

Brazing Assignment - I

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Write short notes on

a) Soft Soldering :-

It is a method of joining metals with a eutectic Tin lead alloy. The heat source is often an electric soldering iron but copper irons heated with a gas torch may be needed for larger work. Soft Solder typically has a melting point range 90°C to 450°C and is commonly used in electronics, plumbing, and sheet metal work.

b) Soldering iron:-

A soldering iron is a hand tool used in soldering. It supplies heat to melt solder so that it can flow into the joint between two work pieces. A soldering iron is composed of a heated metal tip and an insulated handle. Solder melts at approximately at 185°C. Soldering irons are designed to reach a temperature range 200°C to 480°C.

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C) Methods of heating in Soldering -

A temperature of 450°C is usually used as a practical demarcation between soldering and brazing. Soft soldering can be done with a heated iron whereas the other methods typically require a higher temperature furnace to melt the filler metal.

D) Fluxes :-

A flowing or discharge of fluid from the body especially when excessive or abnormal. The rate of transfer of fluid, particles, or energy across a given surface. Silica, dolomite, lime, borax and fluorite are used as other materials fluxes.

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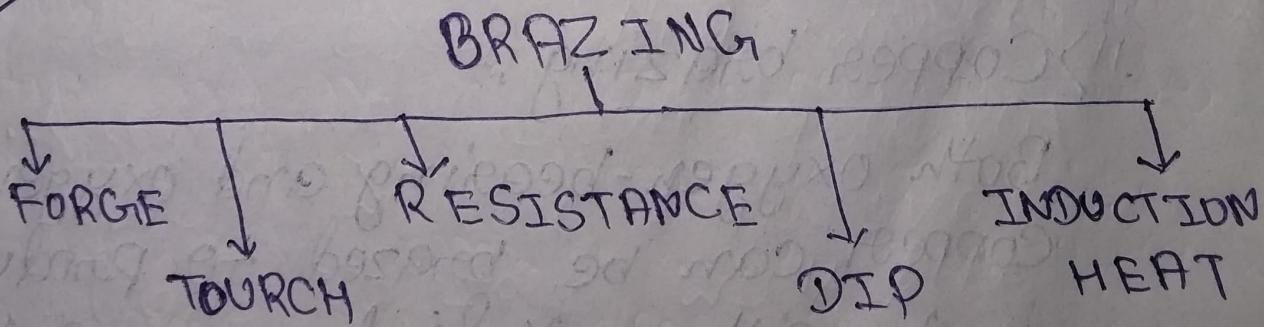
② What is a Spelter? Give the composition and uses of some commonly used spelters.

→ Spelter is a zinc-lead alloy that ages to resemble bronze, but is softer and has a lower melting point. The name can also refer to a copper-zinc alloy (a brass) used for brazing, or to pure zinc. It is mainly composed of zinc, a silvery white metal. Some examples are a cast base metal with a bronze finish, and the glass globe is Italian.

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③ How can brazing be classified?

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b) Describe briefly:-

i) Silver brazing:-

Silver brazing, sometimes known as a hard soldering, is brazing using a silver alloy based filler. These silver alloys consist of many different percentages of silver and other metals, such as copper, zinc and cadmium. It is a popular method for joining or bonding ferrous and non-ferrous base metals like steel, stainless steel, copper and brass. The bulk tensile strength of silver braze alloy is 40,000 - 70,000 Psi.

ii) Copper brazing:-

Both oxygen-bearing and oxygen-free copper can be brazed to produce a joint with satisfactory properties.

The full strength of a copper brazed joint will be developed with a lap

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joint. The flame used should be slightly carburizing. It is done at temperature from about 350°F to 600°F , while most brazing is done at temperature ranging from 1100°F to 1500°F .

iii) Aluminium brazing:-

Brazing aluminium is more difficult than brazing other metals because the melting points of the base metal and the filler are close together, and because of the oxide layer present on the surface of aluminium. Too much oxygen or gas will blow the torch out, so slowly adding oxygen to achieve optimum brazing flame is advised. Its melting point is $600^{\circ}\text{F} / 317^{\circ}\text{C}$. Bonding strength is

30000 Psi

④ Write notes on

a) Brazing material:-

Brazing is used to join metal parts and can be applied to a wide array of materials, like brass, copper, stainless steel, aluminium, zinc-coated steel and ceramics. Laser brazing offers some distinct advantages in applications that require the joining of non-similar metals.

b) Brazing design:-

To make brazing joints more strong and to fit filler melted metal in gap b/w base materials, base materials should be placed in some specific design. Both base metals should overlap more than enough to have good grip on each other and then brazing should be done.

(5) What are the advantages and disadvantages of brazing.



- Advantages of brazing :-

- Needs low temperature for brazing.
- It can join two different type of metal or one metal and one non-metal.
- Less dangerous and more easy than welding.

- Disadvantages of brazing :-

- Joint made by brazing is weaker than joint made by welding.
- It's part size are not found easily and colour of the filler metal is different than colour of base metal.

6. What are the precautions needed in brazing?

→ Precautions needed while brazing are -

- clean the base metal and joints to remove any external element.
- Use right flux for optimal quality.
- Use right solder in minimum quality.
- joint must be reasonably tightly.
- Avoid prolong heating.

7. Enumerate different types of applications of brazing.

→ Some applications of brazing are -

- In joining carbide tips with mild

Steel sheets.

- joining different types of metals.
- joining nickel and its alloy.
- Used in pipe fitting, tanks heat exchange and electrical repair work.

8. Discuss briefly the various types of brazing process used in

→ There are three main categories of torch brazing in use:-

- Manual brazing:-

Manual torch brazing is a procedure where the heat is applied using a gas flame placed on or near the joint being brazed.

- Automatic brazing:-

It's mechanics use filler metals in solid form, like rings and wires, wires and slugs, washers, powder or paste.

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Q. Differentiate b/w Soldering and brazing.

→ Brazing is a welding technique used to join two pieces of metal together using a metallic filler that has been melted and flowed into the joint.

- Soldering is one of the oldest methods of joining metals that allows electronic components to be electrically joined such as wires, capacitors etc.

Practical Work