Thompson

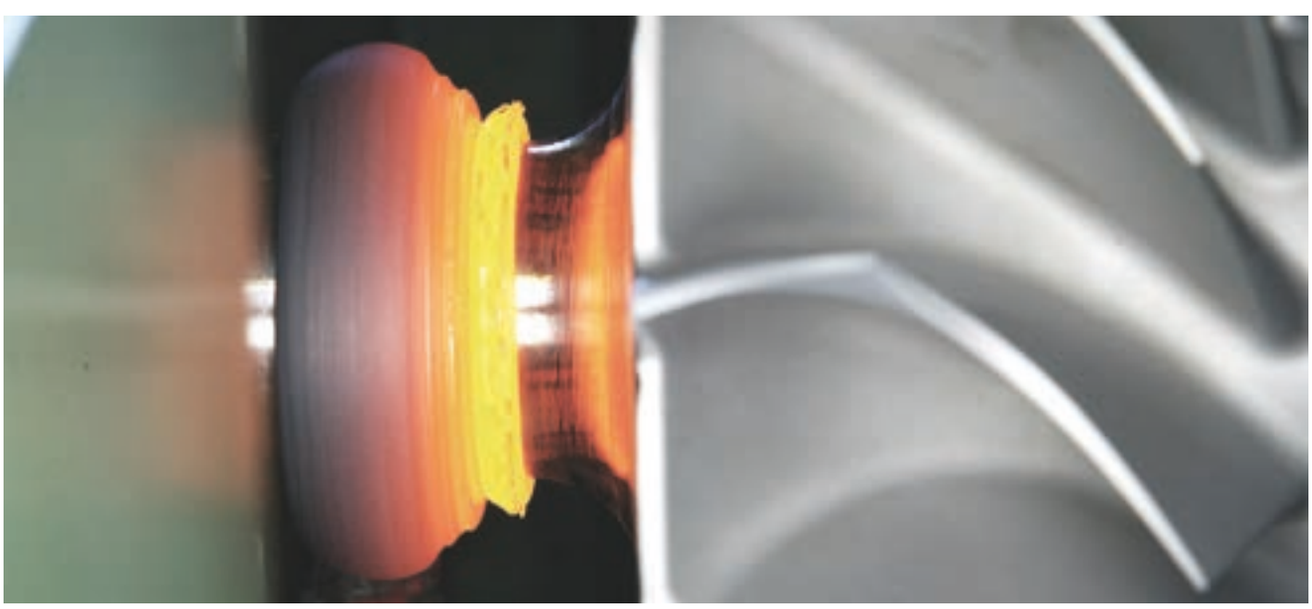
Technology_**Subcontract friction welding**

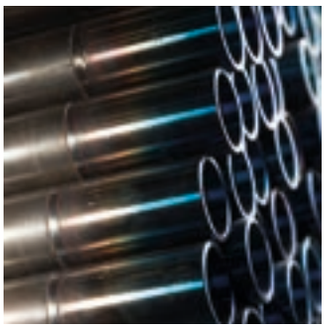
Many years of experience, demonstrated time and again

Technological trends, such as e-mobility and lightweight construction, place great demands on the welding process. Sub contract, rotational friction welding solutions from TFW meet the expectations of modern production processes and ensure that you can industrially join a wide range of different material combinations cost-effectively.

For our customers in the power generation, automotive, chemical and nuclear, aerospace and oil and gas industries, TFW manufacture a large and sometimes complex range of geometries and material combinations ranging from very large section sizes to very small. This is a challenge that future oriented, subcontract rotary friction welding solutions from TFW are designed to meet. Our wide range of welding capabilities are supported by advice on materials, geometry, metallurgy and pre and post weld processing and are supported by on-site metallurgical expertise.

TFW's friction welding capabilities cover many material combinations and geometry options including bar to bar, tube to bar, bar to plate, tube to plate and tube to tube, for example. Commonly friction welded components include drill rods, axles, drive shafts, bi-metal connectors, pump shafts and cv joints.





Advantages of Thompson Friction Welding sub contract rotational friction welding solutions

One key advantage of rotary friction welding is the diversity and range of solid materials that can be joined. The variance in thermal expansion rates would make it impossible to bond dissimilar materials by traditional welding methods; essentially a mechanical connection would be required. Friction welding provides a full strength, homogenous bond across the entire interface, achieved by continuous rotational contact between the two work pieces that produces heat between two interfaces, the materials become plastic and force is applied to displace the plastic material into an upset and a forged bond is created.

One such bi-metallic combination that can be successfully bonded using the friction welding method is copper-aluminium. The use of non-ferrous material combinations such as this features prominently in electrical engineering applications. Consider cable connectors. The electrical properties of copper still make it the best material for electrical conduction and connection. But there are also good reasons for using aluminium in terms of cost and weight reduction and the need for manufacturers to join the two is becoming more and more frequent.

Thompson Friction Welding ensure the supply of a quality product

Quality is as much an internal characteristic as it is external. Whilst your part should look like the product, its structural integrity, function and reliability is paramount to the success of your business. For this reason TFW will only proceed to mass production once a prototype has been accepted as conforming in all respects by the customer/end user.

These rigorous processes and procedures extend right back to receipt of materials on site, to ensure optimum quality output. Where applicable, condition and cleanliness of the material interfaces can affect weld quality. Contaminants at the interface are not permitted. Therefore stringent pre-weld material preparation procedures exist for certain material combinations.

A washing process and subsequent facing operation removes any surface contamination and oxidisation on non-ferrous materials immediately prior to friction welding. These pre weld preparation processes are important to ensure a quality bond.

Thompson Friction Welding metallurgical laboratory supports friction weld expertise

Rotary friction welding, like any welding process can have an impact upon the properties of the materials that are being bonded, for that reason, prior to a product being released to market, TFW can conduct a series of testing and analysis using SEM (Scanning Electron Microscope) alongside EDAX methods (Energy Dispersive Analysis X-ray) conducted on premise by Professor Kameel Sawalha – Specialist in the examination of the integrity of all types of welding including rotational and Linear friction welding of all types of materials.

TFW's metallurgical investigations range from straightforward elemental analysis to in-depth studies of failure or fracture mechanisms, a series of visual, metallurgical and mechanical inspections and checks for instance, hardness surveys, micro and macro inspection, mechanical testing including bend testing and tensile testing.

We also offer materials selection advice, assessing their suitability for friction welding and recommending improvements where appropriate.

Thompson friction welding machines are present across the globe, close to you and your customers.

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