



Rubber Processing Facilities

Rubber Consultants' fully equipped Mill Room has machinery to process and characterise rubbers, thermoplastic elastomers and thermoplastics.

Internal Mixers

The Millroom has a total of five internal mixers with batch capacities ranging from approximately 300gm to 35kg.

Type	Capacity
Polylab PL2000	300gm
BR Banbury (for black mixing)	1.3kg
BR Banbury (dedicated to colour mixing)	1.3kg
OOC Banbury	3.5kg
Intermeshing Mixer	35kg

All of these machines have PC control to allow mixing data collection

Mills

The Millroom has a total of 10 two-roll mills available, ranging from 100gm capacity up to two 1070mm (42 inch) mills, each with a 50kg capacity. One of these mills has pneumatically powered knives to cut strip for extrusion feed.

A 300mm x 150mm mill, situated in a clean room with vacuum ovens and associated equipment for Technically Specified Rubber (TSR) testing.

A cracker mill for the breaking down of high viscosity materials.

Extruders

Two cold feed rubber extruders are available. Screw diameters are 30mm and 60mm. The 60mm extruder has a plain, barrier and pin screw that are interchangeable to vary mixing intensity in the barrel. All running conditions data can be displayed and recorded on a PC.

A Prism twin screw compounding extruder for continuous mixing of TPE and TPR featuring a modular barrel 40:1L/D in 4:1L/D sections with liquid injection ports, variable speed from 0 to 500 rpm, 24mm screw, PLC control system with a touch-screen interface and data logging linked to a PC.

Calender

800mm three-bowl vertical calender with take-up and lining equipment fitted.

Injection Moulding

For rubber:

LWB Steinkl Injection Moulding Press

● Clamping force	1600kN
● Shot volume	1000cc max
● Injection pressure	180MPa
● Platen size	500mm x 510mm

For thermoplastics:

Arburg Allrounder 220-90-350

● Clamping force	350kN
● Shot volume	225cm ³
● Injection pressure	132MPa
● Maximum barrel temperature	450°C

A number of moulds are available for preparation of standard test pieces and products for both machines.

Rubber
Consultants

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Compression Moulding Presses

Ten presses both steam and electrically heated; 150mm x 150mm to 600mm x 600mm platen area, operating at pressures up to 140MPa and temperatures up to 250°C. Most standard test piece moulds are available.

For large, irregular articles autoclaves can be used. A steam-heated autoclave has chamber dimensions of approximately 760mm diameter by 1220mm long and a maximum temperature of 160°C.

Scholz pressurized, electrically heated autoclave. Maximum temperature of 150°C, approximately 1.5m diameter and 3.0m length.

Processability Analyses

Monsanto Rheometers, both moving die (MDR2000 and MDR2000E) and the older oscillating disc type (ODR) operate to 200°C for analysis of the cure behaviour of finalised stocks.

Mooney Viscometers to measure rubber viscosity and scorch safety.

The Negretti TMS Biconical Rheometer has a variable speed rotor revolving in a pressurised cavity.

● Shear rates	0.1 to 100s ⁻¹
● Operating temperatures	50° to 200°C

Rubber viscosity, stress relaxation, wall slip and cure can be assessed.

The RH7 Twin-Bore Capillary Rheometer evaluates the flow behaviour of materials under shear.

● Maximum shear rates	0.1 to 10 ⁶ s ⁻¹
● Maximum load	2kg
● Operating temperatures	25° to 350°C
● Pressure transducer	0.175MPa to 200MPa

Fully computer controlled and data can be supplied either with or without the Bagley and Rabinowitch corrections. A PVT cell is also available for generating pressure-specific volume-temperature data for assessing shrinkage behaviour of materials and if needed as an input to flow simulation software. A slot die is also available.

Flow data can be generated for a wide range of materials.

Rubber Bonding Facilities

A dedicated laboratory is available for surface preparation of substrates for bonding with the following equipment.

- Two ultrasonic degreasing tanks specially dedicated for water based degreasing of small parts.
- Two large degreasing tanks for solvent based degreasing of large parts.
- Grit-blasting machine.
- Spray booth for application of the bonding system.

Several environmental cabinets are available for testing bonded joints such as humidity and salt-spray exposure testing.

Miscellaneous Equipment

Dispergrader for assessment of filler dispersions rated against Cabot standards. The dispergrader is equipped with a number of different reference scales and is based on the ISO11345 method B. A set of ten image standards are available for each of the different reference scales with a numerical rating between 1 and 10. The image of a rubber compound is compared with these reference images to obtain an indication of the level of dispersion.

Pneumatic Guillotine for slicing of rubber bales.

Two Blackfriars Granulators for chopping raw rubber or plastic.

Fielder Blenders for mixing powder or crumb rubber and blending or de-dusting chemicals. 25kg batches can be processed.

We also keep a good stock of rubbers, fillers and rubber chemicals.



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