

# ARC 2020

Direct measure of uncured rubber viscosity at high shear rates.



**ALPHA**TECHNOLOGIES  
A Dynisco Company

## Features

- Measures the viscosity and die swell of rubber and thermoplastic elastomers at high shear rates from 1 to 29,000 sec<sup>-1</sup>.
- High maximum piston force of 15 kN.
- Laser micrometer for die swell measurement.
- Temperature range from 50°C (122°F) to 350°C (662°F).
- 12.7 mm (0.5 in) barrel for easy rubber sample loading.
- ASTM D5099.

## ARC 2020 Specifications

<b>SHEAR RATE RANGE:</b>	1 to 29,000 sec
<b>TEMPERATURE RANGE:</b>	RT to 350°C
<b>BARREL LENGTH:</b>	229 mm (9 in)
<b>DC SERVOMOTOR RAM RATE:</b>	0.03 to 650 mm/minute (0.001 to 23.6 in/minute)
<b>CROSSHEAD FORCE:</b>	0 to 15 kN (0 to 3370 lbf) ±0.5% F/S
<b>PRESSURE:</b>	0 to 140,000 kPa (0 to 20,000 psi) ±0.5% F/S
<b>LASER DIE SWELL:</b>	±0.003 mm
<b>MEASURED DATA:</b>	Pressure, force from load cell, ram rate, time, extrudate diameter
<b>CALIBRATION:</b>	Automatic
<b>CALCULATED DATA:</b>	Shear stress, shear rate, $\eta$ , % die swell, Bagley correction, Rabinowicz correction
<b>REPORTS &amp; EXPORT FILES:</b>	Numerous formats including Excel spreadsheet



ARC 2020 with computer

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## ARC 2020 Specifications *continued*

**ELECTRICAL:** 115 VAC  $\pm 10\%$ , 60  $\pm 3$  Hz,  
10-amp single phase or  
230 VAC  $\pm 10\%$ , 50  $\pm 3$  Hz,  
5-amp single phase

**DIMENSIONS:** Width 49 cm (19 in),  
depth 56 cm (22 in),  
height 150 cm (59 in)

**WEIGHT:** Net 136 kg (300 lb),  
gross 160 kg (350 lb)

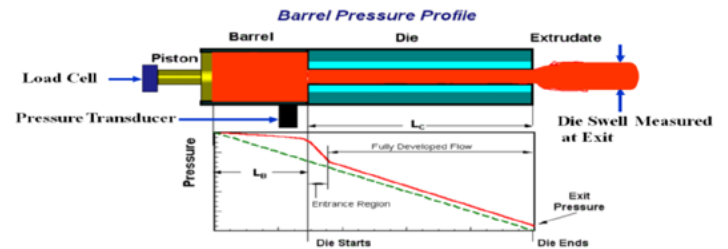
## Performance

- Measure viscosity and die swell of mixed rubber at high shear rates.
- Predict processability of mixed rubber used in calendaring, milling, extrusion, and molding.
- Good test sensitivity to mixing errors or compound changes.
- Suitable for quality control or research and development.

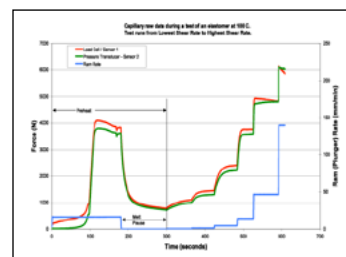
## Options

- Eclipse software systems for LIMS.
- Easy change barrel for plastics (9.5505 mm diameter).
- Die diameters:
  - 0.75 mm – 2 to 29,000  $\text{sec}^{-1}$ .
  - 1.00 mm – 1 to 14,000  $\text{sec}^{-1}$ .
  - 1.50 mm – 0.2 to 4000  $\text{sec}^{-1}$ .
  - 2.00 mm – 0.1 to 1400  $\text{sec}^{-1}$ .
- Die L/Ds: 1 to 30.

## ARC 2020 PRINCIPLE OF OPERATION



*Schematic of ARC 2020*



*Raw data plot from a shear rate sweep.*