

Product Code: **MS02**

Manufacturing  
Improvement  
Training Program

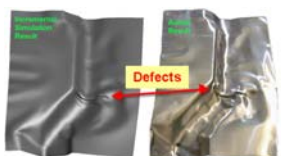
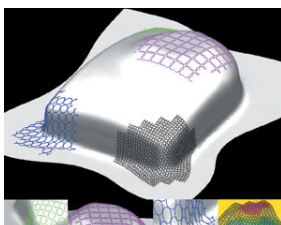
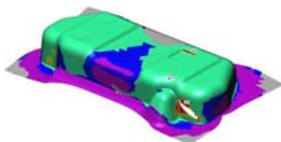
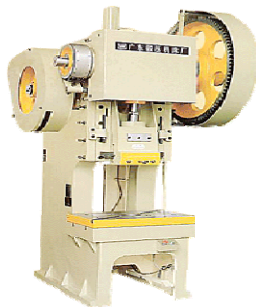
2-day Technical Training Course

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

Session Topic: Sheet Metal Forming & Materials Formability

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

Sheet metal forming is a technological important process in manufacturing industries that allows economical production of parts with complex shapes from flat sheet stock. Sheet metal forming involves bending, drawing processes & their many variations. Metal forming relies on metal's ability to flow plastically in the solid state without significant change in its properties. This course provides an in-depth study of materials characteristics during forming process include the impact of materials properties & quality on formability, changes of materials properties after forming, measuring materials formability, analyzing forming modes, troubleshooting forming defects (springback, wrinkles, fracture, thinning, work hardening, residual stress) etc. Course participants will gain a lot from this 2-day technical short course and learn how to fine tune their existing practices with a more scientific and systematic approach for further development in forming process and improve parts quality & production economy.

### Benefits

1. Understand how materials properties & characteristics can influence the forming results.
2. Gain knowledge on various forming modes during sheet metal forming operation.
3. Learn techniques for continuous process and quality improvement.
4. Study causes of forming defects & apply solutions to overcome it.

### Course Content

#### 1. Materials Characteristics & Formability

Sheet metal forming processes; Materials for sheet metal forming; Engineering stress & engineering strain; Ductility; Elongation; Yield strength & tensile strength; Elastic & plastic strain; Modulus of elasticity; Spring back; Materials Alloying; Delivered Conditions.

#### 2. Materials Properties & Formability

Properties changes through forming; Work hardening; Restoring ductility; n-values; True stress & true strain; Size & thickness effects in forming; R-values; material anisotropy.

#### 3. Measuring Materials Formability

Stress strain limit; Forming modes; Strain calculation; Circle grid analysis (CGA), Forming limit diagram; Forming window.

#### 4. Forming Analysis & Failures Control

Forming analysis; Wrinkles; Thinning; Splitting; Draw Ratio; Blank Holder; Blank size; Punch and Die Radius; Percentage of Reduction; Clearance; Forming force; Forming speed; Lubrication.

## Course Instructor



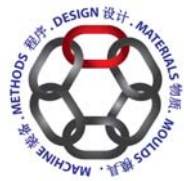
William Lee - Malaysian, Materials Engineer with an honorable Bachelor Degree awarded by The Engineering Council of London (EC, UK). He has over 25 years working & teaching experience in manufacturing industry. William possesses strong fundamentals knowledge in technical science & has special talent 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

This course is recommended for the buyers, manufacturing engineer, engineering technician, design engineer, development engineer, senior project engineer, plant engineer, product manager, tool engineer, product designer, structural engineer and technical personnel from the sheet metal working industry only.

## 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:

### **METALLOY CONSULTANT SERVICES PLT**

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◆ **Developing K-Workers; Promoting Scientific Manufacturing** ◆