Course aims
Delegates will be provided with a working understanding of the material characteristics of carbide tools used in milling, turning and drilling and how they interact with alloy steel, austenitic and duplex stainless steels, Inconel alloys and 6/4 Titanium. Emphasis is placed on tool material selection and optimising machining parameters to minimise disruption to the workpiece by the machining process.

Who should attend
The course has been designed for staff concerned with optimising the machining of metals. This includes the specification of tooling and machining parameters, development of tooling and workpiece alloys, the sale and procurement of machining tools and product evaluation / quality control.

Find out more: For further information please contact
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Metallurgy of Machining

Metallurgy and processing of alloys
• Low alloy steels
• Austenitic and duplex stainless steels
• Nickel alloys
• Titanium alloys
• Casting processes, structure and defects
• Forging processes, structure and defects
• Heat treatment

Machining mechanics
• Tool geometry
• Orthogonal and oblique machining
• Interaction between tool and work-piece
• Swarf formation

Effects of machining on material
• Surface quality
• Temperature changes
• Work hardening
• Residual stresses
• Effect of coolant

Manufacture of carbide tooling
• Ceramic powder production
• Powder quality control
• Pressing and sintering
• Grades of carbide material
• Coatings

LEARNING OUTCOMES
• Appreciate how the choice of alloy type and shape forming and heat treatment processes influence the response of workpieces to machining.
• Understand the carbide materials used for cutting tool manufacture and how tools are made.
• Learn how machining processes can disrupt the metallurgy of the workpiece.
• Acquire techniques to minimise damage whilst optimising machining time and efficiency.