Co-Extrusion and Multilayer Structures - Pipe and Blow Moulding Applications

Short Course at Smithers Rapra, Shawbury, Shropshire, UK

27th April 2016
21st September 2016
Co-Extrusion and Multilayer Structures - Pipe and Blow Moulding Applications

Products containing multiple layers of polymers are becoming more common especially in applications where barrier properties; strength; weight or cost are an issue. Each of the two courses on Co-Extrusion and Multilayer Structures has the same core subjects but each then concentrates on the applications for either Pipe and Blow Moulding or Sheet and Film. Delegates are invited to choose the course which is most relevant to their end use application.

This course will look at the wide range of properties that can be obtained, the production processes to achieve them and the practical extrusion technologies used.

Who will benefit?
This course will be of benefit to:
- Technical Managers; Production Managers; Process Managers/Engineers; Quality and Technical Service Personnel; Technical Sales personnel and those responsible for design and development of products who wish to gain a greater understanding of the properties and processing methods of multilayer structures.

Attendees will learn:
- Reasons for having multilayer structures
- The range of materials that can be used in coextruded structures
- Properties of various barrier polymers
- Product design and material properties needed for desired properties
- How to form multilayer polymer melts
- Line layouts required to achieve products
- Quality and process control implications of multilayer structures
- Possible faults and trouble shooting

Objectives
As a result of attending the course delegates will be able to:
- Understand the benefits and cost implications for having multilayer structures
- Understand the polymer properties needed to provide desired properties or barrier resistance and be aware of the latest developments
- Make informed choices when purchasing equipment
- Identify the equipment required to produce multilayer structures
- Recognise the faults in multilayer products from extrusion processes

Contents
- Processing Technologies
  A review of all the polymer processing technologies and their capability to produce enhanced properties through combining different polymers.
- Polymer selection
  A review of the current and novel polymers available for the use in coextruded and multilayer structures.
- Product design
  How a structure can be designed for packaging, construction, automotive and medical applications.
- Properties of various barrier polymers
  A comparison of the properties for various barrier polymers with an extended evaluation of the properties of EVOH for different applications.
- Forming multilayer polymer melts
  The many types of extrusion dieheads are reviewed and the possibility of forming multilayer structures examined. The rheology of different materials is reviewed in relation to the principles of die design. Examples of theoretical modeling are provided.
- Line layouts
  The implications of using multiple extruders is examined and the requirements made for control and ancillary equipment.
- Quality and process control
  How to be in control of the process and product for multilayer structures with practical SPC examples demonstrated. A practical case study is given for obtaining multilayer pipe to customer standards. Start up and shut down procedures are given.
- Possible faults and trouble shooting
  The instabilities due to using multiple layers are considered. Potential defects in products are examined and linked to the end physical properties and quality control.

Specific Applications
This course will concentrate on structures and processes for blow-moulding and manufacturing pipes/tubes from 1 mm in diameter, for medical applications, to large bore pipes. A practical case study examines how to obtain multilayer pipe to customer standards.

Fee
£475.00 + VAT.
There will be a discount of 20% for delegates registering for both this course and the Sheet and Film Course. However, delegates are reminded that there is substantial overlap between the two courses. The course fee immediately reverts to full price, i.e. £475.00 if the participant cancels his/her place on the other co-extrusion course at a later date.

Presenter
Dr. Peter Cox, BSc(Eng), DK, C.Eng, MIMechE, FIMMM, Associate Consultant

Venue
Smithers Rapra, Shawbury, Shropshire, UK, SY4 4NR.

Conditions of Registration
Payment must be received prior to attending the event and can be paid in £ Sterling, € Euro or US $. NB: Credit card payments can only be taken in £ Sterling, unless payment is made online via our secure payment system.

The Course/Seminar Fee includes training course/seminar lecture notes lunches and refreshments. Accommodation is not included in the fee.

Joining instructions i.e. a letter of confirmation, directions and hotel information will be sent upon receipt of your registration. Please contact the training administrator if you have not received these within 7 days of registration.

Cancellations
1. Cancellation terms for Courses/Seminars held at Shawbury:
   - Cancellations made up to 14 days or more before the requested course/seminar date will be refunded, less a 20% administration fee.
   - Cancellations made within 14 days of the course/seminar date will be subject to the FULL course fee and no refund will be given.

2. Smithers Rapra cannot be held responsible for delegate cancellations and ‘no-shows’ arising from situations beyond its control, e.g. failures to travel or attend owing to cancelled flights, missed connections, weather conditions, strikes etc., emergency or illness. Smithers Rapra may, at its discretion provide a substitute event, or alternative date, if available.

Delegate Substitutions can be made at any time without incurring extra charge.

Transfers to later Course/Seminar Dates - this option only applies when more than one date is offered for the same course/seminar.
- Requests to transfer to a later course/seminar date made up to 14 days or more before the requested course/seminar date will be accommodated, subject to availability of places on the new course/seminar date.
- Requests to transfer to a later course/seminar date made within 14 days of the course date will be regarded as a cancellation and subject to the FULL course fee and no refund will be given.
- The option to transfer can be used only once, after which non-attendance will be treated as a cancellation and all outstanding invoices will be due.

Amendments to Programmes
Smithers Rapra reserves the right to cancel or modify any event in its programme. In the event of a cancellation where an alternative cannot be provided, payment received in respect of that course will be refunded in full. The liability of Smithers Rapra is limited to the reimbursement of the course/seminar fee.
Registration Form

Please reserve a place on the Co-Extrusion and Multilayer Structures Course - Pipe and Blow Moulding Applications:
- 27th April 2016
- 21st September 2016
(please use one form per delegate, photocopies are acceptable)

Surname...................................................................................................................
Forename...................................................................................................................
Job Title/Position...........................................................................................................
Company.......................................................................................................................

Contact Address
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Telephone.......................................................................................................................
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Invoice Address (if different)
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Payment Information
Please indicate in which currency you wish to pay. If no box has been ticked the default currency will be £Sterling.

- £ Sterling
- € Euro (This will be applicable at the prevailing rate)
- $ US (This will be applicable at the prevailing rate)

Please invoice my company - Purchase Order Number (if required)
Please enter your company Reg. no.:
Please enter your company VAT no.:

- Cheque/Bank Transfer
- Credit Card Payment:
  - MasterCard
  - Visa
  - American Express (please indicate)

Name on Credit Card (in CAPITALS)..............................................................................
Security Number (Visa/Mastercard - last 3 numbers in the signature box on reverse of card. Amex - 4 number code on the front of the card) ...........................................................................

Cancellation Terms: By completing and returning this form delegates are agreeing to be bound by the cancellation terms and conditions of registration.

Return to: Smithers Rapra, Shawbury, Shrewsbury, Shropshire, SY4 4NR, United Kingdom.
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