



Case Study: Efficiency of Thermie-S MetalPress Insulation on the Cooling System of Bencsik Transz Kft.

Location: Bencsik Transz Kft., 5600 Békéscsaba, Szerdahelyi u. 2.

Background: A liquid cooling system is installed on the roof of the Bencsik Transz Kft. building. Parts of the cooling pipes were insulated using Thermie-S MetalPress insulation material, produced by Hungarowatt Kft. To evaluate the efficiency of the insulation, measurements were conducted by Strong Energo Kft.

Technology Applied:

- **Cooling Unit:** MIDEA MGA 30W/RN1 (Qh=30kW)
- **Piping:** DN 50 steel pipe
- **Insulation:** Thermie-S MetalPress, with an average thickness of 2 mm, applied over two layers of Tizsakorr red primer paint.

Measurement Conditions:

- **Date:** 2013.07.25., 14:00-15:00
- **Ambient Temperature:** 34°C
- **Relative Humidity:** 25%

Measurement Results:

1. **Supply Cooling Pipe:**
 - **Insulated Surface Temperature:** 22.1°C
 - **Uninsulated (primed only) Surface Temperature:** 14°C
 - **Water Temperature in Pipe:** 6°C
2. **Return Cooling Pipe:**
 - **Insulated Surface Temperature:** 24.5°C
 - **Uninsulated (primed only) Surface Temperature:** 20°C
 - **Water Temperature in Pipe:** 10°C

Efficiency Analysis:

1. **Supply Pipe:**
 - The temperature difference between the uninsulated pipe surface and the environment: $34^{\circ}\text{C} - 14^{\circ}\text{C} = 20^{\circ}\text{C}$.
 - The temperature difference between the insulated pipe surface and the environment: $34^{\circ}\text{C} - 22.1^{\circ}\text{C} = 11.9^{\circ}\text{C}$.
 - Temperature difference reduction: $(20^{\circ}\text{C} - 11.9^{\circ}\text{C}) / 20^{\circ}\text{C} \times 100 = 40.5$
2. **Return Pipe:**
 - The temperature difference between the uninsulated pipe surface and the environment: $34^{\circ}\text{C} - 20^{\circ}\text{C} = 14^{\circ}\text{C}$.
 - The temperature difference between the insulated pipe surface and the environment: $34^{\circ}\text{C} - 24.5^{\circ}\text{C} = 9.5^{\circ}\text{C}$.
 - Temperature difference reduction: $(14^{\circ}\text{C} - 9.5^{\circ}\text{C}) / 14^{\circ}\text{C} \times 100 = 32.1$

Conclusions:

1. The Thermie-S MetalPress insulation significantly reduced heat transfer between the environment and the pipe.
2. On the supply side, the insulation reduced the temperature difference between the pipe surface and the environment by approximately 40.5%, while on the return side, it reduced it by approximately 32.1%.
3. The insulation effectively prevented condensation on the outdoor cooling pipe sections.

This case study demonstrates that Thermie-S MetalPress insulation significantly improves the energy efficiency and operating conditions of the cooling system.

Note: Images related to this case study and the inspection report prepared by an independent company can be found in the attached "metalpress-cooling-pipe-surface-temperature.pdf" document.