Personal Computer Control System

Higher performance type, ensuring easy operation and sophisticated data processing in Windows™ environments

- This system is an upgraded version of the stand-alone system.
  It has the same test items but provides higher data processing capabilities of a wide variety.
- All the operations, including test parameter setting, test start and end, data acquisition, data processing, data saving, and reanalysis of stored data, are carried out by the personal computer.
- Functions of this system include processing various types of curves, overlaid presentation of more than one curve, and zooming.
- This system permits viscosity correction by the Bagley plot method and calculation of shear sensitivity (Dshear stress/Dshear rate), which provides information on the molecular weight distribution.

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The personal computer and printer,
and the bench are not included in the standard setup.

Specifications

Testing Unit

1 Test method: Constant-pressure extrusion system using weights.

2 Type of tests: Constant temperature test and constant heating-rate test

3 Extruding pressure range:
- CFT-500D: 0.4903 - 49.03 MPa, 0.4903 MPa step selection
- CFT-100D: 0.098 - 9.807 MPa, 0.098 MPa step selection
- Pressure precision: Better than ±1% of the set value

4 Measuring range:
- CFT-500D: 8×10^{-1} (*1) - 1×10^{6} (*2) Pa · s
- CFT-100D: 1.6×10^{-1} (*1) - 2×10^{5} (*2) Pa · s

(*1) for 0.5 ID x 1.0 mm length die
(*2) for 1.0 ID x 1.0 mm length die

5 Heating method: Electric, 500 W

6 Test temperature:
- Range (Ambient + 20°C) - 400°C
- Heat sensor: 100Ω platinum resistor
- Measuring precision: error of heat sensor + (±0.3°C)
- Control precision: ±0.2°C in stable state
- Heating rate: 0.5 - 6.0°C/min (0.1°C step). (For constant heating-rate tests)

7 Piston stroke: Effective stroke 15 mm
- Stroke detector: Linear potentiometer
- Measuring predision: ±0.5% (for 15 mm stroke)
- Resolution: 0.01 mm

8 Maximum sample size: 1.5 cm^3

9 Piston diameter: 11.282 mm (1 cm^2 in cross sectional area)

10 Cylinder diameter: 11.329 mm

11 Standard dies (interchangeable):
- 0.5 ID x 1.0 mm length
- 1.0 ID x 1.0 mm length
- 1.0 ID x 2.0 mm length
- 1.0 ID x 10.0 mm length

12 Operational requirements:
- Power source: 100 VAC, 50/60 Hz, 7 A max.
- Pneumatic source: About 0.5 MPa, 15 NL/run
- Temperature: 10 - 35°C (below 29°C in wet bulb reading)
- Humidity: 30 - 80% (No condensation)

13 Approximate dimensions and weight:
- Rheometer main body: 840W x 650D x 1,530H mm, 150 kg
- Attachments: 60 kg

Control Unit

1 CPU: Single chip microcomputer, 16 bit

2 Memory size: 512 Kbyte ROM and 320 Kbyte RAM

3 Display: 5.7" monochromatic LCD, touch panel type

4 Personal computer interface: RS-232C

5 Clock incorporated

	Stand-alone System Specifications	Personal Computer System Specifications
1 Parameters	Selection of constant temperature method (hereafter called constant) or constant heating-rate method (hereafter called heating-rate), piston cross sectional area, piston drive condition, testing load, preheating period, sample name, sample number, test temperature (Constant), number of test repeats (Constant), density, calculation start/end positions (constant), test start temperature (Heating-rate), test final temperature (Heating-rate), heating rate (Heating-rate), interval of flow rate measurement (Heating-rate), die dimensions (orifice diameter and length), selection of flow rate calculation methods (limiting method or automatic method), full scale time, full scale stroke	
2 Dataprocessing items	Shear stress τ (Pa), flow rate Q (cm^3/s), shear rate γ (s^{-1}), viscosity η (Pa · s), melt flow rate (MFR)(*), softening temperature (Constant), flow beginning temperature (Heating-rate), 1/2 method, offset temperature method (Heating-rate)	
3 Graph generation	Stroke-time curve (Constant), stroke-temperature curve (Heating-rate)	Viscosity-shear rate curve (Constant) Shear stress-shear rate curve (Constant) Viscosity-temperature curve (Constant) Shear rate-temperature curve (Constant) Viscosity-time curve (Constant) Shear rate-time curve (Constant) Viscosity-temperature curve (Heating-rate) Shear rate-temperature curve (Heating-rate) Overlay of up to 10 curves Zooming display (Constant and Heating-rate) Viscosity correction by the Bagley plot method Shear sensitivity N

(*) The cylinder dimensions of CFT-500D/100D system is different from that of the melt indexer based on ASTM/JIS standards, therefore, this measurment results are not always equal to those of the melt indexer.

Personal Computer Hardware Requirements

SHIMADZU CFT-500D - Dies		
Die Diameter (mm)	*Die Length (mm)*	*Comment*
0.5	1.0	used for non filled plastics
1.0	1.0	New condition
1.0	5.0	used for non filled plastics
1.0	10.0	used for non filled plastics
1.0	10.0	used for Glass filled plastics
2.095	8.0	ASTM standard for MFR