

# Polymer Products Development Centre

Over the last 90 years Smithers Rapra has gained an unparalleled knowledge of the relationships between polymers, product design, performance, durability and manufacture.

Our processing services are designed to support our clients development throughout the production process, to optimise material selection, product and process performance and to improve existing production. From compound formulation prototype manufacture and pre-production trials to machinery selection, novel process development and failure analysis.

Smithers Rapra provides technical support to plastics and rubber processors and product manufacturers on a confidential basis.

## Key Client Benefits are:

- Extrusion development, including new products and novel processes
- Specialty compounding and formulation development
- Pre-production compounding and extrusion
- Test sample production, including pipe, wire, film, and sheet
- Low pressure RIM and polyurethane products
- Injection moulded test pieces

## Materials Selection and Formulation

Smithers Rapra can provide advice on the most appropriate material or formulation to satisfy client requirements for a wide range of different projects. For demanding applications Smithers Rapra can tailor individual solutions to address specific issues relating to design, performance and durability.

After establishing the right material our technicians can prepare test pieces for mechanical and chemical characterisation. Existing formulations can be re-designed to enhance existing performance.

## Process Development

With almost an unrivalled position of having expertise in virtually every sector of the polymer industry Smithers Rapra advises on all aspects of the process, from die and tool design, scale-up, through to complete line layout. Smithers Rapra consultants can create bespoke processes or tailor existing ones to solve difficult or novel applications.

## Specialist Production

Smithers Rapra undertake the manufacture of specialised or niche products for various industries including medical, security and aerospace. Our technologists are experienced in designing and utilising small scale production lines and developing novel processing technology. The highest production standards are maintained by in house auditing systems to ensure product quality and consistency.

## Prototypes and Pre-production Trials

Smithers Rapra's design and engineering departments utilise CAD drawing and rapid prototyping to design and manufacture prototype tools, moulds, dies and other ancillaries. These are used to produce component parts, sub assembly prototypes and fulfil manufacturing campaigns. Smithers Rapra has experience of assembling processing lines for small scale compounding, extrusion and injection moulding. Extensive testing is undertaken on simulated operating environments to identify potential problems prior to full scale production.

## Plastics Processing

Smithers Rapra's expertise includes commodity resins through to engineering and specialty polymers. Our technologists have access to twin screw 21 mm and 30 mm compounding extruders and 18, 25, 38 and 50 mm single screw extruders. Internal mixers and mills with high speed blenders and small scale batch mixers provide the opportunity of working within the range of 20 g to 1,000 kg batches.

A range of moulding presses are available on site including 25 and 100 tonne Arburg moulders, to handle standard and non standard articles. Single and multi-cavity moulds for BS, ISO and DIN standard test samples, prototype parts and various rubber components are utilised.

## Rubber Processing

Our on site mixers and mills enable our technologists to prepare and mix a wide range of elastomer and TPE formulations. A range of two roll mills allow mixing and milling in quantities from 1 kg to 20 kg batch sizes.

Extensive experience has been gained in the field of rubber bonding. Our knowledge and expertise covers bonding to a range of metallic and non-metallic substrates using a variety of bonding systems.

Extrusion is handled by a 35 mm cold feed extruder, adapted for use with CTM to improve stock homogeneity.

A 100 mm Pre-former Ram extruder for profile and blank preparation is available.

## Extrusion Capabilities

Smithers Rapra's extrusion capabilities include cast and blown film, wire and cable, pipe and profile and extrusion coating/lamination. 25 – 50 mm pilot and lab scale extruders are available, with an extensive range of ancillary and downstream equipment. There are also extensive tool design and manufacturing capabilities.

## Smithers Rapra Cavity Transfer Mixer (CTM)

Developed by Smithers Rapra, the Cavity Transfer Mixer is a cost effective solution designed to increase the distributive mixing performance of a single screw extruder. The CTM can be retrofitted to both twin and single screw extruders, the device has found successful, industry wide application in areas ranging from polymer and colour blending, liquid additive incorporation through to reactive and direct product extrusion. A variation, the By-pass CTM has been designed specifically for skin colouring applications in the pipe and cable industries.

## Smithers Rapra

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