



Thermography finds leaks in district heating networks

Leaking heating pipes cost owners of district heating networks a great deal of money, both in the form of repair costs and through losses of heated and processed water. Checking the district-heating network with a thermal camera is quick and easy, and saves valuable time and money.

In Sweden, consulting engineers Arne Jensen AB use a ThermaCAM™ PM 695 from FLIR Systems to detect leaks in the underground pipes. "Thermography is an excellent way of rapidly obtaining a clear overall picture of the status of the entire network", says Arne Schleimann-Jensen, founder of Arne Jensen AB and chairman of the company.

What is District Heating?

District heating systems distribute steam or hot water from one central source to multiple buildings through an underground network of pipes. The heat can be provided from a variety of systems such as cogeneration plants, waste heat from industry or purpose-built heating plants.

First introduced on a commercial basis in New York in 1877, district heating is now supplied to over 22 billion people in the EU, from Greece to Finland. It has achieved significant penetration in Austria, Italy, the Netherlands and the Scandinavian countries, where Denmark has the highest penetration of district heating in the EU.

By making use of combined heat and power production, as well as surplus heat from industry and waste incineration plants, district heating provides clean and efficient heating to large numbers of homes. At the same time it minimizes energy consumption and the accompanying emissions by eliminating the need for individual boilers in the connected homes.

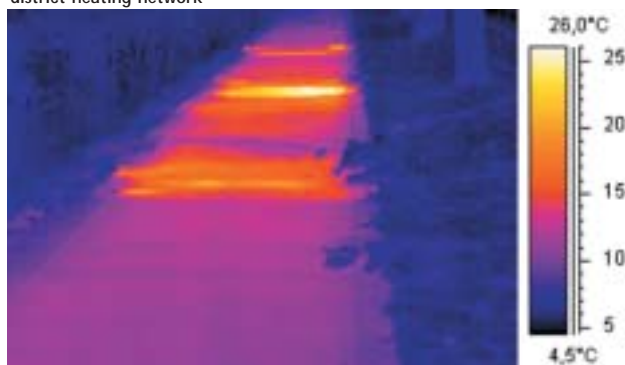


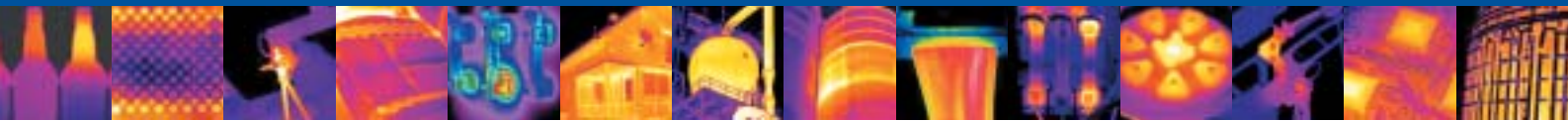
Arne Jensen AB has developed ever better techniques for checking district heating networks. Among other things, they have produced a solution in which the thermal camera is mounted on the roof of a vehicle and is controlled from a special panel inside the vehicle.

Locating underground leaks

Using thermography on a district-heating network involves scanning the network from the ground with a thermal camera. The inspections can be carried out at night when there is less traffic. Additionally, temperature differences are even more visible at night because it is generally cooler. The thermal images produced by the camera clearly show the location of temperature rises, which may indicate that heated water has spread into the insulation, or into the ground. Since the thermal images locate leaks extremely accurately, they are an invaluable resource when the time comes to dig and repair.

The Infrared image clearly shows a leak in the underground district heating network





The thermal images can be used not only for fault location but also to classify and prioritize faults. The thermal camera allows even minor problems to be followed up and repair work to be scheduled as necessary.

Saves money and increases safety

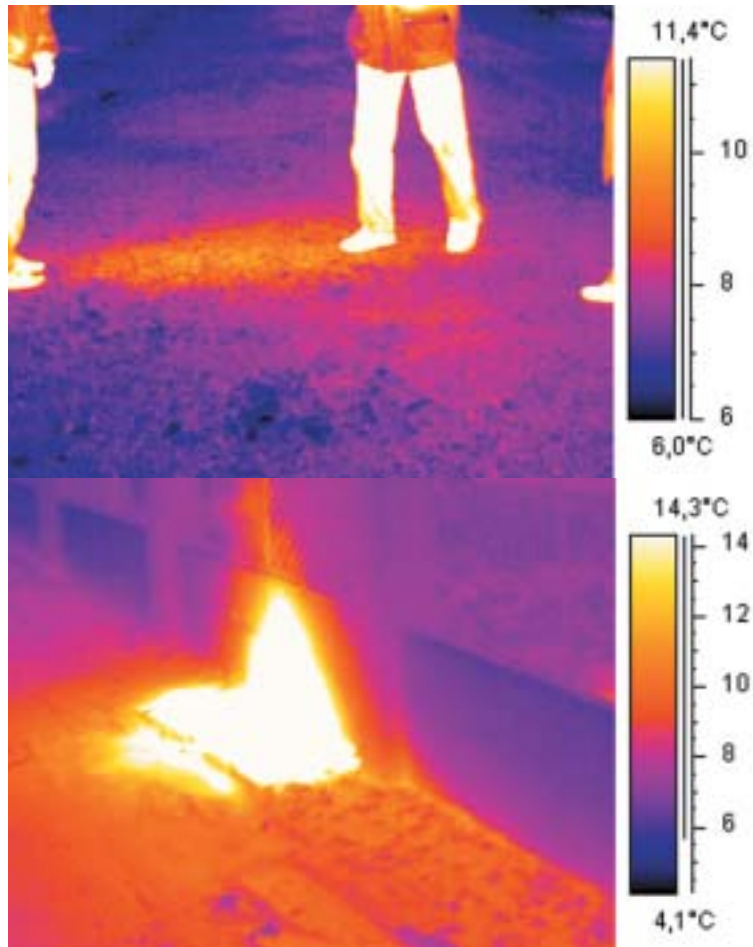
Checking the status of a district heating network with infrared thermography is a quick and cost-effective way to reduce maintenance costs and improve safety.

- * Reports produced with FLIR Systems ThermaCAM Reporter software give a clear and easy-to-interpret picture of any leaks so that you can avoid digging in the wrong place. This can save a lot of time and money!
- * Continuous use of thermography on the district-heating network can also increase the life of the entire network. Because the thermal camera can highlight the critical points, you avoid unnecessarily replacing the entire network and can concentrate instead on repairing the detected faults.
- * Repair costs can also be reduced since faults are found at an earlier stage, before the pipe insulation is seriously damaged.
- * Rapid location of leaks means that district heating plants save a great deal of money because of the reduction in losses of heated and treated water.
- * Safety risks are also minimized, especially in winter. In Sweden the pressure in the pipes can reach 16 bar, and the temperature of the water reaches 120°C, so above-ground leaks can have serious safety consequences.

Planned repairs

In Sweden, many operators of district heating networks routinely use thermography as part of their preventive maintenance programs. "Many plants carry out a check in the spring in order to find out what happened during the winter when the load was high", Arne Schleimann-Jensen explains. "This makes it easy for them to schedule any necessary repairs during the summer." Other operators prefer to carry out a condition check in autumn to reduce the risk of acute leaks arising in the middle of winter. This is the time when output is high and the demand for heat is at its greatest, and therefore when repairs would cause most disturbance.

One thing is clear: more and more district heating operators are discovering the benefits of using thermography on their networks. Whether you do the work yourself or engage an outside firm, there are big benefits to be gained through early detection of problems leading to reduced maintenance costs and disturbances, lower energy and water wastage, and minimized safety risks.



Thermal images produced by the FLIR ThermaCam provide detailed information that is invaluable to accurately locate leaks or damages in district heating networks.

Number of km of district heating piping per country

Denmark	23,900 km
Germany	17,949 km
Sweden	11,180 km
Finland	8,340 km
Austria	2,646 km
Yugoslavia	1,583 km
Estonia	1,200 km
Slovenia	487 km
Croatia	312 km

Source: Swedish district heating association



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