

2-day Technical Training Course (HF01)

Program: Manufacturing Insight Skills (MIS)

Session Topics - "Hot Forging Process, Materials & Die Life Control"

Course Objective:

The objective of this patented MIS program is to raise technical competency of technical employees from local manufacturing industry for product quality & productivity improvement through understanding of vital manufacturing variables. At the end of the MIS training, participants will realize the importance of technical details study & the introduction of science & engineering procedures to their existing practices for a profitable manufacturing operation.

Session Overview:

Hot forging parts are typically used for critical or severe service applications such as automotive components, high pressure fittings, drive train parts, gears, bearings, aircraft landing gear and turbine disks. Quality of hot forged parts involved strength, toughness and geometry. These are established based on materials, processing and tooling specifications. Additionally, requirements for grain flow and defects-free are common. Today, precision forging processes are being performed in controlled presses, forging stock, tooling and process condition. Among others, die failure can be a significant portion of the overall production cost. Hot forging process subject the dies to severe thermal & mechanical fatigue subsequently resulting in die failure primarily through wear, plastic deformation and fatigue fracture.

This first series of Hot Forging training program developed by *Mr William Lee* is specially designed to build up technical competency of engineering and technical staff from hot forging industry. Course participants will learn the nitty-gritty of various forging processes and vital variables to control the processing of their engineering forged parts & die performance through this systematic and information pack 2 days technical training program.

Benefits:

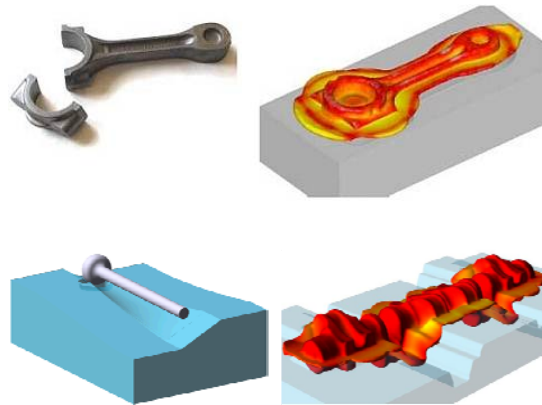
1. Develop & strengthen technical competency in materials processing for a quality & profitable hot forging operation.
2. Get an insight of the forging technology and learn manufacturing variables & how they can impact forgeability and product functionality.
3. Introduce science & engineering procedures to existing forging practices.
4. Train to be a multi-skills & multidiscipline technical personnel for effective technical auditing on hot forging process & parts.

Your Workshop Leader



Mr. William Lee

Dip.Tech (TARC), B.Eng (EC, UK)
Fulltime Technical Training Consultant
PSMB Certified Industry Trainer



Target Participants:

This course is recommended for forging engineers, shop supervisors, plant managers, quality controllers, die makers or any skilled trade personnel (including technical buyers) who work with hot forging products, process and die life improvement programs. The 2-day technical program will be valuable for automotive & forging industries.

Course Contents:

1. Overview of Forging Process –

- Hot forging; Warm forging; Cold forging; Open die forging; Closed die forging; Upset forging; Flashless forging; Seamless forging; Isothermal forging; Hot die forging; Forgeability; Process chain; Forging system & Input variables.

2. Forging Stock Characteristics –

- Forging pressure requirement; Flow stress; Strain hardening; True stress & true strain; Engineering stress & engineering strain.

3. Process Variables & Control –

- Forging equipment; Ram speed & deformation rate; Forging temperature; Friction and lubrication.

4. Die Life Control in Hot Forging –

- Die failure modes & locations; Stress and failures; Thermal softening; Hot hardness; Fatigue strength; S-N curve; Wear mechanisms; High cycle & low cycle fatigues; Die life influencing factors; Corner design; Draft angle design; Surface finish; Flash control etc.

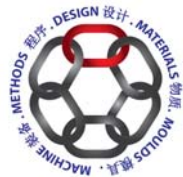
5. Video Presentation –

- Forging Introduction
- Open Die Forging
- Impression Die Forging
- Related Forging Processes
- Forging Automation

Course Instructor



William Lee - Malaysian, Materials Engineer with an honorable Bachelor Degree awarded by The Engineering Council of London (EC, UK). He has over 25 years working & teaching experience in manufacturing industry. William possesses strong fundamentals knowledge in technical science & has special talent to communicate and explain to others the principles involved in various engineering fields. His ability to present and link the various engineering disciplines with real industrial use has made many of his course participants to appreciate the significant of technical details study for manufacturing improvement. Over the years, he has developed a series of patented Manufacturing Insights Skills (MIS) Training programs for various manufacturing industries. He is now a full time contract speaker for a few training organizers as well as professional associations in ASEAN & Australia. William will bring a wealth of teaching experience to this program along with his strong industrial background as a former engineering practitioner in tooling, materials, heat treatment, moulding & metal forming divisions. In addition, William is a versatile trilingual instructor who can instruct technical courses in English, Bahasa Malaysia or Mandarin (or a combination of the languages) to ensure full understanding of his presentation by his trainees from all levels.



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(Registered Training Provider under Ministry of Finance: 357-02128315)

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Tel: 03-80751529 Fax: **Go Green; Avoid Fax**

Email: training@metalloy.com.my Website: www.metalloy.com.my

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