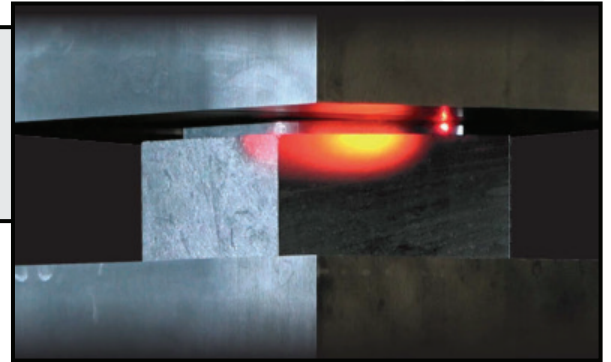


# TECNA DIFFUSION WELDING

Ideal for complex automotive applications

Diffusion welding creates a permanent bond between metal surfaces by applying pressure and high temperatures for an extended period of time.



Diffusion welding relies on atomic diffusion between pressed surfaces, forming a robust, long-lasting bond. Diffusion welding can handle dissimilar material joining, beside copper and other single alloy joints, turning a multi-layered pile into a solid block of material.

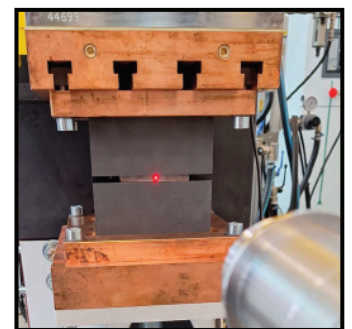
Unlike traditional welding, diffusion bonding does not melt materials or require additional substances. However, this process has traditionally been limited by key parameters – **Heat, Force, Time and Planarity** – in efforts to ensure uniform pressure across large or irregular surfaces.



The primary differentiator lies in how these parameters are controlled and combined to produce consistent, high-quality results, especially as the welding area increases in size.

## HEAT

Heat is critical to achieving the correct temperature for diffusion bonding, which must remain below the melting point but high enough to activate solid-state welding. Accurately controlling this temperature is essential because deviations can either fail to activate the diffusion process or cause material deformation.



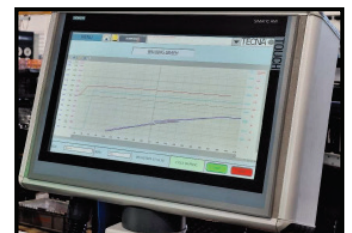
## FORCE

Heat is critical to achieving the correct temperature for diffusion bonding, which must remain below the melting point but high enough to activate solid-state welding. Accurately controlling this temperature is essential because deviations can either fail to activate the diffusion process or cause material deformation.



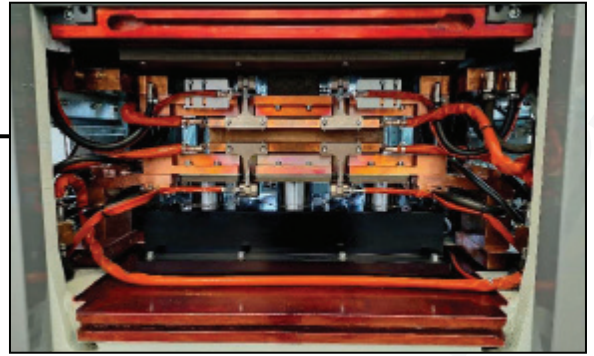
## TIME

Provided both temperature and force are stable, and the target temperature is achieved, a timer will govern the welding cycle according to the predefined recipe. Excessive time can lead to material degradation, while insufficient time can produce weak bonds.



## PLANARITY AND LARGE AREA DIFFUSION WELDING

Achieving perfect planarity across the welding surface ensures uniform heat and force distribution. This becomes increasingly difficult as the size of the part and the welding area increases. Factors such as material irregularities and thermal expansion can introduce distortions that affect the quality of the weld.



TECNA's patented perfect planarity improves the handling of large area multi point projection welding.

## TECNA

From open linear presses to large portal frames, up to 900 x 600 mm effective areas - 40 tons for force and 800 kVA.



TECNA has made diffusion welding faster, more efficient, and more accessible. Technologies including our patented hydrostatic cushion system and temperature-controlled welding cycle, have addressed some of the most significant challenges. By ensuring consistent planarity and precise temperature management, these systems provide a robust, repeatable solution for welding large areas without manual intervention or complex adjustments.

Applications of diffusion welding are into EV mobility, battery manufacturing, energy transfer, hydrogen technology, nuclear technology, heat exchanges and aerospace.

## Buy TECNA Resistance Welders and Tool Balancers

Weld Systems Integrators is a stocking master distributor of [TECNA industrial welders and tool balancers](#). Best of all, we keep an inventory IN-STOCK at our Warrensville Heights, Ohio location for quick shipment and delivery. For more information visit [www.wsiweld.com](http://www.wsiweld.com).

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