

Taking British engineering into the future with composite solutions

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Greater use of bimetal and trimetal bonded composites could solve many problems and generate significant cost savings for British engineering companies, claims contacts materials specialist Samuel Taylor Limited (STL).

Alastair Gordon, STL Managing Director adds that many British engineers are unaware of the cost of contact problems and that when the issues are discovered often a lot of time and money has already been wasted. He is urging firms to think now about qualities they are likely to need in contact and other metal parts and how to save both time and money by speaking to suppliers.

"Bimetals, which consist of silver and copper are our legacy products", explained Mr Gordon. "They consist of a silver cladding onto a copper substrate. More recently we have introduced bonded trimetal composites which consist of silver alloys, copper and nickel 200. The nickel is there to provide a very thin weldable backing, the copper to provide an effective heat sink and to allow for an absolute minimum of expensive silver alloys. This allows switches which traditionally used say 0,3mm of silver alloy to run just as well but with only 0,1mm or even 0,05mm silver alloy – giving huge savings in cost".

The belief at STL is that British firms have still to realise the benefits of trimetal bonded composites to replace solid welded or bimetal rivet constructions for their contacts. However there is still scope for greater use of bimetal bonded composites using other materials and in other applications, such as the fuse industry. The desire of STL to utilise such knowledge and work with other firms has led to numerous successes in diverse projects such as the development of electrical parts for hybrid cars and even adhesively bonded products designed and successfully tested, to destroy Improvised Explosive Devices on the battlefield.

More specifically, within the fuse industry, most high performance fuses use fine silver elements which are designed to blow at very specific fault conditions. Needless to say the actual requirement for the silver is in very limited and specific area of the fuse element and STL has market leading position in the design and manufacture of this edge to edge bonded composite which concentrates the silver only where it is needed.

Regarding hybrid and electric vehicles, the company is working on aluminium and copper composites used to link lithium ion batteries and producing more efficient heat sinks for electronic devices used in the control circuits.

Another early stage working prototype has been the creation of a new bonded composite material including a ceramic-like material which does not expand with heat but retains the conductivity of copper. This material is designed to withstand high temperature fluctuations without moving and cracking the joints between the busbar and the high power thyristors. A thyristor is one of several controllable semi conductor devices that can act either like a switch, rectifier or as a voltage regulator and is very much in demand for EV and hybrids.

Samuel Taylor's understanding of materials has been applied to the defence sector. This involved the creation of customised products which could, it claims, make better use of the Munroe Affect than products currently on the market to safely destroy Improvised Explosive Devices or IEDs. In this case STL combined the use of copper a relatively dense but inert element with magnesium which burns at very high temperatures to create something of a fast moving fireball capable of penetrating more than 500mm of sand and cement and exploding anything volatile in its path.



Hot bonding microprofile tapes

Even the use of two or three different materials combined into one single stamping is another of STL's successes, saving its customer millions of pounds by using only the expensive material where it is actually needed. In this example of STL's out of the box thinking created composite parts made from steel and phosphor bronze assembled and stamped at more than 100 parts per minute using STL's own inhouse design and build prestooling.

All projects indicate the understanding Samuel Taylor Limited has of composite materials coupled with an out of the box thinking style of thinking – knowledge and experience which the company is keen to exploit for other Engineering businesses.

ENDS

Note to editors

Samuel Taylor Limited manufactures precious metal contacts and contact materials. The business can be traced back to before 1895 and has manufactured and supplied precious and other metals right from those early days over 100 years ago. Samuel Taylor was acquired by the present family in 1899 and is now in its 4th generation of owner-managers. Samuel Taylor's long-term approach may be unusual, but it is essential to success in this industry. Our aim is to create and produce the best products possible for each application whilst always being cost competitive. For more information about how Samuel Taylor creates highly efficient, unique components please visit www.samuelstaylor.co.uk.

Contacts

Alastair Gordon, Samuel Taylor Limited
Tel: 01527 504 910
Email: Alastair.Gordon@samuelstaylor.co.uk
Website: <http://www.samuelstaylor.co.uk/>