THERMINOL
Heat Transfer Fluids by Eastman

New Russian fiberboard plant sees surprising benefits of Eastman Therminol® synthetic heat transfer fluid.

PROBLEM	ANALYSIS	SOLUTION	RESULT
A new wood panel plant was designed using mineral oil as a heat transfer fluid, but the addition of an organic Rankine cycle (ORC) installation required synthetic heat transfer fluid (HTF).	Mineral oil had been a tried-and-true solution, so other options were not initially considered.	Eastman's Therminol team demonstrated how synthetic HTF could benefit the entire plant.	The client saved time and money by reducing plant maintenance and the need for topping up fluids.

Russia has vast forest reserves yet, until recently, has been an importer of wood-based panels. That's all changing due to the construction of a massive high-strength laminated veneer lumber plant in the Russian river city of Torzhok. The new plant will help Russia become less dependent on other sources for wood products. Oriented strand board (OSB) is one of the plant's major products. OSB is a multilayer sheet formed by pressing rectangular flat chips at high pressure and temperature with a resin binder.

When a major engineering firm was selected to build the OSB portion of the plant, the firm originally considered specifying mineral oil, its traditional option for these plants. However, the massive size of the Torzhok plant sparked a new idea among the designers. Why not use the plant's excess wood chips to produce energy?

Waste wood converted to energy

The OSB plant is equipped with a state-of-the-art heat and power generating system based on the use of the production waste materials. The plant uses ORC technology to convert waste wood to energy. The principle of the ORC is based on a turbogenerator working as a conventional steam turbine to transform thermal energy into mechanical energy and finally into electric energy through an electrical generator.

ORC systems require a synthetic heat transfer fluid instead of mineral oil because they operate under high temperatures and need an HTF that remains stable under those conditions. When mineral oil is used at high temperatures, it can easily degrade to low boilers which can be removed by system venting and high boilers which stay in the system, ultimately causing clogs, deposits, and even complete shutdowns. To avoid this, the company chose a synthetic fluid, Eastman Therminol® 66 heat transfer fluid.

Therminol 66 is the world's most widely specified high-temperature, liquid-phase heat transfer fluid. Therminol 66 was selected for this project because it offers high-temperature thermal stability. It's ideal for ORC systems and is generally specified by Turboden, a world leader in manufacturing ORC equipment.

The energy produced by the ORC installation provides the plant with its own energy source, which allows the plant to produce wood products far more cost-effectively.

Engineers surprised at Therminol 66 performance

A well-respected engineering company with a track record of designing more than 300 plants across Europe was tapped for the Torzhok OSB plant design and installation. Typically, this engineering firm would specify mineral oil for the heat transfer system in this type of plant.

But because of the need to use synthetic transfer fluid for the ORC portion of the plant, the decision was made to use Therminol 66 throughout the entire plant—a complete paradigm shift for the firm, which had never used a synthetic product before. Since they were accustomed to building heat transfer systems that use mineral oil, typical venting capabilities were installed in the heat transfer systems and typical results were expected—one to two barrels of low-boiler "waste" and then having to regularly top up the systems with several barrels of additional mineral oil.

With typical venting systems, the oil is distilled by evaporating or boiling off low-boiling thermal degradation components (or "light ends"). A reduction of fluid volume occurs as the light ends are removed. Adding new fluid (topping up) is then necessary to maintain the required liquid inventory in the system.

When the plant technician checked the new venting system for the first time to gauge how much oil needed to be replaced, he was surprised to find no need for replenishment. In fact, it will be many years before the plant will ever need a top up with Therminol 66. However, the TLC Total Lifecycle Care® program has and will continue to offer heat transfer fluid sample analysis. The engineering team was delighted, since this will save both time and money from a plant maintenance perspective.

Today, the plant is the largest high-tech OSB producer in the country with a production capacity of 500,000 m^3.* "As the Russian economy begins to improve, high-tech investments like the Torzhok plant will enable the country to tap into its vast forest resources," says Natalia Grishina, account manager for Therminol. "The expected result will be more employment and greater volumes of exports—all key factors for growth."

Source: https://www.woodbizforum.com/mlt-ltd-officially-opened-the-largest-osb-production-facility-in-russia/

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