

H. V. Wooding spots gap in steel bonding for electric vehicle laminations

RADAN Nests provide best commercial solution for customers

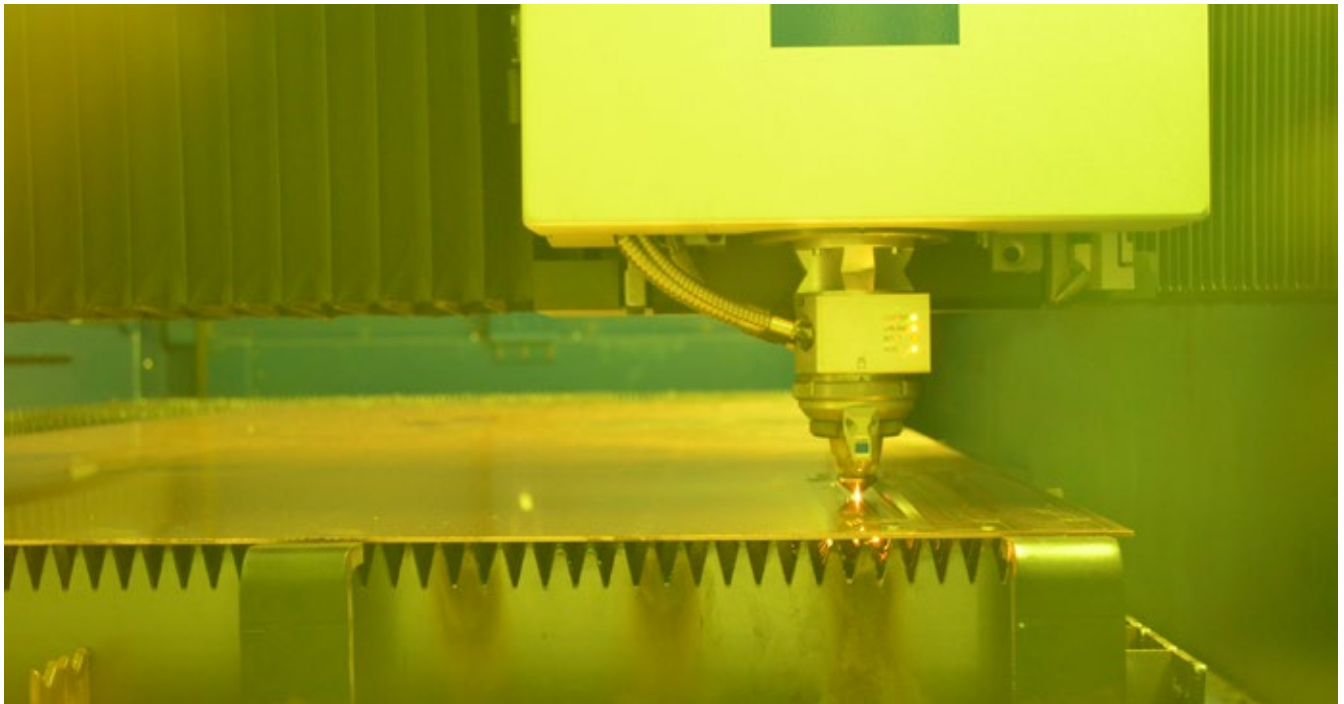


H. V. Wooding Case Study

A company specialising in renewable energy is seeing major changes in the components it is being asked to produce for electric vehicles.

H. V. Wooding Ltd. works at the high end of the electric vehicle market, manufacturing parts for two technologies in the powertrain: involving the battery, and the motors. Customers include companies across the spectrum of electric vehicles – tier one and tier two suppliers of big name car marques; supercar manufacturers; supercar e-racing; electric motorbike GP racing throughout Europe; railways; aerospace; and increasingly electric buses, construction and agricultural vehicles.

For the battery, the Kent-based company makes a wide range of customer-specified busbars, forming part of the electrical connection, along with modular busbars that connect the battery to the rest of the vehicle's configuration.



The other key area for them is around the electric motor itself, producing specialist products both for the drivetrain and in-wheel. While most of their parts, both for busbars and motor laminations, are cut from sheet material on a Trumpf laser CNC machine tool, programmed with the industry-leading RADAN CAD/CAM software, they also use wire erosion, mainly for prototyping and developing small series production.

Sales Director Paul Allen says RADAN is also used as part of the process of quoting for jobs. “For example, most busbars are made from copper or aluminium, so we’d input the relevant material, such as 4 mm copper, and lay the proposed parts out in a RADAN nest. This calculates accurate material usage and prices, in order for us to present the most commercial and cost-effective solution to the customer. Then, when we’re ready to go into production, we’ve got a finished nest already in a file.”

He says as every busbar is different, RADAN is vital for nesting a wide variety of shapes and sizes of the same thickness. “If we were to do all this manually, the quotation process would take much longer and may not be accurate. And we’d need to carry out a lot of manual work prior to manufacturing to get the best material usage. So RADAN speeds up both our quotation and manufacturing processes.”

And Radbend, is used to calculate bend angles, and the order of bends for forming the busbars into a variety of configurations.

RADAN also plays a major role in manufacturing motor laminations – several thin pieces or sheets of electrical steel or cobalt iron cut on the laser and bonded together to form the Core Pack. “It’s vital that these parts are high precision. The busbars and laminations are all required to be cut to tight dimensional tolerances, sometimes down to 50 microns for laminations.”

Higher end electric motors increasingly need thinner electrical steel, meaning the amount of adhesive applied becomes more significant, with as much metal as possible in the motor, and not so much adhesive.

H.V. Wooding have identified gaps in that market and are now actively seeking ways of making a breakthrough to provide a specialist solution. To this end, the company are working to develop a process for accurately applying a bonding agent to the electrical steel. Some types of material are available which is pre-coated with adhesive, but not the very thin grades in low volume and cobalt iron, which are becoming more prevalent. “So we’re working closely with a university and industry, on a bonding process which will enable us to get motors designed, produce and test a prototype using RADAN, and get them to market, much quicker.”

Many of their customers are working on projects involving battery technology, looking at battery life to improve vehicle distance on one charge. "A lot of new designs using different grades of copper and aluminium are coming through to us, and they're also looking closely at the insulation of the busbars." He says the change is being driven by the need to gain more power from the motors, and electrical steels are becoming increasingly more important for motor performance.

In conclusion, he says the market is extremely dynamic, and the company continually invests in line with current demands. "H.V. Wooding has been established for 50 years, diversifying from traditional switchgear through renewable to data centres, and now to electric vehicles and drivetrains. As a result, we now need different technologies and processes to take full advantage of the new opportunities relating to our core activity, particularly around assemblies.

"RADAN is a key part of the processes we have in place to make a one-off component, right up to high volume production."



About the company

Name: H. V. Wooding Ltd

Website: www.hvwooding.co.uk

Business: Subcontractor (specialising in renewable energy, data centres and medical)

Key Benefits achieved:

- Accurate and fast nests for full production runs
- Accurate pricing for competitive customer quotations
- Aids research to get electric vehicle motors designed, prototyped, tested and introduced to market much quicker

Categorisation:

Industry sector: Automotive

Industry segment: Engine/Powertrain





Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications.

Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

Hexagon's Manufacturing Intelligence division provides solutions that utilise data from design and engineering, production and metrology to make manufacturing smarter. For more information, visit hexagonmi.com.

Learn more about Hexagon (Nasdaq Stockholm: HEXA B) at hexagon.com and follow us [@HexagonAB](https://twitter.com/HexagonAB).