FORGING

Forging is an industrial method that involves shaping metal with hammers, presses, or rolls.

These compressive forces are delivered with a hammer or die. Forging is commonly classified according on the temperature at which it is performed: cold, warm, or hot forging. A variety of metals can be forged. Forging commonly uses metals such as carbon steel, alloy steel, and stainless steel.

Aluminum, brass, and copper are all very soft metals that may be forged. The forging technique can produce items with excellent mechanical qualities while generating minimal waste.

The basic idea is that the original metal is plastically distorted into the required geometric shape, giving it increased fatigue resistance and strength.
The procedure is economically sound, having the ability to mass-produce parts while maintaining particular mechanical qualities in the completed product.

Smiths have been forging for millennia, with traditional items including cookware, hardware, hand tools, edged weapons, cymbals, and jewelry.

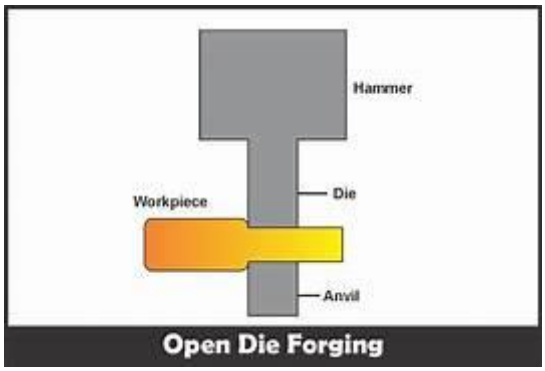
TYPES OF FORGING :

1. **DROP FORGING**

Drop forging gets its name from the process of dropping a hammer on the metal to shape it into the shape of a die. The die refers to the surfaces that make contact with the metal. There are two forms of drop forging: open-die and closed-die forging. Dies are normally flat in design, while some have specially curved surfaces for specialized processes.

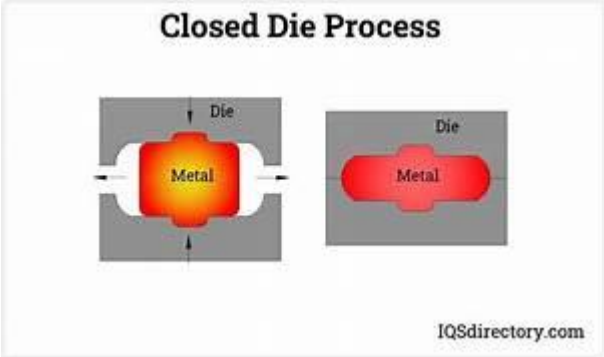
Open-die forging

Open-die forging is also called smith forging. A hammer smashes and bends a metal on a stationary anvil.



Closed-die forging

Closed die forging is often referred to as impression die forging. The metal is placed in a die and secured to an anvil. The hammer is dropped on the metal, forcing it to flow into the die cavities.



The hammer is timed to make contact with the metal in milliseconds.
Excess metal is pushed from the die cavities, causing a flash. The flash cools faster than the remainder of the material, making it more durable than the metal in the die. Following forging, the flash is eliminated.

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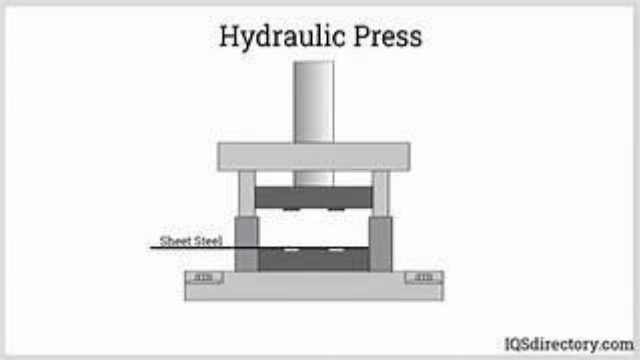
2. PRESS FORGING

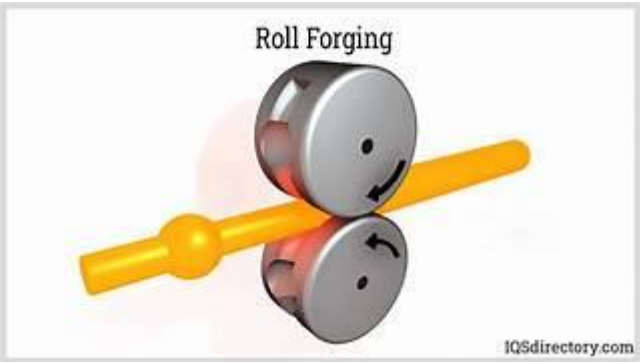
Press forging employs a steady, continuous pressure or force rather than the impact used in drop-hammer forging. The slower ram travel means that the deformation penetrates deeper into the metal, affecting the entire volume equally.



In contrast, drop-hammer forging often just deforms the surface of the metal, leaving the interior relatively unaltered. Internal strain can be controlled by adjusting the compression rate during press forging.

3.ROLL FORGING

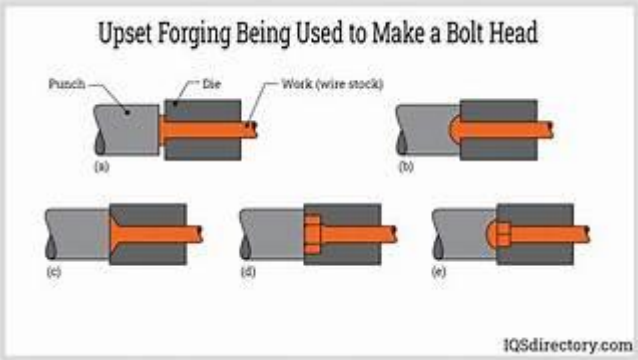
Roll forging uses two cylindrical or semi-cylindrical horizontal rolls to deform a round or flat bar stock. This acts to minimize its thickness while increasing its length.



This heated bar is inserted and passed between two rolls, each with one or more formed

grooves—and is gradually shaped as it travels through the machine. This process will continue until the required form and size are obtained.

1. **UPSET FORGING**
   Upset forging is a manufacturing process that expands the diameter of a metal by compressing its length. Crank presses, which are specialized high-speed machines, are utilized in upset forging procedures.



   Crank presses are often mounted on a horizontal plane to optimize efficiency and facilitate the rapid exchange of metal from one station to the next. Vertical crank presses and hydraulic presses are additional choices.

2. **AUTOMATIC HOT FORGING**
   Automatic hot forging involves inserting mill-length steel bars into one end of the forging machine at room temperature and producing hot forged products from the other end. In less than 60 seconds, high-power induction coils heat the bar to temperatures ranging from 2190 to 2370°F.