	kg/m
HP14032E32	140	(2x) 32 x 2.9 32 32	2 x 26.2 25 25	0.40	1.078	6 - 15	0.6 - 1.3	2.3
HP16040E32	160	(2x) 40 x 3.7 32 32	2 x 32.6 25 25	0.60	1.670	10 - 28	0.6 - 1.5	3.0
HP16050E32	160	(2x) 50 x 4.6 32 32	2 x 40.8 25 25	0.60	2.614	15 - 50	0.6 - 1.8	3.2

[1] The indicated minimum bending radius can be applied permanently without affecting the system's quality or performance
[2] Heat capacity in kW for the carrier pipe (at T_{water} of 60°C and a ΔT of 5°C)

CONNECTORS & ACCESSORIES

	PE-X terminal connector		Dust end cap	Shrink end cap
		Thread		
Art. No.	Art. No.	[inch]	Art. No.	Art. No.
HP14032E32	**HC32/1M**	1" M	**DECQ140/H32S3232**	SECQ/10
HP16040E32	**HC40/1.25M**	1 ¼" M	**DECQ160/H40S3232**	SECQ/10
HP16050E32	**HC50/1.5M**	1 ½" M	**DECQ160/H50S3232**	SECQ/10

To prevent ingress of (ground) water, Terrendis prescribes the usage of shrink end caps to seal the extremities of the non-bonded piping system.

Failing to do so involves a genuine damage risk and automatically voids the system warranty.

04

COLD + COOLING

SINGLE COOL

Hyper flexible, pre-insulated piping system with a single medium pipe, primarily intended for the transport of cold potable water, cooling water, waste water or other fluids, in buried distribution networks.

The medium pipes are made from high density polyethylene HDPE-100 according to EN 12201 and can operate at pressures up to 16 bar.

The multilayer thermal insulation is made from cross-linked, microcellular polyethylene PE-X foam with a water-repellent closed cell structure, characterized by its durable, non-ageing insulation performance, and its permanent elasticity, maximizing and maintaining the thickness of the insulation layer, even after bending multiple times.

The high-grade, black coloured UV-resistant, double walled, corrugated HDPE jacket pipe shields the pre-insulated piping system against mechanical impacts and moisture, whilst maintaining maximum flexibility.

PIPES

SINGLE COOL

	Jacket pipe	Medium pipe		Bending radius	Water content	Weight
Art. No.	d_{out} [mm]	d_{out} x s [mm]	d_{in} [mm]	[m][1]	[l/m]	kg/m
C7525	75	25 x 2.3	20.4	0.20	0.327	0.7
C9032	90	32 x 2.9	26.2	0.25	0.539	1.0
C9040	90	40 x 3.7	32.6	0.30	0.835	1.2
C14050	140	50 x 4.6	40.8	0.40	1.307	2.2
C14063	140	63 x 5.8	51.4	0.50	2.075	2.5
C16075	160	75 x 6.8	61.4	0.75	2.961	3.4
C16090	160	90 x 8.2	73.6	1.00	4.254	3.7
C200110	200	110 x 10.0	90.0	1.20	6.362	5.7
C200125	200	125 x 11.4	102.2	1.40	8.203	6.1

[1] The indicated minimum bending radius can be applied permanently without affecting the system's quality or performance

- Medium pipes: HDPE-100/SDR 11/PN 16
- Operating temperature range: from -20°C up to 20°C (PN16)
  from 20°C up to 40°C (max. PN 11.8 at 40°C)
- PE-X insulation foam: < 1% water absorption in accordance with ISO 2896
- Full coil length, all dimensions: 100 m
- CFC-free production process

CONNECTORS & ACCESSORIES

PE-X terminal connector		Dust end cap	Shrink end cap
	Thread		
Art. No.	[inch]	Art. No.	Art. No.
HC25/0.75M	¾" M	**DEC75/25**	**SEC/75**
HC32/1M	1" M	**DEC90/32**	**SEC/90**
HC40/1.25M	1 ¼" M	**DEC90/40**	**SEC/90**
HC50/1.5M	1 ½" M	**DEC140/50**	**SEC/140**
HC63/2M	2" M	**DEC140/63**	**SEC/140**
HC75/2.5M	2 ½" M	**DEC160/75**	**SEC/160**
HC90/3M	3" M	**DEC160/90**	**SEC/160**
HC110/4M	4" M	**DEC200/110**	**SEC/200-S**
HC125/4M	4" M	**DEC200/125**	**SEC/200**

As an alternative to the PE-X terminal connectors, our cool pipes can be combined with the complete range of PE connectors and couplings in polypropylene (page 34). Particularly suitable for chlorinated water in swimming pool applications.

To prevent ingress of (ground) water, Terrendis prescribes the usage of shrink end caps to seal the extremities of the non-bonded piping system.

Failing to do so involves a genuine damage risk and automatically voids the system warranty.

SINGLE COOL WITH FROST PROTECTION

Hyper flexible, pre-insulated piping system with a single medium pipe, primarily intended for the transport of cold potable water, cooling water, waste water or other fluids, in buried distribution networks.

The medium pipes are made from high density polyethylene HDPE-100 according to EN 12201 and can operate at pressures up to 16 bar. An integrated self-regulating 10 W/m heating cable prevents stagnant water from freezing.

The multilayer thermal insulation is made from cross-linked, microcellular polyethylene PE-X foam with a water-repellent closed cell structure, characterized by its durable, non-ageing insulation performance, and its permanent elasticity, maximizing and maintaining the thickness of the insulation layer, even after bending multiple times.

The high-grade, black coloured UV-resistant, double walled, corrugated HDPE jacket pipe shields the pre-insulated piping system against mechanical impacts and moisture, whilst maintaining maximum flexibility.

PIPES

SINGLE COOL WITH FROST PROTECTION

	Jacket pipe	Medium pipe		Bending radius	Water content	Weight
Art. No.	d_{out} [mm]	d_{out} x s [mm]	d_{in} [mm]	[m][1]	[l/m]	kg/m
C7525W10	75	25 x 2.3	20.4	0.20	0.327	0.7
C7532W10	75	32 x 2.9	26.2	0.20	0.539	0.8
C9040W10	90	40 x 3.7	32.6	0.30	0.835	1.2
C14050W10	140	50 x 4.6	40.8	0.40	1.307	2.2
C14063W10	140	63 x 5.8	51.4	0.50	2.075	2.5
C16075W10	160	75 x 6.8	61.4	0.75	2.961	3.3
C16090W10	160	90 x 8.2	73.6	1.00	4.254	4.0
C200110W10	200	110 x 10.0	90.0	1.20	6.362	5.8
C200125W10	200	125 x 11.4	102.2	1.40	8.203	6.2

[1] The indicated minimum bending radius can be applied permanently without affecting the system's quality or performance

- Medium pipes: HDPE-100/SDR 11/PN 16
- Operating temperature range: from -20°C up to 20°C (PN16)
  from 20°C up to 40°C (max. PN 11.8 at 40°C)
- PE-X insulation foam: < 1% water absorption in accordance with ISO 2896
- Full coil length, all dimensions: 100 m
- CFC-free production process

CONNECTORS & ACCESSORIES

PE-X terminal connector		Dust end cap	Shrink end cap
	Thread		
Art. No.	[inch]	Art. No.	Art. No.
HC25/0.75M	¾" M	**DEC75/25**	**SEC/75**
HC32/1M	1" M	**DEC75/32**	**SEC/75**
HC40/1.25M	1 ¼" M	**DEC90/40**	**SEC/90**
HC50/1.5M	1 ½" M	**DEC140/50**	**SEC/140**
HC63/2M	2" M	**DEC140/63**	**SEC/140**
HC75/2.5M	2 ½" M	**DEC160/75**	**SEC/160**
HC90/3M	3" M	**DEC160/90**	**SEC/160**
HC110/4M	4" M	**DEC200/110**	**SEC/200-S**
HC125/4M	4" M	**DEC200/125**	**SEC/200**

As an alternative to the PE-X terminal connectors, our cool pipes can be combined with the complete range of PE connectors and couplings in polypropylene (page 34). Particularly suitable for chlorinated water in swimming pool applications.

To prevent ingress of (ground) water, Terrendis prescribes the usage of shrink end caps to seal the extremities of the non-bonded piping system.

Failing to do so involves a genuine damage risk and automatically voids the system warranty.

CONNECTION KIT FOR SINGLE COOL PIPE WITH FROST PROTECTION CABLE

Our single cool pipes with frost protection cable are equipped with a self-regulating 10 W/m heating cable to prevent stagnant water from freezing.

The heating cable must be connected to a 220 VAC/50-60 Hz line to operate. It is recommended to protect the circuit with a 30 mA residual current circuit breaker and a fuse of 16 A.

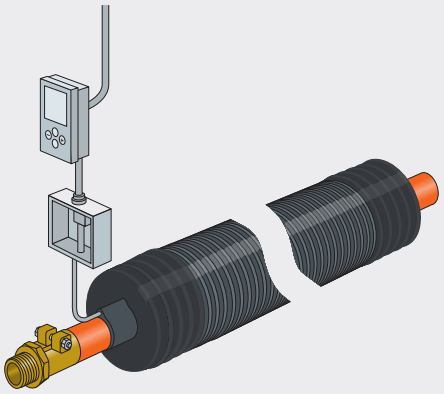
The use of an ambient thermostat is strongly recommended in order to:

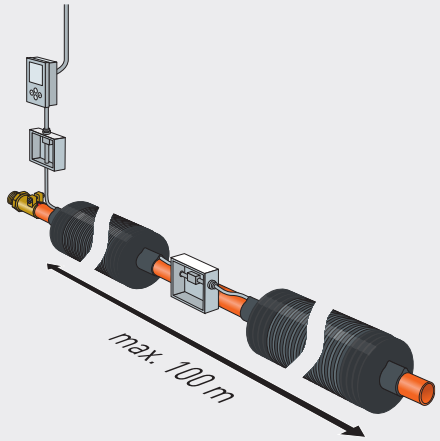
- Automatically switch on/off the power supply of the heating cable at a pre-set temperature (e.g. 2°C)
- To prevent the heating cable being constantly under tension even when surrounding temperatures are well above the freezing point

The total length of the heating cable should not exceed 100 m. Where longer heating cables are required, separate power supplies should be foreseen, each feeding maximum 100 m cable.

The heating cable can be cut to any desired length (< 100 m and as a function of the pipe length).

To assure proper functioning of the cable and to prevent possible short circuits, the cables two conductive wires should be electrically insulated from each other.





HCTHERM
ambient thermostat

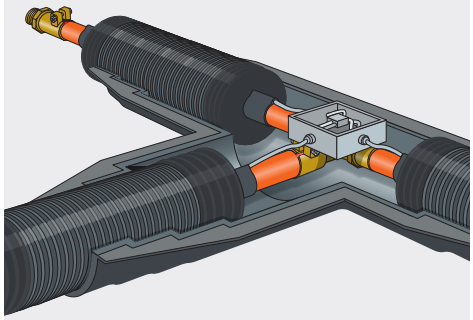
Wall mounted ambient thermostat.

Art. No.
HCTHERM
Protection class: IP 54
Regulation range: -10°C up to 40°C
Switching Power: 16 A/230 VAC
Voltage: 230 VAC
Standard setting: 0°C

HCBOX
electrical junction box

This PVC junction box is used to connect the heating cable with the power supply line.

Art. No.
HCBOX
Protection class: IP 55



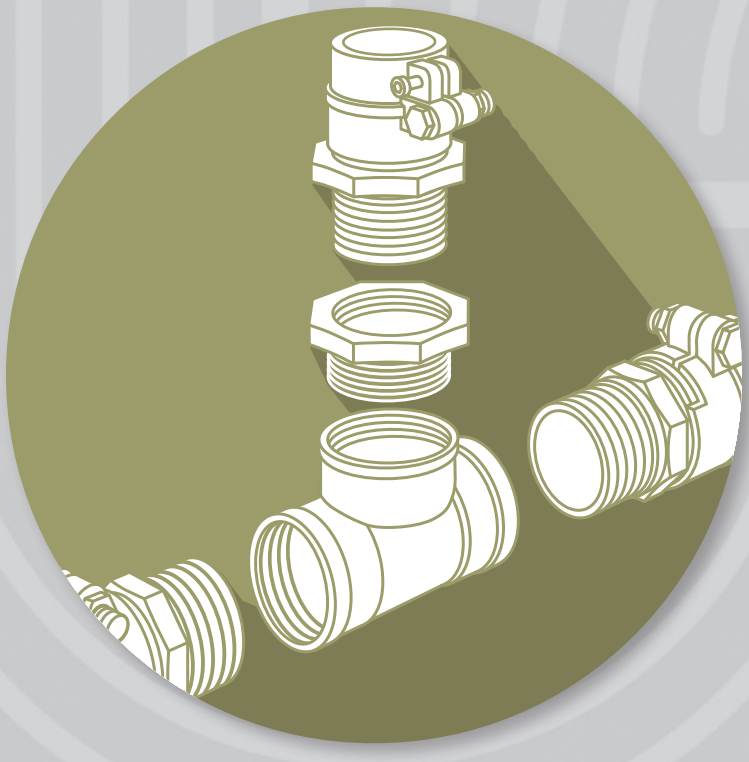
HCSL
electrical connection and insulation kit

This kit is used to connect the heating cable to the power supply and electrically insulate the wire ends.

Art. No.
HCSL
1x bulkhead fitting
3x heat shrink sleeves to insulate the power wires and grounding cable
1x long heat shrink sleeve to insulate the heating cable at the connection
2x shorter heat shrink sleeves to insulate the extremities of the heating cable

05

ACCESSORIES



PE-X CONNECTORS AND BRASS ACCESSORIES

Full dimensional range of strong, reliable and easy to use PE-X terminal connectors from 25-125 mm in SDR 11 (heating, cold and cooling) and 20-110 mm in SDR 7.4 (sanitary).

Purpose-designed connectors with long fitting insert for superior grip on the PE-X pipe and standardized conical male thread for trouble free connection to any downstream piping.

All brass wetted parts are in compliance with the European Drinking Water Directive.

Clamping rings in dezincification-resistant (DZR) brass, preventing dezincification corrosion in aggressive conditions.

Easy to install bolt type connection without requirement for special tools or hydraulic equipment. Superior quality stainless steel pregreased bolts and nuts to avoid corrosion and cold-welding tendency.

O-ring free design, sealing on the PE-X pipe material for a durable leak tight connection.

- PE-X terminal pipe connectors according to ISO 15875-3
- Pipes: PE-X/SDR 11, PE-X/SDR 7.4
  HDPE-100/SDR 11
- Pressure rating: PN 6 for heating,
  PN 10 for sanitary,
  PN 16 for cold and cooling
- Material fitting insert: brass in accordance with European DWD 98/83/EC
- Material clamping ring: DZR brass
- Clamping bolt and nut: AISI 316
- Thread: conical ISO 7-1
- O-ring free design

PE-X TERMINAL CONNECTORS SDR 11

	Pipe size	Thread	Weight
Art. No.	$d_{out}/s/d_{in}$ [mm]	[inch]	[kg]
HC25/0.75M	25/2.3/20.4	¾" M	0.2
HC32/1M	32/2.9/26.2	1" M	0.3
HC40/1.25M	40/3.7/32.6	1 ¼" M	0.6
HC50/1.5M	50/4.6/40.8	1 ½" M	0.6
HC63/2M	63/5.8/51.4	2" M	1.1
HC75/2.5M	75/6.8/61.4	2 ½" M	1.7
HC90/3M	90/8.2/73.6	3" M	2.6
HC110/4M	110/10.0/90.0	4" M	4.1
HC125/4M	125/11.4/102.2	4" M	5.2

PE-X x PE-X CONNECTORS SDR 11

	Pipe size	Weight
Art. No.	$d_{out}/s/d_{in}$ [mm]	[kg]
HC25x25	25/2.3/20.4	0.3
HC32x32	32/2.9/26.2	0.4
HC40x40	40/3.7/32.6	0.8
HC50x50	50/4.6/40.8	1.0
HC63x63	63/5.8/51.4	1.7
HC75x75	75/6.8/61.4	2.6
HC90x90	90/8.2/73.6	4.0
HC110x110	110/10.0/90.0	6.4
HC125x125	125/11.4/102.2	8.1

PE-X x PE-X L-CONNECTORS SDR 11

	Pipe size	Weight
Art. No.	$d_{out}/s/d_{in}$ [mm]	[kg]
HLC25x25	25/2.3/20.4	0.3
HLC32x32	32/3.0/26.2	0.5
HLC40x40	40/3.7/32.6	0.9
HLC50x50	50/4.6/40.8	1.1
HLC63x63	63/5.8/51.4	1.9
HLC75x75	75/6.8/61.4	3.0
HLC90x90	90/8.2/73.6	4.7
HLC110x110	110/10.0/90.0	7.5
HLC125x125	125/11.4/102.2	9.8

PE-X WELD-END CONNECTORS SDR 11

	Pipe size	Weld-end		Weight
Art. No.	$d_{out}/s/d_{in}$ [mm]	d_{out} [mm]	d_{in} [mm]	[kg]
HC25/27W	25/2.3/20.4	29.6	21.6	0.2
HC32/33W	32/2.9/26.2	33.7	27.7	0.3
HC40/42W	40/3.7/32.6	42.4	35.4	0.5
HC50/48W	50/4.6/40.8	48.3	40.0	0.7
HC63/60W	63/5.8/51.4	60.3	52.3	1.0
HC75/76W	75/6.8/61.4	76.0	65.0	1.6
HC90/89W	90/8.2/73.6	88.9	78.9	2.3
HC110/114W	110/10.0/90.0	114.3	104.3	3.5
HC125/114W	125/11.4/102.2	114.3	104.3	4.3

Weld-end connectors with steel supporting pipe for the connection of PE-Xa pipes to steel district heating mains.

PE-X TERMINAL CONNECTORS SDR 7.4

	Pipe size	Thread	Weight
Art. No.	$d_{out}/s/d_{in}$ [mm]	[inch]	[kg]
SC20/0.75M	20/2.8/14.4	¾" M	0.2
SC25/0.75M	25/3.5/18.0	¾" M	0.2
SC32/1M	32/4.4/23.2	1" M	0.3
SC40/1.25M	40/5.5/29.0	1 ¼" M	0.6
SC50/1.5M	50/6.9/36.2	1 ½" M	0.6
SC63/2M	63/8.7/45.6	2" M	1.1
SC75/2.5M	75/10.3/54.4	2 ½" M	1.7
SC90/3M	90/12.3/65.4	3" M	2.7
SC110/4M	110/15.1/79.8	4" M	4.0

DVGW approved for drinking water

PE-X x PE-X CONNECTORS SDR 7.4

	Pipe size	Weight
Art. No.	$d_{out}/s/d_{in}$ [mm]	[kg]
SC20x20	20/2.8/14.4	0.3
SC25x25	25/3.5/18.0	0.3
SC32x32	32/4.4/23.2	0.4
SC40x40	40/5.5/29.0	0.8
SC50x50	50/6.9/36.2	1.1
SC63x63	63/8.7/45.6	1.7
SC75x75	75/10.3/54.4	2.6
SC90x90	90/12.3/65.4	4.1
SC110x110	110/15.1/79.8	6.4

For mounting instructions, please refer to our technical manual.

Brass system accessories such as sleeves, elbows, T-pieces, etc. can be easily combined with the PE-X terminal connectors to the desired dimensional configurations.

All brass accessories are in compliance with the European Drinking Water Directive, Council Directive 98/83/EC.

- Pressure rating: PN 16
- Materials: DZR brass in accordance with DWD 98/83/EC
- Threads: fix points are conical ISO7-1 other brass accessories ISO 228-1

FIX POINTS

	Thread M + F	Weight
Art. No.	[inch]	[kg]
FP0.75	¾"	0.2
FP1	1"	0.3
FP1.25	1 ¼"	0.5
FP1.5	1 ½"	0.6
FP2	2"	0.8
FP2.5	2 ½"	1.0
FP3	3"	1.7
FP4	4"	2.5

SLEEVES

	Thread F + F	Weight
Art. No.	[inch]	[kg]
SL0.75	¾"	0.1
SL1	1"	0.2
SL1.25	1 ¼"	0.2
SL1.5	1 ½"	0.3
SL2	2"	0.5
SL2.5	2 ½"	0.9
SL3	3"	1.1
SL4	4"	1.5

ELBOWS (90°)

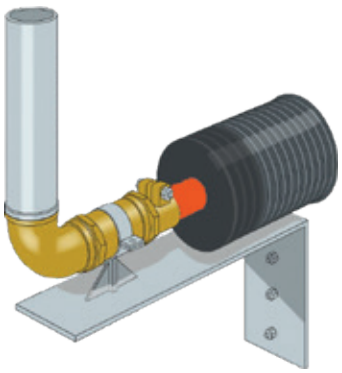
	Thread F + F	Weight
Art. No.	[inch]	[kg]
EL0.75	¾"	0.2
EL1	1"	0.2
EL1.25	1 ¼"	0.3
EL1.5	1 ½"	0.5
EL2	2"	0.7
EL2.5	2 ½"	1.4
EL3	3"	1.9
EL4	4"	2.9

T-PIECES

	Thread F + F + F	Weight
Art. No.	[inch]	[kg]
TP0.75	¾"	0.2
TP1	1"	0.3
TP1.25	1 ¼"	0.4
TP1.5	1 ½"	0.6
TP2	2"	0.8
TP2.5	2 ½"	1.7
TP3	3"	2.2
TP4	4"	3.4

The installation of adequately anchored fix points at the extremities of the pre-insulated piping system (typically at wall penetrations) is essential to secure the connected plumbing against the potential impact of thermal expansion/retraction and longitudinal reversion of the PE-Xa medium pipe(s).

Failing to do so involves a genuine damage risk and automatically voids the system warranty.



REDUCING BUSHES

	Thread M + F	Weight
Art. No.	[inch]	[kg]
RB1/0.75	1" M x ¾" F	0.1
RB1.25/0.75	1 ¼" M x ¾" F	0.2
RB1.25/1	1 ¼" M x 1" F	0.1
RB1.5/0.75	1 ½" M x ¾" F	0.3
RB1.5/1	1 ½" M x 1" F	0.2
RB1.5/1.25	1 ½" M x 1 ¼" F	0.1
RB2/0.75	2" M x ¾" F	0.5
RB2/1	2" M x 1" F	0.4
RB2/1.25	2" M x 1 ¼" F	0.3
RB2/1.5	2" M x 1 ½" F	0.3
RB2.5/1.25	2 ½" M x 1 ¼" F	0.8
RB2.5/1.5	2 ½" M x 1 ½" F	0.6
RB2.5/2	2 ½" M x 2" F	0.5
RB3/1	3" M x 1" F	1.0
RB3/1.25	3" M x 1 ¼" F	1.0
RB3/1.5	3" M x 1 ½" F	1.0
RB3/2	3" M x 2" F	0.8
RB3/2.5	3" M x 2 ½" F	0.5
RB4/2	4" M x 2" F	1.9
RB4/2.5	4" M x 2 ½" F	1.6
RB4/3	4" M x 3" F	1.3

NIPPLES

	Thread M + M	Weight
Art. No.	[inch]	[kg]
NI0.75	¾"	0.1
NI1	1"	0.1
NI1.25	1 ¼"	0.2
NI1.5	1 ½"	0.2
NI2	2"	0.3
NI2.5	2 ½"	0.5
NI3	3"	0.9
NI4	4"	1.4

PLUGS

	Thread M	Weight
Art. No.	[inch]	[kg]
PL0.75	¾"	0.1
PL1	1"	0.1
PL1.25	1 ¼"	0.1
PL1.5	1 ½"	0.2
PL2	2"	0.3
PL2.5	2 ½"	0.5
PL3	3"	0.7
PL4	4"	1.5

BALL VALVES

	Thread M + F
Art. No.	[inch]
BV0.75	¾"
BV1	1"
BV1.25	1 ¼"
BV1.5	1 ½"
BV2	2"
BV2.5	2 ½"
BV3	3"
BV4	4"

Drinking water approved ball valves up to 2" available **on request**.

FLANGES

	Thread F	Weight
Art. No.	[inch]	[kg]
FL0.75	¾"	1.0
FL1	1"	1.5
FL1.25	1 ¼"	2.0
FL1.5	1 ½"	2.1
FL2	2"	2.5
FL2.5	2 ½"	3.3
FL3	3"	4.0
FL4	4"	4.5

PE CONNECTORS

Complete range of PE connectors and couplings in polypropylene (PP) from 25-110 mm in SDR 11.

Applicable for cold drinking and cooling water. Particularly suitable for chlorinated water in swimming pool applications.

- PE pipe connectors: SDR 11
- Pressure rating: max. operating pressure PN 10 at 20°C
- Material: polypropylene (PP)

PE TERMINAL CONNECTORS

	Pipe size	Thread
Art. No.	$d_{out}/s/d_{in}$ [mm]	[inch]
PPC25/0.75M	25/2.3/20.4	¾" M
PPC32/1M	32/2.9/26.2	1" M
PPC40/1.25M	40/3.7/32.6	1 ¼" M
PPC50/1.5M	50/4.6/40.8	1 ½" M
PPC63/2M	63/5.8/51.4	2" M
PPC75/2.5M	75/6.8/61.4	2 ½" M
PPC90/3M	90/8.2/73.6	3" M
PPC110/4M	110/10.0/90.0	4" M

PE x PE CONNECTORS

	Pipe size
Art. No.	$d_{out}/s/d_{in}$ [mm]
PPC25x25	25/2.3/20.4
PPC32x32	32/2.9/26.2
PPC40x40	40/3.7/32.6
PPC50x50	50/4.6/40.8
PPC63x63	63/5.8/51.4
PPC75x75	75/6.8/61.4
PPC90x90	90/8.2/73.6
PPC110x110	110/10.0/90.0

PE x PE ELBOW CONNECTORS

	Pipe size
Art. No.	$d_{out}/s/d_{in}$ [mm]
PPEC25x25	25/2.3/20.4
PPEC32x32	32/2.9/26.2
PPEC40x40	40/3.7/32.6
PPEC50x50	50/4.6/40.8
PPEC63x63	63/5.8/51.4
PPEC75x75	75/6.8/61.4
PPEC90x90	90/8.2/73.6
PPEC110x110	110/10.0/90.0

PE x PE x PE T-CONNECTORS

	Pipe size
Art. No.	$d_{out}/s/d_{in}$ [mm]
PPTC/3x25	25/2.3/20.4
PPTC/3x32	32/2.9/26.2
PPTC/3x40	40/3.7/32.6
PPTC/3x50	50/4.6/40.8
PPTC/3x63	63/5.8/51.4
PPTC/3x75	75/6.8/61.4
PPTC/3x90	90/8.2/73.6
PPTC/3x110	110/10.0/90.0

INSULATION KITS

I - STRAIGHT INSULATION SLEEVE KIT

	Jacket pipe	Insulation sleeve		Weight
Art. No.	d_{out} [mm]	d_{out} [mm]	Length [mm]	[kg]
SIS90/75	90/75	110	600	1.8
SIS110	110	125	600	1.9
SIS140	140	160	850	3.0
SIS160	160	180	1000	4.0
SIS200	200	225	1000	6.0
SIS225	225	250	1000	7.3

Watertight HDPE buried insulation kit for straight extensions of single, double or quadruple pre-insulated pipes. Comes complete with mineral wool insulation, shrink sleeves and mounting instructions.

WARRANTY REQUIREMENT: Order the appropriate size shrink end caps for your specific pre-insulated pipe models separately.

T - INSULATION KIT

	Jacket pipe	Length	Width	Height	Weight
Art. No.	d_{out} [mm]	[mm]	[mm]	[mm]	[kg]
TIK140/90	140/110/90	1250	755	206	5.5
TIK225/140	225/200/160/140	1640	990	290	9.0

Watertight HDPE buried insulation kit for T-junctions between single, double or quadruple pre-insulated pipes. Comes complete with mineral wool insulation, sealing compound, stainless steel bolts and plates and mounting instructions.

WARRANTY REQUIREMENT: Order the appropriate size shrink end caps for your specific pre-insulated pipe models separately.

H - INSULATION KIT

	Jacket pipe	Length	Width	Height	Weight
Art. No.	d_{out} [mm]	[mm]	[mm]	[mm]	[kg]
HIK225/140	225/200/160/140	1640	1250	476	15.0
	2 x Main 225/200/160/140 1 x Branch 200/160/140				

Watertight HDPE buried insulation kit for double T-junctions between single, double or quadruple pre-insulated pipes. Comes complete with mineral wool insulation, sealing compound, stainless steel bolts and plates and mounting instructions.

WARRANTY REQUIREMENT: Order the appropriate size shrink end caps for your specific pre-insulated pipe models separately.

L - INSULATION KIT

	Jacket pipe	Length	Width	Height	Weight
Art. No.	d_{out} [mm]	[mm]	[mm]	[mm]	[kg]
LIK225/140	225/200/160/140	990	990	290	7.5

Watertight HDPE buried insulation kit for double T-junctions between single, double or quadruple pre-insulated pipes. Comes complete with mineral wool insulation, sealing compound, stainless steel bolts and plates and mounting instructions.

WARRANTY REQUIREMENT: Order the appropriate size shrink end caps for your specific pre-insulated pipe models separately.

To prevent ingress of (ground) water, Terrendis prescribes the usage of shrink end caps to seal the extremities of the non-bonded piping system.

Failing to do so involves a genuine damage risk and automatically voids the system warranty.

REDUCING ADAPTOR SETS FOR INSULATION KITS

	Jacket pipe	Weight
Art. No.	d_{out} [mm]	[kg]
RAS200/75	200 to 75 reduction	2.0
RAS200/90	200 to 90 reduction	2.5
RAS200/110	200 to 110 reduction	3.0

Reducing adapters are used to accomodate smaller pipe diameters in larger insulation kit inlets. The reducing adapter is pressed into the insulation kit and the transition between the adapter and the pre-insulated pipe is sealed with the heat shrink end cap, included in the set.

Reducing adapter set 200mm to 125mm (RAS200/125) available on specific request.

UNDERGROUND INSPECTION CHAMBER

	Jacket pipe	Length	Width	Height	Weight
Art. No.	d_{out} [mm]	[mm]	[mm]	[mm]	[kg]
UIC225/140	225/200/160/140	1570	1360	700	55.0

Underground inspection chamber with 6 possible inlets for the connection of single, double or quadruple pipes, allowing the integration of shut-off valves. Comes complete with lid, sealing compound, stainless steel bolts and mounting instructions.

WARRANTY REQUIREMENT: Order the appropriate size shrink end caps for your specific pre-insulated pipe models separately

SHRINK SLEEVE FOR UNDERGROUND INSPECTION CHAMBER

	Jacket pipe	Length	Weight
Art. No.	d_{out} [mm]	[mm]	[kg]
SSL110/125	110	225	0.2
SSL160/180	140	225	0.3
SSL160/180	160	225	0.3
SSL225/250	200	225	0.4
SSL225/250	225	225	0.4

To obtain a leak-tight sealing between the inlets of the underground inspection chamber and the entering pre-insulated pipes. the appropriate shrink sleeves must be ordered separately.

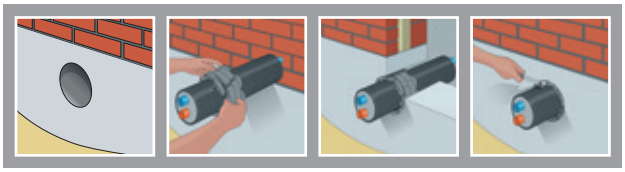
ACCESSORIES

SEAL CHAIN FOR NON-PRESSURIZED WATER

	Jacket pipe	Wall opening	Weight
Art. No.	d_{out} [mm]	d [mm]	[kg]
SCHA9/200	75	100	1.0
SCHA7/300	75	120	0.7
SCHA6/360	75	150	1.4
SCHA8/300	90	130	0.8
SCHA9/340	90	150	0.7
SCHA10/300	110	150	1.0
SCHA13/340	140	200	1.9
SCHA14/300	160	200	1.2
SCHA9/475	160	250	4.0
SCHA9/325	200	250	2.0
SCHA12/410	225	300	5.0

Other dimensions on request

Modular seal chain designed for hydrostatically sealing pre-insulated pipe penetrations in walls, floors and ceilings. Seal Chain Assemblies can be mounted in core drill holes or inside fibre cement or PVC wall sleeves, which are poured into the concrete construction.



RING SEAL FOR PRESSURIZED WATER

	Jacket pipe	Wall opening	Weight
Art. No.	d_{out} [mm]	d [mm]	[kg]
RS75/150	75	150	1.9
RS90/150	90	150	1.7
RS110/150	110	150	1.4
RS140/200	140	200	2.2
RS160/250	160	250	4.1
RS200/250	200	250	2.6
RS225/300	225	300	4.6

Ring seal designed for hydrostatically sealing pre-insulated pipe penetrations in walls, floors and ceilings. Ring seals can be mounted in core drill holes or inside fibre cement or PVC wall sleeves, which are poured into the concrete construction. **Pressure tight waterproof up to 0.5 bar.**

PVC WALL SLEEVE

	Jacket pipe	Wall sleeve		Weight
Art. No.	d_{out} [mm]	d [mm]	Length [mm]	[kg]
WSPVC150	75 or 90 or 110	150	400	1.3
WSPVC200	140 or 160	200	400	1.7
WSPVC250	160 or 200	250	400	6.3
WSPVC300	225	300	400	3.4

Wall feed through sleeves made of PVC accommodates pre-insulated pipe equipped with a seal chain or ring seal. PVC has a dilatation behaviour. similar to that of the concrete in which it is embedded.

FIBRE CEMENT WALL SLEEVE

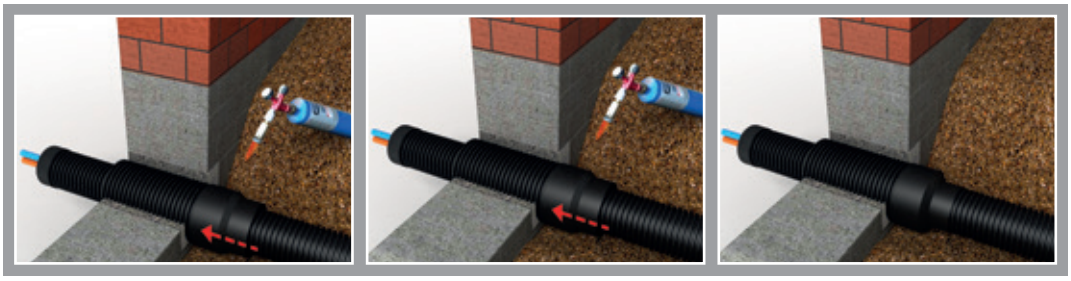
	Jacket pipe	Wall sleeve		Weight
Art. No.	d_{out} [mm]	d [mm]	Length [mm]	[kg]
WSFI150	75 or 90 or 110	150	400	8.0
WSFI200	140 or 160	200	400	13.5
WSFI250	160 or 200	250	400	16.4
WSFI300	225	300	400	20.0

Wall feed through sleeves made of fibre cement accommodates pre-insulated pipe equipped with a seal chain or ring seal. Fiber cement has a dilatation behaviour. similar to that of the concrete in which it is embedded.

WALL FEED THROUGH ASSEMBLY FOR NON-PRESSURIZED WATER

	Jacket pipe	Throughput pipe	
Art. No.	d_{out} [mm]	d_{out} [mm]	Length [mm]
WSL75	75	110	500
WSL90/110	90 or 110	140	500
WSL140/160	140 or 160	200	500
WSL200	200	235	500
WSL225	225	295	500

Wall feed through assembly for wall penetrations above the groundwater table (for non-pressurized water), comprising a corrugated HDPE throughput pipe sleeve and a heat shrink sleeve to seal between the throughput pipe sleeve and the entering pre-insulated pipe. At the outside, the bricked-in throughput pipe sleeve must protrude ± 10 cm from the finished wall surface to allow the mounting of the heat shrinkable sleeve.

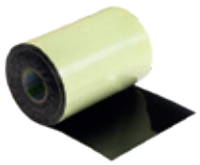


REPAIR TAPE

	Tape dimensions	
Art. No.	Width [mm]	Length [m]
RETAP-H	200	10
RETAP-C	150	10

Repair tape is being used to repair perforations or other damages at the outside jacket pipe.

Available as: **Heat shrinkable** tape (**RETAP-H**)
Cold applied version (**RETAP-C**)



WARNING TAPE

	Tape dimensions		
Art. No.	Width [mm]	Length [m]	Colour
TA80/250WB	80	250	blue
TA80/250WR	80	250	red

Warning tape is positioned above the buried pipes to avoid damaging these pipes when carrying out ground works at a later stage.

SHRINK SLEEVE

	Jacket pipe	Length
Art. No.	d_{out} [mm]	[mm]
SSL75	75	225
SSL90/110	90	225
SSL90/110	110	225
SSL140/160	140	225
SSL140/160	160	225
SSL200/225	200	225
SSL200/225	225	225

Heat-shrinkable tubular sleeve for field-applied repair of perforations or other damages at the outside jacket pipe.

06

TECHNICAL INFORMATION

INSTALLATION

To facilitate the connection of branch pipes to the main pipes, superposition of the inner medium-carrying PE-Xa pipes is recommended (as shown in the drawing).

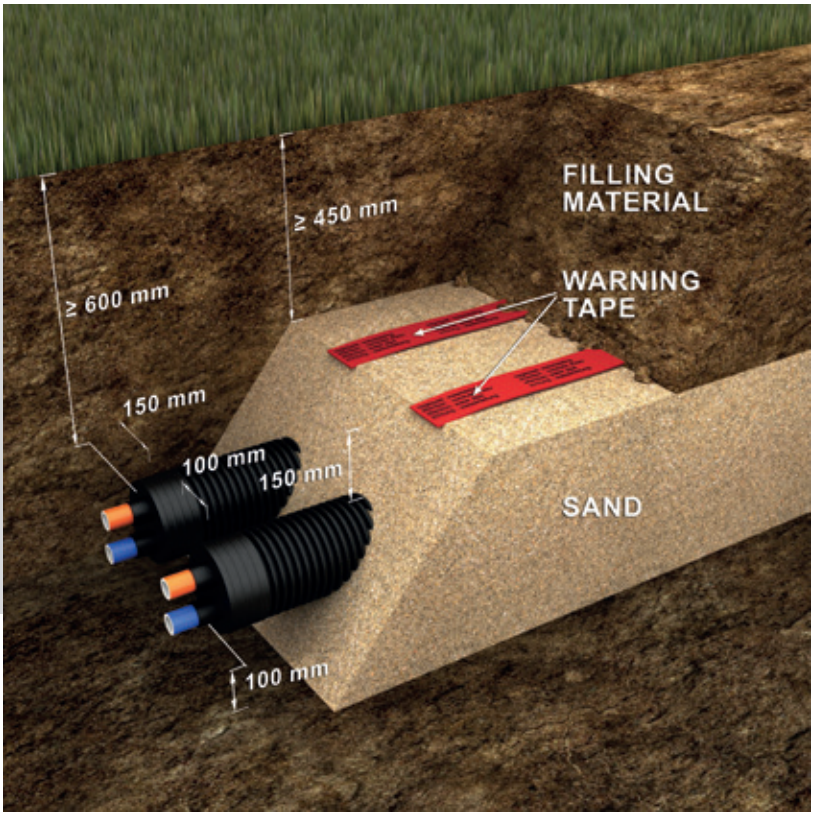
Always consider the local frost depth to determine the minimum placement depth of the pipes.

To avoid damaging the outer protective HDPE jacket, always lay the pipes in a sand bed. Backfill only after fully covering the pipes with sand, respecting the minimal layer dimensions as indicated in the drawing.

Warning tape or warning mesh positioned above the buried pipes should avoid damaging these pipes when carrying out ground works at a later stage.

To avoid potential contamination during transportation and/or installation, our pre-insulated pipes are always delivered with the medium-carrying pipes closed with plastic plugs.

All pipe systems intended for potable (drinking) water and other sanitary domestic tasks, such as washing and showering applications, should always be thoroughly rinsed before commissioning, following the locally applicable hygienic regulations and accepted practices.



For a state-of-the-art installation, the following guidelines should be respected. Failing to do so involves a genuine damage risk and automatically voids the system warranty.

- The installation of adequately anchored fix points at the system's extremities (typically at wall penetrations) is mandatory. This to secure the connected plumbing against the potential impact of the PE-Xa system's dilatation forces (thermal expansion/retraction).
- All buried pipe connections should be executed with our purpose designed PE-X connectors.
- To prevent ingress of (ground) water, the EN 15632-3 standard prescribes the usage of shrink end caps to seal the extremities of the non-bonded piping system.
- Prior to concealing, the methodical execution and documentation of the standardised pressure test of the entire system is required to determine the integrity of the buried plumbing.

PRESSURE TEST ACCORDING TO DIN 1988-2

The pressure test procedure is mandatory before backfilling over any pipes.

Prior to concealing, fill the finished pipework with water, taking care to avoid air locks. The pressure test must be conducted in two stages, starting with the preliminary test, followed by the main test.

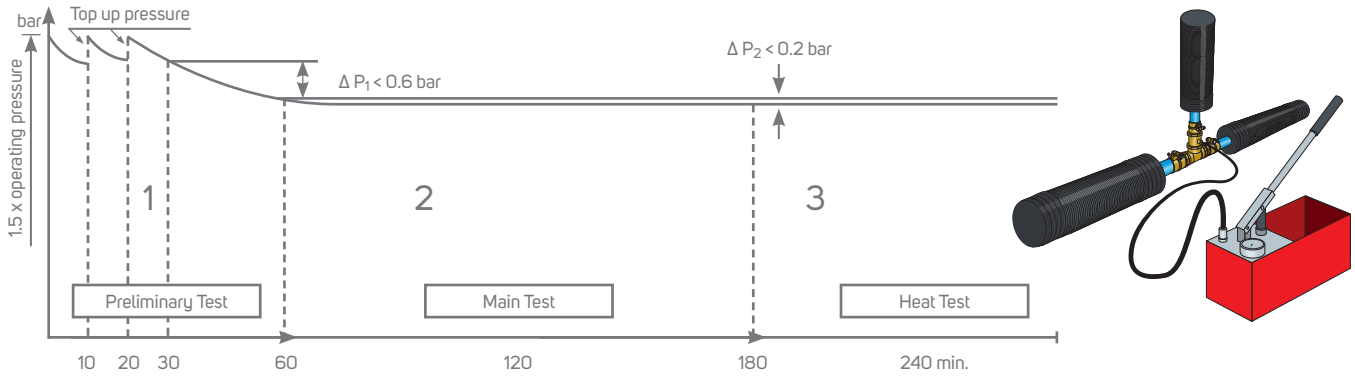
1. Preliminary test

The preliminary test involves applying a test pressure equal to 1.5 times the admissible operating pressure. This pressure must be regenerated twice within the space of 30 minutes at intervals of 10 minutes. Following a test period of another 30 minutes, the test pressure must not have fallen by more than 0.6 bar. Leakages must not occur at any points in the system being tested.

2. Main test

The main test has to be conducted immediately after the preliminary test. The test takes 2 hours. At the end of this period, the test pressure recorded after the preliminary test must not have fallen by more than 0.2 bar. Leakages must not occur at any point in the system being tested.

Leakage testing - DIN 1988-2



1	Preliminary test	Bar/psi
1.1	Operating pressure x 1.5	
1.2	After 10 min (restore 1.1)	
1.3	After 20 min (restore 1.1)	
1.4	After 30 min (restore 1.1)	
1.5	Admissible pressure drop after 60 min < 0.6 bar	

2	Main test	Bar/psi
2.1.1	Beginning (hh:mm)	:
2.1.2	End (hh:mm)	:
2.2	Test pressure	
2.3	After 120 min	
2.4	Admissible pressure drop after 120 min < 0.2 bar	

WARNING:

- Always pressure test the completed pipe-work before concealing! The conscientious execution and documentation of the standardised pressure test for the entire piping system is a warranty requirement!
- Failing to do so involves a genuine damage risk and automatically voids the system warranty.

HEAT LOSS

The heat loss of a pre-insulated piping system is determined by the driving temperature difference (ΔT) between the operating temperature of the heating medium inside the medium pipe(s), and the ground temperature in the immediate neighbourhood of the buried pipe.

Depending on the selected pipe configuration, the ΔT can be calculated as following:

- for **single heating** $\Delta T = t_{flow} - t_{ground}$
- for **double heating** $\Delta T = [(t_{flow} + t_{return})/2] - t_{ground}$

Basis for calculating heat loss:

- λ Insulation material: 0.036 W/mK
- λ PE-Xa pipe: 0.35 W/mK
- λ Ground: 1 W/mK
- Pipe-laying depth: 0.80 m

U-values enable easy heat loss determination, as a function of the driving temperature difference ΔT.
The corresponding heat loss per meter pipe length [W/m] is calculated by multiplying the U-value of the subject pre-insulated pipe system with the applicable ΔT. The below tables allow direct reading of the heat loss for a range of standard temperature differences.

Single heating

U-value	Pipe type	Heat loss [W/m] for indicated ΔT, per meter length of pre-insulated single pipe								
[W/mK]	Art. No.	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°C
0.199	**H7525**	1.99	3.98	5.97	7.96	9.95	11.94	13.93	15.92	17.91
0.145	**H11025**	1.45	2.90	4.35	5.80	7.25	8.70	10.15	11.60	13.05
0.204	**H9032**	2.04	4.08	6.12	8.16	10.20	12.24	14.28	16.32	18.36
0.172	**H11032**	1.72	3.44	5.16	6.88	8.60	10.32	12.04	13.76	15.48
0.255	**H9040**	2.55	5.10	7.65	10.20	12.75	15.30	17.85	20.40	22.95
0.207	**H11040**	2.07	4.14	6.21	8.28	10.35	12.42	14.49	16.56	18.63
0.170	**H14040**	1.70	3.40	5.10	6.80	8.50	10.20	11.90	13.60	15.30
0.204	**H14050**	2.04	4.08	6.12	8.16	10.20	12.24	14.28	16.32	18.36
0.184	**H16050**	1.84	3.68	5.52	7.36	9.20	11.04	12.88	14.72	16.56
0.258	**H14063**	2.58	5.16	7.74	10.32	12.90	15.48	18.06	20.64	23.22
0.227	**H16063**	2.27	4.54	6.81	9.08	11.35	13.62	15.89	18.16	20.43
0.275	**H16075**	2.75	5.50	8.25	11.00	13.75	16.50	19.25	22.00	24.75
0.219	**H20075**	2.19	4.38	6.57	8.76	10.95	13.14	15.33	17.52	19.71
0.353	**H16090**	3.53	7.06	10.59	14.12	17.65	21.18	24.71	28.24	31.77
0.265	**H20090**	2.65	5.30	7.95	10.60	13.25	15.90	18.55	21.20	23.85
0.227	**H22590**	2.27	4.54	6.81	9.08	11.35	13.62	15.89	18.16	20.43
0.347	**H200110**	3.47	6.94	10.41	13.88	17.35	20.82	24.29	27.76	31.23
0.285	**H225110**	2.85	5.70	8.55	11.40	14.25	17.10	19.95	22.80	25.65
0.432	**H200125**	4.32	8.64	12.96	17.28	21.60	25.92	30.24	34.56	38.88
0.340	**H225125**	3.40	6.80	10.20	13.60	17.00	20.40	23.80	27.20	30.60

Double heating

U-value	Pipe type	Heat loss [W/m] for indicated ΔT, per meter length of pre-insulated double pipe								
[W/mK]	Art. No.	10°C	20°C	30°C	40°C	50°C	60°C	70°C	80°C	90°C
0.211	**HD14025**	2.21	4.42	6.63	8.84	11.05	13.26	15.47	17.68	19.89
0.190	**HD16025**	1.90	3.80	5.70	7.60	9.50	11.40	13.30	15.20	17.10
0.262	**HD14032**	2.62	5.24	7.86	10.48	13.10	15.72	18.34	20.96	23.58
0.228	**HD16032**	2.28	4.56	6.84	9.12	11.40	13.68	15.96	18.24	20.52
0.345	**HD14040**	3.45	6.90	10.35	13.80	17.25	20.70	24.15	27.60	31.05
0.286	**HD16040**	2.86	5.72	8.58	11.44	14.30	17.16	20.02	22.88	25.74
0.400	**HD16050**	4.00	8.00	12.00	16.00	20.00	24.00	28.00	32.00	36.00
0.278	**HD20050**	2.78	5.56	8.34	11.12	13.90	16.68	19.46	22.24	25.02
0.409	**HD20063**	4.09	8.18	12.27	16.36	20.45	24.54	28.63	32.72	36.81
0.312	**HD22563**	3.12	6.24	9.36	12.48	15.60	18.72	21.84	24.96	28.08
0.460	**HD22575**	4.60	9.20	13.80	18.40	23.00	27.60	32.20	36.80	41.40

WARNING:

- For a configuration with flow and return, each in their own pre-insulated single heating pipe, the heat loss is to be calculated for both pre-insulated single pipes, and added up to become the overall heat loss of the system. Whereas for a double heating pipe, the indicated heat loss only has to be multiplied by the length of the pre-insulated double pipe to calculate its overall heat loss.

For pipe systems, heat loss is expressed in Watts per unit length of pipe. For our pre-insulated buried pipe systems, this corresponds to temperature loss between medium pipes and the soil surrounding the HDPE jacket pipe. The higher the temperature difference, the higher the heat losses.

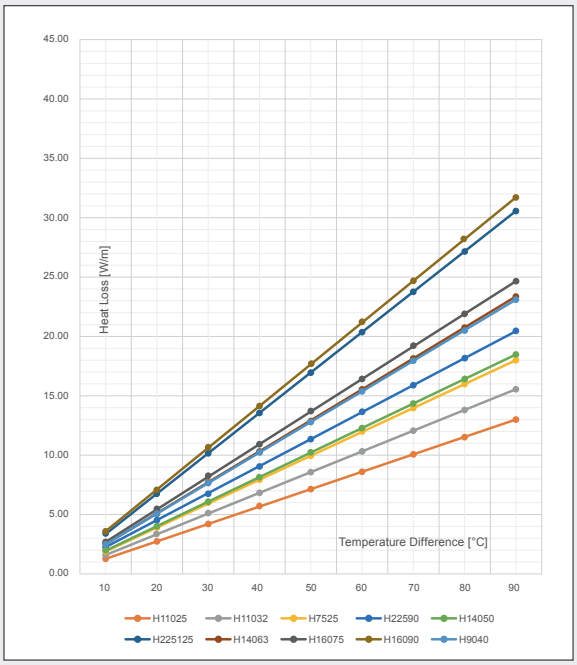
The thermal performance of a pre-insulated pipe system is, for equivalent materials and under comparable operating conditions, primarily a function of the insulation thickness:

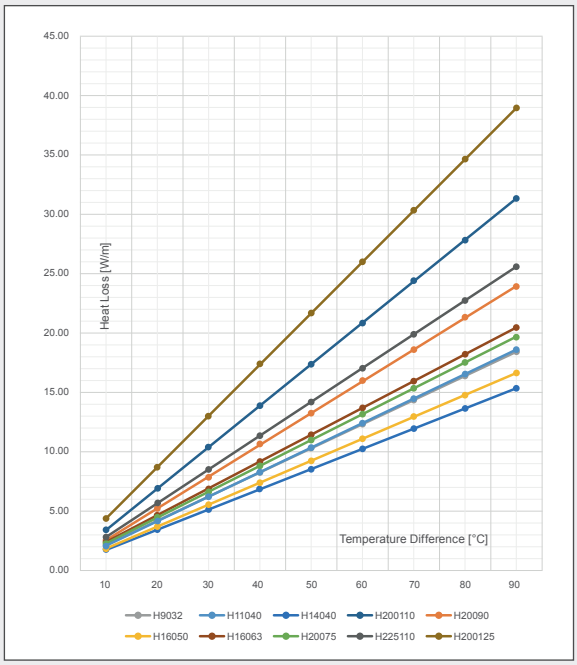
Operating at a 110 kW capacity in a classic 80°C/60°C (flow/return) temperature regime, at 0.80 m placement depth, 100 m of our HD20050 pipe has an approximate heat loss of 1.67 kW and an average heating temperature drop of 0.20°C at 1 m/s.

Under exactly the same circumstances, our HD16050 pipe has an approximate heat loss of 2.40 kW and an average heating temperature drop of 0.25°C.

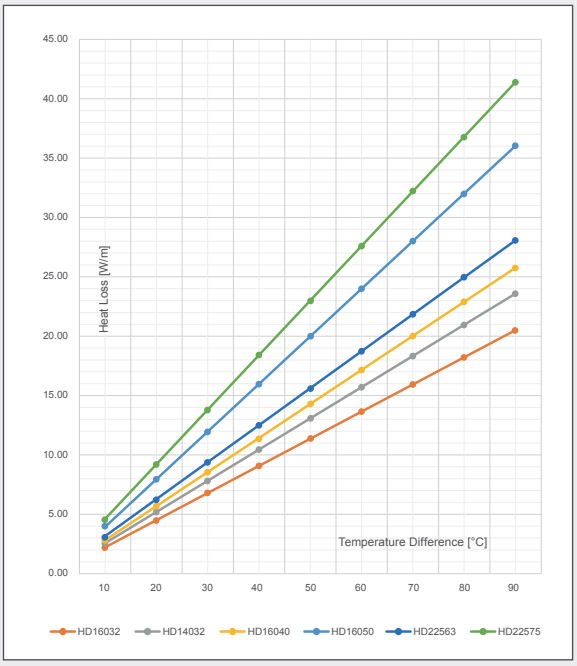
Using the calculated driving temperature difference ΔT as an entrance, the heat loss per meter of pre-insulated pipe can be read from the corresponding line in the graphs. Calculation method for the driving temperature difference ΔT: see previous page.

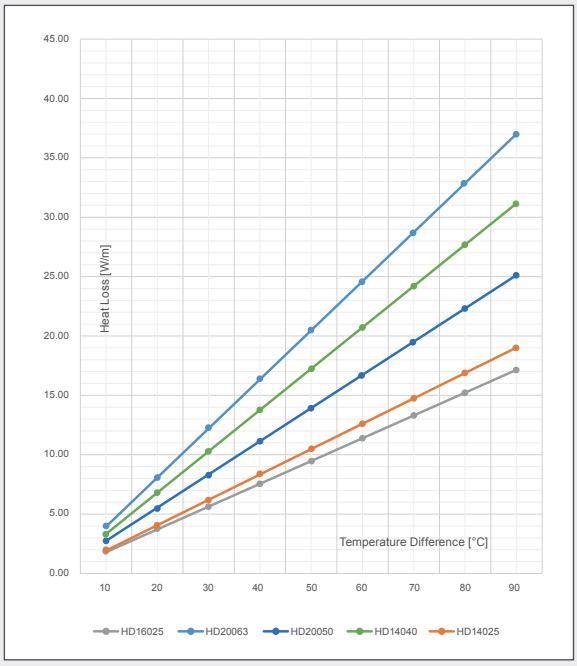
Single heating pipes





Double heating pipes





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PRESSURE LOSS

Heating capacity [kW] for the respective temperature differences ΔT [K].
ΔT = the temperature difference between flow and return. Example: flow @ 80°C and return @ 60°C => therefore ΔT = 20 K

Pressure loss

Heating capacity [kW] at a given ΔT [K]							Flow	Pressure drop Flow velocity	PE-Xa pipe SDR 11/PN 6: d_{out} x s [mm]								
5 K	10 K	15 K	20 K	25 K	30 K	40 K	[l/sec]	[pa/m] [m/sec]	25 x 2.3	32 x 2.9	40 x 3.7	50 x 4.6	63 x 5.8	75 x 6.8	90 x 8.2	110 x 10.0	125 x 11.4
1	3	4	**5**	6	8	10	**0.06**	[pa/m] [m/sec]	27 0.18	9 0.11							
3	5	8	**10**	13	15	20	**0.12**	[pa/m] [m/sec]	91 0.37	27 0.22	9 0.14						
4	8	11	**15**	19	23	30	**0.18**	[pa/m] [m/sec]	**185 0.55**	56 0.33	19 0.21						
5	10	15	**20**	25	30	40	**0.24**	[pa/m] [m/sec]	**306 0.73**	93 0.44	33 0.29						
6	13	19	**25**	31	38	50	**0.30**	[pa/m] [m/sec]	**452 0.91**	**138 0.55**	48 0.36						
8	15	23	**30**	38	45	60	**0.36**	[pa/m] [m/sec]	**622 1.10**	**190 0.66**	67 0.43	23 0.27					
9	18	26	**35**	44	53	70	**0.42**	[pa/m] [m/sec]	815 1.28	**248 0.78**	88 0.50	30 0.32					
10	20	30	**40**	50	60	80	**0.48**	[pa/m] [m/sec]	1030 1.46	**314 0.89**	**111 0.57**	38 0.37	12 0.23				
11	23	34	**45**	56	68	90	**0.54**	[pa/m] [m/sec]	1266 1.64	**386 1.00**	**136 0.64**	47 0.41	15 0.26				
13	25	38	**50**	63	75	100	**0.60**	[pa/m] [m/sec]	1522 1.83	**464 1.11**	**164 0.72**	56 0.46	18 0.29				
14	28	41	**55**	69	83	110	**0.66**	[pa/m] [m/sec]	1799 2.01	**548 1.22**	**194 0.79**	66 0.50	21 0.32				
15	30	45	**60**	75	90	120	**0.72**	[pa/m] [m/sec]	2095 2.19	**639 1.33**	**226 0.86**	77 0.55	25 0.34				
16	33	49	**65**	81	98	130	**0.78**	[pa/m] [m/sec]	2410 2.37	735 1.44	**260 0.93**	**89 0.59**	29 0.37				
18	35	53	**70**	88	105	140	**0.84**	[pa/m] [m/sec]		837 1.55	**296 1.00**	**102 0.64**	33 0.40				
19	38	56	**75**	94	113	150	**0.90**	[pa/m] [m/sec]		944 1.66	**334 1.07**	**115 0.69**	37 0.43				
20	40	60	**80**	100	120	160	**0.96**	[pa/m] [m/sec]		1057 1.77	**374 1.14**	**128 0.73**	42 0.46	18 0.32			
21	43	64	**85**	106	128	170	**1.02**	[pa/m] [m/sec]		1175 1.88	**415 1.22**	**143 0.78**	46 0.49	20 0.34			
23	45	68	**90**	113	135	180	**1.07**	[pa/m] [m/sec]		1299 1.99	**459 1.29**	**158 0.82**	51 0.51	23 0.36			
25	50	75	**100**	125	150	200	**1.19**	[pa/m] [m/sec]		1562 2.22	**552 1.43**	**190 0.91**	62 0.57	27 0.40			
28	55	83	**110**	138	165	220	**1.31**	[pa/m] [m/sec]		1846 2.44	**653 1.57**	**225 1.01**	**73 0.63**	32 0.44			
30	60	90	**120**	150	180	240	**1.43**	[pa/m] [m/sec]		2149 2.66	760 1.72	**262 1.10**	**85 0.69**	37 0.48			
33	65	98	**130**	163	195	260	**1.55**	[pa/m] [m/sec]		2472 2.88	874 1.86	**301 1.19**	**98 0.74**	43 0.52			
35	70	105	**140**	175	210	280	**1.67**	[pa/m] [m/sec]			995 2.00	**343 1.28**	**112 0.80**	49 0.56			
38	75	113	**150**	188	225	300	**1.79**	[pa/m] [m/sec]			1123 2.15	**387 1.37**	**126 0.86**	55 0.60			
40	80	120	**160**	200	240	320	**1.91**	[pa/m] [m/sec]			1258 2.29	**433 1.46**	**142 0.91**	62 0.65	26 0.45		
43	85	128	**170**	213	255	340	**2.03**	[pa/m] [m/sec]			1398 2.43	**482 1.55**	**158 0.97**	69 0.69	29 0.48		
45	90	135	**180**	225	270	360	**2.15**	[pa/m] [m/sec]			1546 2.57	**533 1.64**	**174 1.03**	76 0.73	32 0.51		
50	100	150	**200**	250	300	400	**2.39**	[pa/m] [m/sec]			1859 2.86	**641 1.83**	**210 1.14**	**91 0.81**	38 0.56		
56	113	169	**225**	281	338	450	**2.69**	[pa/m] [m/sec]				788 2.06	**258 1.29**	**113 0.91**	48 0.63		
63	125	188	**250**	313	375	500	**2.99**	[pa/m] [m/sec]				947 2.28	**310 1.43**	**135 1.01**	57 0.70		
69	138	206	**275**	344	413	550	**3.28**	[pa/m] [m/sec]				1120 2.52	**367 1.57**	**161 1.11**	68 0.77		
75	150	225	**300**	375	450	600	**3.58**	[pa/m] [m/sec]					**427 1.71**	**186 1.21**	**79 0.84**	30 0.56	
81	163	244	**325**	406	488	650	**3.88**	[pa/m] [m/sec]					**497 1.85**	**217 1.31**	**92 0.91**	35 0.61	

Pressure loss

Heating capacity [kW] at a given ΔT [K]							Flow	Pressure drop Flow velocity	PE-Xa pipe SDR 11/PN 6: d_{out} x s [mm]								
5 K	10 K	15 K	20 K	25 K	30 K	40 K	[l/sec]	[pa/m] [m/sec]	25 x 2.3	32 x 2.9	40 x 3.7	50 x 4.6	63 x 5.8	75 x 6.8	90 x 8.2	110 x 10.0	125 x 11.4
88	175	263	**350**	438	525	700	**4.18**	[pa/m] [m/sec]					**567 2.00**	**248 1.41**	**105 0.98**	40 0.66	22 0.51
94	188	281	**375**	469	563	750	**4.48**	[pa/m] [m/sec]					**636 2.14**	**278 1.51**	**117 1.05**	45 0.70	25 0.55
100	200	300	**400**	500	600	800	**4.78**	[pa/m] [m/sec]					706 2.28	**309 1.61**	**130 1.12**	50 0.75	28 0.58
106	213	319	**425**	531	638	850	**5.08**	[pa/m] [m/sec]					791 2.43	**346 1.71**	**146 1.19**	**56 0.80**	32 0.62
113	225	338	**450**	563	675	900	**5.37**	[pa/m] [m/sec]					875 2.57	**383 1.82**	**162 1.26**	**62 0.85**	35 0.66
119	238	356	**475**	594	713	950	**5.67**	[pa/m] [m/sec]					960 2.72	**420 1.92**	**177 1.33**	**68 0.89**	38 0.69
125	250	375	**500**	625	750	1000	**5.97**	[pa/m] [m/sec]					1044 2.86	**457 2.02**	**193 1.40**	**74 0.94**	42 0.73
131	263	394	**525**	656	788	1050	**6.27**	[pa/m] [m/sec]						500 2.12	**211 1.47**	**81 0.99**	46 0.76
138	275	413	**550**	688	825	1100	**6.57**	[pa/m] [m/sec]						543 2.22	**229 1.54**	**88 1.04**	**49 0.80**
144	288	431	**575**	719	863	1150	**6.87**	[pa/m] [m/sec]						585 2.32	**247 1.61**	**95 1.09**	**53 0.84**
150	300	450	**600**	750	900	1200	**7.17**	[pa/m] [m/sec]						628 2.42	**265 1.68**	**102 1.13**	**58 0.87**
156	313	469	**625**	781	938	1250	**7.46**	[pa/m] [m/sec]						677 2.52	**286 1.75**	**110 1.18**	**62 0.91**
163	325	488	**650**	813	975	1300	**7.76**	[pa/m] [m/sec]						726 2.62	**307 1.83**	**117 1.22**	**66 0.95**
169	338	506	**675**	844	1013	1350	**8.06**	[pa/m] [m/sec]						774 2.72	**327 1.90**	**125 1.27**	**71 0.98**
175	350	525	**700**	875	1050	1400	**8.36**	[pa/m] [m/sec]						823 2.82	**348 1.97**	**133 1.31**	**75 1.02**
181	363	544	**725**	906	1088	1450	**8.66**	[pa/m] [m/sec]						877 2.92	**371 2.04**	**142 1.36**	**80 1.06**
188	375	563	**750**	938	1125	1500	**8.96**	[pa/m] [m/sec]						932 3.03	394 2.11	**151 1.41**	**85 1.09**
194	388	581	**775**	969	1163	1550	**9.25**	[pa/m] [m/sec]						986 3.13	416 2.18	**160 1.46**	**90 1.13**
200	400	600	**800**	1000	1200	1600	**9.55**	[pa/m] [m/sec]						1040 3.23	439 2.25	**169 1.50**	**95 1.16**
213	425	638	**850**	1063	1275	1700	**10.15**	[pa/m] [m/sec]							490 2.39	**188 1.60**	**106 1.24**
225	450	675	**900**	1125	1350	1800	**10.75**	[pa/m] [m/sec]							540 2.53	**207 1.69**	**117 1.31**
238	475	713	**950**	1188	1425	1900	**11.34**	[pa/m] [m/sec]							595 2.67	**228 1.79**	**129 1.38**
250	500	750	**1000**	1250	1500	2000	**11.94**	[pa/m] [m/sec]							650 2.81	**249 1.88**	**141 1.46**
263	525	788	**1050**	1313	1575	2100	**12.54**	[pa/m] [m/sec]								**272 1.97**	**153 1.53**
275	550	825	**1100**	1375	1650	2200	**13.14**	[pa/m] [m/sec]								**295 2.06**	**166 1.60**
288	575	863	**1150**	1438	1725	2300	**13.73**	[pa/m] [m/sec]								**319 2.16**	**180 1.67**
300	600	900	**1200**	1500	1800	2400	**14.33**	[pa/m] [m/sec]								**343 2.25**	**194 1.75**
313	625	938	**1250**	1563	1875	2500	**14.93**	[pa/m] [m/sec]								**369 2.35**	**208 1.82**
325	650	975	**1300**	1625	1950	2600	**15.52**	[pa/m] [m/sec]								**395 2.44**	**223 1.89**
338	675	1013	**1350**	1688	2025	2700	**16.12**	[pa/m] [m/sec]									**238 1.97**
350	700	1050	**1400**	1750	2100	2800	**16.72**	[pa/m] [m/sec]									**254 2.04**
363	725	1088	**1450**	1813	2175	2900	**17.32**	[pa/m] [m/sec]									**270 2.11**
375	750	1125	**1500**	1875	2250	3000	**17.91**	[pa/m] [m/sec]									**286 2.18**
388	775	1163	**1550**	1938	2325	3100	**18.51**	[pa/m] [m/sec]									
400	800	1200	**1600**	2000	2400	3200	**19.11**	[pa/m] [m/sec]									
413	825	1238	**1650**	2063	2475	3300	**19.70**	[pa/m] [m/sec]									
425	850	1275	**1700**	2125	2550	3400	**20.30**	[pa/m] [m/sec]									

NOTES

Terrendis nv has done everything possible to ensure that all the information in this catalogue is correct and complete. However, Terrendis nv cannot be held liable for eventual false or missing information and retains the right to change or update its technical information without prior notice.

GENERAL TERMS AND CONDITIONS OF SALE

1. GENERAL PROVISIONS

These general terms and conditions of sale apply to all sales of products of the company Terrendis nv (hereinafter specified as the 'seller').

Said general terms and conditions of sale are expressly approved and accepted by the buyer, who declares and acknowledges having full knowledge thereof.

Accordingly, the act of placing an order implies the full and unconditional adherence by buyer to these general terms and conditions of sale, representing all stipulations applicable to the sales concluded by the seller, with the exception of all other documents, such as brochures and catalogues, issued by the seller and which are intended for informative purposes only.

Therefore, the absence of express acceptance thereof, any conflicting condition laid down by the buyer shall be unenforceable against the seller.

Given the legal obligation for the seller to apply the same terms and conditions to all its customers for similar orders, exceptions to these general terms and conditions of sale shall only be possible due to the exceptional nature of the contract concluded with the customer. In such a case, the exceptional conditions shall take precedence over these general terms and conditions of sale.

The fact that the seller does not rely on one or another of the clauses of these general terms and conditions of sale shall not be interpreted as being equivalent to waiving subsequent reliance on any one of these conditions.

2. OFFER AND ORDER

2.1. The offers shown in the catalogue or any other commercial document are only intended for informative purposes and are limited in time.

2.2 The information and drawings sent by the buyer for drawing up estimates are deemed to be correct and complete and serve as basis for the calculation of the offer. In all cases, it is the buyer who remains responsible for the assortment of products it purchases. The seller shall not be held liable if the products purchased are not suited to the application.

2.3 The obligation to deliver is limited to the existing stocks available at the time the order is received.

2.4 The orders are only final once they have been confirmed in writing by the seller, even in the case of orders taken by a representative or agent. Acceptance may also result from simply dispatching the products.

2.5 The orders concerning specific, non-standard products shall result in additional costs. Likewise, any request for handling or unpacking of products shall result in an increase of the order amount.

2.6 The seller reserves the right to not accept orders with an amount that would not be covered by a credit insurance.

2.7 The seller reserves the right to make changes, at any time, that it deems useful for its products and to do so without obligation to modify the products delivered in the past or that are under order.

2.8 The seller can also modify, without notice, the models in its brochures or catalogues.

2.9 The benefit of the order is personal to the buyer, who cannot transfer it without consent from the seller.

2.10 After acceptance of the order by the seller, it is final and therefore may not be changed nor may it be partially or fully cancelled.

In the event of cancellation by the buyer of an order for standard products after its acceptance by the seller, for any reason whatsoever, an amount corresponding to 50 % of the total amount of the cancelled order, excluding taxes, shall be owed to the seller, as damages, as compensation for the damage suffered. In the event of cancellation by the buyer of an order for specific products after its acceptance by the seller, for any reason whatsoever, the full amount of the cancelled order, excluding taxes, shall be owed to the seller, as damages, as compensation for the damage suffered, in addition to the billing of all accessory products for the products for which the order was cancelled.

3. PRICES

3.1 The prices are in euro, excluding taxes and excluding shipping and packaging charges. All taxes, charges, duties or other services that must be paid in addition to them, such as insurance costs, customs charges, handling, assembly, installation charges, etc., shall be borne by the buyer.

3.2 The price list may allow for increases depending on the services provided by the seller or reductions depending on the services performed by the buyer.

4. PAYMENT

4.1 Unless otherwise agreed, the invoices are payable within thirty (30) days, starting from the invoice date of the goods at seller's registered office.

Any deterioration of buyer's credit shall justify the demand for guarantees or for a cash settlement prior to the execution of the orders received.

No discount is granted for cash or advance payment.

4.2 Negotiable instruments and cheques are only means of payment and the payment is only effective when settled at the agreed date.

4.3 In accordance with the title retention clause referred to in Article 12 of these general terms and conditions, the seller retains full ownership of the products sold until payment in full of the principal and other charges and it can exercise its right of retention on all property belonging to the buyer that would be held by the seller for any reason whatsoever. It can also exercise the action for recovery of property provided for under the retention of title clause (Article 12) in the event of delay or default of payment.

4.4 In addition to the right of recovery provided for in Article 12, the non-return of drafts with acceptance and standing order within seven (7) days of their sending, the full or partial non-respecting of any payment due date, a serious undermining of the buyer's credit and in particular, the revelation of any protest or security lead to, ipso jure without notice and at the seller's discretion:

- either the acceleration and consequently the immediate payment of amounts still owed for any reason and/or the suspension of all shipments;
- or the cancellation of all current contracts with retention of all deposits paid and retention of all property as stated hereinabove, without prejudice to all other damages that may be owed to the seller.

4.5 However, the seller may accept payment guarantees (Article 12.3).

4.6 Pursuant to the Commercial Code, any late payment shall, without prior notice, give rise to:

- firstly, the application of late payment penalties, at the refinancing rate of the European Central Bank (refi rate) in effect on the first day of the calendar half-year of the payment due date, increased by 10 percentage points;
- secondly, the application ipso jure and without formalities of the fixed compensation of forty (40) euros for the recovery costs. If the actual recovery costs, justified by the seller, exceed the amount of this compensation, the latter shall be increased by that amount.

4.7 The buyer cannot postpone a contractual payment due date without the approval of the seller if the delivery is delayed by a case of force majeure (Article 6.4). The same applies for the payment of the difference between the total amount of the invoice and the price of products that could give rise to replacements or credits upon complaints by the buyer.

5. PACKAGING

5.1 Unless otherwise agreed, the products are packed under standard packaging as defined in the catalogues or price lists.

5.2 If there is a deposit on the packaging, the deposit price is payable under the same terms as that of the products. Its reimbursement is made after return of the packaging to the seller within a period agreed at the time the order is placed.

5.3 The packing bearing the seller's trademark may not be used for products of other brands.

6. DELIVERY

6.1 Delivery is deemed performed by delivery of the products or by placing them at the buyer's or its haulier's disposal in the warehouses of seller (Incoterm ex works). The transfer of risks occurs at delivery.

6.2 When applicable, the buyer shall indicate the place of delivery on the order.

6.3 Deliveries are made depending on stocks and in the order of arrival of the orders. Partial deliveries may be carried out.

6.4 Delivery times, in particular those confirmed on the acknowledgement of order receipts, are indicated as precisely as possible, but are for information only and in no case constitute strict deadlines. These deadlines depend in particular on stocks and supplying, manufacturing and transport possibilities.

The delivery times are extended in the event of force majeure or fortuitous events such as war, riot, local or national strike, measure laid down by public authorities, fire, water damage, operational accident, machinery breakdown, shortage of raw materials essential to production or any other cause outside the control of the seller or its suppliers preventing delivery under normal conditions. In all cases, the seller must inform the buyer of the problems caused and together with the buyer, seek equitable solutions.

Exceeding delivery deadlines cannot give rise to penalties, damages, withholding or cancellation of orders in progress.

Under no circumstances shall the seller be liable towards the buyer in the event of delayed delivery not exceeding forty-five (45) days or in the event of delayed delivery connected to a force majeure event or that can be blamed on the buyer. In particular, under no circumstances shall the seller be held liable for any penalties for delay billed to the buyer by its own customers. Likewise, the penalty clauses for late delivery listed on the buyer's commercial documents are not enforceable against the seller.

In the event of late delivery of more than forty-five (45) days after the indicated delivery date, for any other cause than force majeure or a delay attributable to the buyer, the buyer may request the cancellation of the sale. The deposits already paid shall then be reimbursed, with the exception of all compensation or damages.

6.5 If the buyer does not take delivery on the agreed date, after formal notification that remained without effect for eight (8) days, the sale shall be cancelled ipso jure if seller so wishes. Any deposits paid by the buyer shall then be kept by the seller, in addition to the billing, under the penalty clause, of penalties equal to 80 % of the total amount of the order.

Moreover, in the event of late collection or delivery of an order of special products at the initiative of or attributable to the buyer, the seller reserves the right to bill the storage and warehousing costs of the goods. In this case the seller's liability cannot be sought under any circumstances in the event of deterioration or expiration of the stored goods.

6.6 The delivery shall only be made if the buyer is up to date with all of its obligations vis-à-vis the seller.

6.7 If it was only possible to partially deliver an order on account of the seller, the additional costs necessitated by delivery of the remainder shall be borne by the latter.

7. TRANSPORT – RECEPTION

7.1 The delivery is deemed carried out at the seller's factory. In all cases, even if the transport is made carriage paid, the products travel at the risk and peril of the buyer, who has the responsibility, in the event of damage or missing packages at the reception of the goods, to make all necessary objections and reservations vis-à-vis the haulier and to confirm them by registered post within forty-eight (48) hours, clearly mentioning them on the consignment note (CMR). The buyer must also immediately inform the seller. By failing to do so, the buyer shall desist from exercising any recourse against the seller.

7.2 It is the responsibility of the buyer to take out all insurance against the risks of loss or deterioration of the products.

7.3 Delivered products are not taken back.

8. WARRANTY

8.1 The seller is only liable for the statutory warranty for hidden defects and non-compliance of products with the order.

8.2 In order to assert its rights, on pain of forfeiting any action related thereto, the buyer shall inform the seller in writing of the existence of defects at the reception of the products for the visible non-compliances and for the other defects or non-compliances within ten (10) days of their discovery, by attaching to said letter the number of the package check list and/or identification codes of the products.

8.3 The buyer shall have to justify the alleged complaints. It shall have to leave the seller every facility for proceeding to the observation of these defects and for remedying them. The buyer shall refrain from intervening itself or having a third party come in for this purpose.

8.4 The seller shall have the opportunity to check the products in situ or to request their return. In no case can the return of the products be decided unilaterally by the buyer. Any product returned without the written consent of the seller shall be held at the disposal of the buyer and shall not give rise to establishment of a credit or cancellation of the sale.

The costs and risks of returning the products purported to be defective shall be borne by the buyer, unless there is prior agreement otherwise.

8.5 After agreement on the authenticity of the defects or defectiveness, the seller can, at its discretion, proceed to:

- either the free replacement of the products if they are still being manufactured;
- or the free provision of similar products;
- or the repair or bringing into compliance of the products, possibly at the buyer's premises;
- or the establishment of a credit.

No other request on any grounds whatsoever will be accepted.

8.6 The seller cannot be held liable for a fault in the assembly, installation or modification of a product done by the buyer, nor for a fault in maintenance or use, the result of a dilapidated state or normal wear and tear.

8.7 No complaint will be possible if the buyer or a third party attempted to remedy a possible non-compliance or defect of the product without the consent of the seller. Likewise, this warranty is excluded:

- in the event of improper use, negligence or faulty maintenance of the products by the buyer;
- in a case of normal wear and tear of the product or of force majeure;
- in the event of use of the products in a manner not in keeping with standards of use or the technical recommendations of the seller, or in the event of use not in compliance with the intended use for which the products were manufactured.

9. OWNERSHIP OF DRAWINGS AND TECHNICAL STUDIES

The drawings, photos, tools and products made and/or developed by the seller, with or without the collaboration of the buyer may under no circumstances be reproduced without prior written permission from the seller.

The buyer shall hold the seller harmless against any third-party claim based on their industrial or intellectual property right and related to the manufacture and delivery of a product made according to the buyer's instructions.

The matrixes, tools, etc. used by the seller within the framework of manufacturing the products ordered by the buyer remain the exclusive property of the seller and do so even on the assumption that the buyer paid for them.

Any technical studies and estimates are drawn up from the elements provided by the buyer under its sole responsibility. The seller only draws up estimates and studies for mere information. The liability of the seller cannot be sought for said estimates and studies or for technical elements supplied by the buyer.

10. CONFIDENTIALITY

The studies, drawings, models and documents that are property of the seller and sent to the buyer may not be imparted by the latter to third parties.

11. RETENTION OF TITLE

The products are sold with a clause expressly subordinating the transfer of their ownership to the payment in full of the principal and other charges, which means that the buyer will only become owner of the products after the full payment.

11.1 As from delivery of the products, the provisions above shall not be an obstacle to the transfer to the buyer of the risks of loss or deterioration of the goods subject to retention of title as well as the damage they could cause. Consequently, as from delivery of the products, the buyer shall assume the risks and for this purpose, take out a multi-risk insurance policy (fire, theft, water damage) covering the risks arising, starting from the delivery of the products.

The buyer may not modify the products sold under retention of title, nor incorporate them, nor resell them without prior written consent from seller.

11.2 In the event of garnishment or any other intervention of a third party on the products, the buyer must imperatively immediately inform the seller thereof to enable it to oppose it and preserve its rights.

The buyer shall also refrain from giving as security or assigning as guarantee the ownership of the products not paid in full.

11.3 If the laws of the buyer's country do not recognise the validity of the retention of title clauses in particular in the event of receivership or winding-up proceedings or if the buyer wants to resell the products before they are paid, it will be obliged to grant the seller serious payment guarantees such as certified cheques, drafts on customers, subrogation of payments, etc.

11.4 The product identification codes must be kept by the buyer.

12. DISPUTES – APPLICABLE LAW

12.1 These general terms and conditions of sale as well as all sale operations referred to herein are governed by Belgian law.

12.2 In the event of dispute, parties shall endeavour to reach an amicable settlement. If there is no amicable solution within two (2) months starting from the commencement of the dispute, the latter will be submitted to the competence of the competent court within the jurisdiction of the Ghent Court of Appeal.

12.3 The seller reserves the right, if it is plaintiff, to submit a matter to the court of the locality where the buyer's registered office is located and possibly to take advantage of the laws thereof.

GENERAL WARRANTY TERMS AND CONDITIONS

1. SCOPE OF THE WARRANTY

1.1 The seller provides the buyer and, should the buyer resell the products, the end user (hereafter jointly specified as the 'buyer'), a ten year warranty on the products sold by the seller. The aforementioned warranty period commences on the date of delivery of the sold products, being the date of delivery ex works warehouse of the seller (Incoterms 2000).

1.2 The present warranty covers defects in the used materials, defects in the production of the products sold or structural faults. However, the buyer must demonstrate that such defects or faults are not directly or indirectly the result of:

- a faulty installation; a 'faulty installation' is to be considered, amongst others:

(i) any installation by an unauthorised and unregistered installer;

(ii) any installation that took place in violation with the instructions as detailed in the seller's technical manual;

(iii) any installation that has not been done according to the rules of good workmanship ('state of the art'); as well as

(iv) any installation for which the seller has received, within seven (7) days after the initial commissioning, however at the latest within one year after the aforementioned delivery of the sold products, the required form, fully completed and duly signed, supplied by the seller concerning the leakage test (delivered with the sold products as well as available in the seller's technical manual);

- the abnormal or incorrect use of the sold products; 'incorrect use' is to be considered, amongst others, any use that took place in violation with the instructions as detailed in the seller's technical manual;
- the lack of appropriate maintenance and (annual) checks;
- the use of incompatible spare parts or accessories;
- subsequent adjustments by the buyer;
- external factors.

1.3 The present warranty is only valid to the extent that said sold products were integrally paid by the buyer in accordance with the applicable terms of payment.

2. NOTIFICATION

To be able to invoke the present warranty, the buyer must notify the seller of the defect by registered mail, within the aforementioned warranty period as well as within seven (7) days following the determination of the defect by the buyer or following the moment that the buyer should have determined the defect. Furthermore, the defect must be determined jointly by the buyer and the seller, in which absence the buyer can no longer invoke the present warranty.

3. EXECUTION OF THE WARRANTY OBLIGATION

If the present warranty can be invoked, the seller shall, at his discretion, replace or repair the faulty part of the sold products or repay the corresponding part of the invoiced price. The buyer is, however, not entitled to claim any other compensation (such as, amongst others, however not limited to, compensation for indirect or consequential damages). Should, at the moment of invoking the present warranty, said sold products no longer be in production or an amended version is being produced, the seller is entitled to replace the faulty part with a similar item. Executing the warranty obligation by the seller during the warranty period shall under no circumstances result in an extension of the total duration of the warranty.

4. SUNDRY

The present warranty is without prejudice regarding applicable mandatory regulatory provisions.

The transfer of the rights of the buyer by virtue of the present warranty with respect to the sales can only take place providing the seller submits a written approval.

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