THE NEXT GENERATION OF PRE-INSULATED PIPES FOR HEAT NETWORKS
The next generation of pre-insulated flexible pipe systems for high-temperature and high-pressure district heating applications

**System Overview**

Hiline FibreFlex and FibreFlex Pro are cutting-edge pre-insulated, flexible pipe systems that combine a high-modulus aramid mesh reinforcement with modern polymer materials in a multi-layer pipe construction. This significantly improved structure allows plastic pipes to be used at high operating pressures of up to 16 bar and operating temperatures of up to 115°C peak.

This makes Hiline FibreFlex and FibreFlex Pro ideal alternative, or complimentary, piping solutions to rigid pre-insulated steel pipes commonly found in district heating networks. Additionally, they can provide an alternative to conventional pre-insulated PE-Xa pipes, offering higher performance and improved factors of safety.

**Efficient Insulation**

FibreFlex and FibreFlex Pro pipes are insulated in one continuous manufacturing process, using a CFC-free bonded polyurethane foam with an outstanding thermal conductivity value of $\lambda \leq 0.021$ W/mK at 50°C. As the insulation layer has a lower thermal conductivity than conventional pre-insulated steel pipes ($\lambda = 0.07$ W/mK), in diameters up to 80mm, both FibreFlex systems’ heat loss is lower than insulation series S3 pipes and in larger diameters, heat loss is lower than series S2 pipes.

When compared to conventional, bonded pre-insulated PE-Xa pipes, the heat loss can be up to 17% lower for the FibreFlex systems and even better when compared to non-bonded pipes.
Applications
Available in service pipe diameters from DN20 to DN129mm, FibreFlex and FibreFlex Pro are ideal solutions for:
• Biomass district heating networks
• High-temperature city heat networks
• High-pressure heat networks supplying high buildings
• High-pressure heat networks in hilly areas
• Special applications at operating temperatures up to 115°C and pressures up to 16 bar

On-Site Flexibility
The service pipe’s reduced wall thickness makes both systems more flexible to install, significantly increasing their range of application in district heating systems. In addition, this includes a full range of fittings and accessories to meet the design requirements of all district heating pipeline projects.

Secure Joining System
FibreFlex and FibreFlex Pro systems are quick and easy to join using specially designed compression fittings, incorporating a unique polymer sleeve, which is inserted between the fitting’s outer sleeve and the service pipe. A steel insert is then easily fitted inside the pipe, without the need for the pipe end to be expanded. This provides a robust connection with maximum joint integrity.

Project Example
In a project where a heat network of 1,400m of FibreFlex piping was installed, it could be demonstrated that when compared to installing the same network in pre-insulated steel, there was an installed cost saving and a significant reduction in the network installation time.

<table>
<thead>
<tr>
<th>Size</th>
<th>Service pipe Nominal Outercasing</th>
<th>Minimum bending radius</th>
<th>Max length</th>
</tr>
</thead>
<tbody>
<tr>
<td>25/91</td>
<td>25.0 x 2.2</td>
<td>20.6</td>
<td>91</td>
</tr>
<tr>
<td>32/91</td>
<td>32.0 x 2.5</td>
<td>27.0</td>
<td>91</td>
</tr>
<tr>
<td>40/111</td>
<td>40.0 x 2.8</td>
<td>34.4</td>
<td>111</td>
</tr>
<tr>
<td>50/111</td>
<td>47.6 x 3.6</td>
<td>40.4</td>
<td>111</td>
</tr>
<tr>
<td>63/126</td>
<td>58.5 x 4.0</td>
<td>50.5</td>
<td>126</td>
</tr>
<tr>
<td>75/142</td>
<td>69.5 x 4.6</td>
<td>60.3</td>
<td>142</td>
</tr>
<tr>
<td>90/162</td>
<td>84.0 x 6.0</td>
<td>72.0</td>
<td>162</td>
</tr>
<tr>
<td>110/182</td>
<td>101.0 x 6.5</td>
<td>88.0</td>
<td>182</td>
</tr>
<tr>
<td>125/202</td>
<td>116.0 x 6.8</td>
<td>102.4</td>
<td>202</td>
</tr>
<tr>
<td>140/202</td>
<td>127.0 x 7.1</td>
<td>112.8</td>
<td>202</td>
</tr>
<tr>
<td>160/225</td>
<td>144.0 x 7.5</td>
<td>129.0</td>
<td>225</td>
</tr>
</tbody>
</table>

Comparison with alternative steel pre-insulated pipe solution
<table>
<thead>
<tr>
<th></th>
<th>FibreFlex systems</th>
<th>Steel pre-insulated pipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total cost for install</td>
<td>94%</td>
<td>100%</td>
</tr>
<tr>
<td>[costs for materials + installation + digging]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of joints</td>
<td>6</td>
<td>180</td>
</tr>
<tr>
<td>Time for install</td>
<td>1 week</td>
<td>4 weeks (expected)</td>
</tr>
</tbody>
</table>

Approvals
The FibreFlex pipe system is certified to OFI CERT ZG 200-2 Class Technical Specification, in line with EN 15632-2

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Complete Range
Hiline FibreFlex Pro is part of the wider Hiline range of pre-insulated pipe systems that include the following service pipes:

- Steel
- Polypropylene
- Copper
- Glass-Reinforced Epoxy (GRE)
- Polyethylene
- PE-Xa
- Stainless steel

World-Class Support
The Hiline range is backed by world-class support services that include assistance with:

- System design and stress analysis
- Planning and drawing support
- Technical support and on-site advice
- Installation training
- Commissioning and operational support services
- Tool hire

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