

2-day Technical Training Course (CF03)

Program: Manufacturing Insight Skills (MIS)

Session Topics - "Hardening Quality of Forging Tools"

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:

In considering ways of improving forging tools performance, quality hardening plays an important role in attaining desirable characteristics & properties, primarily increased toughness, strength & greater wear resistance. Tooling is a skillful & capital investment effort. Tool makers and tool users depend on the heat treaters to make their investment paid-off. Professional heat treater gives the fabricated products the final touch of quality that makes them usable & reliable to do the job they are intended to do.

This course is designed to provide a practical approach on how to evaluate and attain quality hardening result for forging tools (high alloyed tool steel grades). The program will give detailed coverage on potential hardening problems associated with poor heat-treating practices. It is design to make participants familiar with the heat treating principles, proper steps in heating, quenching & tempering, common hardening failures, solutions to overcome it and terminology of hardening process. Participants will learn many of the basic fundamental metallurgical aspect of hardening and the various effects brought about by heat treating on the properties of tool steels including the benefits and limitations for tooling performance.

Benefits:

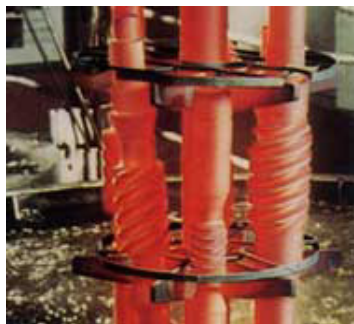
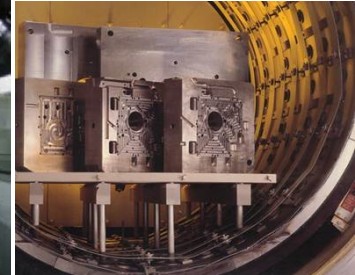
1. Acquire metallurgical knowledge of tool steels heat treating.
2. Study heat-treated problems and its potential risk to forging tools performance.
3. Understand key factors and fundamentals to attain quality result of forging tools hardening.
4. Gain an overview of good heat treating practices & things to ask when dealing with heat treaters.



Your Workshop Leader

Mr. William Lee

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



Target Participants:

The program is recommended for those who concerned the performance & quality of heat treated forging tools in improving productivity of forging process.

Course Contents:

1. The Principle of Hardening

- *The Basic of Heat Treating*

The WHAT, WHEN & HOW of steel heat treating. Guidelines on achieving quality hardening.

2. Problems Associated with Hardening Process (Part 1)

- *Get to know the Potential Risks in Hardening*

Hardness Control / Soft Spots / Surface Chemistry Changes / Overheating & Burning.

3. Problems Associated with Hardening Process (Part 2)

- *Get to know the Potential Risks in Hardening*

Quench Cracking / Size Distortion / Shape Distortion / Residual Stress / Dimensional Instability (Retained Austenite) / Stress Relieve / Stress Temper / Sub-Zero Treatment.

4. Proper Through Hardening Process

- *Steps in performing Quality Hardening Process*

Furnace Type / Protection Against Decarburization & Oxidation / Preheating / Furnace Recovery Time / Heating Time / Holding Time / Austenitizing / Quenching / Tempering Cycles.

5. Video Shows – Seeing is Believing

- Purpose of Heat Treating
- Understanding Metal & Alloy Structures
- Through Hardening Process
- Furnaces & Heat Treating Processes

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.



Organized by:

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