



*AW Bell's facility in Dandenong, south-east Melbourne.*

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### **AW Bell – Award-winning casting solutions**

AMTIL member AW Bell won the Manufacturing and Advanced Materials Export Award at the 2021 Australian Export and Investment Awards last November. The award takes a prime place at the entrance of the Victorian metal casting and precision engineering business.

"It is a great recognition of the innovative work that our team has been doing the past 10 years," says Sam Bell, the company's CEO. "We are also very grateful to our partners, suppliers, customers and ongoing government support."

Leading defence primes are among AW Bell's many valued customers for its precision manufacturing of components, which it supplies for defence land vehicles, submarines, F-35 fighter Jets, missiles, gun mounts and targeting systems. Northrop Grumman Corporation (NGC), BAE, Marand (ground support equipment), Levett, Raytheon, Pratt & Whitney and Lockheed Martin are its key customers for the F35 jet components. AW Bell manufactures and supplies high-strength aluminium castings for the aircraft's camera housing and decoy measure housing.

Among its many other precision defence products and global defence clients, AW Bell also supplies Thales (Bushmaster) and Rheinmetall (Boxer CRV-Australian Government Land 400 Phase 2 program) with ammunition feeds, hinges and armoured steel components. These are used on defence vehicles Bushmaster, Hawkeye, Boxer CRV and Scout.

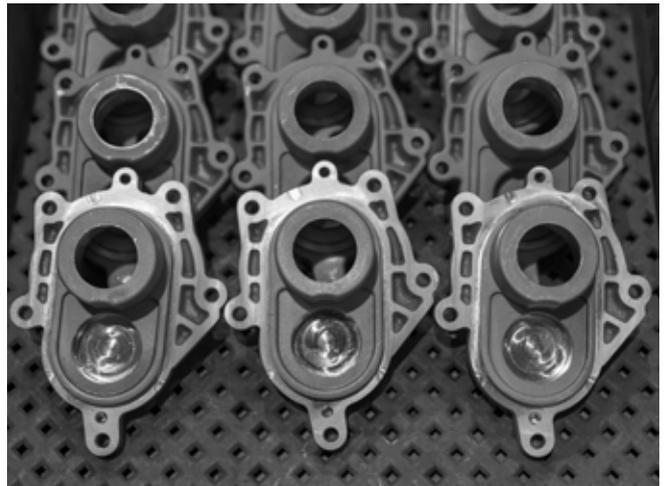
As one of the first five Victorian defence manufacturers participating in the Victorian Government's Smart Enough Factory program, it has been a valuable learning curve on energy consumption and waste for AW Bell. The 70-year-old family-owned business has installed a 284kW solar power system on the roof of its 10,000sqm purpose-built facility in Dandenong, in Melbourne's south-eastern suburbs. Sam advises that the solar system only provides 20% of the power needed for its manufacturing operations.

As part of its engagement with the Smart Enough Factory program, digital analysis was undertaken of the peak energy use on two of the company's essential, but older machines – the analogue autoclave and the furnace.

Sam advises: "From this analysis, we can see that we have a substantial amount of electricity waste in our use of these machines, negatively impacting our environmental footprint, our



*AW Bell CEO Sam Bell with the Manufacturing and Advanced Materials Export Award the company won at the 2021 Australian Export and Investment Awards.*



*AW Bell produces a range of components for sectors including aerospace and defence.*

productivity and overall business performance. Utilising the data from the Smart Enough Factory, we are now working out the most effective ways of using the equipment and hope to reduce our energy consumption by over 68,000kWh per year.

"This project has given us a lot of valuable information that we can implement on other machines for further improvements. The Victorian Government and DMTC have upskilled our staff, teaching them how to set up visual production dashboards which has helped us further our industry 4.0 capabilities."

With a team of 94 employees, the business is going from strength to strength. As well as the defence industry, it also supplies to the space, aerospace, biomedical, mining and commercial sectors in Australia and globally.

Mounted on the canteen wall at AW Bell's plant are wooden patterns of components that Sam's grandfather Allan William Bell built after he started the business in 1952.

“We started off as a pattern shop making patterns for the automotive industry,” says Sam. “Now we produce some of the strongest aluminium investment casting in the world for the aerospace and defence markets using our specialised aluminium casting process called ABE.”

Today, Sam’s father Geoff is the company’s Chairman. After completing degrees in Mechanical Engineering and Business Management from Swinburne University in 2006, Sam worked in the USA before returning to Australia to take on a position as a Process Improvement Manager at AW Bell.

“My father wanted me to get some real-world industry experience overseas before taking on a job at the family business,” he explains.

On a detailed factory tour, Sam explains about the investment casting process. He points to a wax pattern, which has the same geometry as a finished part: “From the customer’s design, we create a wax pattern that is a replica of the finished part but slightly larger. We coat this wax pattern in a ceramic material, creating a ceramic mould around the pattern. We melt the wax out of the mould creating a cavity.

“Once the wax is removed from the completed shell’s interior, we place the shell in the oven to preheat before casting, normally at around 1,000deg C. The metal is melted in the furnace after it passes the required metal specification and then it’s poured into the hot shells, which are then left to cool down.”

When the metal has solidified, the ceramic mould is removed and the part is ready for inspection. This not only includes a visual and dimensional check but also testing anomalies by dye penetrant, magnetic particle and a radiography test.

The AW Bell machinery division is another success story for the AW Bell group; it was a recipient of the US-based Investment Casting Institute’s 2019 Innovator of the Year Award for designing and manufacturing seven new-to-market pieces of equipment in a two-year period. The company continues to further expand its automation and robotics range and these machines are exported throughout the world.

AW Bell’s plans for the future include setting up Australia’s first titanium investment casting facility over the next three years.

“That expansion in the business we hope, will support opportunities in Australian Defence through the guided weapon ordinance enterprise as well as helping our aerospace and biomedical customers,” Sam explains. “We made the move across to defence manufacturing in 2007 and it took us seven years to get established. It has been very challenging but very rewarding supplying to the defence prime companies. The more Australian manufacturers work in the defence sector in this country, the stronger the Australian defence industry will be.”

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*AW Bell’s state-of-the-art foundry produces some of the strongest aluminium investment casting in the world.*

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