

Table 1. Comprehensive list of Premier Improvements across all platforms

Feature	Instrument	2000 Series	Premier Series	Benefits
Dies	RPA/MDR	4 or 5 groove	Cruciform-less	Deeper grooves to ensure better sample grip and reduce slippage. (Improved accuracy / repeatability)
Seals	MDR	Silicone	Optional long-life	Low friction seals to prevent slippage, leakage, and ensure no loss of signal. Plus, they last longer. (Improved variance / longer life)
Seal Plate	RPA	Standard	Premier	Larger surface area seal plates to increase the available cavity pressure. (Improved variance / accuracy)
Post Design	RPA/MDR/MV	3 Post	4 Post	Smart alignment capabilities between upper and lower dies for better seal. Offers dynamic symmetry with a linear bearing and 4 posts to guide floating crosshead. More available working area makes seal changes or calibrations a breeze. Improved variants.
Touch Screen	RPA/MDR/MV	N/A	Standard	Improved ease of use for Operators. Change temperature and perform calibrations faster and easier.
Sampling Rate	RPA	16 samples per cycle	1024 samples per cycle	Improved MDL, improved low torque sensitivity.

		(Optional 116)		
EDR	RPA	Optional	Standard	Extended Dynamic Range (EDR) is especially important at low strains where you have a very small signal. EDR gives you the resolution you need. Only RPA's with EDR capability comply with ASTM D8059
LAOS	RPA	Optional	Standard	Measure the harmonics of torque curves using Large Amplitude Oscillatory Shear (LAOS) to provide LCB index. Do a deeper dive into longchain polymer branching for better understanding of the processing qualities of your elastomeric material.
Pressure Transducer	RPA/MDR	Optional	Standard	Measure the material's pressure response, ensuring precise data for analysis.
Programmable Pressure Regulator	RPA	DSS	Optional	Increasing closing force increases cavity pressure and elastic response for improved repeatability.
Die Gap Sensor	RPA	N/A	Optional	Torque is dependent on sample size. Significant changes in sample shape require a system to actively measure shrinkage and expansion to

				accurately calculate shape factor & modulus.
Sub-Zero	RPA	N/A	Optional	Enables low temperature testing to acquire material properties such as Tg or performance predictors like wet and snow traction.
Motor Improvement	RPA	Integer Controller	Floating Point Controller	Improves the response time, freq. control, and stress relaxation. RPA 2000 uses integer control while Premier uses floating point capable of locking onto all of the conditions. 2X the number of motor counts from 500K to 1M.
Multi-Speed Rotation	MV	2 Speeds	100 Speeds	Comprehensive analysis of the material's viscoelastic properties across different shear rates.
Rapid Change Eccentric	MDR	N/A	Optional	Quickly change between multiple degrees of strain (0.2, 0.5, 1.0, 3.0) to optimize test conditions for soft or stiff materials.
Torque Standard Calibration	RPA/MDR/MV	Tang type	Compression (MV auto calibration)	Ease of mounting the torque standard.
Automation	RPA/MDR	10/100	5/36/226	Improved efficiency.