CAPPA-D
Centre for Advanced Polymer Processing and Design

MMRI
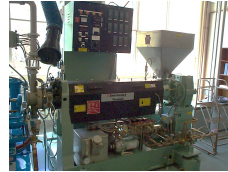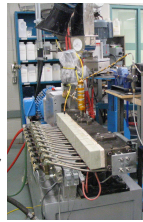McMaster Manufacturing Research Institute

Processing Equipment

2" Davis-Standard Extruder
Improved melting
Multiple pressure ports along the barrel
Grooved feeding capabilities
Screw cooling kit
Rod Die with valved adapter
Higher throughputs
L/D:30/1

Leistritz Twin Screw Extruder
Improved mixing
10 zone modular system
Screw design
Multiple movable injection/feed ports
Side stuffer, hopper and power feeder
Inline liquid injection
L/D:40/1
Inline pelletizer

Haake Batch Mixer
Small scale testing
Blend formulation

Biaxial Rotational Molding Machine
Biaxial rotation
Capabilities of precise rotation
Electrically heated oven
Double ¼" thick channel mold
Air and water mist cooling

Spray Drying
Power production form liquid solution/ suspension

Laminator
Multilayer film production
Doctor Blading
Hot roller for thin film production

Hot Press
Mold testing
Compression molding
Rapid cooling module

Physical Property Testing

Fourier Transform Inferred Spectroscopy (FTIR)
Non-destructive chemical analysis
For powers, films, liquids and pellets

Sintering and Bubble Formation
Digital frame capture and analysis

Differential Scanning Calorimetry (DSC)
Solid, power, or liquid testing
Crystallization, glass transition,
Heat capacity

Contact Angle
Sessile drop
Hydrophobicity

Universal Mechanical Tester (Instron 3366)
Tensile, flexural, compressive
5kN and 500 kN load cells
for variable sensitivity
Environmental control
for non-ambient tests

3-D Printing and Thermoforming
Additive manufacturing
Small scale testing and formulation

Rheology

Melt Flow Index
Material comparison and validation

Advanced Rosand RH-720 Capillary Rheometer
Shear rate range 10-10,000 1/s
Variable shear rate
Temperature range up to 300˚C
Beagly and Rabinowitsch
correlation applied
Twin bore to provide two
simultaneous experiments

Advanced Rheometric Expansion System (ARES)
Controlled strain rheometer
Steady, Dynamic
Transient Test Modes
Fluid bath and air convection
Oven Environmental system
Capable to measure melts and solutions
Wide Frequency range at high sensitivity