

# Deformation and Non-Newtonian Flow

3.044 April 11, 2005

## Mechanics:

- Problem Set 6 due today/Wednesday
- PostScript documents and GSView Windows software/plugin

## Today's lecture:

- Deformation processing
- Non-Newtonian flow

## Deformation Processes

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- Overview of deformation processing
- Non-Newtonian fluids, Viscoelasticity
- Deformation mechanisms: metals, polymers
- Stress-strain, sheet forming, stability
- Consolidation processes and mechanisms:  
sintering, HIP, compression molding

# Deformation Processes

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## Examples:

- Metals: sintering, HIP, rolling, forging, extrusion, stamping
- Polymers: compression molding, extrusion, stretching, stamping
- Ceramics: sintering, HIP; low-rate "forging"

## Advantages:

- Large scale, low cost
- Achieve desired geometry without porosity