CGThermal

Graphite and Ceramic:

Materials and Choices

Engineered, Custom Designed, Replace-in-kind and Repair of Graphite and Ceramic Processing Equipment.

CGThermal

Ceramic. Graphite . Heat Exchangers. Process Equipment

CGThermal

Products | Services | Resources | About | Contact

Increase your plant productivity.

Ceramic. Graphite. Heat Exchangers. Process Equipment.

High Technology Products and Services for Your
Most Demanding Corrosive Chemical Environments

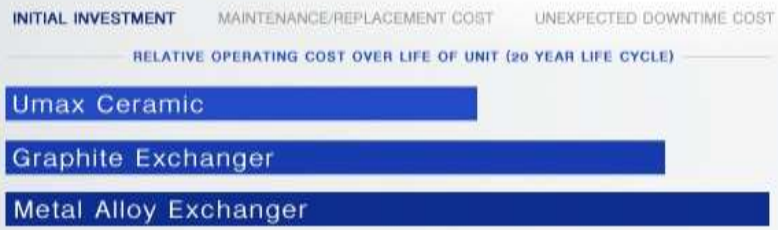
Discover the benefits

Impervite® graphite

The proprietary, highest-quality impregnated graphite we use in our heat exchangers resists highly-corrosive, processed fluids.

Umax® Advanced ceramic

The most universally corrosion and erosion-resistant material in the chemical processing industy.



Is it time to consider upgrading your Graphite or Alloy HE to Umax® Ceramic HE?

See Our Resources

Save time & money.

For less down time & lower maintenance.

- Successful value
- Greater cost savings
- 125 years of engineering & design experience

REQUEST FOR INFO

NAME | PHONE

COMPANY | EMAIL

Or give us a call at 330.787.0101
Twinsburgh, Ohio

Submit Your Request

CGThermal

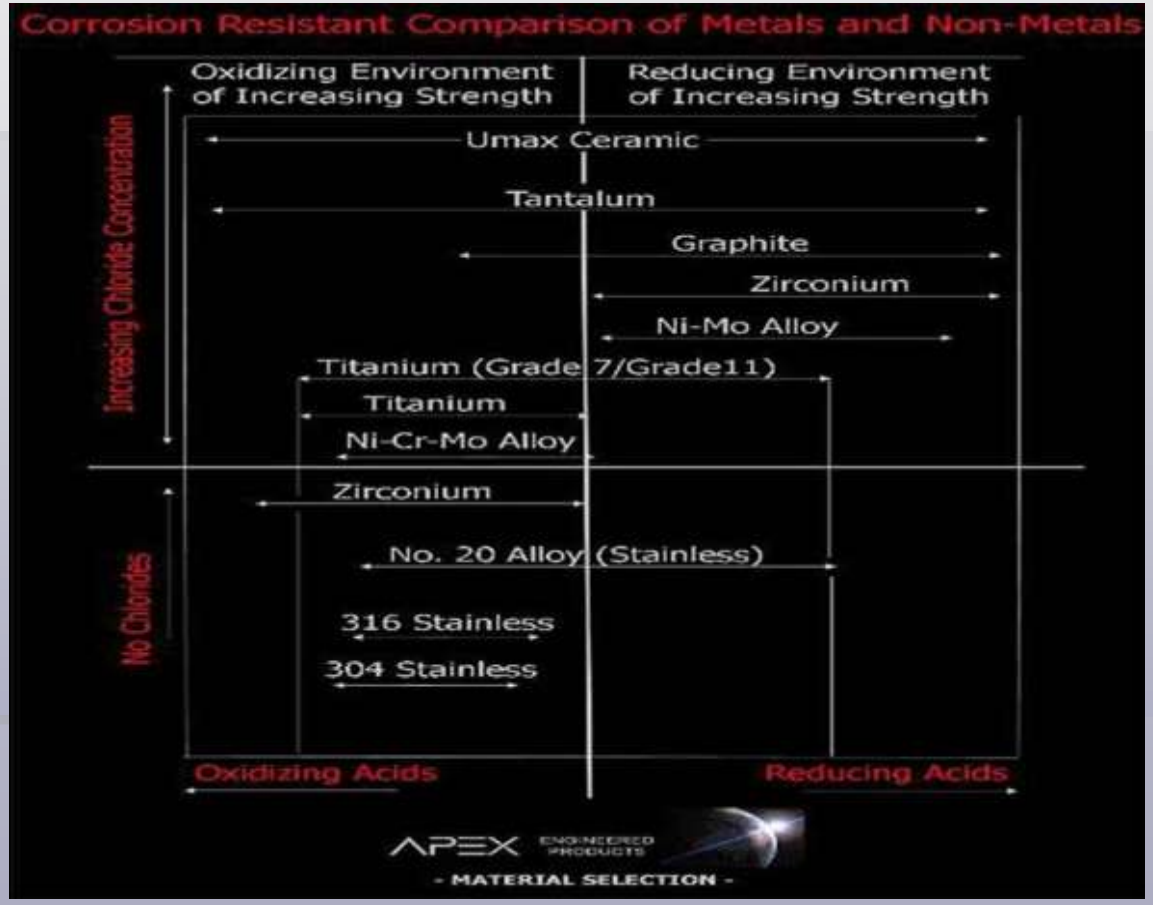
Materials Introduction

Ceramic

Graphite

Most Common Process Fluids

- HCL
- H2SO4
- HNO3
- HF
- P2O5
- Bromine
- Mixed Acids



CGThermal

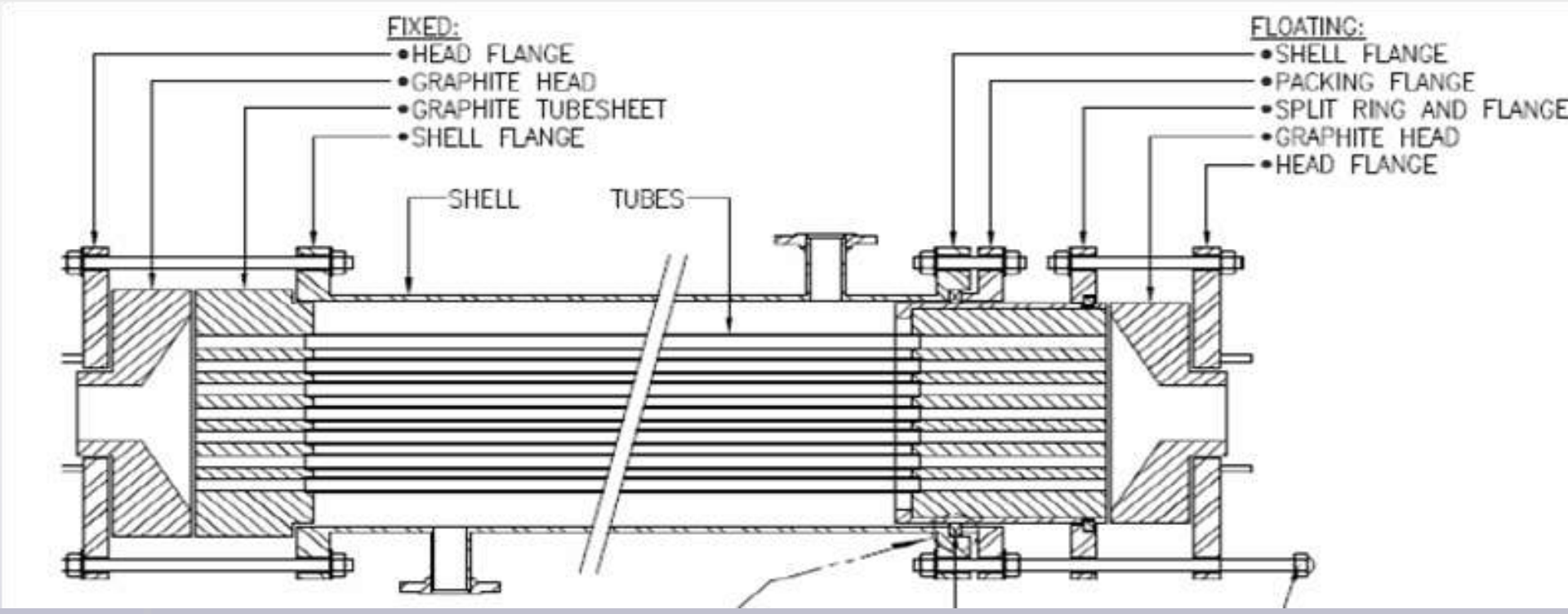
Ceramic. Graphite . Heat Exchangers. Process Equipment

Graphite

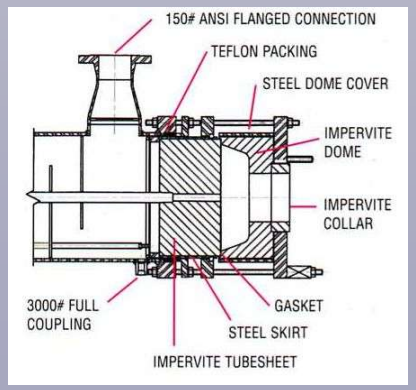
- Excellent corrosion resistance in reducing and moderately oxidizing environments. (resin limiting factor).
- Very good thermal properties., making it thermally stable.
    - High K, low CTE.
- Static corrosion resistance same as dynamic.
- Easily Machined
- 340 Deg f max. material Temp

YOU HAVE CHOICES !!

CGThermal



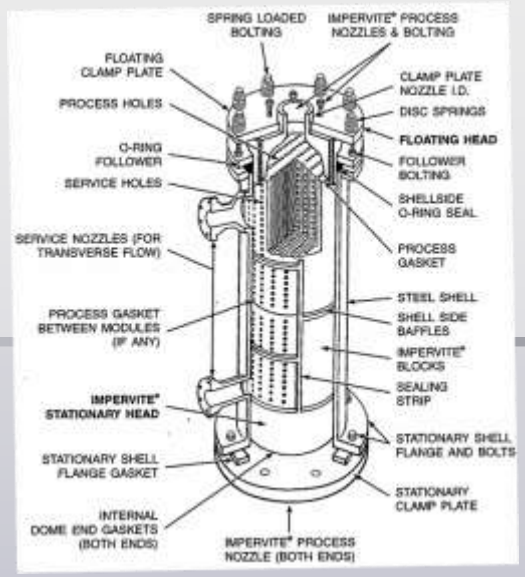
- Skirted or Spring Loaded Design?
- Fully Graphitized or Carbon/Graphite?



CGThermal

Ceramic. Graphite . Heat Exchangers. Process Equipment

- Block Length?
- Hole size?
- Hole Pitch?
- Phenolic or Phenolic/PTFE Resin?



CGThermal

Ceramic. Graphite . Heat Exchangers. Process Equipment

CUBIC UNIT

- Small Envelope Size
- Excellent for inter-changer service (corrosive both sides).
- Good for low temperature approach or temperature cross.
- Easy access to both sides of unit

CGThermal

Ceramic. Graphite . Heat Exchangers. Process Equipment

Umax Ceramic

Umax Tubing – Alpha Sintered Silicon Carbide

Alpha

- No Fillers
- No Free Silicon
- No trace Contaminations

Sintered

- Over 98% Theoretical Density
- 50% Harder than WC

HF, BR2, HNO3, Mixed acids, H2SO4 and High fouling applications

Replaces graphite, glass, reactive metal and nickel alloy material of construction.

CGThermal

Ceramic. Graphite . Heat Exchangers. Process Equipment

Properties Comparison of Common CPI Materials

	Advanced Ceramic	Impervious Graphite	Tantalum	304SS	Borosilicate Glass
Specific Gravity	**3.1**	**1.9**	**16.6**	**8.0**	**2.2**
Flexural (psi)	**60,000**	**6,380**	**50,750**	**75,000**	**1,000**
Compressive (psi)	**560,000**	**11,310**	**NA**	**75,000**	**150,000**
Mod. Elast. (x 10^6 psi)	**59**	**2.3**	**27**	**28**	**98**
CTE (10-6 in/in f)	**2.2**	**1.04**	**5.8**	**9.3**	**1.8**
Conductivity (btu/ft-hr F)	**72.6**	**58**	**32**	**9.1**	**0.67**

CGThermal

Ceramic. Graphite . Heat Exchangers. Process Equipment

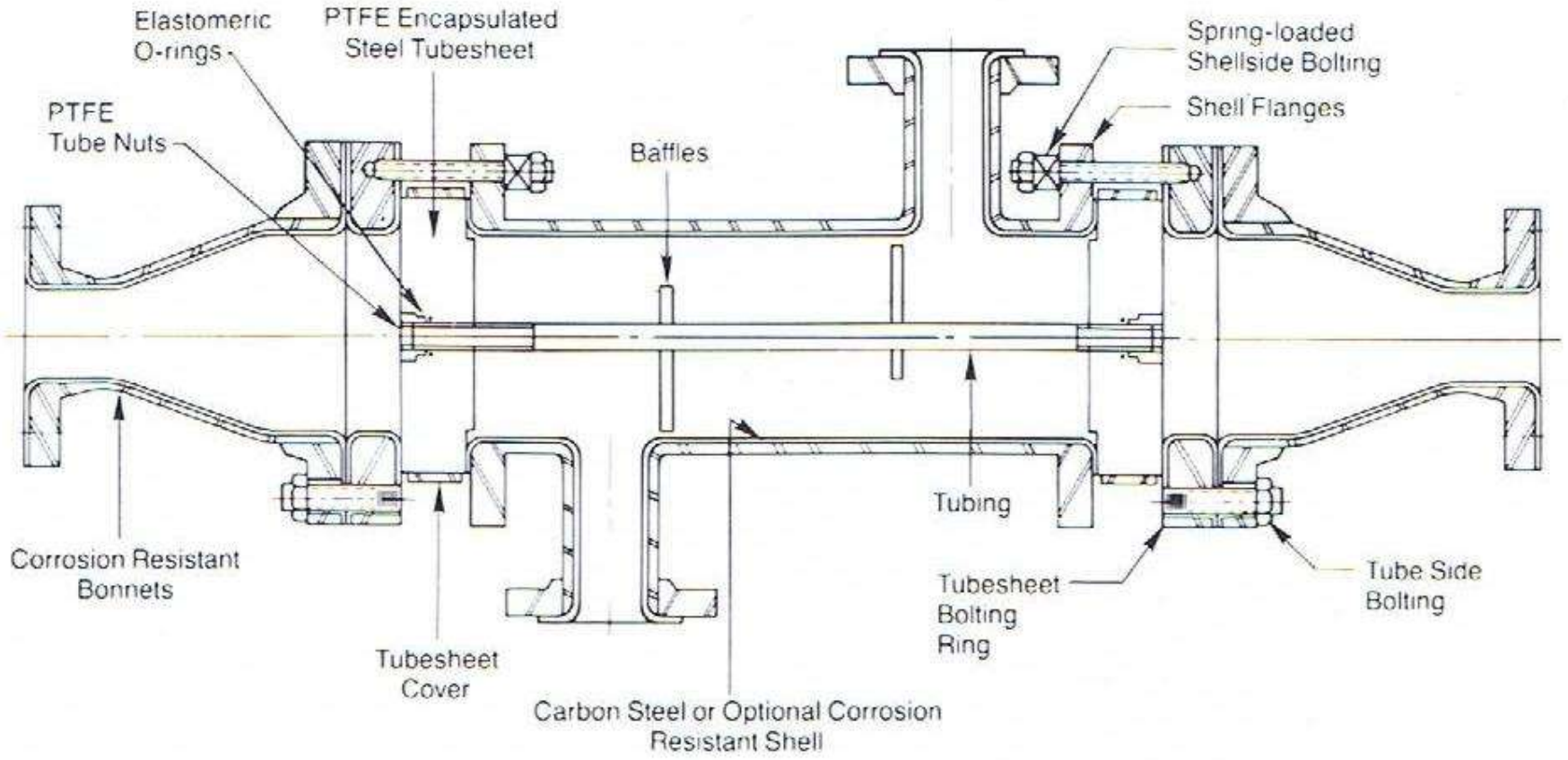
Ceramic

Umax Tubing – Alpha Sintered Silicon Carbide

UNCONDITIONAL 2 YEAR GUARANTEE AGAINST CORROSION AND EROSION!

CGThermal

Ceramic. Graphite . Heat Exchangers. Process Equipment

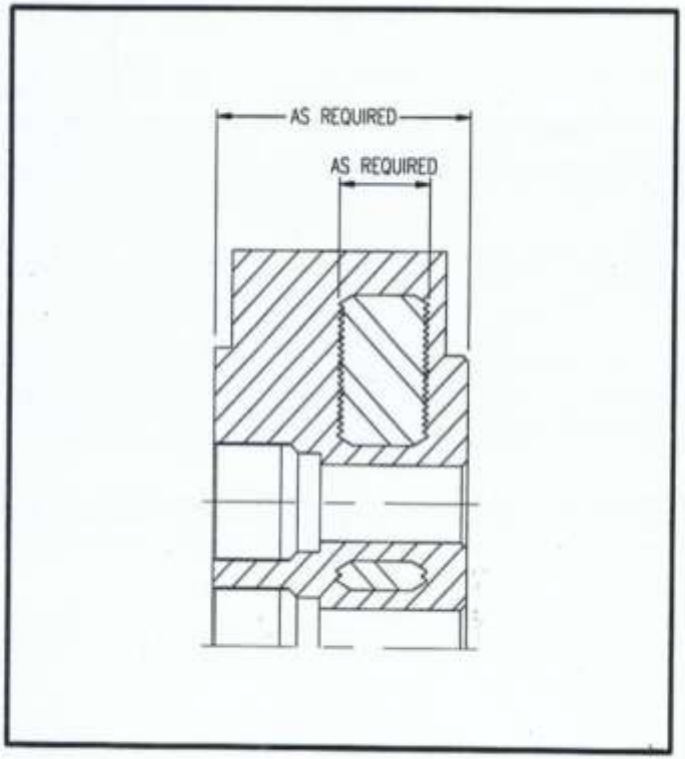


- 14mm, ½", ¾" OD tubes available
- Standard o-ring sizes
- Single pass or Multi-pass process designs
- HD and LD designs
  - HD – Heavy Duty. 100 psig
  - LD – Light Duty. 75 psig

CGThermal

Graphite . Ceramic. Heat Exchangers. Process Equipment

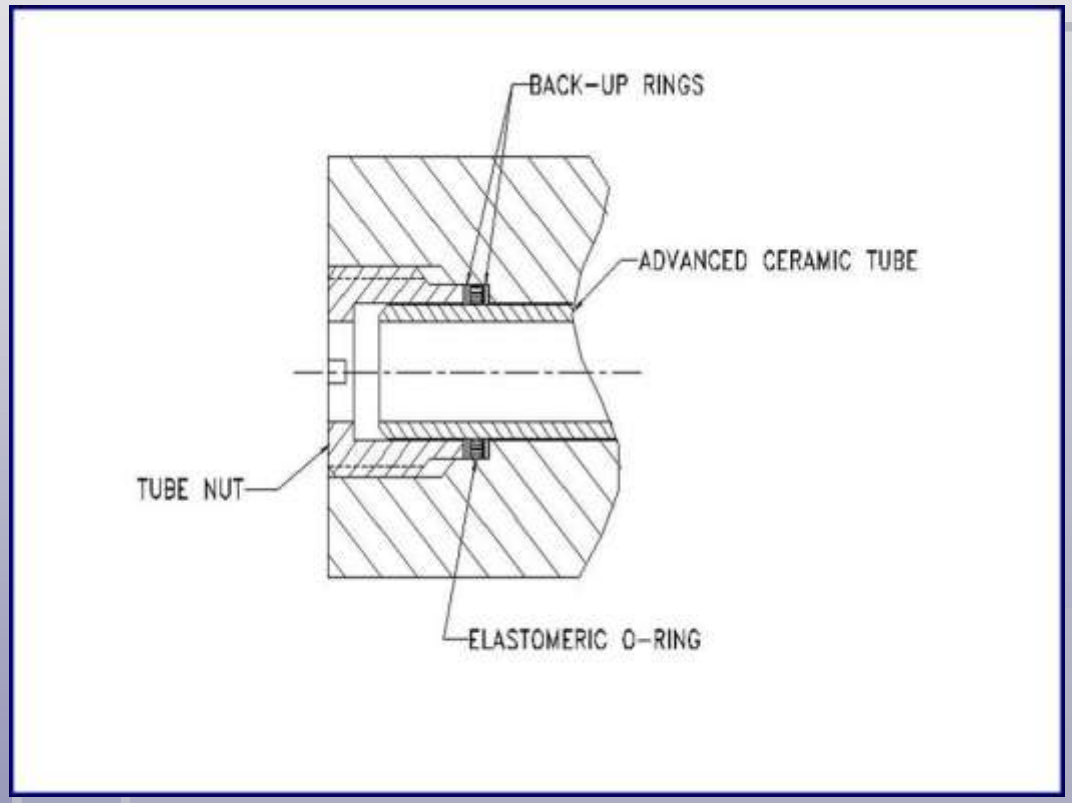
Advanced Ceramic Tubesheet Construction



MATERIAL OPTIONS

Advanced Ceramic-filled ptfe
Glass-filled ptfe

Tube to Tubesheet Sealing



- Tubes can expand independently of tubesheet.
- Easy tube replacement if required.
- Back-up rings create captured sealing mechanism.

CGThermal

Ceramic. Graphite . Heat Exchangers. Process Equipment

All Umax Ceramic Units are Field Repairable Using Common Tools.

CGThermal

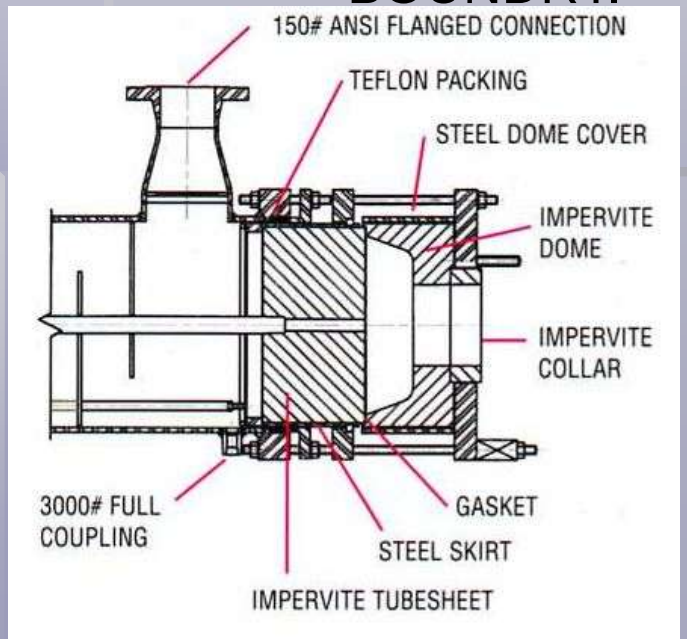
Ceramic. Graphite . Heat Exchangers. Process Equipment

ASME SEC VIII DIV 1 CODE STAMP OPTIONS

- **U1** - APPLIES TO BOTH PROCESS/SERVICE SIDE

- **U2**- APPLIES TO ONLY METAL, “SHELL SIDE ONLY”

- **G** - FOLLOWS PART UIG IN SEC VIII.
  - ALLOWS USE OF GRAPHITE PRESSURE BOUNDRY.



CGThermal

Ceramic. Graphite . Heat Exchangers. Process Equipment

CGThermal

Thank you.

Questions?