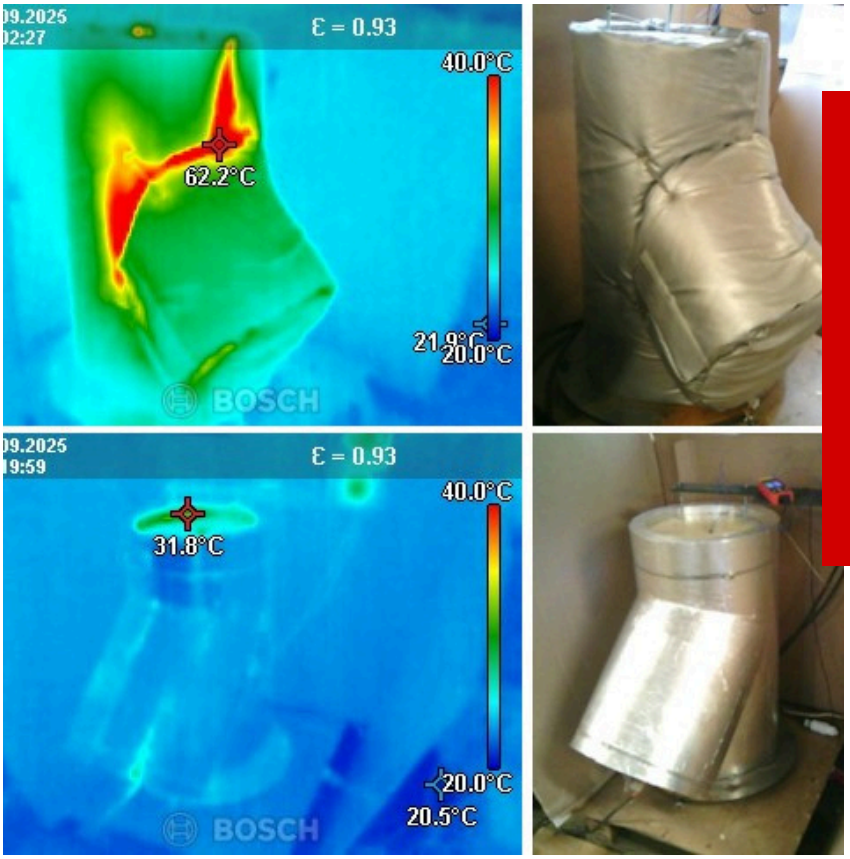


TEST SHOWS: SIGNIFICANT REDUCTION IN ENERGY CONSUMPTION WITH DAN-ISOFIT INSULATION

Thermography of both test installations, along with the corresponding visible light images. Note the large differences in external surface temperatures.
(Photo: Dan-iso)

Introduction

In industrial and district heating systems, non-standard components such as valves, flanges, and dirt arresters are often neglected in insulation strategies—despite being major sources of energy loss. We conducted a comparative test to evaluate the thermal performance of traditional mineral wool insulation versus our proprietary Dan-isoFIT solution on a DN 200 dirt arrester.

Test summary

Two insulation setups were tested:

- **Mineral wool blanket**
- **Dan-isoFIT molded polyurethane shell**

Object: DN-200 dirt arrester filled with water.
Temperature: Maintained at ~85°C for 100 hours.
Environment: Indoor, ~23°C ambient temperature
Instrumentation: Thermocouples, PID controller, power monitors, thermal imaging.

Key findings

Insulation Type	Energy Consumption (100h)	Average Heat Loss (W)	Reduction vs. Mineral Wool
Mineral wool	13,21 kWh	132,1 W	-
Dan-isoFIT	4.56 kWh	45.63 W	65,4%

Thermal imaging revealed significant heat leakage and thermal bridging in the mineral wool setup. Dan-isoFIT maintained surface temperatures close to ambient, indicating superior insulation.

Environmental impact

Switching to Dan-isoFIT insulation significantly reduces energy loss and CO_2 emissions. Even on a single component, the annual savings are substantial, making it a wise choice for both efficiency and sustainability.

Comparison of CO_2 reductions between DE and DK	Annual Energy Savings	CO_2 Reduction (kg/year)
Denmark	757 kWh	104,5 kg
Germany	757 kWh	272,5 kg

Assumes continuous operation and electric heating

Dirt arrester installed in a district heating pump station.

Instrumentation

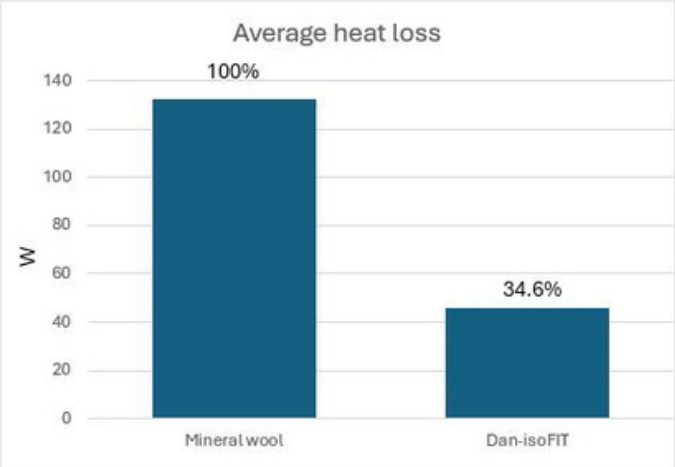
All measurements were conducted using the following equipment:

- Danoplus THE-373 Thermometer/Data Logger
- Ketotek KTEM02 electricity usage monitors
- REX-C100 PID temperature controllers

Preliminary tests ensured steady-state conditions and validated the accuracy of temperature and energy readings, reinforcing the reliability of the results.

Overlooked Components in Insulation Strategies

While straight piping is routinely insulated, non-standard geometries—such as valves, flanges, and dirt arresters—are often ignored, despite their high energy loss potential.



Gaps in Standards and Data

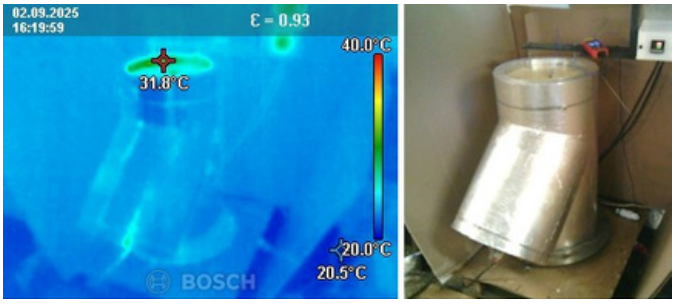
Even updated standards like EN ISO 12241 offer only rough or simplified estimates for these components. For PN10-rated parts, the calculated losses can be vastly overestimated, highlighting the need for real-world testing.

Dan-isoFIT's Contribution

By testing a DN 200 dirt arrester, Dan-isoFIT provides rare, precise data that challenges assumptions and demonstrates how targeted insulation can yield substantial energy savings.

Conclusion

Comparative tests show that Dan-isoFIT insulation clearly outperforms traditional mineral wool in reducing heat loss from non-standard pipe geometries. Over 100 hours, Dan-isoFIT cut energy consumption by 65.4%, with surface temperatures close to ambient. This was confirmed by both power data and thermal imaging, which showed minimal heat leakage.



Dan-isoFIT challenges assumptions in EN ISO 12241:2008, which often overestimate heat loss for PN10-rated insulated components. Measurements show significantly better performance, equivalent to a much shorter pipe length—highlighting the gap between theory and real-world results.

Its rigid polyurethane shell resists compression, ensures consistent insulation, and allows easy removal for maintenance, supporting long-term operational savings. Dan-isoFIT also contributes to sustainability by reducing energy consumption and CO_2 emissions, making it a wise choice for district heating, industrial, and marine applications.