

Manufacturing of Hot Plate Welding Station

Dhananjay Vijayrao Gharad

SangramPatil, Shubham Gandhi, RohitKasture, Prasad Poul

Submitted: 20-06-2022

Revised: 27-06-2022

Accepted: 30-06-2022

INTRODUCTION:

A brief review of the traditional hot-plate welding process and related tooling design should prove helpful in the comparison of today's precise, high-speed welding technology.

The Process Hot-plate welding, as the name implies, involves a heated platen with heated tool 'inserts' and two opposing press platens comprised of non-heated tooling. The heated platen is designed to have interchangeable tooling inserts

to accommodate the specific welding configuration of the parts being assembled. The temperature of the heated tooling is adjustable; a temperature range for contact hot-plate welding is approximately 350 - 900°F. The press tools also are interchangeable and are designed to precisely align and support the parts being welded. The machine design may be configured to function in either the horizontal or vertical orientation.

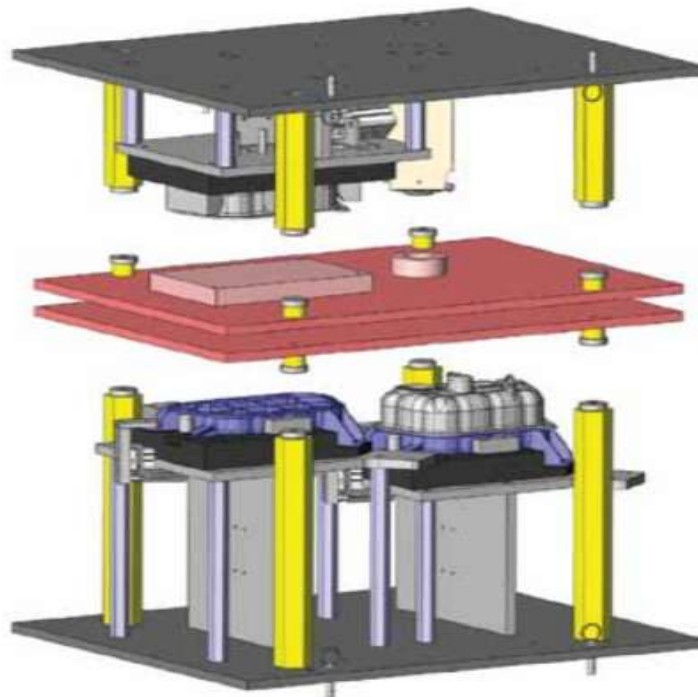


Figure 1. Traditional hot-plate weld tooling depicting a two-place set assembling two halves of a Tank on the left side and a small Fill Neck detail on the right.

The Process Phases Hot-plate welding has the following phases:

Load Components are placed in precision, non-heated locating fixturing which ensure adequate support and accurate alignment.

Melt

Both components are automatically positioned to make contact against the heated tooling. The melt displacement is controlled.

Heat

The components are held at this position (termed ‘melt time’), allowing heat to conduct into the material, even though displacement has stopped.

Open

During this phase, the components are removed from the heated tooling and the heated platen is retracted.

Seal

Components are positioned to bring the semimolten weld joint surfaces together to form a welded surface.

Cool

Components are held at a position allowing the welded joint to cool and the re-solidification of the material to occur.

Unload

Welded assembly is removed from tooling.

Pictorial Representation of Process phase of hot Plate Welding

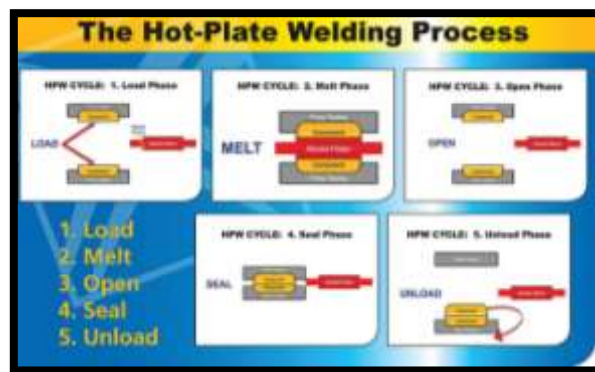


Fig:1.2 Process phase of hot Plate Welding

ASSEMBLY OF MACHINE

The assembly operation is the second basic type of manufacturing, where components are joined together using permanent or semi-permanent methods





Permanent methods of joining components together are used in applications where the components are required to remain together and not easily

disconnected. These permanent methods can be a single or combination of methods such as adhesive bonding, brazing, soldering, and welding.



POWDER COATING

Powder coating is a dry finishing process that has become extremely popular since its introduction in North America over in the 1960s. Representing over 15% of the total industrial finishing market, powder is used on a wide array of products. More and more companies specify powder coatings for a high-quality, durable finish,

allowing for maximized production, improved efficiencies, and simplified environmental compliance. Used as functional (protective) and decorative finishes, powder coatings are available in an almost limitless range of colours and textures, and technological advancements have resulted in excellent performance properties



ADVANTAGES OF POWDER COATING



Variety

While mil spec powder coating has a few common finishes and colors, one of the biggest benefits of the method is the potential for customization. Powder manufacturers will create unique blends to match any color, texture, and finish. There are few competitive options in terms of versatility and range.



Environmental Safety

Because the powder is free of toxic chemicals and solvents, it's regarded as safe for usage and disposal. The processes release no harmful chemicals into the air, and they produce less waste. However, expert painters know to avoid inhaling the powder and to wear safety gear that minimizes skin contact.



Quality

The powder coating application and drying processes create a finish not found in any other paint product. Because the powder melts and reforms as a solid, it creates a smooth surface without drips or runs. Therefore, there's no need to sand or refinish if mistakes are made.

Maintenance



Efficiency

Because of the electromagnetic energy used to apply the powder to parts, there's almost no waste in the powder coating process.



Low Cost

Along with the money you'll save by eliminating extra steps, powder coating is cost-efficient in a few other ways. The materials used are bought according to the job's specifications. The powder is less costly than paint, and it takes up less space when stored.

READY MACHINE

