



DriTherm® Insulates Ball State's Underground Piping in Nation's Largest Geothermal Project



Like many universities with expanding campuses, aging heating and cooling systems, and a commitment to reducing their carbon footprints, Ball State University wanted to improve energy efficiency and reduce CO₂ emissions. “We studied a number of options,” said Jim Lowe, director of engineering and operations. “One of the things we considered was replacing our 60 to 70 year old coal-fired boilers with more efficient ones that would burn an alternative fuel such as wood pellets or other renewables. However, when the cost of that plan rose significantly, the university made a ‘paradigm’ shift from burning a solid fuel to one of using a renewable energy source — which is geothermal.”

New Water Distribution System Required

One of the major components “is a whole new water distribution system,” said Lowe. “It means putting in a new infrastructure of piping that carries hot water as opposed to what we have in place today which is a piping system that carries steam.” Engineering specifications for the water distribution system indicated a preference for using a combination of ductile iron pipe with pour-in-place insulation. “Insulating the pipes is essential to maintaining design temperatures for heating in winter and cooling in summer,” explained Lowe. “Pour-in-place insulation is the best solution for Ball State’s distribution system based upon ease of installation and the ability to go back at a later date and perform repairs as needed. Our experience with this type of insulation around steam and condensate lines is that it is easy to dig up so that repairs can be made.”

DriTherm Chosen to Insulate Underground Piping

Pour-in-place insulation from DriTherm was chosen to insulate the more than 14,000 linear feet of large diameter underground piping. The product is a field-applied insulation and corrosion protection product designed for below grade applications. According to Jared Sandman, President at DriTherm International Inc., “Our insulation is field applied directly around thermal piping to form a dense, closed cell barrier between piping and the surrounding soil. It self-compacts upon backfill to form a strong block of cohesively bonded particles that prevent air and moisture penetration though to the pipe.”



How Ball State's Geothermal System Works

A geothermal heat pump uses the Earth as either a heat source — when operating in heating mode — or a heat sink — dissipating heat while in cooling mode. At two district energy stations on campus, the heat pulled from the ground or returned to the ground will be transferred, or exchanged, with heat pump chillers that will be connected to two district loops that run through campus. One is a cold-water loop, which flows at a constant 42 degrees, and the other is a hot water loop, which flows at a constant 150 degrees. Inside buildings, heat exchangers and fans will deliver the temperature desired by its occupants.

DriTherm® Insulates Ball State's Underground Piping in Nation's Largest Geothermal Project



Typical DriTherm application prior to backfill. (Forms are not required except to minimize material usage.)

About DriTherm International, Inc.

In 1991 DriTherm International Inc. was established to manufacture and distribute DriTherm® underground insulation. Prior to 1991, the DriTherm formula was sold and distributed in North America as Protexulate. Protexulate was invented in Europe in 1967 and distributed by Protexulate Inc. in the US as a subsidiary of Stauffer Chemical Co. The DriTherm formula has remained unchanged since 1967 and has an unparalleled history of success in the United States, Europe, the Middle East, and Asia. During the establishment of DriTherm International, 5 regional factories were built to serve the North American market.



2500 Plaza 5
Harborside Financial Center
Jersey City, NJ 07311
P: 1-800-343-4188
F: 973-808-2815
email: info@dritherm.com
www.dritherm.com

Non-Toxic Ingredients

The product's proprietary formula, which has never been altered in more than 40 years on the market, consists of nontoxic ingredients commonly found in pharmaceutical and food grade products. "One of the things I like about the product," said Lowe, "is that it is safe to use because of the type of material. Another characteristic is that it never saturates in water. Because it's a powder, it flows very well in and around the pipes. It prevents water from penetrating through the pipe so it's an insulator, not just from an energy flow standpoint, but also from a water standpoint."

Just In Time Delivery Critical to Project Success

Having the ability to delivery multiple truckloads of material to the Ball State project often with one day notice has proven crucial to the success of this project from day one. According to Mr. Sandman, "Within weeks of the project kick-off the contractor was pressing for us to deliver product to insulate hundreds of feet of pipe. The whole project is under a compressed time-line. It would have been difficult for a factory insulated pipe product to be delivered to meet these time-lines. Our local factory, freight company, and on-site representative made the all the difference in the world." For exactly this reason DriTherm is often chosen by colleges and universities for projects with tight schedules like those completed during winter and spring recesses or for emergency repairs.

Multi-Phase Construction Plan

The Ball State geothermal project is being completed in two phases. "When Phase I is completed in 2011, half the campus will be heated and cooled via geothermal energy and the other half by our existing steam system," said Lowe. Phase II will be completed as soon as funding is secured. Once fully implemented, the project will save the university \$2 million a year in operating costs and replace four aging coal-fired boilers. "By taking the current, aging boilers offline," said Lowe, "The University will be able to reduce the amount of carbon dioxide it adds to the atmosphere by a substantial amount — nearly 80,000 tons annually. The net result of switching to the geothermal system will allow Ball Sate to cut its carbon footprint roughly in half."



Innovations Enable Novel System Design

In addition to the water distribution system, other system components include 4,100 boreholes, 400 to 500 feet deep spaced around the campus, and two energy stations to house large-capacity heat pump chillers that move water through the system. "The availability of very large capacity heat pump chillers that have come to market in only recent years make the project possible today," said Lowe, adding "This project should debunk the erroneous assumption that alternative energy projects are always too expensive or impractical to be adopted by cost-conscious businesses and consumers."

In addition to insulation projects at major colleges and universities such as Ball State, DriTherm is used in state and federal institutions, military bases (product is approved by U.S. Army Corps of Engineers), refineries and industrial/housing complexes. Typical applications include: high-pressure steam/condensate, hot and chilled water piping, and industrial processing piping.