FULL AUTOMATIC MELT FLOW INDEX TESTER

株式会社安田精機製作所
YASUDA SEIKI SEISAKUSHO,LTD.

No.120-LABOT-MI

www.yasuda-seiki.co.jp

The Demand of MELT FLOW INDEX TESTER

This tester is used to measure the melt flow index of thermo-plastic. The melt flow index is acquired from the weight or the volume of the extruded specimen at a specified cylinder temperature and with a specified load of piston through the die. The tester is equipped with robotic mechanism which enables FULLY AUTOMATIC melt flow index tests up to a maximum of 50 samples (standard of 12 samples). The test conditions and the outputs can be set and observed through the computer software.

This Tester is Manufactured Based on the Following Standards;

JIS-K7210
Plastics - Determination of the melt mass-flow rate (MFR)and the melt volume-flow rate (MVR) of thermoplastics

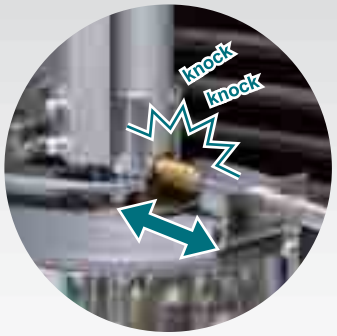
ISO-1133
Plastics - Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics

ASTM-D1238
Standard test method for melt flow rate of thermoplastics by extrusion plastometer

The Full Automatic Testing and Full Automatic Cleaning enabled by the Robotic Arm

Automatically Cleaning the Cylinder and the Die after Pushing out the Left Over Sample

The Sample Cup Automatically sets above the Cylinder and the Sample Cup is Knocked Repeatedly to Inject the Sample



INJECTING

CLEANING

TESTING

MEASURING

Automatically Applying the Test Load to Start Measuring the Melt Flow Rate

The Robot Arm Grabs the Piston and Rotates to Insert the Cylinder

What is YASUDA SEIKI's MELT FLOW INDEX TESTER?

Point.1

FULLY AUTOMATIC Testing and Cleaning

The Test, Cylinder Cleaning, and also the Die Cleaning made all FULLY AUTOMATIC with the Robot Arm.

Point.2

The YASUDA SEIKI Original Robot Arm

Every Process of the Melt Flow Test and Cleaning is Conducted with this Robot Arm which Imitates the Human Hand.

Point.3

Perfect Cleaning Just From YASUDA SEIKI

The Robot Arm will Up and Down and also Twist the Cleaning Rods (including Die Cleaning) to Provide Perfect Cleaning.

Point.4

High Repeatability

The Perfect Cleaning of the No.120-LABOT-MI will Provide an Excellent Repeatability in the Test Result even if Different Test Samples are Tested in Alternate Shifts.

Point.5

Rich in Extensibility to Satisfy Different Needs

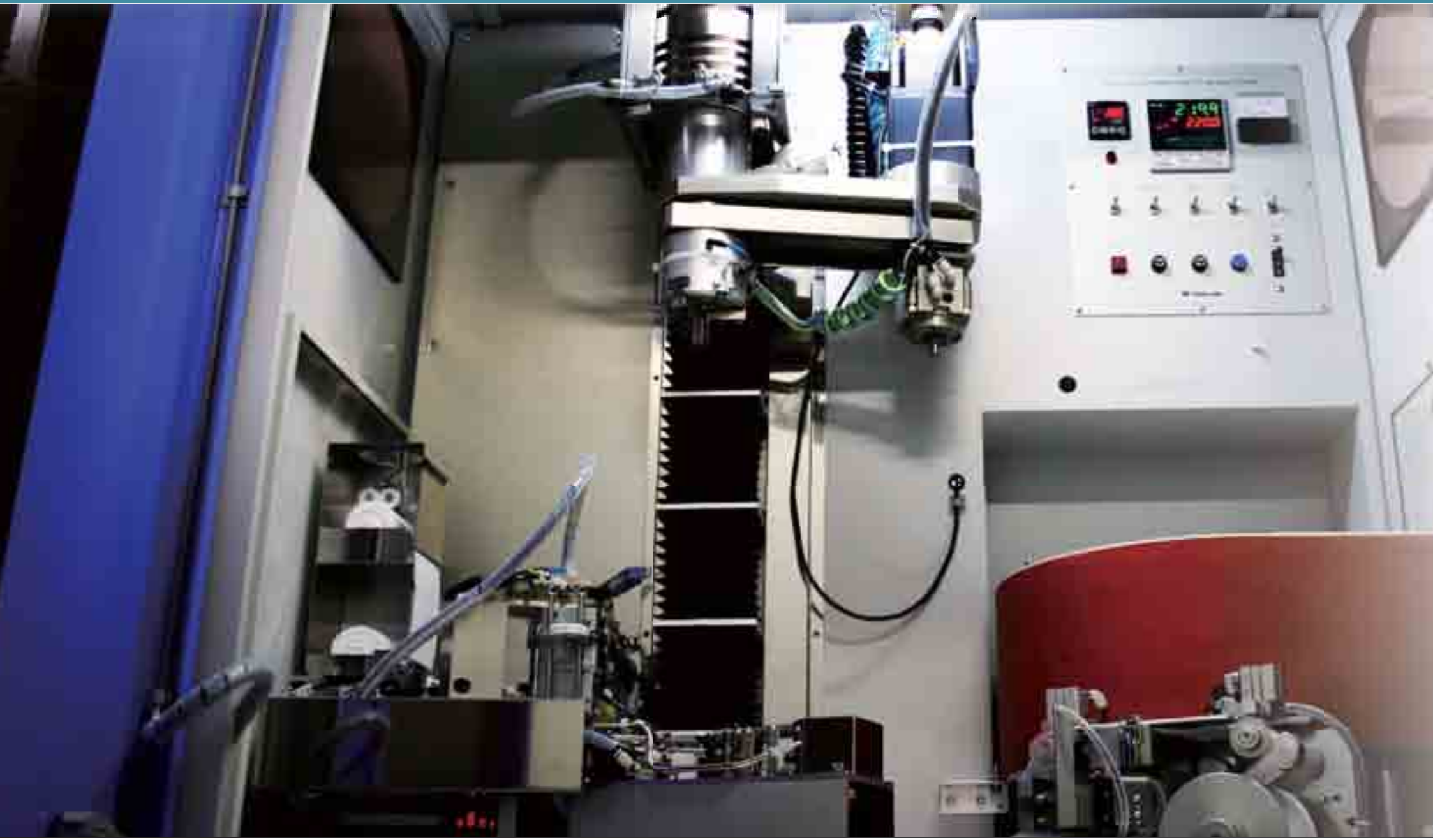
The No.120-LABOT-MI is Capable in Extending the System to Fit the Operators' Demands.
The Machine can also be Extended to a 50 Cycle FULLY AUTOMATIC System.

Point.6

Compact Size and Space Saving Design

The Robotic Arm Structure and the Fixed Cylinder Provides Compact Sized Machine which enables to be placed in Limited Space.

Point.1 Full Automatic Testing and Cleaning



Removing Unnecessary Movements and Realizing a Human Like Movement

The most Simple and the Best Automatic Melt Flow Index Tester

That is the YASUDA 120-LABOT-MI

The only thing that the Operator is Required

while the 120-LABOT-MI is in Function is

"TO DO SOMETHING ELSE" than the Test and the Cleaning

Go On To The Next Page For Further Information

Sample Cup

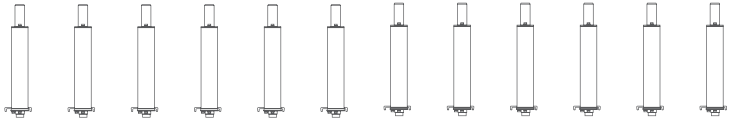
The Below is an Introduction on How the 120-LABOT-MI is Actually used Depending on the Sample Cup Numbers

Standard 12 type

AM 1 Cycle
+
PM 1 Cycle
+
Night Mode 1 Cycle
(Setting Before Going Home)

⇒ 36 samples/day

12 Sample Type
(Standard Spec) **3h**

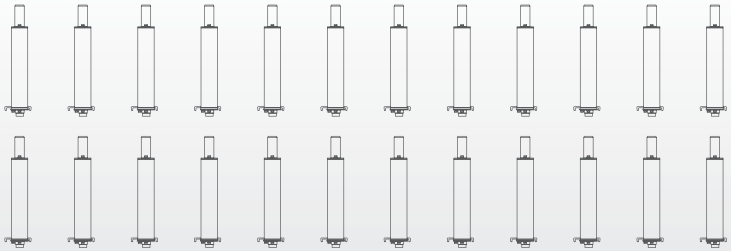


Option 24 type

AM 1 Cycle
+
PM 1 Cycle
+
A Little Overworking and then
with Night Mode 1 Cycle
(Setting Before Going Home)

⇒ 72 samples/day

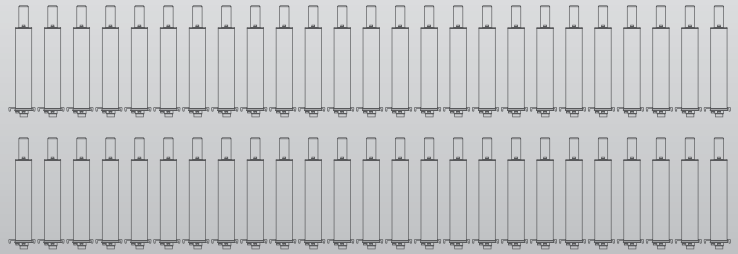
24 Sample Type
(Option Spec) **6h**



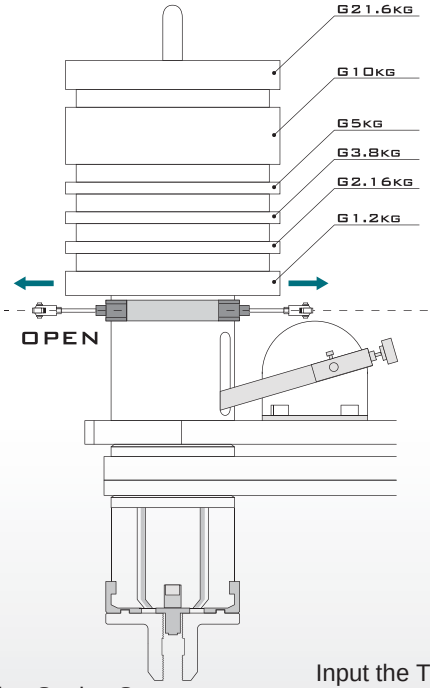
MAX 50 type

Best Solution for a 24 hour non-stop Testing Lab

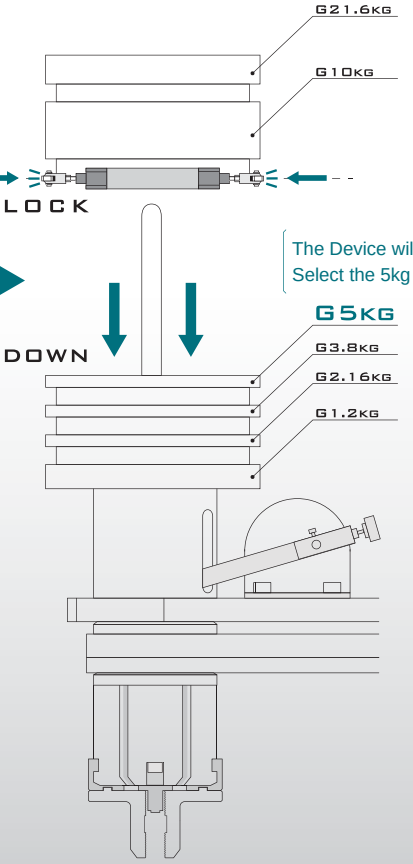
50 Sample Type
(Option Spec) **12.5h**



Automatic Weight Changing Device



Set the Test Load at 5kg



*G=Gross

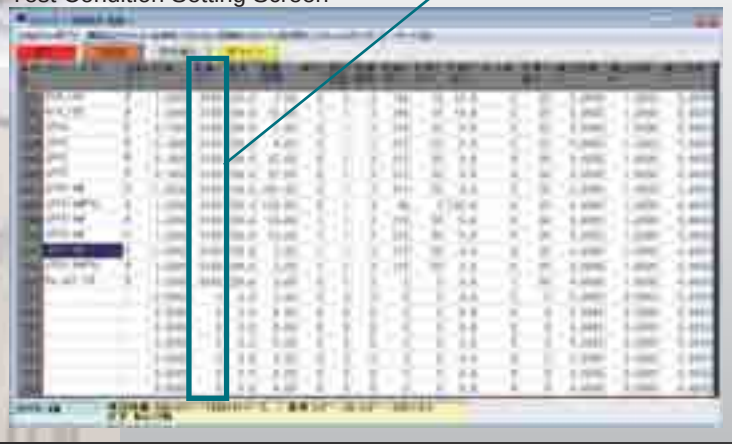
The Device will Automatically Select the 5kg Weight

Automatic Weight Changing

The 120-LABOT-MI can Automatically Change the Test Load According to the Test Condition set in the PC Software. With this Function, there will no more be the Manual Weight Changing which can be a High Risk of Major Injuries.

Test Condition Setting Screen

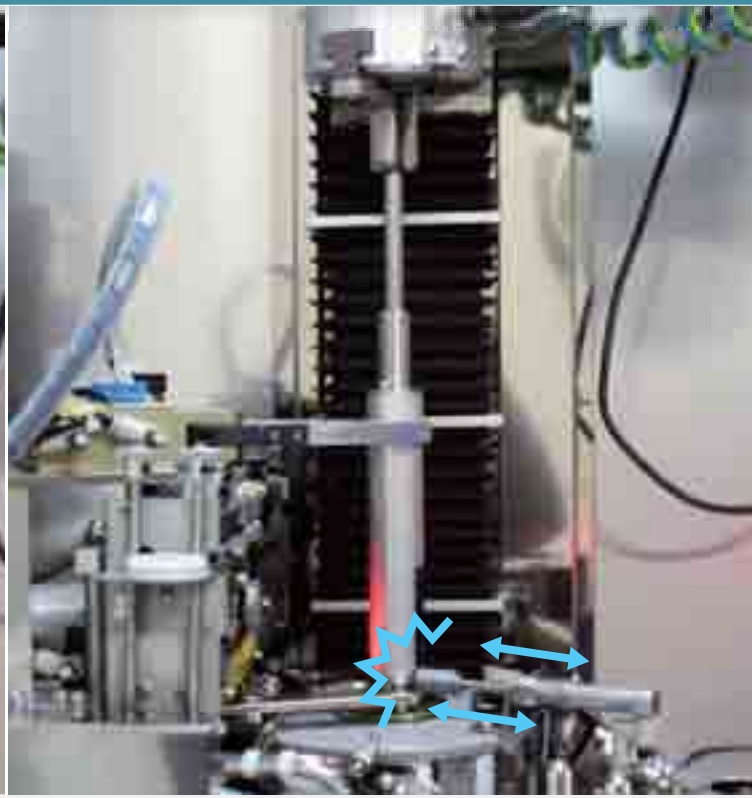
Input the Test Load



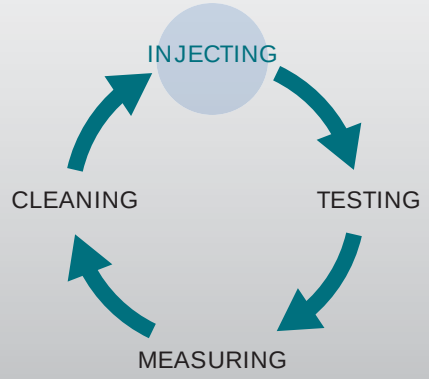
Automatic Sample Feeding

The Robot Arm will Automatically Pick Up the Sample Cup

The Sample Cup will be Placed on Top of the Cylinder



Sample Cup Knocker will Knock the Sample Cup to Inject the Sample Smoothly



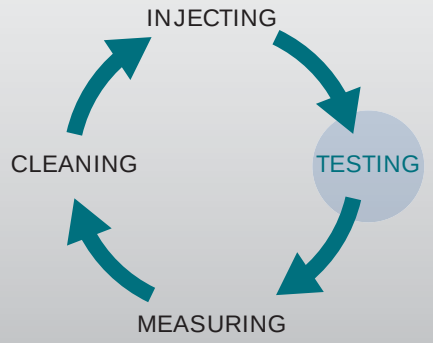
INJECTING

Automatic Testing

The Chuck on the Robot Arm Grabs up the Piston and Inserts it into the Cylinder

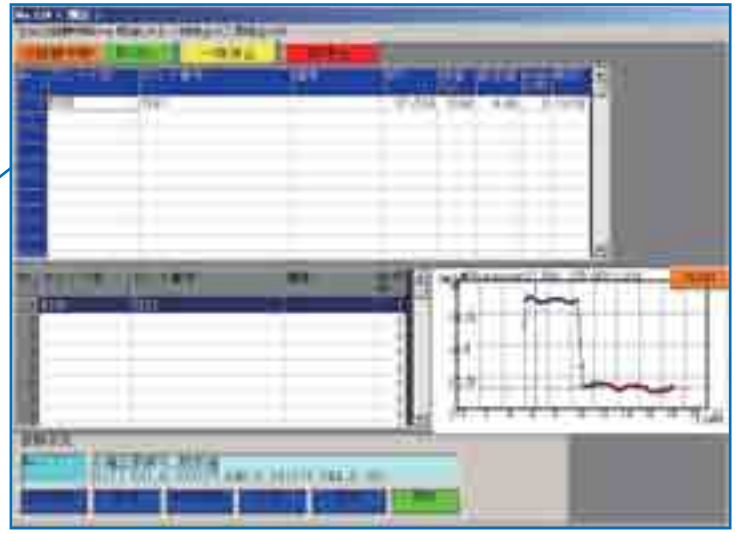
The Up and Down Movement of the Robot Arm Pushes in the Sample to the Starting Position

The Pushed out Sample Flows out from the Die



TESTING

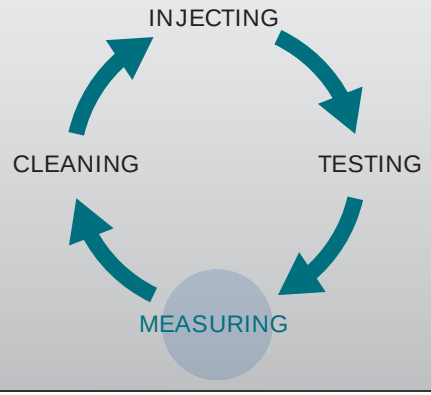
Automatic Measuring



The MVR or the MFR Value is Automatically Measured and the Data is Transferred to the PC Software

The PC Software Displays the Measured Value

The Test Data is Stored in the PC Software to be Compared or to be Analyzed



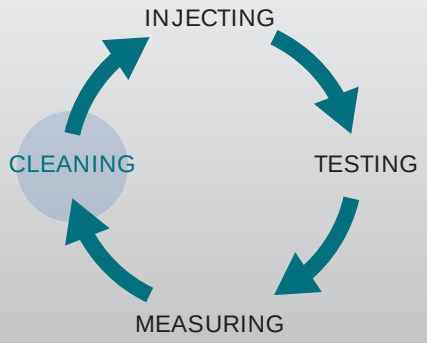
MEASURING

Automatic Cleaning

The Cylinder Cleaned Automatically with the Cylinder Cleaning Rod

The Robot Arm Twists 270° to Wipe off the Left over Sample in the Cylinder's Inner Wall

The Left over Sample in the Die to be Cleaned Automatically with 2 Different Die Cleaning Rods



CLEANING

More Detail in Point.3

Simplicity & Efficiency

ROBOT ARM

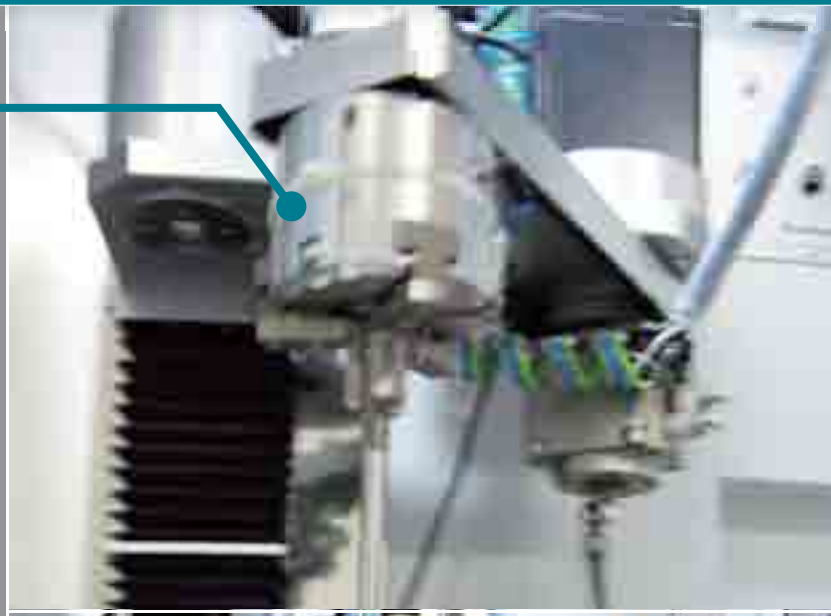
The 'ROBOT ARM' is the main part of the machine and have a various function as grab, push, drag, and twist the rod to

The No.120-LABOT-MI Eliminates Complicated Movements that Usual Automatic Machines tend to have. The Simple Movement of the No.120-LABOT-MI is only the Swing Rotation, Up and Down Elevation, Grabbing, and Twisting, which will be enough in Testing and Cleaning (Cylinder and Die) on the Melt Flow Test.

Including the above, the Barrel, which with no doubt is the Core of the Test is Designed to be Fixed to the System. Fixing the Barrel to the System Realizes Safety and also Compact Structure.

Rotary Motion

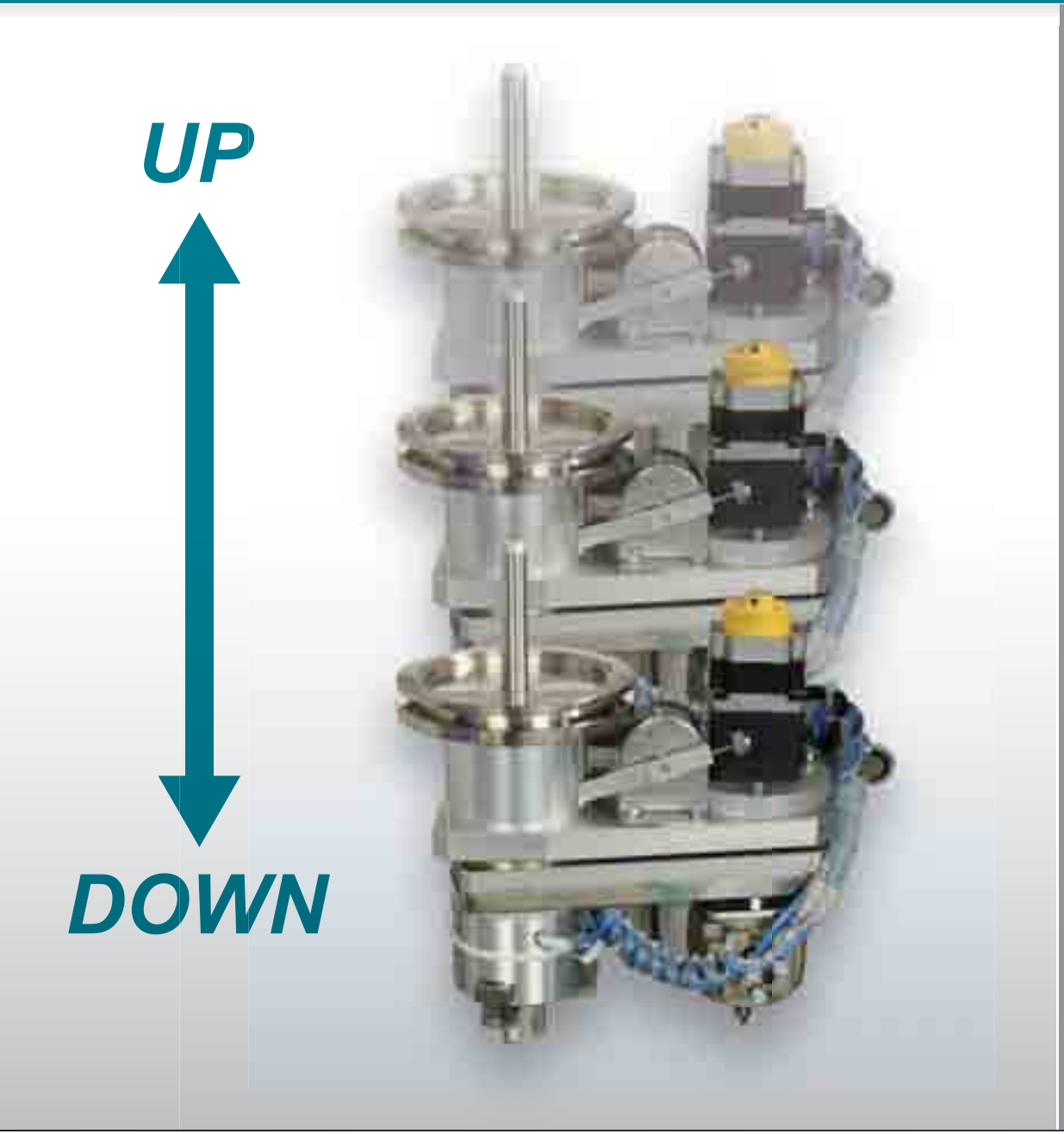
The Test and the Cleaning is done by Swinging the Rods to the Cylinder



The Sample Cup will be Automatically Placed on Top of the Cylinder by Robot Arm

The Cylinder, which is the Core of the Test, is Fixed to the System

Vertical Motion



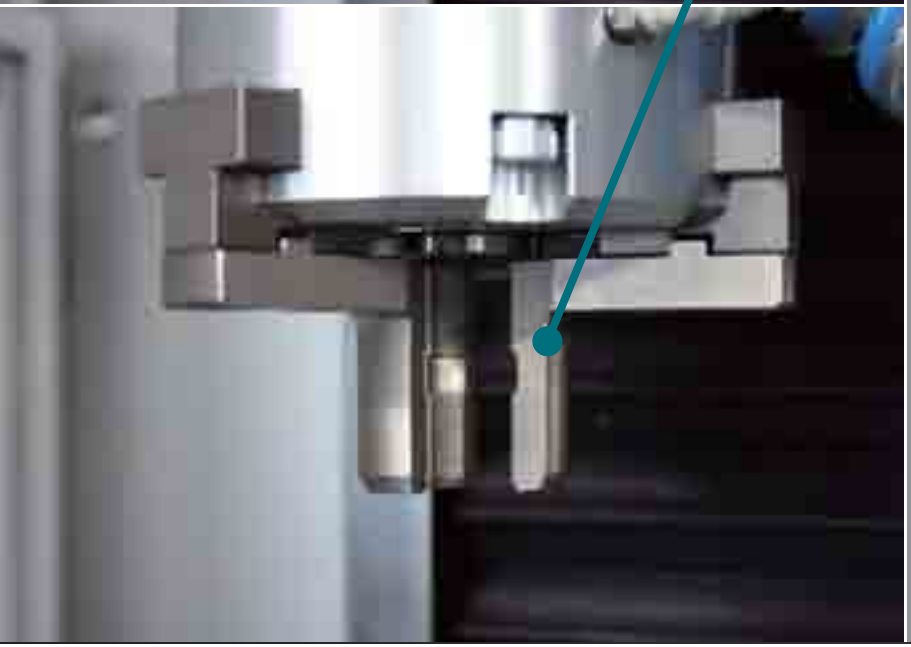
The Injection of the Sample is Conducted by the Elevation Movement of the Robot Arm

The Encoder Built in the Robot Arm Measures the Traveling Distance of the Piston

The Sample is Pushed in at the same Pushing Power Every Time, which Eliminates Human Error and Provides Stable Test Data

Arm Chuck GRABING MOTION

The Chuck on the Robot Arm Tightly Grabs the Piston, Cylinder Cleaning Rod, and Die Cleaning Rods



The Rods are Fabricated to Perfectly Fit the Chuck on the Robot Arm to Prevent Drops of the Rods

Arm Chuck TWIST

Combined Together with the Up and Down Movements, the Robot Arm Cleans both the Cylinder and the Die

The Left over Sample will be Completely Cleaned by the 270° Twisting Motion of the Robot Arm

Pick Up !

Sample Cup

Sample Cup

One Key Factor that Enables the YASUDA SEIKI No.120-LABOT-MI to be a FULLY AUTOMATIC System against Powder and Sheet type Samples is the Original Sample Cup. The Inner Wall of the Sample Cup is Equipped with a Lubricating Property Plastic, which Allows the Sample to Slip into the Cylinder Easily. Also, Since the Sample Cup Directly Injects the Sample into the Cylinder with a Robotic System, the Test Sample does not get Affected with Contamination.

Sample Cup Procedure

Samples Filling Kit

Fill the Samples to Sample Cup

Set the Sample Cups

Automatically Feeding to Cylinder

Point.3 Originative Cleaning Method of the Robot Arm

The 120-LABOT-MI not only Tests Automatically, it also Cleans the System Automatically. The Automatic Cleaning does not only Mean that the System Automatically Cleans the Cylinder and Die. It Means that the Gauze to Clean the Cylinder is Provided Automatically and also the Cleaning Rods and the Piston used in the System is Cleaned Automatically. The 120-LABOT-MI is a well Designed System which can clean the Die Automatically!





Gauze Cutting & Cylinder Cleaning

The Machine will Automatically set the Cleaning Gauze on Top of the Cylinder and also Cut it Automatically to have it go into the Cylinder for Cleaning.

Removing the Gauze

With Pinching and Twisting Movements, the used Cleaning Gauze will be Taken off from the Cleaning Rod.

Piston Head Cleaning

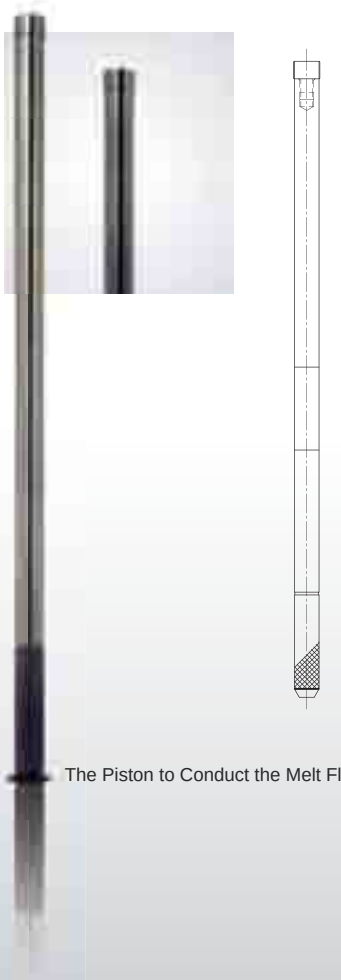
As in the Order in the Picture, the Bottom of the Piston will be Cleaned with the Gauze to Provide Clean Piston for the Samples yet to be Tested.

Piston Side Cleaning & Die Cleaning Rod Cleaning

After the Piston Head has been Cleaned by the Gauze, the Side of the Piston will be Cleaned by the Brass Brush. Also, after Every Time Die Cleaning Rod Cleans the Die, the Tip Top of the Die Cleaning Rod will be Cleaned with this Brass Brush.

Unique Piston and Cleaning Rods

Piston Rod

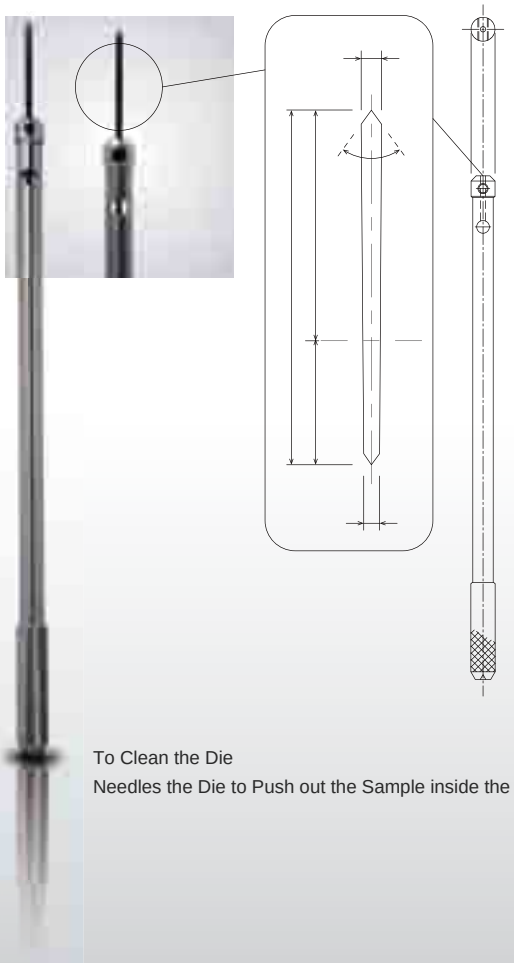


The Piston to Conduct the Melt Flow Test

Cylinder Cleaning Rod

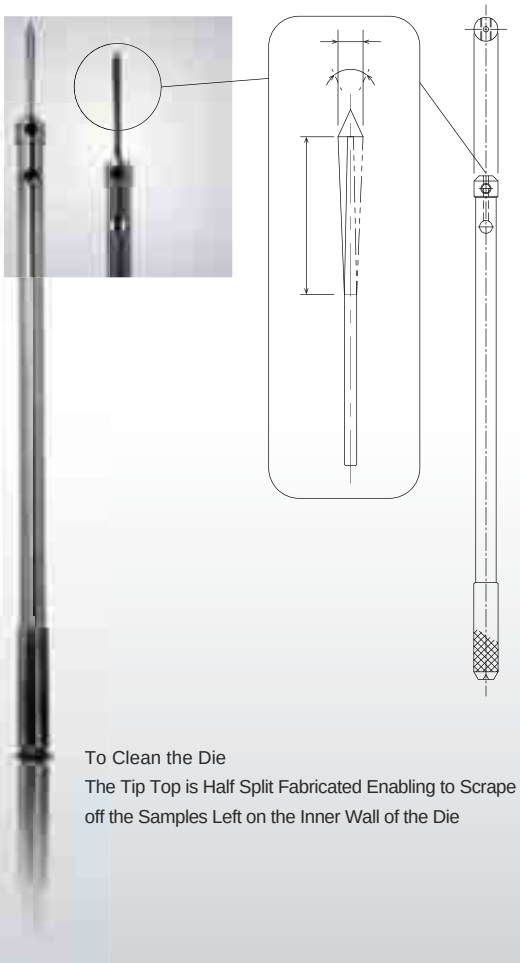
To Clean the Cylinder
Just Wrapping the Gauze and Setting it to the Rod Holder, and the Robot Arm will AUTOMATICALLY Clean the Cylinder

Die Cleaning Rod Straight type



To Clean the Die
Needles the Die to Push out the Sample inside the Die

Die Cleaning Rod Half-Split type



To Clean the Die
The Tip Top is Half Split Fabricated Enabling to Scrape off the Samples Left on the Inner Wall of the Die

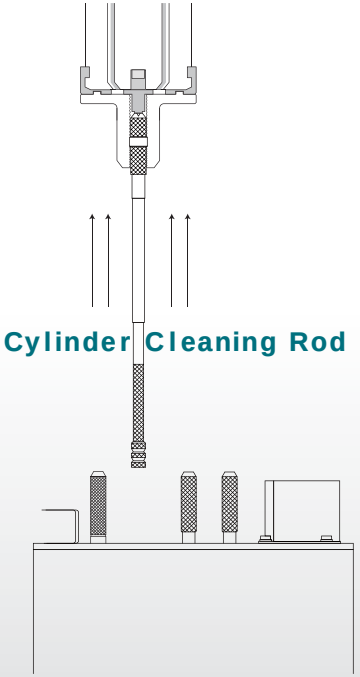
Testing

Cleaning

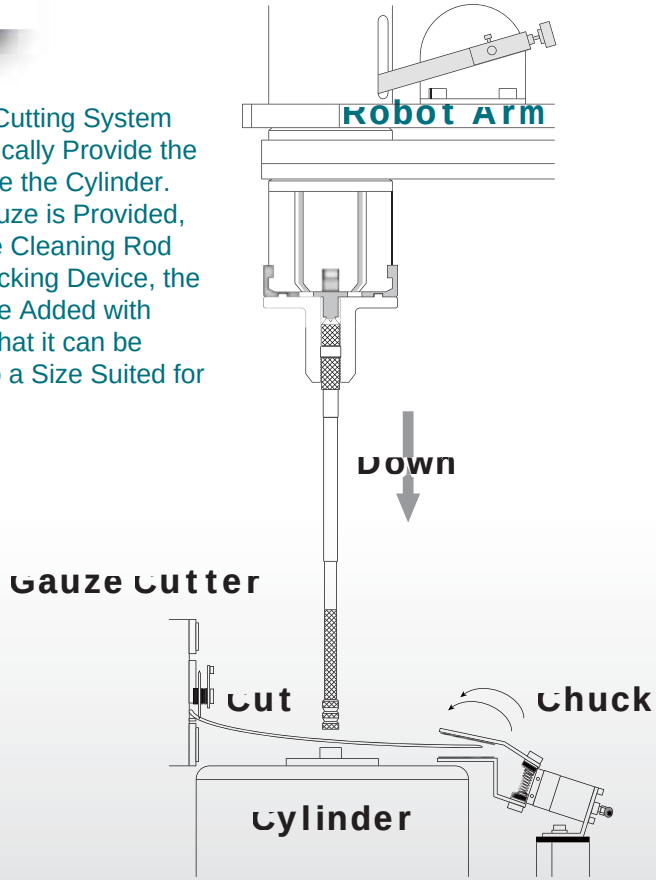
Cylinder Cleaning

AUTOMATIC GAUZE SETTING

The Robot Arm AUTOMATICALLY Selects the Cylinder Cleaning Rod

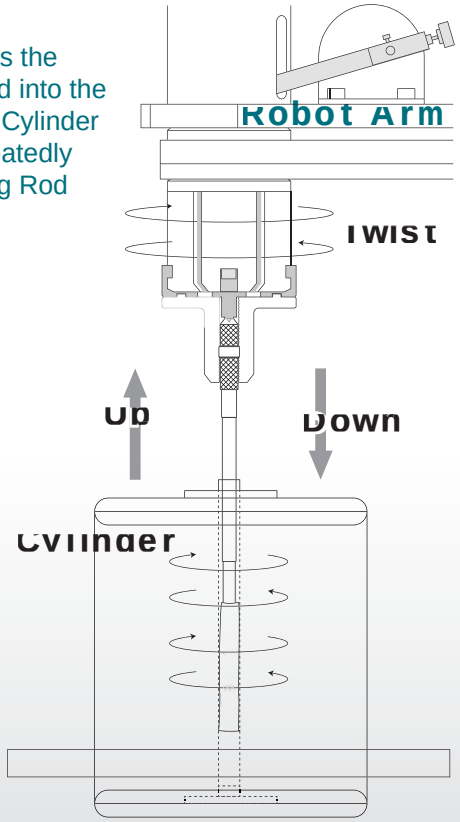


The Gauze Cutting System will Automatically Provide the Gauze Above the Cylinder. After the Gauze is Provided, with both the Cleaning Rod and the Chucking Device, the Gauze will be Added with Tension so that it can be Easily Cut to a Size Suited for Cleaning



Cylinder Cleaning

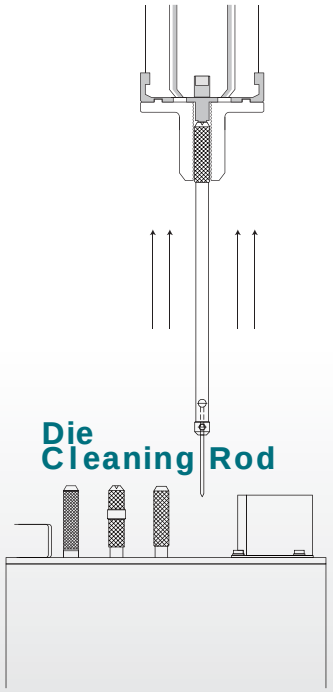
The Robot Arm Inserts the Cylinder Cleaning Rod into the Cylinder to Clean the Cylinder by Twisting and Repeatedly Elevating the Cleaning Rod



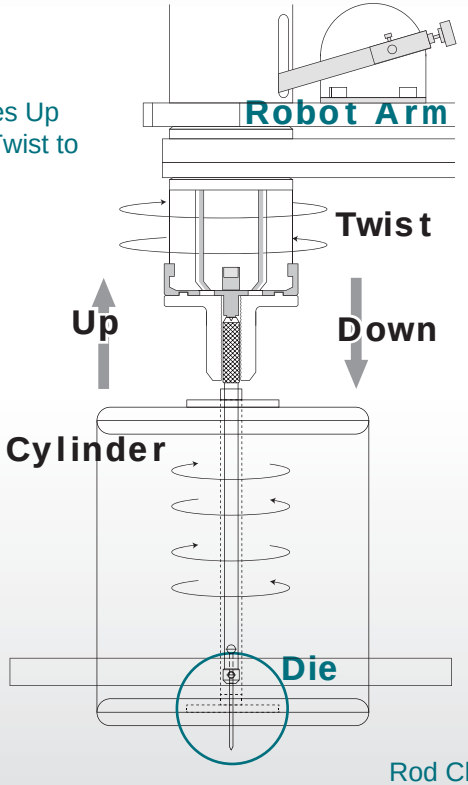
Automatic Die Cleaning

Not Only Automatically Cleaning the Die but also Possible to Clean the Tip Top of the Die Cleaning Rods

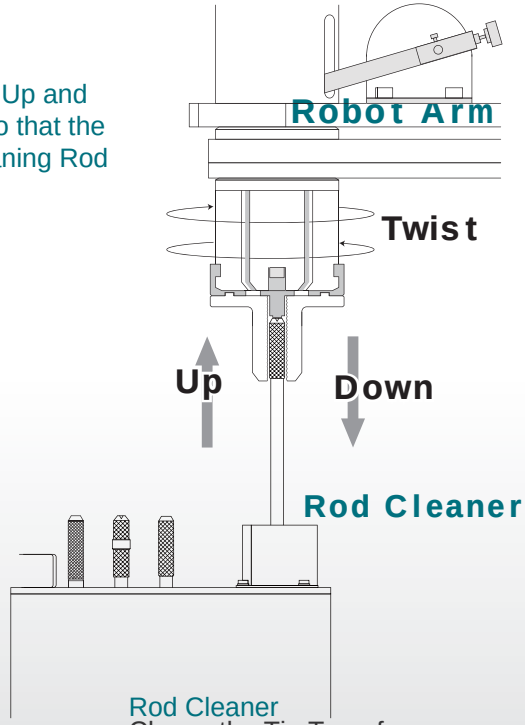
Die Cleaning & Die Cleaning Rod Cleaning



The Robot Arm Moves Up and Down and also Twist to Clean the Die



The Robot Arm Moves Up and Down and also Twist so that the Tip Top of the Die Cleaning Rod can be Cleaned

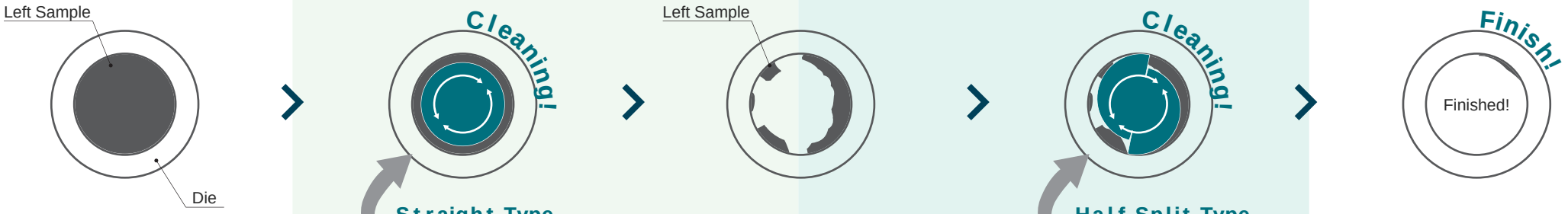


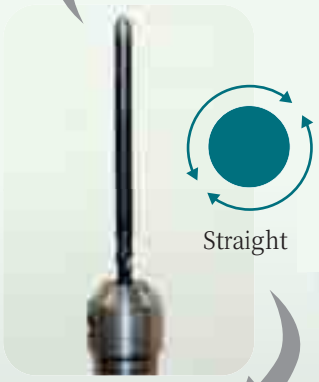
Rod Cleaning

Rod Cleaner
Cleans the Tip Top of the Die Cleaning Rod

2way Die Cleaning

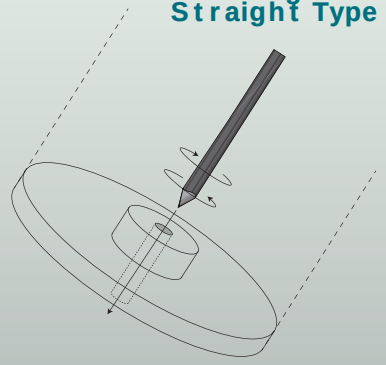
Die Cleaning Image (Inside)





Using both Straight and Half Split Die Cleaners to Completely Clean the Die

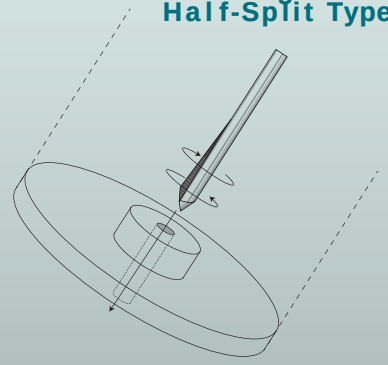
Cleaning Rod
Straight Type



YASUDA Original Die

+

Cleaning Rod
Half-Split Type



YASUDA Original Die

Point.4 Repeatability

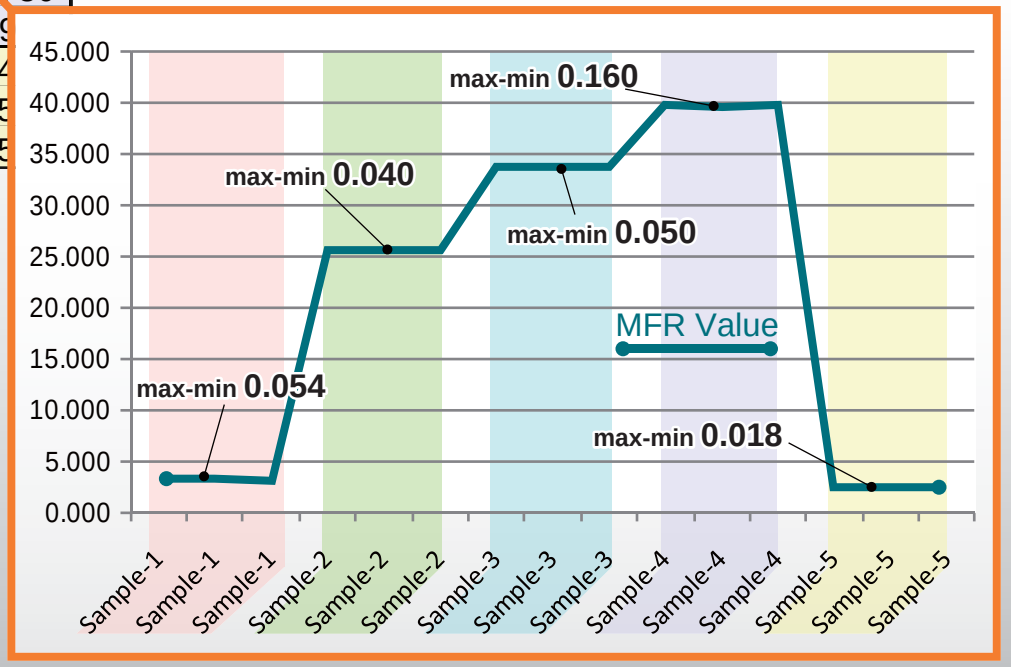
Test Condition

- Sample：Powder
- Temp：230℃
- Load：2,160g
- Pre Heat Time：6min
- Method：B -Method
- Cleaning：3 times

SAMPLE ID	DENSITY	MFR	MVR
Sample-1	0.739	3.257	4.408
Sample-1	0.739	3.287	4.448
Sample-1	0.739	3.233	4.375
Sample-2	0.739	25.600	34.640
Sample-2	0.739	25.610	34.650
Sample-2	0.739	25.640	34.690
Sample-3	0.739	33.710	45.610
Sample-3	0.739	33.760	45.690
Sample-3	0.739	33.710	45.620
Sample-4	0.739	39.850	53.930
Sample-4	0.739	39.700	53.730
Sample-4	0.739	39.860	53.9
Sample-5	0.739	2.572	3.4
Sample-5	0.739	2.590	3.5
Sample-5	0.739	2.591	3.5

Stable

What is the Secret Behind ??



Stable Test Data with High Repeatability
Repeatable System & Complete Cleaning

The above is Conducting the Test with 5 Different Samples to see How Stable the Test Result is. From the Actual Testing, it Proves that the No.120-LABOT-MI has the Ability to Repeatedly Produce the Same Test Result.

The Reason why the No.120-LABOT-MI has High Reproducibility is not only because the System itself is Splendid. The Key Factor for the High Reproducibility is the Complete Cleaning of the Cylinder and the Die.

Solving the Cause of Test Error

Causes of Error

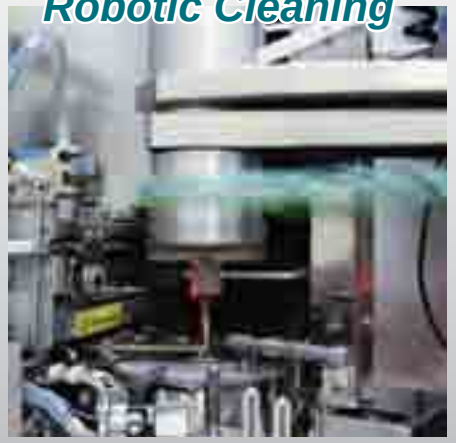
Uneven Cleaning

Unstable Pushing Power

Sample Injection Timing

Resolving The Human Error !!

Robotic Cleaning



Simultaneous Pushing

Accurate Injection Timing

The FULLY AUTOMATIC Testing and Cleaning Provides the Same Test Result Among the Operators

Point.5 High Extensibility

Automatic Weight Changer

The Machine will AUTOMATICALLY Select the Test Load that is set in the PC Software to Apply on the Test Sample. This System will Save the Labor to Change the Heavy Weights

Online DHS Systme (Online Hopper System)

The Hopper System which can be Connected with the Manufacturing Process Line will Automatically Fill in the Sample Cup with Test Samples. After the Test Sample is Filled into the Sample Cup, the 120-LABOT-MI will Conduct MFI Test Automatically

Automatic A-Method System

AUTOMATIC Cutting, Weighing, and Data Processing for A-Method Testing

A-Method Cutter

50 Sample Testing (with Drying Chamber)

The System can be Arranged to a Maximum Sample Size of 50 Samples to Meet Various Demands in Testing MFI. The Sample Cup Table can also be covered with a Drying Chamber to Avoid from Moisture

Meet the Needs

12 Cycle Full AUTOMATIC
B Method

On Line DHS System
A Method B Method

50 Cycle Full AUTOMATIC
A Method B Method

Options

Standard Spec

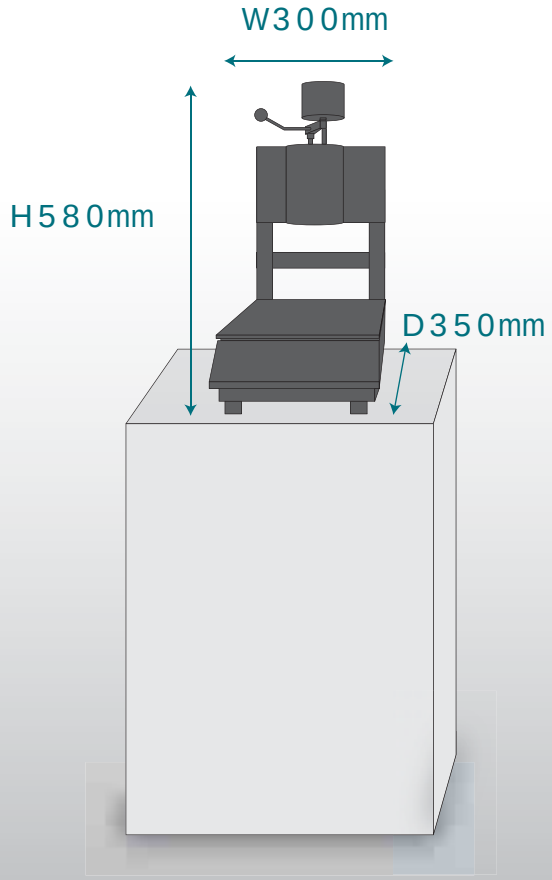
+On Line Hopper System
+Automatic A Method System

+Automatic Weight Changing
+Automatic A Method System
+Sample Drying Chamber

Point.6 Compact Body　コンパクトボディ＆省スペース設計

LABOT-MI はその機能面だけでなく、そのサイズも画期的です。
高さ 175cm、横幅は 1m に足らず、奥行きも 70cm のみ。
このクラス№1 のコンパクトボディを可能には、固定式のシリンダーと、
安田精機独自のロボットアーム機構を採用した省スペース設計です。

一般的な手動タイプ

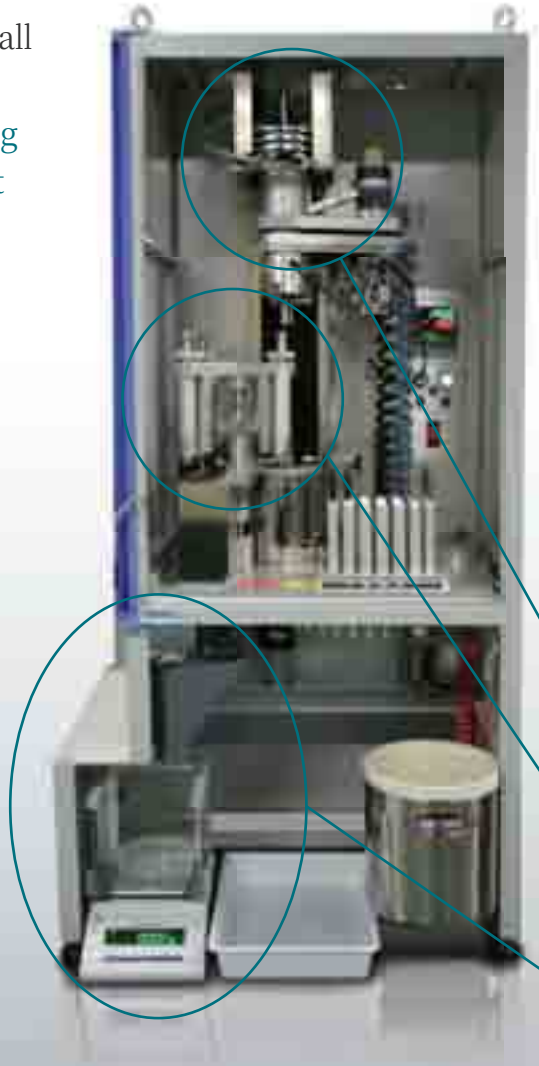


成人男性

Other Lineup 120-SAS-2000

There is no Need in Giving Up a YASUDA AUTOMATIC System when You Feel that the 120-LABOT-MI is Over Specced. We also have a SEMI-AUTOMATIC System Model which the Operator's Job is to Just Attach the Cleaning Gauze to the Cleaning Rods. Although we Call it SEMI-AUTOMATIC, the 120-SAS-2000 can Inject the Test Sample, Test, Measure, and Conduct the Cleaning AUTOMATICALLY. With the Similar Function, the Cost can be Reduced and also the Size is more Compact.

No. 120-SAS-2000



1 Cycle Test and Cleaning Fully AUTOMATIC

The Operator is to ;
1. Fill the Sample Cup with the Test Sample
2. Set the Piston and the Cleaning Rods (with Gauze) to its Starting Positions

That's All !!

After the Above 2 Operations, the 120-SAS-2000 will AUTOMATICALLY start the Test to Acquire the MFR Value. After the Test, same as the 120-LABOT-MI the Cylinder and the Die will be Cleaned Automatically.

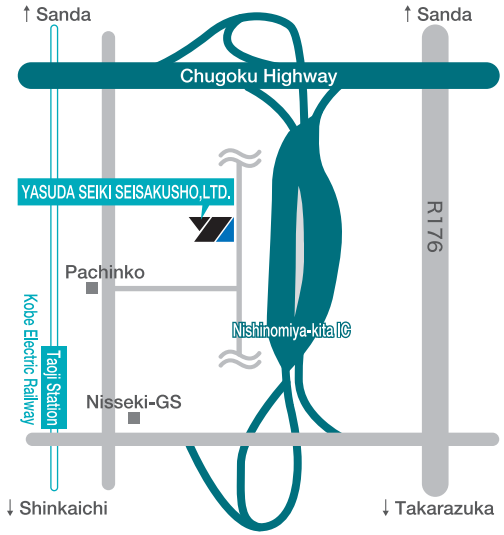
Automatic Weight Changing (Option)

Maximum of 3 Samples can be Tested Continuously (Option)

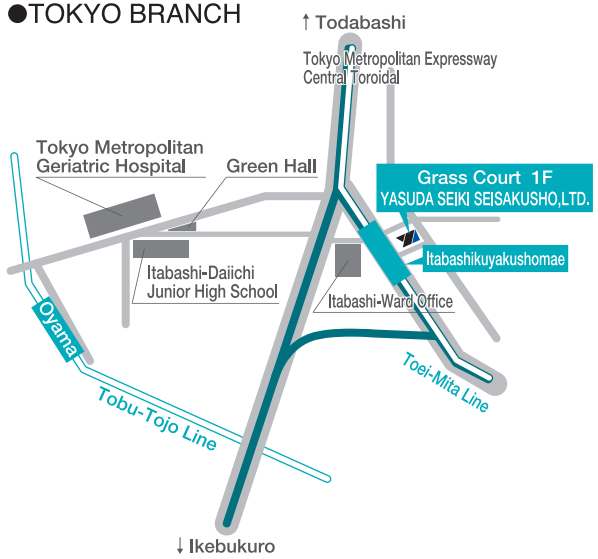
Automatic A Method (Option)

株式会社 安田精機製作所
YASUDA SEIKI SEISAKUSHO,LTD.

●HEAD OFFICE · FACTORY



●TOKYO BRANCH



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