

Injection Mould

2020

Design & Procurement

2 day course

info@polybridgetraining.co.uk
www.polybridgetraining.co.uk

T. +44 (0) 17 46 761 875
M. +44 (0) 77 74 732 129



POLYBRIDGE Training Ltd



Delivered in collaboration



with Polymer Innovations Training Centre Telford Shropshire

Injection Mould Design & Procurement

Who is it for?

Anyone involved in the design, procurement or use, of injection moulds & products

- o Product & Tooling Engineers,
- o CAD Engineers
- o Purchasing & procurement staff
- o Concept, Designers.
- o Product designers.
- o Sourcing & Liaison Engineers
- o Toolmakers & Tooling Engineers,
- o Project & Process Engineers
- o Validation & Feasibility engineers
- o Senior company executives
- o Sales & Marketing executives
- o Logistics Engineers.
- o Device engineers,
- o Process Validation engineers.

Course Objectives

- o Promote effective Communication
- o Guidance through the design & procurement process
- o Create designs for efficient production
- o Understand how product designs affect mould costs
- o Evaluate existing designs for flaws & suggest improvements
- o Identify problems caused by poor mould design
- o Choose the right mould type: how & why
- o Take part in decision making processes, confidently
- o Understand how plastic behaviour dictates mould design
- o Choose the right plastic for your product
- o Control of the design & procurement process effectively
- o Identify cost reduction areas.
- o Understand Trial reports from Tool Trials
- o Appreciate data from Flow Analysis.

Content Summary

Day 1 Injection Moulding: Its influence on Design

- o Overview of the Moulding Process
- o Polymers; their impact on the design process
- o Gates: types, position, size and number
- o Runners; flow and balancing
- o Wall thickness; what is feasible & limiting factors!
- o Shrinkage: how it effects design & performance
- o Fillers and additives; their effects
- o Design and Process related faults
- o Procurement scheduling
- o Manufacturing process time lines
- o Interpreting Trials data

2 day course held at the



TELFORD

Day 2: Mould Types & Construction

- o Mould Types - factors in deciding which one to choose, their advantages and disadvantages
- o 2 plate and multi plate cold runner designs
- o 3 Plate Moulds. Hot runner moulds
- o Stack and family moulds
- o Mould construction methods
- o Mould construction materials, hardening & surface treatment
- o Cavitation selection criteria; including core and cavity insert considerations
- o Mould alignment, cooling channel(s), venting and ejection features
- o Draft angles in respect to surface finishes and / or textures
- o Strength and clamp force requirements
- o Side actions, hydraulic & mechanical, expanding and collapsing cores, unscrewing features

Pre-requisites

To gain the most from this course, attending candidates ideally should have been involved with design and procurement projects associated with the injection moulding process..

Aim of the course

The course has been designed to provide candidates with a fundamental understanding of the principles of injection mould design and the impact plastic materials have on the whole process, from design, construction to efficient production

Duration:

2 days.

Day 1 from 09.00 to 16:30 and Day 2 from 09:00 to 16:00

Location

PTIC Telford Shropshire TF3 3BA

Outcomes:

Attending candidates will leave the course with a full understanding of the various inputs required for a successful design at all stages in to achieve successful, economic and profitable production.

A more detailed explanation of the content is shown below

This course Tailored to your individual needs?

For many years our core business, has been the provision of tailored, cost effective training courses that can target your company's individual needs.

Delivered to suit your schedules, on-site or at our associate locations, this route provides an alternative solution for our customers. Please contact us if you think this could be the route for you.

Detailed Course Content

Introduction

- The moulding process over-view
- Mould Cost structure

Polymers, their influence over mould design

- Material selection.
- Flow in the mould
 - Wall thickness and flow ratio
 - Flow induced stress and product performance
- Shrinkage;
 - How it occurs & varies
 - Allowing for shrinkage
 - Process control of shrinkage
 - Orientation; strengths and shrinkage
- Gates
 - Choosing the optimum position;
 - Selecting the appropriate type, size & number
 - Valve gates & their opportunities
- Runner systems;
 - balance & dimensioning
- Fillers & reinforcements
- Effects During mould design, construction & manufacture
- Cooling
 - Its critical importance to cost, performance & efficiency
 - Implications of poor cooling on quality & consistency
 - Effects on different polymer types

Mould Types;

- Their individual advantages & disadvantages
- Factors which decide which should be used
- 2 Plate mould in its many forms
- 3 Plate & Stack Moulds;
- Family Moulds
- Hot Runner moulds
- Valve gated moulds

Mould construction

- Materials used in mould construction
- Methods of manufacture; EDM 5 Axis etc (overview)
- Hardening & surface modification
- Choosing number of Cavities
- Cores & cavities inserts.
- Strength Requirements
- Cooling channels; location & construction
- Mould alignment
- Venting & parting lines
- Surface treatments; plating, surface finishes/ textures
- Draft & line of draw
- Ejection Methods
- Clamp force
- Hydraulic & mechanically actuated cores
- Unscrewing moulds: continuous internal threads
- Collapsible cores & expanding cores
- Surface finishes Texturing Grain release angles

Common Moulding & Product Faults: Cause & Cure.

- Common Moulding faults
- Faults caused by design errors
- Faults caused by poor mould design
- Faults caused by poor material choice

Over view of CAD & Flow analysis in mould design

- CAD Programs
- 3D Polymer Flow analysis
- Fibre orientation & FEA Analysis
- Virtual Mould Trials

Over view of additive manufacturing techniques

- Explanation of additive Manufacture (A.M)
- Uses of additive Manufacture (A.M)
 - Mould cores & Cavities
 - Eg: Conformal Cooling
- A.M. for prototyping & products
- A.M. for mould construction
- Methods
 - Direct Metal Laser Sintering (DMLS)
- Hybrid Subtractive/ additive systems

Note: Component Cost Calculation spread-sheet is supplied as part of the course content; **Microsoft Excel** [®]™ format

Course Location;
PTIC Trevithick House
Stafford Park 4
Telford
TF3 3BA

Course Fee: £830.00 + VAT per person and includes course materials, lunch and refreshments.

Registration Form

Injection Mould Design & Procurement

Note: on-line booking is available.

Email info@polybridgetraining.co.uk

Select Desired Course Date: 2020

Please use a separate form for each delegate, photocopies are acceptable

☐ January 14th & 15th

☐ May 19th & 20th

☐ September 15th & 16th

Surname: _____

Forename: _____

Position/ Job Title _____

Company: _____

Contact Details;

Company _____

Contact name _____

(If different from above)

Address: _____

Postcode: ____ _

Tel: _____

Email _____

Invoice Address (if different from Contact Details opposite)

Company _____

Contact _____

Address _____

Postcode _____

Tel _____

Email _____

Payment Information

NOTE:

Payment must be received prior to attending the course

☐ Cheque payable to "Polybridge Training Ltd"

☐ Paid via On-line booking 

☐ Please Invoice my company:

Purchase Order No: _____

NOTE: Please read this carefully

Cancellation Terms,

By completing & returning this registration form, delegates are agreeing to be bound by the Conditions of Registration which can be found on the following page.

Full terms & conditions can be found on our website:

www.polybridgetraining.co.uk/downloads/calculator/terms

Please return to:

Training /Seminars,
Polybridge Training Limited
42 Linley View Drive,
Bridgnorth,
Shropshire.
WV16 4RT
United Kingdom.

Info@polybridgetraining.co.uk

www.polybridgetraining.co.uk

BOOKING TERMS & CONDITIONS

Payment is accepted in £GB

Discounts given for multiple registrations: 10% discount for 2 or more delegates from the same company registering at the same time for the same dates

Conditions of Registration

Written confirmation is required: letter, fax, email.

Payment must be received prior to attending the course.

Accommodation is NOT included in the fee.

Cancellation up to 14 days prior to the course start date will be refunded minus a 20% administration charge. Cancellation after this date will be subject to the FULL fee with NO REFUND.

Transfer to a later course, prior to the course start date can be accommodated without charge.

Transfer within the 14-day period prior to course start date will incur a 20% administration charge.

All transfer requests must be confirmed in writing by the delegate requesting transfer or their representative. The option to transfer can only be used once after which non-attendance will be treated as a cancellation subject to the terms above

Delegate substitutions can be made without incurring penalty

Locations

The final course delivery location will be advised at the time of booking. Location choice is dependent on majority course candidates moulding discipline and travel logistics.

Tailor Made "In-House" Courses

This has for many years been our core business, providing companies with cost effective solutions to meet their own specific needs. Please contact us if this route will be more effectively meet your company's individual needs.

Polybridge reserve the right to modify this course schedule without notification.



POLYBRIDGE Training Ltd

Registered Business Address

42 Linley View Drive, Bridgnorth, Shropshire, WV16 4RT, ENGLAND. UK.

Co Reg 4683206 VAT No:559 444 115 Director; D.J. Jeavons.

Tel/ Fax: +44 (0) 1746 761 875

Mob: +44 (0) 7774 732 129

info@polybridgetraining.co.uk www.polybridgetraining.co.uk



This particular course is delivered in collaboration between
Polybridge Training Ltd & City of Wolverhampton College PTIC
(Polymer Training & Innovation Centre)
Trevithick House, Stafford Park 4, Telford,
Shropshire, TF3 3BA

Tel: 01952 610101 Fax: 01952 273744

Website: www.wolvcoll.ac.uk/polymer

Email: PTIC@wolvcoll.ac.uk

