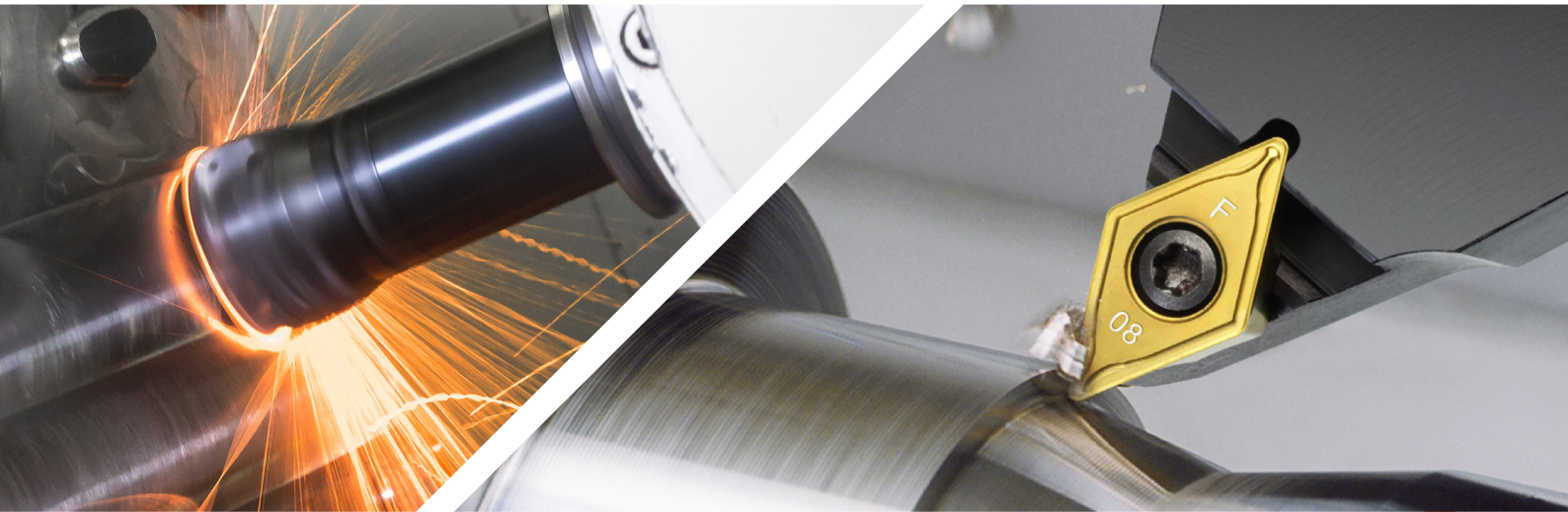




# Metallurgy of Machining



**A two day workshop** describing the interactions between carbide machining tools and metal alloy workpieces.



## 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 ferrous and non-ferrous alloys. 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.

**Participation is free of charge to qualifying SMEs in the Sheffield City Region.**

To register please contact Jack Greenwood  
[j.greenwood@amrc.co.uk](mailto:j.greenwood@amrc.co.uk) 0114 222 4446

**AMRC Training Centre**  
Advanced Manufacturing Park, Off Highfield Spring,  
Catcliffe, Rotherham, S60 5BL

# Metallurgy of Machining

## Ferrous & Non-ferrous metallurgy

- Metallurgy of steels
- Metallurgy of non-ferrous alloys
- Casting processes, structure and defects
- Forging processes, structure and defects
- Heat treatment

## Manufacture of carbide tooling

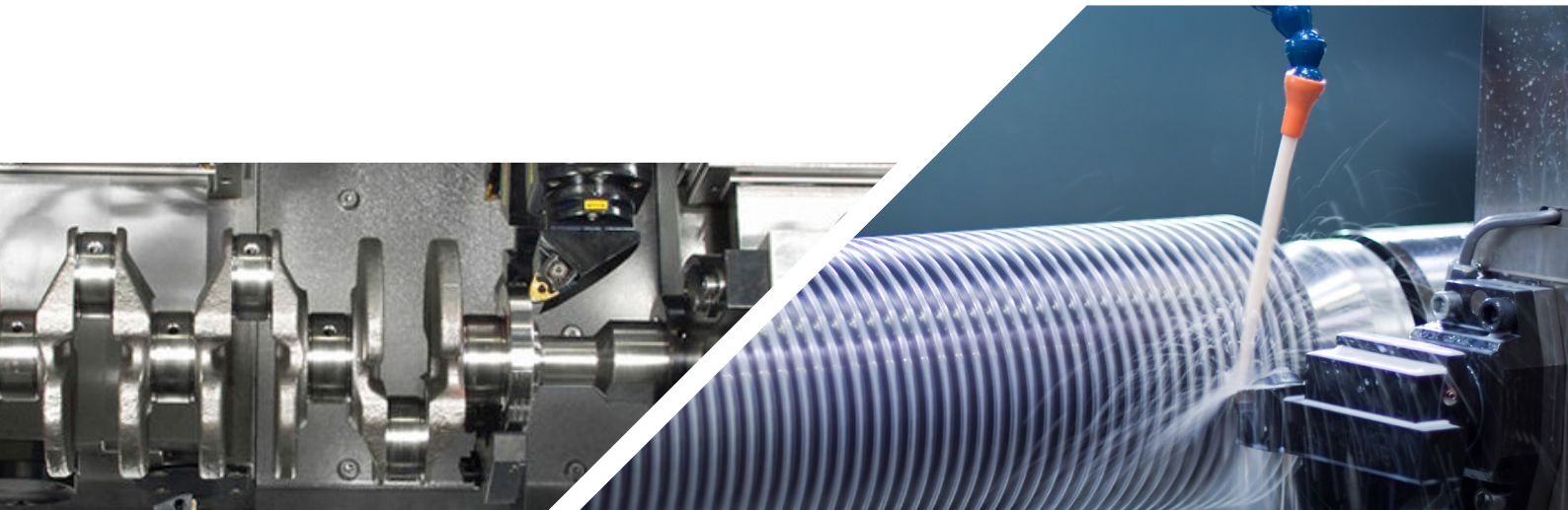
- Ceramic powder production
- Powder quality control
- Pressing and sintering
- Grades of carbide material
- Coatings

## 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



## 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.

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