Our method of flow forming is essentially a modified form of metal spinning, differing from the conventional method in that in place of a forming roller that follows a specific contour, a contoured cup shaped tool is used, incorporating the complete shape required. The workpieces that can be formed by this method must show a symmetry of rotation geometry.
Machine data

A wide range of closed end shapes with different wall thicknesses can be formed using the required contoured tooling and rate of feeding of the raw material. Only flat ends perpendicular to the axes are fundamentally excluded. The versatility of the method also applies to the internal geometry: the workpieces can be shaped internally using contoured mandrels.

Examples of application

- Gas pressure vessels
- Air bag pressure vessels
- Shock absorbers
- Gas springs
- Gear flanges (epicyclic gear star wheels)
- Gearbox shafts
- Conveyor rolls
- Printing rolls

Advantages

- Cost reduction
- Assemblies replaced by parts made as single piece components
- Reduced cycle times – increased productivity
- 100% gas tight closure
- Optimum grain structure
- Elimination of welded seams
The die segments (2, 3 or 4 die configuration) perform a continuous hammering action on the workpiece whilst the workpiece rotates. The dies are shaped according to the contour to be formed on the workpiece. Depending on the amount of deformation required the method can be employed cold or hot.

The method can be used for forming steel, titanium, aluminium, copper and other metals and alloys.
Machine data

The machine data for the swage forging machine is selected to suit the particular work to be done. All aspects, including the controls involving electronics, servo hydraulics and pneumatics, are optimised to achieve consistent high quality production.

Examples of application

- Trailer axles (non driven axles)
- Drive axles
- Rear axle tubes
- Drive shafts
- Stabilisers rear axles
- Cylinder liners (engine)
- Suspension components
- Prop shafts
- Steering columns
- Exhaust pipes
- Shock absorbers
- Cam shafts
- Air damping pistons
- Rotor heads for helicopters
- Drill pipes
- Gas pressure vessels
- Lamp posts
- Tubing for the furniture industry

Advantages of Swage Forging

- Weight reduction (optimised wall thickness distribution)
- Material saving
- Near shape production
During the forming process the tube is held in a pair of clamping jaws to prevent axial movement. A guided reducing ring or expanding mandrel is moved over or into the tube and in this way the tube is reduced or expanded.

The closed configuration of machine housing preferred by GFU features:

- Long working life
- Consistent precision of the workpieces
- Good accessibility to the tooling.
- Additional external guiding for the tools
- External guides guarantee concentricity

For cases where frequent tool changes are required we offer an automatic die changer.
Machine data

Press forces are calculated individually for every workpiece and the press type is selected on this basis. Drive systems incorporate basic and servo hydraulic systems, and CNC.

Fields of application

- Air bag cartridges
- Shock absorber tubes
- Servo steering cylinders
- Chassis components
- Steering columns

Advantages

- Cost reducing production method
- Short cycle times
- Low concentricities
The workpiece, which is heated in the area to be formed, is held in a die made up of two segments and is then upset using an arrangement of either one or two plungers. Different contours can be formed if the tooling is shaped accordingly.

Upsetting technology often allows to change from full bar to tube material.
Machine data

The data for each upsetting machine for specific workpieces is established individually with the aid of a simulation programme. The drive of the machine employs hydraulic and servo hydraulic and CNC systems. Consistent high quality production is a fundamental feature of the method.

Examples of applications

- Cam shafts / tubes
- Drive shafts
- Steering columns / steering shafts
- Steering racks
- Gearbox shafts
- Rear axle shafts
- Stabilisers
- Drill pipes
- Pressure vessels
- Tubes for the furniture industry

Advantages

- Weight reduction resulting from optimised distribution of wall thickness.
- Near net-shape metalforming
- Saving in material
- Safety: increased strength due to more homogenous grain structure
- Often the number of different shapes required can be reduced, thus saving stock holding
- Welded seams previously required eliminated