

Enhanced Surfaces for Emerging Technologies

The rate of change has accelerated in the fields of energy, transportation and computer technology. As we endeavor to harness power from new sources or operate equipment more efficiently, managing heat in the most efficient way possible becomes more and more important. Fortunately, Rigidized[®] Metals, a leader in surface engineering, has responded to this call with Vipertex[®] enhanced surfaces. Engineers in emerging technology fields will find merit in becoming familiar with the benefits of Vipertex[®] to improve the efficiency of processes from cooling batteries and computer servers to obtaining geothermal energy more productively.

Many processes can benefit greatly from the use of Vipertex[®] enhanced surfaces. In some applications, heat transfer is enhanced fivefold compared to smooth tubing. Vipertex[®] affords the opportunity to build a higher capacity unit. Another way to consider this is that a unit of given capacity will be smaller if constructed using Vipertex[®] materials. Building a smaller unit in the first place can be economically compelling in terms of reduced materials, reduced space required, and less project complexity.

Potential benefits of Vipertex[®] in emerging technologies applications include:

- Reduced energy consumption
- Bottleneck resolution
- Higher capacity operations
- Smaller, less expensive heat exchanger installations
- Demonstrated anti-fouling properties
- Readily enhanced stainless steel and titanium for corrosive applications



Vipertex[®] enhanced surfaces are rolled in coil form, promoting repeatability, volume production and cost efficiency. These surfaces can then be transformed into tube or used in a flat configuration to incorporate into heat exchanger designs with greater flexibility and scalability, helping you optimize a solution for your project.

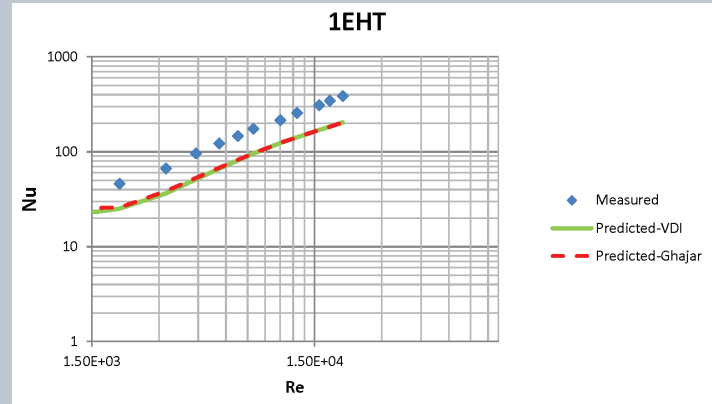
Whether you are retrofitting an existing installation or building new, let us help you determine the economic value of using Vipertex[®].

Pressure Applications

Vipertex® tubes can be used in exchangers operating at most pressure levels. Different alloy systems, wall thicknesses and processing specifications contribute to the ability to produce various pressure ratings.

Burst and collapse tests of welded Vipertex® tubes confirm higher ratings than their smooth, welded tube counterparts. It is apparent that the enhanced surface pattern serves to create a stronger, more rigid tube. Lorem ipsum

Variation of single phase heat transfer performance (Nu) with flow rate (Re) shows an increase of heat transfer performance of around 100% in Vipertex® tubes when compared to smooth tubes. This evaluation was performed at HTRI®.



Flow Rate

Typical single phase Vipertex® performance enhancement values are near 100%. This produces performance enhancement criteria (PEC) values greater than 1.

Two Phase Applications

Vipertex® tubes work extraordinarily well in single phase processes. Additionally, they enhance two phase applications.

Vipertex® is available in various surface texture options that may, based on other operating conditions, be more appropriate for particular functions, such as evaporators or condensers.

Fouling

Vipertex® enhanced surfaces have heat transfer anti-fouling characteristics for many conditions. Studies have been performed in crude, and once through water. Results show the design of the Vipertex® surface produces a wall shear that cleans the tube surface, allowing less debris to form on the surface.

Charging Substance

Since Vipertex® tubes are produced in a variety of alloy systems, optimization is possible to accommodate a wide variety of charging substances. It is important to consider what substances come in contact with the enhanced surfaces in your heat exchanger. This is helpful in determining a suitable alloy, as well as a suitable enhanced heat transfer pattern.

The increased thermal efficiency of a Vipertex® installation can reduce the amount of charging substance required, which provides the following benefits:

- Charge minimization
- Less environmental liability
- Footprint reduction

Temperature Range

Vipertex® enhanced surfaces can be produced in a number of alloy systems that can be optimized for operating temperatures ranging from high temperature to cryogenic, allowing the use of Vipertex® products in a wide variety of conditions.