

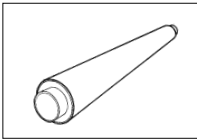
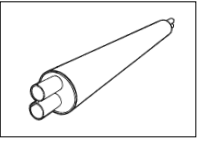
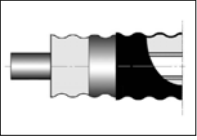
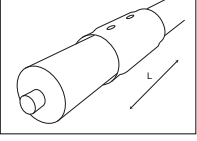
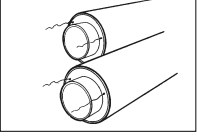
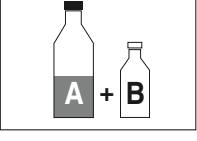
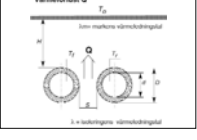
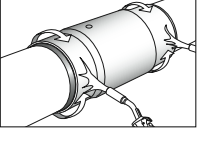



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## Introduction

This catalogue describes Powerpipe and the standard products offered by the company. The purpose being, to give interested parties important information about the company, it's products and their construction, handling and installation.

Consideration has been taken to assure that the information given in this catalogue is correct in regard to standards, norms and regulations at the time of printing.

## Attention

Specifications given in this catalogue can be changed without prior notice .  
Always check with our website at [www.powerpipe.se](http://www.powerpipe.se)

## Technical Support

Powerpipe has, through its many years in the market , developed a wide and comprehensive knowledge in regard to it's products , production and handling of aforementioned products.

As a customer you will have full access to our resources in the form of our technical and Environmental / Quality Departments. Otherwise our first – line technical support is normally carried out by technically experienced sales personnel and our staff at Backoffice.

## Powerpipe – Advantages.

Our combined production facility and administration is in Hisings Kärra outside Göteborg. Our compact facility gives advantages to our customers in the form of flexibility and speedy service and support. We offer individualized solutions for customers to meet the demands of specific applications. We are a company with a focus on the individual customer and to have an extremely high standards for delivery with short delivery times.

First and foremost our standard product portfolio.

## District Heating Distribution Systems

Our products are constructed as a bonded system using a steel service pipe surrounded by a polyurethane foam . These are enclosed in an impact-proof polyethylene casing pipe . These combined elements form a rigid structure with no relative movement between the internal steel pipe and external polyethylene casing. Pipe and pipe fittings are delivered as standard with two copper alarm wires. These for connection to an electronic moisture surveillance system.

We also offer the electronic surveillance system as an option.

Powerpipes pipe fittings are developed to cover a wide area of usage for the customer in respect to bends, valves, branching, drainage, air release etc.

All mentioned components conform to the following norms technical specifications.

## Norms and Standards

Fundamental for Powerpipe's operations are the European Standards for preinsulated pipes and fittings. These are:

District heating systems – *Prefabricated buried pipes with solid bond between the insulation and the service pipe for the distribution of hot water.*

- |                        |  |
|------------------------|--|
| <b>EN 253:2009</b>     | Fitting assemblies of straight steel service pipes, polyurethane thermal insulation (PUR) and outer casing of polyethylene (PE).   |
| <b>EN 448:2009</b>     | Fitting assemblies of steel service pipes, polyurethane thermal insulation (PUR) and outer casing of polyethylene (PE).  |
| <b>EN 488:2009</b>     | Steel valve assembly for steel service pipes, polyurethane thermal insulation (PUR) and outer casing of polyethylene (PE).   |
| <b>EN 489:2009</b>     | Joint assembly for steel service pipes, polyurethane thermal insulation (PUR) and outer casing of polyethylene (PE).   |
| <b>EN 13941:2009</b>   | District heating system - Design and installation of preinsulated bonded pipe systems for district heating with impact proof insulation between service pipe and outer casing.   |
| <b>EN 14419:2009</b>   | District heating system - Preinsulated bonded pipe systems for directly buried hot water networks - Surveillance systems   |
| <b>EN 15698-1:2009</b> | District heating system - Preinsulated bonded twin pipe systems for directly buried hot water networks. Twin pipe assembly of steel service pipe, polyurethane thermal insulation and outer casing of polyethylene(PE) |

In addition to these there are national standards which regulate our operations and products. For example the technical specifications controlled by Svenska Fjärrvärmeföreningen (Swedish District Heating Association) These technical standards conform with EU standards .

## Technical Specifications

### Service pipe (Steel)

Unless otherwise stated in the order, in request or quotation, the following steel qualities are delivered as standard. The products are produced as standard for PN16. Most dimensions can withstand 25 bar. Contact Powerpipe!

### Straight pipes      Longitudinally or spirally welded steel pipe

Material: For dimensions  $\geq$  DN65 P235GH i.a. EN10216-2, EN10217-2 or EN10217-5.  
For dimensions  $\leq$  DN50 P235TR1 i.a. EN10217-1 or EN10217-2.

Certificate According to EN10204/3 3.1.  
can be delivered with each shipment provided our customer forwards this requirement with the order.

Joint preparation: EN ISO 9692-1  
Standard: EN 253:2009

### Seamless steel pipe (can be delivered on request).

Material: As standard P235GH according to EN10216-2.

Certifikat: Enligt EN 10204/ 3.1.

Standard: EN 253:2009

### Insulation (PUR)

The insulation consists of hard polyurethane foam insulation with excellent thermal insulating ability, good mechanical properties and good resistance to aging.

Material: Polyurethane produced by the polyol and isocyanate. C-pentane is used as propellants. Production takes place in a modern high-pressure process.

Standard: EN 253:2009

	Type values: Powerfoam	Requirements : EN 253:2009
Cell size, mm	0,20	–
Closed cell content, %	90,6	–
Core density, kg/m <sup>3</sup>	73	–
Compression strength, MPa	0,39	$\geq 0,30$
Water absorption, %	3,50	–
Axial shear strength, MPa		
+23°C, nes	0,30	$\geq 0,12$
+23°C, aged	0,14	$\geq 0,12$
+140°C, new	0,22	$\geq 0,08$
+140°C, aged	0,13	$\geq 0,08$
Thermal conductivity, W/mK	0,026	$\leq 0,029$
Maximum continuous working temperature °C	145	$\geq 120$
i.a. EN 253:2009		

## Technical Specifications

### Jacket pipe

The product is delivered with a casing pipe in polyethylene bimodal PE80 or PE100 produced by Powerpipe in compliance with EN 253:2009 standards.

Production is within the standards issued by the Swedish Plastic Pipe Manufacturers Association . Norm 5100. All Jacket pipes are treated by corona directly during the extrusion process.

The material fills all the technical specifications stated in EN 253 and is stabilised to withstand thermal, chemical and oxidative degeneration. The material has high impact strength and weather resistance even at low temperatures. In addition the material has excellent welding characteristics and a high resistance to stress corrosion. Pipes with a casing diameter of > 560 mm should be handled with care at outdoor temperatures between 0 and -20° C.

At temperatures below -20°C pipes of these diameters should not be handled without prior instructions from Powerpipe.

Material: High molecular weight Polyethylene (PEH)  
Density:  $\geq 944 \text{ kg/m}^3$   
Standard: EN 253:2009  
Pipe wall thickness: according to EN 253:2009

### Fittings

All fittings are in compliance with the requirements specified in EN 448 and are designed to manage all loads that normally occur within a district heat net.

When in service dependent on the systems design, a number of different loads can affect the fittings which in turn can govern the dimensions and the design used .

Therefore , certain components have a strengthened service pipe to allow greater flexibility in system design.

Steelbends are delivered bended or welded in compliance with DIN 2605. The standard materials used are P235TR1 or P235GH

T- Pieces are normally delivered in a strengthened version which takes into consideration the normal pressure in the main pipe based on a constant pressure specification where the area reduction that the connecting steel pipe governs is limited .

Valves in the Powerpipe product range are as standard delivered according to demands in EN 448. This means they tolerate the normal pressure in the connecting service pipe that corresponds to an axial stress of 300 MPa without the valves functions being compromised.

### Joints

Powerpipe offer a complete range of joints to suit different installation conditions and customer demands. The joints comply with the technical function specifications stated in EN 489

- Weld casing
- Heat- shrinkable casing PEX
- Double –expanded shrinkable casing
- Casing with shrinkable sleeve/tubular sleeve
- Double sealed shrinkable casing (PEH) with shrinkable sleeve and tubular sleeve

The joints are manufactured from high density polyethylene (PEH). The heat shrinkable material are in addition cross-linked. Most joints can be installed by use of a gas flame torch. In the case of electro welding joints, while the weld joints are installed with electric welding equipment.

## Integrated business system:

### Certified in compliance with ISO 9001:2008

Our company has been certified in compliance with ISO 9001:2008 since 1997.

This quality system ensures that customer requirements and wishes are fulfilled. This in addition to compliance with official norms and regulations.

### Certified in compliance with ISO 14001:2004

Our company has always had a strong focus on environmental issues. Powerpipe have been certified in compliance with ISO 14001:2004 since early 2004. This ensures that we work continuously with improvements that reduce the environmental impact caused by our business and products.

### Quality System

ISO 9001 gives assurances that the company fulfils agreed demands. This encompasses our organization, shared responsibilities, routines, processes, and our use of resources. These, in combination, mean that our delivered product has the correct quality and is compliant with both customer requirements and a consistent quality control policy.

### Quality Policy

Powerpipe shall manufacture and adapt products that are compliant with the individual customer's wishes and requirements. This, in addition to fulfilling the demands of the relevant EN standards.

We shall deliver the correct and appropriate products and services to the correct location at the correct time, both of which are to the customers satisfaction in relation to quality.

### Testing

Powerpipe have routines and procedures for continuous testing and control of all products and equipment which are consistent with customer demands and official regulation. As a component of our quality control system, a continuous visual inspection and test of alarms on 100% of our products is carried out. In addition, we have constantly test and check foam density on straight pipes and fittings. All testing is fully documented and has a comprehensive follow-up. All our products are labelled and marked in compliance with the relevant norms.

### SP

The Swedish Technical Research Institute (SP), is testing our products on a yearly basis. This, in compliance with EN 253. These tests are carried out in the following areas:

- Adhesion
- Tensile test
- Compressive Strength
- Voids and bubbles

The results are documented in official reports and free for inspection

Welds in steel pipe fittings are checked and controlled by X-ray in compliance with EN 253, or to a customer specification over and above this standard.

## Environment

### **Certified according to ISO 14001:2004**

The system includes a control for the external environment. It describes the activities, emissions and emission status, surveys / inspections, waste management, including recycling and reporting internally and to the authorities. Environment Department carries out an annual inspection of the business. Every three years, is a third-party inspection.

### **Recycling**

During the production of preinsulated pipes and fittings, different types of waste materials are produced. Such waste comes from the start up of the process and sometimes also from products rejected by our quality control. Powerpipe has defined routines for how to handle these waste materials.

- PEH is re-granulated and re-used
- Steel pipes are re-used, when possible, in our own production or else sent as steel scrap for re-melting.
- PUR foam is sent to an incineration plant where it is burned (generates district heating)
- Alarm wire will be sent as scrap for re-melting

Hazardous waste are collected for transportation to a licensed professional. In cases where the client wants to return the remains of materials, we are able to provide the service against payment.

## **Environmental policy**

Powerpipe Systems AB develops, produce and offer environmental products for district heating and industrial applications. Due to the supply to the Society with high-insulated products, which intend to give a good long-term energy supply. We are convinced that an activity regarding environmental issues is creating a competitive strength on long term and will strengthen our reputation on the market.

This we achieve by:

- Prevent pollution in air, ground and water.
- The Transports internal as external shall encourage for a decreased influencing on environment.
- To do constant improvement in production facilities which leads to effectiveness in increased use of energy and materials.
- Laws and regulation will be followed and provided.

## Certificat

# EUROHEAT & POWER

CERTIFICATE NUMBER 01/12

<b>PRODUCT</b>	"Powerpipe" preinsulated district heating pipes and fittings, single pipe system, with service pipes DN 20 - 1000 mm and casing pipes 75 - 1200 mm
<b>LICENSEE</b>	Powerpipe Systems AB Box 44, SE-425 05 Hisings-Kärra, Sweden
<b>PRODUCTION PLANT</b>	Powerpipe Systems AB Box 44, SE-425 05 Hisings-Kärra, Sweden

**EUROHEAT & POWER**  
GUIDELINES: EHP/001  
CERTIFICATE: 01 / 12

VALID UNTIL 31/12/2011

This certificate is granted in accordance with the Euroheat & Power Certification Guidelines for Quality Assessment of District Heating Pipes [001]

<b>Name, Signature</b>	<b>Date, Place</b>
Lennart Mansson 	06.04.2009, Borås

SP Technical Research  
Institute of Sweden  
PO Box 857,  
SE-50115 Borås,  
Sweden  
www.sp.se

The production complies with EN 253, EN 448 and EHP Certification Guidelines [001]. The licensee may use the Euroheat & Power Certification Board quality mark.

The certificate is valid only for the production plant mentioned in the certificate.

The materials used are contained in the confidential Annex to this certificate.

The certificate is valid for 3 years subject to periodic surveillance. Re-issue is automatic.

Refer to the Euroheat & Power Certification Guidelines [001] for full requirements and conditions.

Certificate

Certifikat  
Utfärdat till

**Powerpipe Systems AB**  
Hisings Kärra, Sverige

Bureau Veritas Certification intygar härmed att ledningssystemet hos ovan nämnda företag har undergått granskning och befunnits vara i överensstämmelse med kraven i ledningssystemstandarden nedan

---

Standard

SS-EN ISO 9001: 2008  
SS-EN ISO 14001: 2004

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Giltighetsområde

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Utveckling och försäljning av förisolerade rörssystem.

Upprättat datum ISO 9001: 7 april 1997  
Upprättat datum ISO 14001: 14 mars 2005

Under förutsättning att ledningssystemets formatta funktion befinns vara tillfredsställande, är detta certifikat giltigt till **30 maj 2012**

För att kontrollera detta certifikats giltighet varligen ring +46 31 60 65 00

Ytterligare förtydligande rörande certifikatets giltighetsområde och tillämpningen av ledningssystemets krav kan erhållas genom att kontakta företaget

Jan-Olof Mårberg, Technical Manager, Bureau Veritas Certification Sverige AB

Datum: 7 maj 2009

Certifikat Nummer: 9000191

Bureau Veritas Certification Sverige AB, Förlagsgatan 13, 412 16 GÖTEBORG, Sverige

1236  
ISO/IEC 17021