



Heat Transfer Fluids

The DOWTHERM™ A Difference

Higher Purity Fluid Leads to Lower Operating Costs for Concentrating Solar Power (CSP) Plants

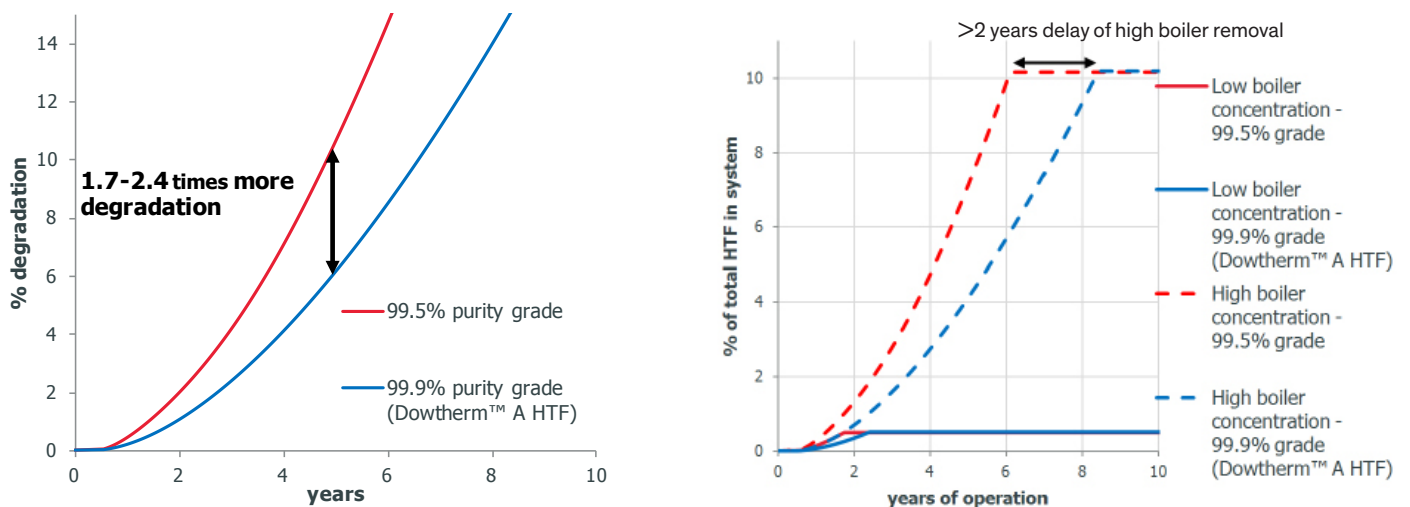
High performance heat transfer fluids (HTF) are essential for energy creation at CSP plants. Most often, a synthetic organic HTF consisting of 73.5% diphenyl oxide (DPO) and 26.5% Biphenyl is used. DOWTHERM™ A Heat Transfer Fluid from Dow is the most widely used HTF for CSP and has 99.9% purity, compared to lower purity products at 99.5%. New original Dow research, presented at SolarPACES 2014, explains how using high quality heat transfer fluid (HTF), like DOWTHERM™ A, is key to increasing fluid lifetime and minimizing maintenance and operating costs in CSP plants.



Low Purity Fluid Leads to Twice as Much Degradation

Compromising on fluid purity leads to major disadvantages over a CSP plant's lifetime. Most notably, 99.5% purity fluids degrade 1.7-2.4 times more than higher purity fluids, like DOWTHERM™ A. With lower purity fluids, more frequent degradation separation operations are needed, which ultimately means extra operating cost. In addition to that, refill cost for lower purity fluids needed over 25 years of operation is \$2/kg higher.

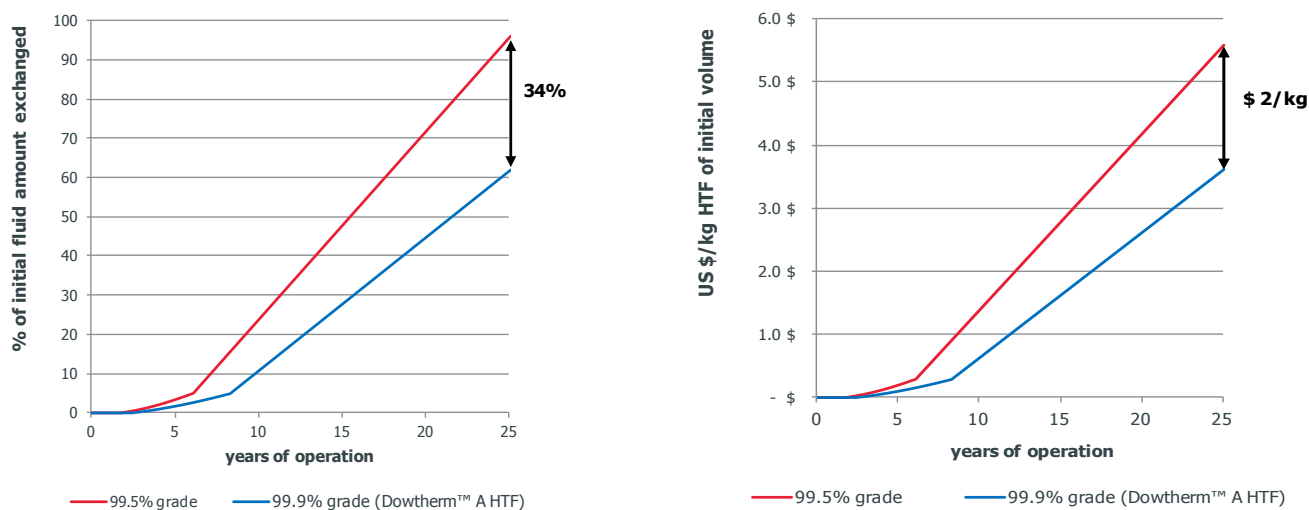
Fig. 1: Degradation concentration in a trough CSP plant over time a: no degradation removal; b: control high and low boilers at 10% / 0.5%



The Dow Difference

The difference in fluid purity comes from Dow’s high purity DPO. Lower purity DPO contains low thermal stable organic compounds, the cause of increased degradation. In addition, most low purity grades contain chloride that will cause pitting in steel under the right conditions, like under deposits, gaskets or in small crevices in a metal surface. Over time, this can lead to failure of piping and relief components at the high points. Another type of corrosion from chloride is chloride stress cracking, which can lead to leaks at joints and ultimately weld failures all over the plant.

Fig. 2: Heat transfer fluid demand and fluid costs over CSP plant life time.



Enabling Capabilities

Today, more than 40 CSP plants filled with DOWTHERM™ A Heat Transfer Fluid provide enough electrical generation capacity to meet the needs of over one million homes at a savings of over 5 million metric tons of carbon dioxide emissions per year.



For more information, call...

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Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

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