

Product Code: **PE02**

Manufacturing  
Improvement  
Training Program

2-day Technical Training Course

**Program: MANUFACTURING INSIGHTS SKILLS (MIS)**

**Session Topic: Hardening Quality & Tooling Performance**

**By: William Lee**

**SBL TRAINING PROGRAM**



### 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

Poor quality hardening is the single largest source of tool failures during tool making or in subsequent service. By the time when the tools are ready for hardening, they are already worth a lot of money as investment already paid to design fees, tooling materials & machining costs. Improper hardened tools or dies will incur higher overhead costs during tool running as frequent tooling maintenance and repair are required. In addition, poorly hardened tools & dies will affect the tooling performance and produce scrap during production. Thus, the economical risk factor from hardening is high. This program will teach course participants one of the very important industry skills on how to achieve and ensure good quality heat treating job. It is design to make participants familiar with the heat treatment principles, processes, common heat treatment failures, solutions to overcome it and terminology of hardening process. The program will also present practical data for use in hardening shop. 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 tool life performance.

### Benefits

1. Learn tool failures due to heat treatment related problems.
2. Trouble shooting of common heat treatment failures.
3. Obtain practical data for heat treatment process.
4. Learn new heat treatment process to improve tooling performance.

### Course Content

#### 1. Hardening of Moulds, Tools & Dies

The WHAT, WHEN & HOW of tooling heat treatment & its hardening mechanism.

#### 2. Hardening Problems, Causes & Solutions

Hardness Control / Soft Spots / Surface Chemistry Changes / Overheating & Burning / Quench Cracking / Size Distortion / Shape Distortion / Residual Stress / Dimensional Instability ( Retained Austenite) / Stress Relieve / Stress Temper / Sub-Zero Treatment.

#### 3. Through Hardening & Its Procedures

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

#### 4. Improved Hardening for Quality Tooling & Performance

The case of Ford & General Motor / 5 rules of quality heat treatment / 7 tips for successful heat treating guidelines / Subzero treatment.

## 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

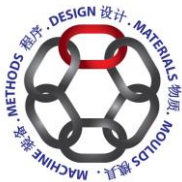
industries. He is now a full time contract speaker for a few training organizers as well as professional associations in ASEAN & Australia. William will bring a wealth of teaching experience to this program along with his strong industrial background as a former engineering practitioner in tooling, materials, 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.

## Target Participants

Participating companies can be from heat treatment, moulds & dies making, tool steels as well as manufacturing industry including metal stamping, forming & machining, plastic moulding, electronic, automotive, extrusion and die casting. Target audience can be those involved in activities related to heat treating, tooling, parts or products manufacturing such as technical group personnel, production managers, supervisors, tooling engineers, tool makers, engineering specialists, quality controllers and R&D researchers, designers, machinists and technicians.

## Administrative Details

1. Should public training not be scheduled for this program we will consider opening an ad hoc public training class if you've minimum guaranteed participants to attend this program.
2. We can bring this program to your premises as in-house training event for your in-house employees only. Interested participating company may contact us for an in-house training proposal.
3. In-house training can be conducted on weekdays or weekends (including public holidays) to meet the scheduling needs of your targeted staff.
4. For in-house training, a list of participants complete with their full name & designation must be presented to training provider one week prior commencement of each program. The total no. of training manual is supplied to the actual no. of turned out attendees only.
5. Substitute is allowed to replace the earlier registered person if he / she is unable to attend the training program (both public and in-house training). Participating company must inform us the details of replacement person.
6. All programs are of SBL (Skim Bantuan Latihan) type. Eligible company (Human Resources Development Fund contributor) must apply through themselves for the rebate of any eligible expenses (including training fees) from Human Resources Development Council. Training provider bears no responsibility for the approval of training grants or any form of rebates between participating company and HRDC.



Organized by:

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