A simple method for joining metal tubes to fittings and flanges

Because the mechanical joint will not leak, vibrate loose or pull off when properly installed, engineers who design hydraulic or pneumatic systems consider it superior to welded or brazed joints.

Practically every tubing material, except plastic, can be mechanically joined, providing the tube is annealed or is ductile. Copper, cupro-nickel, carbon steel, stainless steel, admiralty brass, titanium, Inconel and other high-strength materials have been successfully joined to fittings by this cold rolling process.

The tool itself is a tube expander consisting of a cage, rolls and mandrel and is driven by hand with a suitable wrench, air or electric drills, drill units or standard shop machines. The tool components are modified to meet the needs of the job.

Factors affecting design are the size, thickness, hardness and configuration of the tube and flange or fitting.

After the tool is inserted in the tube, the rotating rolls force the tube wall into the machined grooves or serrations of the fitting. Because the tube is thus “locked” into the fitting, it cannot move as a result of temperature changes, internal pressures or vibration.

The amount of compression required for an optimum joint varies with the tube material.

Tubes with 0.015” to 0.500” (0.38 to 13mm) wall-thickness and .500” to 12.000” (13 to 305mm) diameter have been cold rolled successfully with Elliott Mechanical Joining Tools.

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