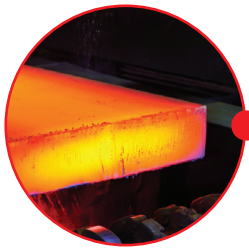


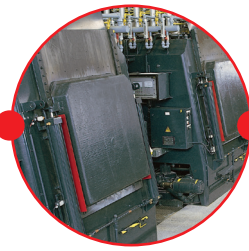
A component journey

Safety critical service – Engine shaft

The main drive shaft in a civil aircraft engine is a safety critical component. In service, part failure could mean disaster. Thermal processing is essential to ensure this part has the necessary material properties to operate effectively, keeping the aircraft in the air.



The component begins life as a steel bar from which a forging is made.



The forged shaft is hardened and tempered to give the correct tensile strength.



The shaft is stabilised at approximately 50°C below the final tempering temperature to remove any machining stresses.



Rough machining is carried out, usually to within 1/16th inch of the final part size.



The part undergoes final machining and grinding.



Areas that do not require surface hardening are masked using bronze, tin or copper plating, and the shaft is then gas nitrided at a temperature not exceeding the stabilising temperature. This diffuses nitrogen on to the surface to provide high hardness and excellent wear resistance.



End application, **aircraft, or land-based gas turbine, engine.**



Post-nitriding, the plating and the white layer (nitrogen-rich layer which does not diffuse on to the surface) are removed.

 Denotes the parts of the component journey undertaken by Bodycote