

# CGThermal

Process Technology Solutions  
for Harsh and Corrosive Process Streams

Lifetime unconditional  
guarantee on tubing  
against erosion and  
corrosion.

## Umax® Advanced Ceramic Heat Exchanger

The Industries Most Reliable and Technically  
Advanced Sulfuric Acid Cooler/Heater

- Maximum Corrosion Resistance.
- Maximum Thermal Efficiency.
- Maximum Heat Exchanger Life.



### Umax Advanced Ceramic

heat exchangers are the high value, long life alternative to nickel-alloy metal, graphite, and TFE heat exchangers for acid dilution and concentration, pickling, or drying processes involving H<sub>2</sub>SO<sub>4</sub>. They offer an unequalled combination of corrosion resistance, thermal efficiency, low fouling, and maintainability.

### Maximum Corrosion Resistance

Umax® Ceramic heat exchangers represent the ultimate solution for your most corrosive heat transfer applications. It is universally corrosion resistant against virtually all chemicals within its design temperature of 340° F. In addition to H<sub>2</sub>SO<sub>4</sub>, it is particularly well suited for processes involving HF, HCL, high concentrations of bromine, fluorine and caustics, and mixed acids. Its physical and thermal properties will not degrade over time.

### Superior Erosion Resistance

Umax® advanced ceramic tubing is over 50% harder than tungsten carbide making it, for all practical purposes, immune to erosion.

### Low Fouling

The structure of the Umax ceramic results in a low friction surface with a lower propensity to fouling. This means higher overall performance and lower maintenance costs.

### Superior Heat Transfer Efficiency

The thermal conductivity of Umax ceramic is greater than that of graphite, 2x that of tantalum, and over 100x that of TFE. Since erosion is not a concern and it doesn't rely on an oxidizing barrier for corrosion resistance, a Umax can operate with higher velocities resulting in less required surface area compared to other options.

	Umax Ceramic	Graphite	Tantalum	Teflon
Specific Gravity	3.1	1.9	16.6	.78
Flexural (psi)	60,000	6,380	50,750	Non Break
Compressive (psi)	560,000	11,310	NA	3500
CTE (10-6 in/in f)	2.2	2.4	5.8	75
Conductivity (btu/ft-hr F)	72.6	58	32	.142

## Superior Thermal and Mechanical Shock Resistance

Umax tubing compressive, tensile, and flexible strengths are unmatched by any other non-metallic tubing currently available in the market, with strength values that rival many metal materials. The exceptionally high thermal conductivity and low thermal expansion characteristic of Umax ceramic result in a tube that is 100% immune to thermal shock and has exceptional resistance to mechanical abuse.

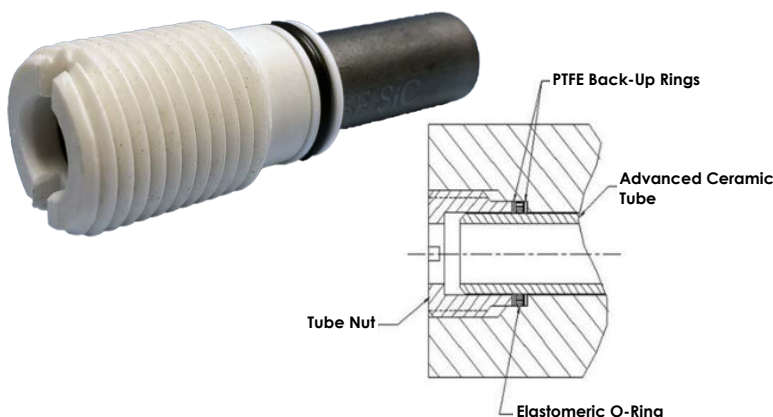
## Proprietary Self-Contained Elastomeric Sealing System

The proven tube to tube sheet seal system utilizes a combination of specifically selected elastomeric seals and PTFE support rings. When coupled together with the close tolerance tube nut and tube sheet hole it results in a highly reliable, static, self-contained seal that is 100% leak free with exceptional service life. Units in service have proven that after over 20 years the seal is still performing leak free without the need of maintenance or replacement.



## Completely Field Repairable

If ever required, individual tubes can be replaced in the field simply and economically without the need for special tools and/or highly specialized welding procedures. Gaining access to the tubes is quickly and easily accomplished. A single tube can be removed and replaced without disturbing any other tubes. This can be accomplished on site, with a simple, straightforward operation eliminating shipping concerns and minimizing downtime.



## Superior Operational Value

- ✓ **Lifetime unconditional guarantee on tubing against erosion and corrosion**
- ✓ Superior strength properties.
- ✓ Excellent thermal conductivity - 2x higher than tantalum and 100x higher than TFE.
- ✓ Resistant to fouling.
- ✓ Easily cleaned without damage to the tubes.
- ✓ Completely field repairable with common tools.
- ✓ Immune to thermal shock

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