### Wood

- **Machining properties**
  - Ease of Cutting: Soft
  - Ease of Adhering: Non-splitting
- **Practical properties**
  - Food-safe: Yes
  - Anti-corrosive: Yes
- **Mechanical properties**
  - Strength: Medium
  - Stiffness: Medium
  - Thermally conductive: Yes

### Metal

- **Machining properties**
  - Ease of Cutting: Hard
  - Ease of Adhering: Non-splitting
- **Practical properties**
  - Good workability: Yes
  - However, difficult to weld
- **Mechanical properties**
  - Strength: High
  - Stiffness: High
  - Thermally conductive: Yes

### Plastic

- **Machining properties**
  - Ease of Cutting: Soft
  - Ease of Adhering: Non-splitting
- **Practical properties**
  - Food-safe: Yes
  - Anti-corrosive: Yes
- **Mechanical properties**
  - Strength: Low
  - Stiffness: Low
  - Thermally conductive: No

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### Which material should I use?

- **Wood**
  - Soft
  - Hard
  - Plywood
  - Other plant-based materials

- **Metal**
  - Stainless steel
  - Alloy/Tool steel
  - Aluminum

- **Plastic**
  - PET
  - HDPE
  - PVC

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### What other materials should I consider?

- **Concrete / Brick**
- **Plaster**
- **Ceramic**
- **Paper / Cardboard**

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### Wooden properties

- Weight:
  - Soft: Less than hard wood
  - Hard: Heavily dense

- Texture:
  - Soft: Smooth and pliable
  - Hard: Stiff and brittle

- Hardwood:
  - Common applications:
    - House frames
    - Simple furniture
  - Specific characteristics:
    - Low cost
    - Easy to work with

- Softwood:
  - Common applications:
    - Furniture
    - Building construction
  - Specific characteristics:
    - High cost
    - Difficult to work with

### Metal properties

- Strength (Yield point):
  - Describes the stress a material can handle before it starts to permanently deform.

- Stiffness/Rigidity (Elastic modulus, λ):
  - Describes how a material can handle stress before it moves.

- Thermal conductivity (k or U-value):
  - Describes how easily heat travels through the material.

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### Plastic properties

- **Thermoplastics** (PET, HDPE, LDPE, PVC, PP)
  - Can be remolded or melted,
  - but should not be mixed together.

- **Thermoset plastics** (epoxy, polyurethane) CANNOT be remolded with heat.

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### Typical uses

- **Wood**
  - Furniture
  - Building construction

- **Metal**
  - Tools
  - Machineries

- **Plastic**
  - Containers
  - Dishes
  - Packaging

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### General notation

<table>
<thead>
<tr>
<th>Notation</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>A36</td>
<td>Hot rolled steel, specification based on carbon content and dimensions</td>
</tr>
<tr>
<td>304</td>
<td>Stainless steel, general grade</td>
</tr>
<tr>
<td>PVC</td>
<td>Polyvinyl chloride</td>
</tr>
</tbody>
</table>

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### Recycled plastics

- Typically, products made from recycled plastics are not recyclable.