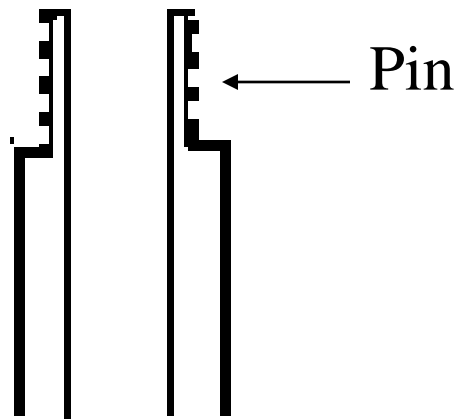
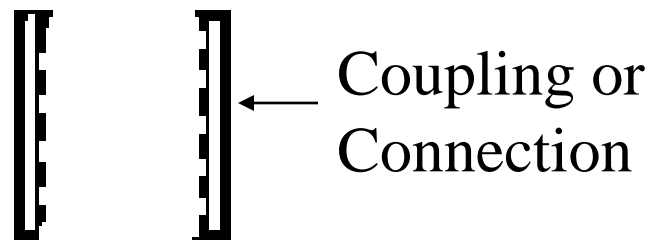
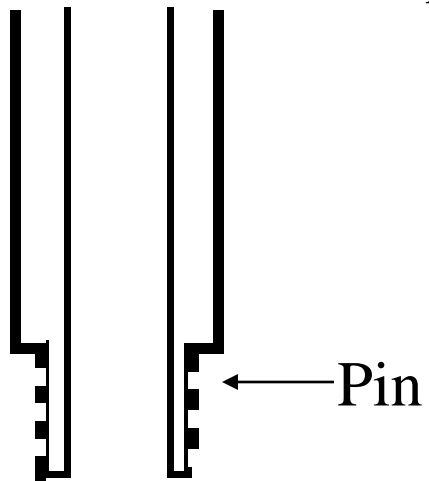


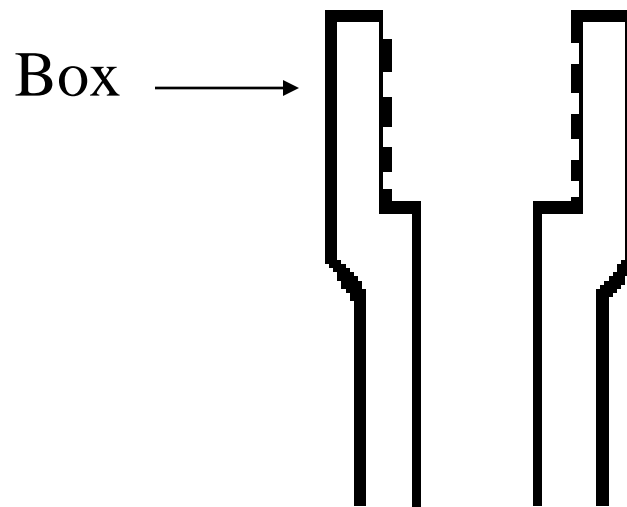
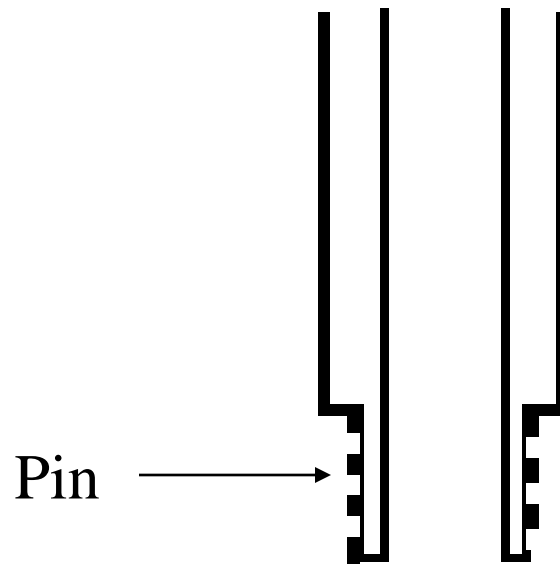
Tubular Joints

- T&C – Threaded and Coupled
- LT&C – Long Thread and Coupled
- ST&C – Short Thread and Coupled
- Integral – direct connection using thread cut onto one pipe and a box and thread cut into another.

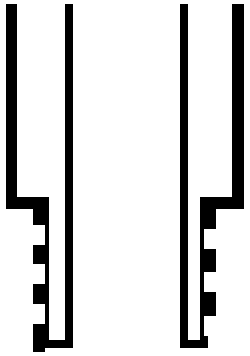
Threaded and Coupled



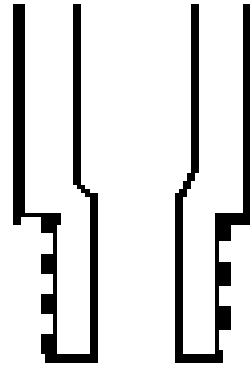
Integral Connector



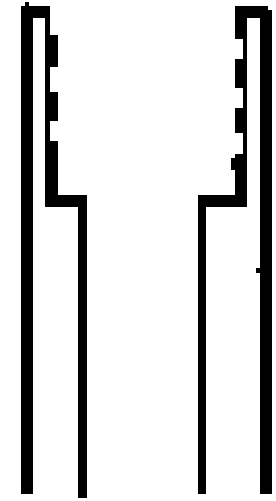
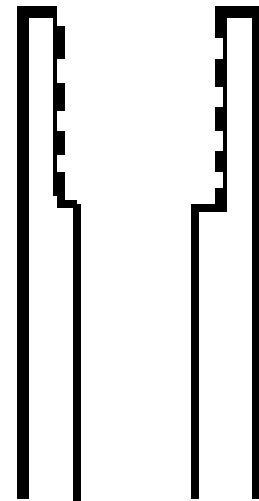
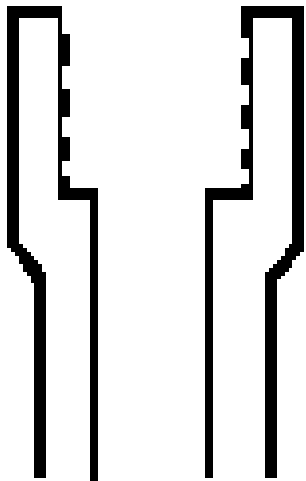
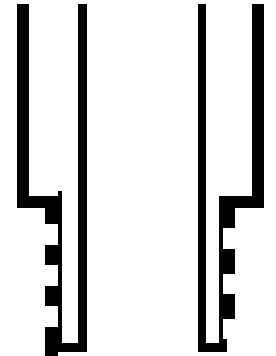
EU or external
upset – strong
connection, full
opening, clearance
problems



IU or internal upset –
moderately strong
connection, reduced
opening, good
external clearance



NU or non-upset
– weak
connection, full
opening, good
external clearance



Heat Treatment of Steels – General Information

- Annealing – heated above critical temp and cooled slowly in an oven (drives out stress risers from handling, rolling and cutting and reduces effect of heat affected zones from welding).
- Normalizing – same as annealing, but steel is air cooled. Example: K-55 is annealed at 1580°F (860°C)

Heat Treatment of Steels – General Information

- Quenching – Same procedure as normalizing but rapid cooling, usually done in water, salt water, or oil, depending on the rate of cooling needed for a specific property.

Heat Treatment of Steels – General Information

- Tempering – Heating a quenched or normalized steel to a set temperature below the critical, then cooling back to ambient. (rate of cooling is often critical). Level of heating is usually about 1110 to 1260°F (600 to 680°C). The steel becomes tougher (sometimes locally at an edge or surface), but loses a small amount of strength.

Heat Treatment of Steels – General Information

- Stress Relieving – similar to tempering, but relieves local stresses built up during manufacturing such as upsetting the pipe before making a threaded box. Annealing is a step beyond this process.

Threads

- Seals and strength
- This is not an examination of threads – just a introduction to what joint threads do and some problems faced in interventions.

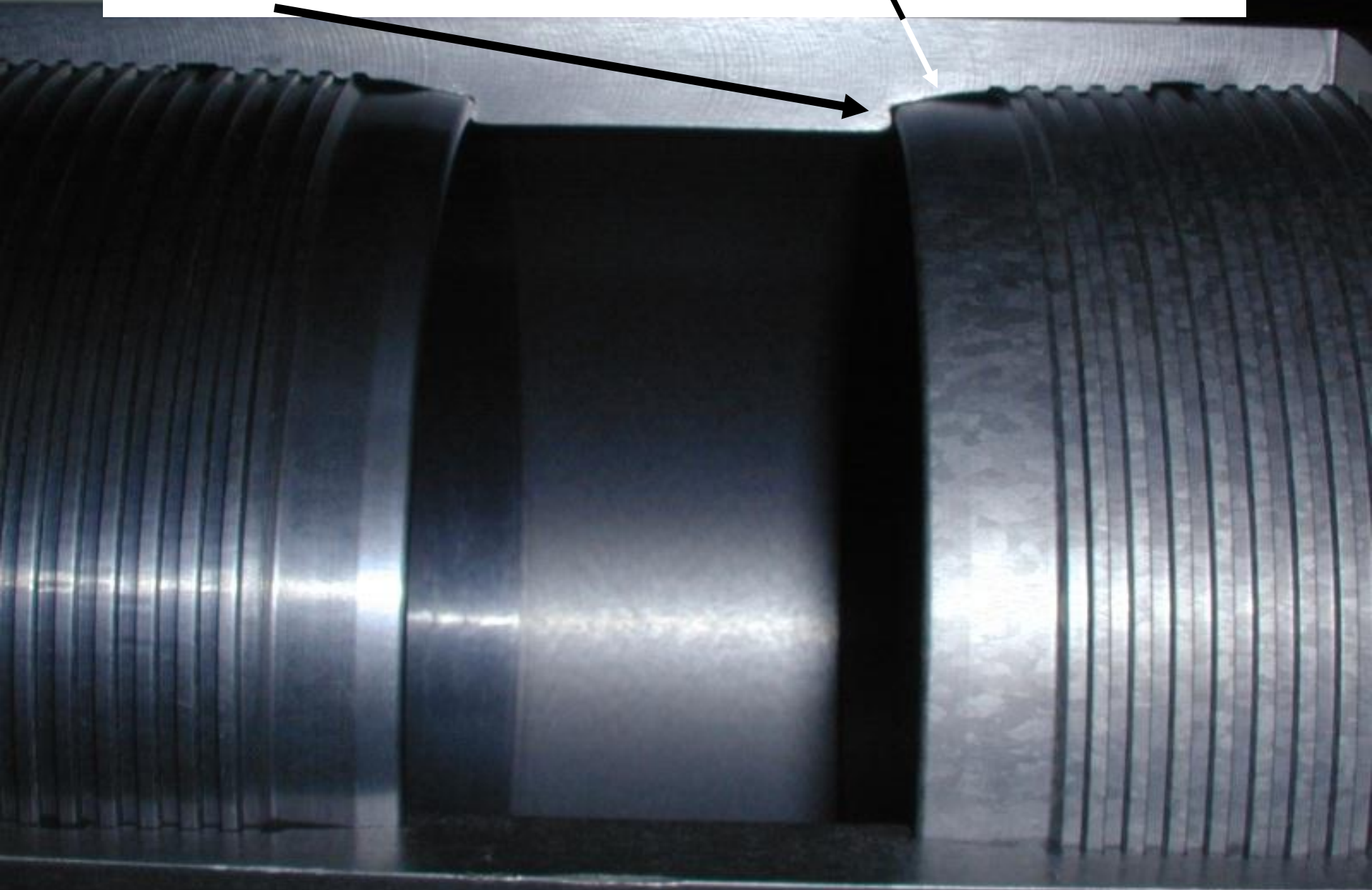


A cross section of threads in a patented connection. Notice the hook design of the threads and the metal-to-metal sealing surfaces. This type of thread, unlike the API 8-round thread, does not depend on pipe dope for sealing. It only needs a small amount of dope for lubrication. It does, however, depend on proper joint make-up to engage the metal-to-metal seals.

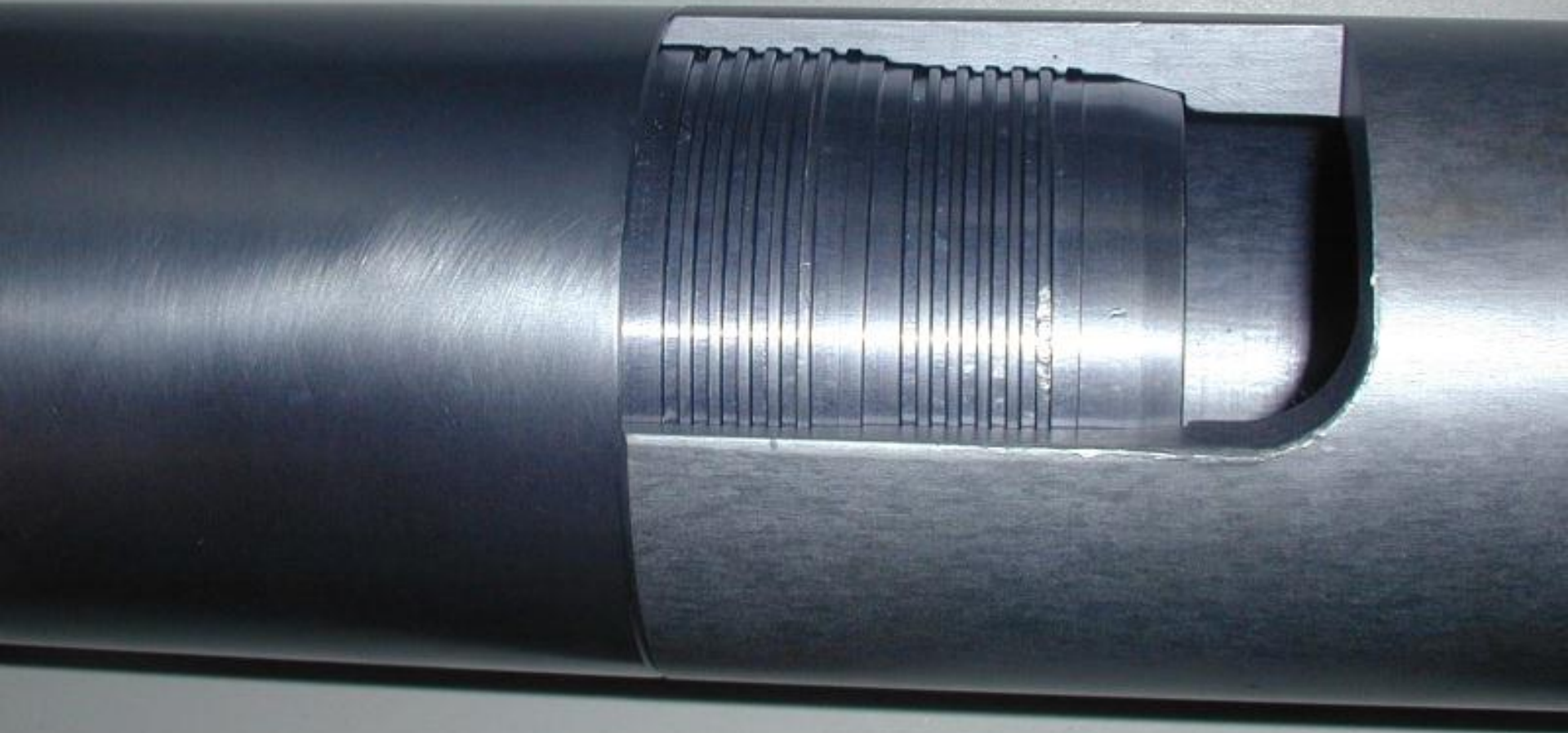


This patented connection has a space for an elastomer seal at the bottom of the box. The Seal is really the main sealing point and its condition is critical to sealing the string.

A very simple, short thread with a metal-to-metal seal and a shoulder at the bottom of the box.



A flush connection (not upset) with metal-to-metal seal.





Seal at connection – teflon insert.



