

NIKKEN CNC802 Rotary Table

Large CNC Table

Aerospace Exhaust Manufacture Streamlined Doncasters Bramah, Sheffield

NIKKEN Kosakusho Europe were called on by Doncasters Bramah to increase efficiency, overcome a potential health and safety concern and improve working practices in their aerospace exhaust manufacturing process. The resulting success improved accuracy of set-up, achieved a 50% increase in efficiency and provided a number of additional benefits whilst eliminating all health and safety concerns.

The Doncasters Group is a leading international manufacturer of high-precision alloy components which are designed to operate in the most demanding of conditions.

With nearly 240 years of experience, this fast-moving group is constantly developing its broad range of products and processes to best serve the aerospace, industrial gas turbine, specialist automotive, petrochemical, construction, industrial and transportation markets.

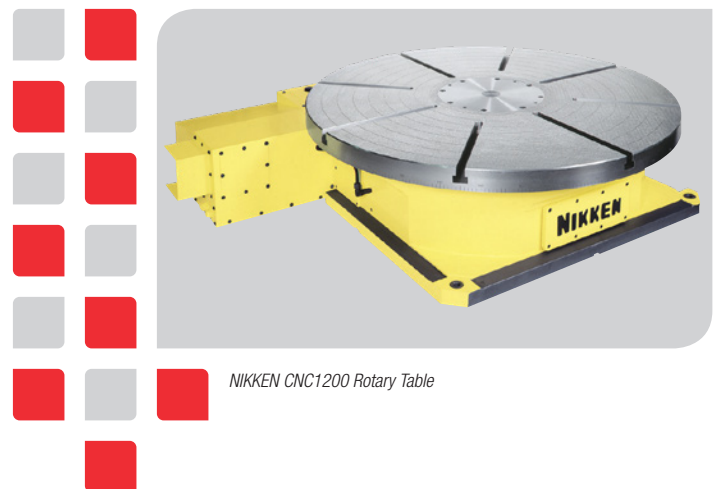
Core areas of expertise include new product development, precision casting, forging, fabrication, machining and the production of superalloys and fasteners.

Doncasters Bramah in Sheffield manufacture a wide range of components for the aerospace industry and this particular application is the milling and drilling of Safran Plug and Nozzle flanges. These items are jet engine component parts and are manufactured on a Hartford Blockbuster PRO3150 Vertical machining centre.

Prior to the NIKKEN solution being installed, the process had resulted in a number of near miss concern forms being raised by machine operators due to the potential of slipping while loading and unloading the components into the machining fixtures. In addition to this, there have been occasions where the operator was required to stand on the machine table to check parts before un-clamping from the fixture. This would only occur rarely but nevertheless was contrary to Doncasters Bramah's total commitment to operator health and safety.



NIKKEN solution showing CNC table in place with fixturing easily accessible.



NIKKEN CNC1200 Rotary Table



In addition to the Health and safety concerns, upcoming project work for Safran Aircelle demanded resource from the Hartford machining centre to carry out drilling and milling operations. The installation of a rotary table would speed up the process and provide time saving and efficiency benefits, resulting in increased capacity.

NIKKEN were asked to propose a solution to the challenges faced by Doncasters Bramah when manufacturing the Safran flanges and also take in to account up and coming project work – incorporating future functionality and flexibility in to the investment.

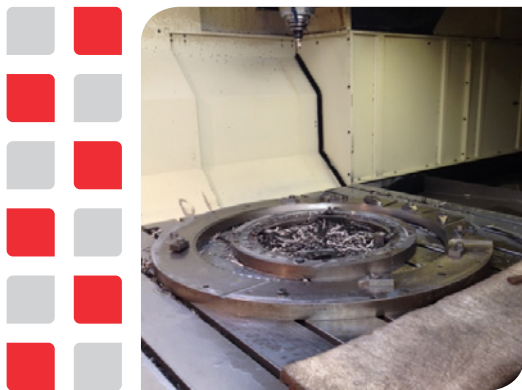
Because the components being manufactured were relatively light weight in comparison to their size, the standard NIKKEN Rotary Table was excessively large and heavy for this application so an oversized faceplate was designed and fitted to a smaller rotary table to reduce costs and the overall weight placed on the machine bed, without compromising on performance.

Scott Beardmore, Manufacturing Engineer at Doncasters Bramah commented; *“Fitting a rotary table to the machine bed has eliminated the need for operators to enter the machine to clamp and unclamp fixtures, with all clamping areas now being rotated to within easy reach via the rotary axis. Having the component clamps at the ideal position directly in front of the operator means that positioning the part within the fixture and being able to rotate the fixture to measure a surface to ensure the part is positioned flat, has reduced the risk of scrap due to misalignment. Recently there had been two instances of high-value items being scrapped due to the operator not realizing the part was not sat down correctly, because the clamping location was at the rear of the machine and the operator could not climb in to carry out any check due to the potential of slipping.”*

Mick Wooley (pictured), the CNC operator responsible for running the cell producing the Plug and Nozzle flanges added *“The implementation of the NIKKEN Rotary Table has also increased the speed of loading and unloading of components by around 50%, with 6 or 7 components loaded and unloaded per day, this has resulted in a significant improvement in efficiency and throughput. There has also been an Improved accuracy of finished work due to ease of setup.”*

In addition to the desired outcomes of the project there have been more benefits achieved - rotary tables allow the operator to index to numerous positions accurately, this has created the ability manufacture one off jig work easily, as well as being used for specific production work. The custom detachable face plate can be modified to accommodate additional applications on the Hartford Blockbuster, improving flexibility, and the table is also able to be fitted to other comparable machining centres depending on workload and changes in resources.

Future possibilities yet to be investigated are to use the table for indexing and milling of scallop features, reducing cycle times on existing jobs and opening up new business opportunities, drilling and milling large diameter components that would otherwise be outside the existing machine capability or not economically viable.



Previous fixturing solution.



Operator entering machining environment to secure component on fixture.