# ETG DEFENCE MANUFACTURING SECTOR

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## ETG ARE YOUR DEFENCE SUPPLY CHAIN PARTNER

When it comes to manufacturing for the military or defence industries, the scope and variation in production demands can be significant.

After all, what is required to meet the production characteristics and demands of a fighter jet will be completely different to that of a submarine, aircraft carrier, tank, or helicopter – and that is just the modes of military transport, there is also the munitions, communications and supplies that cover everything from weapons and ammunition to radios and telecoms and more.

Whatever technology is required, two things are certain – manufacturing precision, quality and consistency can save lives; secondly, wherever defence technology is being developed and manufactured – machine tools from the Engineering Technology Group (ETG) are delivering to the stringent requirements of the industry. The diversity of the defence industry can be noted in the difference in manufacturing technology developed by the top 100 defence industry suppliers. With names such as BAE Systems, Rolls-Royce, Airbus, and Lockheed Martin. Safran and Leonardo being front-runners in the air; telecommunications, weapons and guidance system manufacturers such as Raytheon, Thales, Honeywell, Moog and General Electric emphasise the sheer scale and diversity of the industry.


## CHIRON

When it comes to the defence sector; precision, process capability and minimum unit costs are crucial – and this is why manufacturers of compact telecommunication and weapon systems rely on machine tools and turnkey solutions from CHIRON. A CNC machining centre from CHIRON is the ideal solution for high-speed cutting of components manufactured from military grade materials, whether its chromium, magnesium, inconel, plastic, aluminium, steel or cobalt – whatever the material, challenge and complexity, CHIRON has the perfect solution.

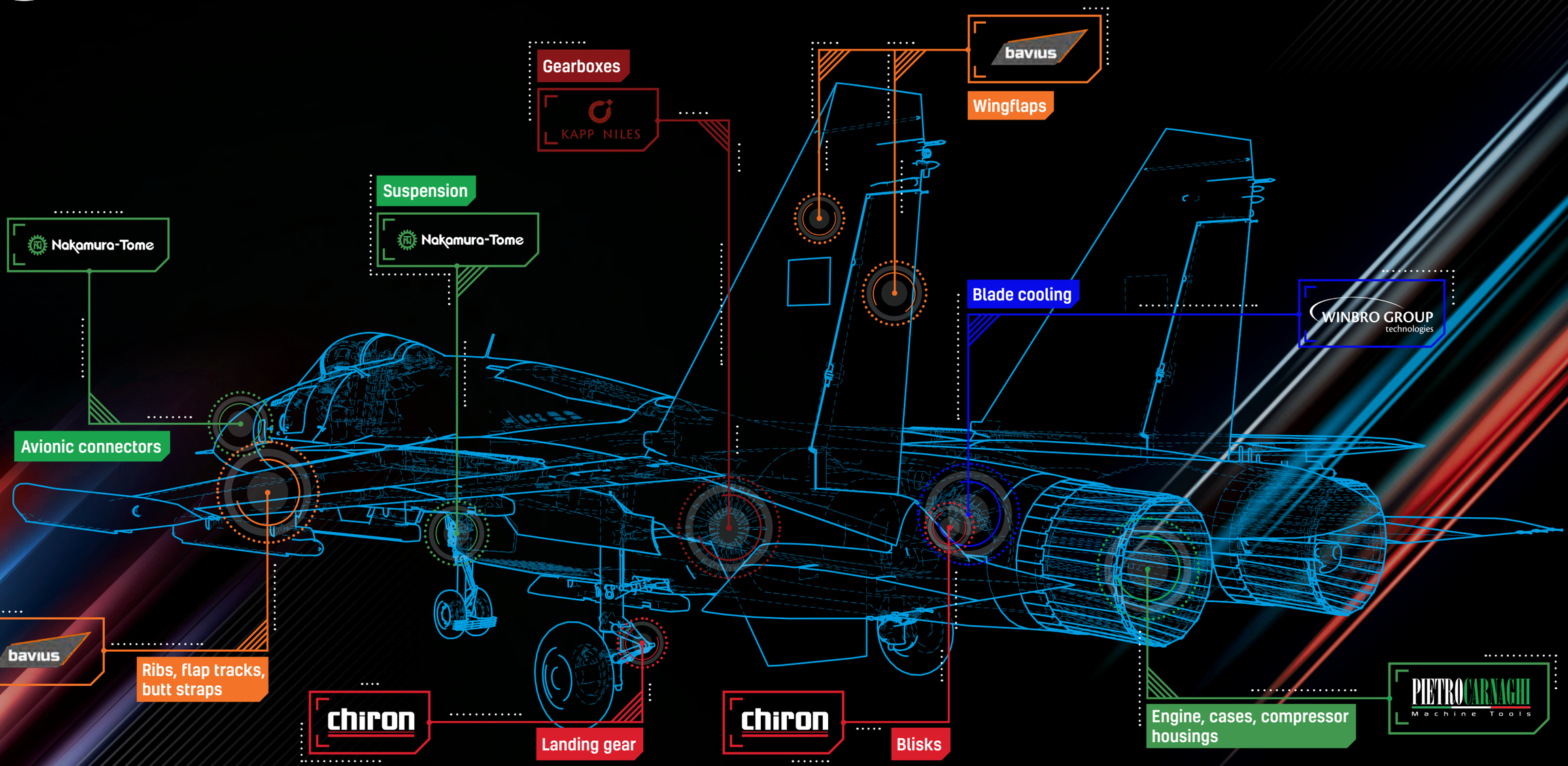
For the aerospace segment of the defence industry, CHIRON machine tools are frequently applied to the manufacturing of complex structural components where high machining rates, exact dimensional, geometric and positional tolerances, and excellent surface quality must combine. With the perfect combination of performance, precision, and dynamics, CHIRON Group machines are often found manufacturing turbine workpieces and titanium structural components for engines. Wherever there is a challenge, CHIRON machines are deployed to the frontline of manufacturers in the military and defence supply chain.


## NAKAMURA-TOME

As a world leader in the design and manufacture of single-process, multi-tasking mill turning machines for the automotive industry, Nakamura-Tome comfortably transfers this knowledge to provide the most innovative technologies available for the defence industry.

In the production of military ground vehicles, Nakamura turning centres can be found as the perfect solution for producing knuckles, studs and drums, steering rack shafts, suspension ball joints, semi-active suspension, shock absorbers, constant-velocity joints, parking brakes and so much more. When it comes to military aerospace applications, Nakamura turning centres are deployed for the production of flap transmission systems for the wings, connectors and safety critical components for the avionics, specialist fasteners and parts for the engines and casing, sub-assemblies and fasteners for the landing gear and then there's the telecommunication components. Whatever your defence industry turned component requirement, ETG can provide the solution with a Nakamura multi-tasking turning centre.

Engineering
Technology Group




# DEFENCE PRODUCTION


## KAPP NILES

KAPP NILES is a globally renowned group of companies with high-quality and economical solutions for finishing gears and profiles. This makes this benchmark brand a partner for companies in the defence industry - for both land vehicles and aircraft. The perfect interaction between machines, tools and technologies enables extremely precise machining to a thousandth of a millimetre. The KAPP NILES brand incorporates machines for profile grinding, generation grinding, dressing and grinding tools as well as measuring machines and solutions – not only are these machines utilised by manufacturers of military ground vehicles, but also the aircraft and maritime supply chains.


## BAVIUS

The bavius portfolio incorporates gantry machining centres, horizontal machining centres, profile machining centres and universal machining centres for the simple to complex 5-axis machining of large components. It is this niche area that makes the bavius brand the 'go-to' choice for the aerospace defence industry supply chain.

bavius machines offer table sizes to meet the demands of the customer. So, whether you are machining small components or if you need a table that can accommodate aerospace structural parts to 50m long with widths of 7m and even beyond – bavius is the name you need. The machines offer speed, power, acceleration and material removal rates that will accelerate your production - making bavius the name the defence industry turns to.

For large components in the defence industry such as the production of aerospace wings, bavius is a formidable brand. The machines can be seen producing ribs, butt straps, spars, pylons and wing boxes. The machines are frequently found producing interior structures of the fuselage of fighter jets. Likewise, the machines are chosen by many of the leading OEMs for the production of safety-critical components that demand the utmost in rigidity, stability and safety – such as the landing gear, beams and sub-assemblies.


## PIETRO CARNAGHI

Pietro Carnaghi is a brand synonymous with the defence industry, working with recognised manufacturers such as Boeing, Lockheed Martin and countless others

Pietro Carnaghi is the 'go-to' name for the machining of jet engine components, supplying its machine tools to the leading aerospace manufacturers. The company's vertical lathes are involved in the production of many of the components related to the most sophisticated aeronautical projects known to the military. With a vast array of vertical turning centres, large vertical turning centres, automation systems, gantry milling machines and vertical machine tools for turning and milling, Pietro Carnaghi manufactures critical aero-engine components such as disks, casings, drums, containment cases, compressor housings and rings that require turning, milling, drilling and grinding on materials such as inconel and titanium.


## WINBRO GROUP TECHNOLOGIES

Winbro is a specialist in the defence industry sector. Its advanced EDM machine systems are unique in their approach to drilling cooling holes in turbine blades, vanes and combustors. The company has established itself as the global technology leader in that sector – and this technology is available from ETG.

The company has broadened its range of technologies to include laser systems, multi-axis grinding and ECM (Electrochemical Machining). The Winbro Group uses four primary processes within its comprehensive range of machining systems. This includes electrical discharge machining (EDM) technology for high-speed drilling, laser technology for drilling, cutting, ablation, welding and cladding, creep-feed grinding and electrochemical machining (ECM) for finish forming. These four main processes form just a part of Winbro's overall portfolio, with many additional integrated technologies, features and capabilities available.

The Winbro machines are unique in their capabilities and this is extensively utilised by the world's leading military aerospace and marine OEMs to generate complex cooling holes and forms in the most challenging of applications and materials.

# Making Engineers Champions...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