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No.520 Melt Flow Rater
Model D-M

Fully Automatic Melt Indexer

Note:

Optional method A automatic measurement unit (D-M-A), Dry air supply unit (D-A) and Dram type piston cleaning gauze is shown.

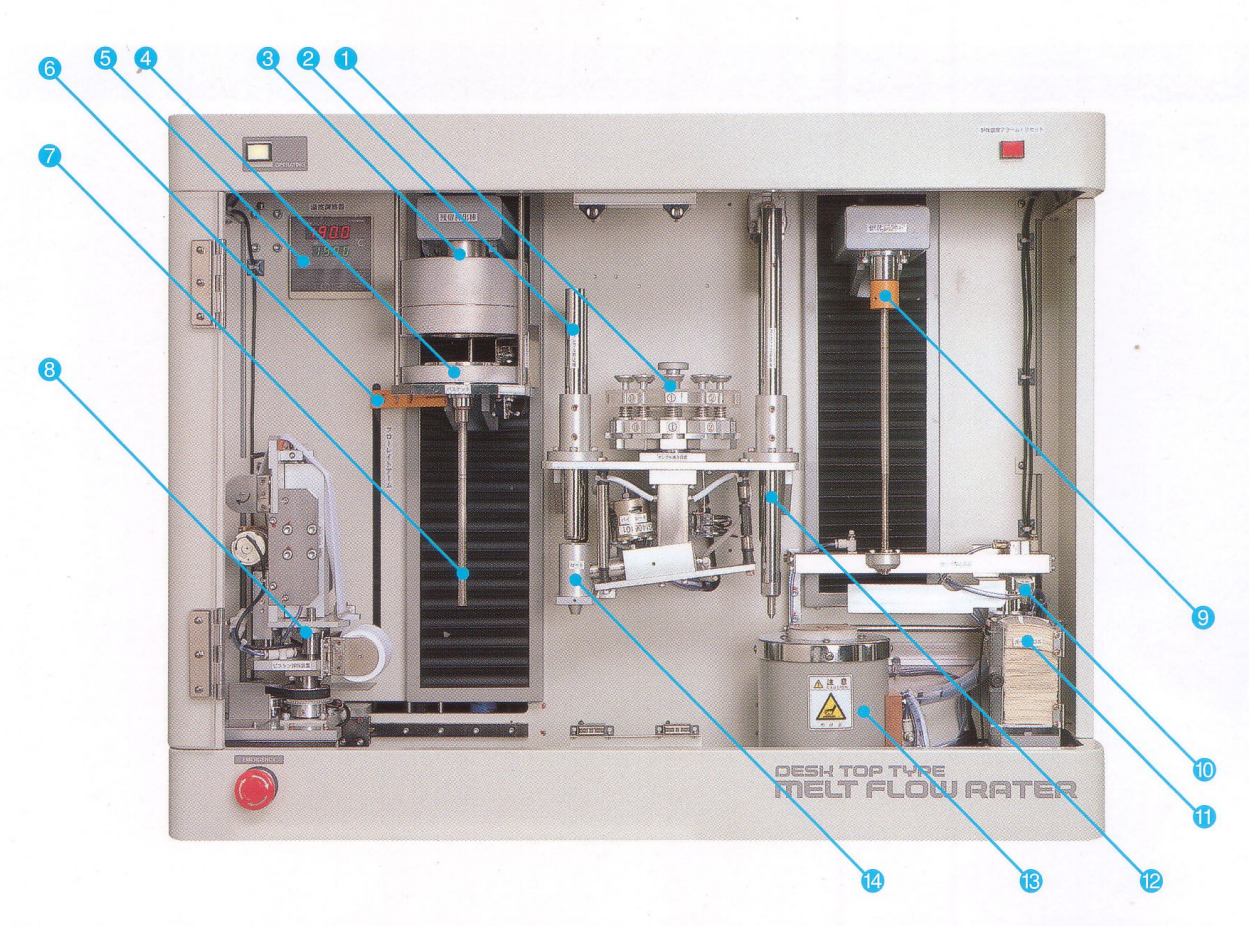
■INTRODUCTION

The **Melt Flow Rater** is designed for measuring of the Melt Flow Rate (MFR) and Melt Volume Rate (MVR) conforms to ISO 1133 and ASTM D1238 in fully automated mode. This machine follows a sequential operation from the loading of materials, testing, data processing to the cleaning of barrel and performing the next test all on its own. This tremendously reduces the workload of the user who can go on to perform other job functions after loading in the samples.

■FEATURES

- Does not occupy much space because it is compact and desktop type.
- Dialog type operation.　Easy to operate.
- Sample can be set in up to 10 cups.　(40 cups optional)
- Sample table can be mounted/dismounted by one touch.
- Fully automatic operation assures labor saving for line use.
- Simple construction for easy maintenance.
- When the machine stops due to an error, an error message is displayed on the monitor screen.
- Equipped with machine test function to check operation of each part.
- Full automatic operation of Method B.

■NAMES AND FUNCTIONS OF PARTS



1. Sample Cup Table

- Allows one-touch setting.
- Absorption of moisture by sample can be prevented by setting a dehydrator in the center of the table.
- Transparent cover assures sealing for dust proofing, preventing absorption of moisture and for monitoring of inside.
- Up to 10 sample cups can be mounted on the table.
- Cup's bottom lid opens and sample drops.

2. Sample Push-in Rod

- After filling sample into the furnace cylinder bubbles are removed by pushing in the sample.
- Push in operation is performed two times.

3. Remaining Sample Push-out Unit

- Pushes out excess amount of sample during preheating.
- Pushes out residual sample after end of test.
- Mount by gently pressing at the time of piston cleaning.

4. Weight Bucket

- Put piston and weight
- Intermediate stop and measurement operations are automatically performed according to the data input into the computer.
- 3 pins are incorporated to prevent falling down of weight.

5. Temperature Controller

- Controls furnace temperature with an accuracy of ±0.1°C.
- Digital indication setting is controlled by the temperature input from the personal computer.
- Control is of PID system with auto tuning function.

6. Flow Rate Unit (Encoder)

- Measurement distance is automatically selected according to the data input from among 5 kinds namely the ASTM 6.35mm, 25.4mm, JIS 4.0mm, 25.0mm and out of standard 1.0mm.
- Intermediate stop distance is measured and the machine stops.

7. Piston

- Applies load to sample.

8. Piston Cleaning Unit

- Cleans dirty surface of piston after end of test.
- Automatically winds up dirty part of the cloth after end of test.

9. Barrel Cleaning Rod

- Gauze is pushed into the barrel by means of cleaning rod and up/down movement can be selected up to 9 strokes.
- Cleaning rod moves up/down while rotating.

10. Gauze Feed Unit

- Gauze is automatically sent one by one on top of barrel from the gauze box.
- Vibration is applied to the sucking plate so that two gauzes pieces may not be fed at a time.

11. Gauze Holder for Cleaning Barrel

- 10 pieces of barrel cleaning gauze can be set in the holder.
- Gauze is supplied automatically.

12. Orifice Cleaning Rod

- Sample remaining inside the orifice is pushed out by means of a pin of same dimensions as the orifice.

13. Furnace

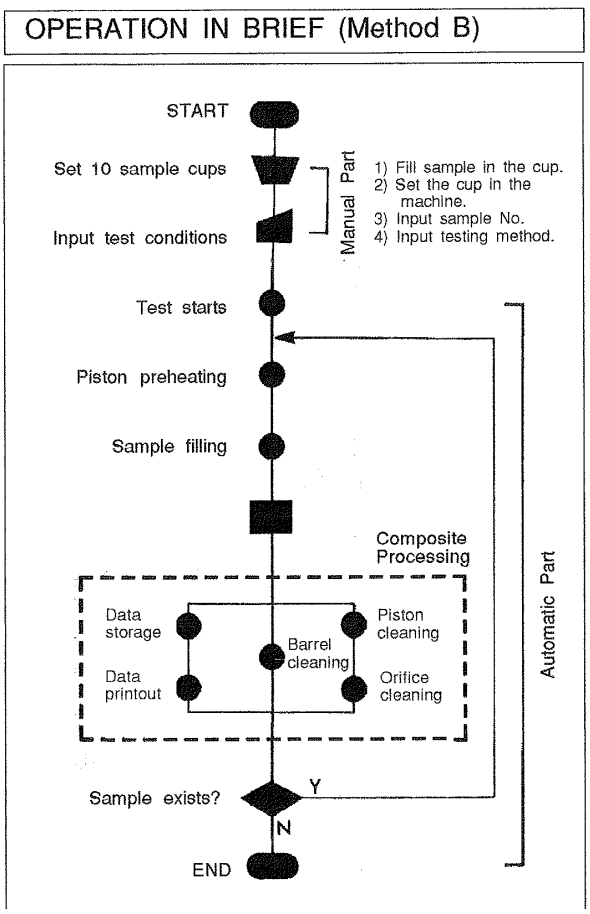
- Automatic shifting and setting at the 4 stations of test position, sample insertion position, orifice cleaning position and barrel cleaning position.
- At the bottom of the furnace is installed scissors for automatically cutting off pushed out sample, which is used in Method A.

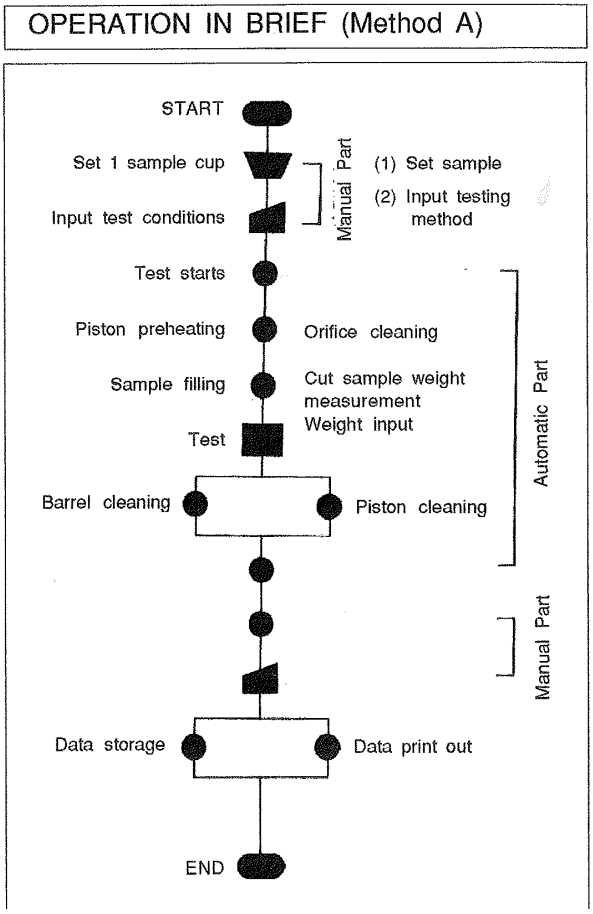
14. Sample Filling Funnel

- This funnel serves as a guide for inserting sample into the cylinder's sample hole.
- Vibration is applied to it for smooth flow of sample.

■OPERATION

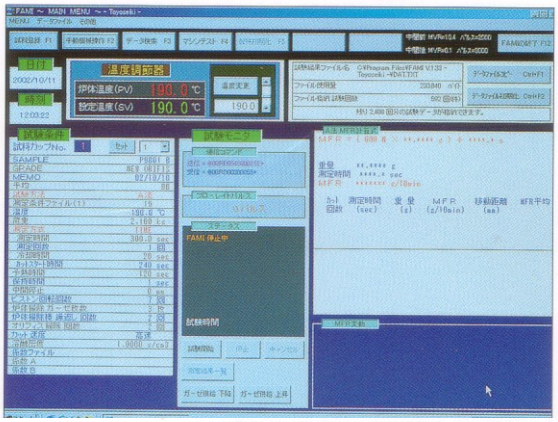
- Operation of the machine is easy. All operations are conducted by dialog system and test conditions are set from personal computer keyboard.
- Control is easy because test conditions, machine operation indications, lapsed time and measurement results, etc. are displayed on the monitor screen.
- Operating program (number of cleaning cycles, etc.) can be easily changed according to kind of sample.

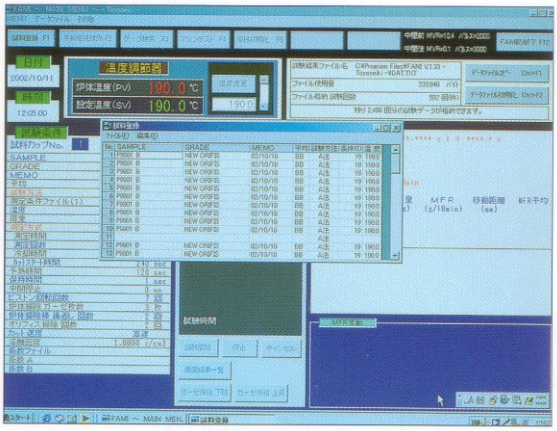


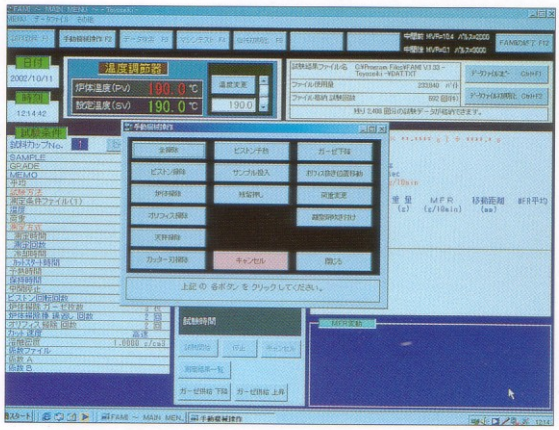


■MENU, REGISTRATION, OPERATIONAL SCREEN

Note: English version software is available







■EXAMPLE OF MEASUREMENT RESULTS

MEASUREMENT RESULTS <METHOD B>

Date : 94/08/03

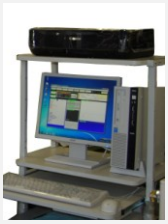
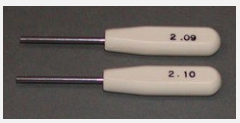
Cup No.	Sample Name	Grade No.	Lot No.	Temp. (°C)	Interval	Preheat Time (s)	Hold Time (s)	Intermediate Stop (mm)	Load (kgf)	Cleaning (Times)	Melt Density	Measurement Time (s)	MFR Value (g/10min)
1	SAMPLE-2	GRADE-2	ROT-2	190.0	JIS-4.00	270	30	5	2.16 [21.18 N]	3	1.0000	81.8	2.08313
2	SAMPLE-2	GRADE-2	ROT-2	190.0	JIS-4.00	270	30	5	2.16 [21.18 N]	3	1.0000	82.2	2.07299
3	SAMPLE-2	GRADE-2	ROT-2	190.0	JIS-4.00	270	30	5	2.16 [21.18 N]	3	1.0000	81.0	2.10370
4	SAMPLE-2	GRADE-2	ROT-2	190.0	JIS-4.00	270	30	5	2.16 [21.18 N]	3	1.0000	82.2	2.07299
5	SAMPLE-2	GRADE-2	ROT-2	190.0	JIS-4.00	270	30	5	2.16 [21.18 N]	3	1.0000	81.1	2.10111
6	SAMPLE-2	GRADE-2	ROT-2	190.0	JIS-4.00	270	30	5	2.16 [21.18 N]	3	1.0000	83.3	2.04562
7	SAMPLE-2	GRADE-2	ROT-2	190.0	JIS-4.00	270	30	5	2.16 [21.18 N]	3	1.0000	82.2	2.07299
8	SAMPLE-2	GRADE-2	ROT-2	190.0	JIS-4.00	270	30	5	2.16 [21.18 N]	3	1.0000	81.7	2.08568
9	SAMPLE-2	GRADE-2	ROT-2	190.0	JIS-4.00	270	30	5	2.16 [21.18 N]	3	1.0000	82.9	2.05549
10	SAMPLE-2	GRADE-2	ROT-2	190.0	JIS-4.00	270	30	5	2.16 [21.18 N]	3	1.0000	82.9	2.05549

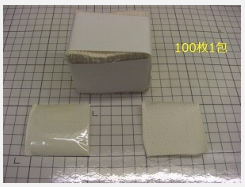
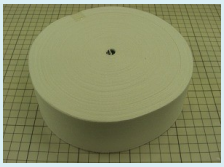
■SPECIFICATIONS

Model	D-M
Sample cups	■10 pcs. type…For 10 single tests (Standard feature) ■20 pcs. type*…For 20 single tests (Optional) ■40 pcs. type*…For 40 single tests (Optional) ** To be selected together with optional dram type piston cleaning gauze and large type furnace cleaning gauze holder for 200pcs.*
Temperature range	Max. 300°C
Test load	■0.325, 2.16, 5, 10kg (Standard feature) ■2.16, 10, 21.6kg (Optional)
Test method	■Method A: Manual operation (Automatic operation: Optional) ■Method B: Automatic operation (Encoder is equipped as standard feature)
Sample feeding	Automatic operation
Weight loading	Automatic operation
Weight change	Manual operation (Automatic operation: Optional)
Barrel cleaning	Automatic operation ■Cleaning gauze: 100pcs. type (Standard feature) ■Cleaning gauze: 200pcs. type (Optional)
Orifice (Die) cleaning	Automatic operation
Piston cleaning	Automatic operation
Orifice (Die) cleaning rod cleaning	Automatic operation
Cleaning gauze feeding	Automatic operation
Data processing	■Method A: Manual operation (Automatic operation: Optional) ■Method B: Automatic operation
Power requirement	Single-phase, AC100V, 50Hz or 60Hz, 1.5kVA
Compressed air requirement	0.6MPa
Dimensions	W900 x D700 x H1060mm (Main unit)
Weight	Approx. 320kg (Main unit)

■STANDARD ACCESSORIES & OPTIONS

●Standard ○Option ---Not available

	Name	Model (Part No.)	Photo	
1	Data processing unit (Software, PC, LCD monitor, Printer)	-----	 *Note: Table shown is option*	● (x1)
2	Piston, S50C type	2100385		● (x1)
3	Weight pan (0.325+0.045kg) *Note: In order to cancel reaction force of encoder, 0.045kg load is added.*	-----		● (x1)
4	Weight, 1.835kg (For 2.16kg)	-----		● (x1)
5	Weight, 2.84kg (For 5kg)	-----		● (x1)
6	Weight, 5kg (For 10kg)	-----		● (x1)
7	Orifice	2101005		● (x2)
8	O-Ring for orifice	1300109		● (x5)
9	Orifice gauge (Go/no go gauge)	2100330		● (x1)
10	Orifice cleaning rod (For manual operation)	-----		● (x1)
11	Orifice cleaning rod (For automatic operation)	-----		● (x1)
12	Drill brush for orifice cleaning rod	-----		● (x1)
13	Sample cup (Standard type, approx. 5g)	-----		● (x10)

14	Sample cup (Long type option, approx 7g)	-----		○
15	Glass epoxy adiabatic material for S50C type piston	1100385		● (x2)
16	Cleaning gauze for barrel cleaning (100pcs/pack)	5140018		● (x30pcs =0.3packs)
17	Roll gauze for piston cleaning	5140031		● (x2)
18	Orifice push-out rod	-----		● (x1)
19	Air hose (outer dia.6mm, 3m), hose coupling (outer dia. 6mm, Y type), hose joint (outer dia. 6mm x 1/4”)	-----		● (x1)
20	Method A automatic measurement unit	D-M-A		○
21	Automatic load changing unit (Necessary for 21.6kg spec)	K		○
22	Electric heating type sample drying device (Oven) Temperature range: Max. 120ºC Note: Possible to choose with 40pcs. sample cups option	D		○

23	Dry air supply unit for sample purging	D-A		○
24	Automatic strand cutting unit	A-S		○
25	20 pcs. sample cups option	-----		○
26	40 pcs. sample cups option	-----	 *Note:* *Picture shown is including electric heating type sample drying device*	○
27	Dram type (Large type) piston cleaning gauze unit Note: To be selected with 20 pcs. or 40 pcs. sample cups option	-----		○
28	Large type barrel cleaning gauze holder (Cleaning gauze for barrel: 200pcs.) Note: To be selected with 20 pcs. or 40 pcs. sample cups option	-----		○
29	Exhaust port Right side, Ø100mm	-----		○
30	Piston cleaning with solvent	-----		○

Note:

Specifications are subject to change without notice.

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