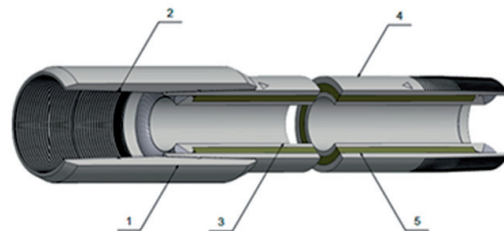


Exceed High Thermal Efficiency Tubing

High Thermal Efficiency Tubing (HTET) features innovated nanomaterial for insulation to reduce steam heat loss, maintain steam quality, decrease casing deformation, and protect cemented casing. It contains:

- An enclosed-welded double-wall structure
- A pre-stressed inner tube fitted into an outer tube
- A nanomaterial insulation liner reduces heat transfer and energy loss by convection and radiation
- Only soft vacuuming is required to achieve high insulating grade
- Multi-stage bakeout process incorporated with continuous thorough vacuuming
- The sealing ring and insulation sleeve in the annular space between the inner and outer tubes reduces heat loss at the connection



1. Coupling with USS Buttress (Coupling for Outer Tube Threads)
2. Seal Ring
3. Inner Tube – API 5CT gr N80 range 2
4. Outer Tube – API 5CT gr N80 range 2
5. Thermal Insulation

HTET is suitable for the lift cycle operation with the heat carrier temperature below 350°C. Examples of operating conditions are:

- SAGD (Steam Assisted Gravity Drainage)
- CSS (Cyclic Steam Stimulation)
- Steam Flooding
- Offshore oil production
- Wells susceptible to paraffin deposits
- Wells in environmentally sensitive areas

A variety of HTET tubes with different thermo-insulation performance grades are available to meet your needs. HTET tubes can substantially save energy consumption, reduce water consumption and shorten the steaming cycle with successful field applications.

■ **HTET Heat Insulating Property**

					Exceed HTET Insulation Grade	
Rate	A	B	C	D	E	
Thermal Conductivity Coefficient λ	0.06 – 0.08	0.04 – 0.06	0.02 – 0.04	0.006 – 0.02	0.002 – 0.006	
K Value BTU/h·ft·°F	0.0346758 ~ 0.0462344	0.0231172 ~ 0.0346758	0.0115586 ~ 0.0231172	0.00346758 ~ 0.0115586	0.00115586 ~ 0.00346758	

■ **Exceed Key HTET Products**

Sizes	Grade	Connection Type	Insulators	Thermal Conductivity	Max. Operating Temperature
3 ½" x 2 ¾"	J55, L80, N80Q	Integral connection with flush OD or external coupled connection	Internal or External	D & E	350° C
4 ½ x 2 ¾"	J55, L80, N80Q	Integral connection with flush OD or external coupled connection	Internal or External	D & E	350° C
4 ½ x 2 7/8"	J55, L80, N80Q	Integral connection with flush OD or external coupled connection	Internal or External	D & E	350° C
4 ½ x 3 ½"	J55, L80, N80Q	Integral connection with flush OD or external coupled connection	Internal or External	D & E	350° C
5" x 3 ½"	J55, L80, N80Q	Integral connection with flush OD or external coupled connection	Internal or External	D & E	350° C

Note:

Custom design combinations of grades and sizes are available.

We are also able to provide buttress or semi premium and premium connections. Range 3 joints also available.