

Rocking your world - high temperature epoxy fixes speaker coils

Description

Real World engineering is rarely *rocket science*, but often it is very much about pushing the boundaries of performance and balancing conflicting parameters. This was exactly the kind of situation which we met when a customer asked our advice on an adhesive application.

This unusually challenging application was in the production of very high power and performance voice coils to fit some of the most extreme chassis speakers in the world , as used at stadium-type events – *rock concerts*, outdoor conventions etc, in widely varying climatic conditions around the globe.

The best way to achieve this is by wet winding the copper or aluminium wire for the coil while drawing it through a bath of adhesive. Low viscosity reduces the weight of adhesive used, and the time frame of the process calls for an extended pot life for the adhesive after mixing it. After curing, the resulting coil would then need to withstand temperatures as high as 190°C for extended periods at anything between 20Hz to 5KHz.

Initially the customer found a number of apparent candidate products, but none could offer the combination required of low viscosity with high heat capacity and all had serious health and safety issues of [worker sensitisation](#) which were simply unacceptable. As a long-term customer of ours for a [UV cure adhesive](#) (used to bond titanium to Kapton in other parts of the process), they consulted us for this new application and were recommended [Opti-tec 5054 High Temperature Epoxy Adhesive](#) for the coil unitising.

[Opti-tec 5054](#) not only met all the specification parameters – and exceeded many, since for example it can operate as high as 350°C for limited period – it also exhibited absolutely no worker issues in

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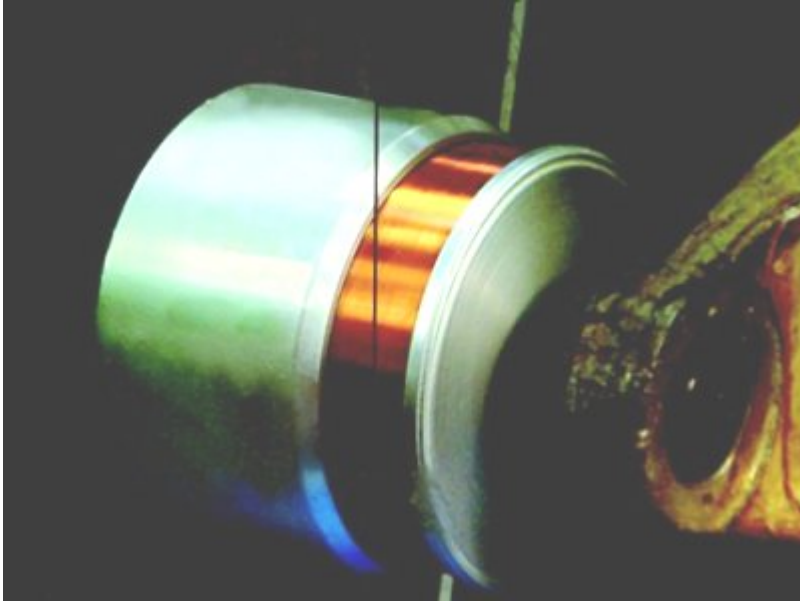
production.

The Technical Manager involved commented:

The production process is essentially very simple – the science *magic* is in the adhesive, which has enormous thermal capacity and is obviously very user friendly.

[Opti-tec 5054](#) also features a high surface energy, which combined with low viscosity allows it to readily wet and wick between multiple strands, e.g. for fibre optic terminating and endoscope manufacture and repair. It has low shrinkage on cure, which reduces internal stresses in the assembly and has excellent impact and thermal shock resistance. Resistance to moisture, vapours and most chemicals is also very high, while it exhibits low outgassing and low vapour pressure, making it an ideal sealing material for electronic and optical applications.

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Opti-tec 5054 used for wet winding a coil

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