Titanium Metallurgy

A one day technical course on all aspects of titanium and its applications.

Course aims
The course aims to provide industry professionals with a full understanding of the unique properties titanium alloys, how they are processed and applications to which they are suited.

Who should attend
Any professionals engaged in the supply, processing and application of titanium alloys in the aerospace, defence, offshore, chemical, oil & gas and other industries. The course is suited to, for example; designers, production & technical managers, marketing & sales professionals.

“Excellent reference material”
Valerie Hart
Fine Tubes Ltd

“The course will help in making quality related decisions”
Paul Drewbury
RTI

Contact us
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Titanium Metallurgy

Titanium production & processing

- Sponge production & vacuum arc melting
- The Cambridge FFC process
- Hot & cold forging
- Superplastic forming
- Machining
- Welding & fabrication
- Induction bending
- Powder forming

Physical Properties of Titanium

- Density
- Modulus of Rupture
- Thermal Characteristics
- Magnetic Susceptibility
- Surface Characteristics – Friction
- Fire Resistance

Alloy & Alloy Development

- Physical Metallurgy
- Alloy Types
- Heat Treatment
- Phase Transformations
- Alloy development
- Aluminides
Mechanical properties of alloys

- Alloy range/ASTM range
- Strength and strength/weight ratio
- Design codes/stress allowables
- Low temperature properties
- High temperature and creep
- Fatigue and fracture toughness
- Impact tests
- Sustained load cracking

Corrosion resistance

- Pitting resistance
- Erosion and cavitation resistance
- Microbiologically Influenced Corrosion
- Crevice Corrosion
- Stress Corrosion Cracking, Sour Service
- Galvanic Corrosion
- Hydrogen Uptake
- Hydraulic fluids
- Oxidation and Ignition

Applications & Markets

- Aerospace
- Chemical and Process Industry
- Power Generation and Desalination
- Marine and Offshore Oil and Gas
- Medical – Implants, Instruments
- Flue Gas Desulphurisation and Wet Air Oxidation
- Automotive & Armour
Titanium Metallurgy

Learning Outcomes

- Appreciation of the processes used for producing titanium metal
- Understanding of the unique physical, mechanical & chemical properties of titanium and how they can be manipulated by alloying and heat treatment
- Selection of titanium alloys for a range of applications and understanding the advantages and limitations of titanium over other material options

Other Continuous Professional Development (CPD) Services

General Metallurgy
- Introduction to metals
- Fundamentals of metallurgy
- Metallurgy for non-metallurgists

Metals Processing
- Casting of metals
- Hot & warm forging
- Introduction to heat treatment
- Heat treatment for professionals
- Machining of metals
- Welding of metals
- Powder metallurgy
- Principles of heat treatment

Metals & alloys
- Carbon & alloy steels
- Stainless steels
- Titanium metallurgy
- Nickel metallurgy
- Aluminium metallurgy

Metals Applications
- Subsea application of metals
- Metals for aerospace
- Metals for gas turbine applications
- Materials for automotive
- Materials for nuclear
- Materials for medical

Apprenticeships
- Mechanical
- Electrical
- Manufacturing
- Materials
- Fabrication
- Machining
- Composites
- Design

In-Service Performance
- Introduction to corrosion
- Combating metal corrosion
- Introduction to fatigue
- Failure analysis & prevention
- Mechanical testing
- Non-destructive testing
- Quality assurance

Certificate in Metallurgy
QCF level 3
- Science & engineering principles
- Fundamentals of metallurgy
- Principles of heat treatment
- Mechanical testing techniques
- Non-destructive testing
- Principles of quality assurance
- Metals processing & manufacturing technologies
- Metals for aerospace

Manufacturing Leaders Programme
(ILM level 3)
- Developing yourself
- Creating a high performance team
- Effective communication
- Conflict to compromise
- Getting the best out of your people
- Problem solving
- Production planning
- Maximising resources
- World class manufacturing
- Safety is no accident
- Customer is king
- Leading in a lean environment

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