

Subject: Building Material and Construction-IV

Topic: Metals-II

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HEAVY METALS

- **LEAD:**

SOURCE	CHARACTERISTICS	USES
Galena	<ul style="list-style-type: none">- Silvery grey- Soft and malleable.- Isvery toxic when lead fumes are inhaled.	<p>Batteries, protective measures against nuclear radiation.</p> <p>An additive in glass to give hardness and add wight.</p>



Tin:

SOURCE	CHARACTERISTICS	USES
Casstierite	<ul style="list-style-type: none">- Shiny white.- Very soft.- Does not oxidise at room temperature.	Tin foil and tin plate (a sheet of steel coated on both sides with a thin layer of tin). Alloyed with lead, it is used for soft soldering



Zinc:

SOURCE	CHARACTERISTICS	USES
Sphalerite and hemimorphite	<ul style="list-style-type: none">-Bluish grey-Shiny-Weak at low temperatures-Not very hard	Roofing, plumbing and in the car industry. A layer of zinc is used on other materials to stop corrosion



• Cooper:

SOURCE	CHARACTERISTICS	USES
Cuprite, chalcopyrite and malachite	-Corrodes or oxidises very easily	Electrical wire, telephone lines, pipes, radiators, as decoration and in architecture jewellery and handicrafts



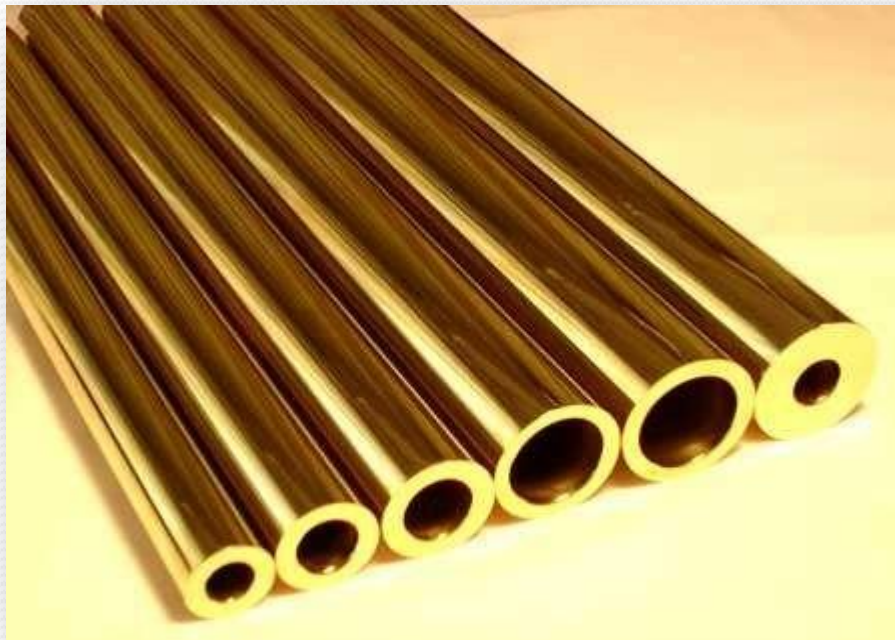
• Bronze:

SOURCE	CHARACTERISTICS	USES
Alloy cooper and tin	-Resistant to wear and corrosion	Boat propellers, filters, church bells, sculptures, nuts, bearings and cogs.



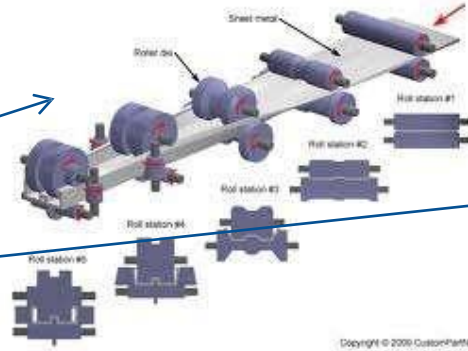
Brass:

SOURCE	CHARACTERISTICS	USES
Alloy cooper and zinc	-Very resistant to corrosion	Handcrafts, jewellery, plumbing, capacitors and turbines

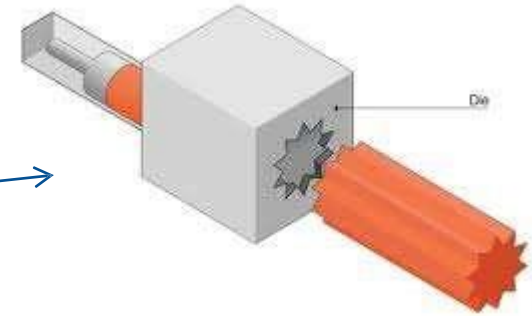


Shaping techniques

- Shaping:
 - Rolling



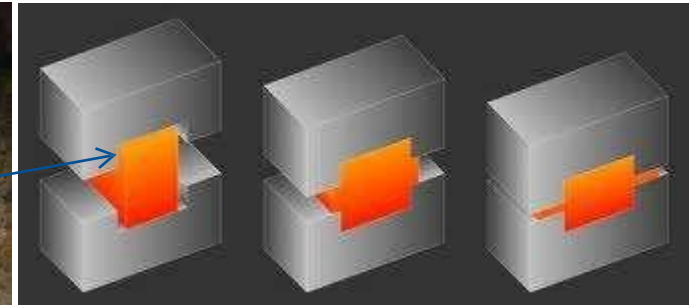
- Extrusion



- Forging



- Press forging



- Punching

- Bending

- Wiredrawing



Shaping techniques

- Casting: used to change the dimensions of the object.
 - The metals is heated to the casting process
 - The liquid metal is poured into the mould
 - The mould and metal are left to cool until the metal has solidified.
 - The solidified piece is extracted from the mould

Permanent join

- Rivet



- Press fit joint

- Adhesive



- Welding and soldering



- Nuts and bolts

Temporary joint

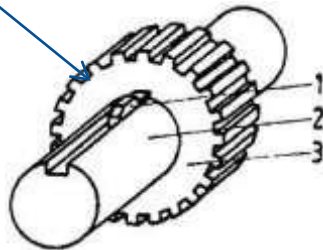
- Screws



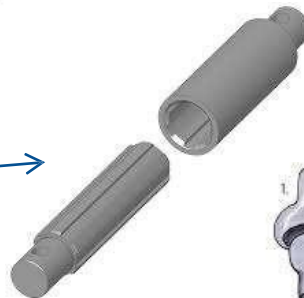
- Threaded stay bolts



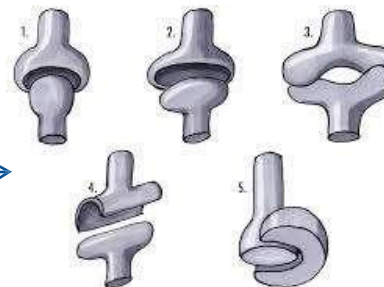
- Keyed joints



- Splined shafts



- Sliding joints



Finishies

Finishing is for:

- Removing surface imperfections
- Polishing
- Protecting metals from water and corrosion

Finishing techniques:

- Grinding
- Lapping
- Polishing
- Buffing
- Coatings

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