

# FUNDAMENTALS OF METAL FORMING

## Metal Forming

- Large group of manufacturing processes in which plastic deformation is used to change the shape of metal workpieces
- The tool, usually called a **die**, applies stresses that exceed yield strength of metal
- The metal takes a shape determined by the geometry of the die

## Stresses in Metal Forming

- Stresses to plastically deform the metal are usually **compressive**  
Examples: forging, rolling, extrusion
- However, some forming processes:  
    Stretch the metal (**tensile** stresses)  
    Others bend the metal (tensile and compressive)  
    Still others apply **shear** stresses

\*Tensile - capable of being stretched or extended; ductile.  
\*Shear stress - exists when two parts of a material tend to slide across each other in any typical plane of shear upon application of force parallel to that plane.

## Material Properties in Metal Forming

Desirable material properties:

- **Low yield strength and high ductility**

\*Yield strength refers to an indication of maximum stress that can be developed in a material without causing plastic deformation.

These properties are affected by temperature:

**Ductility increases and yield strength decreases** when work temperature is raised

Other factors:

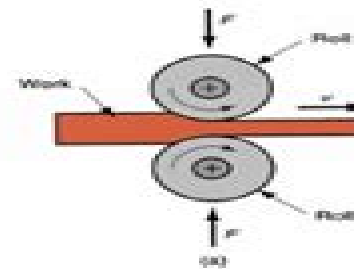
Strain rate and friction

## Bulk Deformation Processes

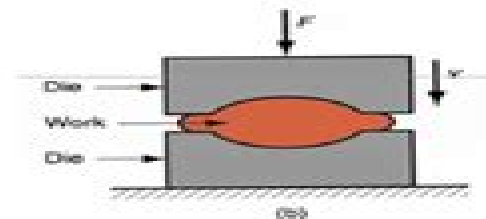
- Characterized by significant deformations and massive shape changes
- "Bulk" refers to workparts with relatively low surface area-to-volume ratios
- Starting work shapes include cylindrical billets and rectangular bars

## BASIC PROCESSES BULK DEFORMATION

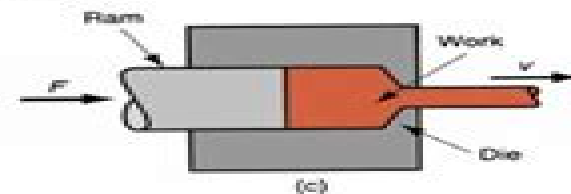
### A. Rolling



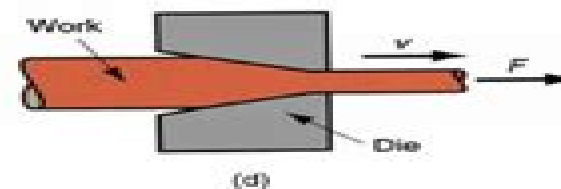
### B. Forging



### C. Extrusion



### D. Drawing



# Handbook Of Metal Forming Processes

**Sebastian Brünink**



## **Handbook Of Metal Forming Processes:**

## The Enigmatic Realm of **Handbook Of Metal Forming Processes**: Unleashing the Language is Inner Magic

In a fast-paced digital era where connections and knowledge intertwine, the enigmatic realm of language reveals its inherent magic. Its capacity to stir emotions, ignite contemplation, and catalyze profound transformations is nothing lacking extraordinary. Within the captivating pages of **Handbook Of Metal Forming Processes** a literary masterpiece penned with a renowned author, readers attempt a transformative journey, unlocking the secrets and untapped potential embedded within each word. In this evaluation, we shall explore the book's core themes, assess its distinct writing style, and delve into its lasting impact on the hearts and minds of those who partake in its reading experience.

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