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Biomass District Heating opts for Hiline Aqua pipe system at Farm

CPV’s pre-insulated Hiline Aqua pipe system has been specified for a new home heating scheme, fuelled by sustainable biomass. Lead system designers for the project, The Bruce Boucher Consultancy, demanded high performance, ease of installation and strong field support when choosing energy conserving pipes for the Binton Farm project, at Seale, near Farnham in Surrey.

The Hiline Aqua pipework at Binton Farm distributes central heating and hot water services from a wood chip-fired energy centre to seven new properties, converted from a barn and adjacent buildings. Water at a nominal flow temperature of 80°C and 2 bar pressure is circulated to seven ‘X-Block’ compact heating interfaces. This arrangement provides secondary heating to a conventional wet radiator system within each property.

CPV supplied insulated 40mm and 32mm pipes, in straight lengths of 6m and 12m, together with associated fittings and electrofusion welded joints, ensuring complete joint integrity and long term performance. The same system can alternatively be offered with socket fusion or butt fusion joints, all of which offer maximum long term reliability of joints below ground and avoids the use of mechanical joints. All materials were delivered from stock and to short lead times demanded by the project managers.

The Hiline Aqua system combines a polypropylene random copolymer (PP-R Faser) service pipe with a polyurethane insulation layer and a tough HDPE outer casing, a bonded construction that makes it rugged as well as light in handling and thermally efficient. As a factory standard the bonded pipe layers produce a robust, composite pipe generally in accordance with BS EN 253. These pipes are suitable for use above and below ground.

Responsible for specifying all of the products and installation services involved in the district heating project, Bruce Boucher explained: “Good thermal performance in the distribution pipework is an important, integral aspect of the whole design. We consider Hiline to be a better performing system than most of the competition on offer and our experience of CPV’s level of service and their field support during installation is also excellent. The service connections entering the houses at Binton Farm are piped in copper and again, Hiline had the advantage of simple, mechanical jointing to a rigid pipe material, where necessary.”

The heart of the district heating system is a containerised energy centre. This includes a low CO2 60kW D’Alessandro boiler with a wood chip burner and a 2500-litre buffer vessel. This maximised the accommodation space at the site by avoiding the need to install a boiler room and was pre-wired and pre-piped, ready for connection to the Hiline distribution pipes.
Canterbury Cathedral Looks to the Future with New Heating Pipes

For a structure with a history approaching 1,000 years, it is apt that Canterbury Cathedral has replaced its underground heating pipework with a system designed for long-term reliability. CPV’s Hiline pre-insulated system, with a polypropylene inner service pipe, will never suffer the same fate as the 12-year old, steel pipes it has replaced.

The existing underground steel pipework in the main heating system had corroded beyond repair, causing leaks along its length. This resulted in flooding in the underground boiler house that supplies heating to the cathedral and the library archives.

Clerk of Works for the cathedral Peter Long explained: “The pipes appeared to have rotted along the bottom, within the lagging, so that the developing problem was not easily detected”. On the recommendation of surveyors, CPV engineers were invited to visit the site and demonstrate the Hiline system, which can, if required, also be fitted with a leak detection system. As a result it was decided to replace the steel pipes with Hiline pre-insulated polypropylene pipes, thereby eliminating the possibility of any future corrosion.

Hiline pipes are pre-insulated at the factory prior to being delivered to site. CFC-free, rigid polyurethane foam is used for the insulation, which is securely bonded to the metal, or plastic service pipe during manufacturing. A very strong impact resistant outer layer of high-density polyethylene protects the insulation externally. This casing ensures that the insulation remains intact and effective, making Hiline suitable for both over and underground installations, whatever material is chosen for the internal service pipe.

“This was our first use of Hiline and we found it very easy to install. As a result it was a very successful project.” Peter Long added “It looks to be an excellent job with the pipes already working well at full pressure.”

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One problem with CHP is how best to conserve heat when it is distributed around a large site. Traditional pipework does not offer the efficient answer. Plastic pipe systems manufacturer, CPV Ltd, has addressed this issue by coming up with a pre-insulated system that offers customers a choice of internal service pipe, in metals or plastics. The standard features are a highly insulating rigid foam layer and a tough, impervious high density PE casing.

The tough, outer casing and built-in leak detection were decisive in the choice of CPV’s Hiline pre-insulated pipe system for new heating pipes at the Queen Elizabeth Hospital in Woolwich.

Almost 200 metres of Hiline pipe were installed below ground in a new 100 metre long twin run, external to the hospital buildings, along a main road. The Hiline system, in this application incorporating a steel internal service pipe, takes medium pressure hot water from a mains service street into the Ranken House plant room. Water temperature is then reduced by plate heat exchangers for use in the hospital.

By using Hiline, Cofathec Heatsave were able to install the pipes straight into the ground owing its tough, weatherproof outer casing. Additionally, the built-in leak detection system provided both the installer and the hospital’s maintenance engineers with an easy-to-use diagnostic tool. Commenting on the CPV leak detection system, Brian Alvis of Cofathec Heatsave added: “This is a very reliable feature that can be used during installation to check joints, and in the future, should a problem should ever occur.”

Hiline pipes are pre-insulated at the CPV factory prior to being delivered to site. CFC-free, rigid polyurethane foam provides the insulation, which is securely bonded to the service pipe during manufacturing. A very strong impact resistant outer layer of high-density polyethylene protects the insulation externally. This casing ensures that the insulation remains intact and effective, making Hiline suitable for both over and underground installations.

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CPV Hiline Helps Leeds University to Gain 185 Degrees

The University of Leeds was founded in 1904, but its origins go back to the nineteenth century with the founding of the Leeds School of Medicine in 1831 and then the Yorkshire College of Science in 1874. The Leeds University site is serviced by a long standing district heating scheme but now in need of upgrading and extending to service new facilities on site.

CPV’s Hiline-Steel pre insulated piping system was chosen and has now been successfully installed as the successor to existing district heating networks at the Leeds University site for heating water pipe services and including steam pipes operating at 185°C. The decisive factor in selection of CPV to provide the materials for the district heating network was the support offered by their experienced Project Engineering Team and the ability to service the project from their UK based manufacturing and stocking facility in Hampshire.

CPV’s Hiline pre insulated steel pipes and fittings are also manufactured to and fully in accordance with the requirements of EN 253:2009, ‘District heating pipes, Pre-insulated bonded pipe systems for directly buried hot water networks’, which was a pre-requisite for this project.

Pre-insulated pipes from CPV, branded as Hiline, offer a range of service pipe materials, both traditional and polymer options, to providing safe and efficient methods of transporting media whilst minimising heat loss or gain. The Hiline pre-insulated pipework systems are offered for a wide range of industrial and commercial applications and in particular for district energy schemes.

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Faster Installation Earns School Project for Hiline Aqua pipe system

CPV’s Hiline Aqua pre-insulated pipe system was selected for underground heating and hot and cold water distribution at the Robert Blake Science College and Elmwood School, which underwent construction in Bridgwater, Somerset by a BAM PPP-led consortium.

The availability of straight lengths as an alternative to coiled pipe, coupled with the easy handling of single pre-insulated pipes, drew installers HV Fusion and Drilling Ltd to Hiline Aqua at the specification stage. Working with mechanical and electrical main contractors, FP Hurley, the company adopted Hiline Aqua for pre-insulated constant temperature, variable temperature and DHCW flow and return systems.

“We felt we could produce a better engineered, mechanical installation in a shorter time with Hiline”, explained HV Fusion director, Carl Davies, “Pipe coils are fine in open expanses but with the space restrictions and connections in a building, allowing us to install 30 to 40 metres per day at best, we prefer to work with straight lengths. The product quality and ease of installation justified our decision and the delivery capability, stockholding and technical advice given by CPV were faultless.”

This project totalled 360m of Hiline Aqua pre-insulated pipe, which consists of service pipe made from polypropylene random copolymer (PP-R) with a polyurethane insulation layer and a tough HDPE outer casing.

As a factory standard these layers are bonded, producing a robust, composite pipe generally in accordance with BS EN 253. These pipes are suitable for use above and below ground with a choice of socket fusion, butt fusion and electrofusion connection.

Pipe and fittings were supplied in 6m and 12m lengths of 50, 90 and 110mm diameter and all pipe joints were made using electrofusion fittings to give optimum reliability with ease of installation. Offering service pipes in a range of plastics and steel, the Hiline series of pre-insulated systems is unique in having a UK manufacturing capability. CPV’s production facility, near Southampton, also carries stock, allowing for immediate despatch and fast delivery of product at short notice.

The underground mains at the Bridgwater site connect the 900-pupil Robert Blake Science College, the adjacent 60-pupil Elmwood special School and a Primary Care Trust building. Heating is provided by an energy centre comprising a 400kW biomass fuelled boiler with two gas fired boilers in reserve. Linked to a chiller and AHU, the system serves 4-pipe fan coils in the building clerestories as well as underfloor heating and wet radiators.

Subcontract to FP Hurley, HV Fusion and Drilling also installed the site’s gas, fire hydrant, sprinklers, potable water and rainwater recovery pipe systems. The work was part of the reconstruction of six schools, in the first £100m phase of Somerset Council’s £600m Building Schools for the Future project.
OTHER COMPLETED PROJECTS INCLUDE:

HILINE-STEEL:

Leisure
- Swallow Hotel, Northampton
- Coral Reef Leisure Centre, Bracknell
- Le Poisson hotel, Parkhill, Hampshire
- Minnack Theatre, Cornwall
- Horniman Museum, London

Hospitals
- Shelton Hospital
- Beverley Hospital
- Broadmore Hospital, Crowthorne

- Government Facilities
  Various sites around the UK

Housing Estates
- Leicester City Council
- Wimpey Homes London
- Academy Central, London
- Calendar Park Scotland
- London Borough, Enfield
- London Borough, Hackney
- Graham Park, London
- Pennyhill Park, Bagshot
- Appollo Housing, London
- Laindon Hills Estate, Langdon
- Academy Central, London
- Leicester Council
- Aylesbury Academy

Education
- Warwick University
- Lincoln School
- Bristol University
- York Uni Accommodation Block
- CEU Leeds University
- Lancaster Uni New Sports Centre
- Rotherham Council Swinton School
- Manchester Schools
- Eton College
- University College, London
- Uxbridge College
- Bordon Garrison Pre-School

Other
- Rolls Royce Factory, Derby
- Rockwool Factory, Bridgend
- Butlins, Skegness
- Falkland Islands
- British Antarctic Survey

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