

# LOGSTOR Product Catalogue Industry





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**Industrial pipes**

LOGSTOR has manufactured pre-insulated pipe systems since 1992, adjusting them to the demands in the industrial market. Our primary markets for the pipe systems are the food processing section, the chemical, the energy, and the vessel industry.

With a wide product range the pre-insulated industrial pipes are adaptable to even very specific demands.

The pre-insulated industrial pipes are characterized as follows:

- Pre-insulated systems with PUR/PIR- insulation have a very high insulation property
- Pipe supports are to be fitted on the outer jacket to avoid thermal bridges
- Insulation and jacket material have a high mechanical strength, which makes the pre-insulated pipe systems resistant to physical impacts, e.g. when used as footbridge.
- Jacket joints and so the pipe systems are 100 % sealed, so that the pipes are cleanable, resulting in low maintenance costs.

The pipes are all dimensionally stable, sturdy and have good insulation properties. The installation is simple and quick. This means, lower total costs, higher security and a long service life.

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**LOGSTOR and the customers**

Over 40 years' experience in developing and selling complete pre-insulated pipe systems leaves its footprint on the surroundings. A well-developed network of distributors and subsidiaries has resulted in thousands of kilometres of the characteristic LOGSTOR pipes, installed all over the world.

We regularly attend national and international fairs, manned by personnel from LOGSTOR and local distributors.

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**Extensive service**

LOGSTOR provides an extensive service for any given project – right from initial planning to commissioning, engineering and follow-up servicing and training of fitters.

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**Production sites**

LOGSTOR has production sites in Denmark, Poland, Sweden, and Finland as well as sales and service divisions in all major markets worldwide.

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## Quality and Environmental Management

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<b>Introduction</b>	<p>Order processing and production of products take place in accordance with a quality and environment management system. The system is administered by the local Quality and Environment Department.</p> <p>The Quality Department is authorised to stop production or delivery of products which do not comply with the established specifications.</p> <hr/>
<b>Certification ISO 9001</b>	<p>The quality management system is prepared and certified in accordance with ISO 9001:2015.</p> <hr/>
<b>Quality Manual</b>	<p>The quality management system is documented in quality manuals for each company/country. The quality management system includes:</p> <ul style="list-style-type: none"><li>- Policies and objectives</li><li>- Organisation charts</li><li>- Procedures and instructions for processes, affecting the quality. They cover administrative and production processes e.g. order processing, inspection etc.</li><li>- Process and inspection plans</li></ul> <hr/>
<b>Inspection routines in the production</b>	<p>The production of the pipe systems is subject to extensive inspection routines.</p> <p>This ensures the compliance with established standards and specifications and a homogeneous, high production quality, irrespective of the place of origin, which are conditions of a dependable system with a long service time.</p> <p>The inspection routines are described in the process and inspection plans which include receipt of raw materials and semi-products, qualification test, the production process and finished products.</p> <hr/>
<b>Environment ISO 14001</b>	<p>Compliance with environmental requirements, optimization of resource consumption and minimization of environmental strains are ensured by means of an environmental management system, based on the environmental management standard ISO 14001:2015.</p> <hr/>
<b>Reference</b>	<p>For all relevant LOGSTOR certificates see: <a href="http://www.logstor.com">www.logstor.com</a>.</p> <hr/>

## Introduction

# Waste treatment and recycling

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<b>General</b>	When installing a new preinsulated pipe system or replacing parts of an old pipe system, different types of waste materials shall be treated according to below instructions and local regulations
<b>Preinsulated products</b>	First insulation, jacket, carrier pipe and other sub-components shall be separated.
<b>PUR/PIR foam</b>	If possible, the PUR/PIR-foam shall be reused or burned at a waste incineration plant under controlled conditions according to local regulations. Mineral wool shall be deposited according to local regulations.
<b>Jacket</b>	PE jacket material can be regranulated and recycled. Steel jacket material, including galvanized steel, can be melted down and recycled.
<b>Carrier pipe</b>	Black steel pipes: - If possible, black steel pipes shall be reused or melted down and recycled. Copper pipes: - If possible, copper pipes shall be reused or melted down and recycled. Stainless steel pipes: - If possible, stainless steel pipes shall be reused or melted down and recycled. - Separate PEX/aluminium. PE pipes: - If possible, PE pipes shall be reused or regranulated and recycled.
<b>Surveillance wires and cables</b>	Copper wires - Copper wires can be melted down and recycled. Plastic-coated surveillance wires and cables - Plastic-coated surveillance wires and cables are handled in accordance with local regulations about handling electric surveillance wire and cable waste.
<b>Cross-linked material</b>	Cross-linked material shall be burned at a waste incineration plant under controlled conditions according to local regulations.
<b>HDPE-material</b>	HDPE-material can be regranulated and recycled.



## Waste treatment and recycling

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**Electronic components**

Electronic components like detectors, connecting boxes i.e. shall be treated as electronic waste according to local regulations.

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**Chemicals**

If possible, polyole and isocyanate shall be reused otherwise they shall be treated as chemical waste in accordance with local regulations.

Alternatively foaming is done under controlled conditions according to regulations and the PUR/PIR foam is handled as stated on the previous page.

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## Introduction Catalogue layout

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The Product Catalogue describes LOGSTOR's industrial standard products. How they can be combined into systems, how to handle and install them.

The subsequent pages give an overview of the three standard systems of the industrial program: Low temperature, Normal temperature and High temperature.

Followed by general information on the pipe structure, specifications about materials as well as general handling and installation.

The subsequent chapters – from chapter 2 to 4 – describe the individual standard systems and deal with technique, components, and joints.

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### Use of the Product Catalogue

No part of this catalogue may be reproduced for external use without the express written permission of LOGSTOR.

The information/instructions are general. Application and implementation of the systems shall take place with due respect to national and local rules and regulations

The responsibility for this lies solely and exclusively with the buyer. LOGSTOR offers to assist with consultancy in this respect. However, it shall be stressed that the responsibility for the legality of the actual use always solely and exclusively rests with the buyer.

The corporate language of LOGSTOR is English, so the English version of the Catalogue is valid in case of doubt and/or discrepancies.

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**Application fields** LOGSTOR industrial systems are designed as complete systems for specific applications, divided into three fields of application.

**Low temperature – LT**

Operating temperature –200 to –60° C

Bonded system

See system description page 2.1.1

**Normal temperature – NT**

Operating temperature –60 to +120° C

Bonded system only

See system description page 3.1.1

**High temperature - HT**

Operating temperature +120 to +170°C

Bonded system

Operating temperature +120°C til +250°C

Sliding system

See system description 4.1.1.

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**System types**

**Bonded system**

In a bonded system, the carrier pipe, insulation, and jacket are bonded together by adhesion, which allows them to expand and move as a single entity.

The outer surface of the carrier pipe and the inner surface of the jacket pipe are pretreated, so that the foam adheres to the pipes, and that stresses can be transmitted through the insulation.

The pipes move as a single entity. Movements can be restricted by pipe supports or other friction against the jacket pipes. Freely suspended pipe systems must be able to move freely.

Temperature changes in directly buried systems can be absorbed as stresses in the system or be compensated for by means of U-bends or pre-heating the system.

**Sliding system**

In a sliding system, the carrier pipe moves inside the insulation, which adheres to the jacket pipe. Therefore, the jacket pipe must be retained from the outside, e.g. by the soil friction in case of directly buried pipe systems.

All expansion is absorbed within the jacket of the system in special components (compensators and expansion bends), and therefore the carrier pipe must be fixed with anchors.

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**Introduction  
Product programme**

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**Structure of the  
industrial pipe****Carrier pipe**

LOGSTOR's industrial systems are supplied with carrier pipes of different types.

The choice of carrier pipe depends on the transported medium. The carrier pipe is available in black steel, stainless steel, plastic etc. The pipe can also be supplied with tracer pipes.

**Insulation**

The insulation type to choose depends on the medium temperature.

PUR-foam is applicable for temperatures from -200°C to +120°C and together with all types of carrier pipe.

PIR-foam is an alternative to PUR-foam and applicable for temperatures from -60°C to +170°C. Likewise applicable for all types of carrier pipe.

For vapour and hot-oil systems up to +250°C with steel carrier pipe the insulation consists of mineral woll and PUR.

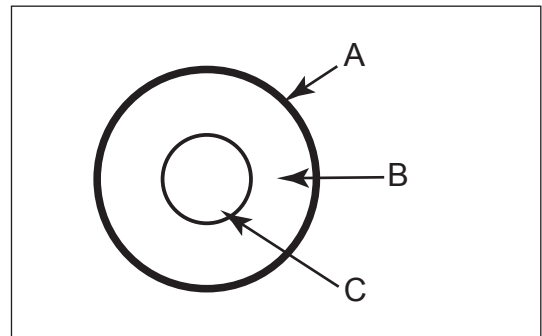
**Jacket pipe**

As a standard the industrial pipes are available with black or white HPDE jackets. Other jacket pipe materials on inquiry.

A: Jacket pipe

B: Insulation

C: Carrier pipe

**Surveillance  
wires**

The pipe systems are available with integrated surveillance wires, registering leaks, caused by damages to the jacket or carrier pipe. In this way, damages can be discovered in due time and be repaired, before e.g. corrosive damages arise on the carrier pipe. See the LOGSTOR Surveillance Manual.

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## Introduction Product programme

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**Joints**

We offer you a range of joints, which fit the use of the pipes and components.

LOGSTOR supplies two different joint solutions:

- Joints with pre-fabricated PUR- or PIR-shells
  - Joints for foaming on site
- 

**Fittings**

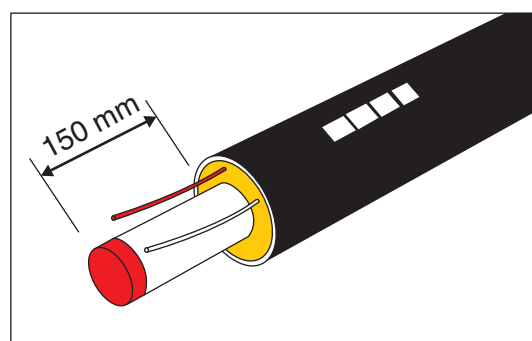
LOGSTOR also offers you a complete fitting programme in black and stainless steel, as well as PE pressure pipes, which complement our joint solutions. The programme includes i.a.:

- Elbows
  - T-joints
  - Reductions
  - Anchors
- 

**Free pipe ends**

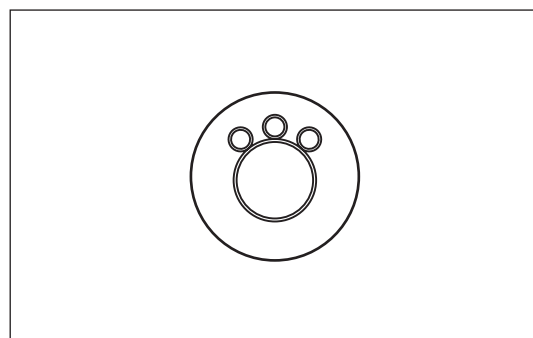
Pipes and fittings are delivered with free pipe ends without insulation due to the joining of the carrier pipes.

Free carrier pipe end: 150 mm

**Tracer pipe**

All pipe types can be supplied with a tracer pipe embedded in the insulation. In the tracer pipe a heat cable or a liquid heat medium can be inserted

Example:

**Certificates**

Inspection certificate type 3.1 on steel and fittings as well as the preinsulated product are delivered, provided they are requested when placing the order.

LOGSTOR documentation is filed for minimum 5 years.

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**Service life**

A correctly installed pipe system has a service life of up to 30 years dependent on the operational conditions.

## Introduction

### Product programme

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#### Heat and energy loss

LOGSTOR has a thorough knowledge about calculation of heat loss on the basis of specific conditions. The heat loss is calculated by means of the web-based program "LOGSTOR Industry Calculator".

By means of LOGSTOR Industry Calculator the energy efficiency of the closed pre-insulated pipe system can be calculated as regards:

- Energy loss
- Costs of the energy loss
- Comparison with conventional insulation

The calculation program is available for free on [www.logstor.com](http://www.logstor.com)

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## Material specifications

### Carrier pipe - steel

**General**

The following carrier pipe qualities are delivered as a standard.

**P235GH welded**

Welded steel pipes P235GH according to EN 10217-2 or EN10217-5.

Bevelled ends:

Wall thickness  $S \leq 3.2$  mm is delivered with straight ends.

Wall thickness  $S > 3.2$  mm is delivered with 30° bevelled ends, root face 1.6 mm  $\pm 0,8$  mm.

Mill certificate according to EN 10204/3.1.

Supplied in lengths of 6, 12 and 16 m.

**Typical application**

Heat ( $T \leq 210^\circ\text{C}$ ).

Mechanical properties of 235GH:

Density	7850	kg/m <sup>3</sup>
Tensile strength	> 360	N/mm <sup>2</sup>
Yield stress	> 235	N/mm <sup>2</sup>
Young's modulus	$2.1 \cdot 10^5$	N/mm <sup>2</sup>

Thermal properties:

Coefficient of expansion	$1.2 \cdot 10^{-5}$	$^\circ\text{C}^{-1}$
Specific heat	0.48	kJ/kg $^\circ\text{C}$
Thermal conductivity	52	W/m $^\circ\text{C}$

**P235GH seamless**

Seamless steel pipes St. 35.8 I to P235 GH TC1 according to EN 10216-2.

Bevelled ends:

Wall thickness  $S \leq 3.0$  mm is delivered with straight ends.

Wall thickness  $S > 3.0$  mm is delivered with bevelled ends according to ISO 9692-1, ref. 1.3.

Mill certificate according to EN 10204/3.1.

Supplied in lengths of 6 and 12 m.

**Typical application**

Heat, steam and condensate ( $T \leq 250^\circ\text{C}$ ).

Mechanical properties of 235GH:

Density	7850	kg/m <sup>3</sup>
Tensile strength	> 360	N/mm <sup>2</sup>
Yield stress	> 235	N/mm <sup>2</sup>
Young's modulus	$2.1 \cdot 10^5$	N/mm <sup>2</sup>

Thermal properties:

Coefficient of expansion	$1.2 \cdot 10^{-5}$	$^\circ\text{C}^{-1}$
Specific heat	0.43	kJ/kg $^\circ\text{C}$
Thermal conductivity	52	W/m $^\circ\text{C}$

## Material specifications

### Carrier pipe - stainless steel

#### AISI 304 L (EN 1.4307)

Welded pipes AISI 304L TC1 according to EN 10217-7.  
Mill certificate according to EN 10204/3.1.  
Supplied in lengths of 6 m.

**Typical application** Heat, steam and condensate.

Mechanical properties of AISI 304 L TC1:

Density		7950	kg/m <sup>3</sup>
Tensile strength	(20°C)	> 470	N/mm <sup>2</sup>
Yield stress	(20°C)	> 180	N/mm <sup>2</sup>
Young's modulus	(20°C)	1,95·10 <sup>-5</sup>	N/mm <sup>2</sup>

Thermal properties:

Coefficient expan.	(20°C)	1,7·10 <sup>-5</sup>	°C <sup>-1</sup>
Specific heat		0,50	kJ/kg°C
Thermal conductivity		15	W/m°C

#### AISI 316 L (EN 1.4404)

Welded pipes AISI 316L TC1 according to EN 10217-7.  
Mill certificate according to EN 10204/3.1.  
Supplied in lengths of 6 m.

**Typical application** Heat, steam and condensate.

Mechanical properties of AISI 316 L:

Density		7950	kg/m <sup>3</sup>
Tensile strength	(20°C)	> 490	N/mm <sup>2</sup>
Yield stress	(20°C)	> 190	N/mm <sup>2</sup>
Young's modulus	(20°C)	1,95·10 <sup>-5</sup>	N/mm <sup>2</sup>

Thermal properties:

Coefficient expan.	(20°C)	1,7·10 <sup>-5</sup>	°C <sup>-1</sup>
Specific heat		0,50	kJ/kg°C
Thermal conductivity		15	W/m°C

#### Diary pipe (EN 1.4307 and EN 1.4404)

Stainless steel pipes are also supplied as welded dairy pipes in the quality AISI 304 L and 316L TC1 according to EN 10357.  
Mill certificate according to EN 10204/3.1  
Supplied in 6 m lengths.

**Typical application** Milk and dairy products.



**Material specifications**  
**Carrier pipe - stainless steel**

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**Mapress**  
**(EN 1.4401)**

High-alloyed, austenitic CrNiMo-steel EN 1.4401 (according to EN 10088).  
Supplied in 6 m lengths.

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**Typical application**

Treated water, production water, cooling water with and without anti-freeze agent, and rain water.

Corrosion resistant. No corrosion caused by foreign substances.

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## Material specifications

### Carrier pipe - plastic

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**PE100 pressure pipe** High-density polyethylene according to EN 12201-2.  
Supplied in 6 and 12 m lengths.

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**Typical application** Waste water and biomass.

Mechanical properties of PE100:

Density	> 945	kg/m <sup>3</sup>
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Yield stress	> 23	N/mm <sup>2</sup>
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Thermal properties:

Coefficient of expansion	$1.7 \cdot 10^{-4}$	°C <sup>-1</sup>
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Thermal conductivity	0.4	W/m°C
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Melt flow rate	0.22	g/10 min.
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**Other carrier pipe qualities** Other carrier pipe qualities (steel, plastic, coated pipes etc.) are available on request.  
Steel in both EN/ISO and ASTM/ASME dimensions.

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**Carrier pipe choice** It rests with the customer to choose the carrier pipe - including the suitability of the material to transport the medium in question.

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## Material specifications

### Fittings

<b>General</b>	<p>Fittings in P235GH welded comply with the technical functional requirements in EN 448.</p> <p>Fittings in P235GH seamless, welded and stainless material quality subject to the Pressure Equipment Directive are delivered with technical documentation, which has been specified by the customer or defined by the requirements in the directive.</p>
<b>Elbows</b>	<p>Elbows are carried out bent, with weld fittings and segment welded.</p> <p>As a standard the following applies:</p> <p>P235GH welded  <math>\varnothing 21.3-406.4</math> mm cold-bent steel pipe, <math>R = 2.5 \times d</math>  <math>\geq \varnothing 457</math> mm weld elbow according to EN 10253-2 Type A, <math>R = 1.5 \times d</math></p> <p>P235GH seamless  <math>\varnothing 21.3-406.4</math> mm weld elbow according to EN 10253-2 Type A, <math>R = 1.5 \times d</math> or <math>2.5 \times d</math></p> <p>Stainless metric and ISO dimension  Weld elbow according to EN 10253-3/4, <math>R = 1.5 \times d</math></p> <p>Plastic (PE100)  Segment welded*, <math>R=1.5 \times d</math> or  On request moulded weld elbows according to EN 12201-3, <math>R=d</math>  *Pressure reduction factor: <math>0.8 \times PN_{\text{pipe}}</math></p>
<b>T-fittings</b>	<p>T-fittings in P235GH welded are as a standard made as collars or with weld fittings according to EN 10253-2 Type A.</p> <p>In P253GH seamless T-fittings are as a standard made with weld fittings according to EN 10253-2 Type A.</p> <p>T-fittings stainless, metric, and ISO are as a standard made with weld fittings according to EN 10253-3/4.</p> <p>T-fittings in plastic (PE100) are as a standard made with moulded weld fittings according to EN 12201-3.</p>
<b>Anchors</b>	<p>The anchor in P235GH welded and seamless consists of an anchor plate which is welded on to the carrier pipe.</p> <p>Max. axial stress on the anchor plate corresponds to differential stress of 150 MPa from the two sides.</p>
<b>Compensators</b>	<p>Compensators are used to absorb expansions in high-temperature systems and are delivered fully expanded (extended position) ready for use.</p>
<b>Reductions</b>	<p>Reductions in P235GH welded and seamless are as a standard made with weld reductions according to EN 10253-2 Type A.</p>
<b>Other components</b>	<p>Special components designed according to project-specific requirements are available on request. They may be: elbows, T-fittings, reductions etc. in various shapes and material qualities.</p>

## Material specifications

### Insulation

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<b>General</b>	<p>The pre-insulated straight pipes and components for bonded systems are supplied with PUR-insulation of a hard polyurethane foam or with PIR-insulation of hard polyisocyanurate foam.</p> <p>Sliding systems are delivered with a 2-part insulation where the inner layer consists of mineral wool and the outer layer of PUR-foam.</p>
<b>PUR-insulation</b>	<p>Hard polyurethane foam (PUR) which complies with the functional requirements of EN 253:</p> <p>Blowing agent: Pentane</p> <p>Thermal conductivity: Traditionally produced pipes (50°C) 0.027 W/m K</p> <p>Max. continuous operating temperature: 120°C (max. = 140°C for max. 300 hours per year)</p>
<b>PIR-insulation</b>	<p>Hard polyisocyanurate foam (PIR) which complies with the functional requirements of EN 253.</p> <p>Blowing agent: Pentane</p> <p>Thermal conductivity: Traditionally produced pipes (50°C) 0.028 W/m K</p> <p>Max. continuous operating temperature: 170°C (max. = 180°C for max. 300 hours per year)</p> <p>With fire retardant additives: 159°C (max. = 170°C for max. 300 hours per year)</p>
<b>Mineral wool/ PUR-foam</b>	<p>Inner layer:</p> <p>Mineral wool with an aluminium foil layer on the outside.</p> <p>Made of rockwool.</p> <p>Thermal conductivity: (50°C) 0.040 W/mK</p> <p>Outer layer:</p> <p>Hard polyurethane foam (PUR), complying with the functional requirements in EN 253.</p> <p>Blowing agent: Pentane</p> <p>Thermal conductivity: (50°C) 0.027 W/mK</p> <p>Max. continuous operating temperature: 250°C</p>
<b>PIR- or PUR-insulation</b>	<p>Low temperature pipe systems are supplied with PUR-foam.</p> <p>Normal temperature pipe systems are supplied with PUR- or PIR-foam.</p> <p>High temperature pipe systems are supplied with either PIR-foam or mineral wool/PUR-foam. With PIR-foam as freely suspended and directly buried systems up to 170°C, and with mineral wool/PUR-foam as directly buried systems up to 250°C.</p> <p>PUR- and PIR-foam are available in insulation series up to series 6.</p>

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## Material specifications

### Jacket pipe

#### General

HDPE jackets comply with the technical functional requirements, stated in EN 253.

Black HDPE jacket pipes are UV-resistant as a result of addition of UV-impeding additives. Black jacket pipes can therefore be used freely suspended or directly buried outdoor as well as indoor.

White jacket pipes are moderately UV-resistant and are only suitable for indoor installations.

#### HDPE jacket

High-density polyethylene.

Mechanical properties of HDPE:

Density	> 940	kg/m <sup>3</sup>
Yield stress	> 19	N/mm <sup>2</sup>
Max. compressive stress (during transport)	3	N/mm <sup>2</sup>
(continuously)	0.5	N/mm <sup>2</sup>

Thermal properties:

Coefficient of expansion	$2 \cdot 10^{-4}$	°C <sup>-1</sup>
Thermal conductivity	0.43	W/m°C
Melt flow rate	≤ 0.5	g/10 min.

#### Other jacket materials

Other jacket materials e.g. galvanised spiral-folded pipes, corten steel pipes, steel pipes with outside PE coating and others are available on enquiry.

## Material specifications

### Joints

---

<b>Joint types</b>	<p>The following different types of joints can be delivered:</p> <p>For HDPE jacket</p> <ul style="list-style-type: none"><li>- Weld joints</li><li>- Cross-linked shrink joints</li><li>- PE shrink joints</li></ul> <p>For other jacket materials</p> <ul style="list-style-type: none"><li>- Special joints, designed for the specific purpose</li></ul>
<b>Properties</b>	<p>Weld joints and PE shrink joints, made of extruded PE-joints are available as open or closed joints for pre-installation.</p> <p>Cross-linked shrink joints, made of modified PE-pipes are available as closed joints for pre-installation.</p> <p>Open joints are installed after the carrier pipe has been joined, whereas closed joints are installed before the carrier pipe is joined.</p> <p>Black PE-joints are UV-stabilised.</p> <p>White PE-joints are not UV-stabilised and must not be used outdoors or buried in the ground.</p>
<b>Package</b>	<p>If the joint is delivered in a protective bag, the protective bag must remain on the joint until installation. This means it must not be removed, when the sleeve is pulled onto the pipe.</p>
<b>Fields of application</b>	<p><b><i>Weld joints</i></b> Can be used in all soil types - also where the groundwater table is constantly &gt; 0.5 m over the pipes e.g. crossing streams or in oil-polluted soil as well as strongly acid soil, bacterially active dumps and lake/sea deposits. Weld joints are recommended for freely suspended, high- and low-temperature systems.</p> <p><b><i>Cross-linked shrink joints</i></b> Can be used in all normal soil types, where the groundwater table is constantly &lt; 0.5 m over the pipes and for freely suspended, normal- and high-temperature systems.</p> <p><b><i>PE shrink joints</i></b> Can be used in all normal soil types, where the groundwater table is constantly &lt; 0.5 m over the pipes and for freely suspended, normal-temperature systems.</p>

---

## Material specifications

### Tracer pipes

#### General

Tracer pipes are as a standard made in copper or PE.

Foamed tracer pipes for heat cables or liquids heat media can partly make a pipe system frostproof, partly maintain the required temperature. A conductive material, installed between the tracer pipe and the carrier pipe, ensures the heat transmission.

An embedded tracer pipe makes it possible to replace a defective cable and avoid assembling the cable for every 6-12 m.

For further information on tracer pipes, see information on each individual system.

#### PE tracer pipe

Mechanical properties of PE100:

Density	>	945 kg/m <sup>3</sup>
Yield stress	>	23 N/mm <sup>2</sup>

Thermal properties:

Coefficient of expansion	$1.7 \cdot 10^{-4}$	°C <sup>-1</sup>
Thermal conductivity	0.4	W/m°C
Melt flow rate	0.22	g/10 min

#### Cu tracer pipe

Hard copper Cu-DHP according to EN 1057.

Mechanical properties of hard copper:

Density	>	8940 kg/m <sup>3</sup>
Tensile strength	>	290 N/mm <sup>2</sup>
Elongation at break	>	min. 3 %
Hardness		min. 100 HV5

Thermal properties:

Coefficient of expansion	$1,68 \cdot 10^{-5}$	°C <sup>-1</sup>
Specific heat	0.385	kJ/kg°C
Thermal conductivity	365	W/m°C
Electrical conductivity	57	Sm/mm <sup>2</sup>

#### Other material qualities

Other material qualities are available on enquiry

## Material specifications

### General

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#### Cleaning

Industrial systems with HDPE jacket pipes can be cleaned by means of hydroblasting.

Max. water temperature 60° C

Cleaning distance between nozzle and product surface: Min. 50 cm.

Detergents which are used must be safe for polyethylene (PE).

---

#### Chemicals

Industrial systems with HDPE jacket pipes are resistant to the following chemicals: Lye, petrol, turpentine, petroleum products, salt, sodium sulphate, chlorine etc.

Industrial systems with HDPE jacket pipes have a short-term resistance to the following chemicals: Acetone, cellulose, hydrochloric acid, acetic acid, sulphuric acid.

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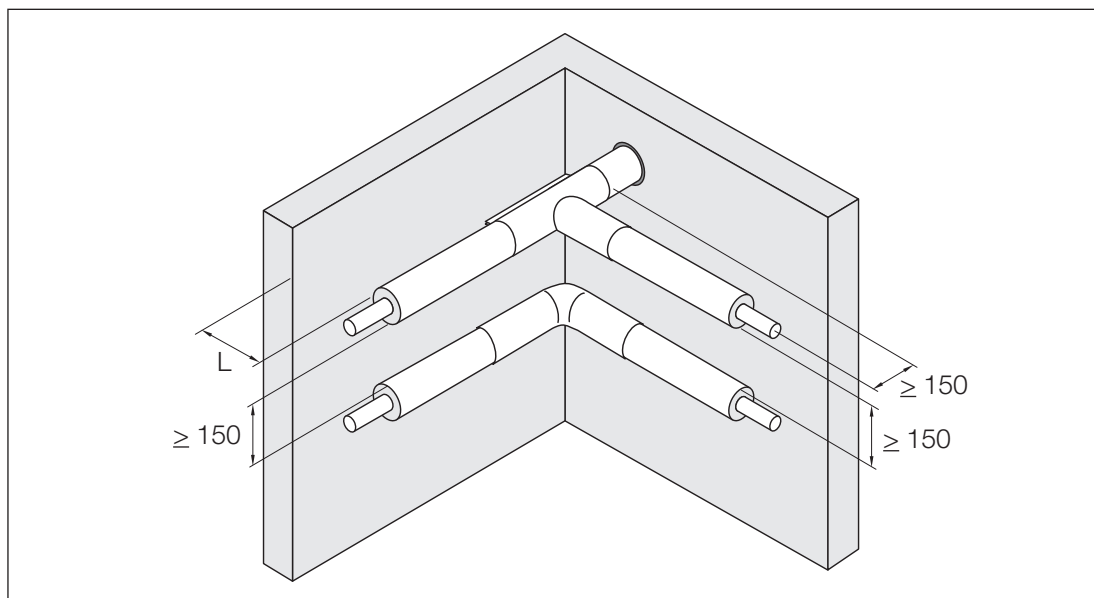


## General handling and installation

### Design rules, freely suspended system

#### General

From below illustration the relationship between pipe position and distances to wall appears.



Recommended minimal mounting distance between jacket/jacket and jacket/wall:

$L \geq 320$  on installation of T-joint.

$L \geq 150$  after installation of pipes.

#### Supports

The support distance for pre-insulated pipes and fittings is the same as for non-insulated ones. However, the permissible surface pressure of the insulation material must be accounted for. The width of the support shall be calculated as follows:

$$A = \frac{(G \cdot L_b + \sum F_v) \cdot g}{d_{\text{steel}} \cdot \sigma_{\text{till}}}$$

$d$  = Outer diameter of carrier pipe [mm]

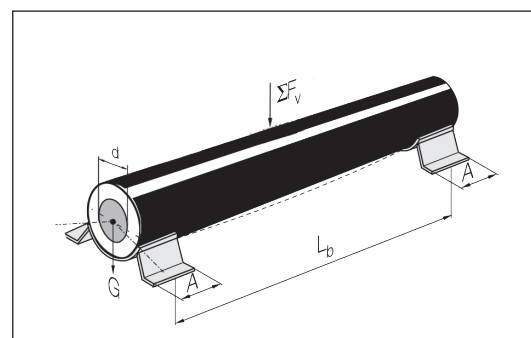
$G$  = Net weight pipe, incl. medium [kg/m]

$g$  = Gravity [9.81]

$L_b$  = Distance between supports or the pipe length to be supported [m]

$\sum F_v$  = The sum of any vertical load [kg]  
(snow, walk bridge or support for other pipes)

$\sigma_{\text{till}}$  = Permissible surface pressure on the insulation material is 0.15 N/mm<sup>2</sup>



The recommended distance from a support to a joint is minimum 100 mm.

**General handling and installation  
Design rules, directly buried system**

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**General**

LOGSTOR industry pipes must be installed in accordance with the instructions in the District Heating design manual.

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## General handling and installation Project preparations

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### Trench routing

The LT, NT and HT industrial systems can be subject to significant expansion due to the operating temperatures. Expansion is absorbed using expansion components L-, Z-, or U bends or compensators which must be precisely calculated in accordance with the trench routing.

Installation may therefore only be carried out in accordance with the trench route agreed with LOGSTOR or other approving consultant.

If no agreement on trench routing and installation facilities exists, or if installation has been performed in contradiction of the agreement, no liability or responsibility for deficiencies and the like is incurred by the consultant.

Please note that freely suspended and directly buried systems may only be used for the purpose for which they are designed, cf. chapter 1.1.4.

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## General handling and installation

### Transport and storage

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#### General

The present instructions describe vital aspects to take into account when using LOGSTOR products to ensure that the product are not damaged during transport and handling.

LOGSTOR recommends that these instructions are followed. Please note that the instructions are an integrated part of the supplementary technical terms for installation services.

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#### Delivery

Terms of delivery in accordance with the order confirmation.

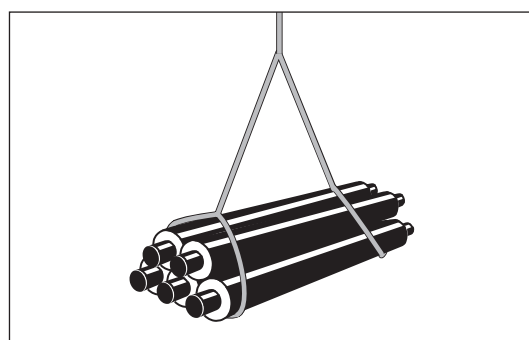
At delivery there must be sufficient personnel and gear available for unloading.

The consignment must be checked for completeness and damage.

LOGSTOR industrial pipes can be unloaded manually or by means of lifting straps.

When using straps, they must be min. 100 mm wide.

Max. pressure on the jacket pipe is 300 kPa (0,3 N/mm<sup>2</sup>).



When unloading, pipes, fittings, and other components must not be tipped or dropped from the truck or the like.

The pipes must be unloaded onto a level surface, so that the pipe has a substantial surface of support. To avoid damages of the jacket the surface must not contain stones.

---

#### Transport

During transport of pipes/fittings, care must be taken that they do not come into contact with sharp edges or objects which may damage the jacket pipe. Pipes must not protrude the end of a trailer or truck bed by more than 2 m. They must be placed flat or upon minimum 100 mm wide wooden slats with no more than 2 m between them. For the HT3 pipe system the maximum distance must be 1 m.

Pipes and fittings must be transported in such a way that the ends of the jacket and carrier pipes are not damaged.

At very low temperatures below -10° C jacket pipes contract what creates strong tension. At such low temperatures special care must be taken when transporting pipes. Avoid sharp blows to the jacket pipes.

---

## General handling and installation

### Transport and storage

#### Storage

Pipes and fittings must not be stored in disorderly piles, as this may cause unintended punctual loads.

For temporary storage, pipes must be stacked on a flat surface or wooden slats either in the shape of a pyramid or straight-sided with slats between each layer. When using the pyramidal shape LT and NT pipe systems can be stacked at a maximum height of 2 m. HT3 can only be stacked at a height of 1 m.

All systems may be stacked on slats up to a height of 1 m with a distance of 2 m between the slats.

For the HT3 system, the maximum distance between the slats must be 1 m. The slats must be at least 100 mm wide.

Fittings must also be placed on a level surface. It is important to ensure that the free pipe ends point downwards to avoid rainwater collecting on them.

White pipes are to be stored on slats – preferably indoor or covered.

Shrink sleeves and shrink materials must be stored indoor at a temperature  $< 50^{\circ}\text{C}$  to avoid a premature shrinking of the material.

Likewise insulation shells must be stored indoor or under roof. Foam packs must be stored indoor at  $16\text{-}22^{\circ}\text{C}$ .

Rigid joints are to be stacked upright to prevent ovalisation.

#### Pipes with coated jacket pipes

Coated jacket pipes must be treated with special care. The pipes must be handled and stored carefully to avoid damage to the coating.

#### Pipes with white HDPE jackets

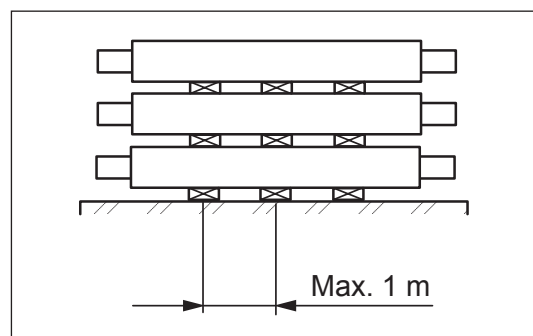
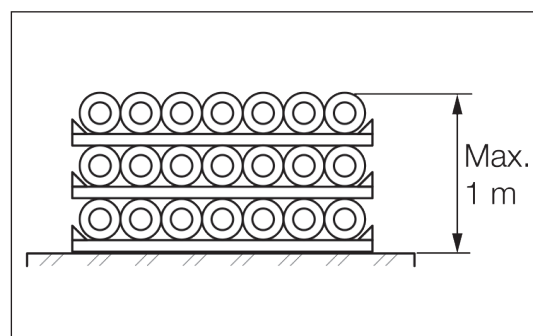
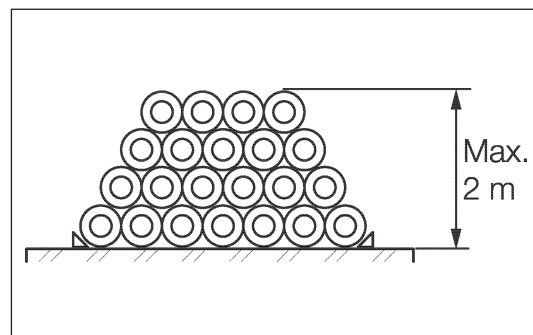
The white jacket pipe is supplied wrapped in a white polyethylene bag to protect the pipe against impurities, weather, scratches and discolorations.

Handling and storage of the white jacket must take place most carefully, as it is easily becomes dirty.

In case of discoloration, clean the jacket, if necessary with a solvent. Dirt can be removed with a concentrated dishwashing liquid. Oil residues and the like are removed with solvents.

It is recommended to leave the protective bag on the pipe until the installation has been completed. The protective bag is removed by cutting it open with a scissor along the pipe.

The polyethylene bag is to be deposited like ordinary garbage, as burned polyethylene is recyclable.



## General handling and installation

### Winter measures

#### Winter measures

At jacket pipe temperatures for HDPE lower than  $+10^{\circ}\text{C}$  the measures, described below should be regarded, when

- handling
- cutting and adapting
- removing insulation from
- bending

preinsulated pipes must be focused upon in addition to other specifications.

The reason:

All plastic materials become more rigid/sensitive towards wrong treatment at low temperatures. During the foaming process inner stresses have been induced to the jacket pipe which are affected by handling and working.

Note! When working with pipes in cold periods/areas follow the given instructions, even though the sun is shining. A frozen pipe is not heated to summer conditions, just because the temperature suddenly rises.

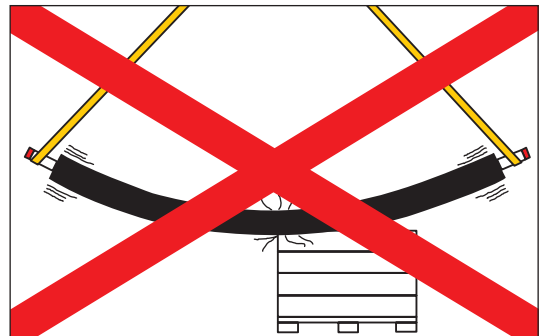
The preheating rules at outdoor temperatures below  $+10^{\circ}\text{C}$  apply to foaming and application of mastic etc.

#### Absolute minimum temperature

According to the district heating standard it is not permitted to work with preinsulated pipes and components at outdoor temperatures below  $-15^{\circ}\text{C}$ .

#### Handling

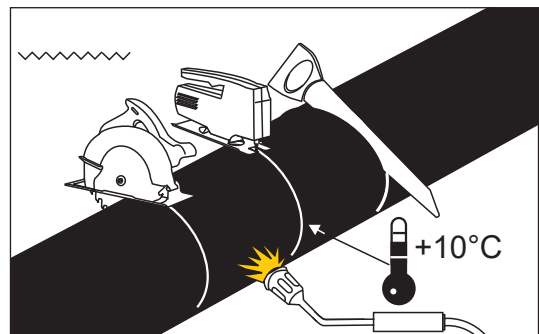
Do not expose the jacket pipe to extreme influences - e.g. impacts, shocks, large deflections and strong compressive forces - when handling it in cold periods/areas.



#### Cutting and adaption

Prior to cutting preheat the jacket pipe with a soft gas flame to frostfree condition.

Notice that the heat relatively slowly penetrates the plastic material, on the other hand do not superheat, especially not on locations where plastic weldings are later carried out. Use a tent and a heating gun, if large wall thicknesses and diameters are to be preheated.



## General handling and installation

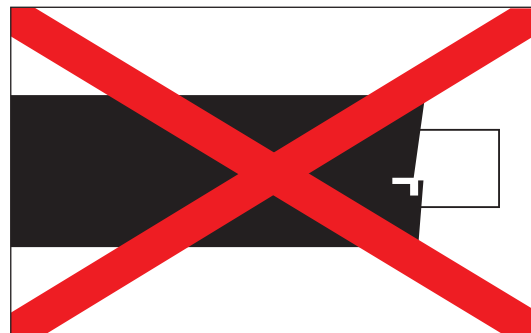
### Winter measures

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#### Cutting and adaption, *continued*

Especially at low temperatures sharp notches e.g. when making a diagonal cut must be avoided.

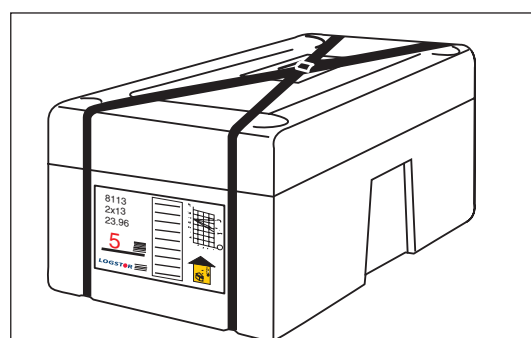
Always neutralize possible notches before installing a joint.



---

#### Storage and use of foam packs

See Handling & Installation for District Heating.



## General handling and installation

### Installation

---

#### General

It is crucial for the service life of the components that the joints between the two jacket pipes are and remain watertight.

If installed correctly, the joint will be tight and just as strong as the jacket pipes.

The pre-treatment of the plastic material is crucial to the effectiveness of the joint. It is of importance, that the materials used in the joint are completely clean and dry.

Any labels on the jacket pipe within the installation area must be removed.

Scratches must be scraped off. Large scratches must be filled with mastic.

When components designed to absorb expansion are installed, it has to be ensured that the necessary expansion is possible.

During joint installation the working site must be protected against wind and weather.

The joint installation must not be carried out under circumstances, where the activation of the plastic surfaces cannot be maintained throughout the installation process or other circumstances, which might reduce the quality of the joint.

---

#### Leak and pressure test

The leak and pressure test must be carried out in accordance with accepted standards, and in all respects as described by the client.

There are five "golden rules" of installing a HDPE-jacket pipe joint:

1. Prepare:  
All materials must be at hand when the installation work starts.
  2. Clean:  
All surfaces must be cleaned.
  3. Activate:  
All plastic surfaces must be activated by grinding and by means of a gas flame to ensure that the plastic oxides are reduced. At the same time, the components are preheated.
  4. Install:  
All components of the joint must be installed in a single work routine without interruptions.
  5. Inspect:  
Finally, the fitter ensures that the joint has been made correctly, and that the surface is even and smooth. Follow the fitting instructions of the joints accurately.
- 

#### Courses

##### **Objective:**

The objective of the courses is i.a. to communicate the required knowledge of the materials and their application to the fitters in order to enable them to carry out insulation of the carrier pipe joints in LOGSTOR pipe systems, and to store and support them. The courses are held at LOGSTOR's course centers in Denmark.

##### **Certificate:**

A certificate is issued upon completion of the course.

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## General handling and installation

### Installation - Joining jacket pipes

---

#### Terminology

**Shrink sleeve:**

Drifted polyolefin. Shrinks when heated.

**Shrink wrap:**

Open material shaped in the form of a pipe when installed. Mastic on the inside. Sealed with closure patch. Shrinks when heated.

**Closure patch:**

A patch with melting glue for fixation of longitudinal joint of wrap and cut shrink sleeve. To be heat-treated. Does not shrink.

**End cap:**

Drifted mastic polyolefin. Used to seal end. Shrinks when heated.

**Shrink film:**

Open, thin-walled wrap without closure patch. Cut in lengths suitable for the joint in question. Shrinks when heated.

**Collar:**

Soft, short sleeve. Mastic on the inside. Shrinks when heated.

**Mastic:**

Sealing compound, activated when heated. Adheres to clean and dry surfaces.

**Adhesive tape:**

Film with an adhesive agent. Adheres to clean, degreased surfaces.

**Insulation shells:**

Half shells used for insulation of pipe joints.

**Foaming:**

Injection of a suitable volume of mixed polyol and isocyanate. These agents react and develop PUR –foam.

---

#### Activation

The plastic surface of a joint must always be activated. The surface is activated to remove the plastic oxides (soapy surface coat – “plastic rust”) which cover any plastic surface. Activation ensures that the sealing and adhesion materials adhere directly to the clean plastic surface.

Activation can be made mechanically (grinding), electrically (spark-treatment) or thermally (flame).

Activation of LOGSTOR joints is normally carried out mechanically and thermally.

Thermal activation also ensures that all moisture is removed and that no dew is formed during shrinking.

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## General handling and installation

### Installation - Joining jacket pipes

#### Activation, *continued*

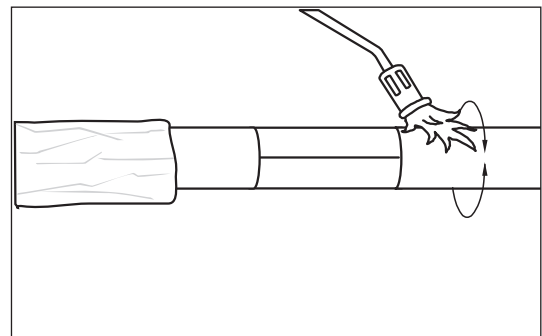
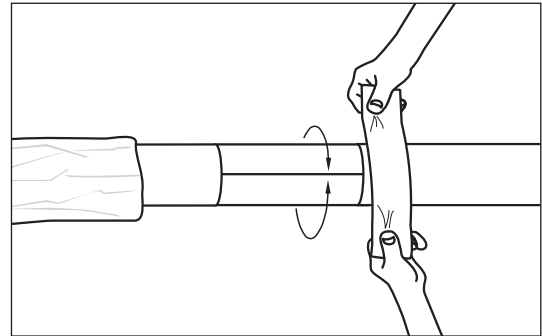
Activation is carried out by grinding the surface with emery paper, and afterwards slowly heat the surfaces using a soft gas flame (with yellow ends). The flame must “lick” the plastic surfaces.

After a thoroughly activation of the plastic, the surface temperature must be at least 60° C.

Once the right temperature has been reached, i.e. when the plastic oxides have been reduced, the surface of the plastic becomes silk-matt. The plastic material must not look shiny or burned.

The joint must be installed immediately after activation, since plastic oxides reform quickly.

The heat used when activating the surface is also used in the following installation, thereby ensuring a close connection between the surfaces and correct adhesion.



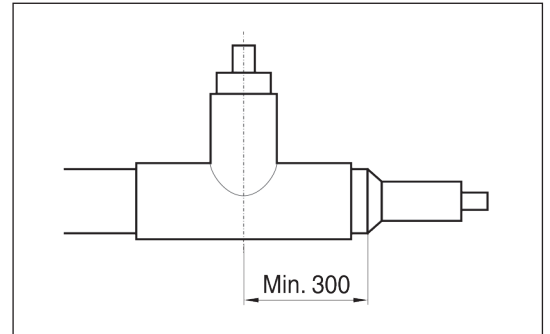
## General handling and installation Installation - Branches

### Reduction

Reductions are not to be placed on the main pipe of the T-joint. Reductions near the T-joint must be completed before the installation of the T-joint.

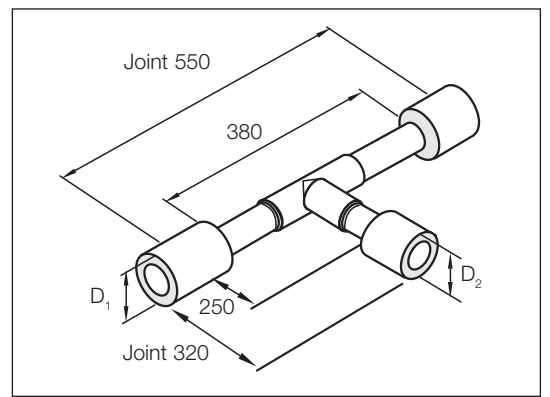
Reductions on branch pipes must be done with a reduction tee, not a reduction welded directly onto the weld tee.

All free pipe ends = 150 mm.



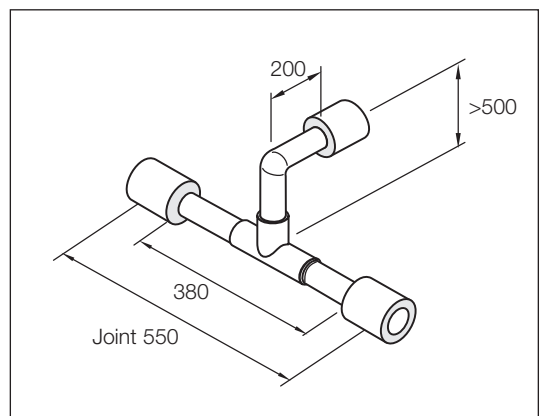
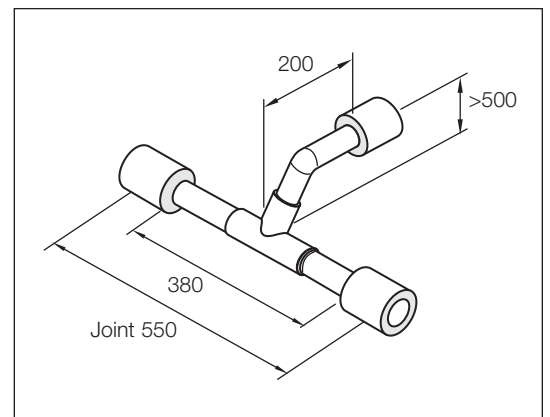
### TMC/TMC-C

During branch pipe installation the maximum measures must be observed to use TMC/TMC-C.



### TMC/TMC-C and BM

In case of a branch pipe with offset, TMC/TMC-C and BM are used together. The maximum measures appear from the illustrations.



## General handling and installation

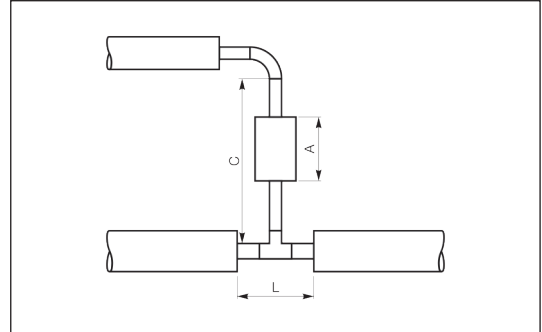
### Installation - Branches

**Examples**

The examples below demonstrate how to shorten free ends or welded T-fittings, so that the stated measures are observed..

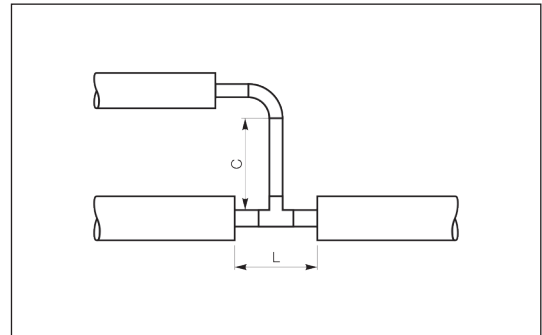
A = C-400, dog min. 100 mm.

L = Maximum 380 mm.

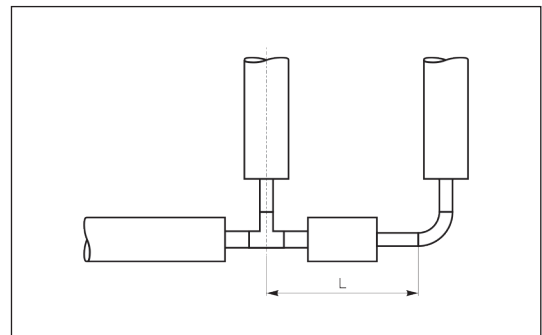


C = Maximum 400 mm without use of a fitting piece.

L = Maximum 380 mm



L = Min. 450 mm at 150 mm free end.



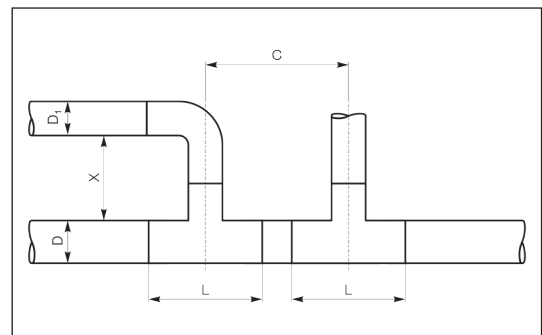
D = Jacket diameter

X = Minimum D

C = Minimum 650 mm

L = 530 mm

$D_1 \leq D$



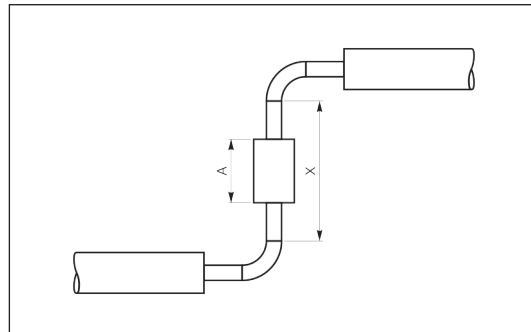
## General handling and installation Installation - Z-bend and end caps

**Z-bend**

The examples below demonstrate how to install two BM units.

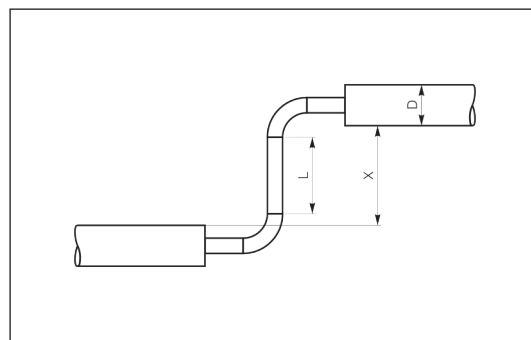
These measures are valid at free ends of 150 mm and at a weld elbow radius of 1.5xd.

A = X – 400, however min. 100 mm.



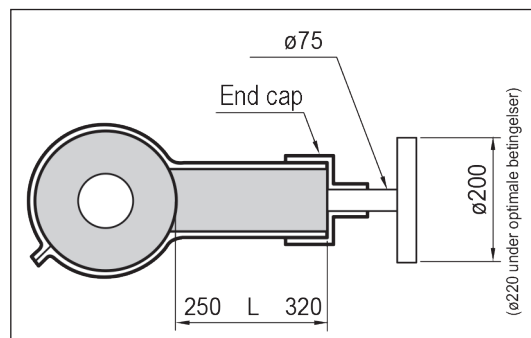
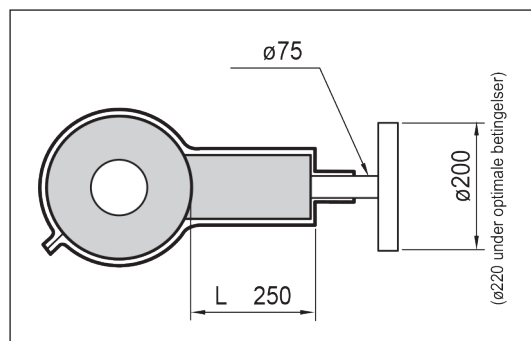
X = Min. D, but may also be carried out in cases, where weld fittings are welded directly together.

L = Fitting piece. Max. 400 mm fitting piece without using pre-insulated fitting piece.



**End cap**

Note! End caps must be installed before welding of flanges.



## General handling and installation

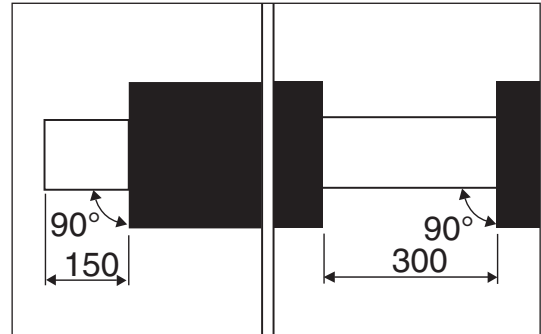
### Installation - Cutting and adaption of pipes

#### Cutting and adaption of pipes

When pipes are cut or adapted it is necessary to remove part of the jacket pipe and the PUR-foam insulation for a certain length from the steel pipe.

It is essential that the bare steel pipe end is thoroughly cleaned and free from foam remnants.

Also see the valid installation instructions for the casing joint in question.



#### Cutting the jacket pipe

Cut the jacket pipe around the entire circumference with a saw - never an angle grinder, except for the cases, mentioned in the following.

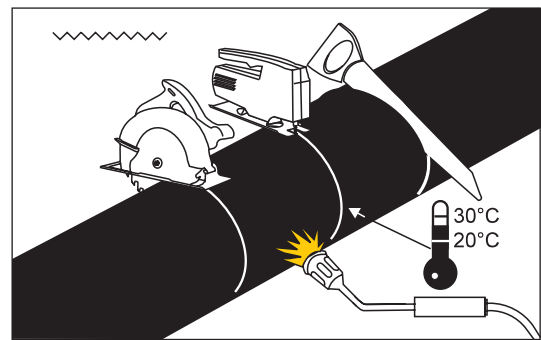
Beware of possible alarm wires.

Hand saw and electric jig saw are preferable. Use electrical circular saw with caution.

In cold periods/areas preheat the PE-jacket pipe, before cutting, with a soft gas flame to 20-30°C (lukewarm).

Notice that the heat relatively slowly penetrates the plastic material; but do not superheat, especially not on locations where plastic weldings are later carried out.

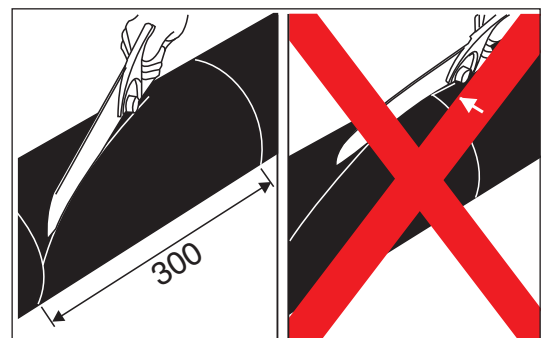
Use a tent and a heating gun, if large wall thicknesses and diameters are to be preheated.



#### Removal of jacket pipe

Remove the jacket pipe by making a diagonal cut.

Do not damage the remaining jacket pipe, because it can cause a notch effect which might start cracks at casing pipe ends.

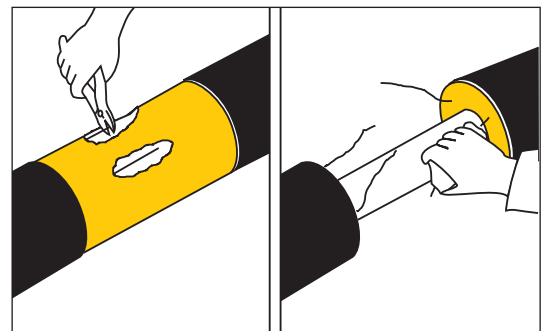


#### Removing foam from possible alarm wires

When cutting and adapting pipes with integral copper wires for the surveillance system avoid to stress these wires during the removal of the foam insulation.

Remove the foam around the wires and cut them.

Then carefully pull the loosened foam insulation from the wire ends.

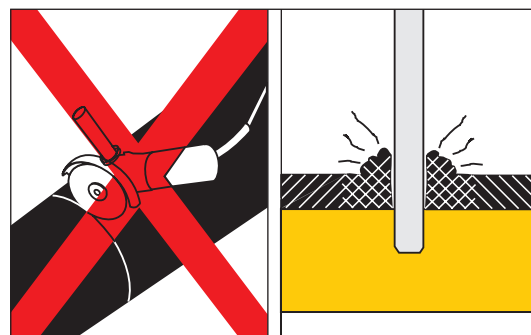


## General handling and installation

### Installation - Cutting and adaption of pipes

#### Using an angle grinder

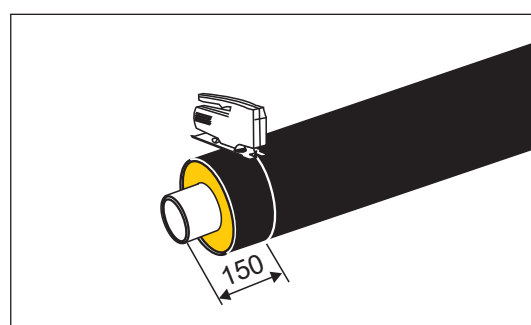
An angle grinder should not be used for anything else than for the cutting of straight preinsulated pipes which are later prepared with bare steel pipe ends for jointing. An angle grinder in use creates high temperatures in the cut and burns through the polyethylene material, creating beads and making the cutting area brittle, thus creating ground for notches and crack propagation



#### Cutting straight pipes

Make two circumferential cuts with the jig saw as it appears from the previous page and remove the jacket pipe and foam insulation.

Cut the steel pipe and prepare the pipe ends for welding/jointing.



## General handling and installation

### Installation - Pipe support

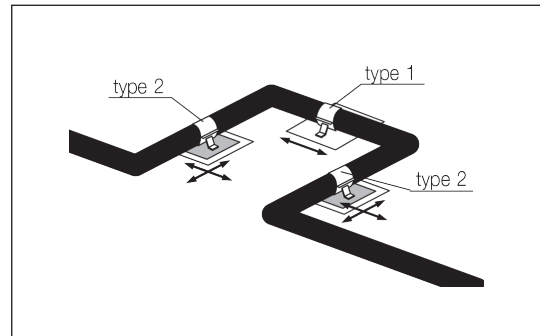
#### Installation of pipe supports

It is important that the pipe either lies loosely in the support to allow unhindered movement, or that slip supports with slippers are used.

It is also possible to place a teflon sliding plate under the support.

When the pipe is laid in such a way that it moves in the support, it is important not to place the supports on or near the joints, as these would otherwise be damaged by the movement of the pipe.

Recommended minimum distance from support to joint = 100 mm.



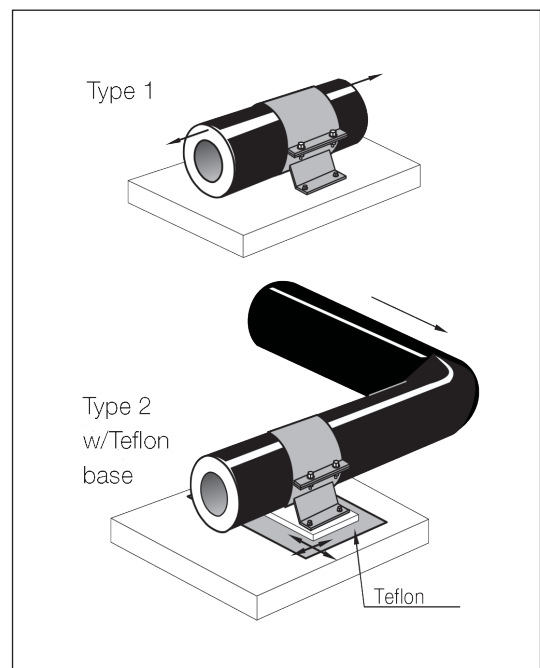
#### Installation of pipe supports, continued

When expansion is absorbed in the joints, it is important that the support does not block the movement. The supports at the elbows must therefore be able to move in two directions. This can be done by letting the support slide on the plate.

Pendular suspensions are not permitted when using axial compensators.

Avoid placing the supports directly on or near the joint. If this is impossible use a support type 2.

In general it is recommended to use closed supports to prevent pipes and fittings from taking off on expansion/contraction.



#### Supporting distances

LOGSTOR recommends that the supporting distance of a pre-insulated pipe, is the same as the one applied on a pipe that has not been insulated.



**System description - LT, low temperature**

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**General**

Operating temperatures from -200° C to -60° C

Bonded system

LT is applied as a freely suspended system and is not for under ground use.

The system is applicable for media such as e.g. liquid nitrogen, natural gas, ethylene and petroleum. The system is delivered with PUR-foam which has unique insulation properties, which ensure low operating costs.

30% moisture in the foam and the joint results in a higher heat loss and a reduction of the mechanical properties of the PUR-foam. Therefore, it is very important to install all joints correctly, and to cover all free ends with high temperature end caps in order to ensure low operating costs and a long service life. The HEC, HDHEC or HSEC end caps are applied at operating temperatures below -20° C and at temperatures above 120° C.

The system is available with black or white jacket. White jacket is only for indoor installation.

The energy loss of a system can be calculated by means of the calculation program LOGSTOR Industry Calculator ([www.logstor.com](http://www.logstor.com)).

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**Pipe - AISI 304L (EN 1.4307) / AISI 316L (EN 1.4404)****Description**

Component No. 20000 LS.

Supplied in lengths of 6 m.

Up to jacket dimension  $\varnothing 315$  only straight pipes and joints are recommended. Straight pipes, fittings and straight joints are supplied in dimensions exceeding  $\varnothing 315$ .

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.

Density of PUR-foam:  $85 \text{ kg/m}^3$ .

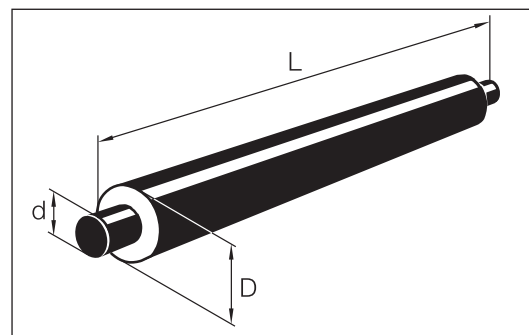
Available with black or white jacket. White jacket up to jacket dimension  $\varnothing 315 \text{ mm}$ .

Series 5

<b>Steel pipe, diameter d, mm</b>	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3
<b>Steel pipe, wall thickness, mm</b>	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
<b>Jacket pipe, diameter d, mm</b>	160	160	160	180	180	200	225	250	315
<b>Weight, kg/m</b>	3.1	3.4	3.7	4.6	4.9	6.0	7.3	8.8	12.6
<b>Liquid content, l/m</b>	0.2	0.4	0.7	1.2	1.5	2.5	4.1	5.7	9.6

Other carrier pipe dimensions are available on request.

As for fittings and joints contact LOGSTOR.



## NT technique

### System description - NT, normal temperature

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#### Description

Operating temperature from -60° C to +120° C.

Bonded system.

The steel systems can be used as freely suspended and directly buried systems. We also refer to LOGSTOR's district heating catalogue for choice of components and joints, if the steel pipe systems are to be directly buried. Installing directly buried stainless pipes requires special attention. Contact LOGSTOR for assistance as regards choosing system and components.

PE100 are used in directly buried and freely suspended systems.

The NT system is applicable for media such as condensate, ammonia, and dairy products. The system is available with PUR-foam or PIR-foam which both have unique insulating properties ensuring low operating costs.

30% moisture in the foam and the joint results in a higher heat loss and a reduction of the mechanical properties of the foam. Therefore, it is very important to install all joints correctly, and to cover all free ends with end caps. This ensures low operating costs and a long service life. At operating temperatures below -20°C and temperatures higher than 120°C HEC, HDHEC or HSEC end cap is used.

The system is available with black or white jacket. White jacket is only for indoor installation.

The energy loss of a system can be calculated by means of the calculation program LOGSTOR Industry Calculator ([www.logstor.com](http://www.logstor.com)).

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**NT technique  
Pipe with tracer**

**Description**

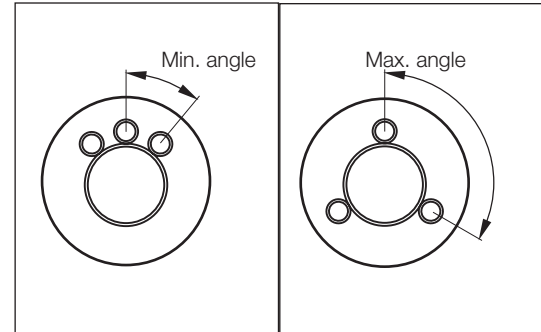
The pipe systems can be supplied with tracers on all carrier pipe types.

Tracer pipe material:  
Cu  $\varnothing$ 18 x 1.0 mm  
HDPE  $\varnothing$ 20 x 2.0 mm.

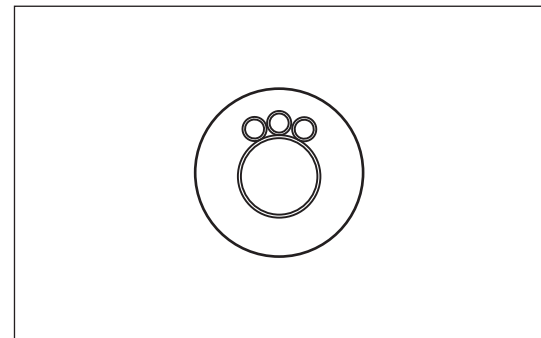
Other dimensions or material qualities are available on enquiry.

Tracer pipes can be installed with alu tape or PVC-free plastic tape.

**2-4 tracers**



**Tracers, installed**



Ød [mm]	1 tracer	2 tracers		3 tracers		4 tracers		Installed tracers No.
		min [°]	max [°]	min [°]	max [°]	min [°]	max [°]	
21.3	x	-	-	-	-	-	-	-
26.9	x	-	-	-	-	-	-	-
33.7	x	-	-	-	-	-	-	-
42.4	x	120	180	-	-	-	-	2
48.3	x	90	180	90	120	-	-	2-4
60.3	x	90	180	90	120	90	90	2-4
76.1	x	90	180	90	120	90	90	2-4
88.9	x	90	180	90	120	90	90	2-4
114.3	x	60	180	60	120	60	90	2-4
139.7	x	60	180	60	120	60	90	2-4
168.3	x	30	180	30	120	30	90	2-4
219.1	x	30	180	30	120	30	90	2-4
273	x	30	180	30	120	30	90	2-4
323.9	x	30	180	30	120	30	90	2-4
355.6	x	30	180	30	120	30	90	2-4
406.4	x	30	180	30	120	30	90	2-4
457	x	30	180	30	120	30	90	2-4
508	x	30	180	30	120	30	90	2-4

## NT components - Steel pipe system

### Pipe - P235GH welded

#### Description

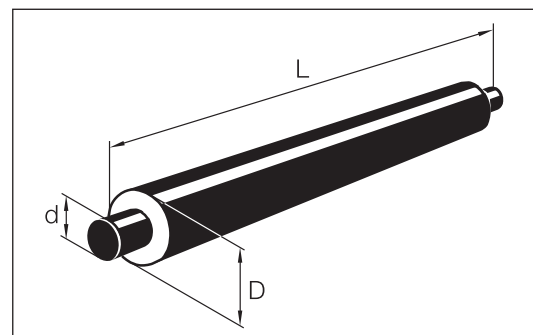
Component No. 20000LS.

Supplied in lengths of 6, 12 and 16 m depending on dimension.

Pipes in jacket dimension  $\varnothing 90$  are supplied with 100 mm free pipe ends.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



#### Series 1

Steel pipe dia. d, "	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6
Steel pipe dia. d, mm	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3
Steel pipe wall thick., mm	2.6	2.6	2.6	2.6	2.6	2.9	2.9	3.2	3.6	3.6	4
Jacket pipe dia. D, mm	90	90	90	110	110	125	140	160	200	225	250
Weight, kg/m	2.2	2.5	3.4	3.9	4.3	5.7	7.2	9.1	13.2	16.1	20.9
Liquid content, l/m	0.2	0.4	0.6	1.1	1.5	2.3	3.9	5.4	9	13.8	20.2
Lengths L, m	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12/16	6/12/16	6/12/16

Steel pipe dia. d, "	8	10	12	14	16	20
Steel pipe dia. d, mm	219.1	273	323.9	355.6	406.4	508
Steel pipe wall thick., mm	4.5	5	5.6	5.6	6.3	6.3
Jacket pipe dia. D, mm	315	400	450	500	560	710
Weight, kg/m	31.1	45	58.3	66.3	84.4	114
Liquid content, l/m	34.7	54.3	76.8	93.2	121.8	192.8
Lengths L, m	6/12/16	6/12/16	12/16	12/16	12/16	12/16

#### Series 2

Steel pipe dia. d, "	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6
Steel pipe dia. d, mm	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3
Steel pipe wall thick., mm	2.6	2.6	2.6	2.6	2.6	2.9	2.9	3.2	3.6	3.6	4
Jacket pipe dia. D, mm	110	110	110	125	125	140	160	180	225	250	280
Weight, kg/m	2.9	3.2	4	4.5	4.3	6.5	8.1	10.1	14.9	18.1	23.6
Liquid content, l/m	0.2	0.4	0.6	1.1	1.5	2.3	3.9	5.4	9	13.8	20.2
Lengths L, m	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12/16	6/12/16	6/12/16

Steel pipe dia. d, "	8	10	12	14	16	20
Steel pipe dia. d, mm	219.1	273	323.9	355.6	406.4	508
Steel pipe wall thick., mm	4.5	5	5.6	5.6	6.3	6.3
Jacket pipe dia. D, mm	355	450	500	560	630	800
Weight, kg/m	35.5	51.9	66.4	72.8	92.7	127.8
Liquid content, l/m	34.7	54.3	76.8	93.2	121.8	192.8
Lengths L, m	6/12/16	6/12/16	12/16	12/16	12/16	12/16

## NT components - Steel pipe system

### Pipe - P235GH welded

**Series 3**

Steel pipe dia. d, "	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6
Steel pipe dia. d, mm	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3
Steel pipe wall thick., mm	2.6	2.6	2.6	2.6	2.6	2.9	2.9	3.2	3.6	3.6	4
Jacket pipe dia. D, mm	125	125	125	140	140	160	180	200	250	280	315
Weight, kg/m	3.2	3.6	4.4	5	5.4	7.1	8.7	10.9	16.3	20	26
Liquid content, l/m	0.2	0.4	0.6	1.1	1.5	2.3	3.9	5.4	9	13.8	20.2
Lengths L, m	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12/16	6/12/16	6/12/16

Steel pipe dia. d, "	8	10	12	14	16	20
Steel pipe dia. d, mm	219.1	273	323.9	355.6	406.4	508
Steel pipe wall thick., mm	4.5	5	5.6	5.6	6.3	6.3
Jacket pipe dia. D, mm	400	500	560	630	710	900
Weight, kg/m	39.4	57.4	73.8	81.2	103.7	142.3
Liquid content, l/m	34.7	54.3	76.8	93.2	121.8	192.8
Lengths L, m	6/12/16	6/12/16	12/16	12/16	12/16	12/16

**Other dimensions**

Other dimensions and insulation series are available on inquiry.

## NT components - Steel pipe system

### Pipe - P235GH seamless

#### Description

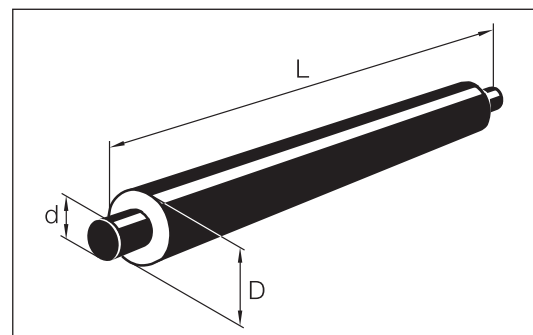
Component No. 20000LS.

Lengths: 6 and 12 m dependent on dimension.

Pipes in jacket dimension  $\varnothing 90$  are supplied with 100 mm free pipe ends.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



#### Series 1

Steel pipe dia. d, "	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12
Steel pipe dia. d, mm	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273	323.9
Steel pipe wall thick., mm	2	2.3	2.6	2.6	2.6	2.9	2.9	3.2	3.6	4	4.5	6.3	6.3	7.1
Jacket pipe dia. D, mm	90	90	90	110	110	125	140	160	200	225	250	315	400	450
Weight, kg/m	1.9	2.3	2.9	3.8	4.2	5.6	7.1	9	13	17.1	22.6	39.8	53.3	69.8
Liquid content, l/m	0.2	0.4	0.6	1.1	1.5	2.3	3.9	5.3	9	13.6	19.9	33.5	53.3	75.3
Lengths L, m	6	6	6	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12

#### Series 2

Steel pipe dia. d, "	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12
Steel pipe dia. d, mm	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273	323.9
Steel pipe wall thick., mm	2.0	2.3	2.6	2.6	2.6	2.9	2.9	3.2	3.6	4	4.5	6.3	6.3	7.1
Jacket pipe dia. D, mm	110	110	110	125	125	140	160	180	225	250	280	355	450	500
Weight, kg/m	2.3	2.7	3.3	4.1	4.5	6.1	7.6	9.5	13.9	18.3	24.1	43.1	57.6	74.7
Liquid content, l/m	0.2	0.4	0.6	1.1	1.5	2.3	3.9	5.3	9.0	13.6	19.9	33.5	53.3	75.3
Lengths L, m	6	6	6	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12

#### Series 3

Steel pipe dia. d, "	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12
Steel pipe dia. d, mm	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273	323.9
Steel pipe wall thick., mm	2.0	2.3	2.6	2.6	2.6	2.9	2.9	3.2	3.6	4	4.5	6.3	6.3	7.1
Jacket pipe dia. D, mm	125	125	125	140	140	160	180	200	250	280	315	400	500	560
Weight, kg/m	2.6	3.0	3.6	4.6	5.0	6.6	8.1	10.2	15.1	19.9	26.1	46.6	62.5	81.2
Liquid content, l/m	0.2	0.4	0.6	1.1	1.5	2.3	3.9	5.3	9.0	13.6	19.9	33.5	53.3	75.3
Lengths L, m	6	6	6	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12

#### Other dimensions

Other dimensions and insulation series are available on inquiry.

## NT components - Steel pipe system

### Pipe - AISI 304L (EN 1.4307) / AISI 316L (EN 1.4404)

**Description**

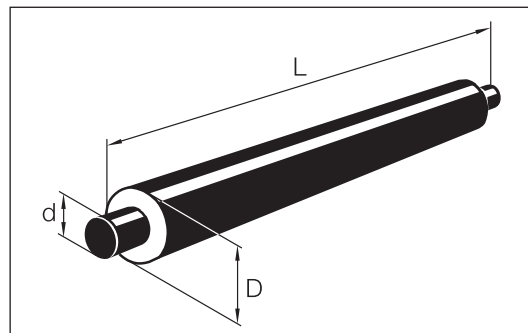
Component No. 20000LS.

Supplied in lengths of 6 m.

Pipes in jacket dimension  $\varnothing 90$  are supplied with 100 mm free pipe ends.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.

**Series 1****- ISO dimension**

Steel pipe dia. d, mm	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273	323.9
Steel pipe wall thick., mm	2	2	2	2	2	2	2	2	2	2	2	2	2.6	2.6
Jacket pipe dia. D, mm	90	90	90	110	110	125	140	160	200	225	250	315	400	450
Weight, kg/m	1.9	2.2	2.5	3.3	3.6	4.4	5.6	6.6	8.8	10.9	13	18.1	29.6	35.3
Liquid content, l/m	0.2	0.4	0.7	1.2	1.5	2.5	4.1	5.7	9.6	14.5	21.2	36.3	56.3	79.8

**- metric dimension**

Steel pipe dia. d, mm	104	129	154	204	254	305
Steel pipe wall thick., mm	2	2	2	2	2	2.5
Jacket pipe dia. D, mm	180	200	250	315	355	400
Weight, kg/m	7.8	9.4	12.4	17.5	24.7	34.8
Liquid content, l/m	7.9	12.3	17.7	31.4	49.1	70.7

**Series 2****- ISO dimension**

Steel pipe dia. d, mm	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273	323.9
Steel pipe wall thick., mm	2	2	2	2	2	2	2	2	2	2	2	2	2.6	2.6
Jacket pipe dia. D, mm	110	110	110	125	125	140	160	180	225	250	280	355	450	500
Weight, kg/m	2.3	2.6	2.9	3.6	3.9	4.9	6.1	7.2	9.8	12.1	14.7	20.9	33.8	40.2
Liquid content, l/m	0.2	0.4	0.7	1.2	1.5	2.5	4.1	5.7	9.6	14.5	21.2	36.3	56.3	79.8

**- metric dimension**

Steel pipe dia. d, mm	104	129	154	204	254	305
Steel pipe wall thick., mm	2	2	2	2	2	2.5
Jacket pipe dia. D, mm	200	225	280	355	400	450
Weight, kg/m	8.5	10.4	14	20.1	28.7	39.7
Liquid content, l/m	7.9	12.3	17.7	31.4	49.1	70.7



## NT components - Steel pipe system

### Pipe - AISI 304L (EN 1.4307) / AISI 316L (EN 1.4404)

#### Series 3

##### - ISO dimension

Steel pipe dia. d, mm	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273	323.9
Steel pipe wall thick., mm	2	2	2	2	2	2	2	2	2	2	2	2	2.6	2.6
Jacket pipe dia. D, mm	125	125	125	140	140	160	180	200	250	280	315	400	500	560
Weight, kg/m	2.6	2.9	3.2	4.1	4.4	5.4	6.6	7.9	11	13.8	16.8	24.4	38.7	46.8
Liquid content, l/m	0.2	0.4	0.7	1.2	1.5	2.5	4.1	5.7	9.6	14.5	21.2	36.3	56.3	79.8

##### - metric dimension

Steel pipe dia. d, mm	104	129	154	204	254	305
Steel pipe wall thick., mm	2	2	2	2	2	2.5
Jacket pipe dia. D, mm	225	250	315	400	450	500
Weight, kg/m	9.4	11.5	15.9	23.4	33.4	46.3
Liquid content, l/m	7.9	12.3	17.7	31.4	49.1	70.7

#### Other dimensions

Other dimensions and insulation series are available on inquiry.

## NT components - Steel pipe system

### Pipe - AISI 316L (diary pipe - EN 1.4404)

**Description**

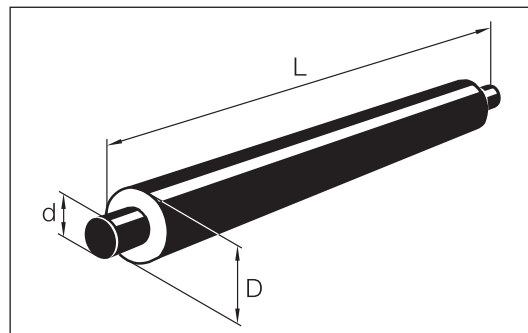
Component No. 20000LS.

Supplied in lengths of 6 m.

Pipes in jacket dimension  $\varnothing 90$  are supplied with 100 mm free pipe ends.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.

**Series 1**

Steel pipe dia. d, mm	25	32	38	51	63.5	76	101.6
Steel pipe wall thick., mm	1.2	1.2	1.2	1.2	1.6	2	2
Jacket pipe dia. D, mm	90	90	110	110	125	140	180
Weight, kg/m	1.7	1.8	2.4	2.8	3.8	5.6	7.7
Liquid content, l/m	0.4	0.7	1	1.9	2.9	4.1	7.5

**Series 2**

Steel pipe dia. d, mm	25	32	38	51	63.5	76	101.6
Steel pipe wall thick., mm	1.2	1.2	1.2	1.2	1.6	2	2
Jacket pipe dia. D, mm	110	110	125	125	140	160	200
Weight, kg/m	2.1	2.3	2.7	3.1	4.3	6.1	8.4
Liquid content, l/m	0.4	0.7	1	1.9	2.9	4.1	7.5

**Series 3**

Steel pipe dia. d, mm	25	32	38	51	63.5	76	101.6
Steel pipe wall thick., mm	1.2	1.2	1.2	1.2	1.6	2	2
Jacket pipe dia. D, mm	125	125	140	140	160	180	225
Weight, kg/m	2.4	2.6	3.2	3.6	4.8	6.6	9.3
Liquid content, l/m	0.4	0.7	1	1.9	2.9	4.1	7.5

**Other dimensions**

Other dimensions and insulation series are available on inquiry.

## NT components - Steel pipe system

### Pipe - AISI 304L (diary pipe - EN 1.4307)

**Description**

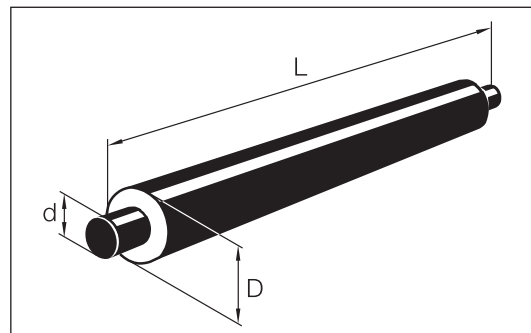
Component No. 20000LS.

Supplied in lengths of 6 m.

Pipes in jacket dimension  $\varnothing 90$  are supplied with 100 mm free pipe ends.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.

**Series 1**

Steel pipe dia. d, mm	25	32	38	51	63.5	76	101.6
Steel pipe wall thick., mm	1.2	1.2	1.2	1.2	1.6	2	2
Jacket pipe dia. D, mm	90	90	110	110	125	140	180
Weight, kg/m	1.7	1.8	2.4	2.8	3.8	5.6	7.7
Liquid content, l/m	0.4	0.7	1	1.9	2.9	4.1	7.5

**Series 2**

Steel pipe dia. d, mm	25	32	38	51	63.5	76	101.6
Steel pipe wall thick., mm	1.2	1.2	1.2	1.2	1.6	2	2
Jacket pipe dia. D, mm	110	110	125	125	140	160	200
Weight, kg/m	2.1	2.3	2.7	3.1	4.3	6.1	8.4
Liquid content, l/m	0.4	0.7	1	1.9	2.9	4.1	7.5

**Series 3**

Steel pipe dia. d, mm	25	32	38	51	63.5	76	101.6
Steel pipe wall thick., mm	1.2	1.2	1.2	1.2	1.6	2	2
Jacket pipe dia. D, mm	125	125	140	140	160	180	225
Weight, kg/m	2.4	2.6	3.2	3.6	4.8	6.6	9.3
Liquid content, l/m	0.4	0.7	1	1.9	2.9	4.1	7.5

**Other dimensions**

Other dimensions and insulation series are available on inquiry.

## NT components - Steel pipe system

### Pipe - Mapress (EN 1.4401)

**Description**

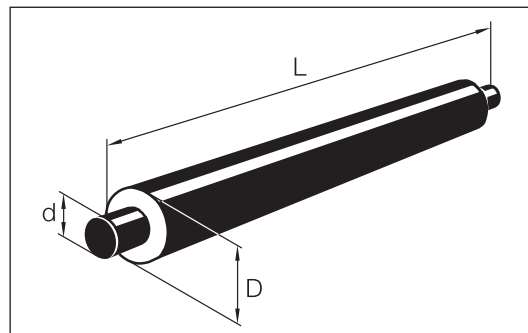
Component No. 20000LS.

Supplied in lengths of 6 m.

Pipes in jacket dimension  $\varnothing 90$  are supplied with 100 mm free pipe ends.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.

**Series 1**

Steel pipe dia. d, mm	22	28	35	42	54	76.1	88.9	108
Steel pipe wall thick., mm	1.2	1.2	1.5	1.5	1.5	2.0	2.0	2.0
Jacket pipe dia. D, mm	90	90	90	110	125	140	160	180
Weight, kg/m	1.8	2.0	2.4	3.0	3.8	5.6	6.7	8.1
Liquid content, l/m	0.3	0.5	0.8	1.2	2.0	4.1	5.7	8.5

**Series 2**

Steel pipe dia. d, mm	22	28	35	42	54	76.1	88.9	108
Steel pipe wall thick., mm	1.2	1.2	1.5	1.5	1.5	2.0	2.0	2.0
Jacket pipe dia. D, mm	110	110	110	125	140	160	180	200
Weight, kg/m	2.1	2.3	2.7	3.1	4.3	6.1	8.4	8.7
Liquid content, l/m	0.3	0.5	0.8	1.2	2.0	4.1	5.7	8.5

**Series 3**

Steel pipe dia. d, mm	22	28	35	42	54	76.1	88.9	108
Steel pipe wall thick., mm	1.2	1.2	1.5	1.5	1.5	2.0	2.0	2.0
Jacket pipe dia. D, mm	125	125	125	140	160	180	200	225
Weight, kg/m	2.4	2.6	3.2	3.6	4.8	6.6	9.3	9.6
Liquid content, l/m	0.3	0.5	0.8	1.2	2.0	4.1	5.7	8.5

**Other dimensions**

Other dimensions and insulation series are available on inquiry.

## NT components - Steel pipe system

### Fix pipe

#### Description

Component No. 20001LS.

Fix pipes are produced to the same specifications as those for straight pipes. See page:

- 3.2.1 P235 welded
- 3.2.2 P235 seamless
- 3.2.3 AISI 304L/AISI 316L
- 3.2.4 AISI 304L/AISI 316L - Dairy pipe
- 3.3.1 PE 100

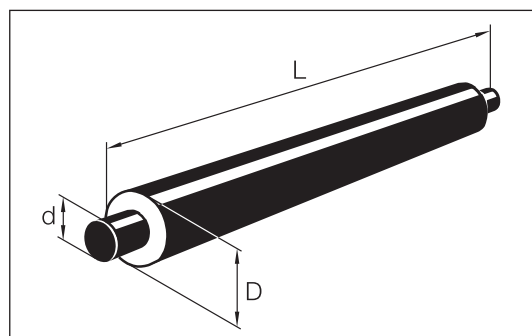
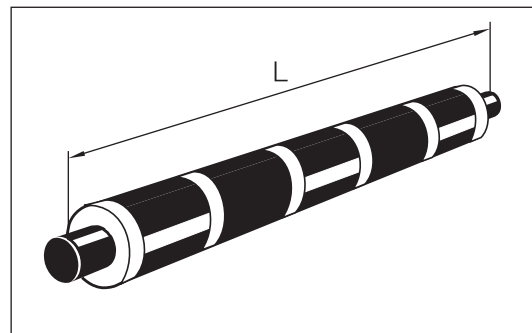
Fix pipes are used as adaptors. One pipe section must not include more than one fix pipe.

A fix pipe has no adhesion between insulation and carrier pipe. It is available in two designs:

- Divided into 0.5-1.5 m sections, marked with circumferential tape for each second section, where there is no adhesion between insulation and carrier pipe. Marked with longitudinal tape.
- No adhesion between insulation and carrier pipe in the entire pipe length. Marked with text on label.

Pipes with jacket dimension  $\varnothing 90$  are delivered with 100 mm free ends.

Available in the same series as straight pipes.



## NT components - Steel pipe system

### Reduction fitting - P235GH welded and seamless

#### Description

Component No. 4900S.  
Pre-insulated reduction fitting is with concentric weld reduction according to EN 10253-2. Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

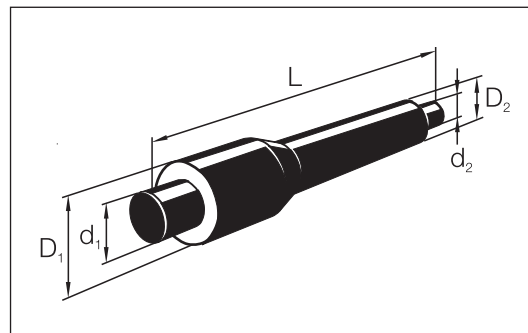
Max. axial stress:

1 dimensional offset: 300 N/mm<sup>2</sup>

2 dimensional offsets: 150 N/mm<sup>2</sup>

Nominal operating pressure: 25 bar at 120°C.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



#### P235GH welded Series 1

From dimension $\varnothing$ mm	To dimension $\varnothing$ mm	L, mm
33.7/90	26.9/90	900
42.4/110	26.9/90	900
42.4/110	33.7/90	900
48.3/110	33.7/90	900
48.3/110	42.4/110	900
60.3/125	42.4/110	900
60.3/125	48.3/110	900
76.1/140	48.3/110	1000
76.1/140	60.3/125	1000
88.9/160	60.3/125	1000
88.9/160	76.1/140	1000
114.3/200	76.1/140	1000
114.3/200	88.9/160	1000
139.7/225	88.9/160	1000
139.7/225	114.3/200	1000

From dimension $\varnothing$ mm	To dimension $\varnothing$ mm	L, mm
168.3/250	114.3/200	1000
168.3/250	139.7/225	1000
219.1/315	139.7/225	1100
219.1/315	168.3/250	1100
273.0/400	168.3/250	1500
273.0/400	219.1/315	1500
323.9/450	219.1/315	1500
323.9/450	273.0/400	1500
355.6/500	273.0/400	1500
355.6/500	323.9/450	1500
406.4/560	323.9/450	1500
406.4/560	355.6/500	1500
508.0/710	406.4/560	1500

#### P235GH welded Series 2

From dimension $\varnothing$ mm	To dimension mm	L mm
33.7/110	26.9/110	900
42.4/125	26.9/110	900
42.4/125	33.7/110	900
48.3/125	33.7/110	900
48.3/125	42.4/125	900
60.3/140	42.4/125	900
60.3/140	48.3/125	900
76.1/160	48.3/125	1000
76.1/160	60.3/140	1000
88.9/180	60.3/140	1000
88.9/180	76.1/160	1000
114.3/225	76.1/160	1000
114.3/225	88.9/180	1000
139.7/250	88.9/180	1000
139.7/250	114.3/225	1000

From dimension $\varnothing$ mm	To dimension mm	L mm
168.3/280	114.3/225	1000
168.3/280	139.7/250	1000
219.1/355	139.7/250	1100
219.1/355	168.3/280	1100
273.0/450	168.3/280	1500
273.0/450	219.1/355	1500
323.9/500	219.1/355	1500
323.9/500	273.0/450	1500
355.6/560	273.0/450	1500
355.6/560	323.9/500	1500
406.4/630	323.9/500	1500
406.4/630	355.6/560	1500
508/800	355.6/560	1500
508/800	406.4/630	1500

## NT components - Steel pipe system

### Reduction fitting - P235GH welded and seamless

#### P235GH welded Series 3

From dimension ø mm	To dimension mm	L mm
33.7/125	26.9/125	900
42.4/140	26.9/110	900
42.4/140	33.7/125	900
48.3/140	33.7/125	900
48.3/140	42.4/140	900
60.3/160	42.4/140	900
60.3/160	48.3/140	900
76.1/180	48.3/140	1000
76.1/180	60.3/160	1000
88.9/200	60.3/160	1000
88.9/200	76.1/180	1000
114.3/250	76.1/180	1000
114.3/250	88.9/200	1000
139.7/280	88.9/200	1000
139.7/280	114.3/250	1000

From dimension ø mm	To dimension mm	L mm
168.3/315	114.3/250	1000
168.3/315	139.7/280	1000
219.1/400	139.7/280	1100
219.1/400	168.3/315	1100
273.0/500	168.3/315	1500
273.0/500	219.1/400	1500
323.9/560	219.1/400	1500
323.9/560	273.0/500	1500
355.6/630	273.0/500	1500
355.6/630	323.9/560	1500
406.4/710	323.9/560	1500
406.4/710	355.6/630	1500
508/900	355.6/630	1500
508/900	406.4/710	1500

#### P235GH seamless Series 1

From dimension ø mm	To dimension ø mm	L, mm
33.7/90	26.9/90	900
42.4/110	26.9/90	900
42.4/110	33.7/90	900
48.3/110	33.7/90	900
48.3/110	42.4/110	900
60.3/125	42.4/110	900
60.3/125	48.3/110	900
76.1/140	48.3/110	1000
76.1/140	60.3/125	1000
88.9/160	60.3/125	1000
88.9/160	76.1/140	1000
114.3/200	76.1/140	1000
114.3/200	88.9/160	1000

From dimension ø mm	To dimension ø mm	L, mm
139.7/225	88.9/160	1000
139.7/225	114.3/200	1000
168.3/250	114.3/200	1000
168.3/250	139.7/225	1000
219.1/315	139.7/225	1100
219.1/315	168.3/250	1100
273.0/400	168.3/250	1500
273.0/400	219.1/315	1500
323.9/450	219.1/315	1500
323.9/450	273.0/400	1500

## NT components - Steel pipe system

### Reduction fitting - P235GH welded and seamless

#### P235GH seamless Series 2

From dimension ø mm	To dimension ø mm	L, mm
33.7/110	26.9/110	900
42.4/125	26.9/110	900
42.4/125	33.7/110	900
48.3/125	33.7/110	900
48.3/125	42.4/125	900
60.3/140	42.4/125	900
60.3/140	48.3/125	900
76.1/160	48.3/125	1000
76.1/160	60.3/140	1000
88.9/180	60.3/140	1000
88.9/180	76.1/160	1000
114.3/225	76.1/160	1000
114.3/225	88.9/180	1000
139.7/250	88.9/180	1000
139.7/250	114.3/225	1000

From dimension ø mm	To dimension ø mm	L, mm
168.3/280	114.3/225	1000
168.3/280	139.7/250	1000
219.1/355	139.7/250	1100
219.1/355	168.3/280	1100
273.0/450	168.3/280	1500
273.0/450	219.1/355	1500
323.9/500	219.1/355	1500
323.9/500	273.0/450	1500

#### P235GH seamless Series 3

From dimension ø mm	To dimension ø mm	L, mm
33.7/125	26.9/125	900
42.4/140	26.9/110	900
42.4/140	33.7/125	900
48.3/140	33.7/125	900
48.3/140	42.4/140	900
60.3/160	42.4/140	900
60.3/160	48.3/140	900
76.1/180	48.3/140	1000
76.1/180	60.3/160	1000
88.9/200	60.3/160	1000
88.9/200	76.1/180	1000
114.3/250	76.1/180	1000
114.3/250	88.9/200	1000
139.7/280	88.9/200	1000
139.7/280	114.3/250	1000

From dimension ø mm	To dimension ø mm	L, mm
168.3/315	114.3/250	1000
168.3/315	139.7/280	1000
219.1/400	139.7/280	1100
219.1/400	168.3/315	1100
273.0/500	168.3/315	1500
273.0/500	219.1/400	1500
323.9/560	219.1/400	1500
323.9/560	273.0/500	1500

#### Other dimensions

Eccentric reduction fittings, other dimensions and insulation series are available on inquiry.



## NT components - Steel pipe system

### Elbow 90° - P235GH welded and seamless

**Description**

Component No. 25000LS.

Available in black or white jacket. White jacket up to dimension ø315 mm.

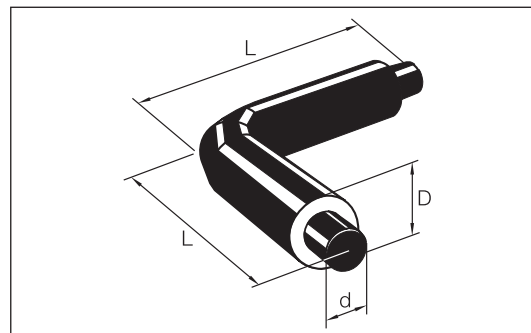
Elbows with other angles can be supplied to order in 5° offsets.

Nominal operating pressure:

P235GH welded: 16 bar at 120°C

P235GH seamless: 25 bar at 120°C

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.

**P235GH welded**

Steel pipe ø mm	Jacket pipe ø mm			L mm
	series 1	series 2	series 3	
26.9	90	110	125	1000
33.7	90	110	125	1000
42.4	110	125	140	1000
48.3	110	125	140	1000
60.3	125	140	160	1000
76.1	140	160	180	1000
88.9	160	180	200	1000
114.3	200	225	250	1000
139.7	225	250	280	1000
168.3	250	280	315	1000
219.1	315	355	400	1000
273.0	400	450	500	1300
323.9	450	500	560	1500
355.6	500	560	630	1600
406.4	560	630	710	1600
457.0	630	710	800	1200
508.0	710	800	900	1200

**P235GH seamless**

Steel pipe ø mm	Jacket pipe ø mm			L mm
	series 1	series 2	series 3	
26.9	90	110	125	1000
33.7	90	110	125	1000
42.4	110	125	140	1000
48.3	110	125	140	1000
60.3	125	140	160	1000
76.1	140	160	180	1000
88.9	160	180	200	1000
114.3	200	225	250	1000
139.7	225	250	280	1000
168.3	250	280	315	1000
219.1	315	355	400	1000
273.0	400	450	500	1300
323.9	450	500	560	1500

**Other dimensions**

Other dimensions and insulation series are available on inquiry.

## NT components - Steel pipe system

### Elbow 90° - AISI 316L EN 1.4404

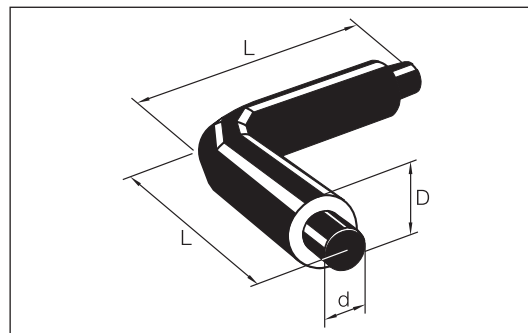
#### Description

Component No. 25000LS.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

Elbows with other angles can be supplied to order in 5° offsets.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



#### ISO dimension

Steel pipe $\varnothing$ mm	Steel pipe, wall thickness, mm	Jacket pipe $\varnothing$ mm			L mm
		series 1	series 2	series 3	
26.9	2.0	90	110	125	1000
33.7	2.0	90	110	125	1000
42.4	2.0	110	125	140	1000
48.3	2.0	110	125	140	1000
60.3	2.0	125	140	160	1000
76.1	2.0	140	160	180	1000
88.9	2.0	160	180	200	1000
114.3	2.0	200	225	250	1000
139.7	2.0	225	250	280	1000
168.3	2.0	250	280	315	1000
219.1	2.0	315	355	400	1000
273.0	2.6	400	450	500	1300
323.9	2.6	450	500	560	1500

#### Metric dimension

Steel pipe $\varnothing$ mm	Steel pipe, wall thickness, mm	Jacket pipe $\varnothing$ mm			L mm
		series 1	series 2	series 3	
104	2.0	180	200	225	1000
129	2.0	200	225	250	1000
154	2.0	250	280	315	1000
204	2.0	315	355	400	1000
254	2.0	355	400	450	1300
305	2.5	400	450	500	1500

#### Other dimensions

Other dimensions and insulation series are available on inquiry.

## NT components - Steel pipe system

### T-fitting straight - P235GH welded and seamless

**Description**

Component No. 34000LS.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

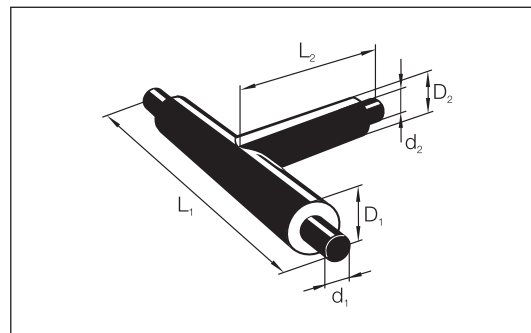
Grey fields only P235GH welded.

Nominal operating pressure:

P235GH welded: 16 bar at 120°C

P235GH seamless: 25 bar at 120°C

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



Main pipe					Branch pipe $\varnothing$ d, series 1, 2, and 3													
					26,9	33,7	42,4	48,3	60,3	76,1	88,9	114,3	139,7	168,3	219,1	273,0	323,9	
$\varnothing$ d, mm	Series			$L_1$ mm	Length $L_2$ , mm													
	1	2	3															
26.9	90	110	125	1000	500													
33.7	90	110	125	1000	500	500												
42.4	110	125	140	1000	500	500	500											
48.3	110	125	140	1000	500	500	500	500										
60.3	125	140	160	1200	600	600	600	600	600									
76.1	140	160	180	1200	600	600	600	600	600	600								
88.9	160	180	200	1200	600	600	600	600	600	600	600							
114.3	200	225	250	1200	600	600	600	600	600	600	600	600						
139.7	225	250	280	1200	600	600	600	600	600	600	600	600	600					
168.3	250	280	315	1200	600	600	600	600	600	600	600	600	600	600				
219.1	315	355	400	1500	700	700	700	700	700	700	700	700	700	700	700			
273.0	400	450	500	1500	700	700	700	700	700	700	700	700	700	700	700	700		
323.9	450	500	560	1500	800	800	800	800	800	800	800	800	800	800	800	800	800	800
355.6	500	560	630	1500	800	800	800	800	800	800	800	800	800	800	800	800	800	800
406.4	560	630	710	1600	800	800	800	800	800	800	800	800	800	800	800	800	800	800
457.0	630	710	800	2000	900	900	900	900	900	900	900	900	900	900	900	900	900	900
508.0	710	800	900	2000	900	900	900	900	900	900	900	900	900	900	900	900	900	900

**Other dimensions**

Other dimensions and insulation series are available on inquiry.

## NT components - Steel pipe system

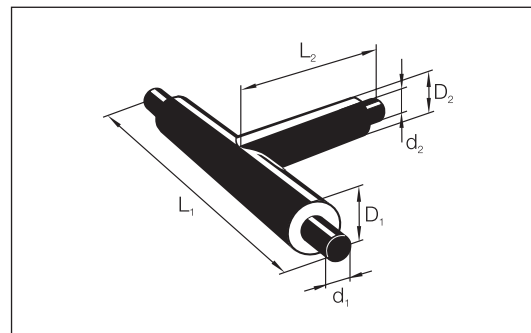
### T-fitting straight - AISI 316L EN 1.4404

**Description**

Component No. 34000LS.

Available in black or white jacket. White jacket up to dimension ø315 mm.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



**ISO dimension**

Main pipe						Branch pipe ød, series 1, 2, and 3											
						26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273.0
ød, mm	Wall th. mm	Series			L <sub>1</sub> mm	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.6	2.6
		1	2	3		Length L <sub>2</sub> , mm											
26.9	2.0	90	110	125	1000	500											
33.7	2.0	90	110	125	1000	500	500										
42.4	2.0	110	125	140	1000	500	500	500									
48.3	2.0	110	125	140	1000	500	500	500	500								
60.3	2.0	125	140	160	1200	600	600	600	600	600							
76.1	2.0	140	160	180	1200	600	600	600	600	600	600						
88.9	2.0	160	180	200	1200	600	600	600	600	600	600	600					
114.3	2.0	200	225	250	1200	600	600	600	600	600	600	600	600				
139.7	2.0	225	250	280	1200	600	600	600	600	600	600	600	600	600			
168.3	2.0	250	280	315	1200	600	600	600	600	600	600	600	600	600	600		
219.1	2.0	315	355	400	1500	700	700	700	700	700	700	700	700	700	700	700	
273.0	2.6	400	450	500	1500	700	700	700	700	700	700	700	700	700	700	700	700
323.9	2.6	450	500	560	1500	800	800	800	800	800	800	800	800	800	800	800	800

**Metric dimension**

Main pipe						Branch pipe ød, series 1, 2, and 3					
						104	129	154	204	254	305
ød, mm	Wall th. mm	Series			L <sub>1</sub> mm	2.0	2.0	2.0	2.0	2.0	2.5
		1	2	3		Length L <sub>2</sub> , mm					
104	2,0	180	200	225	1200	600					
129	2,0	200	225	250	1200	600	600				
154	2,0	250	280	315	1200	600	600	600			
204	2,0	315	355	400	1500	700	700	700	700		
254	2,0	355	400	450	1500	700	700	700	700	700	
305	2,5	400	450	500	1500	700	700	700	700	700	700

**Other dimensions**

Other dimensions and insulation series are available on inquiry.

## NT components - Steel pipe system T-fitting - P235GH welded and seamless

**Description**

Component No. 30000LS.

Available in black or white jacket. White jacket up to dimension ø315 mm.

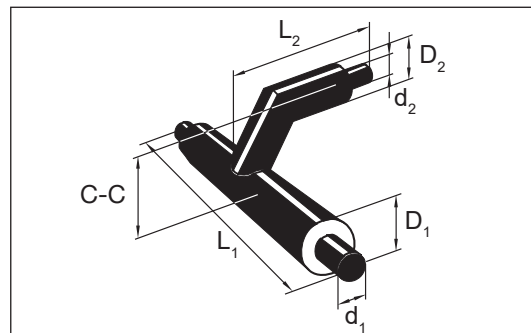
Grey fields only P235GH welded.

Nominal operating pressure:

P235GH welded: 16 bar at 120°C

P235GH seamless: 25 bar at 120°C

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



**Series 1**

Main pipe ød, mm		Branch pipe ød, series 1																
		26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273.0	323.9	355.6	406.4	457.0	508.0
ød/D, mm	L <sub>1</sub> mm	Length L <sub>2</sub> , mm C-C, mm																
		26.9/90	1000	700														
170																		
33.7/90	1000	700	700															
		170	170															
42.4/110	1000	700	700	700														
		178	178	185														
48.3/110	1000	700	700	700	700													
		178	178	185	185													
60.3/125	1200	700	700	700	700	700												
		185	185	193	193	200												
76.1/140	1200	700	700	700	700	700	700											
		195	195	203	203	210	220											
88.9/160	1200	700	700	700	700	700	700	700										
		205	205	213	213	220	230	240										
114.3/200	1200	700	700	700	700	700	800	800	800									
		228	228	235	235	243	253	263	285									
139.7/225	1200	700	700	700	700	800	800	800	800	900								
		240	240	248	248	255	265	275	298	310								
168.3/250	1200	800	800	800	800	800	800	800	900	900	900							
		255	255	263	263	270	280	290	313	325	340							
219.1/315	1500	800	800	800	800	800	800	800	900	900	900	1000						
		293	293	300	300	308	318	328	350	363	378	415						

## NT components - Steel pipe system

### T-fitting - P235GH welded and seamless

#### Series 1, continued

Main pipe ød. mm		Branch pipe ød. series 1																
		26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273.0	323.9	355.6	406.4	457.0	508.0
ød/D <sub>1</sub> mm	L <sub>1</sub> mm	Length L <sub>2</sub> , mm C-C, mm																
		273.0/400	1500	800	800	800	800	900	900	900	900	1000	1000	1100	1200			
340	340			348	348	355	365	375	398	410	425	463	510					
323.9/450	1500	900	900	900	900	900	900	900	1000	1000	1000	1100	1200	1200				
		365	365	373	373	380	390	400	423	435	450	488	535	560				
355.6/500	1500	900	900	900	900	900	900	900	1000	1000	1000	1100	1200	1200	1300			
		395	395	403	403	410	420	430	453	465	480	518	565	590	620			
406.4/560	1600	900	900	900	900	900	1000	1000	1000	1100	1100	1200	1300	1300	1300	1400		
		430	430	438	438	445	455	465	488	500	515	553	600	625	655	690		
457.0/630	2000	1000	1000	1000	1000	1000	1000	1000	1100	1100	1100	1200	1300	1300	1300	1400	1500	
		470	470	478	478	485	495	505	528	540	555	593	640	665	695	730	770	
508.0/710	2000	1000	1000	1000	1000	1000	1000	1100	1100	1100	1200	1200	1300	1300	1400	1400	1500	1500
		515	515	523	523	530	540	550	573	585	600	638	685	710	740	775	815	860

#### Series 2

Main pipe		Branch pipe ød <sub>2</sub> , series 2																
		26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273.0	323.9	355.6	406.4	457.0	508.0
ød <sub>1</sub> /D <sub>1</sub> mm	L <sub>1</sub> mm	Length L <sub>2</sub> , mm C-C, mm																
		26.9/110	1000	700														
170																		
33.7/110	1000	700	700															
		170	170															
42.4/125	1000	700	700	700														
		178	178	185														
48.3/125	1000	700	700	700	700													
		178	178	185	185													
60.3/140	1200	700	700	700	700	700												
		185	185	193	193	200												
76.1/160	1200	700	700	700	700	700	700											
		195	195	203	203	210	220											
88.9/180	1200	700	700	700	700	700	700	700										
		205	205	213	213	220	230	240										
114.3/225	1200	700	700	700	700	700	800	800	800									
		228	228	235	235	243	253	263	285									
139.7/250	1200	700	700	700	700	800	800	800	800	900								
		240	240	248	248	255	265	275	298	310								
168.3/280	1200	800	800	800	800	800	800	800	900	900	900							
		255	255	263	263	270	280	290	313	325	340							

## NT components - Steel pipe system

### T-fitting - P235GH welded and seamless

#### Series 2, continued

Main pipe		Branch pipe $\phi d_2$ , series 2																
		26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273.0	323.9	355.6	406.4	457.0	508.0
$\phi d_1/D_1$ mm	$L_1$ mm	Length $L_2$ , mm C-C, mm																
		219.1/355	1500	800	800	800	800	800	800	800	800	900	900	900	1000			
293	293			300	300	308	318	328	350	363	378	415						
273.0/450	1500	800	800	800	800	900	900	900	900	1000	1000	1100	1200					
		340	340	348	348	355	365	375	398	410	425	463	510					
323.9/500	1500	900	900	900	900	900	900	900	1000	1000	1000	1100	1200	1200				
		365	365	373	373	380	390	400	423	435	450	488	535	560				
355.6/560	1500	900	900	900	900	900	900	900	1000	1000	1000	1100	1200	1200	1300			
		395	395	403	403	410	420	430	453	465	480	518	565	590	620			
406.4/630	1600	900	900	900	900	900	1000	1000	1000	1100	1100	1200	1300	1300	1300	1400		
		430	430	438	438	445	455	465	488	500	515	553	600	625	655	690		
457.0/710	2000	1000	1000	1000	1000	1000	1000	1000	1100	1100	1100	1200	1300	1300	1300	1400	1500	
		470	470	478	478	485	495	505	528	540	555	593	640	665	695	730	770	
508.0/800	2000	1000	1000	1000	1000	1000	1000	1100	1100	1100	1200	1200	1300	1300	1400	1400	1500	1500
		515	515	523	523	530	540	550	573	585	600	638	685	710	740	775	815	860

#### Series 3

Main pipe		Branch pipe $\phi d_2$ , series 3																
		26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273.0	323.9	355.6	406.4	457.0	508.0
$\phi d_1/D_1$ mm	$L_1$ mm	Length $L_2$ , mm C-C, mm																
		26.9/125	1000	700														
190																		
33.7/125	1000	700	700															
		190	190															
42.4/140	1000	700	700	700														
		198	198	205														
48.3/140	1000	700	700	700	700													
		198	198	205	205													
60.3/160	1200	700	700	700	700	700												
		208	208	215	215	225												
76.1/180	1200	700	700	700	700	700	700											
		218	218	225	225	235	245											
88.9/200	1200	700	700	700	700	700	800	800										
		228	228	235	235	245	255	265										
114.3/250	1200	800	800	800	800	800	800	800	900									
		253	253	260	260	270	280	290	315									
139.7/280	1200	800	800	800	800	800	800	800	900	900								
		268	268	275	275	285	295	305	330	345								
168.3/315	1200	800	800	800	800	800	800	800	900	900	900							
		285	285	293	293	303	313	323	348	363	380							

## NT components - Steel pipe system

### T-fitting - P235GH welded and seamless

#### Series 3, continued

Main pipe		Branch pipe $\phi d_2$ , series 3																
		26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273.0	323.9	355.6	406.4	457.0	508.0
$\phi d_1/D_1$ mm	L, mm	Length $L_2$ , mm C-C, mm																
		219.1/400	1500	800	800	800	800	800	900	900	900	1000	1000	1100				
328	328			335	335	345	355	365	390	405	423	465						
273.0/500	1500	900	900	900	900	900	900	900	1000	1000	1000	1100	1200					
		378	378	385	385	395	405	415	440	455	473	515	565					
323.9/560	1500	900	900	900	900	900	900	900	1000	1000	1100	1200	1300	1300				
		408	408	415	415	425	435	445	470	485	503	545	595	625				
355.6/630	1500	900	900	1000	1000	1000	1000	1000	1100	1100	1100	1200	1300	1300	1400			
		443	443	450	450	460	470	480	505	520	538	570	630	660	695			
406.4/710	1600	1000	1000	1000	1000	1000	1000	1000	1100	1100	1100	1200	1300	1300	1400	1400		
		483	483	490	490	500	510	520	545	560	578	620	670	700	735	775		
457.0/800	2000	1000	1000	1000	1000	1000	1100	1100	1100	1200	1200	1300	1400	1400	1400	1500	1500	
		528	528	535	535	545	555	565	590	605	623	665	715	745	780	820	865	
508.0/900	2000	1100	1100	1100	1100	1100	1100	1100	1200	1200	1200	1300	1400	1400	1500	1500	1600	1700
		578	578	585	585	595	605	615	640	655	673	715	765	795	830	870	915	965

#### Other dimensions

Other dimensions and insulation series are available on inquiry.



## NT components - Steel pipe system

### Anchor - P235GH welded and seamless

**Description**

Component No. 40000LS.

An anchor consists of a steel anchor plate.

To avoid an excessive heat transfer from the anchor plate to the PE jacket, a stainless plate wrap is welded onto the anchor plate.

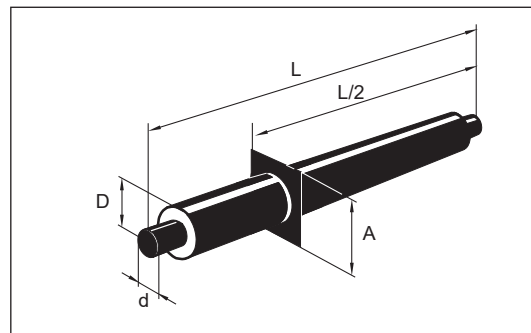
The component must not be shortened.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

Nominal operating pressure: 25 bar at 120°C.

Any surveillance wires are transferred through electrical insulation in the anchor plate.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



Steel pipe d mm	Series 1			Series 2			Series 3		
	Jacket D mm	L mm	A mm	Jacket D mm	L mm	A mm	Jacket D mm	L mm	A mm
26.9	90	2000	140	110	2000	160	125	2000	160
33.7	90	2000	140	110	2000	160	125	2000	165
42.4	110	2000	170	125	2000	180	140	2000	190
48.3	110	2000	170	125	2000	180	140	2000	190
60.3	125	2000	200	140	2000	200	160	2000	220
76.1	140	2000	220	160	2000	225	180	2000	250
88.9	160	2000	235	180	2000	260	200	2000	275
114.3	200	2000	300	225	2000	310	250	2000	340
139.7	225	2000	320	250	2000	350	280	2000	370
168.3	250	2000	370	280	2000	390	315	2000	425
219.1	315	2000	450	355	2000	480	400	2000	525
273	400	2500	550	450	2500	590	500	2500	630
323.9	450	2500	600	500	2500	650	560	2500	710
355.6	500	2500	650	560	2500	710	630	2500	780
406.4	560	2500	730	630	2500	800	710	2500	880
457	630	3000	800	710	3000	880	800	3000	980
508	710	3000	880	800	3000	980	900	3000	1100

**Other dimensions**

Other dimensions and insulation series are available on inquiry.





## NT components - Plastic pipe system

### Pipe - PE100

#### PN10 SDR17, series 3

Carrier pipe diameter d, mm	32	40	50	63	75	90	110	125	140
Carrier pipe wall thick., mm	2,0	2,4	3,0	3,8	4,5	5,4	6,6	7,4	8,3
Jacket pipe diameter D, mm	125	140	140	160	180	200	225	250	280
Weight, kg/m	1,9	1,9	2,6	3,6	4,4	5,5	8,6	9,3	11,6
Liquid content, l/m	0,5	0,8	1,3	2,1	3,0	4,3	6,4	8,2	70,3
Length L, m	6	6	6	6/12	6/12	6/12	6/12	6/12	6/12

Carrier pipe diameter d, mm	160	180	200	225	250	280	315
Carrier pipe wall thick., mm	9,5	10,7	11,9	13,4	14,8	16,6	18,7
Jacket pipe diameter D, mm	315	355	355	400	450	500	560
Weight, kg/m	14,5	18,9	20,3	25,7	37,0	39,9	50,3
Liquid content, l/m	13,4	17,0	21,0	26,6	32,9	41,3	52,2
Length L, m	6/12	6/12	6/12	6/12	6/12	6/12	6/12

#### PN16 SDR11, series 1

Carrier pipe diameter d, mm	32	40	50	63	75	90	110	125	140	160	180	200	225	250	280	315
Carrier pipe wall thick., mm	3	3,7	4,6	5,8	6,8	8,2	10	11,4	12,7	14,6	16,4	18,2	20,5	22,7	25,4	28,6
Jacket pipe diameter D, mm	90	110	110	125	140	160	180	200	225	250	280	280	315	355	400	450
Weight, kg/m	1,4	1,5	2,1	2,7	3,4	4,4	5,8	7,2	8,9	11,2	14	15,4	19,6	24,4	30,6	38,6
Liquid content, l/m	0,5	0,8	1,3	2,1	3	4,3	6,4	8,2	10,3	13,4	17	21	26,6	32,9	41,3	52,2
Length L, m	6	6	6	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12

#### PN16 SDR11, series 2

Carrier pipe diameter d, mm	32	40	50	63	75	90	110	125	140	160	180	200	225	250	280	315
Carrier pipe wall thick., mm	3	3,7	4,6	5,8	6,8	8,2	10	11,4	12,7	14,6	16,4	18,2	20,5	22,7	25,4	28,6
Jacket pipe diameter D, mm	110	125	125	140	160	180	200	225	250	280	315	315	355	400	450	500
Weight, kg/m	1,8	2	2,5	3,1	4	5	6,5	8,2	10	12,8	16,2	17,6	22,2	27,7	34,7	43
Liquid content, l/m	0,5	0,8	1,3	2,1	3	4,3	6,4	8,2	10,3	13,4	17	21	26,6	32,9	41,3	52,2
Length L, m	6	6	6	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12

#### PN16 SDR11, series 3

Carrier pipe diameter d, mm	32	40	50	63	75	90	110	125	140	160	180	200	225	250	280	315
Carrier pipe wall thick., mm	3	3,7	4,6	5,8	6,8	8,2	10	11,4	12,7	14,6	16,4	18,2	20,5	22,7	25,4	28,6
Jacket pipe diameter D, mm	125	140	140	160	180	200	225	250	280	315	355	355	400	450	500	560
Weight, kg/m	2,2	2,3	2,8	3,7	4,5	5,8	7,5	9,3	11,6	14,9	18,8	20,2	25,5	31,7	39,2	48,9
Liquid content, l/m	0,5	0,8	1,3	2,1	3	4,3	6,4	8,2	10,3	13,4	17	21	26,6	32,9	41,3	52,2
Length L, m	6	6	6	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12	6/12

**Other dimensions**    Other dimensions, insulation series and pressure classes are available on inquiry.

## NT components - Plastic pipe system

### Elbow 90° - PE100

#### Description

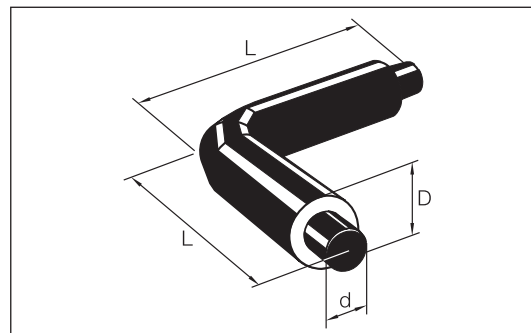
Component No. 25000LS.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

Elbows with other angles are supplied to order in 5% offsets.

Available in PN10 SDR17 and PN16 SDR11.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



Carrier pipe $\varnothing$ mm	Jacket pipe $\varnothing$ mm			L mm
	series 1	series2	series 3	
32	90	110	125	1000
40	110	125	140	1000
50	110	125	140	1000
63	125	140	160	1000
75	140	160	180	1000
90	160	180	200	1000
110	200	225	250	1000
125	200	225	250	1000
140	225	250	280	1000
160	250	280	315	1000
180	280	315	355	1000
200	280	315	355	1000
225	315	355	400	1000
250	355	400	450	1000
280	400	450	500	1300
315	450	500	560	1500

#### Other dimensions

Other dimensions, insulation series, and pressure classes are available on inquiry.

## NT components - Plastic pipe system

### T-fitting straight - PE100

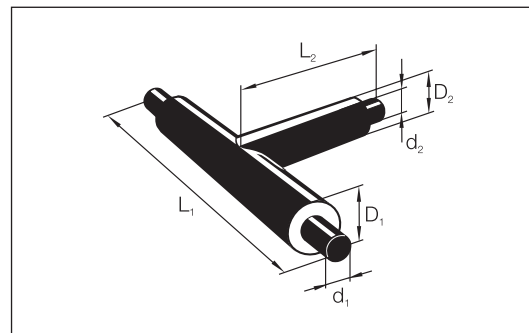
**Description**

Component No. 34000LS.

Available in black or white jacket. White jacket up to dimension ø315 mm.

Available in PN10 SDR17 and PN16 SDR11.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



Main pipe					Branch pipe ød, series 1, 2 and 3													
					90	110	125	140	160	180	200	225	250	280	315			
ød mm	Series			L <sub>1</sub> mm	Length L <sub>2</sub> , mm													
	1	2	3															
110	200	225	250	1200	600	600												
125	200	225	250	1200	600	600	600											
140	225	250	280	1200	600	600	600	600										
160	250	280	315	1200	600	600	600	600	600									
180	280	315	355	1200	600	600	600	600	600	600								
200	280	315	355	1500		700	700	700	700	700	700							
225	315	355	400	1500					700	700	700	700						
250	355	400	450	1500					700	700	700	700	700					
280	400	450	500	1500						700	700	700	700	700				
315	450	500	560	1500								800	800	800	800			

**Other dimensions**

Other dimensions, insulation series and pressure classes are available on inquiry.

## NT components - Joints

### FXJoint, black

#### Application

Shrink joint in UV-stabilized, cross-linked PE (PEX) material with insulation shells made of PUR or PIR.

The FXJoint is single sealed and can be used for angles up to max. 5°.

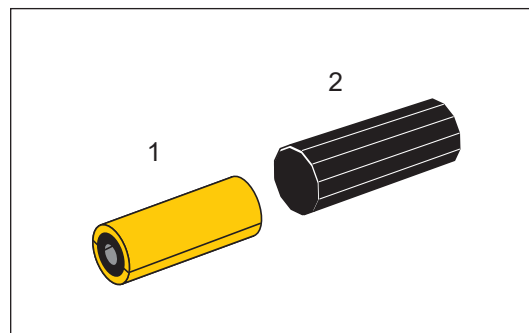
The FXJoint is used for freely suspended systems.

#### Description

Component No. 5057C.

The FXJoint consists of:

1. Insulation shells
2. Shrink sleeve with integrated mastic



Jacket pipe diameter D, mm	90	110	125	140	160	180	200	225	250	280	315
Shrink sleeve size	77-125	77-125	77-125	125-180	125-180	125-180	180-225	180-225	250-315	250-315	250-315
Shrink sleeve length, mm	555	555	565	565	565	565	565	565	565	565	565

Delivered with insulation shells for series 1, 2 or 3.

The shrink sleeve is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

## NT components - Joints

### FXCJoint, black

**Application** Shrink joint in UV-stabilized, cross-linked PE (PEX) material with insulation shells made of PUR or PIR.

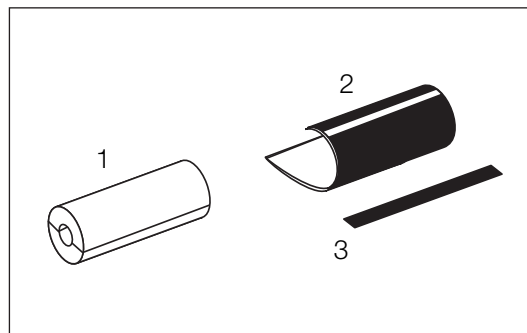
The joint is single sealed and can be used for i.a. repairs.

The FXCJoint is used for freely suspended systems.

**Description** Component No. 5058.

The FXCJoint consists of:

1. Insulation shells
2. Shrink wrap with mastic
3. Closure patch



<b>Jacket pipe diameter D, mm</b>	90	110	125	140	160	180	200	225	250	280	315
<b>Shrink wrap length, mm</b>	555	555	565	565	565	565	565	565	565	565	565

Delivered with insulation shells for series 1, 2 or 3.

The shrink sleeve is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.



## NT components - Joints

### BXjoint, black

#### Application

Shrink joint in UV-stabilized, cross-linked PE (PEX) material with insulation shells made of PUR or PIR.

The joint is double sealed and can be used for angles up to max. 5°.

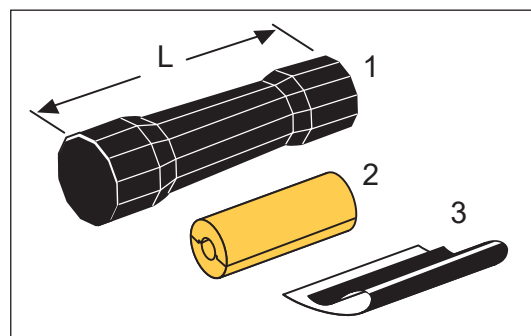
The BXJoint is used for directly buried as well as freely suspended systems.

#### Description

Component No. 5022.

The BXJoint consists of:

1. PEX shrink sleeve with integrated hotmelt and mastic
2. Insulation shells
3. Shrink foil with mastic



Jacket pipe dia. D, mm	90	110	125	140	160	200	225	250	280	315	355	400	450	500	560	630
Shrink sleeve length, mm	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780

Delivered with insulation shells for series 1, 2 or 3.

The shrink sleeve is wrapped in a solid white PE foil on delivery.

The shrink sleeve must be stored upright.

Max. temperature during transport and storage is 40°C.

## NT components - Joints

### EWJoint, black

#### Application

Weld joint in PE for foaming.

The weld joint is welded together with the jacket pipe by means of a loose welding strip between the sleeve and the jacket.

Joints in standard lengths > ø280 mm can be extrusion welded.

The EWJoint is used for directly buried as well as freely suspended systems.

#### Description

Component No. 5027.

The EWJoint consists of:

1. Shrink sleeve
2. Weld strip
3. Venting plugs
4. Weld plugs
5. Staples to fix weld strips

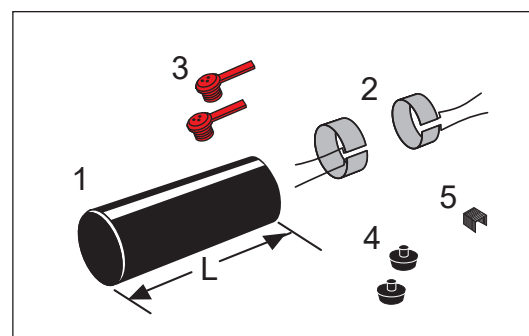
The sleeves are delivered wrapped in white PE foil.

The accessories 2-4 are delivered separately in a plastic bucket.

Staples (5) are ordered separately

Store the sleeve vertically.

Max. temperature during transportation and storage: 40°C.



<b>Jacket pipe dia. D, mm</b>	90	110	125	140	160	180	200	225	250	280
<b>Shrink wrap length, mm</b>	700	700	700	700	700	700	700	700	700	700

<b>Jacket pipe dia. D, mm</b>	315	355	400	450	500	560	630	710	800	900
<b>Shrink wrap length, mm</b>	700	700	700	700	700	700	750	750	750	800

#### Welding strips

Component No. 5556.

Welding strips and welding plugs for 1 EWJoint are delivered together in a bucket.

#### Accessories

Staples for fixing welding strips to be ordered, component No. 9050

To be foamed with foam packs (PUR), component No. 0700.

When ordering state insulation series, and that delivery must include foam packs.

## NT components - Joints

### EWJoint with insulation shells, black

#### Application

Weld joint in PE with insulation shells of PUR or PIR.

The joint is welded together with the jacket pipe by means of a loose welding strip between the joint and the jacket.

Joints in standard lengths >  $\varnothing 280$  mm can be extrusion welded.

The EWJoint is used for directly buried as well as freely suspended systems..

#### Description

Component No. 5027.

The EWJoint consists of:

1. Weld joint
2. Welding strips
3. Staples for fixing welding strips
4. Insulation shell

The sleeve is wrapped in a white PE foil at delivery.

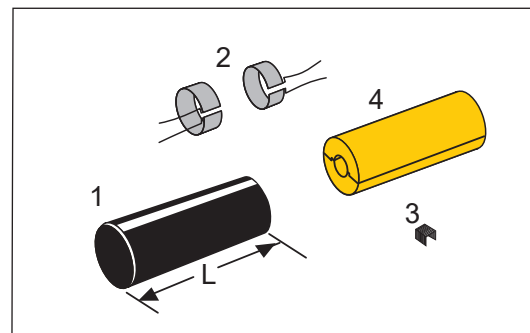
Welding strips are delivered separately in a plastic bucket.

Staples (3) and insulation shells (4) are ordered separately.

Delivered with insulation shells for series 1, 2 or 3. Other series on enquiry.

The shrink sleeves must be stored upright.

Max. temperature during transport and storage is 40°C.



<b>Jacket pipe dia. D, mm</b>	90	110	125	140	160	180	200	225	250	280
<b>Shrink wrap length, mm</b>	700	700	700	700	700	700	700	700	700	700

<b>Jacket pipe dia. D, mm</b>	315	355	400	450	500	560	630	710	800	900
<b>Shrink wrap length, mm</b>	700	700	700	700	700	700	750	750	750	800

#### Welding strips

Component No. 5556.

Welding strips for 1 EWJoint are delivered together in a bucket.

#### Accessories

Staples for fixing welding strips to be ordered, component No. 9050.

Insulation shells in PIR to be ordered, component No. 5314.

Insulation shells in PUR to be ordered, component No. 5300.

## NT components - Joints

### C2LJoint, black

**Application** PE shrink joint with insulation shells. Prior to installation the shrink sleeve is cut longitudinally.  
The joint is double sealed and i.a. used for repairs  
The C2LJoint is used for directly buried as well as freely suspended systems.

#### Description

Component No. 5035.

The C2LJoint consists of:

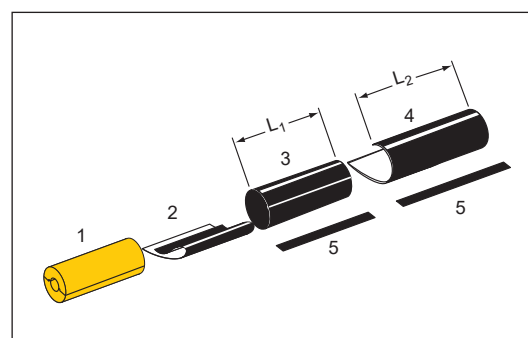
1. Insulation shell
2. Shrink film with mastic
3. Shrink sleeve
4. Shrink wrap with mastic
5. Closure patches

The sleeve is wrapped in a white PE foil on delivery.

Delivered with insulation shells for series 1, 2 or 3.. Other series on enquiry.

The shrink sleeve must be stored upright.

Max. temperature during transport and storage is 40°C.



Jacket pipe ø out. mm	L <sub>1</sub> mm	L <sub>2</sub> mm
90	670	900
110	670	900
125	670	900
140	670	900
160	670	900
180	670	900
200	670	900
225	670	900
250	670	900
280	670	900
315	670	900
355	670	900
400	670	900
450	670	900
500	670	900
560	670	900
630	670	900

## NT components - Joints

### LMJoint, white

#### Application

Shrink joint in UV-stabilized, cross-linked PE (PEX) material with insulation shells made of PUR or PIR.

The joint is single sealed and can be used for angles up to max. 5°.

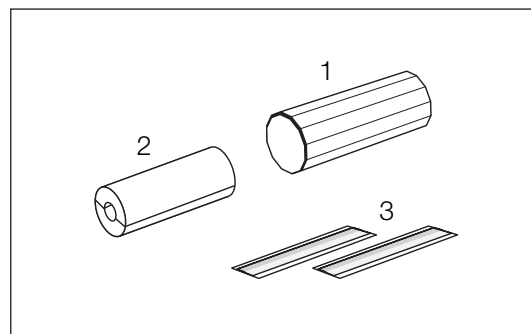
The LMJoint is used indoor for freely suspended systems.

#### Description

Component No. 53501C.

LMJoint consists off:

1. Shrink sleeve
2. Insulation shells
3. Mastic



<b>Jacket pipe dia. D, mm</b>	90	110	125	140	160	180	200	225	250	280	315
<b>Shrink sleeve length, mm</b>	535	535	535	535	535	535	575	575	575	575	575

Delivered with insulation shells for series 1, 2 or 3.

The shrink sleeve is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

## NT components - Joints

### LMCJoint, white

#### Application

Shrink joint in non-UV-stabilized, cross-linked PE (PEX) material with insulation shells made of PUR or PIR.

The joint is single sealed and can be used for repairs.

Retaining tool is required in order to carry out installation - to be ordered separately.

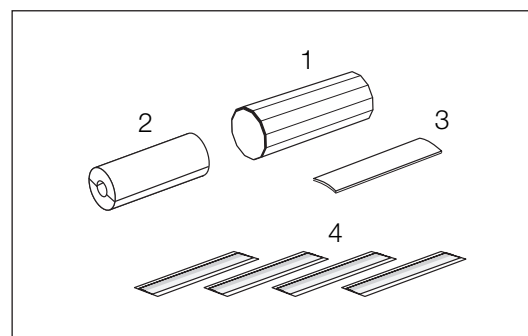
The LMCJoint is used indoor for freely suspended systems.

#### Description

Component No. 53700C.

LMCJoint consists of:

1. Shrink sleeve
2. Insulation shells
3. Profile plate
4. Mastic



<b>Jacket pipe dia. D, mm</b>	90	110	125	140	160	180	200	225	250	280	315
<b>Shrink sleeve length, mm</b>	535	535	535	535	535	535	575	575	575	575	575

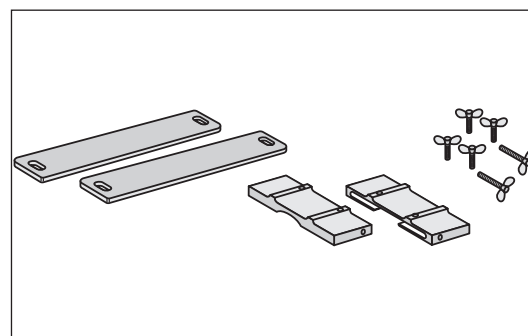
Delivered with insulation shells for series 1, 2 or 3.

The shrink sleeve is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

#### Retaining tool for installation

Product No. 9000 0000 027 003.



## NT components - Joints

### BMJoint, black and white

#### Application

Bendable shrink sleeve in cross-linked PE (PEX) material with insulation shells made of PUR or PIR.

The joint is used for directional changes from 5 - 90°, and is single sealed.

The white BMJoint is not UV-stabilized and is only used indoor for freely suspended systems.

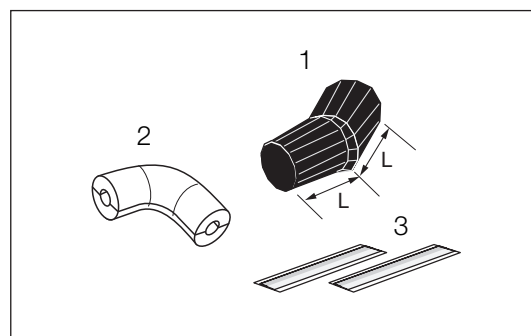
The black BMJoint is UV-stabilized and used for freely suspended systems (the joint is not suitable for directly buried systems).

#### Description

Component No. 54000LC.

BMJoint consists of:

1. Shrink sleeve
2. Insulation shells
3. Mastic



<b>Jacket diameter D, mm</b>	90	110	125	140	160	180	200	225	250	280	315
<b>Length L, mm</b>	260	430	430	495	495	495	655	655	695	695	695

Delivered with insulation shells for series 1, 2 or 3.

The joint is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

Insulation shells are stocked for the bends, appearing from the following pages.

## NT components - Joints

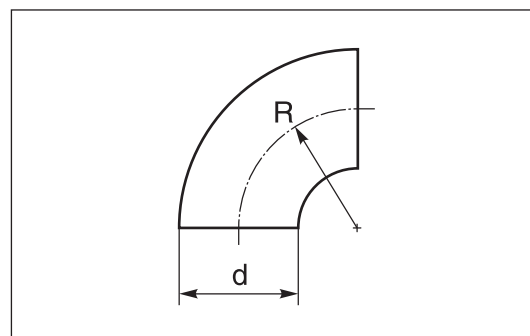
### BMJoint, insulation shells

**General**

Weld and press elbows are to be ordered from an external supplier. The insulation shells are as a standard delivered in a 90° angle for below dimensions and bend types.

d = Diameter, mm  
 R = Radius, mm  
 Z = Z-measure, mm

**Material qualities**



P235GH EN 10253-2

<b>d</b>	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1
<b>R</b>	38	38	38	47.5	57	76	95	114	152	190	229	305

AISI 304L / 316L EN 10253-3/4 - ISO

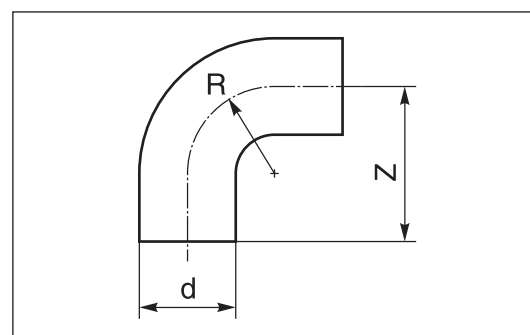
<b>d</b>	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1
<b>R</b>	38	38	38	47.5	57	76	95	114	152	190	229	305

AISI 304L / 316L EN 10253-3/4 - metric

<b>d</b>	104	129	154	204
<b>R</b>	150	188	225	300

AISI 304L / 316 L (diary pipe)

<b>d</b>	25	38	51	63.5	76	101.6
<b>R</b>	25	38	51	63.5	76	150
<b>Z</b>	55	70	82	105	110	150

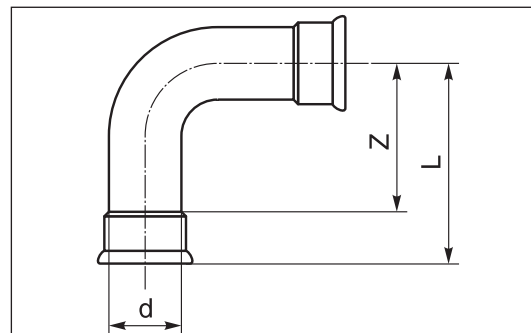




## NT components - Joints

### BMJoint, insulation shells

Mapress

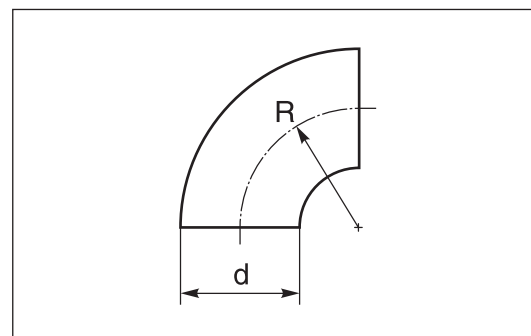


<b>d</b>	15	18	22	28	35	42	54	76.1	88.9	108
<b>Z</b>	29	33	40	49	96	136	165	182	217	266
<b>L</b>	49	53	61	72	122	166	200	235	277	341

PE pressure pipe  
elbow  
PN10 and PN16

<b>d</b>	63	75	90	110	125	140	160	180	200	225
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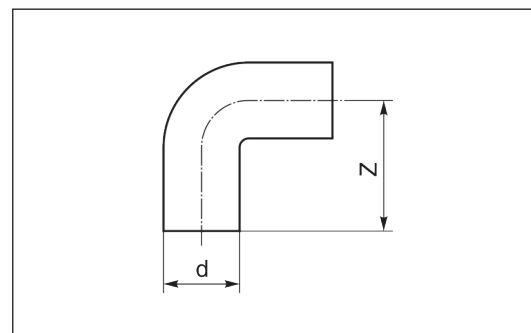
Radius  $R = d$



PE pressure pipe  
angle  
PN10 and PN16

<b>d</b>	25	32	40	50
<b>Z</b>	65	65	74	86

$d$  = Weld elbow diameter, mm  
 $Z$  = Z-measure, mm



Other dimensions  
and radii

Insulation shells for other bend types, dimensions, angles, and radii are available on inquiry.

## NT components - Joints

### TMCJoint, white

#### Application

T-shrink joint in non-UV-stabilized, cross-linked PE (PEX) material with insulation shells made of PUR or PIR.

The joint is single sealed and can be used to branch perpendicular to the main pipe.

Retaining tool is required in order to carry out installation - to be ordered separately.

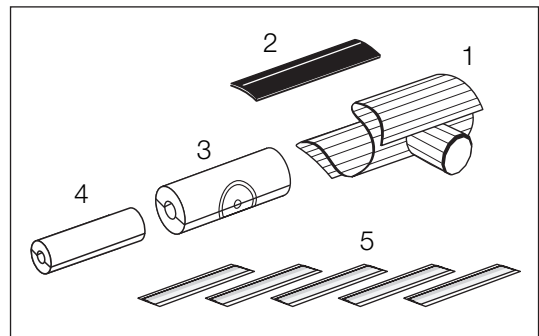
The TMCJoint is used indoor for freely suspended systems.

#### Description

Component No. 52500L.

TMCJoint consists off:

1. Shrink sleeve
2. Profile plate
3. Insulation shells for main pipe
4. Insulation shells for branch
5. Mastic



Delivered with insulation shells for series 1, 2 or 3.

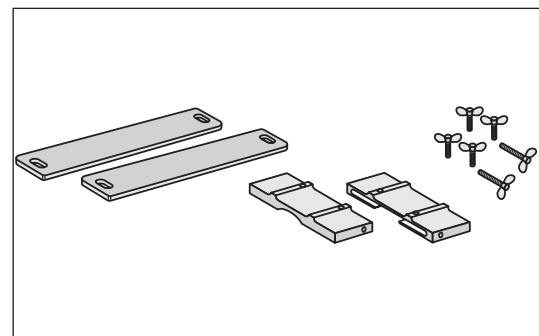
The joint is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

	Jacket diameter base pipe, mm						
	90	110	125	140	160	180	200
Branch							
90	X	X	X	X	X	X	X
110	X	X	X	X	X	X	X
125		X	X	X	X	X	X
140			X	X	X	X	X
160				X	X	X	X
180					X	X	X

#### Retaining tool for installation

Product No. 9000 0000 027 003.



**NT components - Joints**  
**TMC-CJoint, black**

**Application**

T-shrink joint in UV-stabilized, cross-linked PE (PEX) material with insulation shells made of PUR or PIR.

The joint is single sealed and can be used to branch perpendicular to the main pipe.

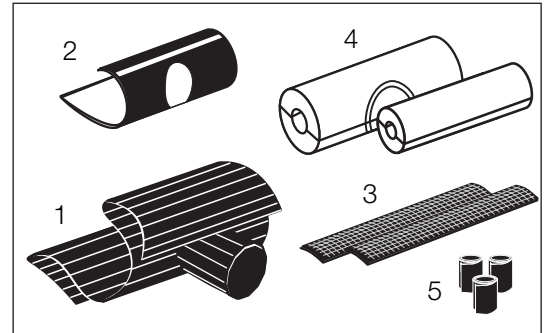
The TMC-CJoint is used for freely suspended systems.

**Description**

Component No. 52600L.

TMC-CJoint consists of:

1. Shrink sleeve
2. Shrink wrap
3. Closure patch
4. Insulation shells for main pipe and branch
5. Mastic



Delivered with insulation shells for series 1, 2 or 3.

The joint is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

Branch	Jacket diameter base pipe, mm						
	90	110	125	140	160	180	200
90	X	X	X	X	X	X	X
110	X	X	X	X	X	X	X
125		X	X	X	X	X	X
140			X	X	X	X	X
160				X	X	X	X
180					X	X	X

## NT components - Joints

### Reduction joint

#### Reduccion joints

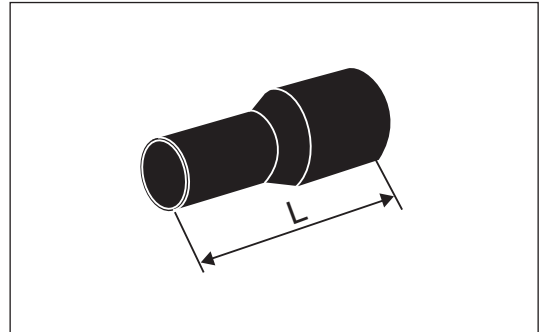
LOGSTOR offers various reduction joints i.a. as weld joints or shrink joints.

If other lengths are needed, please contact LOGSTOR.

#### EWJoint

Reduction with an EW-reduction joint is possible with one or more dimensional offsets.

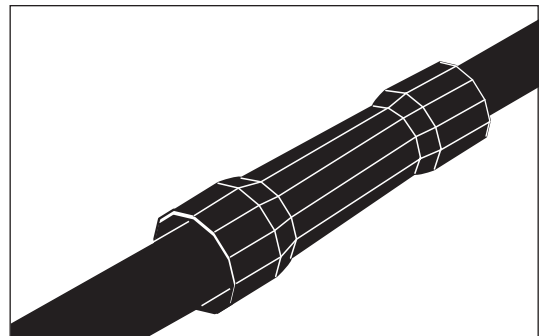
Component No. 5028



#### BXJoint

Reduction with a standard BXJoint is possible with 1 and 2 dimensional offsets in dimensions  $\varnothing 90-315$  mm and with 1 dimensional offset in dimensions  $\varnothing 355-630$  mm.

Component No. 5022.



## NT components - Joints

### Reduction joint - Weld joint

**Application**

Reduction with the weld joint EWJoint can be carried out in the dimensions, stated below.

Weld joints must be carried out by fitters, certified by LOGSTOR.

For EWJoints the total non-insulated pipe length, inclusive weld reduction, is 2 x free pipe end + length of the weld reduction.

Where 2 or 3 dimensional offsets are possible, the design instructions must be complied with..

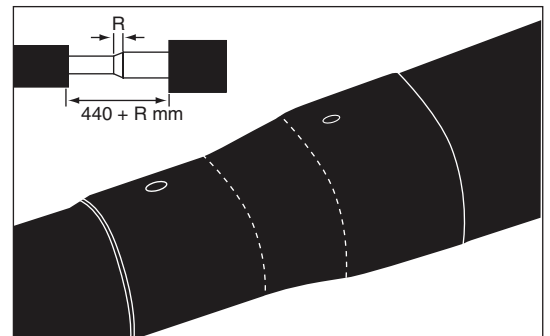
**EWJoint**

Shrink sleeve reduction with EWJoint, Component No. 5028.

Accessories set:

EW welding strips and plugs-, Component No. 5556.

Order 1 set for each dimension. The two sets cover two reductions.



Dimensional offsets and lengths:

Also available with 2 or 3 dimensional offsets..

From ø mm	To ø mm	Joint length mm
110	90	800
125	110	800
140	125	800
160	140	800
180	160	800
200	180	900
225	200	900
250	225	900
280	250	900
315	280	900
355	315	900
400	355	1000
450	400	1000
500	450	1000
560	500	1100
630	560	1100
710	630	1200
800	710	1200
900	800	1350
1000	900	1350

## NT components - Joints

### Reduction joint - Shrink joint

#### Application

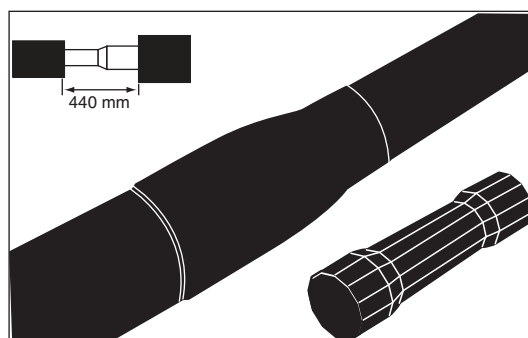
Reductions with the the shrink joints BX and LM can be carried out udføres mellem dimensionerne angivet nedenfor i 1 eller 2 dimensionsspring.

In connection with 2 dimensional offsets, the design instructions must be complied with.

#### Reduction with-BXJoint

Reduction with BXJoint with insulation half shells in PUR or PIR.

Component No. 5022.



The joint is applicable for both 1 and 2 dimensional offsets.

2 offsets up to  $\varnothing$  315/280 mm.

1 offset from  $\varnothing$  355/315 mm.

From $\varnothing$ mm	To $\varnothing$ mm	Joint length mm
110	77	780
125	90	780
140	110	780
160	125	780
180	140	780
200	160	780
225	180	780
250	200	780
280	225	780
315	250	780
355	315	780
400	355	780
450	400	780
500	450	780
560	500	780
630	560	780

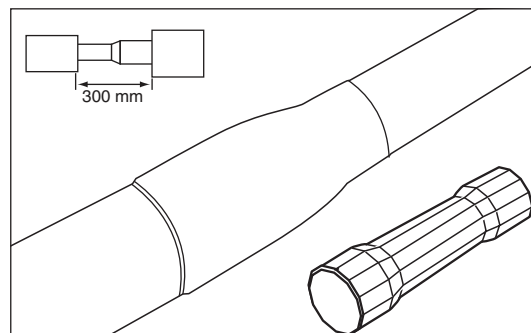
## NT components - Joints

### Reduction joints - Shrink joint

#### Reduction with LMJoint

Reduction with LMJoint with insulation half shells in PUR or PIR.

Component No. 5350.



The joint is applicable for the following dimensional offsets:

Joint size ø mm	From ø mm	To ø mm	Joint length mm
125-90	110	77	535
180-140	125	90	535
250-200	140	110	575
315-280	160	125	575

## NT components - Joints EC end cap, white

**Application**

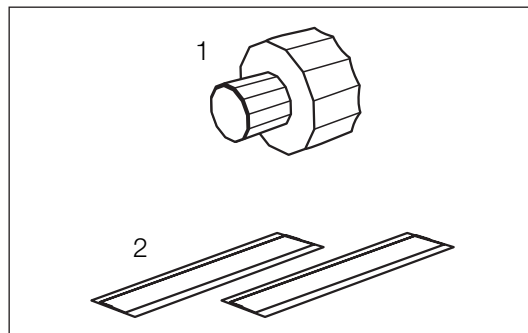
End cap in non-UV-stabilized, cross-linked PE (PEX) material.  
 Used as a termination to prevent moisture ingress in the insulation.  
 The end cap is applicable in carrier pipe temperatures ranging from -30° to +70° C.  
 The EC end cap is used indoor for freely suspended systems..

**Description**

Component No. 55000L.

EC end cap consists off:

1. End cap
2. Mastic



From the table the type designation of the end caps per dimension appears.

Jacket diameter	Carrier pipe diameter d, mm															
	21.3	25	26.9	33.7	38	42.4	48.3	51	54	60.3	63.5	70	76.1	84	88.9	101.6
90	40A	40A	40A	40A	40A	40A										
110	40A	40A	40A	40A	40A	40A	170A	170A	170A	170A	170A					
125						170A	170A	170A	170A	170A	170A	170B	170B			
140						170B	170B	170B	170B	170B	170B	170B	170B	170B	170B	
160						170B	170B	170B	170B	170B	170B	170B	170B	170B	170B	230A
180													230A	230A	230A	230A
200													230A	230A	230A	230A
225													230C	230C	230C	230C

Jacket diameter	Carrier pipe diameter d, mm									
	104	114,3	129	133	139,7	154	168,3	193,7	204	219
180	230A	230C								
200	230A	230C	230C							
225	230C	230C	230C	230C	230C					
250	350B	350B	350B	350B	350B	350B	350B	350B		
280	350C	350C	350B	350B	350B	350B	350B	350C	350C	350C
315	350C	350C	350C	350C	350C	350C	350C	350C	350C	350C

The end cap is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.



## NT components - Joints

### DHEC end cap, black

#### Application

End cap in UV-stabilized, cross-linked PE (PEX) material.

Used to seal the pipe to prevent moisture ingress in the insulation.

The end cap is applicable in carrier pipe temperatures ranging from -20° to +120° C.

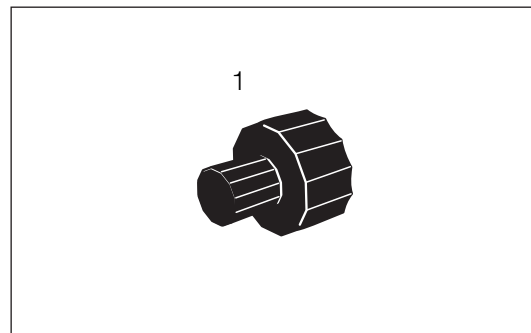
The DHEC end cap is used for directly buried systems and freely suspended systems.

#### Description

Component No. 5600.

DHEC end cap consists of:

1. End cap with embedded mastic



The end cap is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

Steel pipe ø out. mm	Jacket pipe ø mm	DHEC No.
26.9 - 33.7	90	2100
26.9 - 42.4	110 - 125	2200
42.4	140	2300
48.3	110 - 140	2300
60.3 - 76.1	125 - 140	2400
60.3 - 88.9	160 - 180	2500
88.9 - 114.3	200	2600
114.3 - 139.7	225	2630
139.7 - 168.3	250	2700
168.3	280	2700
219.1	315	2800
219.1 - 273	355 - 400	2900
323.9	450	3000

## NT components - Joints

### Split end cap, black

#### Application

Open end cap in UV-stabilized, cross-linked PE (PEX) material with a zipper closing function and embedded mastic.

Used to seal the pipe to prevent moisture ingress in the insulation. Usually, for repair or subsequent installation. For jacket pipe dimension  $> \varnothing 450$  mm it is however used as a standard end cap as well as for repairs.

The end cap is applicable for carrier pipe temperatures ranging from  $-20$  to  $+120^{\circ}\text{C}$ .

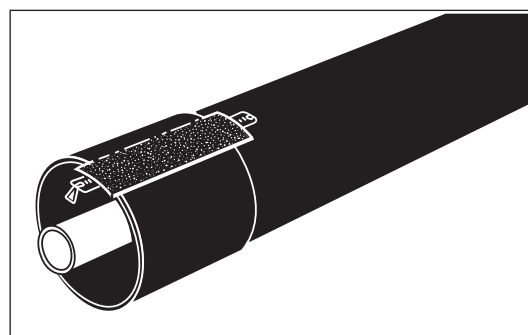
Split end caps are used for freely suspended systems and directly buried systems.

#### Description

Component No. 5601.

The end cap is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is  $40^{\circ}\text{C}$ .



Steel pipe $\varnothing$ udv. mm	Jacket pipe $\varnothing$ mm	CCS-DHEC nr.
26.9 - 42.4	90 - 110	110 / 26
48.3 - 60.3	110 - 125	128 / 48
60.3 - 88.9	140 - 160	163 / 60
76.1 - 88.9	180	186 / 70
76.1 - 114.3	200	200 / 76
88.9 - 114.3	225	225 / 89
114.3 - 139.7	225 - 250	250 / 108
139.7 - 168.3	250 - 280	280 / 133
168.3 - 273.0	280 - 315	315 / 168
219.1 - 355.6	355 - 400	400 / 219
273.0 - 508.0	450 - 560	560 / 273
355.6 - 610.0	630 - 710	710 / 355
457.0 - 813.0	800 - 900	900 / 457
610.0 - 1016.0	1000 - 1200	1200 / 610

## NT components - Joints

### HEC end cap, white

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#### Application

End cap in non-UV-stabilized, cross-linked PE (PEX) material with stainless steel reduction and mineral wool shells.

Used to seal the pipe to prevent moisture ingress in the insulation.

The HEC end cap is applicable for carrier pipe temperatures ranging from  $-200^{\circ}$  to  $+250^{\circ}$  C. HEC must always be applied at temperatures below  $-30^{\circ}$  C or above  $+70^{\circ}$  C.

The HEC end cap is used indoor for freely suspended systems

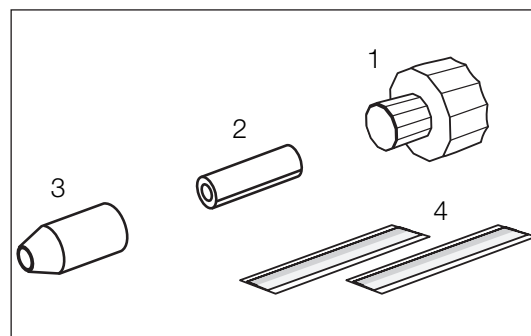
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#### Description

Component No. 55001L.

HEC end cap consists of:

1. End cap
2. Mineral wool shells
3. Steel reduction (EN 1.4404)
4. Mastic



The end cap is available up to carrier pipe dimension 219.1 mm and jacket pipe dimension 315 mm.

The end cap is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is  $40^{\circ}$ C.

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**NT components - Joints**  
**HDHEC end cap, black****Application**

End cap in UV-stabilized, cross-linked PE (PEX) material with stainless steel reduction and mineral wool shells.

Used to seal the pipe to prevent moisture ingress in the insulation.

The end cap is applicable for carrier pipe temperatures ranging from -200° to +250° C. HEC must always be applied at temperatures below -20°C or above 120°C.

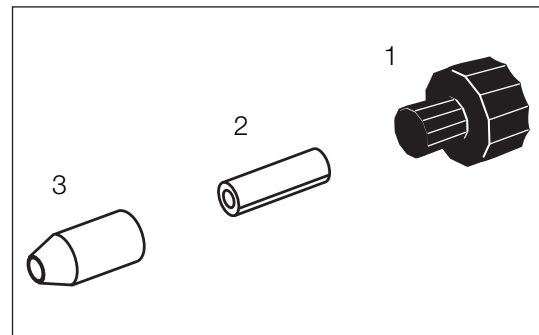
The HDHEC end cap is used for directly buried systems and freely suspended systems.

**Description**

Component No. 55101L.

HDHEC end cap consists of:

1. End cap with embedded mastic
2. Mineral wool shells
3. Steel reduction (EN 1.4404)



The end cap is available up to carrier pipe dimension 406.4 mm and jacket pipe dimension 710 mm.

The end cap is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

## NT components - Joints

### HSEC end cap, black

---

**Application**

End cap in UV-stabilized, cross-linked PE (PEX) material with stainless steel cap and mineral wool shells.

Used to seal the pipe to prevent moisture ingress in the insulation.

The end cap is applicable for carrier pipe temperatures ranging from -200° to +250° C. HSEC must always be applied at temperatures below -20°C or above 120°C.

The HSEC end cap is used for directly buried systems and freely suspended systems.

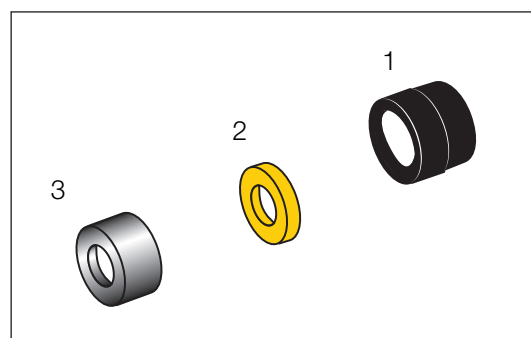
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**Description**

Component No. 56001L.

HSEC end cap consists of:

1. End cap
2. Mineral wool disc
3. Steel cap (EN 1.4404)



The end cap is available up to carrier pipe dimension 506 mm and jacket pipe dimension 900 mm.

The end cap is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

---

**NT components - Joints**  
**HSEC end cap, white****Application**

End cap in non-UV-stabilized, cross-linked PE (PEX) material with stainless steel cap and mineral wool shells.

Used to seal the pipe to prevent moisture ingress in the insulation.

The end cap is applicable for carrier pipe temperatures ranging from -200° to +250° C. HSEC must always be applied at temperatures below -30° C or above +70° C.

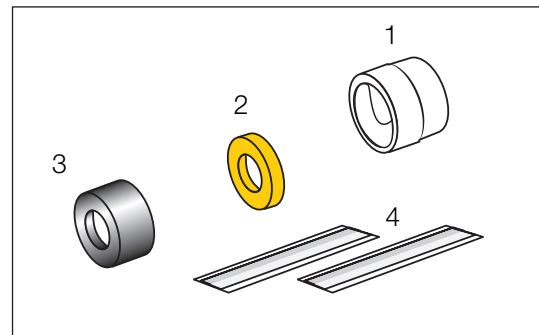
The HSEC end cap is used indoor for freely suspended systems

**Description**

Component No. 56001L.

HSEC end cap consists of:

1. End cap
2. Mineral wool disc
3. Steel cap (EN 1.4404)
4. Mastic



The end cap is available up to carrier pipe dimension 219.1 mm and jacket pipe dimension 315 mm.

The end cap is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

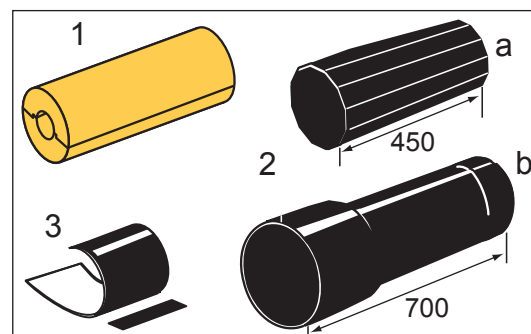
## NT components - Joints

### End fitting for insulation shells, $\varnothing$ 90-630 mm

**Application** To terminate a pipe system where the carrier pipe is terminated with an end bottom, a PE end fitting is used.

**Description** An end fitting set consists of:

1. Insulation shells of PUR or PIR
2. End fitting:
  - a.  $\varnothing$  90-160 mm, expanded
  - b.  $\varnothing$  180-630 mm, drifted
3. Shrink collar PEX with PIB mastic and closure patches



**Component overview** Component No. 5700.

Irrespective of the service pipe dimension the end fitting is ordered according to the outer casing dimension. This means, that sometimes there will be a little gap between the service pipe and the insulation shell. This is of no practical importance.

(x) = not standard delivery.

Jacket $\varnothing$ out. mm	Insul. shells $\varnothing$ int/out. mm	Carrier pipe range $\varnothing$ out. mm	Lengths, mm	
			450	700
90	33/90	26.9-33.7	x	(x)
110	48/110	26.9-48.3	x	(x)
125	60/125	26.9-60.3	x	(x)
140	76/140	26.9-76.1	x	(x)
160	88/160	42.4-88.9	x	(x)
180	114/180	60.3-114.3		x
200	139/200	76.1-139.7		x
225	168/225	88.9-168.3		x
250	168/250	114.3-168.3		x
280	219/280	114.3-219.1		x
315	219/315	139.7-219.1		x
355	219/355	219.1		x
400	323/400	219.1-273.0		x
450	323/450	273.0-323.9		x
500	355/500	273.0-355.0		x
560	406/560	323.9-406.0		x
630	457/630	355.0-457.0		x

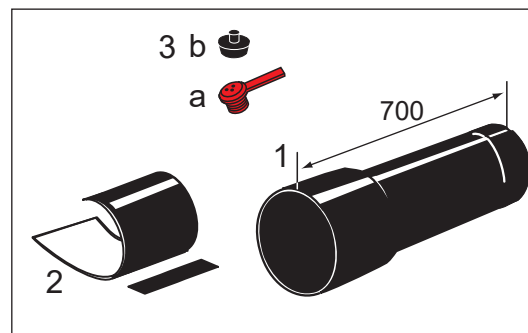
## NT components - Joints

### End fitting for foaming, $\varnothing$ 710-1000 mm

**Application** To terminate a pipe system with a  $\varnothing$  710-1000 mm jacket pipe PE end fittings for foaming (PUR) are used.

**Description** An end fitting set consists of:

1. End fitting, drifted
2. Shrink wrap with closure patch
3. a. venting plug, b. weld plug



**Component overview** Component No. 5700.  
Irrespective of the carrier pipe dimension the end fitting is ordered according to the jacket pipe dimension.

Jacket pipe $\varnothing$ out. mm	Carrier pipe dimensional range $\varnothing$ out. mm
710	406.4-508.0
800	457.0-610.0
900	508.0-711.0
1000	610.0-813.0

**Accessories** To be foamed with foam pack, component No. 0700.  
Machine foam is used for major dimensions.  
When ordering state insulation series, and that foam pack must be included in the delivery.



## NT components - Joints

### Wall entry sleeve

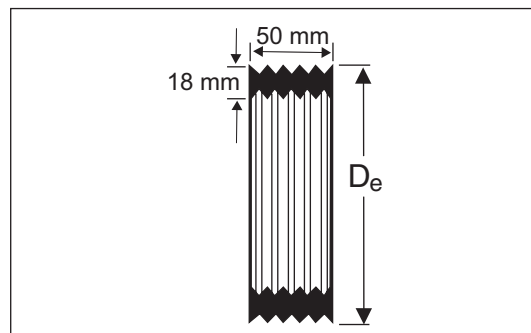
**Application** Where pipes are installed through masonry - at wells, footings etc. - wall entry sleeves are installed as a seal against water ingress.

**Description** The wall entry sleeves are made of an extremely resistant rubber which, together with a good sealing effect, also allows minor expansion movements at the entry point.

Exposed to groundwater pressure the wall entry sleeves may not be watertight. In such cases please contact LOGSTOR.

Note!  $D_e - 2 \times 18 \text{ mm}$  is smaller than the nominal diameter, so the sleeve fits tightly around the outer casing.

As regards diameter of the hole in the base, see Design manual for District Heating.



**Materials** NR-SBR rubber

**Component overview** Component No. 5800

Jacket pipe ø out. mm	Outside diameter, $D_e$ approx. ø mm
90	124
110	142
125	158
140	173
160	191
180	209
200	229
225	255
250	281
280	312
315	345
355	385
400	430

Jacket pipe ø out. mm	Outside diameter, $D_e$ approx. ø mm
450	480
500	530
560	590
630	660
710	740
800	830
900	930
1000	1030
1100	1130
1200	1230
1300	1330
1400	1430
1500	1530

## NT components - Joints

### Roof entry sleeve, black

#### Application

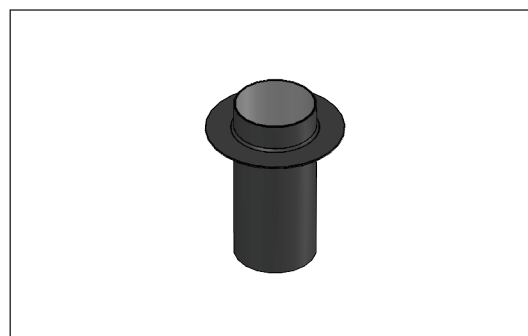
Roof entry sleeves are used, when the pre-insulated pipes are installed through a flat roof construction.

Made of UV-stabilized PE with a flange, making it possible to fix the roof entry sleeve to the underlayment for subsequent installation of roof felt and roof foil.

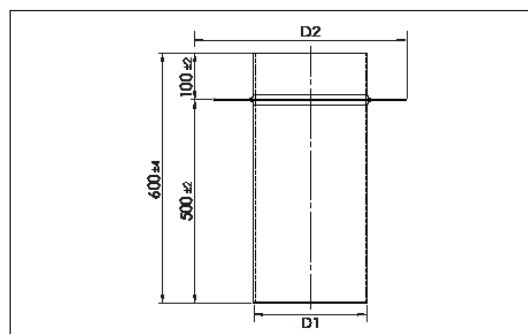
Sealing between roof entry sleeve and pipe is carried out with collars - to be ordered separately.

#### Description

Component No. 1157.



For jacket dimension mm	D1 mm	D2 mm	L1 mm	L2 mm
90	102	302	600	500
110	122	322	600	500
125	138	338	600	500
140	155	355	600	500
160	177	377	600	500
180	196	396	600	500
200	216	416	600	500
225	245	445	600	500
250	271	471	600	500
280	299	499	600	500
315	339	539	600	500
355	381	581	600	500
400	426	626	600	500
450	479	679	600	500
500	533	733	600	500



#### Accessories

Collar to be ordered on component No. 5500.

Available in lengths of 150 mm and 225 mm.

## System description - HT, high temperature

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#### Beskrivelse

Operating temperatures from +120°C to +250°C

#### PIR

The high temperature system with PIR foam is a bonded system and can be used freely suspended and directly buried. The system is applicable for operating temperatures from 120°C to 170°C, and delivered with a black or a white jacket. With white jacket only for freely suspended indoor installation.

#### HT3

The high temperature system with mineral wool and PUR-foam, HT3, is a sliding system which is only used directly buried. The system can be used for operating temperatures from 120°C to 250°C, and is delivered with a black jacket.

Both systems are used for media like e.g. vapour and thermal oil.

30% moisture in the insulation and joint areas reduces the thermal and mechanical properties. It is very important to install all joints correctly, and to cover all free ends with end caps. This ensures low operating costs and a long service life. At operating temperatures higher than 120°C HEC, HDHEC or HSEC end cap is used.

The energy loss of a system can be calculated by means of the calculation program LOGSTOR Industry Calculator ([www.logstor.com](http://www.logstor.com)).

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## PIR components - Steel Pipe - P235GH seamless

### Description

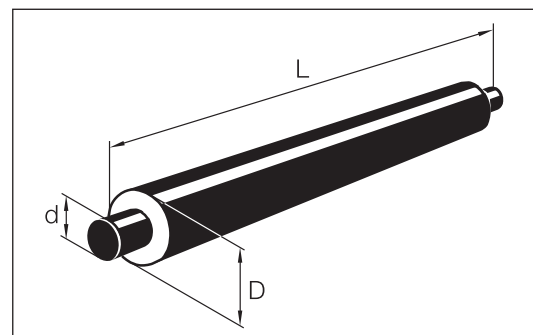
Component No. 20000LS.

Lengths: 6 and 12 m dependent on dimension.

Pipes in jacket dimension  $\varnothing 90$  are supplied with 100 mm free pipe ends.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



### Series 1

Steel pipe dia. d, "	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12
Steel pipe dia. d, mm	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273	323.9
Steel pipe wall thick., mm	2	2.3	2.6	2.6	2.6	2.9	2.9	3.2	3.6	4	4.5	6.3	6.3	7.1
Jacket pipe dia. D, mm	90	90	90	110	110	125	140	160	200	225	250	315	400	450
Weight, kg/m	1.9	2.3	2.9	3.8	4.2	5.6	7.1	9	13	17.1	22.6	39.8	53.3	69.8
Liquid content, l/m	0.2	0.4	0.6	1.1	1.5	2.3	3.9	5.3	9	13.6	19.9	33.5	53.3	75.3

### Series 2

Steel pipe dia. d, "	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12
Steel pipe dia. d, mm	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273	323.9
Steel pipe wall thick., mm	2.0	2.3	2.6	2.6	2.6	2.9	2.9	3.2	3.6	4	4.5	6.3	6.3	7.1
Jacket pipe dia. D, mm	110	110	110	125	125	140	160	180	225	250	280	355	450	500
Weight, kg/m	2.3	2.7	3.3	4.1	4.5	6.1	7.6	9.5	13.9	18.3	24.1	43.1	57.6	74.7
Liquid content, l/m	0.2	0.4	0.6	1.1	1.5	2.3	3.9	5.3	9.0	13.6	19.9	33.5	53.3	75.3

### Series 3

Steel pipe dia. d, "	1/2	3/4	1	1 1/4	1 1/2	2	2 1/2	3	4	5	6	8	10	12
Steel pipe dia. d, mm	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273	323.9
Steel pipe wall thick., mm	2.0	2.3	2.6	2.6	2.6	2.9	2.9	3.2	3.6	4	4.5	6.3	6.3	7.1
Jacket pipe dia. D, mm	125	125	125	140	140	160	180	200	250	280	315	400	500	560
Weight, kg/m	2.6	3.0	3.6	4.6	5.0	6.6	8.1	10.2	15.1	19.9	26.1	46.6	62.5	81.2
Liquid content, l/m	0.2	0.4	0.6	1.1	1.5	2.3	3.9	5.3	9.0	13.6	19.9	33.5	53.3	75.3

### Other dimensions

Other dimensions and insulation series are available on inquiry.

## PIR components - Steel Reduction fitting - P235GH seamless

### Description

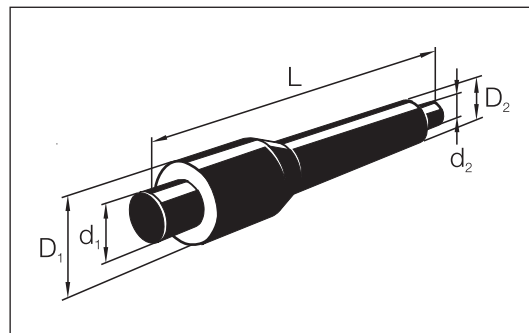
Component No. 4900S.

Pre-insulated reduction fittings are with eccentric weld reductions according to EN 10253-2.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

Nominal operating pressure: 25 bar at 170°C.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



### Series 1

From dimension $\varnothing$ mm	To dimension $\varnothing$ mm	L, mm
33.7/90	26.9/90	900
42.4/110	26.9/90	900
42.4/110	33.7/90	900
48.3/110	33.7/90	900
48.3/110	42.4/110	900
60.3/125	42.4/110	900
60.3/125	48.3/110	900
76.1/140	48.3/110	1000
76.1/140	60.3/125	1000
88.9/160	60.3/125	1000
88.9/160	76.1/140	1000
114.3/200	76.1/140	1000
114.3/200	88.9/160	1000

From dimension $\varnothing$ mm	To dimension $\varnothing$ mm	L, mm
139.7/225	88.9/160	1000
139.7/225	114.3/200	1000
168.3/250	114.3/200	1000
168.3/250	139.7/225	1000
219.1/315	139.7/225	1100
219.1/315	168.3/250	1100
273.0/400	168.3/250	1500
273.0/400	219.1/315	1500
323.9/450	219.1/315	1500
323.9/450	273.0/400	1500

### Series 2

From dimension $\varnothing$ mm	To dimension $\varnothing$ mm	L, mm
33.7/110	26.9/110	900
42.4/125	26.9/110	900
42.4/125	33.7/110	900
48.3/125	33.7/110	900
48.3/125	42.4/125	900
60.3/140	42.4/125	900
60.3/140	48.3/125	900
76.1/160	48.3/125	1000
76.1/160	60.3/140	1000
88.9/180	60.3/140	1000
88.9/180	76.1/160	1000
114.3/225	76.1/160	1000
114.3/225	88.9/180	1000
139.7/250	88.9/180	1000
139.7/250	114.3/225	1000

From dimension $\varnothing$ mm	To dimension $\varnothing$ mm	L, mm
168.3/280	114.3/225	1000
168.3/280	139.7/250	1000
219.1/355	139.7/250	1100
219.1/355	168.3/280	1100
273.0/450	168.3/280	1500
273.0/450	219.1/355	1500
323.9/500	219.1/355	1500
323.9/500	273.0/450	1500

## PIR components - Steel Reduction fitting - P235GH seamless

**Series 3**

From dimension ø mm	To dimension ø mm	L, mm
33.7/125	26.9/125	900
42.4/140	26.9/110	900
42.4/140	33.7/125	900
48.3/140	33.7/125	900
48.3/140	42.4/140	900
60.3/160	42.4/140	900
60.3/160	48.3/140	900
76.1/180	48.3/140	1000
76.1/180	60.3/160	1000
88.9/200	60.3/160	1000
88.9/200	76.1/180	1000
114.3/250	76.1/180	1000
114.3/250	88.9/200	1000
139.7/280	88.9/200	1000
139.7/280	114.3/250	1000

From dimension ø mm	To dimension ø mm	L, mm
168.3/315	114.3/250	1000
168.3/315	139.7/280	1000
219.1/400	139.7/280	1100
219.1/400	168.3/315	1100
273.0/500	168.3/315	1500
273.0/500	219.1/400	1500
323.9/560	219.1/400	1500
323.9/560	273.0/500	1500

**Other  
dimensions**

Other dimensions and insulation series are available on inquiry.

## PIR components - Steel Elbow - P235GH seamless

### Description

Component No. 25000LS.

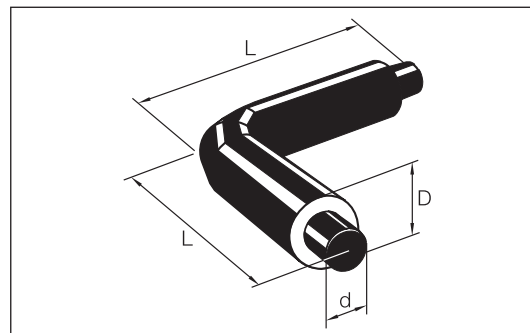
Delivered with weld fitting according to EN 10253-2.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

Elbows with other angles can be supplied to order in 5° offsets.

Nominal operating pressure: 25 bar at 170°C.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



### P235GH seamless

Steel pipe $\varnothing$ mm	Jacket pipe $\varnothing$ mm			L mm
	series 1	series 2	series 3	
26.9	90	110	125	1000
33.7	90	110	125	1000
42.4	110	125	140	1000
48.3	110	125	140	1000
60.3	125	140	160	1000
76.1	140	160	180	1000
88.9	160	180	200	1000
114.3	200	225	250	1000
139.7	225	250	280	1000
168.3	250	280	315	1000
219.1	315	355	400	1000
273.0	400	450	500	1300
323.9	450	500	560	1500

### Other dimensions

Other dimensions and insulation series are available on inquiry.



## PIR components - Steel T-fitting straight - P235GH seamless

### Description

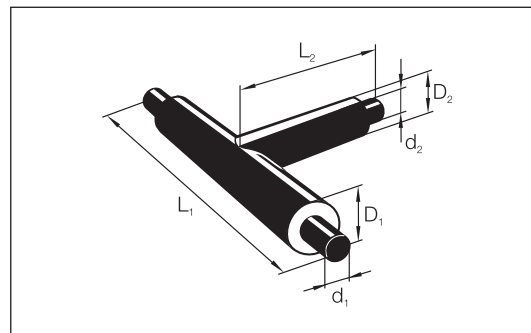
Component No. 34000LS.

Delivered with weld fitting according to EN 10253-2.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

Nominal operating pressure: 16 bar at 170°C.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



Main pipe					Branch pipe $\varnothing$ . series 1. 2 and 3														
					26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273.0	323.9		
$\varnothing$ . mm	Series			$L_1$ mm	Length $L_2$ , mm														
	1	2	3																
26.9	90	110	125	1000	500														
33.7	90	110	125	1000	500	500													
42.4	110	125	140	1000	500	500	500												
48.3	110	125	140	1000	500	500	500	500											
60.3	125	140	160	1200	600	600	600	600	600										
76.1	140	160	180	1200	600	600	600	600	600	600									
88.9	160	180	200	1200	600	600	600	600	600	600	600								
114.3	200	225	250	1200	600	600	600	600	600	600	600	600							
139.7	225	250	280	1200	600	600	600	600	600	600	600	600	600						
168.3	250	280	315	1200	600	600	600	600	600	600	600	600	600	600					
219.1	315	355	400	1500	700	700	700	700	700	700	700	700	700	700	700				
273.0	400	450	500	1500	700	700	700	700	700	700	700	700	700	700	700	700			
323.9	450	500	560	1500	800	800	800	800	800	800	800	800	800	800	800	800	800		

### Other dimensions

Other dimensions and insulation series are available on inquiry.

## 4.2.5 - 1/2

### PIR components - Steel T-fitting - P235GH seamless

#### Description

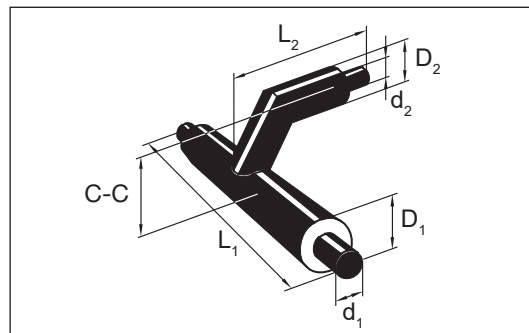
Component No. 30000LS.

Delivered with weld fitting according to EN 10253-2.

Available in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

Nominal operating pressure: 16 bar at 170°C.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



#### Series 1

Main pipe ød. mm		Branch pipe ø d. series 1												
		26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273.0	323.9
ød/D. mm	L <sub>1</sub> mm	Length L <sub>2</sub> . mm C-C. mm												
		26.9/90	1000	700										
170														
33.7/90	1000	700	700											
		170	170											
42.4/110	1000	700	700	700										
		178	178	185										
48.3/110	1000	700	700	700	700									
		178	178	185	185									
60.3/125	1200	700	700	700	700	700								
		185	185	193	193	200								
76.1/140	1200	700	700	700	700	700	700							
		195	195	203	203	210	220							
88.9/160	1200	700	700	700	700	700	700	700						
		205	205	213	213	220	230	240						
114.3/200	1200	700	700	700	700	700	800	800	800					
		228	228	235	235	243	253	263	285					
139.7/225	1200	700	700	700	700	800	800	800	800	900				
		240	240	248	248	255	265	275	298	310				
168.3/250	1200	800	800	800	800	800	800	800	900	900	900			
		255	255	263	263	270	280	290	313	325	340			
219.1/315	1500	800	800	800	800	800	800	800	900	900	900	1000		
		293	293	300	300	308	318	328	350	363	378	415		
273.0/400	1500	800	800	800	800	900	900	900	900	1000	1000	1100	1200	
		340	340	348	348	355	365	375	398	410	425	463	510	
323.9/450	1500	900	900	900	900	900	900	900	1000	1000	1000	1100	1200	1200
		365	365	373	373	380	390	400	423	435	450	488	535	560

## PIR components - Steel T-fitting - P235GH seamless

**Series 2**

From dimension ø mm	To dimension ø mm	L, mm
33.7/110	26.9/110	900
42.4/125	26.9/110	900
42.4/125	33.7/110	900
48.3/125	33.7/110	900
48.3/125	42.4/125	900
60.3/140	42.4/125	900
60.3/140	48.3/125	900
76.1/160	48.3/125	1000
76.1/160	60.3/140	1000
88.9/180	60.3/140	1000
88.9/180	76.1/160	1000
114.3/225	76.1/160	1000
114.3/225	88.9/180	1000
139.7/250	88.9/180	1000
139.7/250	114.3/225	1000

From dimension ø mm	To dimension ø mm	L, mm
168.3/280	114.3/225	1000
168.3/280	139.7/250	1000
219.1/355	139.7/250	1100
219.1/355	168.3/280	1100
273.0/450	168.3/280	1500
273.0/450	219.1/355	1500
323.9/500	219.1/355	1500
323.9/500	273.0/450	1500

**Series 3**

From dimension ø mm	To dimension ø mm	L, mm
33.7/125	26.9/125	900
42.4/140	26.9/110	900
42.4/140	33.7/125	900
48.3/140	33.7/125	900
48.3/140	42.4/140	900
60.3/160	42.4/140	900
60.3/160	48.3/140	900
76.1/180	48.3/140	1000
76.1/180	60.3/160	1000
88.9/200	60.3/160	1000
88.9/200	76.1/180	1000
114.3/250	76.1/180	1000
114.3/250	88.9/200	1000
139.7/280	88.9/200	1000
139.7/280	114.3/250	1000

From dimension ø mm	To dimension ø mm	L, mm
168.3/315	114.3/250	1000
168.3/315	139.7/280	1000
219.1/400	139.7/280	1100
219.1/400	168.3/315	1100
273.0/500	168.3/315	1500
273.0/500	219.1/400	1500
323.9/560	219.1/400	1500
323.9/560	273.0/500	1500

**Other  
dimensions**

Other dimensions and insulation series are available on inquiry.

## PIR components - Steel Anchor - P235GH seamless

### Description

Component No. 40000LS.

An anchor consists of a steel anchor plate.

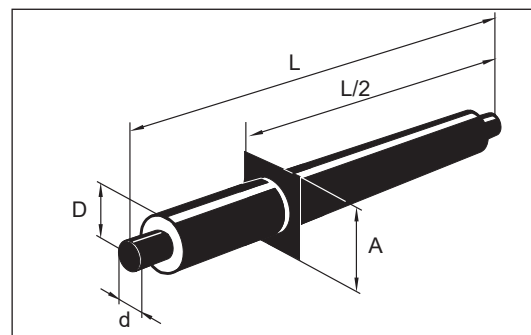
To avoid an excessive heat transfer from the anchor plate to the PE jacket, a stainless plate wrap is welded onto the anchor plate.

As a standard available in series 1, 2, and 3 in black or white jacket. White jacket up to dimension  $\varnothing 315$  mm.

Nominal operating pressure: 25 bar at 170°C.

Any surveillance wires are transferred through electrical insulation in the anchor plate.

As for specifications of the carrier pipe, insulation and jacket pipe, see section 1.2 Material specifications.



Steel pipe d mm	Series 1			Series 2			Series 3		
	Jacket D, mm	L mm	A mm	Jacket D, mm	L mm	A mm	Jacket D, mm	L mm	A mm
26.9	90	2000	140	110	2000	160	125	2000	160
33.7	90	2000	140	110	2000	160	125	2000	165
42.4	110	2000	170	125	2000	180	140	2000	190
48.3	110	2000	170	125	2000	180	140	2000	190
60.3	125	2000	200	140	2000	200	160	2000	220
76.1	140	2000	220	160	2000	225	180	2000	250
88.9	160	2000	235	180	2000	260	200	2000	275
114.3	200	2000	300	225	2000	310	250	2000	340
139.7	225	2000	320	250	2000	350	280	2000	370
168.3	250	2000	370	280	2000	390	315	2000	425
219.1	315	2000	450	355	2000	480	400	2000	525
273	400	2500	550	450	2500	590	500	2500	630
323.9	450	2500	600	500	2500	650	560	2500	710

### Other dimensions

Other dimensions and insulation series are available on inquiry.

## PIR components - Joints

### BXJoint, black

#### Application

Shrink joint in UV-stabilized, cross-linked PE (PEX) material with insulation shells made of PIR.

The joint is double sealed and can be used for angles up to max. 5°.

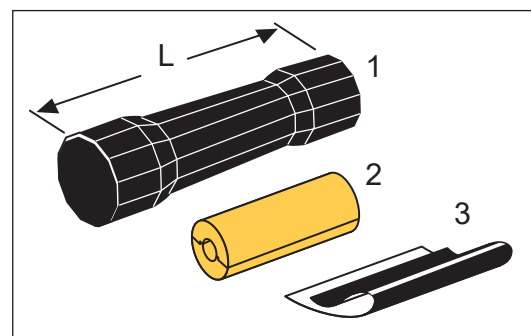
The BXJoint is used for directly buried as well as freely suspended systems.

#### Description

Component No. 5022.

The BXJoint consists of:

1. PEX shrink sleeve with integrated hotmelt and mastic
2. Insulation shells
3. Shrink foil with mastic



Jacket pipe dia. D, mm	90	110	125	140	160	200	225	250	280	315	355	400	450	500	560	630
Shrink sleeve length, mm	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780	780

Delivered with insulation shells for series 1, 2 or 3.

Other series on inquiry.

The shrink sleeve is wrapped in a solid white PE foil on delivery.

The shrink sleeve must be stored upright.

Max. temperature during transport and storage is 40°C.

## PIR components - Joints

### EWJoint, black

#### Application

Weld joint in PE for insulation shells.

The joint is welded together with the jacket pipe by means of a loose welding strip between the joint and the jacket.

Joints in standard lengths  $> \varnothing 280$  mm can be extrusion welded.

The EWJoint is used for directly buried as well as freely suspended systems..

#### Description

Component No. 5027.

The EWJoint consists of:

1. Weld joint
2. Welding strips
3. Staples for fixing welding strips
4. Insulation shell

The sleeve is wrapped in a white PE foil at delivery.

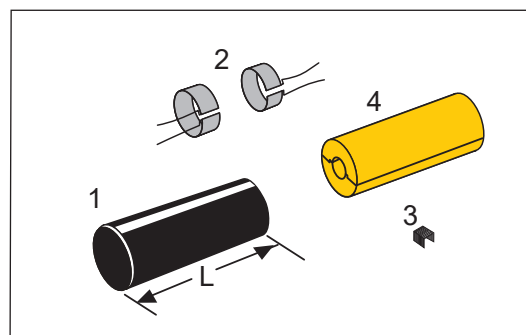
Welding strips are delivered separately in a plastic bucket.

Staples (3) and insulation shells (4) are ordered separately.

Delivered with insulation shells for series 1, 2 or 3. Other series on enquiry.

The shrink sleeves must be stored upright.

Max. temperature during transport and storage is 40°C.



<b>Jacket pipe dia. D, mm</b>	90	110	125	140	160	180	200	225	250	280
<b>Shrink wrap length, mm</b>	700	700	700	700	700	700	700	700	700	700

<b>Jacket pipe dia. D, mm</b>	315	355	400	450	500	560	630	710	800	900
<b>Shrink wrap length, mm</b>	700	700	700	700	700	700	750	750	750	800

#### Welding strips

Component No. 5556.

Welding strips for 1 EWJoint are delivered together in a bucket.

#### Accessories

Staples for fixing welding strips to be ordered, component No. 9050.

Insulation shells in PIR to be ordered, component No. 5314.

## PIR components - Joints

### C2LJoint, black

#### Application

PE shrink joint with insulation shells of PIR. Prior to installation the shrink sleeve is cut longitudinally.

The joint is double sealed and i.a. used for repairs

The C2LJoint is used for directly buried as well as freely suspended systems.

#### Description

Component No. 5035.

The C2LJoint consists of:

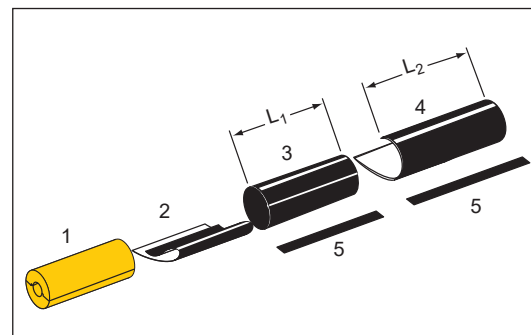
1. Insulation shell
2. Shrink film with mastic
3. Shrink sleeve
4. Shrink wrap with mastic
5. Closure patches

The sleeve is wrapped in a white PE foil on delivery.

Delivered with insulation shells for series 1, 2 or 3.. Other series on enquiry.

The shrink sleeve must be stored upright.

Max. temperature during transport and storage is 40°C.



Jacket pipe ø out. mm	L <sub>1</sub> mm	L <sub>2</sub> mm
90	670	900
110	670	900
125	670	900
140	670	900
160	670	900
180	670	900
200	670	900
225	670	900
250	670	900
280	670	900
315	670	900
355	670	900
400	670	900
450	670	900
500	670	900
560	670	900
630	670	900

## PIR components - Joints

### LMJoint, white

#### Application

Shrink joint in UV-stabilized, cross-linked PE (PEX) material with insulation shells made of PIR.

The joint is single sealed and can be used for angles up to max. 5°.

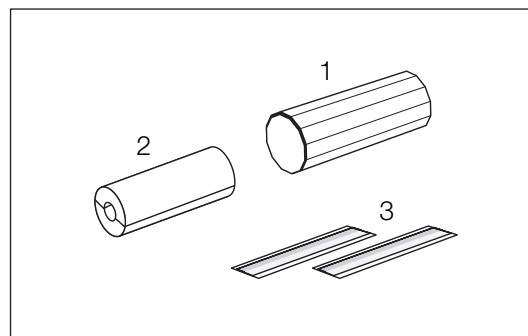
The LMJoint is used indoor for freely suspended systems.

#### Description

Component No. 53501C.

LMJoint consists off:

1. Shrink sleeve
2. Insulation shells
3. Mastic



<b>Jacket pipe dia. D, mm</b>	90	110	125	140	160	180	200	225	250	280	315
<b>Shrink sleeve length, mm</b>	535	535	535	535	535	535	575	575	575	575	575

Delivered with insulation shells for series 1, 2 or 3.

The shrink sleeve is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.



## PIR components - Joints

### LMCJoint, white

#### Application

Shrink joint in non-UV-stabilized, cross-linked PE (PEX) material with insulation shells made of PIR.

The joint is single sealed and can be used for repairs.

Retaining tool is required in order to carry out installation - to be ordered separately.

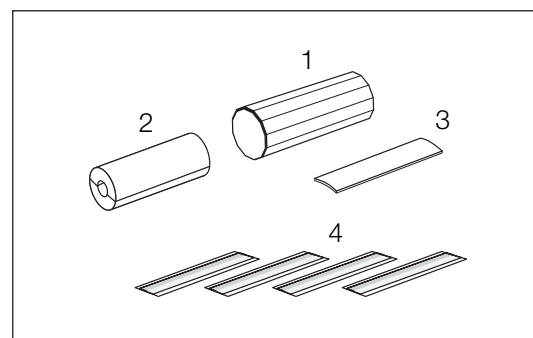
The LMCJoint is used indoor for freely suspended systems.

#### Description

Component No. 53700C.

LMCJoint consists of:

1. Shrink sleeve
2. Insulation shells
3. Profile plate
4. Mastic



<b>Jacket pipe dia. D, mm</b>	90	110	125	140	160	180	200	225	250	280	315
<b>Shrink sleeve length, mm</b>	535	535	535	535	535	535	575	575	575	575	575

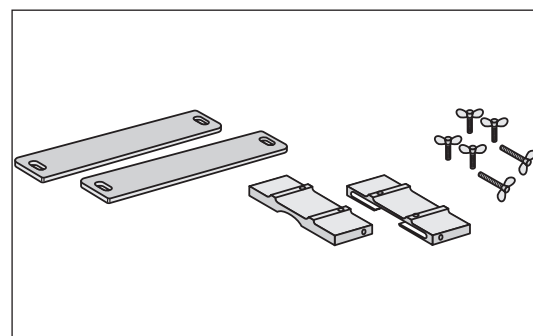
Delivered with insulation shells for series 1, 2 or 3.

The shrink sleeve is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

#### Retaining tool for installation

Product No. 9000 0000 027 003.



## PIR components - Joints

### BM - Elbow joint with insulation shells, black and white

#### Application

Bendable shrink sleeve in cross-linked PE (PEX) material with insulation shells made of PIR.

The joint is used for directional changes from 5 - 90°, and is single sealed.

The white BMJoint is not UV-stabilized and is only used indoor for freely suspended systems.

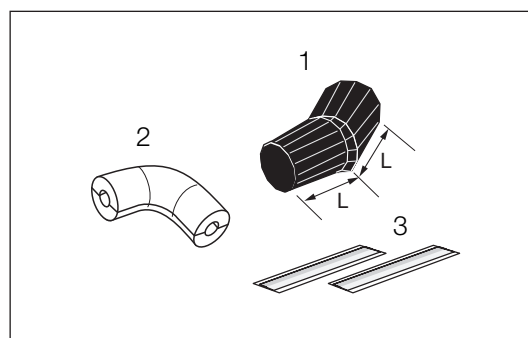
The black BMJoint is UV-stabilized and used for freely suspended systems (the joint is not suitable for directly buried systems).

#### Description

Component No. 54000LC.

BMJoint consists of:

1. Shrink sleeve
2. Insulation shells
3. Mastic



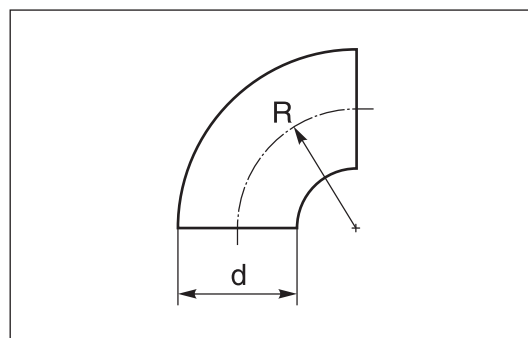
<b>Jacket diameter D, mm</b>	90	110	125	140	160	180	200	225	250	280	315
<b>Length L, mm</b>	260	430	430	495	495	495	655	655	695	695	695

Delivered with 90° insulation shells for series 1, 2 or 3.

The joint is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

Insulation shells are stocked according to below weld elbow.



P235GH EN 10253-2

<b>d</b>	21.3	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1
<b>R</b>	38	38	38	47.5	57	76	95	114	152	190	229	305

#### Other dimensions and radii

Insulation shells for other dimensions, degrees, and radii are available on inquiry.

## PIR components - Joints

### TMC-CJoint, black

#### Application

T-shrink joint in UV-stabilized, cross-linked PE (PEX) material with insulation shells made of PIR.

The joint is single sealed and can be used to branch perpendicular to the main pipe.

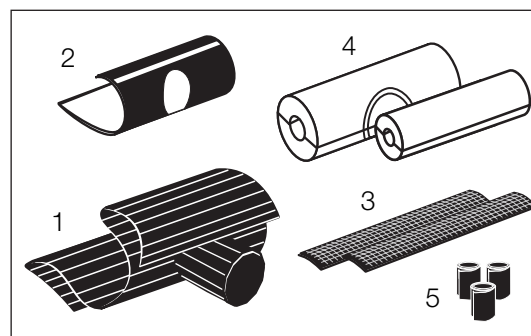
The TMC-CJoint is used for freely suspended systems.

#### Description

Component No. 52600L.

TMC-CJoint consists of:

1. Shrink sleeve
2. Shrink wrap
3. Closure patch
4. Insulation shells for main pipe and branch
5. Mastic



Delivered with insulation shells for series 1, 2 or 3.

The joint is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

Branch	Jacket diameter base pipe, mm						
	90	110	125	140	160	180	200
90	X	X	X	X	X	X	X
110	X	X	X	X	X	X	X
125		X	X	X	X	X	X
140			X	X	X	X	X
160				X	X	X	X
180					X	X	X

## PIR components - Joints

### TMCJoint, white

#### Application

T-shrink joint in non-UV-stabilized, cross-linked PE (PEX) material with insulation shells made of PIR.

The joint is single sealed and can be used to branch perpendicular to the main pipe.

Retaining tool is required in order to carry out installation - to be ordered separately.

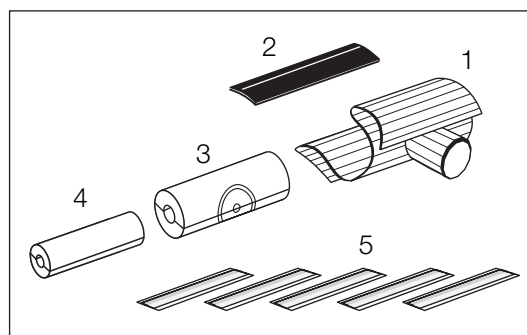
The TMCJoint is used indoor for freely suspended systems.

#### Description

Component No. 52500L.

TMCJoint consists off:

1. Shrink sleeve
2. Profile plate
3. Insulation shells for main pipe
4. Insulation shells for branch
5. Mastic



Delivered with insulation shells for series 1, 2 or 3.

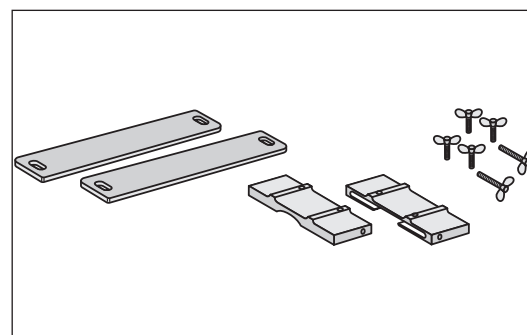
The joint is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

	Jacket diameter base pipe, mm						
	90	110	125	140	160	180	200
Branch							
90	X	X	X	X	X	X	X
110	X	X	X	X	X	X	X
125		X	X	X	X	X	X
140			X	X	X	X	X
160				X	X	X	X
180					X	X	X

#### Retaining tool for installation

Product No. 9000 0000 027 003.



**PIR components - Joints****Reduction joint****Reduction joints**

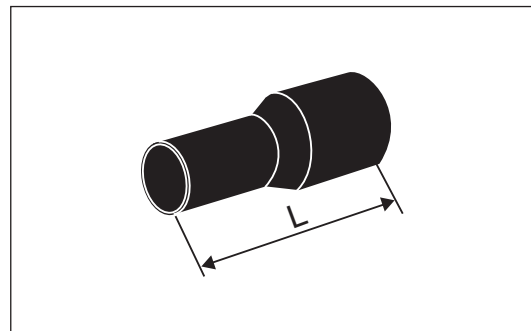
LOGSTOR offers various reduction joints i.a. as weld joints or shrink joints.

If other lengths are needed, please contact LOGSTOR to learn which solutions are possible.

**EWJoint**

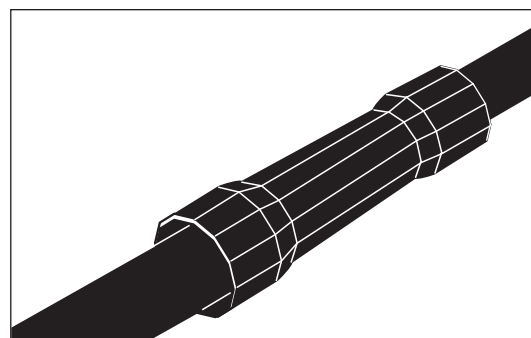
Reduction with an EW-reduction joint is possible with one or more dimensional offsets.

Component No. 5028

**BXJoint**

Reduction with a standard BXJoint is possible with 1 and 2 dimensional offsets in dimensions  $\varnothing 90$ -315 mm and with 1 dimensional offset in dimensions  $\varnothing 355$ -630 mm.

Component No. 5022.



## PIR components - Joints

### Reduction joint - Weld joint

#### Application

Reduction with the weld joint EWJoint can be carried out in the dimensions, stated below.

Weld joints must be carried out by fitters, certified by LOGSTOR.

For EWJoints the total non-insulated pipe length, inclusive weld reduction, is 2 x free pipe end + length of the weld reduction.

Where 2 or 3 dimensional offsets are possible, the design instructions must be complied with..

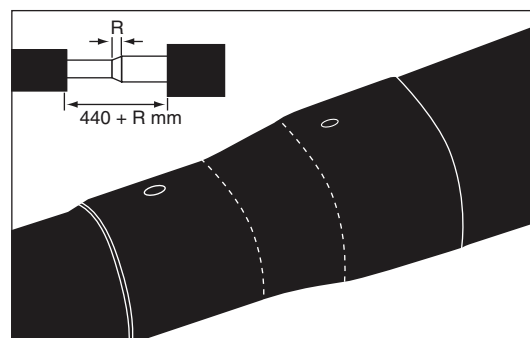
#### EWJoint

Shrink sleeve reduction with EWJoint,  
Component No. 5028.

Accessories:

PIR insulation shells,  
Component No. 5314.

Order 1 set for each dimension.



Dimensional offsets and lengths:

Also available with 2 or 3 dimensional offsets..

From ø mm	To ø mm	Joint length mm
110	90	800
125	110	800
140	125	800
160	140	800
180	160	800
200	180	900
225	200	900
250	225	900
280	250	900
315	280	900
355	315	900
400	355	1000
450	400	1000
500	450	1000
560	500	1100
630	560	1100
710	630	1200
800	710	1200
900	800	1350
1000	900	1350

## PIR components - Joints

### Reduction joint - Shrink joint

#### Application

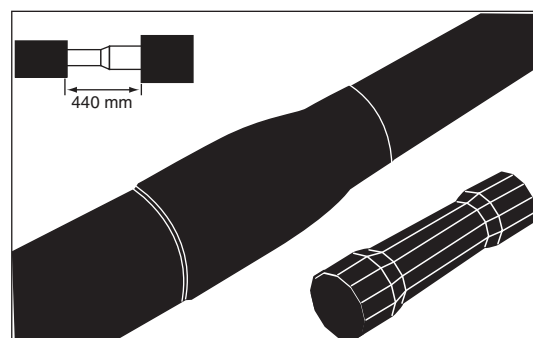
Reductions with the the shrink joints BX and LM can be carried out udføres mellem dimensionerne angivet nedenfor i 1 eller 2 dimensionsspring.

In connection with 2 dimensional offsets, the design instructions must be complied with.

#### Reduction with-BXJoint

Reduction with BXJoint with insulation half shells in PIR.

Component No. 5022.



The joint is applicable for both 1 and 2 dimensional offsets.

2 offsets up to  $\varnothing$  315/280 mm.

1 offset from  $\varnothing$  355/315 mm.

From $\varnothing$ mm	To $\varnothing$ mm	Joint length mm
110	77	780
125	90	780
140	110	780
160	125	780
180	140	780
200	160	780
225	180	780
250	200	780
280	225	780
315	250	780
355	315	780
400	355	780
450	400	780
500	450	780
560	500	780
630	560	780

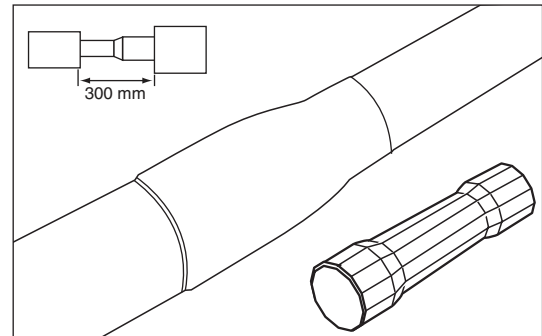
## PIR components - Joints

### Reduction joint - Shrink joint

#### Reduction with LMJoint

Reduction with LMJoint with insulation half shells in PIR.

Component No. 5350.



The joint is applicable for the following dimensional offsets:

Joint size ø mm	From ø mm	To ø mm	Joint length mm
125-90	125	77	535
180-140	180	90	535
250-200	250	180	575
315-280	315	20	575



## PIR components - Joints

### HEC end cap, white

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#### Application

End cap in non-UV-stabilized, cross-linked PE (PEX) material with stainless steel reduction and mineral wool shells.

Used to seal the pipe to prevent moisture ingress in the insulation.

The HEC end cap is applicable for carrier pipe temperatures ranging from  $-200^{\circ}$  to  $+250^{\circ}$  C. HEC must always be applied at temperatures below  $-30^{\circ}$  C or above  $+70^{\circ}$  C.

The HEC end cap is used indoor for freely suspended systems

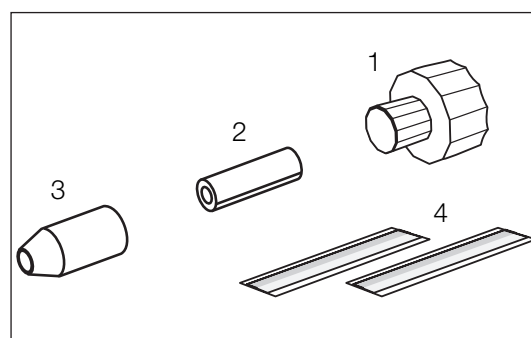
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#### Description

Component No. 55001L.

HEC end cap consists of:

1. End cap
2. Mineral wool shells
3. Steel reduction (EN 1.4404)
4. Mastic



The end cap is available up to carrier pipe dimension 219.1 mm and jacket pipe dimension 315 mm.

The end cap is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is  $40^{\circ}$ C.

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## PIR components - Joints

### HDHEC end cap, black

#### Application

End cap in UV-stabilized, cross-linked PE (PEX) material with stainless steel reduction and mineral wool shells.

Used to seal the pipe to prevent moisture ingress in the insulation.

The end cap is applicable for carrier pipe temperatures ranging from -200° to +250° C. HEC must always be applied at temperatures below -20°C or above 120°C.

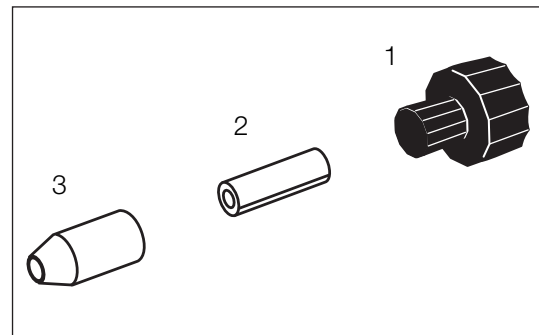
The HDHEC end cap is used for directly buried systems and freely suspended systems.

#### Description

Component No. 55101L.

HDHEC end cap consists of:

1. End cap with embedded mastic
2. Mineral wool shells
3. Steel reduction (EN 1.4404)



The end cap is available up to carrier pipe dimension 406.4 mm and jacket pipe dimension 710 mm.

The end cap is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

## PIR components - Joints

### HSEC end cap, black

**Application** End cap in UV-stabilized, cross-linked PE (PEX) material with stainless steel cap and mineral wool shells.

Used to seal the pipe to prevent moisture ingress in the insulation.

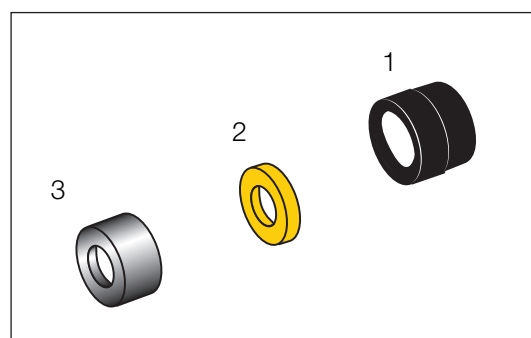
The end cap is applicable for carrier pipe temperatures ranging from -200° to +250° C. HSEC must always be applied at temperatures below -20°C or above 120°C.

The HSEC end cap is used for directly buried systems and freely suspended systems.

**Description** Component No. 56001L.

HSEC end cap consists of:

1. End cap
2. Mineral wool disc
3. Steel cap (EN 1.4404)



The end cap is available up to carrier pipe dimension 506 mm and jacket pipe dimension 900 mm.

The end cap is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is 40°C.

**Other dimensions** Other dimensions are available on enquiry.

### PIR components - Joints HSEC end cap, white

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#### Application

End cap in non-UV-stabilized, cross-linked PE (PEX) material with stainless steel cap and mineral wool shells.

Used to seal the pipe to prevent moisture ingress in the insulation.

The end cap is applicable for carrier pipe temperatures ranging from  $-200^{\circ}\text{C}$  to  $+250^{\circ}\text{C}$ . HSEC must always be applied at temperatures below  $-30^{\circ}\text{C}$  or above  $+70^{\circ}\text{C}$ .

The HSEC end cap is used indoor for freely suspended systems

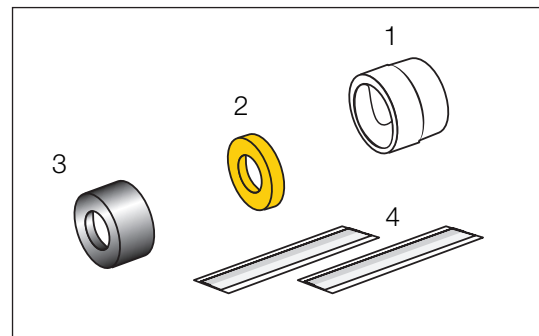
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#### Description

Component No. 56001L.

HSEC end cap consists of:

1. End cap
2. Mineral wool disc
3. Steel cap (EN 1.4404)
4. Mastic



The end cap is available up to carrier pipe dimension 219.1 mm and jacket pipe dimension 315 mm.

The end cap is wrapped in a solid white PE foil on delivery.

Max. temperature during transport and storage is  $40^{\circ}\text{C}$ .

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## PIR components - Joints

End fitting for insulation shells,  $\varnothing$  90-630 mm

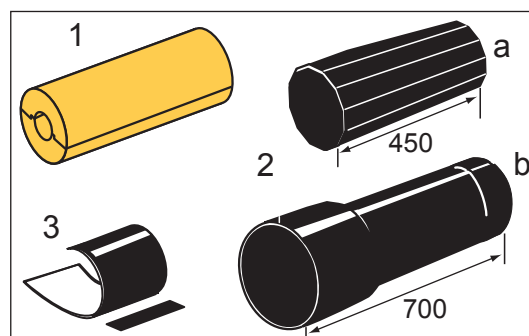
## Application

To terminate a pipe system where the carrier pipe is terminated with an end bottom, a PE end fitting is used.

## Description

An end fitting set consists of:

1. Insulation shells of PIR
2. End fitting:
  - a.  $\varnothing$  90-160 mm, expanded
  - b.  $\varnothing$  180-630 mm, drifted
3. Shrink collar PEX with PIB mastic and closure patches



## Component overview

Component No. 5700.

Irrespective of the service pipe dimension the end fitting is ordered according to the outer casing dimension. This means, that sometimes there will be a little gap between the service pipe and the insulation shell. This is of no practical importance.

(x) = not standard delivery.

Casing $\varnothing$ out. mm	Insul. shells $\varnothing$ int/out. mm	Service pipe range $\varnothing$ out. mm	Lengths, mm	
			450	700
90	33/90	26.9-33.7	x	(x)
110	48/110	26.9-48.3	x	(x)
125	60/125	26.9-60.3	x	(x)
140	76/140	26.9-76.1	x	(x)
160	88/160	42.4-88.9	x	(x)
180	114/180	60.3-114.3		x
200	139/200	76.1-139.7		x
225	168/225	88.9-168.3		x
250	168/250	114.3-168.3		x
280	219/280	114.3-219.1		x
315	219/315	139.7-219.1		x
355	219/355	219.1		x
400	323/400	219.1-273.0		x
450	323/450	273.0-323.9		x
500	355/500	273.0-355.0		x
560	406/560	323.9-406.0		x
630	457/630	355.0-457.0		x

## PIR components - Joints

### Wall entry sleeve

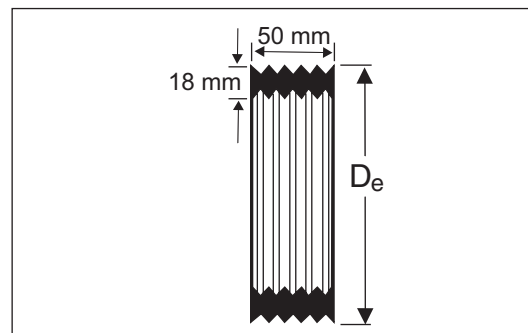
**Application** Where pipes are installed through masonry - at wells, footings etc. - wall entry sleeves are installed as a seal against water ingress.

**Description** The wall entry sleeves are made of an extremely resistant rubber which, together with a good sealing effect, also allows minor expansion movements at the entry point.

Exposed to groundwater pressure the wall entry sleeves may not be watertight. In such cases please contact LOGSTOR.

Note!  $D_e - 2 \times 18 \text{ mm}$  is smaller than the nominal diameter, so the sleeve fits tightly around the outer casing.

As regards diameter of the hole in the base, see Design manual for District Heating.



**Materials** NR-SBR rubber

**Component overview** Component No. 5800

Jacket pipe ø out. mm	Outside diameter, $D_e$ approx. ø mm
90	124
110	142
125	158
140	173
160	191
180	209
200	229
225	255
250	281
280	312
315	345
355	385
400	430

Jacket pipe ø out. mm	Outside diameter, $D_e$ approx. ø mm
450	480
500	530
560	590
630	660
710	740
800	830
900	930
1000	1030
1100	1130
1200	1230
1300	1330
1400	1430
1500	1530

## PIR components - Joints

### Roof entry sleeve, black

#### Application

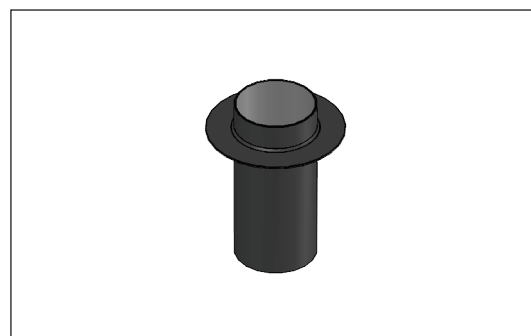
Roof entry sleeves are used, when the pre-insulated pipes are installed through a flat roof construction.

Made of UV-stabilized PE with a flange, making it possible to fix the roof entry sleeve to the underlayment for subsequent installation of roof felt and roof foil.

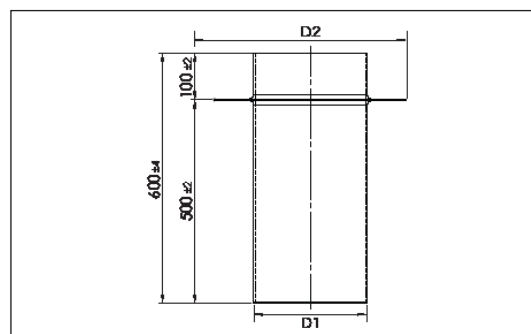
Sealing between roof entry sleeve and pipe is carried out with collars - to be ordered separately.

#### Description

Component No. 1157.



For jacket dimension mm	D1 mm	D2 mm	L1 mm	L2 mm
90	102	302	600	500
110	122	322	600	500
125	138	338	600	500
140	155	355	600	500
160	177	377	600	500
180	196	396	600	500
200	216	416	600	500
225	245	445	600	500
250	271	471	600	500
280	299	499	600	500
315	339	539	600	500
355	381	581	600	500
400	426	626	600	500
450	479	679	600	500
500	533	733	600	500



#### Accessories

Collar to be ordered on component No. 5500.

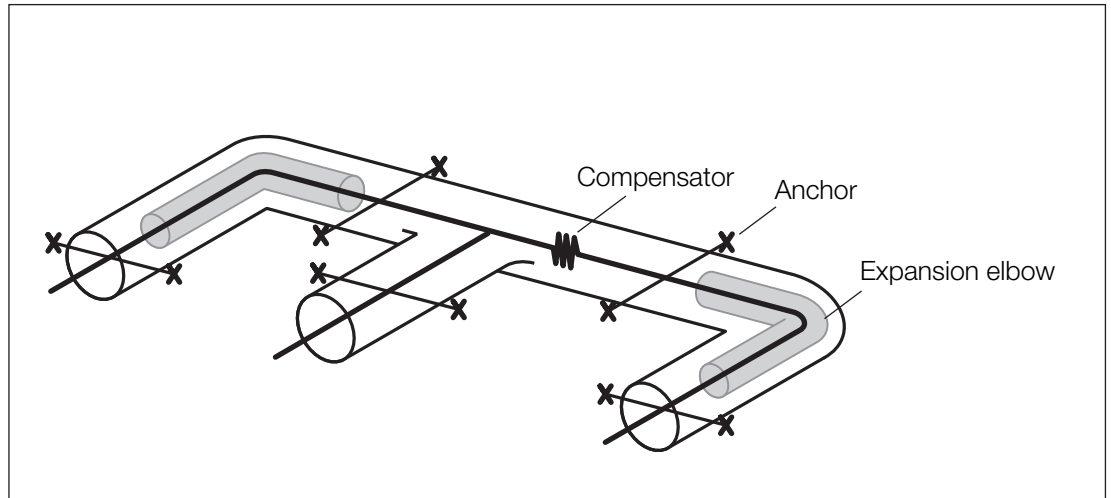
Available in lengths of 150 mm and 225 mm.





## HT3 technique System

### General



The directly buried high temperature system HT3 is installed as a compensating sliding system. In the HT3 system, movements caused by temperature changes are absorbed within the system.

The jacket pipe is fixed by soil friction and does not move.

The carrier pipe moves within the insulation. The movements are absorbed by corresponding expansion absorbing elements such as L, Z or U bends or axial compensators.

On installation the system is divided into expansion sections that can be calculated.

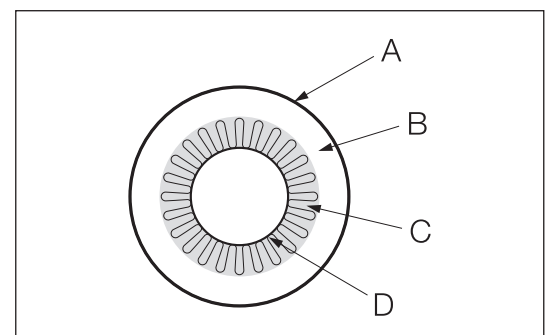
Each section is separated from the next section by means of anchors.

The expansion absorbing elements are placed inside each expansion section, and should ideally be loaded equally from both sides.

### Insulation

The insulation in the HT3 system consists of a combination of PUR foam and mineral wool, helping to ensure that neither the allowable limit value of the PUR foam nor that of the HDPE jacket is exceeded.

- A: HDPE jacket, black
- B: PUR foam
- C: Mineral wool
- D: Carrier pipe



The insulation system is available in two standard versions, one for medium temperature 210°C and one for 250°C.

## HT3 technique System

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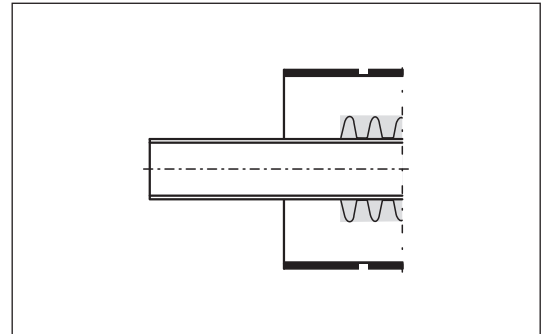
### Pipe ends

Insulated HT3 components are filled with foam in the ends.

This protects the mineral wool ends from moisture during storage and handling.

The pipe ends may only be cut and removed after the carrier pipes have been welded together and just before shrinking the joint.

A notch is milled into the HDPE jacket to mark the place where the ends should be cut.



## HT3 technique

### Operating temperature

#### General

All pipes and components in the HT 3 system are as standard available in series for two different maximum operating temperatures: 210°C or 250°C.

The wall thickness of the mineral wool and PUR insulation are designed to keep the temperature of the PUR foam below the allowable limits.

DN = Nominal diameter

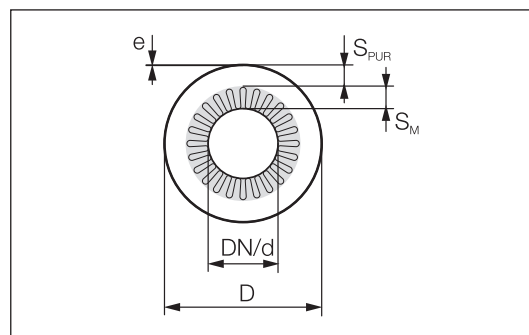
D = Ext. diameter jacket pipe, mm

e = Nominal wall thickness jacket pipe, mm

d = Outside diameter carrier pipe, mm

$S_M$  = Mineral wool thickness, mm

$S_{PUR}$  = Insulation thickness PUR, mm



#### Series max. 210°C

DN	d, mm	D, mm	e, mm	$S_M$ , mm	$S_{PUR}$ , mm
20	26.9	140	3.0	20	34
25	33.7	140	3.0	20	30
32	42.4	160	3.0	20	36
40	48.3	160	3.0	20	33
50	60.3	200	3.2	30	37
65	76.1	225	3.4	30	41
80	88.9	225	3.4	30	35
100	114.3	250	3.6	30	34
125	139.7	315	4.4	40	43
150	168.3	355	4.5	50	39
200	219.1	400	4.8	50	36
250	273.0	450	5.2	50	33
300	323.9	500	5.6	50	32
350	355.6	560	6.0	50	46
400	406.4	630	6.6	60	45

**HT3 technique**  
**Operating temperature**

Series max. 250°C

DN	d, mm	D, mm	e, mm	S <sub>M</sub> , mm	S <sub>PUR</sub> , mm
20	26.9	180	3.0	40	34
25	33.7	180	3.0	40	30
32	42.4	200	3.2	40	36
40	48.3	225	3.4	50	35
50	60.3	225	3.4	50	29
65	76.1	250	3.6	50	33
80	88.9	280	3.9	60	32
100	114.3	315	4.1	60	36
125	139.7	400	4.8	80	45
150	168.3	400	4.8	80	31
200	219.1	450	5.2	80	30
250	273.0	500	5.6	80	28
300	323.9	560	6.0	80	32
350	355.6	630	6.6	100	31
400	406.4	710	7.2	100	45

## HT3 technique

### Thermal expansion

#### Thermal expansion in straight pipes

The linear thermal expansion in metallic pipes can be calculated using material-dependent expansion coefficients:

$$\Delta L = L \times \alpha \times \Delta T$$

$\Delta L$  Thermal expansion, mm

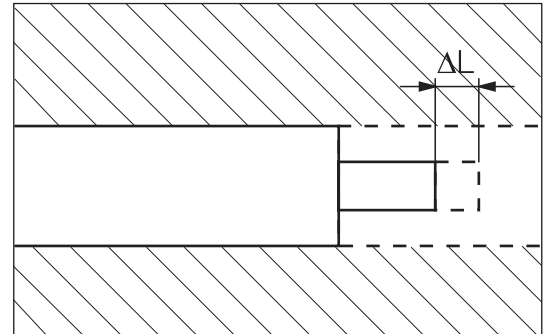
$L$  Pipe section length, m

$\alpha$  Expansion coefficient, mm/mK

$\Delta T$  Operating / Installation temperature, K

$\alpha$  For P235GH at 200°C = 0.0121

Pure thermal expansion in the HT3 system is counteracted by friction resistances, abutment forces and bend forces in the pipe curve and forces in the compensator.



#### Thermal expansion in bends

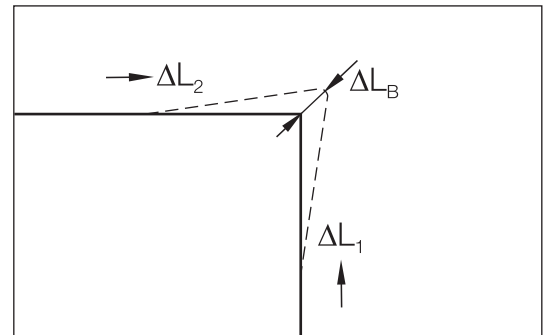
Axial displacement from both directions occur in 90° bends.

The illustration shows the resultant lateral displacement.

This displacement can be calculated using the following formula:

$$\Delta L_B = \sqrt{\Delta L_1^2 + \Delta L_2^2} \leq \Delta L_{MAX}$$

**Note!**  $\Delta L_{MAX}$  for expansion bends must not be exceeded.



## HT3 technique

### Expansion absorption

**Expansion length** The HT 3 system is designed to allow the insulation to absorb the expansion of the carrier pipe within the jacket.

The maximum expansion absorption  $\Delta L_{MAX}$  for each expansion absorption element can be found in the following catalogue chapters:

Elbows 4.5.3

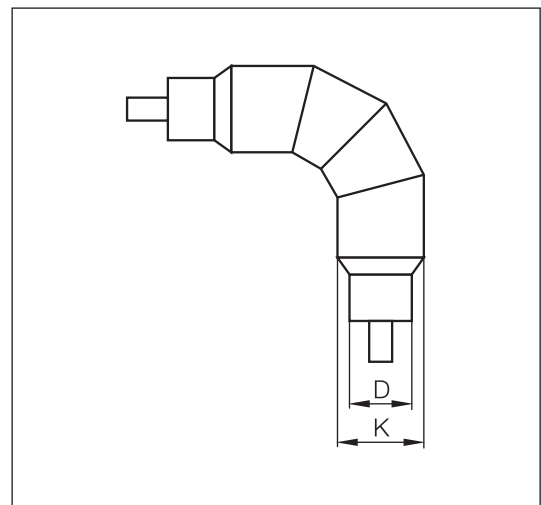
Axial compensators 4.5.9

The maximum distance  $L_{MAX}$  from the anchor to the expansion element is:

$$L_{MAX} = \Delta L_{MAX} / \alpha \cdot \Delta T$$

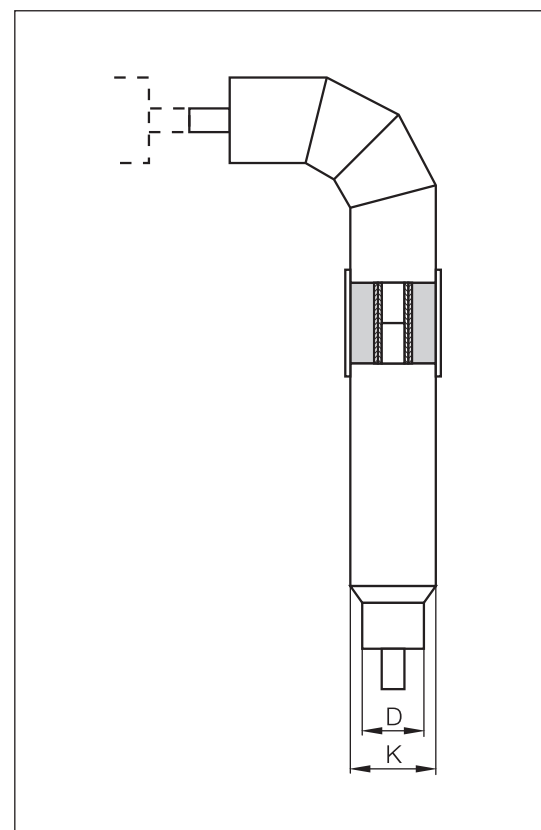
#### Expansion absorption in 90° bends

LOGSTOR offers 90° expansion bends for absorption of an expansion of 20 and 40 mm respectively (cf. 4.5.3)



The bends must be assembled as L, Z or U bends on-site and must not under any circumstances be cut.

When bends are supplied in larger dimensions, the leg length will be too long for transport on a truck and they are therefore divided into three pieces: a short bend and two expansion pipes for assembly on-site.



## HT3 technique

### Expansion absorption

#### Max. expansion lengths, $L_{MAX}$ P235GH

As a guideline value, the following maximum expansion lengths  $L_{MAX}$  can be used from the anchor to the pipe bend.

These distances presume full utilisation of the expansion length and temperatures of 210°C and 250°C respectively.

Operating temperature	Expansion section		
	0 mm	20 mm	40 mm
210°C	3.0 m	8 m	18 m
250°C	2.0 m	7 m	14 m

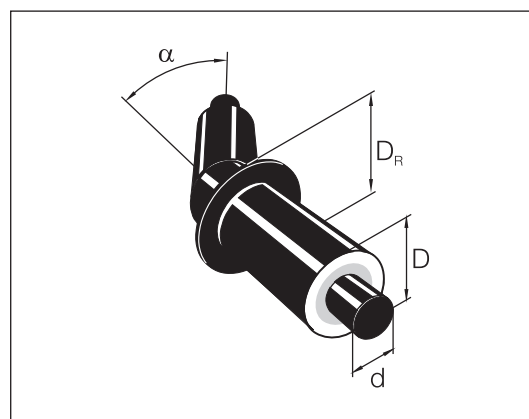
#### Expansion absorption in elbows

Elbows of 90° can be used for expansion absorption.

The resulting lateral expansion is calculated as shown in 4.4.3 and must not exceed 20 or 40 mm respectively.

Elbows with an angle  $< 90^\circ$  is not suitable for expansion absorption and must in general be installed in direct connection with an anchor

Up to 45° anchor elbows are used.



#### Expansion absorption in compensators

The expansion absorption capacity of standard compensators  $\Delta L_{MAX}$  stated in chapter 4.5.9.

If the customer requires other compensators, all relevant data - including data about expansion absorption - must be obtained from the relevant manufacturer, before they can be approved for insulation.

Only one compensator can be mounted between two anchors, a U-bend or Z-bend for absorption of expansion.

The maximum distance between two anchors  $\Delta L_{MAX}$  on straight pipe lengths is:

$$L_{MAX} = \Delta L_{MAX} / \alpha \cdot \Delta T$$

$\Delta L_{MAX}$  is the compensator or expansion element's maximum expansion length.

#### Expansion in T-fittings

There are no expansion elements in T-fittings which must always be directly installed together with an anchor in the main pipe.

The maximum distance for black steel of a T-fitting to an expansion element in a branch pipe is:

- 6 m for the 210°C series
- 4 m for the 250°C series

## HT3 technique

### Expansion absorption

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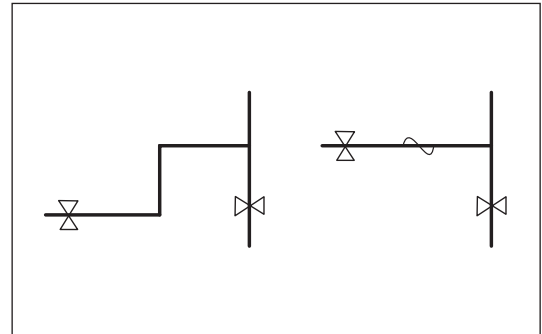
#### Expansion in HT-end termination

The maximum distance for black steel from a HT-end termination to an anchor is:

- 5 m for the 210°C series
- 3 m for the 250°C series

---

#### Installation examples



#### Expansion absorption in reductions

Reductions cannot absorb major expansions, and therefore they are to be installed directly together with a T-fitting or an anchor.

---



## HT3 technique

### Anchors

#### Anchor forces

Anchor forces exerted by thermal expansion and internal compressive force have to be absorbed by the concrete blocks in the excavation trench. Absorption of the axial forces is sufficient for the calculation.

Consequently, anchor force  $F_p$ , which is to be absorbed can be calculated as follows:

$$F_p = |S \cdot F_1 - F_2|$$

Where S is a supplementary safety value and  $F_1 > F_2$

The forces exerted on both sides of the anchor consist of different individual forces, depending on the geometric conditions.

They may be:

- The frictional force.
- The spring resistance of the compensator.
- The internal compressive force of the compensator.
- Resistance from L-, Z-, and U-bends.
- Internal compressive force in bends.
- Initial force of the compensator.

In this connection the compensator's spring resistance and resistance in the bends can be ignored as they are included in the safety factor.

#### Frictional forces

The reactive force resulting from the friction between the carrier pipe and the mineral wool can be calculated by:

$$F_R = \pi \cdot d \cdot L \cdot \mu$$

$d$  = The dimension of the carrier pipe [m].

$L$  = The pipe length during friction [m].

$\mu$  = The friction factor (7 kN/m<sup>2</sup>)

#### Internal compressive force of the compensator

The internal diameter of the compensator's corrugation is larger than that of the carrier pipe, resulting in the corrugation creating a hydraulic axial compressive force  $F_{KP}$ :

$$F_{KP} = p \cdot A_B$$

$A_B$  = The effective corrugated area [cm<sup>2</sup>]

$P$  = Max. operating pressure [N/mm<sup>2</sup>]

$A_B$  is stated in chapter 4.5.9.

#### Initial force of the compensator

The compensator is factory-set for maximum fluctuation and separation bolts are used to retain this setting. The bolts will part once the compensator becomes active, and the required force  $P$  kN, is stated in chapter 4.5.9.  $P$  should be calculated as a unilateral force.

## HT3 technique Anchors

**The anchor force** The resulting anchor force is:

$$F_{PR} = |S \cdot \sum F_1 - \sum F_2|$$

or:

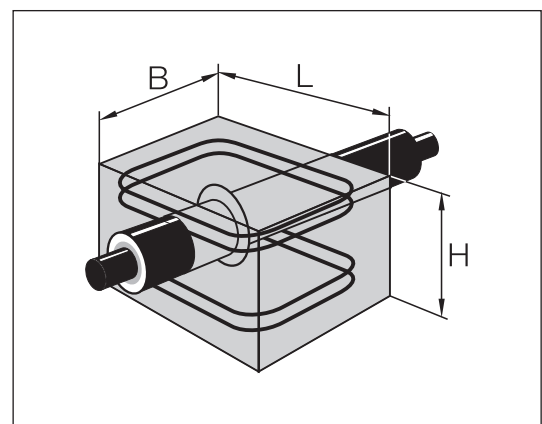
$$F_{PR} = S \cdot (F_{R1} + F_{KP1}) + P \\ - (F_{R2} + F_{KP2})$$

The supplementary safety factors are given in the local instructions, but in most instances  $S = 1.2$  will be sufficient.

### Anchor construction

Anchors must be cast in concrete directly onto unprepared ground.

The concrete block must be dimensioned so it can absorb the reaction force  $F_{PR}$ .



An anchor must be cast in concrete directly onto unprepared ground. The ground will yield, making it impossible to define an anchor precisely, i.e.  $\Delta L = 0$ . Permitted anchor displacement  $\Delta L_F$  will require case-by-case evaluation.

Permitted surface pressure  $\sigma$  against the ground, dependent on the  $\Delta L_F$  that can be tolerated, can then be calculated using the following formula:

$$\sigma = 15 \cdot \Delta L_F$$

The vertical reaction area  $A_w$  can be calculated by the reaction force  $F_{PR}$  and the permitted surface pressure  $\sigma$  :

$$A_w = F_{PR} / \sigma$$

The concrete block must be cast in a concrete quality with a compressive force of more than 25 MN/m<sup>2</sup>, and must have sufficient height, length and reinforcement to absorb the transmission forces.

Recommended dimensions for the concrete block are calculated on the basis of the following:

Soil pressure: 150 kN/m<sup>2</sup> against the entire blockmod

Reinforcement: Steel bar Ks 410,

$$f_{yk} > 410 \text{ N/mm}^2$$

Concrete: 20 N/mm<sup>2</sup>,

$$f_{ck} > 20 \text{ N/mm}^2$$

Calculating the necessary size of the concrete block is the responsibility of the project engineer.

## HT3 technique

### Anchors

Anchor  
construction,  
*continued*

Diameter steel pipe d, mm	Permitted axial force kN	Concrete block			Reinforcement	
		L m	H m	B m	No. of brackets	Dim mm
26.9-48.3	30-80	1.0	0.5	1.0	4	8
60.3-76.1	100-130	1.2	0.5	1.0	4	8
88.9-114.3	130-200	1.8	0.7	1.0	4	10
139.7	250	2.3	0.8	1.0	4	12
168.3	350	2.3	0.9	1.0	4	12
219.1	625	2.8	1.2	1.0	6	12
273.0	800	3.0	1.5	1.0	6	16
323.9	1050	3.8	1.5	1.0	6	20
355.6	1300	4.6	1.6	1.2	6	20
406.0	1600	4.8	1.8	1.4	6	20

## HT3 technique

### Trench and soil cover

**Installation depth** Soil friction must be clearly larger than pipe friction for the sliding pipe system to function. In order to ensure this and avoid overloading of sleeves, a certain amount of soil cover is required. How much depends on the pipe dimensions and the nature of the backfill material.

The table below shows the minimum soil cover required for the HT 3 system, depending on the nature of the backfill material and the type of sleeve selected.

Compliance with these recommendations will ensure the pipes that are protected against traffic loads.

#### 210°C series

DN/D	Minimum soil cover H			
	Groundwater under the pipe		Groundwater above the pipe	
	HBXS/HBX	HEW	HBXS/HBX	HEW
20/140	0.60	-	0.80	-
25/140	0.60	-	0.80	-
32/160	0.60	-	0.90	-
40/160	0.60	-	0.95	-
50/200	0.60	-	1.00	-
65/225	0.75	0.60	1.10	1.00
80/225	0.75	0.60	1.20	1.05
100/250	0.85	0.70	1.40	1.20
125/315	0.90	0.80	1.50	1.25
150/355	-	0.85	-	1.30
200/400	-	0.85	-	1.35
250/450	-	0.90	-	1.50
300/500	-	0.95	-	1.50
350/560	-	1.00	-	1.55
400/630	-	1.00	-	1.60

#### 250°C series

DN/D	Minimum soil cover H			
	Groundwater under the pipe		Groundwater above the pipe	
	HBXS/HBX	HEW	HBXS/HBX	HEW
20/180	0.6	-	0.6	-
25/180	0.6	-	0.6	-
32/200	0.6	-	0.6	-
40/225	0.6	-	0.6	-
50/225	0.6	0.6	0.8	0.8
65/250	0.6	0.6	0.8	0.8
80/280	0.7	0.6	0.8	0.8
100/315	0.8	0.6	0.9	0.9
125/400	-	0.6	-	0.9
150/400	-	0.6	-	1.1
200/450	-	0.7	-	1.3
250/500	-	0.7	-	1.4
300/560	-	0.8	-	1.5
350/560	-	0.9	-	1.6
400/710	-	1	-	1.6

#### Dimensioning the trench

Dimensioning of the trench depends on the pipe dimensions. When establishing a trench, local regulations on safety and working environment must be observed.

To obtain a good friction between soil and outer casing the trench should be made so there is minimum 100 mm stoneless friction material around the pipes to protect the casing against sharp stones and to establish a homogeneous friction between outer casing and the backfill material.

Pipes should be supported by polystyrene foam or sandbags. If wooden wedges are used, they must be removed before backfilling.

## HT3 technique Trench and soil cover

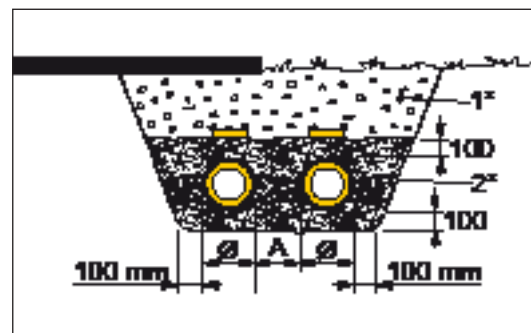
### Dimensioning the trench, *continued*

From the illustration a standard support profile, designed according to EN 13941 appears.

A minimum 100 mm of friction material must be filled over and around the pipe. The friction material in zone 2\* is specified below. Zone 1\* is stoneless material of your own choice.

Backfill over the jacket pipe must be in accordance with the specifications for the installation depth – and the same applies to branch pipes.

LOGSTOR recommends the distance A between pipes according to the table.



Outer casing Ø mm	Distance A between casings mm
90 - 225	150
250 - 560	250
630 - 1400	300

Once the trench has been excavated, check that the soil can carry the weight to avoid the risk of settlements. If it is not, make the trench deeper and replace the excavated soil with friction material for backfilling.

### Friction material

The backfill material in the friction zone (zone 2\*) must comply with below requirements, and a sieve analysis must lie e.g. like the blue curve between the two red limit curves according to EN 13941-2:

- Maximum grain size  $\leq 10$  mm
- Coefficient of uniformity  $\frac{d_{60}}{d_{10}} \geq 1.8$

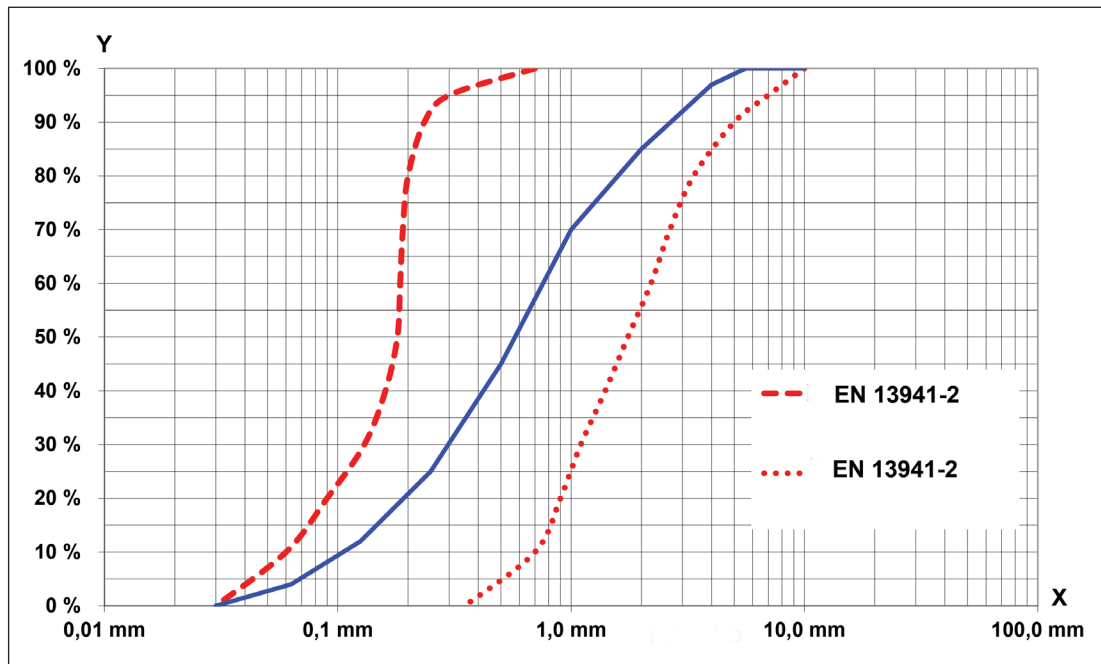
The coefficient is found by means of a sieve test.

$d_{60}$  is the grain size, where 60% fall through the sieve.

$d_{10}$  is the grain size, where 10% fall through the sieve.

## HT3 technique Trench and soil cover

Friction material,  
*continued*



x-axis: Grain size in mm

y-axis: Amount passing in weight percent

The material should not contain harmful quantities of plant residues, humus, clay or silt lumps.

Especially, in connection with major pipes it is important to pay attention to the amount of fine-grained material in the backfill to prevent the risk of a tunnelling effect, when the pipes are cooled.

### Compacting

Fill all around the pipes, and pay special attention that an even and well-compacted backfilling is obtained.

Compact the gravel between and at the sides of the outer casings.

The friction is based on a mean compaction of 97% standard proctor with no values less than 94% standard proctor.

Please note that special requirements from e.g. road builders must be taken into account.

## HT3 technique

### Trench and soil cover

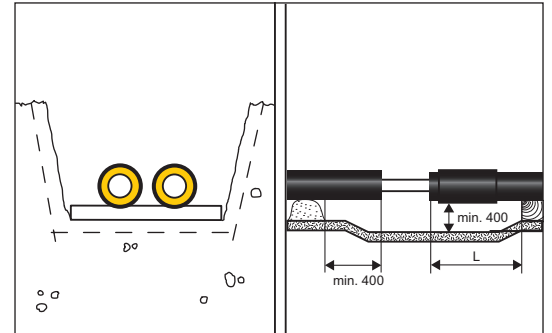
#### Installation in trench

The pipes can be installed in the trench, supported by sand cushions or styrofoam chocks which are removed before the trench is filled with sand.

According to EN 13941-2 at joints there must be min. 400 mm from the casing to the bottom and 500 mm to the side in the trench to ensure sufficient space for the weld and installation work with casing joints.

Distance to the support in connection with preinstalled casing joints:

$$L = L_{\text{casing joint}} + 300 \text{ mm.}$$



#### Drainage

Until the joints are finished and the trench completely backfilled, water must be kept adequately out of the trench. Surface water must be led away from the trench and if necessary establish a sump using submersible pumps. Beware of the risk of undermining.

**NOTE!** When installing the HT3 system, the trench must under no circumstances be under water, until the joints are fully installed.

#### Distance to other directly buried conduits

In the immediate surroundings of directly buried heat-conveying pipes the soil temperature is higher than usual. This can affect the transmission capacity of underground power cables. Maintaining a minimum distance to other conduits is also necessary with regard to maintenance work.

Regarding minimum distances which must be observed see the regulations of the owner of the conduits in question.





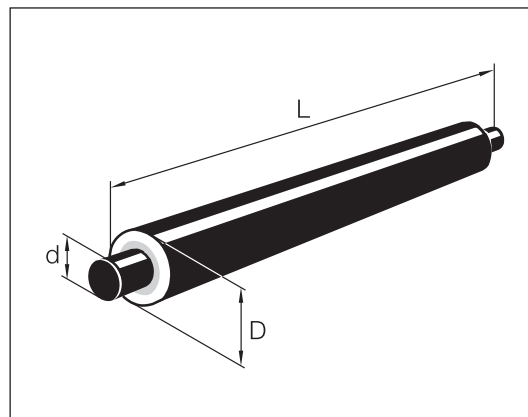
## HT3 components - steel Pipe - P235GH seamless

### Description

Component No. 20001L

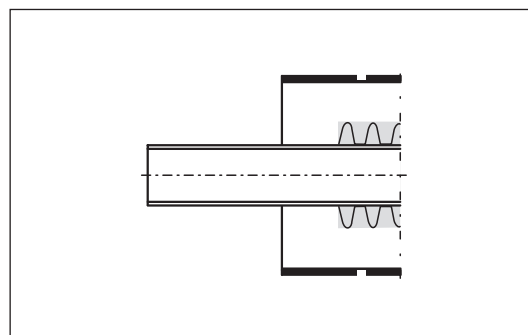
As described in the following table, pipes are supplied in lengths of 6 and 12 m.

As a standard the pipes and all our other pre-insulated components are supplied in two series: the 210°C series and the 250°C series.



All pipes and pre-insulated components are completely foamed at the ends, protecting the mineral wool end sections against moisture ingress during storage and handling. These pipe ends may only be cut and removed after the carrier pipes have been welded and just before shrinkage of the sleeves.

For specifications of carrier pipes, insulations and jackets, see section 1.2 Material specifications.



DN	d	210°C series		250°C series		L 6 m	L 12 m
		D	Jacket thick. e	D	Jacket thick. e		
20	26.9	140	3.0	180	3.0	x	
25	33.7	140	3.0	180	3.0	x	
32	42.4	160	3.0	200	3.2	x	
40	48.3	160	3.0	225	3.4	x	
50	60.3	200	3.2	225	3.4	x	
65	76.1	225	3.4	250	3.6	x	
80	88.9	225	3.4	280	3.9	x	x
100	114.3	250	3.6	315	4.1	x	x
125	139.7	315	4.4	400	4.8	x	x
150	168.3	355	4.5	400	4.8	x	x
200	219.1	400	4.8	450	5.2	x	x
250	273.0	450	5.2	500	5.6	x	x
300	323.9	500	5.6	560	6.0	x	x
350	355.6	560	6.0	630	6.6	x	x
400	406.4	630	6.6	710	7.2	x	x

## HT3 components - steel Reduction - P235GH seamless

### Description

Component No. 49001L

Reductions are supplied complete in lengths as specified in the table below.

Delivered with eccentric weld fitting according to EN 10253-2.

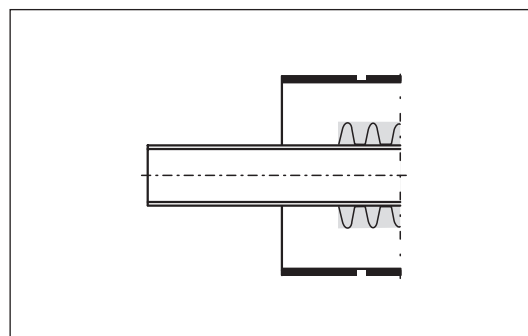
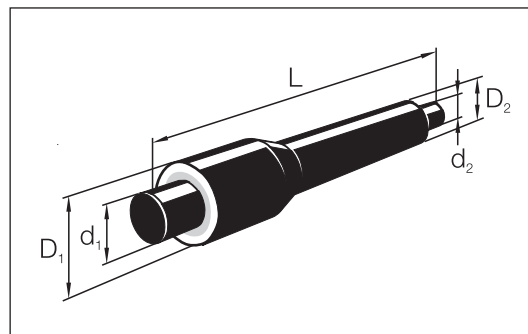
The carrier pipe is marked longitudinally with a white line. Please observe that this line must be at the top on installation.

As a standard reductions and all other pre-insulated components are manufactured in two series: the 210°C series and the 250°C series.

All pipes and pre-insulated components are completely foamed at the ends, protecting the mineral wool end sections against moisture ingress during storage and handling. The pipe ends may only be cut and removed after the carrier pipes have been welded and just before shrinkage of the sleeves.

Besides cutting off the end protection the component must not be shortened additionally.

For specifications of carrier pipes, insulation and jackets, see section 1.2, Material specifications.



DN <sub>1</sub>	d <sub>1</sub> mm	DN <sub>2</sub>	d <sub>2</sub> mm	L mm	210°C series		250°C series	
					D <sub>1</sub> , mm	D <sub>2</sub> , mm	D1, mm	D <sub>2</sub> , mm
25	33.7	20	26.9	1200	140	140	180	180
32	42.4	25	33.7	1200	160	140	200	180
40	48.3	32	42.4	1200	160	160	225	200
50	60.3	40	48.3	1200	200	160	225	225
65	76.1	50	60.3	1200	225	200	250	225
80	88.9	65	76.1	1200	225	225	280	250
100	114.3	80	88.9	1200	250	225	315	280
125	139.7	100	114.3	1200	315	250	400	315
150	168.3	125	139.7	1200	355	315	400	400
200	219.1	150	168.3	1200	400	355	450	400
250	273.0	200	219.1	1200	450	400	500	450
300	323.9	250	273.0	1200	500	450	560	500
355	355.6	300	323.9	1200	560	500	630	560
400	406.9	350	355.6	1200	630	560	710	630

## HT3 components - steel Elbow - P235GH seamless

### Description

As a standard elbows and all other pre-insulated components are supplied in two series, the 210°C series and the 250°C series.

Elbows are manufactured in three versions, without expansion and with 20 mm or 40 mm expansion absorption. These expansions must not be exceeded. Elbows without expansion can be supplied in 45°, 60°, 75°, and 90° angles as a standard. Other angles can be supplied to order with a tolerance of  $\pm 5^\circ$ . Elbows with 20 mm or 40 mm expansion are only available in 90° angle.

For elbows below 45°, anchor elbows must be used, see chapter 4.5.8.

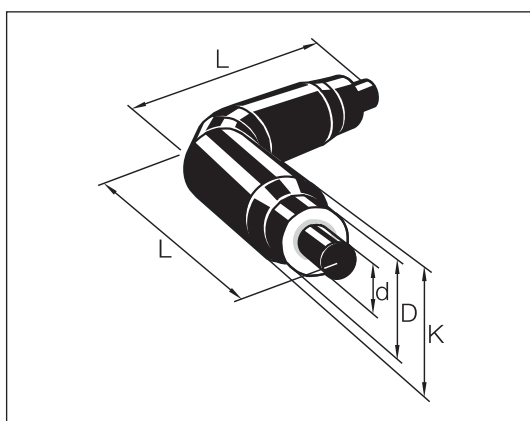
For transporting large dimensions are manufactured in several components: a short elbow with one or two leg extensions, see chapter 4.5.4, expansion pipes.

All pipes and pre-insulated components are fully foamed at the ends, protecting the mineral wool end sections against moisture ingress during storage and handling. The pipe ends may only be cut and removed after the carrier pipes have been welded and just before shrinkage of the sleeves.

For specifications of carrier pipes, insulations and jackets, see chapter 1.2 Material specifications.

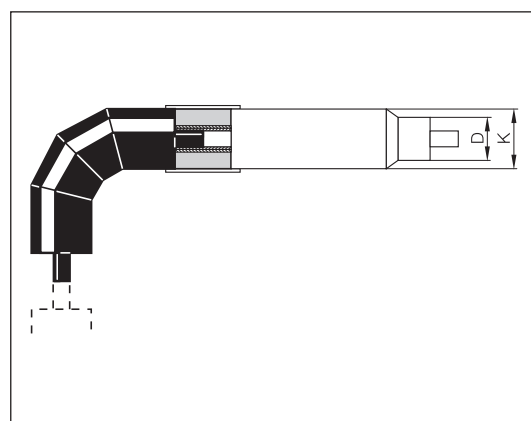
Delivered with weld fitting according to EN 10253-2.

Type 1



Component No. 25001LC

Type 2



Component No. 25001LC

## HT3 components - steel

### Elbow - P235GH seamless

## 210°C series

DN	d mm	D mm	Without expansion		20 mm expansion			40 mm ekspansionx		
			L, mm	Type	K, mm	L, mm	Type	K, mm	L, mm	Type
20	26.9	140	1000	1	-	-	-	225	1600	1
25	33.7	140	1000	1	-	-	-	225	1800	1
32	42.4	160	1000	1	-	-	-	250	2000	1
40	48.3	160	1000	1	-	-	-	250	2200	1
50	60.3	200	1000	1	-	-	-	280	2500	1
65	76.1	225	1000	1	280	2000	1	315	2600	1
80	88.9	225	1000	1	280	2200	1	315	1200	2
100	114.3	250	1000	1	315	2400	1	355	1200	2
125	139.7	315	1000	1	355	2600	1	400	1200	2
150	168.3	355	1000	1	400	1500	2	450	1200	2
200	219.1	400	1000	1	450	1500	2	500	1500	2
250	273.0	450	1300	1	500	1500	2	560	1500	2
300	323.9	500	1500	1	560	1500	2	630	1500	2
350	355.6	560	1600	1	630	1500	2	-	-	-
400	406.4	630	1600	1	710	1500	2	-	-	-

## 250°C series

DN	d mm	D mm	Without expansion		20 mm expansion			40 mm expansion		
			L, mm	Type	K, mm	L, mm	Type	K, mm	L, mm	Type
20	26.9	180	1000	1	-	-	-	315	1600	1
25	33.7	180	1000	1	-	-	-	315	1800	1
32	42.4	200	1000	1	-	-	-	315	2000	1
40	48.3	225	1000	1	-	-	-	355	2200	1
50	60.3	225	1000	1	-	-	-	355	2500	1
65	76.1	250	1000	1	355	2000	1	400	2600	1
80	88.9	280	1000	1	355	2200	1	400	1200	2
100	114.3	315	1000	1	400	2400	1	450	1200	2
125	139.7	400	1000	1	450	2600	1	500	1200	2
150	168.3	400	1000	1	450	1500	2	500	1200	2
200	219.1	450	1000	1	500	1500	2	560	1500	2
250	273.0	500	1300	1	560	1500	2	630	1500	2
300	323.9	560	1500	1	630	1500	2	710	1500	2
350	355.6	630	1600	1	710	1500	2	-	-	-
400	406.4	710	1600	1	800	1500	2	-	-	-

## HT3 components - steel

### Expansion pipe - P235GH seamless

#### Description

As a standard expansion pipes and all other pre-insulated components are supplied in two series: the 210°C series and the 250°C series.

Expansion pipes are produced as three components: a short elbow with two expansion pipes as extensions. Expansion pipes are manufactured in two versions, with 20 mm or 40 mm expansion absorption. These expansion absorptions must not be exceeded and expansion pipes must not be shortened.

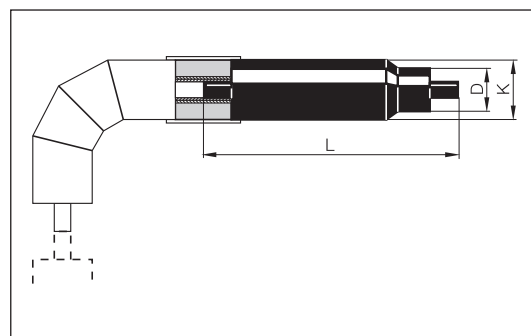
All pipes and pre-insulated components are fully foamed at the ends, protecting the mineral wool end sections against moisture ingress during storage and handling. The pipe ends may only be cut and removed after the carrier pipes have been welded and just before shrinkage of the sleeves.

**Please note that the text on expansion pipes must be at the top during installation, as expansion is only permitted in lateral direction to the text.**

For specifications of carrier pipe, insulations and jackets, please see section 1.2 Material specifications.

Type 2

Component No. 25001LC - expansion pipe



DN	d, mm	210°C series						250°C series					
		20 mm expansion			40 mm expansion			20 mm expansion			40 mm expansion		
		L	D	K	L	D	K	L	D	K	L	D	K
80	88.9	-	-	-	2000	225	315	-	-	-	2000	280	400
100	114.3	-	-	-	2200	250	355	-	-	-	2200	315	450
125	139.7	-	-	-	2500	315	400	-	-	-	2500	400	500
150	168.3	1700	355	400	3000	355	450	1700	400	450	3000	400	500
200	219.1	2000	400	450	3500	400	500	2000	450	500	3500	450	560
250	273.0	2300	450	500	4000	450	560	2300	500	560	4000	500	630
300	323.9	2700	500	560	4500	500	630	2700	560	630	4500	560	710
350	355.6	2900	560	630	-	-	-	2900	630	710	-	-	-
400	406.4	3100	630	710	-	-	-	3100	710	800	-	-	-

## HT3 components - steel

### Expansion pipe - P235GH seamless

**Joint - type 2**

The joint is automatically supplied with the expansion pipe as a HEW joint with extra mineral wool for expansion absorption. On ordering DN 65 and DN 80 with 40 mm expansion in series 210° HBXS is delivered instead with extra mineral wool.

Joint for expansion elbow, type 2

20 mm expansion

DN	d, mm	Series 210°C					Series 250°C				
		L, mm	D, mm	S <sub>M'</sub> , mm	PUR, l	Foam pack size	L, mm	D, mm	S <sub>M'</sub> , mm	PUR, l	Foam pack size
150	168,3	700	400	80	12,3	7	700	450	100	15,8	8
200	219,1	700	450	70	17,3	9	700	500	100	17,5	9
250	273,0	700	500	80	14,7	8	700	560	100	21,2	10
300	323,9	700	560	80	18,7	9	750	630	100	28,8	11
350	355,6	750	630	70	35,6	2x9	750	710	120	35,2	2x9
400	406,4	750	710	80	43,2	12	750	800	120	52,3	10+11

40 mm expansion

DN	d, mm	Series 210°C					Series 250°C				
		L, mm	D, mm	S <sub>M'</sub> , mm	PUR, l	Foam pack size	L, mm	D, mm	S <sub>M'</sub> , mm	PUR, l	Foam pack size
80	88,9	700	315	80	8,8	6	700	400	100	18	9
100	114,3	700	355	80	12	7	700	450	100	24,4	10
125	139,7	700	400	80	16,5	9	700	500	120	24,9	10
150	168,3	700	450	100	15,8	8	700	500	120	19,6	10
200	219,1	700	500	100	17,5	9	700	560	120	24,2	10
250	273,0	700	560	100	21,2	10	750	630	120	31,5	11
300	323,9	750	630	100	28,8	11	750	710	120	43,9	12

## HT3 components - steel

### T-fitting, straight - P235GH seamless

#### Description

As a standard T-fittings and all other pre-insulated components are supplied in two series: the 210°C series and the 250°C series. Carrier pipes are made exclusively according to the customer's specifications and the branch pipe is welded on at an angle of 90°.

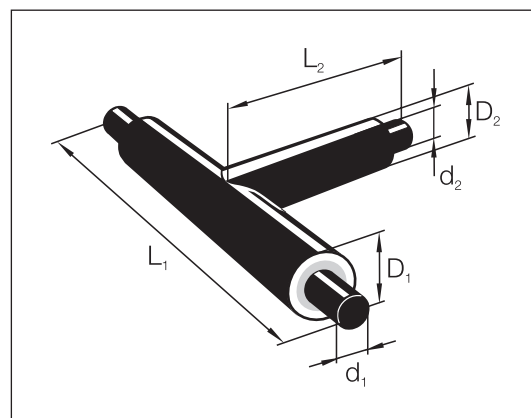
T-fittings cannot be used as expansion-absorbing components and must therefore always be directly placed together with an anchor in the main pipe.

All pipes and pre-insulated components are completely foamed at the ends, protecting the mineral wool end sections against moisture ingress during storage and handling. The pipe ends may only be cut and removed after the carrier pipes have been welded and just before shrinkage of the joints.

For specifications of carrier pipes, insulations and jackets, see section 1.2 Material specifications.

Delivered with weld fitting according to EN 10253-2.

Component No. 34001L



#### 210°C series

$d_2$	$D_2$	DN	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
		$d_1$	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273.0	323.9	355.6	406.4
		$D_1$	140	140	160	160	200	225	225	250	315	355	400	450	500	560	630
		$L_1$	1000	1000	1000	1000	1200	1200	1200	1200	1200	1400	1400	1600	1600	1800	2000
26.9	140		500	500	500	500											
33.7	140			500	500	500	500										
42.4	160				500	500	500	500									
48.3	160					500	500	500	500	600							
60.3	200						500	500	500	600	600						
76.1	225							500	500	600	600	600					
88.9	225								500	600	600	600	600				
114.3	250									600	600	600	600	700			
139.7	315										600	600	600	700	700		
168.3	355											600	600	700	700	700	
219.1	400												600	700	700	700	800
273.0	450													700	700	700	800
323.9	500														700	700	800
355.6	560															700	800
406.4	630																800

$L_2$  appear from the table.





## HT3 components - steel

### T-fitting - P235GH seamless

#### Description

As a standard T-fittings and all other pre-insulated components are supplied in two series: the 210°C series and the 250°C series.

Carrier pipes are made exclusively to the customer's specifications and the branch pipe is bent at an angle of 45°.

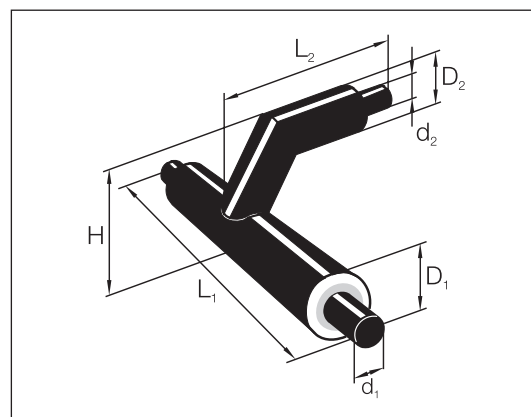
T-fittings cannot be used as expansion-absorbing components and must therefore always be directly placed together with an anchor.

All pipes and pre-insulated components are completely foamed at the ends, protecting the mineral wool end sections against moisture ingress during storage and handling. The pipe ends may only be cut and removed after the carrier pipes have been welded and just before shrinkage of the sleeves.

For specifications of carrier pipes, insulation and jackets, see section 1.2 Material specifications.

Delivered with weld fitting according to EN 10253-2.

Component No. 30001L



#### 210°C series

d <sub>2</sub>	D <sub>2</sub>	L <sub>2</sub>	DN	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400
			d <sub>1</sub>	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273.0	323.9	355.6	406.4
			D <sub>1</sub>	140	140	160	160	200	225	225	250	315	355	400	450	500	560	630
			L <sub>1</sub>	1000	1000	1000	1000	1200	1200	1200	1200	1400	1400	1600	1600	2000	2000	2000
26.9	140	1000		215	215	225	225	245										
33.7	140	1000			215	225	225	245	258									
42.4	160	1000				235	235	255	268	268								
48.3	160	1000					235	255	268	268	280							
60.3	200	1000						275	288	288	300	333						
76.1	225	1000							300	300	313	345	365					
88.9	225	1000								300	313	345	365	388				
114.3	250	1000									325	358	378	400	425			
139.7	315	1000										390	410	433	458	508		
168.3	355	1000											430	453	478	528	558	
219.1	400	1000												475	500	550	580	615
273.0	450	1000													525	575	605	640
323.9	500	1200														600	630	665
355.6	560	1200															660	695
406.4	630	1200																730

The centre line offset, H, appears from the table.

## HT3 components - steel T-fitting - P235GH seamless

250°C series

d <sub>2</sub>	D <sub>2</sub>	L <sub>2</sub>	D <sub>2</sub>	20	25	32	40	50	65	80	100	125	150	200	250	300	350	400		
			d <sub>1</sub>	26.9	33.7	42.4	48.3	60.3	76.1	88.9	114.3	139.7	168.3	219.1	273.0	323.9	355.6	406.4		
			D <sub>1</sub>	180	180	200	225	225	250	280	315	400	400	450	500	560	630	710		
			L <sub>1</sub>	1000	1000	1000	1000	1200	1200	1200	1400	1400	1600	1600	1800	2000	2000	2000		
26.9	180	1000		255	255	265	277	277												
33.7	180	1000			255	265	277	277	290											
42.4	200	1000				275	287	287	300	315										
48.3	225	1000					300	300	312	327	345									
60.3	225	1000						300	312	327	345	387								
76.1	250	1000							325	340	357	400	400							
88.9	280	1000								355	372	415	415	440						
114.3	315	1000									390	433	433	458	508					
139.7	400	1000										475	475	500	550	580				
168.3	400	1000											475	500	550	580	615			
219.1	450	1200												525	575	605	640	680		
273.0	500	1200													600	630	665	705		
323.9	560	1600														660	695	735		
355.6	630	1600															730	770		
406.4	710	1600																810		

The centre line offset, H, appears from the table.

Total offset at jacket < ø 450:

$$H = D_1 + D_2 + 75 \text{ mm}$$

Total offset at jacket > ø 500:

$$H = D_1 + D_2 + 100 \text{ mm}$$

## HT3 components - steel

### Anchoring - P235GH seamless

#### Description

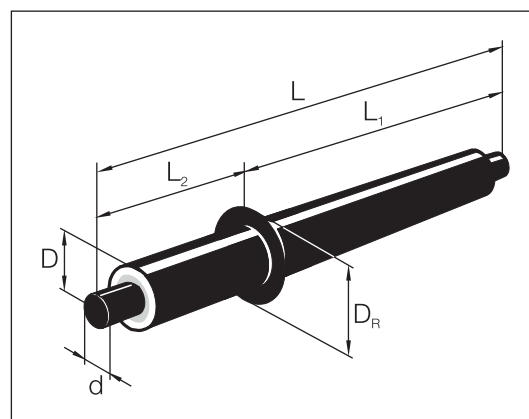
As a standard anchors and all other pre-insulated components are supplied in two series: the 210°C series and the 250°C series.

The anchor plate is sufficiently thermally insulated to ensure that the jacket pipe and shrink seals are not overloaded. Its thickness and diameter are designed to ensure that any forces arising are transferred to the concrete block, see chapter 4.4.5.

All pipes and pre-insulated components are fully foamed at the ends, protecting the mineral wool end sections against moisture ingress during storage and handling. The pipe ends may only be cut and removed after the carrier pipes have been welded and just before shrinkage of the sleeves.

For specifications of carrier pipes, insulations and jackets, see section 1.2, Material specifications.

Component No. 40011L



DN	d	L	L <sub>1</sub>	210°C series		250°C series	
				D	D <sub>R</sub>	D	D <sub>R</sub>
20	26.9	2000	1000	140	240	180	280
25	33.7	2000	1000	140	240	180	280
32	42.4	2000	1000	160	260	200	300
40	48.3	2000	1000	160	260	225	325
50	60.3	2000	1000	200	300	225	325
65	76.1	2000	1000	225	325	250	350
80	88.9	2000	1000	225	325	280	380
100	114.3	2000	1000	250	350	315	415
125	139.7	2000	1000	315	415	400	500
150	168.3	2000	1000	355	455	400	500
200	219.1	2000	1000	400	500	450	550
250	273.0	2000	1000	450	550	500	600
300	323.9	2000	1000	500	600	560	660
350	355.6	2000	1000	560	660	630	730
400	406.4	2000	1000	630	730	710	810

Anchors can be supplied with HT end cap in L<sub>1</sub> or L<sub>2</sub> ends. See also chapter 4.6.4 and 4.6.5.

## HT3 components - steel

### Anchor elbow - P235GH seamless

#### Description

As a standard anchor elbows and all other pre-insulated components are supplied in two series: the 210°C series and the 250°C series.

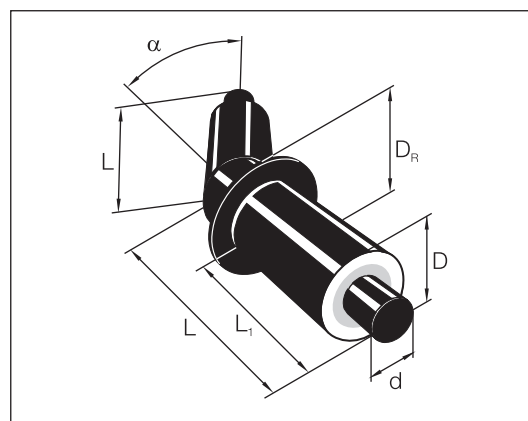
The anchor plate is sufficiently thermally protected to ensure that the jacket pipe and shrink seals are not overloaded. Its thickness and diameter are designed to ensure that any forces arising are transferred to the concrete block, see chapter 4.4.5.

All pipes and pre-insulated components are fully foamed at the ends, protecting the mineral wool end sections against moisture ingress during storage and handling. The pipe ends may only be cut and removed after the carrier pipes have been welded and just before shrinkage of the sleeves.

For specifications of carrier pipes, insulation and jackets, see section 1.2, Material specifications.

Delivered with weld fitting according to EN 10253-2.

Component No. 40012L



DN	d	L	L <sub>1</sub>	210°C series		250°C series	
				D	D <sub>R</sub>	D	D <sub>R</sub>
20	26.9	1700	1015	140	240	180	280
25	33.7	1700	1015	140	240	180	280
32	42.4	1700	1015	160	260	200	300
40	48.3	1700	1015	160	260	225	325
50	60.3	1700	1015	200	300	225	325
65	76.4	1700	1015	225	300	250	350
80	88.9	1700	1015	225	300	280	380
100	114.3	1700	1015	250	350	315	415
125	139.7	1700	1015	315	415	400	500
150	168.3	1700	1015	355	455	400	500
200	219.1	1700	1015	400	500	450	550
250	273.0	1700	1015	450	550	500	600
300	323.9	1700	1015	500	600	560	660
350	355.6	1700	1015	560	660	630	730
400	406.4	1700	1015	630	760	710	810

Anchors can be supplied with HT end cap in one of the ends. See also chapter 4.6.4 and 4.6.5.

## HT3 components - steel Compensator - P235GH seamless

### Description

As a standard compensators and all other pre-insulated components are supplied in two series: the 210°C series and the 250°C series.

Compensators are available in standard format for PN 16 or PN 25.

Compensators for higher pressures are made to the customer's specifications.

The nominal pressure applies at 120°C.

At 200°C a pressure reduction factor of 0.91 and at 300°C a factor of 0.82 is required.

All pipes and pre-insulated components are fully foamed at the ends, protecting the mineral wool end sections against moisture ingress during storage and handling. The pipe ends may only be cut and removed after the carrier pipes have been welded and just before shrinkage of the sleeves.

The compensator is factory-set for maximum expansion absorption and retaining bolts are used to retain this setting. The bolts will burst once the compensator becomes active, and the required burst force  $P$ , is stated on the next page..

The expansion-absorbing element is a corrugated section consisting of several layers of stainless steel, welded onto both pipe ends. This section is approved to max. 1000 full load cycles.

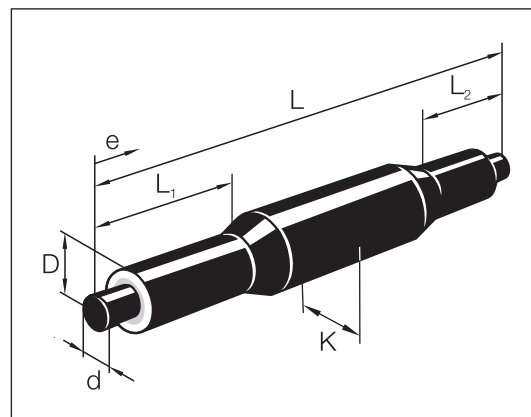
A housing of either steel or stainless steel protects this construction.

The compensator exerts spring force at a spring constant  $C_A$ .

The effective corrugated surface  $A_B$  mm<sup>2</sup> is stated on the next page.

For specifications of carrier pipes, insulation and jackets, see section 1.2, Material specifications.

Component No. 41001L



## HT3 components - steel

### Compensator - P235GH seamless

Description,  
*continued*

d, mm	L, mm	D, mm	210°C / PN 16					250°C / PN 25					
			K, mm	ΔLe, mm	P, kN	C <sub>A</sub> , N/mm	A <sub>B</sub> , mm <sup>2</sup>	D, mm	K, mm	ΔLe, mm	P, kN	C <sub>A</sub> , N/mm	A <sub>B</sub> , mm <sup>2</sup>
48.3	2500	160	200	100	18	15	4100	-	-	-	-	-	-
60.3	2500	200	250	100	18	43	5500	-	-	-	-	-	-
76.1	2500	225	280	100	18	51	7600	-	-	-	-	-	-
88.9	2500	225	280	100	18	45	10800	280	400	90	18	37	10900
114.3	2500	250	315	125	18	27	17300	315	400	90	18	31	16700
139.7	2500	315	400	125	23	58	23700	400	500	90	23	58	24800
168.3	2500	355	400	125	23	63	33200	400	500	90	23	45	35100
219.1	3000	400	450	125	23	53	56000	450	560	90	23	66	57600
273	3000	450	500	125	41	81	81000	500	630	90	41	106	85700
323.9	3000	500	560	125	41	91	110700	560	710	90	41	153	121600
355.6	3000	560	630	125	64	101	130500	630	710	90	64	105	136500
406.4	3000	630	710	125	64	108	173800	710	800	90	64	119	179300

The compensators can be supplied with double expansion on request.

## HT3 components - joints

### HBXSJoint, black

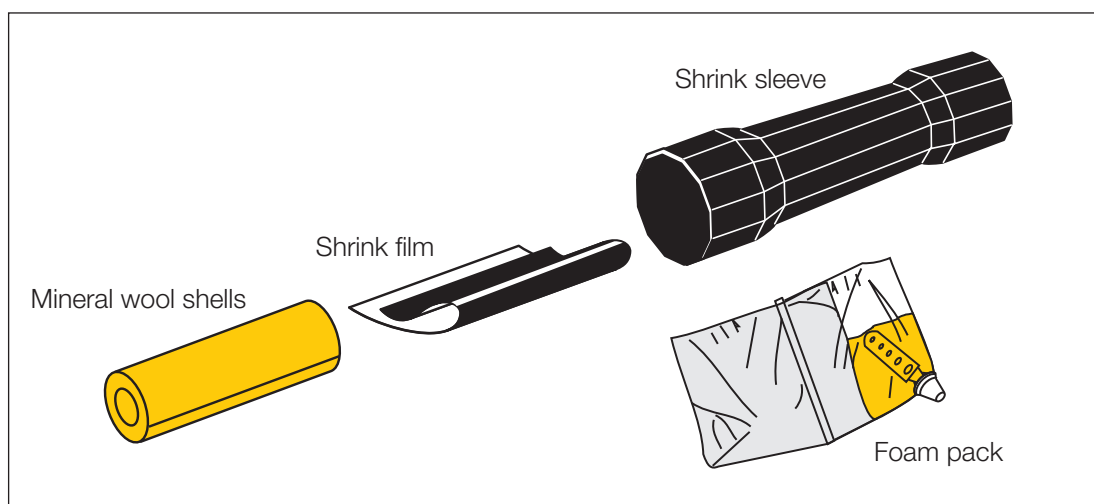
#### Description

The insulation of the HBXSJoint consists of mineral wool shells and PUR insulation, foamed in an aluminium sleeve.

The joint is double sealed. The first seal is obtained by shrinking the shrink film over the joint. The second seal is obtained by shrinking a PEX shrink sleeve, fitted internally with an adhesive at both ends.

The PEX shrink sleeve has a high wall thickness, so the joint is mechanical and safely secured against tensile stress.

The HBXSJoint can be used anywhere it has been established that soil friction can firmly hold the jacket pipe in place. See chapter 4.4.6.



Component No. 50501LC

DN	d mm	L mm	210°C series					250°C series				
			D mm	S <sub>M</sub> mm	S <sub>PUR</sub> <sup>*</sup> mm	PUR l	Foam pack size	D mm	S <sub>M</sub> mm	S <sub>PUR</sub> <sup>*</sup> mm	PUR l	Foam pack size
20	26.9	780	140	20	34	3.6	1	180	40	33	4.9	3
25	33.7	780	140	20	30	3.3	1	180	40	30	4.6	2
32	42.4	780	160	20	36	4.4	2	200	40	35	5.9	4
40	48.3	780	160	20	33	4.2	2	225	50	35	6.7	4
50	60.3	780	200	30	37	6.0	4	225	50	29	5.9	4
65	76.1	780	225	30	41	7.6	5	250	50	33	7.4	5
80	88.9	780	225	30	35	6.7	4	280	60	31	8.2	5
100	114.3	780	250	30	34	7.6	5	315	60	36	10.4	6
125	139.7	780	315	40	43	12	7	400	80	44	16.5	9

S<sub>M</sub> : Mineral wool thickness in the insulation shells

S<sub>PUR</sub><sup>\*</sup>: PUR insulation thickness

## HT3 components - joints

### HBXJoint, black

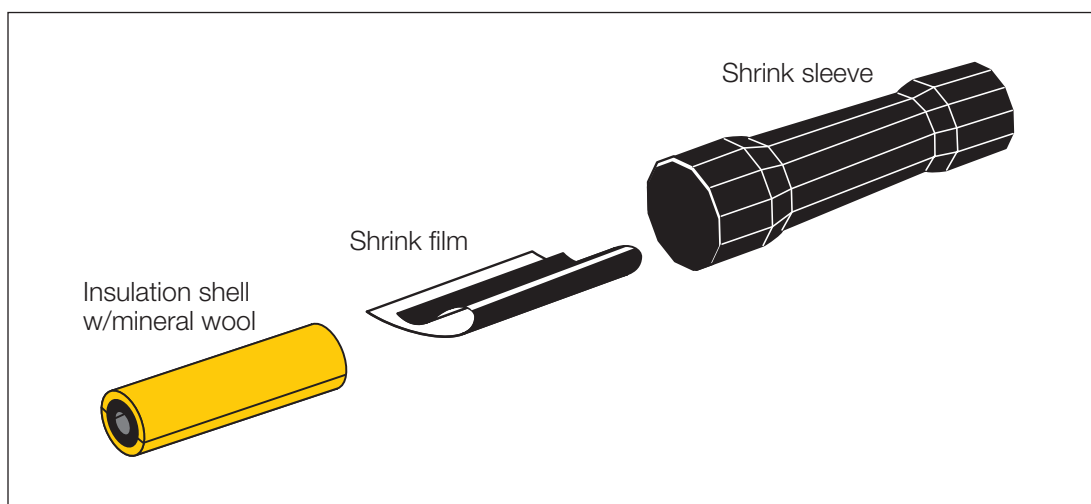
#### Description

The insulation of the HBXJoint consists of shells with mineral wool.

The joint is double sealed. The first seal is obtained by shrinking the shrink film over the joint. The second seal is obtained by shrinking a PEX shrink sleeve, fitted internally with an adhesive at both ends.

The PEX shrink sleeve has a high wall thickness, so the joint is mechanical and safely secured against tensile stress.

The HBXJoint can be used anywhere it has been established that soil friction can firmly hold the jacket pipe in place. See chapter 4.4.6.



Component No. 50301LC

DN	d	L	210°C series		250°C series	
			D	S <sub>M</sub>	D	S <sub>M</sub>
	mm	mm	mm	mm	mm	mm
20	26.9	780	140	20	180	40
25	33.7	780	140	20	180	40
32	42.4	780	160	20	200	40
40	48.3	780	160	20	225	50
50	60.3	780	200	30	225	50
65	76.1	780	225	30	250	50
80	88.9	780	225	30	280	60
100	114.3	780	250	30	315	60
125	139.7	780	315	40	400	80

S<sub>M</sub> : Mineral wool thickness of insulation shell



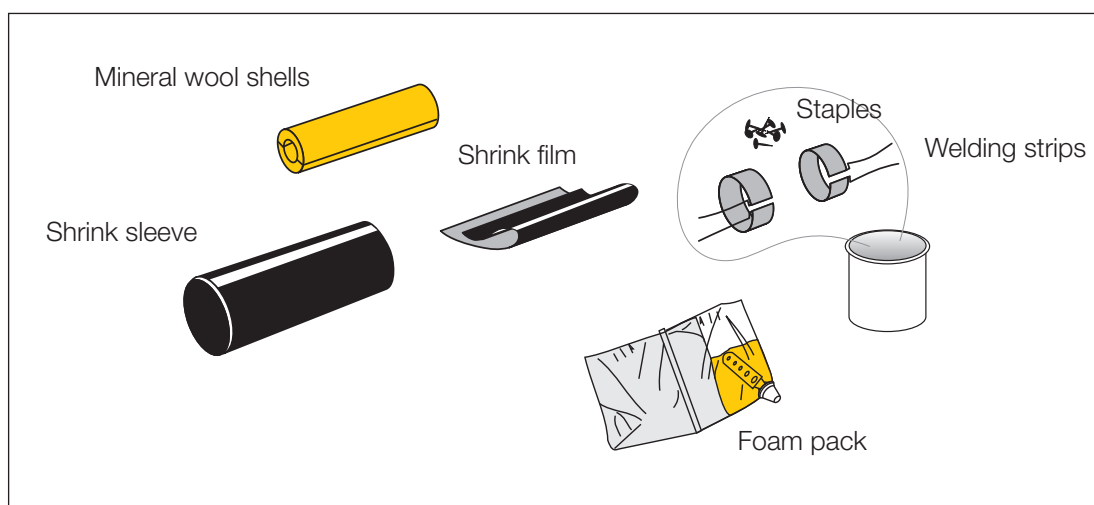
## HT3 components - joints

### HEWJoint, black

#### Description

The HEWJoint consists of a mineral wool insulation, covered by PUR insulation, foamed in an aluminium sleeve. A shrink film is applied as the initial seal. A thick walled HDPE shrink sleeve is fitted to the joint as a second seal and a mechanically solid jacket pipe joint. The sleeve is welded at both ends using electrically-heated welding strips, making the joint power transmitting and resistant to tensile stress.

The HEWJoint must be used, if it cannot be ascertained that soil friction alone can hold the jacket pipe in place. See chapter 4.4.6.



Component No. 50111LC

DN	d mm	Serie 210°C					Serie 250°C				
		L mm	D mm	S <sub>M</sub> mm	PUR l	Foam pack size	L mm	D mm	S <sub>M</sub> mm	PUR l	Foam pack size
50	60.3	-	-	-	-	-	700	225	50	5.9	4
65	76.1	700	225	30	7.6	5	700	250	50	7.4	5
80	88.9	700	225	30	6.7	4	700	280	60	8.2	5
100	114.3	700	250	30	7.6	5	700	315	60	10.4	6
125	139.7	700	315	40	12	7	700	400	80	16.5	9
150	168.3	700	355	50	12.7	7	700	400	80	12.3	7
200	219.1	700	400	50	13.7	8	700	450	80	13.9	8
250	273.0	700	450	50	14.9	8	700	500	80	14.7	8
300	323.9	700	500	50	16.6	9	700	560	80	18.7	9
350	355.6	700	560	50	25	10	750	630	100	20.8	10
400	406.4	750	630	60	28.3	11	750	710	100	32.1	11

S<sub>M</sub> : Mineral wool thickness of insulation shell

S<sub>PUR</sub> : PUR insulation thickness

## HT3 components - joints

### High temperature - HDHEC, black

#### Description

The HDHEC end cap is designed to protect all pipe ends in the system against moisture and oxygen ingress. All open pipe ends **MUST** be fitted with HT caps, as missing HT caps will reduce the service life of the system and the guarantee will lapse.

HDHEC consists of:

- A cone of stainless steel in material quality EN 1.4404, that slots into the carrier pipe at one end and into the insulation between the mineral wool and the PUR at the other. The cone is welded to the carrier pipe.
- To insulate the cone from the carrier pipe, a shell of mineral wool is positioned into the cone.
- The foam is protected by a PEX shrinkable end fitting which is shrunk onto the jacket and the cone.

HDHEC must never be insulated externally as this will cause an unacceptable temperature increase in the shrink materials.

HDHEC can only tolerate a certain amount of expansion so the maximum distance from an HDHEC end cap to an anchor cannot exceed:

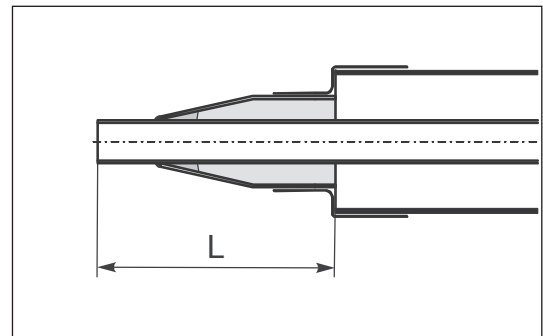
For black steel:

- 5 m in the 210°C series
- 3 m in the 250°C series

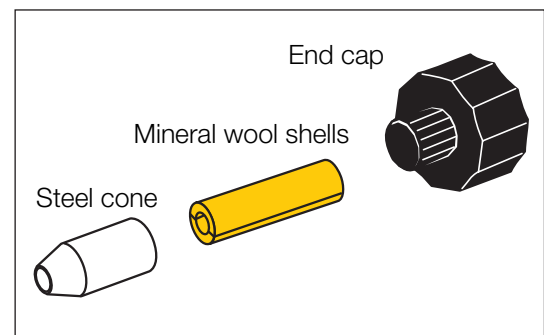
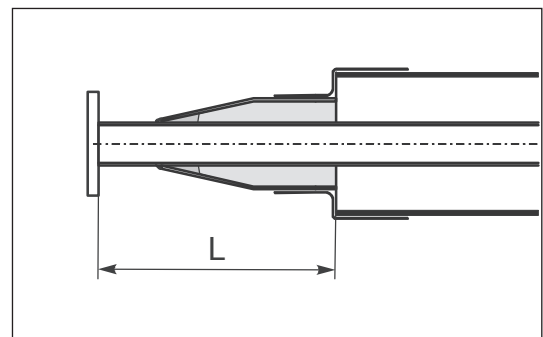
For stainless steel:

- 3 m in the 210°C series
- 2 m in the 250°C series

#### Example 1



#### Example 2



Component No. 55101L

## HT3 components - joints

### High temperature - HDHEC, black

Description  
*continued*

DN	d	210°C series		250°C series	
		D	L	D	L
20	26.9	140	175	180	175
25	33.7	140	195	180	195
32	42.4	160	205	200	205
40	48.3	160	215	225	215
50	60.3	200	215	225	215
65	76.1	225	235	250	235
80	88.9	225	235	280	235
100	114.3	250	235	315	235
125	139.7	315	255	400	255
150	168.3	355	255	400	255
200	219.1	400	275	450	275
250	273.0	450	425	500	425
300	323.9	500	455	560	455
350	355.6	560	485	630	485
400	406.4	630	515	710	515

## HT3 components - joints

### High temperature - HSEC, black

#### Description

The HSEC end cap is designed to protect all pipe ends in the system against moisture and oxygen ingress. All open pipe ends **MUST** be fitted with HT caps, as missing HT caps will reduce the service life of the system and invalidate the guarantee.

HSEC consists of:

- A cap of stainless steel in material quality EN 1.4404, adjusted to the diameters of the carrier pipe and the jacket pipe.
- To isolate the cap from the foam a mineral wool disc is inserted in the cap.
- The foam is protected by a PEX shrink collar which is shrunk onto the jacket and the cap.

HSEC must never be insulated externally as this will cause an unacceptable temperature increase in the shrink materials.

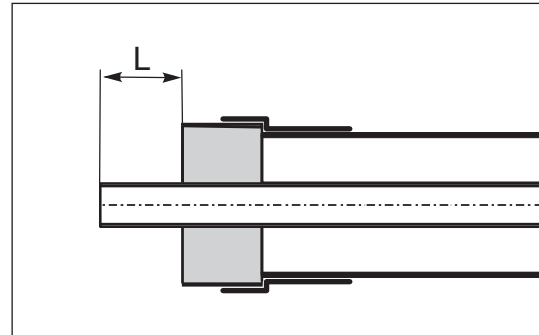
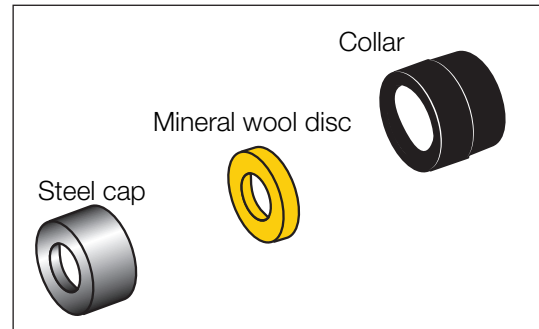
HSEC can only tolerate a certain amount of expansion so the maximum distance from a HSEC end cap to an anchor cannot exceed:

For black steel:

- 5 m in the 210°C series
- 3 m in the 250°C series

For stainless steel:

- 3 m in the 210°C series
- 2 m in the 250°C series



Component No. 56001L

DN	d	Series 210°C		Series 250°C	
		D	L	D	L
20	26.9	140	100	180	100
25	33.7	140	100	180	100
32	42.4	160	100	200	100
40	48.3	160	100	225	100
50	60.3	200	100	225	100
65	76.1	225	100	250	100
80	88.9	225	100	280	100
100	114.3	250	100	315	150
125	139.7	315	150	400	150
150	168.3	355	150	400	150
200	219.1	400	150	450	150
250	273.0	450	150	500	150
300	323.9	500	150	560	150
350	355.6	560	150	630	150
400	406.4	630	150	710	150

## HT3 components - joints

### Wall entry sleeve

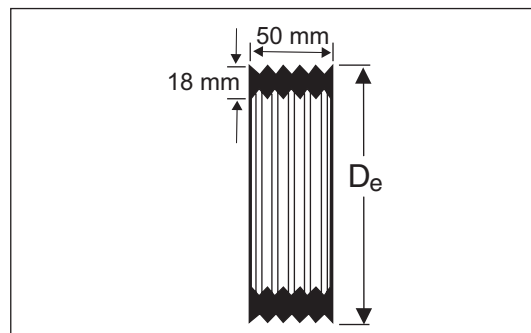
**Application** Where pipes are installed through masonry - at wells, footings etc. - wall entry sleeves are installed as a seal against water ingress.

**Description** The wall entry sleeves are made of an extremely resistant rubber which, together with a good sealing effect, also allows minor expansion movements at the entry point.

Exposed to groundwater pressure the wall entry sleeves may not be watertight. In such cases please contact LOGSTOR.

Note!  $D_e - 2 \times 18 \text{ mm}$  is smaller than the nominal diameter, so the sleeve fits tightly around the outer casing.

As regards diameter of the hole in the base, see Design manual for District Heating..



**Materials** NR-SBR rubber

**Component overview** Component No. 5800

Outer casing ø out. mm	Outside diameter, $D_e$ approx. ø mm
90	124
110	142
125	158
140	173
160	191
180	209
200	229
225	255
250	281
280	312
315	345
355	385
400	430

Outer casing ø out. mm	Outside diameter, $D_e$ approx. ø mm
450	480
500	530
560	590
630	660
710	740
800	830
900	930
1000	1030
1100	1130
1200	1230
1300	1330
1400	1430
1500	1530



## Accessories

### Plugs

**Introduction** This section contains a list of accessories, included in the joint systems. They are normally included in a joint supply, but may be ordered separately.

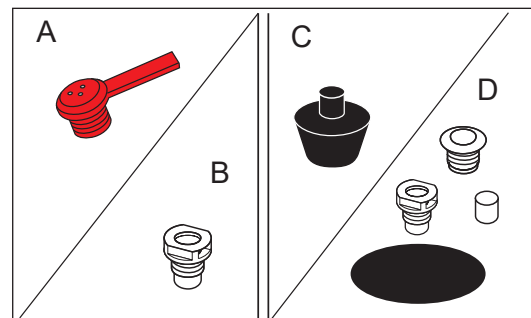
**Description**

A) Loose venting plug:  
ø 17 mm.

B) Loose venting plug:  
ø 24 mm

C) Welding plug:  
ø 35 or 43 mm.

D) Expansion plug, wedge plug and patch  
incl. ø 24 mm venting plug



**Materials**

Venting plug ø 17 mm:	PP
Venting plug ø 24 mm:	LDPE
Welding plug:	HDPE
Expansion plug:	PEX with a ring of butyl mastic
Wedge plug:	PEX
Patch:	PEX with water-resistant hotmelt

**Product No.**

Venting plugs:	A: 25 pcs. in bag, product No. 1220 0000 035 750
	B: 50 pcs. in bag, product No. 1220 0000 020 009
Welding plugs:	C: ø 35 mm, t = 12.5 mm, 25 pcs. in a bag, product No. 1220 0000 035 002 ø 43 mm, t = 12.5 mm, 50 pcs. in a bag, product No. 1220 0000 043 014 ø 43 mm, t = 22.5 mm, 25 pcs. in a bag, product No. 1220 0000 043 005
Expansion plug, wedge plug patch incl. venting plug	D: 1 set in a bag, product No. 1220 0000 010 005

**Application**

Mastic is used to seal between a casing joint and the jacket pipe in connection with LM-, LMC-, BM-, TMC-C- and TMCJoint as well as EC and HEC end cap.

**Component overview/ measurements****- White mastic for LM-, LMC- and BMJoint**

Delivered in packages with 2 pcs. mastic tape

Cross section 20 x 1.5 mm (width x thickness)

Component No. 5435

Product. No.	Jacket pipe ø udv. mm	Mastic L, mm
5435 0110 011 010	90	395
5435 0110 011 010	110	395
5435 0125 011 010	125	435
5435 0140 011 010	140	490
5435 0160 011 010	160	550
5435 0180 011 010	180	610
5435 0200 011 010	200	680
5435 0225 011 010	225	750
5435 0250 011 010	250	830
5435 0280 011 010	280	940
5435 0315 011 010	315	1040

**- White mastic for EC and HEC end cap**

Delivered in packages with 2 pcs. mastic tape

Cross section 20 x 1.5 mm (width x thickness)

Component No. 5435

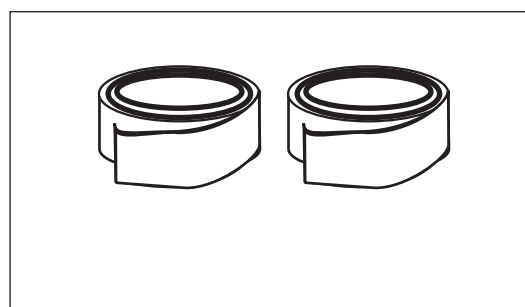
Product. No.	Jacket pipe ø udv. mm	Type designation
5435 0040 013 011	90-110	40A
5435 0170 013 011	110-125	170A
5435 0170 014 011	125-160	170B
5435 0230 013 011	160-200	230A
5435 0230 015 011	200-225	230C
5435 0350 014 011	250-280	350B
5435 0350 015 011	280-315	350C

**- White mastic for other casing joints**

Delivered in 10 m coils

Cross section 20 x 1.5 mm (width x thickness)

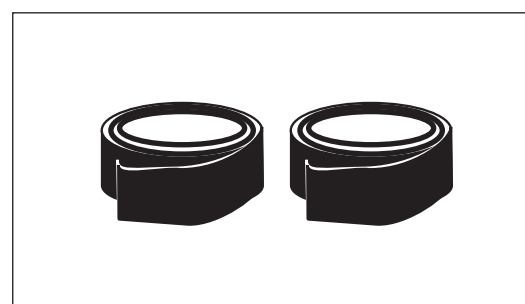
Product. No. 5430 0020 013 000

**- Black mastic for TMC-C- and BMJoint**

Delivered in 10 m coils

Cross section 20 x 1.5 mm (width x thickness)

Product. No. 5430 0020 008 000





## Accessories

### Shrink materials

**Application** For jointing, post-installation, and repairs a number of shrink materials for various purposes are delivered.

**Shrink wrap** A shrink wrap is an open joint which is used for open shrink collars to obtain an additional seal e.g. of SX-WPJoint and BXJoint.

The shrink wrap is with mastic and hotmelt.

The shrink wrap is delivered cut to measure for the dimension with 2 bevelled corners in order to ensure sealing against outer casing and casing joint.

Is delivered with closure patch.

Shrinkability: 25%

Component No. 5400

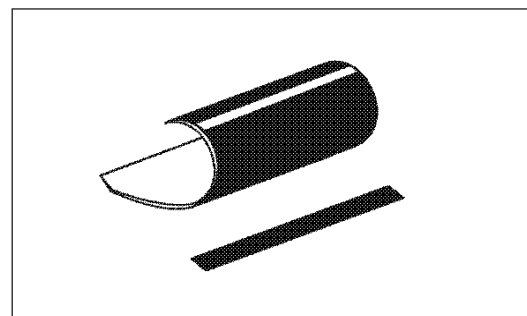
From the table it appears which widths are used as open collars for different outer casing dimensions.

The shrink wrap is available in 3 widths incl. closure patch.

Shrink wrap is also available in coils of 30 m.

To fix the shrink wrap during shrinkage a closure patch is used which fits the width of the shrink wrap.

Component No. 5505



Dimensionan range for outer casing, mm	Shrink wrap Width, mm
77-355	155
400-710	230
780-1400	300

Width, wrap, mm	155	230	300
Width, closure patch, mm	100	150	200
Length, closure patch, mm	153	228	298

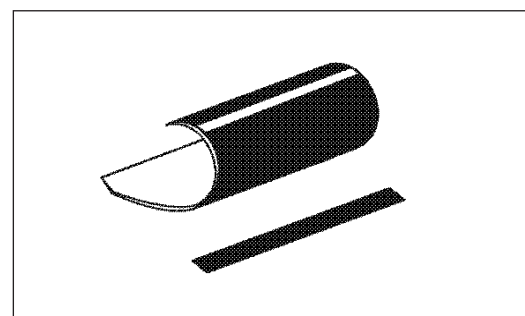
Product No.	Width, mm
5500 0155 017 010	155
5500 0230 017 010	230
5500 0300 017 010	300

Product No.	Closure patch, mm	Shrink wrap, Width, mm
5505 0100 000 153	100 x 153	155
5505 0150 002 228	150 x 228	230
5500 0200 002 298	200 x 298	300

**Shrink wrap for repairs**

Shrink wrap in widths, used for repairs and sealing joints of e.g. C2LJoint is delivered with closure patch.

The shrink wrap is delivered cut to measure for the dimension with 2 bevelled corners in order to ensure sealing against outer casing at the overlap.



**Accessories**  
**Shrink materials**

**Shrink wrap for repairs, continued**

Component No. 5400

Shrink wrap is available in the following widths incl. closure patch.

Width, shrink wrap, mm	640	900
Width, closure patch, mm	100	100
Length, closure patch, mm	638	898

Shrink wrap is also available in coils.

Component No. 5500.

Product No.	Width, mm	Length, m
5500 0640 010 030	640	30
5500 0900 017 010	900	20

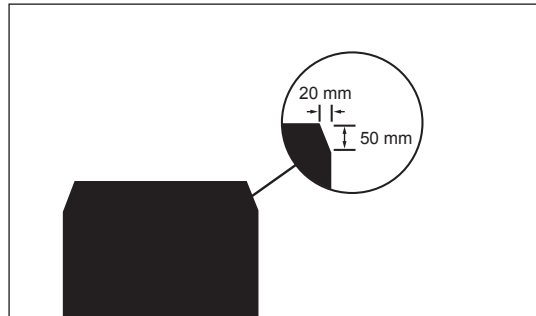
To fix the shrink wrap during shrinkage a closure patch is used which fits the width of the shrink wrap.

Component No. 5505

Product No.	Closure patch, mm	Shrink wrap, Width, mm
5505 0100 002 638	100 x 638	680
5505 0100 002 898	100 x 898	900

From the table the cutting lengths for the shrink wrap appears.

For correct installation 2 corners must be bevelled.



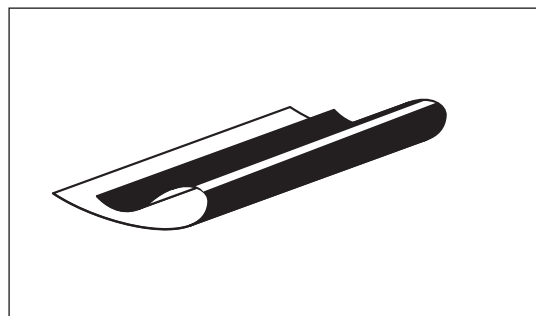
Outer casing ø out. mm	Wrap l mm	Outer casing ø out. mm	Wrap l mm
77	350	315	1150
90	390	355	1340
110	460	400	1440
125	510	450	1600
140	560	500	1780
160	620	560	2000
180	690	630	2200
200	760	710	2450
225	850	800	2800
250	940	900	3100
280	1040	1000	3400

**Shrink film**

A shrink film is used for the first seal of outer casing joints.

Must always be covered by a wrap or a casing joint.

Shrinkability: 20%



## Shrink materials

**Shrink film,  
continued**

Width of shrink film: 550 mm

Closure patch is not used for shrink film.

Component overview:

Outer casing ø out. mm	Film l mm	Outer casing ø out. mm	Film l mm
77	340	315	1140
90	380	355	1265
110	445	400	1400
125	520	450	1560
140	560	500	1720
160	630	560	1960
180	690	630	2180
200	750	710	2430
225	830	800	2710
250	910	900	3030
280	1000	1000	3340

Shrink film is also available in coils.

Product No.	Width, mm	Length, m
5500 0550 011 030	550	30

**Shrink wrap for  
T-joint**

Shrink wrap for T-joint is with mastic.

The shrink wrap is delivered cut to measure for the dimension and with a hole for one or two branches.

Two corners are bevelled to ensure sealing against the outer casing and the T-joint.

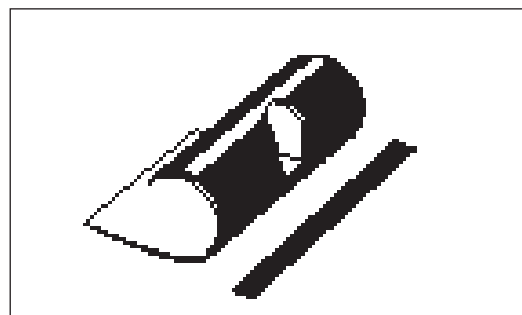
Is delivered with closure patch.

Shrinkability: 30%.

Component No. 5405.

Shrink wrap for T-joint is available in 2 widths dependent on the length of the base pipe of the T-joint.

Ordered to measurements and with hole(s) for one or two branches.



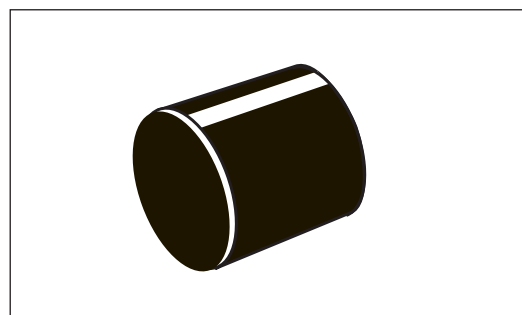
Component overview:

Width, shrink wrap, mm	650	900
Width, T-joint, mm	400	600-700
Length, closure patch, mm	100 x 648	100 x 898

**Shrink collar**

A shrink collar is primarily used to seal outer casings joints on flexible pipes.

Shrink collars are with mastic.



## 5.1.7 - 7/10

### Accessories Shrink materials

Shrink collar,  
*continued*

Sleeve length:  
ø 77-315 mm = 150 mm  
ø 355-560 mm = 225 mm

Component overview:

Product No.	Outer casing ø out. mm	Shrinkability from/to mm	Product No.	Outer casing ø out. mm	Shrinkability from/to mm
5500 0095 010 150	77	95/65	5500 0290 010 150	250	290/185
5500 0115 010 150	90	115/80	5500 0330 010 150	280	330/210
5500 0130 010 150	110	130/90	5500 0370 010 150	315	370/235
5500 0155 010 150	125	155/100	5500 0395 010 225	355	395/250
5500 0170 010 150	140	170/110	5500 0450 010 225	400	450/285
5500 0190 010 150	160	190/125	5500 0505 010 225	450	505/315
5500 0210 010 150	180	210/135	5500 0555 010 225	500	555/350
5500 0225 010 150	200	225/145	5500 0625 010 225	560	625/385
5500 0260 010 150	225	260/165	5500 0775 010 225	630	775/480

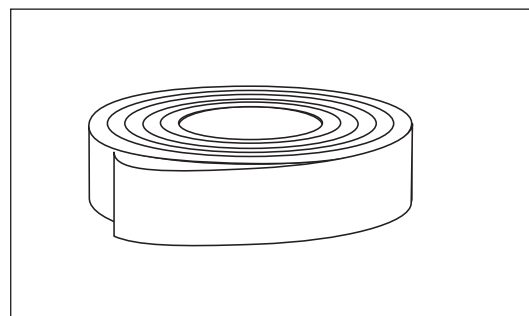
**Application** For casing joint installation and corrosion protection a number of types for various purposes are available.

**Linen tape**

Linen tape is used to secure the insulation shells when installing casing joints.

Measurements: B = 38 mm  
L = 10 m

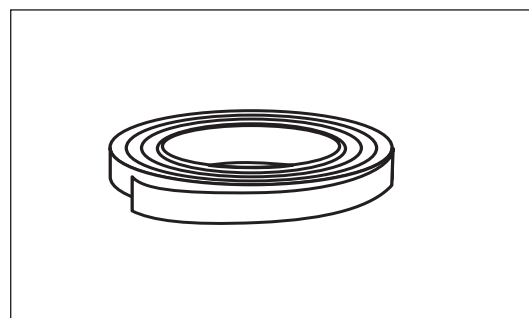
Product No. 7100 0038 001 000

**Filament tape**

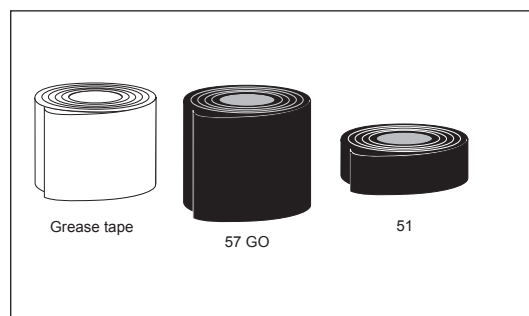
Filament tape is used to secure the casing joint during installation.

Measurements: B = 25 mm  
L = 50 m

Product No. 7100 0025 003 000

**Anti-corrosion tape**

There are 3 types of anti-corrosion tape.

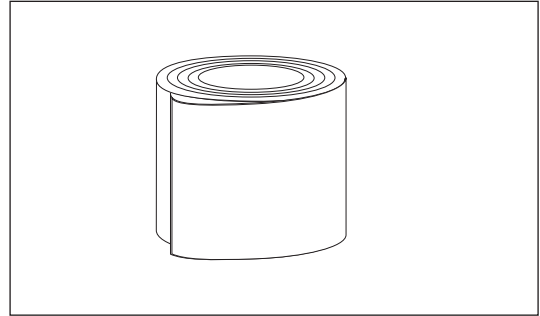


Product No.	Application	Type	Measurements
5520 0150 002 020	Repair of smooth and corrugated outer casing without use of gas burner. The 57 GO tape is self vulcanizing.	Nitto 57 GO/C	150 mm x 2 mm x 2 m
5520 0150 002 100		Nitto 57 GO/CA	150 mm x 2 mm x 10 m
5520 0450 002 100		Nitto 57 GO/cA	450 mm x 2 mm x 10 m
5520 0050 001 305	Used on the outside of Nitto "57 GO" to protect against corrosion	Nitto 51	50 mm x 30,5 m
5620 0100 001 305		Nitto 51	100 mm x 30,5 m
4000 0100 036 010	Used to protect steel pipes e.g. when using 2 wall entry sleeves in connection with a house entry	Denso - FEU or Densyl TDC	100 mm x 10 m

**Application** For foaming at service pipe temperatures  $< +10\text{ }^{\circ}\text{C}$  or  $> +50\text{ }^{\circ}\text{C}$  a layer of PUR-foam around the service pipe can be before foaming.

---

**Description** 5 mm thick cross-linked polyethylene foam.



**Material** Cross-linked polyethylene foam with closed cells.

---

**Product No.** Product No. 9000 0000 023 156.

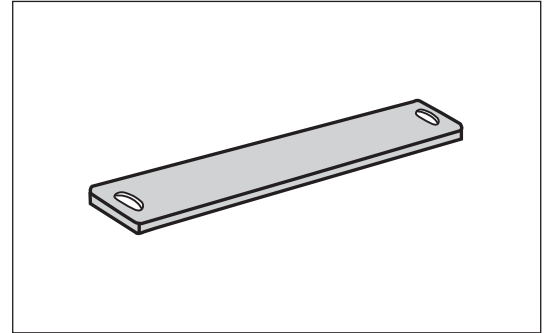
W x L = 420 mm x 25 m

---

**Application** Tile to be used in the retaining tool, when installing LMC- and TMCJoint.  
2 pcs. are required for one set of retaining tools.

---

**Description** Loose tile in 8 mm thickness.



**Material** Glazed ceramic.

---

**Product No.** Product No. 9050 0000 021 001.  
B x L = 57 x 590 mm.

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# 6.1.1

## Tools

### Contents

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<b>Contents</b>	6.1.2	Tools for shortening and calibration
	6.1.3	Welding machines for weld joints
	6.1.4	Tool boxes for weld joints
	6.1.5	Installation equipment for BandJoint
	6.1.7	Installation equipment for EWJoint
	6.1.8	Tools for shrink joints
	6.1.9	Tools for expansion plugs
	6.1.10	Tools for weld plugs
	6.1.11	Leakage test equipment
	6.1.12	Tools for LOGSTOR Detect

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## Tools for shortening and calibration

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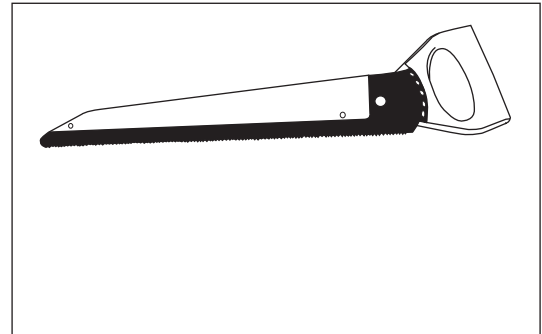
### Eclipse saw

An eclipse saw with depth guard is used to cut outer casings and insulation.

The depth guard prevents that the service pipe and surveillance wires are damaged, when cutting the outer casing.

To shorten insulation shells the eclipse saw is used without depth guard.

Product No.: 9000 0000 003 002



## Welding machines for weld joints

### General

To buy or hire installation equipment for LOGSTOR weld joints please contact LOGSTOR Service Department.

### Weld trailer

Contains generator, air compressor, high-pressure hose, 400V + 230V cables and accessories.

- L 4.5m x W 2.1m x H 2.1 m
- Total weight: 2,000 kg
- Power: 16A, 400V - 20 kWh



### WeldMaster

Contains 2 sets weld cables, drawbar, and transport wheels, hand-held computer (PDA). Applicable for all LOGSTOR weld joints.

- L 750 x W 380 x H 560 mm
- Total weight: 107 kg
- Mains voltage: 3 x 230/400V AC +/- 4% 50 Hz
- Mains connection: 5-pole 16 A CEE plug (3 phase, neutral, earth)



### WeldMaster Light

- L 740 x W 280 x H 340
- Total weight: 25 kg (excl. cables)
- Mains voltage: 3 x 230/400V AC +/- 4% 50 Hz
- Mains connection: 5-pole 16 A CEE plug (3 phase, neutral, earth)



## Tool boxes for weld joints

### General

To buy or hire installation equipment for LOGSTOR weld joints please contact LOGSTOR Service Department.

### BandJoint

#### Basic set

Contains hand tools necessary to install BandJoints in dimensions up to and including  $\varnothing 710$  mm.

Product No. 9050 1650 000 000



#### Additional tools

Additional tools for installing PlateJoint in dimensions  $\geq \varnothing 800$  mm.

To be used together with the basic set.

Product No. 9050 1390 000 000



### EWJoint

Hand tools necessary to install EWJoints.



### Extrusion welding

Milling guide and extrusion guide for longitudinal extrusion welding.



## Installation equipment for BandJoint

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### General

To install BandJoints two pressure bands and a pressure rail are used. To buy or hire installation equipment for weld joints please contact LOGSTOR Service Department.

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Pressure band  
ø90 - 200 mm

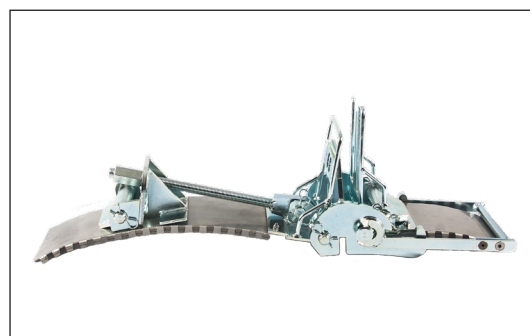


Pressure band  
ø225 - 800 mm



Pressure band  
ø800-1400 mm

Handles for pressure bands and straps.



Pressure bands and straps.

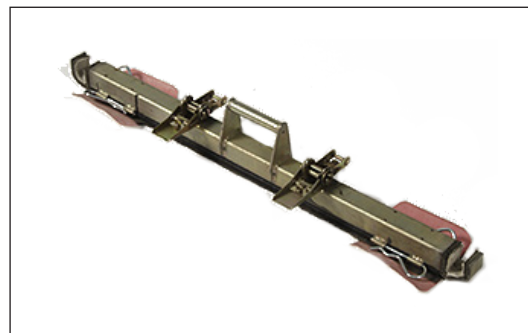


## Installation equipment for BandJoint

**Pressure rail**  
ø90 - 200 mm

Standard:  
Fits casing joint length 570 mm.

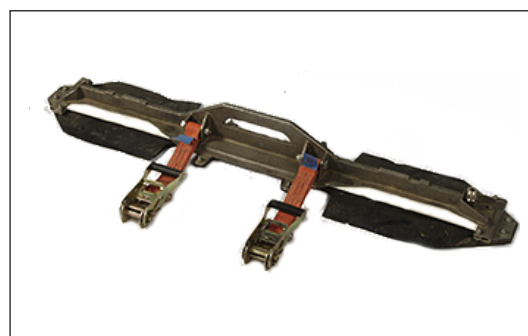
Long:  
For E-Comp and repairs.  
Fits casing joint length 830 mm.



**Pressure rail**  
ø225 - 1400 mm

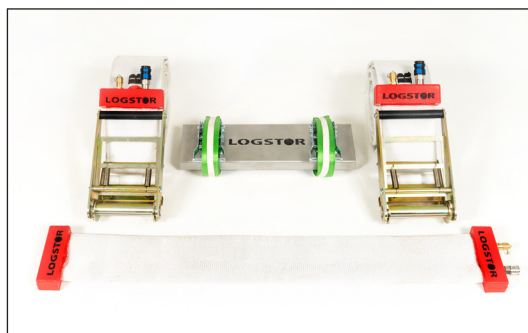
Standard:  
Fits casing joint lengths 630 mm.

Long:  
For E-Comp and repairs.  
Fits casing joint length 1020 mm.



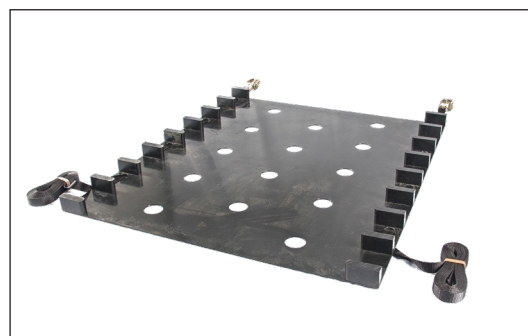
**Flexible pressure tool**  
ø225-800 mm

Product No. 9050 0000 000 007



**Guiding tool**

Auxiliary tool facilitating the installation of BandJoints in large dimensions ( $\geq \text{ø}630 \text{ mm}$ ).



## Installation equipment for EWJoint

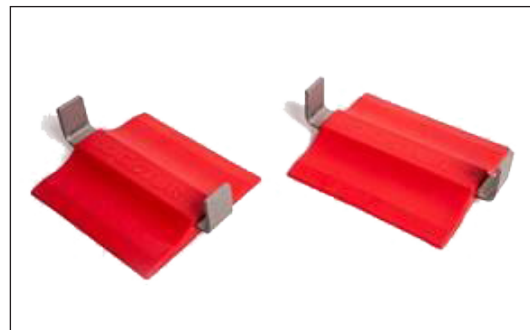
### General

To buy or hire installation equipment for weld joints please contact LOGSTOR.

### EW wedge set

For use with flexible pressure tool  $\varnothing 225 - 800$  mm.

Product No. 9050 0000 000 021



### EW band

Pressure band to install EWJoint in dimensions  $\varnothing 90-1400$  mm.

One size per dimension.



### EW tightening clamp

Tightening clamp for EW band.

Small for  $\varnothing 90-560$  mm

Big for  $\varnothing 90-1400$  mm



### EW multi tool

Pressure band for more dimensions:

- $\varnothing 140-160$  mm
- $\varnothing 180-200$  mm
- $\varnothing 225-280$  mm
- $\varnothing 315-400$  mm
- $\varnothing 450-560$  mm
- $\varnothing 630-800$  mm



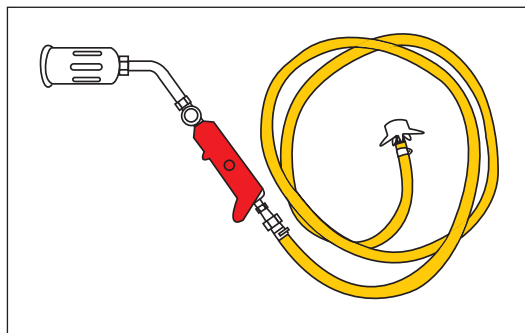
## Tools for shrink joints

## Gas burner set

For installation of shrink sleeve.

Complete burner set for propane gas with a 10 m hose and a 50 mm burner head.

Hose union	Product No.
for regulator	9000 0000 001 943
with ½" thread	9000 0000 001 944



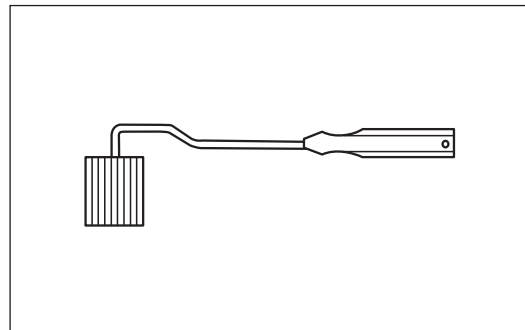
## Spare parts for gas burner set

	Product No.
Burner head ø50 mm	9000 0000 010 001
Burner head ø60 mm	9000 0000 010 002
Burner pipe 200 mm	9000 0000 011 000
Burner handle	9000 0000 012 000
Gas hose 10 m	9000 0000 013 000
Hose union for regulator	9000 0000 017 000
Hose union with ½" thread	9000 0000 021 000

## Roller

For compressing overlap on open shrink wraps and collars.

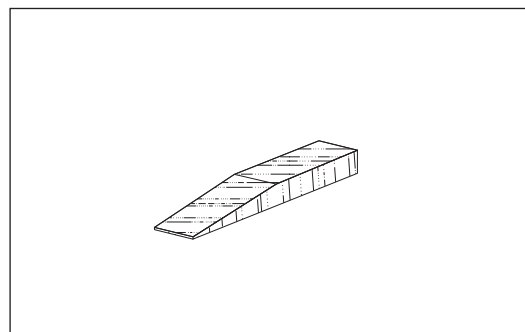
Product No. 9000 0000 008 000



## Wooden wedge

For centering shrink sleeves during installation.

Delivered in bags with 24 pcs.



Type	Length, mm	Height, mm	Width, mm	Product No.
Small, type A	240	13	22	1997 0000 033 002
Big, type B	345	27	32	1997 0000 033 003



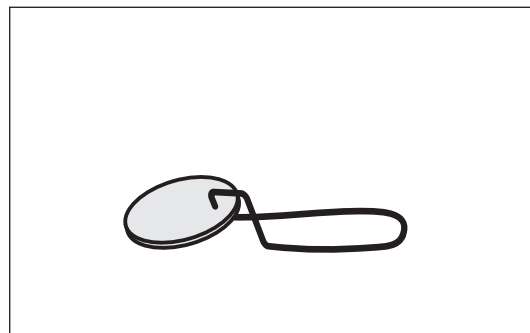
## Tools for expansion plugs

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**Patch spoon**

Retaining tool for installation of patch.

Product No. 9050 0000 025 002

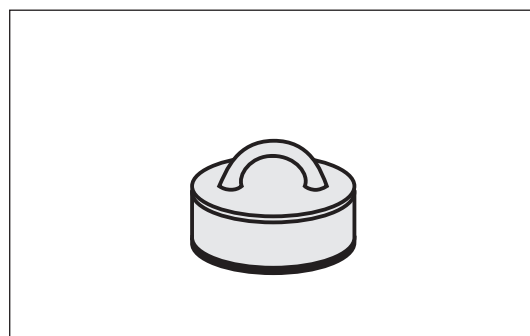


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**Patch press**

For compressing patch.

Product No. 9050 0000 025 004



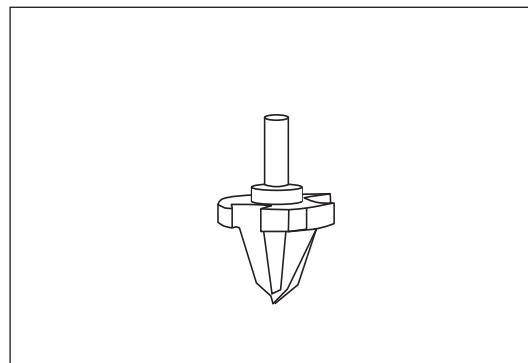
## Tools for weld plugs

**Conical drill bit**

For drilling the foam hole before installing weld plug.

Hole size	Product No.
ø35 mm	9050 0035 023 001
ø43 mm*	9050 0043 023 001

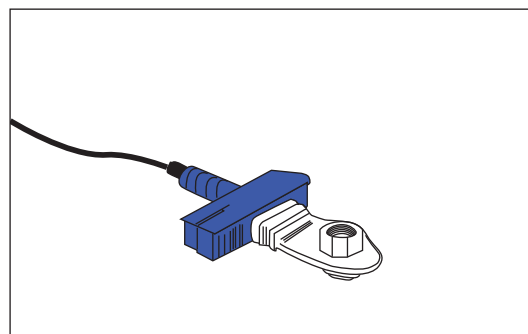
\* For repair use.

**Socket welder**

Socket welder HHSW-63-W for replaceable cones. Cones are ordered separately.

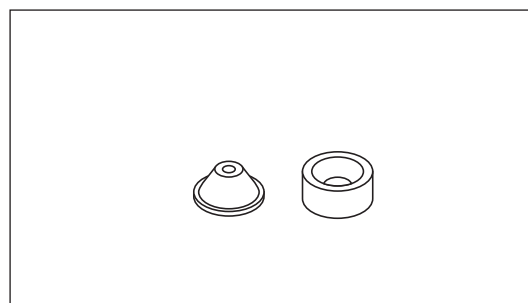
Delivered in a box.

Product No. 9050 0000 023 013.

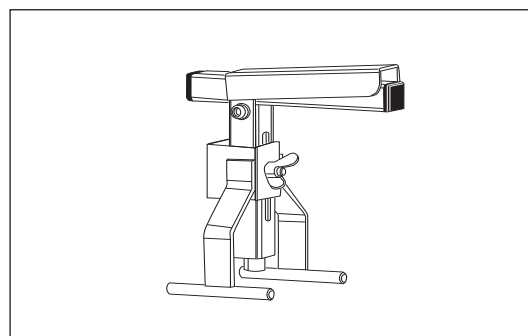
**Cones for socket welder**

Weld plug size	Product No.
ø35 mm	9050 0000 023 010
ø43 mm*	9050 0000 023 011

\* For repair use.

**Retaining tool for weld plug**

Plug No. 9050 0000 025 008



**Leakage test equipment**

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**Hand pump**

Air pump to leakage test casing joints before foaming.

Product Nos. air pumps, complete:  
Hole size 24 mm 9050 0000 027 000  
Hole size 17.5 mm 9050 0000 027 007

Product Nos. manometer with plug:  
Hole size 24 mm 9050 000 027 001  
Hole size 17.5 mm 9050 0000 027 008

Product Nos. extra plug:  
Hole size 24 mm 9050 0000 027 003  
Hole size 17.5 mm 9050 0000 027 009

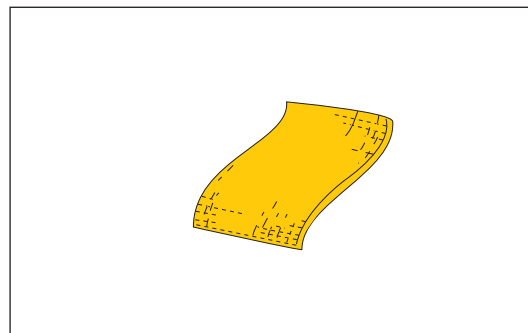


**Tools for LOGSTOR Detect****Synthetic cloth**

For cleaning wire ends before connection and soldering.

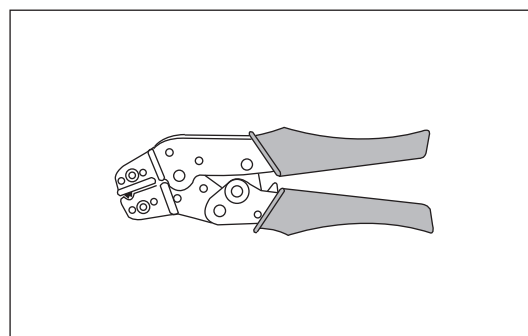
Delivered in packages of 10 pcs.

Product No. 1998 0000 002 002 (10 pcs.)

**Crimping pliers**

Special pliers to compress crimp connectors for connection of copper wires.

Product No. 9000 0000 029 001

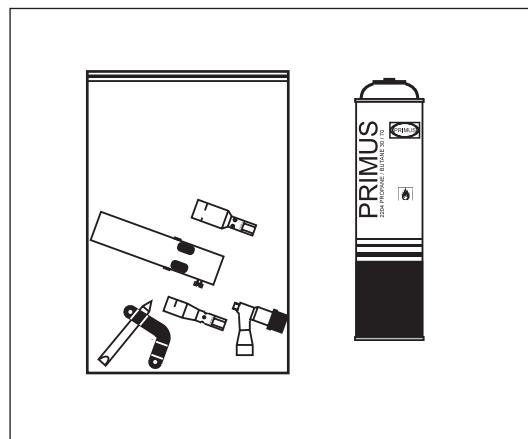
**Gas soldering iron**

For soldering copper wires after connection with crimp connector.

Product No. 9050 0000 040 001

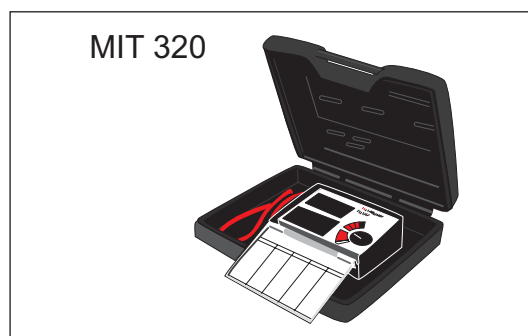
**Extra gas cartridge**

Product No. 9050 0000 019 002

**Megger**

For checking the copper wires.

The megger can be used for low as well as high ohmic systems with or without felt in the joints.



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# Contact details

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