



Offered in NSW and Victoria, this course is designed for production and extrusion plant managers, experienced operators, engineers and senior maintenance personnel to enhance existing knowledge and skills in PVC extrusion practice.

**Your course instructor:** Dr Chris Rauwendaal, President, Rauwendaal Extrusion Engineering, Inc.

Chris is a well-known author, lecturer, researcher, entrepreneur, and consultant in the field of extrusion. He holds numerous patents and has written more than 200 articles and seven books related to extrusion, mixing, injection moulding, and statistical process control. Chris regularly delivers interactive training programs and video training courses on extrusion, blown film extrusion, injection moulding, and SPC.



## Course Outline

The two-day course will cover aspects such as:

- Using a high-speed data acquisition system (HS-DAS) in troubleshooting
- Determining the melt fracture behaviour of your polymer
- Eliminating melt fracture and gels
- Extrusion screw and die design
- Optimising the extrusion process
- Solving problems with polymer degradation, wear, voids in the extruded product
- Avoiding warping and shrinkage

## Dates, Locations and Venues

### Sydney

17 - 21 February 2020 (exact dates to be confirmed)  
University of Western Sydney, Kingswood (tbc)

Starts 8.30am Ends 4.30pm (both days)

### Melbourne

24 – 28 February 2020, Melbourne (exact dates tbc)  
Monash University, Clayton (tbc)

Starts 8.30am Ends 4.30pm (both days)

## Registrations

Numbers are strictly limited for delivery of this course. Please register early to secure your place.

Registration fee per person: \$1550.00 (inc GST)

Vinyl Council Members discounted fee: \$990.00 (inc GST)

Registration and Payment through Try Booking only, using the following links: **SYDNEY** <https://www.trybooking.com/BGNXP> and **MELBOURNE** <https://www.trybooking.com/BGNYF>

**Company consultation opportunity:** Available only to companies that register at least one delegate to the course, we can offer a private company consultation with Chris (max 1 day per company). Please contact the Vinyl Council's Office Manager, Ms Carol Hassan to book this on 03 9510 1711 or email: [Carol.hassan@vinyl.org.au](mailto:Carol.hassan@vinyl.org.au). Consultations will be booked on a first come, first served basis.

**Refund Policy:** Registrations are transferable in full until 72 hours prior to the course commencement, subject to notification of the Vinyl Council of Australia's Office Manager. Refunds will only be provided where a participant/s withdraws at least 28 days prior to the course being conducted, or if the course is cancelled or postponed. The Vinyl Council reserves the right to retain an administration fee of \$200. For cancellations received less than 28 days prior to the event, the Vinyl Council reserves the right to retain all monies. Cancellation must be received in writing by the Vinyl Council.

Please note: If you are attending this course from interstate of the location, the Vinyl Council bears no responsibility for travel costs incurred due to the course being cancelled or postponed.



Vinyl Council Australia

# Advanced PVC Extrusion Course

## Sydney

17 - 21 February 2020 (exact dates to be confirmed)

University of Western Sydney, Kingswood (tbc)

Starts 8.30am Ends 4.30pm (both days)

## Melbourne

24 – 28 February 2020, Melbourne (exact dates tbc)

Monash University, Clayton (tbc)

Starts 8.30am Ends 4.30pm (both days)



## Course Outline: Understanding, Optimizing, and Troubleshooting the Extrusion Process

### Day 1

#### Introduction to extrusion

- Basic extruder components
- Screw, barrel, and feed system
- High speed extruders
- Screw drive systems
- Breaker plate and screens
- Heating and cooling
- Instrumentation and DAS
- Twin versus single screw extruders

#### Extruder screw design

- Standard extruder screw
- Multi-stage screws for venting
- Mixing screws
- Twin screws modelling and simulation
- Conical vs parallel twin screws

#### Important polymer properties

- Different PVC resin K values
- Bulk density
- Melt flow properties
- Thermal properties
- Viscous heat generation
- Optimizing process conditions
- How to set process conditions

#### Functional aspects of extrusion

- Solids conveying
- Plasticating/gelation
- Melt conveying
- Degassing
- Mixing
- Energy efficiency

### Day 2

#### Extrusion die design

- General rules and guidelines
- Methods of flow balancing
- Types of extrusion dies
- Analysis of dies
- Coextrusion dies

#### Optimizing the Extrusion Process

- Assess efficiency of an extrusion operation
- Efficient machine design & setup
- Product changeover and purging
- Reducing material cost
- Reducing energy consumption
- Optimizing extruder barrel temperatures
- Flexible manufacturing methods, examples

#### Troubleshooting the Extrusion Process

- Requirements
- Collection of historical data
- Condition of equipment
- Information on feedstock
- Tools for troubleshooting
- Systematic troubleshooting
- Upset vs. development problem
- Troubleshooting techniques
- Polymer degradation
- Extrusion instabilities
- Functional problems
- Air entrapment
- Gel problems
- Die flow problems
- Wear problems
- Case studies