



DOWTHERM™, DOWFROST™, and DOWCAL™

For Heating and Hockey, DOWTHERM™ SR-1 Fluid Provides Peak Performance at UND

DOWTHERM™ SR-1 Heat Transfer Fluid has teamed up with Ralph Engelstad Arena to provide state-of-the-art building systems performance in a world-class sports and entertainment venue on the campus of the University of North Dakota in Grand Forks.

Widely described as the finest facility of its kind in the world, the arena was constructed at a cost of more than \$104 million. The 400,000 square foot arena has a seating capacity of 13,000 and boasts granite concourse floors, leather and cherry wood seating, 50 luxury suites, 14 locker rooms, courts for basketball and volleyball, and the home ice surface of the acclaimed UND intercollegiate hockey team. Since its grand opening in October, 2001, Engelstad Arena has played host to a wide array of sporting events, concerts and other entertainment events.

Heating and cooling systems for Engelstad Arena presented a number of engineering challenges to the facility's designers and contractors. Providing the proper temperatures needed to build and maintain the hockey ice sheet while assuring comfortable temperatures for athletes and facility patrons was complicated by the North Dakota climate. Winter temperatures in Grand Forks can drop as low as -40°C (-40°F) with wind chills below -62°C (-80°F), while summer temperatures can rise up to the mid 80s (in degrees Fahrenheit).

To ensure a comfortable interior environment in all seasons, engineers designed two chilled water systems to supply the ice arena and the remainder of the structure, plus a total of six heat recovery systems. Depending on the application, heating and cooling is delivered by 30% to 50% solutions of DOWTHERM™ SR-1 Inhibited Ethylene Glycol-based Heat Transfer Fluid and water.

The fluid circulates through a tube and shell-type heat exchanger where it is heated in winter by steam supplied by the central campus heating plant. The same fluid circulates through chillers in the summer to provide facility-wide cooling. Chilled fluid is used year-round to build and maintain the ice skating sheet at the optimum temperature for hockey or other skating events.

Fargo, ND-based Agassiz Chemical & Equipment Inc., an authorized reseller of Dow Heat Transfer Fluids, served as the water treatment chemical and glycol subcontractor for the project. Agassiz Chemical President, Steve Hareland, states "DOWTHERM™ SR-1 Fluid was the logical choice for use in the arena. We selected this particular heat transfer fluid because of our experience with the product in addition to its solid performance."

DOWTHERM™ SR-1 Fluid has been used in a variety of past UND campus projects including dormitory systems, chemistry labs, a biomedical research

facility and many others. Over the past 20 years, Agassiz Chemical has done extensive design-phase work with engineers in the initial stages of new and retrofit projects on UND's campus. Hareland says Agassiz Chemical works actively with system inspections to review water treatment procedures and verify equipment and troubleshooting issues related to water treatment. Hareland further states that "DOWTHERM™ SR-1 Fluid is a widely recognized brand with a proprietary package of inhibitors that provides superior performance. Agassiz Chemical has grown familiar with DOWTHERM™ Heat Transfer Fluids over the years because they deliver predictable, superior performance for projects in the long-run."

David Obermiller, Principal with Fargo, North Dakota-based Obermiller-Nelson Engineering, Inc., was the design engineer on the Engelstad Arena project. He also agrees with Hareland that DOWTHERM™ SR-1 Fluid offers significant advantages when it comes to dependable, long-term performance. Obermiller observes, "Over the last two decades we've had good results with DOWTHERM™ SR-1 Fluid in a number of projects for the University, ranging from the new \$18 million Wellness Center to facilities for student housing. The fluid's inhibitor package means that equipment operates maintenance-free for years to come."

DOWTHERM™ SR-1 Fluid for the Engelstad Arena project was supplied by Univar USA, an authorized Dow distributor. According to Kerry Cipra, Univar Sales Manager in St. Paul, Minnesota, shipment of the heat transfer fluid is carefully managed to ensure the fluid is delivered on time and that product purity is maintained. Cipra says Univar USA, “follows stringent procedures to prevent contamination of the mixture and, for larger capacity systems, we use dedicated 5,000-gallon tankers for delivery directly to the job site. The Engelstad Arena project required us to arrange for the delivery of DOWTHERM™ SR-1 Fluid using two tankers, with deliveries scheduled two hours apart to provide one smooth, quick fill.”

All involved with the HVAC and ice sheet refrigeration systems at Engelstad Arena agree, the UND hockey program and other university events deserve building systems that perform like champions. The team of UND facilities staff, Agassiz Chemical & Equipment, Obermiller-Nelson Engineering, Univar USA, and DOWTHERM™ SR-1 Heat Transfer Fluid help ensure that they do.



Agassiz Chemical President, Steve Hareland (right) and his father, Don Hareland, in the mechanical center of the UND Arena.



Ralph Engelstad Arena at the University of North Dakota in Grand Forks.

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