

The logo for Samuel Taylor Limited (STL) consists of the letters 'STL' in a bold, white, sans-serif font, centered within a solid red square.

Historic manufacturer celebrates 125 years in business with focus on battery technology innovation

A 125-year-old precision engineering firm is celebrating their historic milestone by pioneering new production methods for busbars that are found in the next generation of battery technology.

Redditch based Samuel Taylor Limited (STL), manufactures precision stamped components and welded contact assemblies; specialising in the sophisticated bonding of bi-metals such as AlCu (bonded aluminium and copper strip) within the development of battery busbar technology.

2024 marks the company's 125th anniversary year.

Since the early 2000's, STL has been exporting to a global customer base, complimenting the bonding of base and precious metals with precision stamping and the manufacture of electrical contact rivets and welded contact assemblies.

One of STL's success stories involves producing the dual thickness, contacted busbars used in smart meters. Utilising this core competency, STL recently innovated to manufacture busbars for world's first fully electric British hyper car and is now utilising decades of metal bonding expertise to explore a variety of other applications within next generation battery technologies.

This is a far cry from the company's origins. Founded in 1899 by Mr Betts - great grandfather of current owners

Alastair and Robert Gordon - the company, based in Lionel Street Birmingham, produced what is known as 'Sheffield plate'; hot bonded bi-metal plating consisted of silver and copper for products traditionally found in the jewellery industry, handheld mirrors and cigarette cases.

At this time trade would have been extremely localised, with a customer in London plausibly holding the 'export' status of some of STL's existing overseas customers in Europe, North America and China today. 1899 was a notable year for other historical engineering events, as Charles C. Wakefield began the lubricating oil company which would become Castrol, Guglielmo Marconi successfully transmitted a radio signal across the English Channel and the first motor bus appeared in London.

Around 1927 the company diversified into producing electrical contacts utilising its' expertise in bimetal bonding, supplying markets for electrical switchgear amongst others – thus making it one of



the first engineering firms in the UK to do so. Interestingly, only five years later, the 132 kV National Grid started operating as an interconnected set of regional grids.

The 1950's saw STL commence work on rail focused projects, typically precious and semi-precious metal stamping of components and metal assemblies used in electro-mechanical switches as well as sophisticated bonding of base and precious metals. The company has seen remained a valuable supplier to the industry, supplying small order contacts and items for refurbishment of existing rolling stock. In many cases this would be where the historical supplier has gone out of business or no longer supplies the market, but increasingly this is also for new designs.

As the company grew through the ensuing decades notable milestones include the acquisition of gauge making firm Birmingham Engineering Company Limited in the mid 1950's, the attainment of the company's first ISO accreditation in 1988 and the introduction of in-house design and manufacture of press tooling in 1996.

In the early 2000's STL successfully diversified to produce the dual thickness, contacted busbars used in smart meters – developing core competencies that would enable further diversification into new markets moving forward.

Investment in high-speed rivet sub assembly was made in 2013 and at around the same time, STL commenced the supply of metal contacts into the aerospace sector. 2015 saw further investment totalling £450,000 in the commissioning of a new multi-slide press to increase its production capacity for terminal blocks and circuit breaker components – also including automated box packing equipment and camera technology, which allowed extended manufacturing through evenings and weekends for the high-volume quantities involved in these markets.

Reflecting the company's ongoing commitment to maintaining a world class, safe working environment, STL became one of the first 100 companies in the UK to achieve the conversion from BS18001 to ISO45001 standard certification for Health and Safety in 2019.

Alongside this, the company announced investments totalling over £500,000 in new machinery and factory space. The investments were part of a focused effort to increase capacity and efficiency and include the purchase and commission of a Forming Machine, an 80-ton Press and an Image Dimension Measuring System. This afforded STL more flexibility in the housing of production machinery and as part of a factory modernisation project, the company also took on an additional 500 square metres of factory space.

By 2020, following the promotion of its' busbar technology developed for smart metering at several international trade shows, STL were successful in winning work with a leading automotive technology company, specifically for the development of busbar technology. STL's expertise in metal contacts and the manufacture of precision stamped components and sub-assemblies secured a significant contract to support vehicle electrification, a first for the Redditch manufacturer who specialised in the sophisticated bonding of bi-metals within the development of battery busbar technology.

In late 2020, STL secured Innovate UK funding as part of the 'Catalysing Green Innovation: Securing the Future of ZEV' competition.

The funding enabled STL to engage within a collaborative Innovate UK project titled 'EVBus', working alongside The Welding Institute (TWI Ltd) with the aim of investigating an innovative Copper to Aluminium bonding technique for use in zero emission vehicle (ZEV) busbars. This represented the start of a working process that culminated in STL being able to create a proprietary cold-cladding process that they can now use to produce AlCu aluminium-copper bimetal strip.

The foundation for this was the successful development of a bonding technique that overcomes the challenge of aluminium's high reactivity to oxygen – which makes it impossible to hot weld as the metals are immiscible. The development has great potential for industry, particularly aligned with the radical changes in automotive technology and the worldwide transition to EVs usage.

Further STL developments with aluminium now include the potential to 'spot weld' the two materials - meaning that stampings of aluminium can have copper terminals properly attached.

By 2023, an innovative new production process developed by STL successfully enabled the production of over 70,000 busbars for the battery packs of the world's first fully electric British hypercar. Busbars are an integral part of EV battery packs. Improving the busbar can lead to lighter packs, extended range, and greater power output.

This was followed by the development of a brand-new dual thickness method of manufacture to enable scalable production of a total of 70,000 busbars in accordance with stringent quality requirements. An evolution of this technique is now being used on prototype shunt for a different application being developed by STL and a Cambridge based design house. STL believe the new production process to be significantly more accurate than simply stamping the component out with a traditional press tool, achieving a ± 0.020 on the dual thickness tolerance on the weldable connector tab.

Presently, STL export globally across four continents supplying the smart metering, electrical, rail, automotive and aerospace sectors amongst others. The company's long-term success can be attributed to a commitment to both a 'quality first' approach and an appetite to innovative, utilising its' core competencies to solve complex engineering challenges for its' customers.

Reflecting on 125 years in business, Managing Director and Co-owner Alastair Gordon says: "STL in 2024 has a greater pipeline of potential new products than for a very long time, reflecting the long held can-do attitude within the team in Redditch. This pipeline ranges from the unexpected to the evolutionary, with numerous confidential projects under way that highlight a bright future for the business".

The company is also marketing its' 125th year with the expansion of its' long-established apprenticeship scheme. Regarding developing the STL engineers of the future via the scheme, co-Director Robert Gordon adds: "AT STL we are committed to growing our own talent through apprenticeships. For many years we have invested in the training and development of apprentice Toolmakers within our in-house Toolroom. 2024 is no different, as we will again take on an apprentice Toolmaker. In addition to that - in what is a company first - we will expand the scheme into new roles, as we recruit for an apprentice Quality Engineer and an Apprentice Technical Support Technician".

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