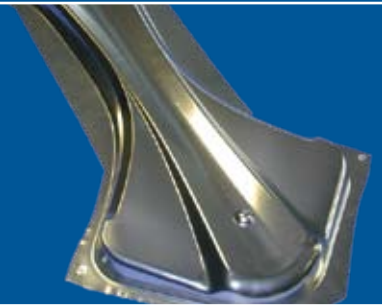


# Hydroforming

## Methods of sheet forming with a fluid medium



STYLING | PACKAGING | SAFETY | ENVIRONMENTAL PROTECTION | LIFETIME | DURABILITY | FLEXIBILITY | SERVICE

### SHEET METAL FORMING USING A FLUID MEDIUM

Schuler Hydroforming offers a number of methods for the manufacture of complex parts by means of a fluid medium. In this process, the parts are formed with the aid of a fluid medium under pressure. In contrast to conventional drawing, spherical geometries can be produced in a single operation. The dimensional accuracy and surface quality of the components are significantly better than can be achieved using conventional drawing. These methods are finding new applications in both the automotive and nonautomotive sectors.

#### Potential parts

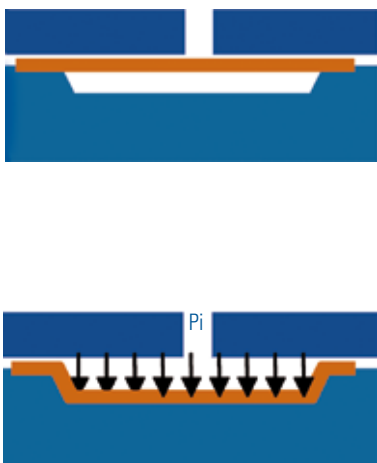
- Small and medium production lot sizes
- Parts with demanding surface quality requirements
- Parts with pretreated, brushed or coated surfaces (drawing with films)
- Interior covers
- Exterior covers for chrome plating/high polish
- Structural parts, exterior parts

#### SCHULER SMG GMBH & CO. KG

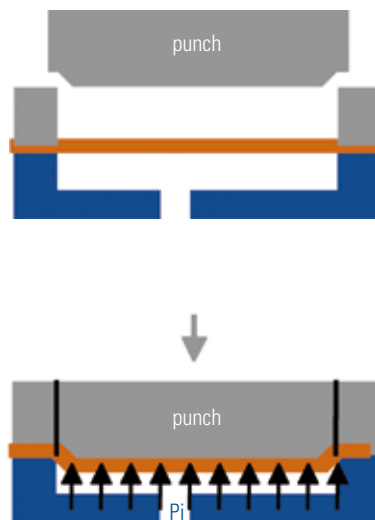
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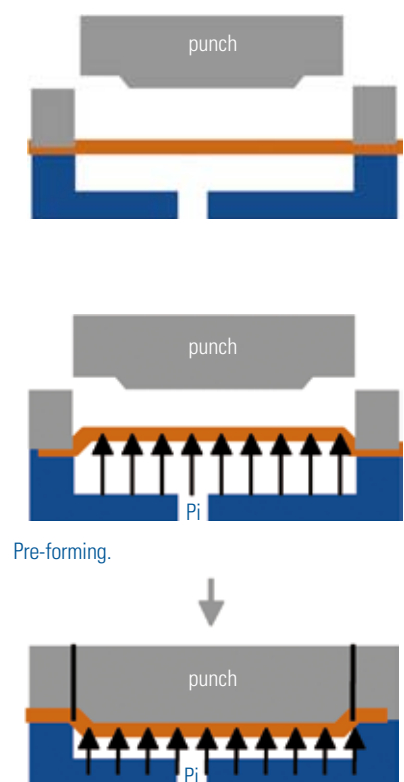
Hydraulic deep drawing



Hydromechanical deep drawing



Active hydromechanical deep drawing



In hydraulic deep drawing, the blank is formed by a fluid medium in a rigid die. During the process, the pressure chamber is sealed using a polyurethane cord – also used in hydromechanical deep drawing. Forming, especially of spherical shapes, can be done in a single operation thanks to the use of a fluid medium. Moreover, there is no significant relative movement between die and workpiece as the pre-form meets the lower die, thus ensuring excellent surface quality.

In hydromechanical deep drawing, the punch determines the contour and the lower die is replaced by the fluid medium. The chamber is usually sealed under pressure using a cord-type seal. As the punch lowers, the pressure in the fluid medium rises due to the reduction in volume and the blank moves against the punch. Since in this forming process the friction between blank and drawing radius is significantly reduced, hydromechanical deep drawing permits much greater drawing depths than conventional deep drawing.

Active hydromechanical deep drawing is an extension of hydraulic deep drawing. In this variant, the blank is preformed by active elevation of the pressure in the fluid medium in the opposite direction of the actual forming before the punch moves against the blank. The blank is then subsequently finished-formed – just as in simple hydromechanical deep drawing – by the drawing punch moving against the water pressure. The pre-forming step that works against the actual direction of the punch can be used for two applications.