CGThermal

Ceramic. Graphite. Heat Exchangers. Process Equipment

Umax® Advanced Ceramic Heat Exchanger.

State-of-the-Art Heat Transfer Technology for HCL and HF/Nitric acid Service.

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

Umax® Advanced Ceramic heat exchanger is the high value, long life alternative to reactive metal, graphite, and TFE heat exchangers with an unequalled combination of corrosion resistance, thermal efficiency, low fouling, and maintainability.

Superior 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 up to 400° F. They are particularly well suited for processes involving mixed acids, HF, HCL, high concentration H2SO4, bromine, fluorine or caustics.

2 year unconditional guarantee on tubing against erosion and corrosion.

Superior Thermal and Mechanical Shock Resistance

The compressive and flexural strengths of Umax® are 50x and 10x those of graphite, respectively. The flexural strength is even higher than that of many metals, including tantalum.

Coupled with our unique "no load" tubesheet design these properties result in a unit that has exceptional mechanical shock resistance.

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

Superior Heat Transfer Efficiency

Thermal properties are just as impressive, with a thermal conductivity equal to that of graphite, 2x that of tantalum and 100x that of TFE.

Overall Transfer Rate	Umax (.060")	Tantalum (.020")	Teflon (.025")
Heater (steam)	246	247	44
Cooler(water)	197	198	42

Superior Erosion Resistance without using an oxide film or TFE coating.

Umax® advanced ceramic tubing is over 50% harder than tungsten carbide making it for all practical purposes immune to erosion. It can even be sandblasted without damaging the tube surface.

Therefore, we can maximize the thermal efficiency by increasing acid flow velocities well above the industry standard operating limits of graphite and tantalum, knowing that short and/or long term erosion damage/failure is not a concern.

In the case of tantalum, operating above standard velocity limits damages the oxide film that protects the tube from erosion/corrosion. The constant reforming of this film reduces the tube wall thickness and pin holes will appear. Since it is not economical to repair the unit it must be replaced. In many cases this is only after 5 to 7 years of service.

Superior Operational Value

- ✓ ***2 year unconditional guarantee on tubing against erosion and corrosion.***
- ✓ Not susceptible to pin hole leaks.
- ✓ Superior strength properties.
- ✓ Excellent thermal conductivity, 2x higher than tantalum and 100x higher than TFE.
- ✓ 50% harder than tungsten carbide. Erosion proof.
- ✓ Can easily and safely be cleaned without damage to the tubes.
- ✓ Easily and economically field repairable if required.

Our Umax® tubing is combined with proprietary TFE tubesheets using a proven, highly reliable o-ring design.

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Gaining access to the tubes is quick and convenient making process side cleaning or a clogged tube replacement simple, safe, and economical. The ceramic's extreme hardness and inherent low adhesion properties make hydro-blasting effective without worry of damaging the tubes.

Summary of Features

- *Corrosion-proof tubing coupled with PTFE tubesheets and highly corrosion resistant o-rings.*
- *Erosion-proof. Tubing is 1.5 times harder than tungsten carbide.*
- *High efficiency heat transfer..*
- *Immune to thermal shock throughout its operating range.*
- *Not susceptible to pin hole leaks.*
- *Completely field repairable with common shop tools.*