

Session Code: **IJM10**

Manufacturing Improvement  
Training Program

3-day Technical Training Course (Onsite or at Our Taiping Training Center)

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

Session Topic: **Practical Scientific Injection Moulding**

By: William Lee

**SBL TRAINING PROGRAM**

**Session Overview:**

Developing a process for any mould involves setting many process variables. Dealing with so many variables can get confusing especially the way they are interact to each other and there can be more than 1 process setting solutions for a single moulding problem or it can be more than 1 problem solved by a single adjustment. One way to get a control on them is to organize a sequential moulding process in order to isolate non related parameters and define the root cause of problem.

This 3-day hands-on workshop training is designed to train moulding practitioners on how to establish a robust injection moulding process, using the scientific moulding technique. A scientific moulding technique is an efficient & repeatable moulding process with a large processing window. Using this technique to develop a stable & reliable moulding process is also an important prerequisite prior running DOE for injection moulding. The training will conduct a series of practical experiments to determine shot size, transfer position, cushion size, plastic temperature, fill time, part weight, gate seal time, holding pressure etc. In addition, it will review important aspect of factors in injection moulding, proper process documentation and how to use the achieved data to develop original process or for process revalidation purpose.

**Equipment Needed (for Onsite training):**

This 3-day practical in-house training requires participating company to prepare a unit injection moulding machine (**with closed loop process control system**), a mould (**with at least 2-cavity design**), resin and a standby employee who is familiar to operate the provided machine. In addition, weigh scale (**accuracy within 1% of the total part weight**), temperature probe, purge plate, dial or digital indicator (**accuracy to 25  $\mu$ m**) with magnetic base and adjustable extension arm, safety equipment such as face shields, safety glasses, heat resistant hand gloves, ear protection plugs, and onsite training tables, chairs, writing pads, calculator, ruler, white board (**large size**), markers, and eraser are necessary to run this program at workshop area.

**Benefits:**

1. Learn how to develop & maintain a consistent, robust & repeatable scientific moulding process based on scientific principles and measured outputs.
2. Perform various process and machine evaluation tests to establish scientific moulding process.
3. Gain guidelines to document process setup sheet.
4. Train to be a scientific moulder who acts upon facts & data but not depend on guesswork.

**Course Contents:**

- **Developing Scientific Moulding**
  - Establishing 1<sup>st</sup> Stage Fill
  - Packing Pressure Progression
  - Gate Seal Study
  - Setting Final Cushion
  - Feed Zone Temperature Study
  - Setting Screw Recovery
  - Cooling Time Progression
  - Determining Clamping Tonnage
  - Melt Temperature Measurement
  - Mould Temperature Progression
- **In-Mould Rheology Test**
- **Cavity Imbalance Test**
- **Platen Deflection Test**
- **Check Ring Repeatability Test**
- **Process Documentation**
- **Troubleshooting using Scientific Moulding**



## Course Instructor



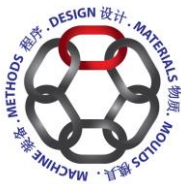
William Lee - Malaysian, Materials Engineer with an honorable Bachelor Degree awarded by The Engineering Council of London (EC, UK). He has over 28 years working & teaching experience in manufacturing industry. William possesses strong fundamentals knowledge in technical science & has special talent 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 3 days practical training course is designed for processors, mould setters, troubleshooters, quality controllers and buyers who want to witness and have a hands-on training to perform machine settings in developing and establishing a consistent and reliable moulding process, how to conduct process validation & revalidation, and how to interpret recorded processing parameters from a process setup sheet & learn what are the ramifications on the moulded parts. Injection moulding practitioners, technical purchasers as well as supplier quality engineers should plan to participate this 3-day technical training.

## 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**

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

(Registered Training Provider under PSMB: LLP0003449-LGN)

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

**Email: [training@metalloy.com.my](mailto:training@metalloy.com.my) Website: [www.metalloy.com.my](http://www.metalloy.com.my)**

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



3 Days Technical Training at Taiping, Perak

## IJM10: "Practical Scientific Injection Moulding"

**A Joint-Venture Vocational Technical Training Project Between Metalloy Consultant Services PLT & ADTEC Taiping**

### Course Overview:

Developing a process for any mould involves setting many process variables. Dealing with so many variables can get confusing especially the way they are interact to each other and there can be more than one process setting solutions for a single moulding problem or it can be more than one problem solved by a single adjustment. One way to get a control on them is to organize a sequential moulding process in order to isolate non related parameters and define the root cause of problem.

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### Course Content:

#### 1. Developing Scientific Moulding

- Establishing 1<sup>st</sup> Stage Fill
- Packing Pressure Progression
- Gate Seal Study
- Setting Final Cushion
- Feed Zone Temperature Study
- Setting Screw Recovery
- Cooling Time Progression
- Determining Clamping Tonnage
- Melt Temperature Measurement
- Mould Temperature Progression

#### 2. In-Mould Rheology Test

#### 3. Cavity Imbalance Test

#### 4. Platen Deflection Test

#### 5. Check Ring Repeatability Test

#### 6. Process Documentation

#### 7. Troubleshooting by Scientific Moulding



### Target Participants:

This 3 days practical training course conducted at ADTEC Taiping, Perak, is designed for processors, mould setters, troubleshooters, quality controllers and buyers who want to witness and have a hands-on training to perform machine settings in developing and establishing a consistent and reliable moulding process, how to conduct process validation & revalidation, and how to interpret recorded processing parameters from a process setup sheet & learn what are the ramifications on the moulded parts. Injection moulding practitioners, technical purchasers as well as supplier quality engineers should plan to participate this 3-day technical training.

## Benefits:

1. Learn how to develop & maintain a consistent, robust & repeatable scientific moulding process based on scientific principles and measured outputs.
2. Perform various process and machine evaluation tests to establish scientific moulding process.
3. Gain guidelines to document process setup sheet.
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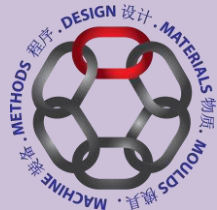
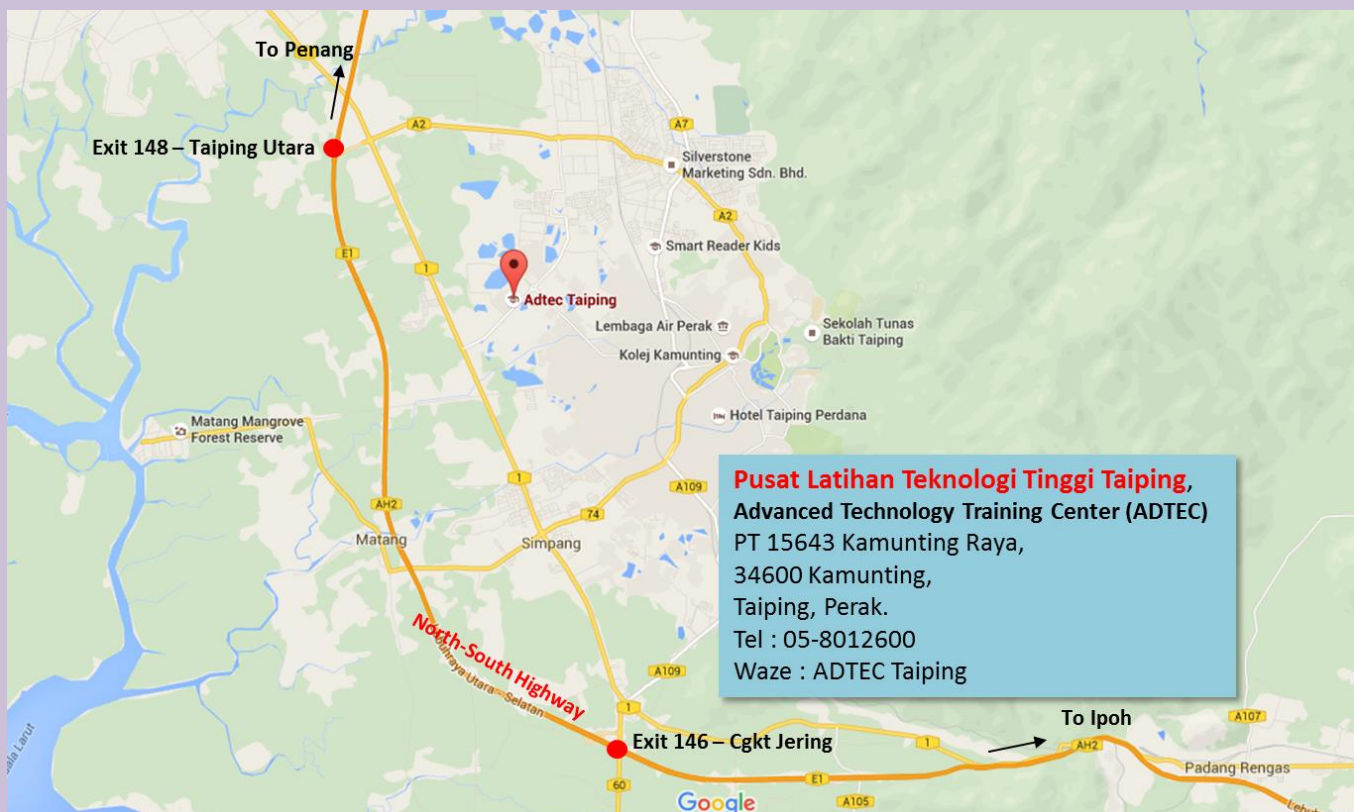
## Course Designer and Instructor:



William Lee - Malaysian, Materials Engineer with an honorable Bachelor Degree awarded by The Engineering Council of London (EC, UK). He has over 28 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

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## Training Location:



Organized by:

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