Boeing Aerostructures Australia leads large-scale development of resin infusion as an industrial process.

Resin infusion technology enables use of lower cost materials ... without the need for expensive autoclaves,” said David Pook, Melbourne Tech Centre manager for BR&T-Australia.

Using Hexcel’s (Stamford, CT, US) HexRTM6 epoxy resin and a specially developed HexForce 12K spread-tow carbon fiber fabric, BAA uses a modified form of VARTM, Boeing’s patented Controlled Atmospheric Pressure Resin Infusion (CAPRI). This reportedly
resolves the lack of compaction pressure on the preform after resin infiltration by placing the resin reservoir under partial vacuum so that its pressure is below 1 atm. Boeing has used CAPRI to demonstrate parts with fiber volume fractions and performance equivalent to autoclave-cured prepreg parts. CAPRI also has been used in conjunction with stitched preforms to make landing gear doors for the C-17 Globemaster III transport aircraft for the US Air Force.

BAA cures MTE parts in 15 large ovens supplied by Furnace Engineering (Victoria) which provide air recirculation rates and heating power to match an autoclave’s efficiency in delivering heat to both the tool and part, while still reducing the overall process cost. “At first glance, the fans on these aerospace infusion ovens may seem disproportionately large for the oven,” says Furnace Engineering director Brian Gooden, but he explains, “This is in order to ensure rapid but uniform heat-up rates are achieved.”

BAA currently ships 10 MTE sets per month to the B787 final assembly line, and aims for 12 per month by 2016 and 14 per month by 2020. It will continue working hand-in-hand with BR&T-A to develop the next generation of resin-infused composites to meet targets for improved performance, rapid processing and reduced environmental impact.