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Mr. Ralf Horn
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Date: June 15, 2010

Dear Ralf Horn,

I want to thank you for sharing your thoughts and the vast amount of technical information regarding GDT TEK's system's low grade heat recovery and power generation conversion process and its associated equipment. Of the many technologies that I have evaluated over the course of the past several decades, GDT TEK's heat to power conversion solution has proven to be the most reliable, versatile, efficient, lowest emissions, and overall cost-effective solution available in today's changing world market. The changes are driven by ever increasing oil prices as well as climate change concerns. Together, these two factors have opened up great opportunities for GDT TEK.

The description for the technology is described here-in as follows,

The Organic Rankine cycle (ORC) is named for its use of an organic, high molecular mass fluid with a liquid-vapor phase change, or boiling point, occurring at a lower temperature than the water-steam phase change. The fluid allows Rankine cycle heat recovery from lower temperature sources such as industrial waste heat, geothermal heat, solar ponds, etc. The low temperature heat is converted into useful work, that can itself be converted into electricity.

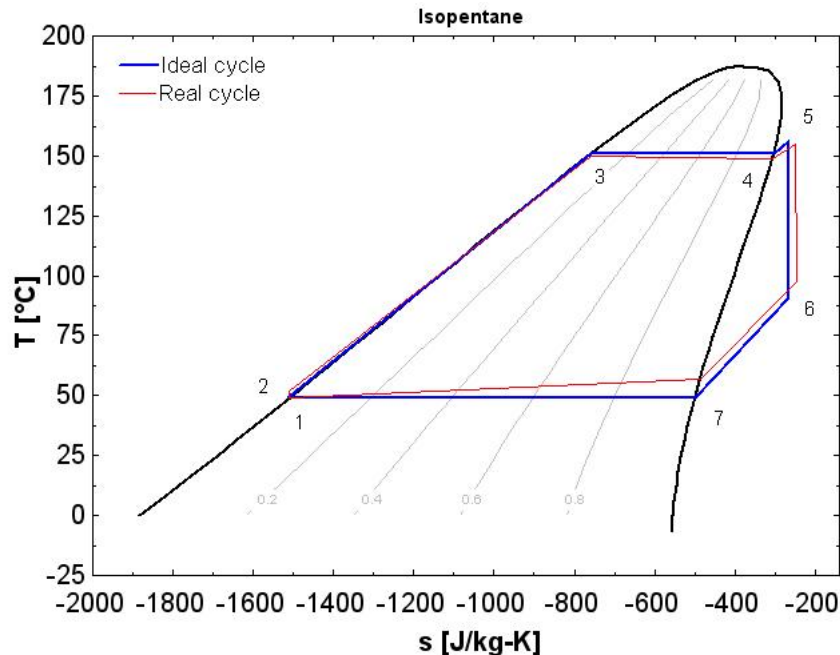
The operation for the technology is described here-in as follows,

The working principle of the organic Rankine cycle is the same as that of the Rankine cycle : the working fluid is pumped to a boiler where it is evaporated, passes through a turbine and is finally re-condensed. In the ideal cycle, the expansion is [isentropic](#) and the evaporation and condensation processes are [isobaric](#).

In the real cycle, the presence of [irreversibility's](#) lowers the cycle [efficiency](#). Those irreversibility's mainly occur :

- During the expansion : Only a part of the energy recoverable from the pressure difference is transformed into useful work. The other part is converted into heat and is lost. The efficiency of the expander is defined by comparison with an isentropic expansion.

- In the heat exchangers : The working fluid takes a long and sinuous path which ensures good heat exchange but causes pressure drops that lower the amount of power recoverable from the cycle.



Although you are using r-123 and r-245fa in your system, the pressure diagram attached shows the similar properties for the working fluids in your system.

The benefit of using a cycle such as the ORC, is the gain in efficiency on the use of conventional fossil fuel burning systems, as well as the stand-alone ability to generate power from heat produced and waste heat sources. Such sources as an example are Concentrating Solar Panels (CSP), Geothermal and many Industrial Waste Heat applications such as steel mill stacks. With the amount of waste heat available and/or the potential to generate renewable heat without fuels, there is a huge potential to generate renewable power with such technologies.

The use of this technology will have a significant impact on the environment in terms of the ability to reduce the production of Green House Gases as well as creating a platform for a renewable product being able to produce renewable power in a simple and efficient manner.

It has been a real pleasure interfacing with you this past several years; please continue to keep me abreast of any advances made with respect to GDT TEK's technology and/or business.

If you have any question or comments, you know to call or write.
Cell 510 406 0031 email dibble@me.berkeley.edu

Sincerely,

Professor Robert W. Dibble