



ThermoTips

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Sulfur Piping: Performance Comparison of a Full Steam Jacket and a Thermon SnapTrace® System with TFK Strap-On Steel Jackets

Quite often traditional specifications for temperature maintenance of sulfur piping and equipment call for the use of a steam jacket as a requirement for the proper handling of sulfur. This is usually based on historical practice which has not considered the availability of newer more economical methods such as the Thermon SnapTrace system which has also been proven to be an effective method for heating sulfur. As an example of the performance comparison between a jacketed system and a SnapTrace system, two identical 4" pipes (10 feet in length) were set up in the Thermon testing laboratory.

One 4-inch pipe was jacketed its entire length with a 6" outer steam jacket. The other 4-inch pipe had two 1/2" tubes installed with SnapTrace and TFK-4 Strap-On Steel Jackets at the 10 o'clock and 2 o'clock positions. A thermocouple was located 90 degrees from the tracer on the external surface of the SnapTrace system heated midway down the test pipe. As there was no external access to the jacketed pipe, a thermocouple was extended into the sulfur on the jacketed pipe midway along the test pipe length. Both systems had 1-1/2" thick Fiberglass insulation installed over the outside of the heating system and pipe. Both pipes were then filled with sulfur, which was subsequently allowed to freeze solid as shown in Figure 1.



Figure 1 - Sulfur in Its Crystalline State
(Top of Fill Pipe)

Each heating system was then supplied with 60 psig-saturated steam and the heat-up curve was tracked with a Fluke Hydra. The jacketed pipe and Snap Trace system heat-up curves are as shown in Figure 2 and 3 respectively.

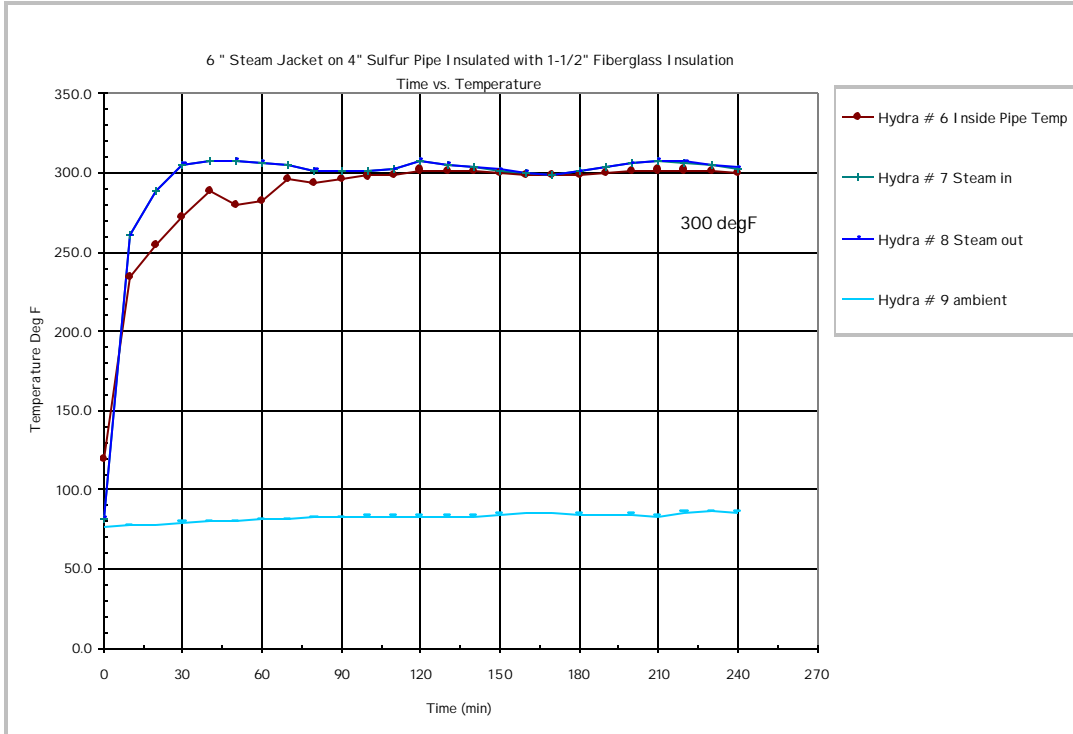


Figure 2 - Jacketed Pipe Heat-Up Curve

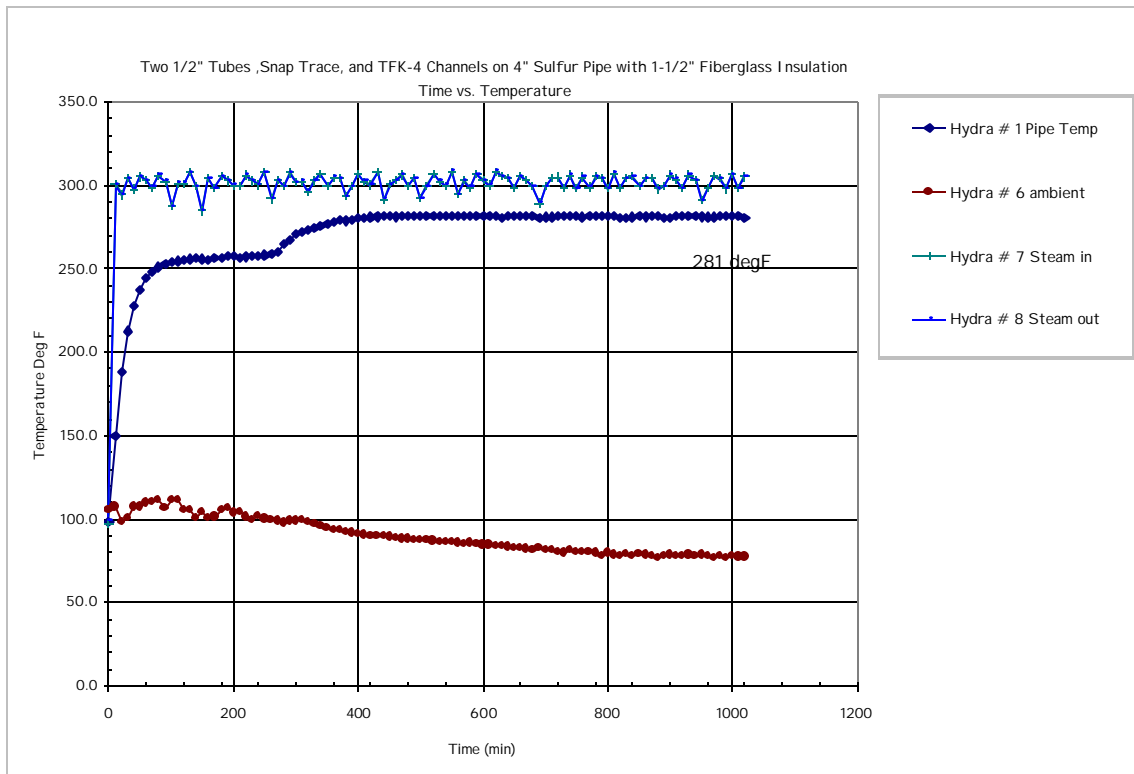


Figure 3 - SnapTrace System Heat-Up Curve

In summary, both heating systems melted out and maintained the sulfur well above the minimum 260°F requirement.

As one might imagine, there is a dramatic cost reduction potential associated with the use of the SnapTrace system over that of a fully jacketed pipe system. The capital cost of jacketing is high because it requires not only a larger pipe to surround the process pipe, but also special fittings, skilled welders and more trap stations than required for a SnapTrace system. Today, fabricated jacket assemblies or “spools” are often built at fabrication shops and transported to the job site. Inspection and testing is quite expensive. Special testing such as dye penetrant, x-ray and hydrostatic testing increases the cost of a jacketed system even further. Construction time for jacketed pipe is quite long, and the final system cannot be easily adapted or modified because the steam jacket is a part of the piping system itself which makes repairs or changes difficult and costly. The SnapTrace system, on the other hand, is more easily installed and can be readily modified to adapt to necessary changes in the piping system.

The Thermon SnapTrace system can reduce the cost of heating sulfur lines versus steam jacketed lines with little decrease in system heating efficiency as shown in Figures 2 and 3 above.



Figure 4 - Molten Sulfur

June, 2002