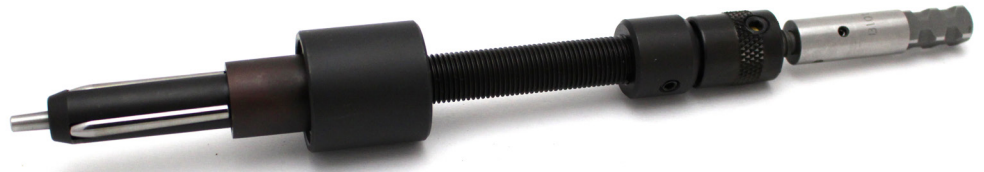# MECHANICAL JOINING TOOLS

The superior method for joining tubing to flanges and fittings.

EASILY CREATE SECURE, LEAK-PROOF JOINTS BETWEEN DUCTILE TUBULAR PRODUCTS AND FITTINGS WITH THE ELLIOTT MECHANICAL JOINING TOOL.

Easy-to-use

Limited training required to operate.

Used on manual electric rolling motors, pneumatic motors, special machines and in rare cases, on CNC machines.

Superior joints

Creates secure, leak-proof joints between ductile tubular products and fittings.

Mechanically joined joints will not leak, pull apart, or come loose due to pressure, vibrations or temperature change.

Superior to a welded, brazed, or crimped joint.

Roll to a torque or diameter spec

Rolling to a torque ensures consistent results regardless of tolerance and variations of the tube OD, wall thickness, and component ID.

Rolling to a diameter guarantees a consistent ID of the tube. This makes it possible to "iron out" and round up the ID of the tube.

Materials

Practically every tubing material except plastic can be mechanically joined, providing the tube is annealed or is ductile.

Annealed and ductile materials include:
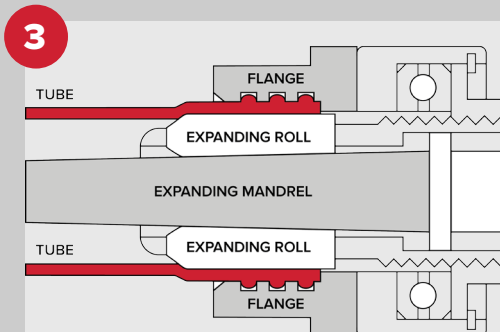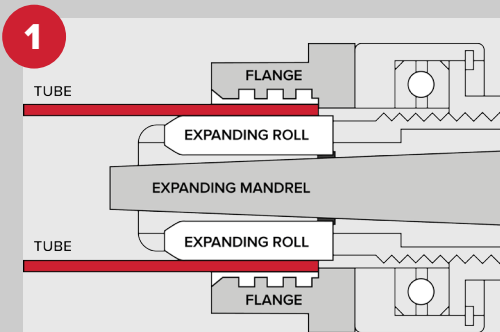steel, stainless steel, aluminum, titanium, copper, cupronickel, iconel, etc.
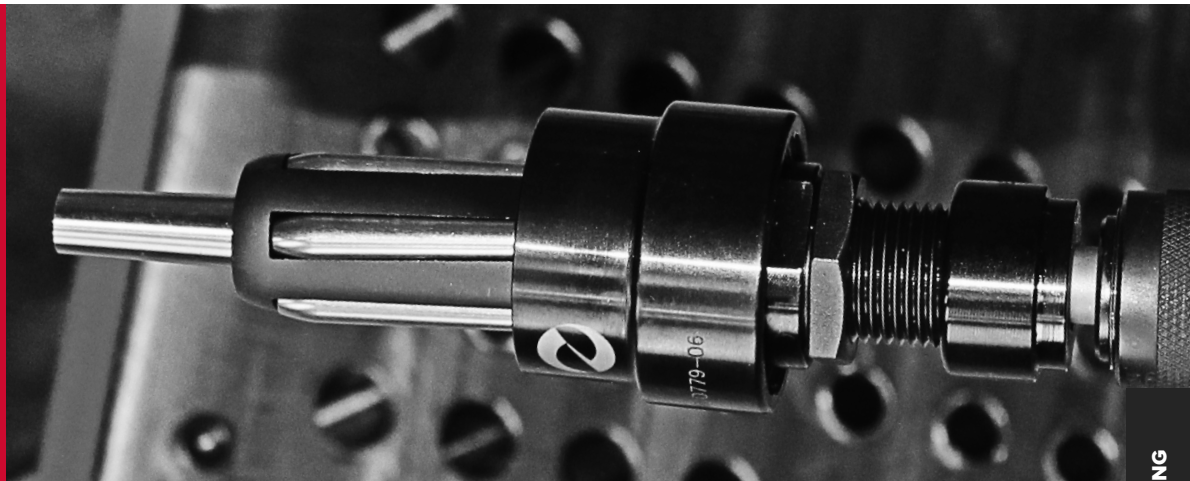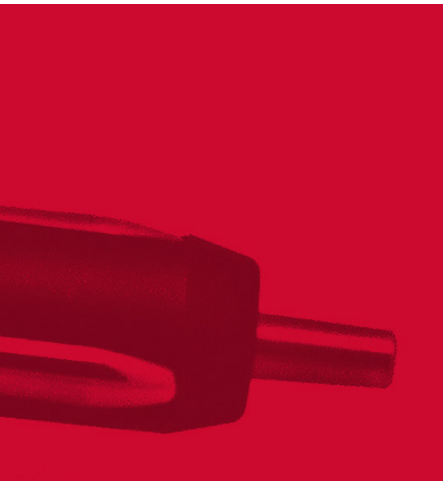
1: 0% EXPANSION

Tube is inserted into flange and mechanical joining tool is then inserted into tube. A generous radius or chamfer should be provided at back side of flange.
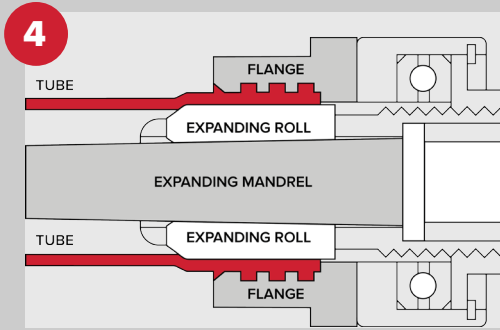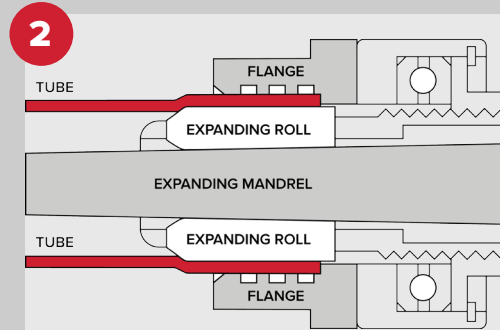
At the opposite end, there should be a shoulder against which the tube can butt. Grooves should always have sharp corners at the top edge and the bottom of the groove.

Width of the groove can be 0.062″ to 0.375″ (1.6 to 9.5mm); depth can be from 0.005″ to .0320″ (0.13 to 0.81mm) - both dimensions are dependent on flange width, thickness and hardness of tube.

1

TUBE

FLANGE

EXPANDING ROLL

EXPANDING MANDREL

TUBE

EXPANDING ROLL

FLANGE

3

TUBE

FLANGE

EXPANDING ROLL

EXPANDING MANDREL

TUBE

EXPANDING ROLL

FLANGE

3: 50% EXPANSION

Now the tube metal has begun to flow into the grooved serrations of the flange.

2

TUBE

FLANGE

EXPANDING ROLL

EXPANDING MANDREL

TUBE

EXPANDING ROLL

FLANGE

4

TUBE

FLANGE

EXPANDING ROLL

EXPANDING MANDREL

TUBE

EXPANDING ROLL

FLANGE

4: 100% EXPANSION

Grooved serrations are now completely filled and tube metal has flowed to the point of least resistance beyond the flange.

2: 25% EXPANSION

When the tube has been rolled to about 25% of total expansion required, it makes metal-to-metal contact with flange.

RAPID HAWK™

## Electrically-Driven Mechanical Tube Rolling System

Bold precision, fierce productivity.

Engineered with productivity and precision in mind, Elliott's Rapid Hawk electric tube rolling system consistently and efficiently rolls tubes.

Utilize the Rapid Hawk with its proven electric tube rolling system and complete the job in less time.

The Rapid Hawk's articulated arm supports the weight and absorbs the torque of the rolling motor using a pneumatic counterbalance, which allows the operator to eff ortlessly move the rolling motor into position.

Combining an electric rolling motor and the ELC110220 Electric Torque Controller offers a quick-to-set-up, easy to use electric tube rolling system for achieving consistent tube rolling.
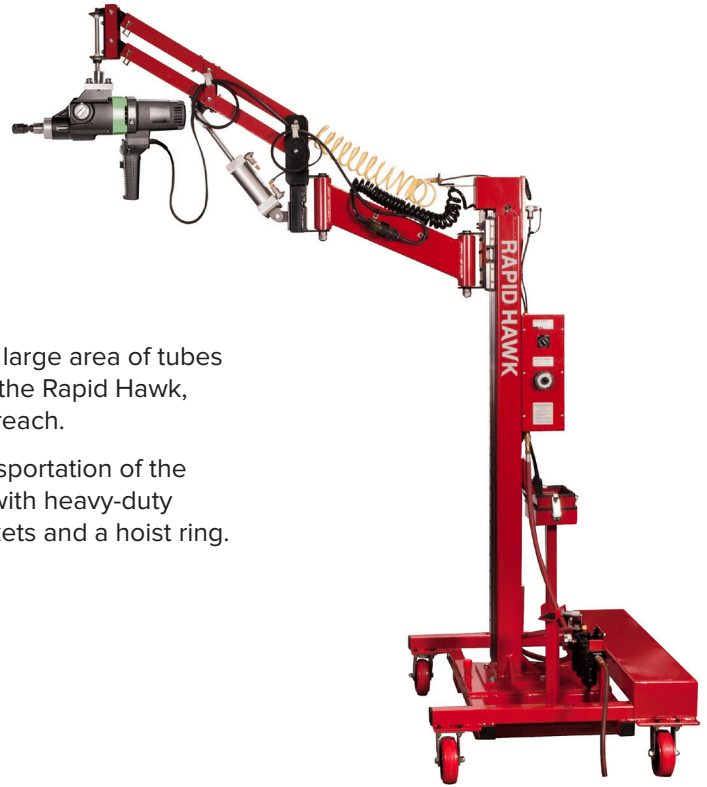
Ergonomically roll a large area of tubes without readjusting the Rapid Hawk, with its large radial reach.

For convenient transportation of the unit, it is equipped with heavy-duty casters, forklift pockets and a hoist ring.

CUP PLUG EXPANDERS

Used to install cups in motor blocks, heads and other similar assemblies.

The cup plug expander offers substantial savings over the pipe or welch plug. It can be used to expand rings or sleeves inside any bore diameters.

APPLICATION
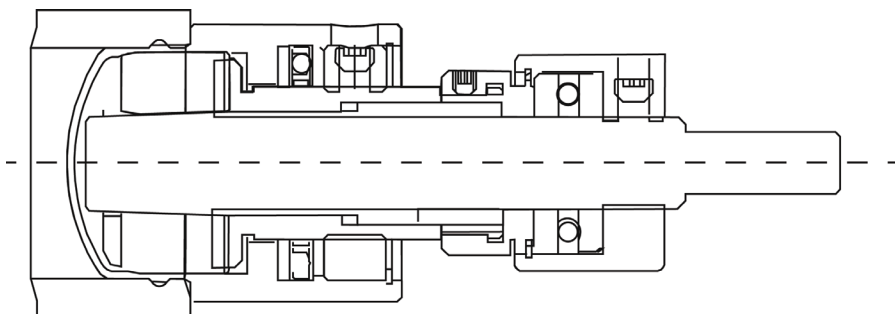
Mechanical joint
can withstand...

THE JOB

Part Material:
Stainless steel tube to cast manifold

Tube ID:
0.992″

Tube Wall Thickness:
0.125″

Torque:
45 ft. lbs. using Elliott hydraulic rolling motor

THE SOLUTION

Tool Used:
B10779-00

Entry diameter minimum: 0.975″

Max expansion diameter: 1.062″

Depth: 1.250″
Max depth: 1.750″

Speed:
80 RPM

THE RESULTS

Mechanically joined a stainless steel tube to a cast fitting for a brake line connection.

Post Surface Finish:
$6 \mu R_a$

Cycle Time:
13SEC.

...over **20,000 pounds** of hydrostatic pressure.