Titanium Heat Exchangers

Exergy’s Technology Group have completed the R&D phase and successfully designed & manufactured prototype units in titanium alloy. Exergy’s entire range of shell and tube & tube in tube heat exchangers are now available in titanium.

Applying Exergy’s highly efficient manufacturing technologies has resulted in less material required for fabrication and high heat transfer rates in a small geometry.

Titanium is an excellent solution for highly corrosive applications

Targeted Industry and Applications:

- **SEMICONDUCTOR**
  Heated DI water and other highly corrosive semiconductor applications

- **MARINE**
  Sea water and De-salinization; sea water can be used as a coolant in the heat exchanger

- **CHEMICAL**
  Impervious to fluctuations in PH levels; performs well in oxidizing media such as hot nitric acid; for chlorine and organic chlorides it is resistant to pitting and crevice corrosion

- **AEROSPACE AND DEFENSE**
  A significantly lighter material that is strong as steel but with 60% less density

- **PHARMACEUTICAL**
  Improved corrosion resistance minimizes contamination of ultra-pure water

Benefits of Titanium:

- Maintains its integrity at elevated temperatures

- Improved corrosion resistance minimizes contamination of ultra-pure water

- Low cost of ownership

- Small geometry, large heat transfer area and rates
About Titanium:
Overwhelming market demand for 100% titanium heat exchangers as a heat transfer solution motivated Exergy to advance the development of Exergy’s standard designs using the latest technology for titanium fabrication. Exergy has been successful in applying highly efficient manufacturing technologies to the manufacture of titanium heat exchangers. The results of these advances are outstanding performance in 100% titanium; as compared to other solutions currently available in the market.

Exergy’s titanium heat exchangers are manufactured in 100% Commercially Pure (CP) Titanium. Unalloyed CP Titanium is available in four grades; 1, 2, 3, 4 which are used based on the corrosion resistance, ductility and strength requirements of a specific application. Grade 1 has the highest formability and grade 4 has the highest strength with moderate formability; while grade 2 combines both features and widely available in the market. CP titanium ASTM grade 2, (UNS R50400) offers excellent corrosion resistance, superior formability and strength; a widely used grade that offers a yield strength of 275MPa (40 ksi) minimum. It is considered the best combination of strength, ductility and brazeability.

Performance Features:
- Working Operation Pressure:
  Tube Side: 510-1,275 psi (3515-8790 kPa)
  Shell Side: 340-850 psi (2344-5860 kPa)
- Working Operation Temperature:
  600-1000 °F (316-536 °C)

About Exergy’s Technology Group
Discovery, invention, and innovation from basic research to deployment. Exergy’s Technology Group headed by Dr. Elias Aljallis and established by Mr. Robert Scott in 2012. It is that part of the technological field which requires the application of scientific and engineering knowledge and methods combined with technical skills in support of engineering activities within the company. The Technology group is engaged in R&D of heat exchangers and manufacturing processes that include several subjects such as: analytical R&D, mechanical and metallurgical R&D and manufacturing design.

ROBERT SCOTT
Mr. Scott joined Exergy in 1995 as a junior engineer and advanced to VP of engineering, and CTO. In his roles, Scott, is responsible for developing the overall technology vision for Exergy, driving cross-company engineering initiatives and collaboration. With an MS in Mechanical Engineering, Thermofluids from Northeastern Univ., Boston, MA, Scott brings a unique blend of deep technical and business management expertise to his role at Exergy. Scott is a member of ASME and ISPE.

ELIAS ALJALLIS
Dr. Aljallis joined Exergy in 2013, and served as senior analytical engineer and R&D scientist. He earned his PHD in CFD and Thermal Analysis, from Stevens Institute of Technology, NJ. Aljallis has published several articles concerning the fluid dynamic and heat transfer areas in the AIP physics of fluid, APS physics and ASME journals. Aljallis is a member of ASME, AWS and ASTM.

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