

Innovative Concept with Flexible Pipes

## New Record: 1,5 Hours for Ten House Connections

In the Dutch City of Hengelo a new record has been established by installing a pre-fabricated network from the coil within 1,5 h – fully pre-fabricated and tested in the Thermaflex factory. The coil contained 75 m main line and ten house connections (figure 1). Within 90 min the entire network was directly pulled from the coiler and guided under the crossing lines to the house connections. Using this technology will help to develop district heating in a faster and more sustainable way.

**W**armtenet Hengelo is an innovative thinking District Heating Company in the Netherlands. The municipality of Hengelo invests in sustainability and has several projects in the planning stage to achieve a 50% reduction in CO<sub>2</sub> emissions targeted for 2020. The use of residual heat from the local industry is an important source for the city heating which is operated at flow/return temperatures of 70 °C/40 °C. Warmtenet Hengelo is responsible for the construction of the new district heating network. In the next years around 5,000 new homes with district heating are planned to be built in several eco neighbourhoods.

Thermaflex is working closely together with the district heating engineers since 2010 on concepts to speed up the installation of the networks for the sake of the citizens and for cost savings as well. Flexalen with weldable medium pipes made from Polybuten (PB) has been chosen as the most suitable basic system.



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Figure 1. Uncoiling of 75 m Flexanet including ten house connections

in Waalwijk/ the Netherlands the basics were laid. The specially trained and certified installer SOP proved that it is possible with the necessary site preparations to connect an entire street to the district heating network of Warmtenet Hengelo in only one day (figure 2).

### Advantages of pre-fabricated network parts

Since its introduction in 2010 already 500 homes have been connected. Peter Mooij, project manager at Warmtenet Hengelo: »Initially we chose metal pipes, but we reversed this decision quickly. It appeared that the pre-insulated plastic pipe system Flexalen offered a better solution. It is an innovative and sustainable pipe system with a high insulation value. In addition, the water resistance of the foam is an advantage, since alternatives absorb water in due time, and then lose much of their insulation. Moreover Flexalen is much quicker to install, which makes the pipe system better to fit into plans that sometimes have a tight time schedule.«

### Example Klimopstraat

The Klimopstraat in Hengelo had a challenging time frame regarding the connection of 15 houses. On Monday, the road construction workers would come, whereas on

the Friday before the digging works were still ongoing, which made the installation work in the ground impossible. The Installer SOP was therefore asked whether the heat pipes of Flexalen could be laid at the weekend.

Michael de Vries, managing director of SOP: »Based on the drafts Thermaflex has largely prefabricated the pipes for the network, including the branches with Flexalink. These are T-joints for the flexible pipes that are welded onto the pipe in the factory, pressure tested and checked for leaks. This saves a lot of installation time in hard to reach areas like crawl spaces. We had already experienced that Flexalen with Flexalinks was up to four times faster to install, but the Klimopstraat marked a new record (figure 3 and 4). On Saturday morning the trenches were dug, the pre-insulated pipes were placed and the house connections were welded. In the afternoon the street was already closed again.«

SOP located in Zaandam is a specialist in underground installation work. Four years ago, SOP had their first experience with the Flexalen pre-insulated pipes. M. De Vries: »It was a complex project in Amstelveen. The situation called for creative solutions and support from our suppliers. Thermaflex turned out to be the right partner and made the necessary adjustments in accordance with our wishes. Since then, we are excited about Flexalen and have gained much experience in other projects.«

### From Flexalink to Flexanet – a new record

Until 2013 more than 5,000 Flexalinks have been successfully installed especially in Hengelo and Purmerend. Now Thermaflex made the next step: the prefabrication of a complete network section with ten house connections in the factory.

Again Warmtenet Hengelo was the ideal partner to try this solution. The network with 75 m main line and ten integrated house connections was made in two single lines which were coiled on a drum. The trench was opened in the morning and the installer was confronted with more crossing lines than ex-



Figure 2. Installation of Flexalinks for new built houses

pected – not the ideal conditions for such a project. However these were very good test conditions to demonstrate the advantages of such concepts.

Within 90 min the entire network has been directly pulled from the coiler and guided under the crossing lines to the house connections (figure 5). The house entries were al-



Figure 3. Laying of Flexalen with Flexalinks in the Klimopstraat

## PIPELINE CONSTRUCTION

### Flexible Pipelines



Figure 4. Installed Flexalinks



Figure 5. Pulling of the pre-fabricated network into the open trench – within 1,5 h the network was fully laid including all ten house connections

ready prepared to slide the Flexalen pipes easily to the connection points.

Despite the challenging site conditions all people involved in this project were satisfied about the smooth installation. The high flexibility of Flexalen and the innovative parallel branch connections allow for the necessary adaptation to the real site situation. Differences in measurements between planning and reality could be compensated due to build-in reserves in the length of the house connections.

#### Innovation Award and second project

Thermaflex has already received an Award for technical innovation in The Netherlands for Flexanet. More important however is the success in a second project with the installer Ordelman & Dijkman. The project was carried out in Terborg/the Netherlands to connect nine houses with four separate Flexanet-pipes – two for flow and return of the heating, and two for flow and return of the cooling. These pilot projects have demonstrated the advantages of this high speed installation of factory-made and tested network sections. More pilot projects are in the pipeline and the development of an efficient production of Flexanets is in preparation.

#### What does this mean for district heating and cooling?

Smart green cities are looking at district heating and cooling as an ideal way to enable the intensified use of renewables, waste to heat and all sorts of industrial waste heat. Building heating networks has been a time consuming exercise with a lot of on-site installation work. This resulted in long building cycles with lots of disturbance for the citizens.

With Flexanet prefabricated networks the most complicated part, the connections to individual buildings, can be significantly improved in both speed and costs. Using this technology will help to develop district heating in a faster and more sustainable way. ■

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