

MELT FLOW INDEX TESTER

MELT FLOW INDEX TESTER

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

MELT FLOW INDEX TESTER - Catalogue

THE DEMAND OF MELT FLOW INDEX TESTER



By adopting the Robot Arm, we have accomplished a FULLY AUTOMATIC system in measuring the melt flow rate. With the simple and reliable software system, the Robot Arm conducts the test and cleaning just as a human hand does it. The No.120-SAS-2000 is the most suitable machine to test the melt flow rate.

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

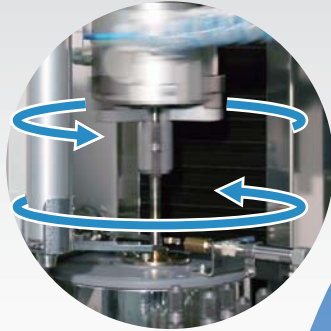
Plastics - Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics

ASTM-D1238

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

FULL AUTOMATIC TESTING & FULL AUTOMATIC CLEANING

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



CLEANING

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



TESTING

INJECTING

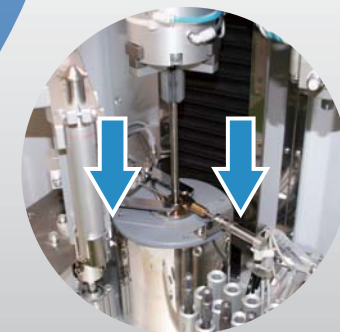


MEASURING

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

1 Cycle 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.





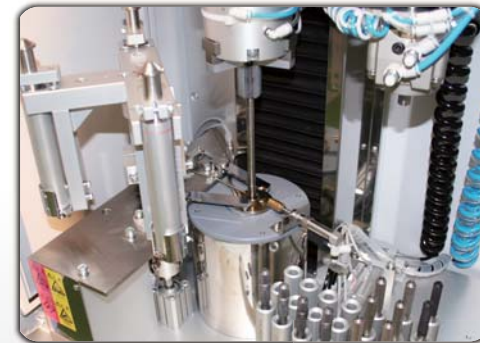
High Repeatability

The Perfect Cleaning of the No.120-SAS-2000 will Provide an Excellent Repeatability in the Test Result even if Different Test Samples are Tested in Alternate Shifts.



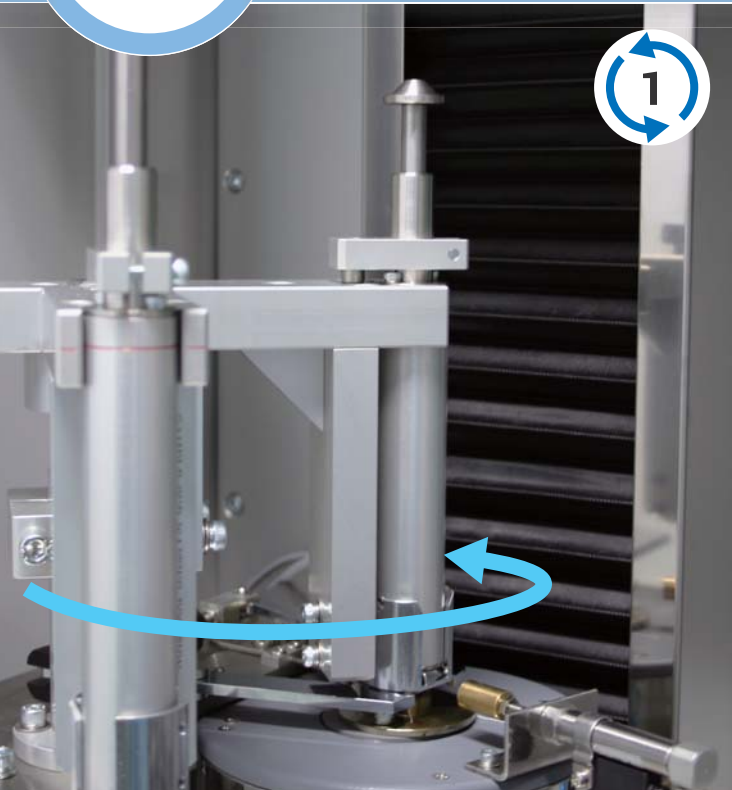
Rich in Extensibility to Satisfy Different Needs

The No.120-SAS-2000 is Capable in Extending the System to Fit the Operators' Demands. The Machine can also be Extended to a 3 Cycle FULLY AUTOMATIC System.

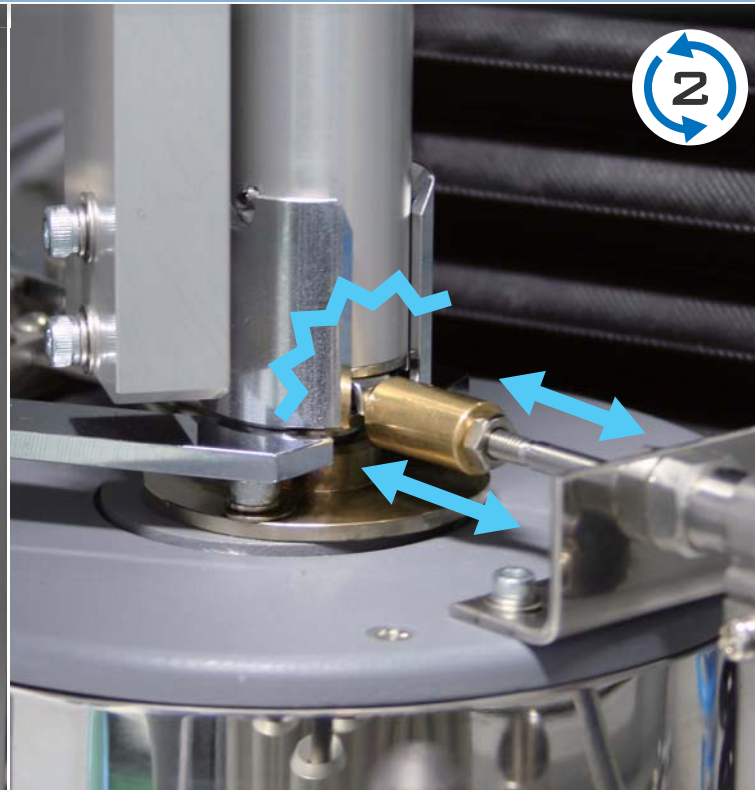


Point.1

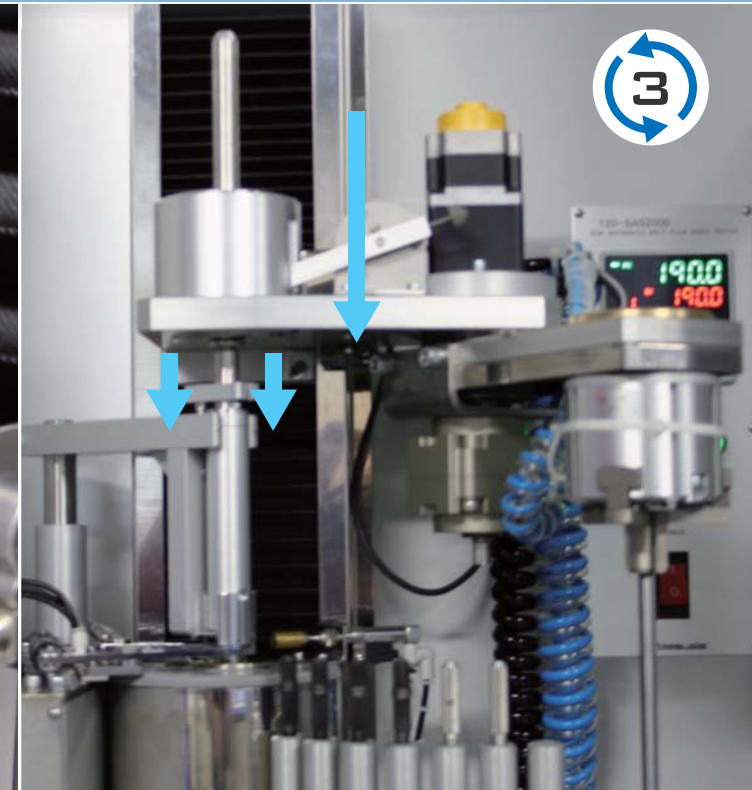
AUTOMATIC SAMPLE FEEDING



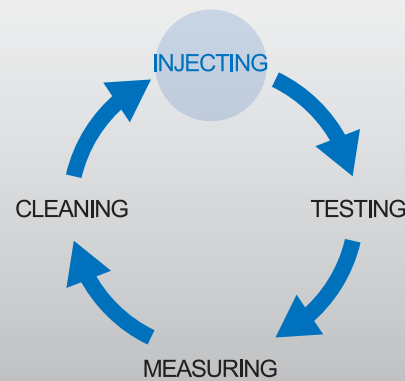
The Sample Cup Automatically Shifting above the Cylinder



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

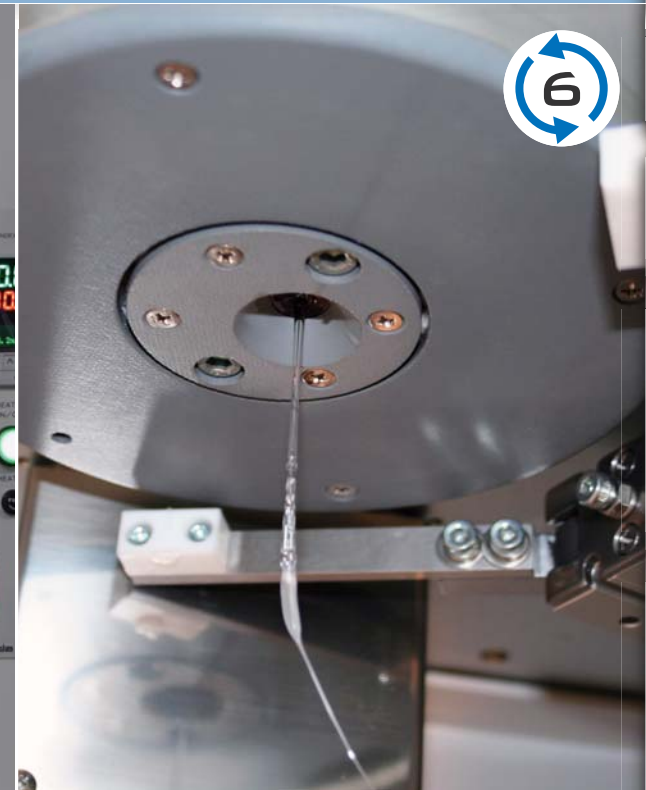


The Robot Arm Pushes the Sample into the Cylinder



INJECTING

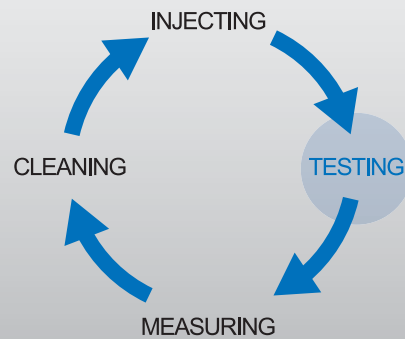
AUTOMATIC TESTING



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

Point.1

Automation

Point.2

Robot Arm

Point.3

Cleaning

Point.4

Repeatability

Point.5

Extensibility

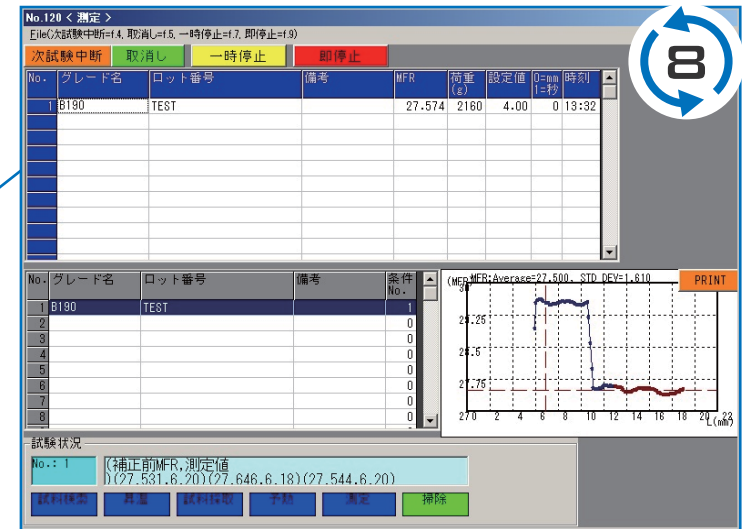
AUTOMATIC MEASURING



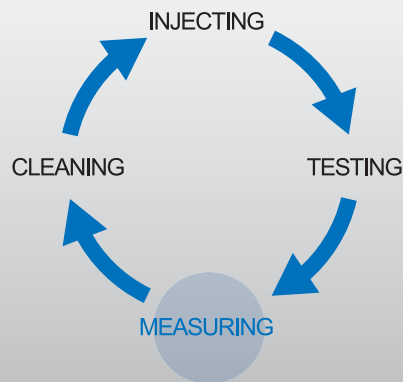
The MVR or the MFR Value is Automatically Measured and the Data is Transferred to the PC Software



The PC Software Displays the Measured Value

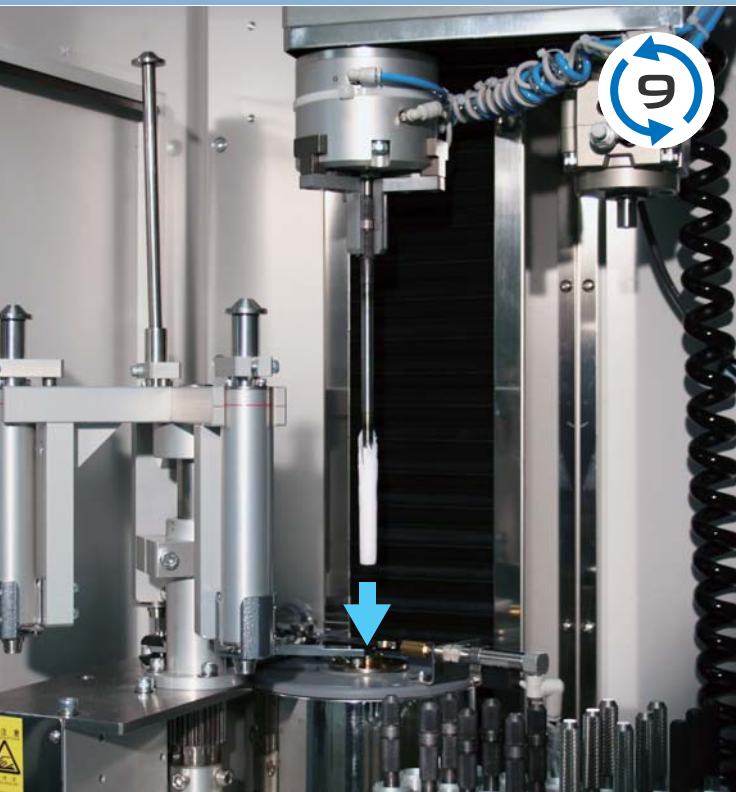


The Test Data is Stored in the PC Software to be Compared or to be Analyzed

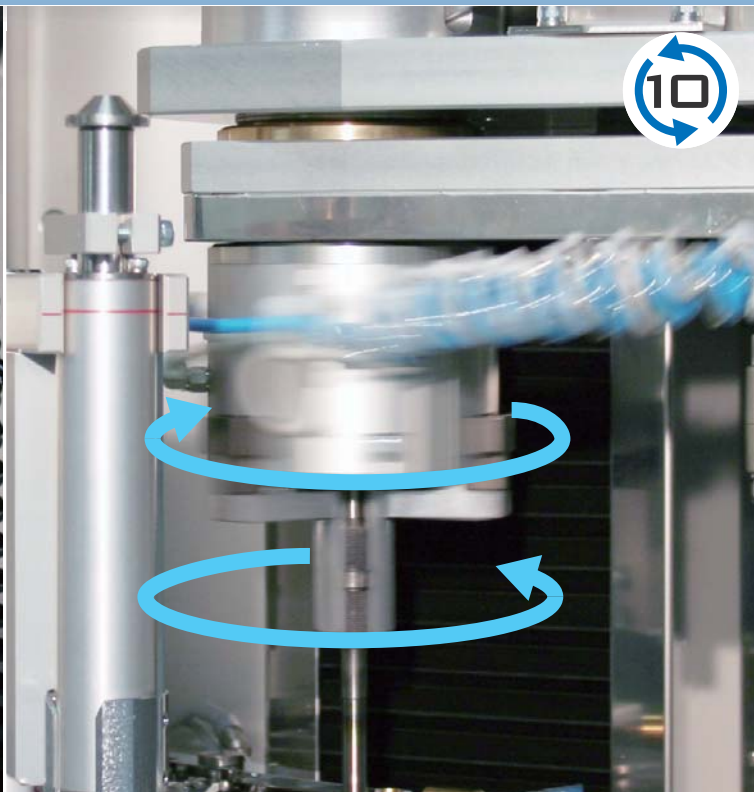


MEASURING

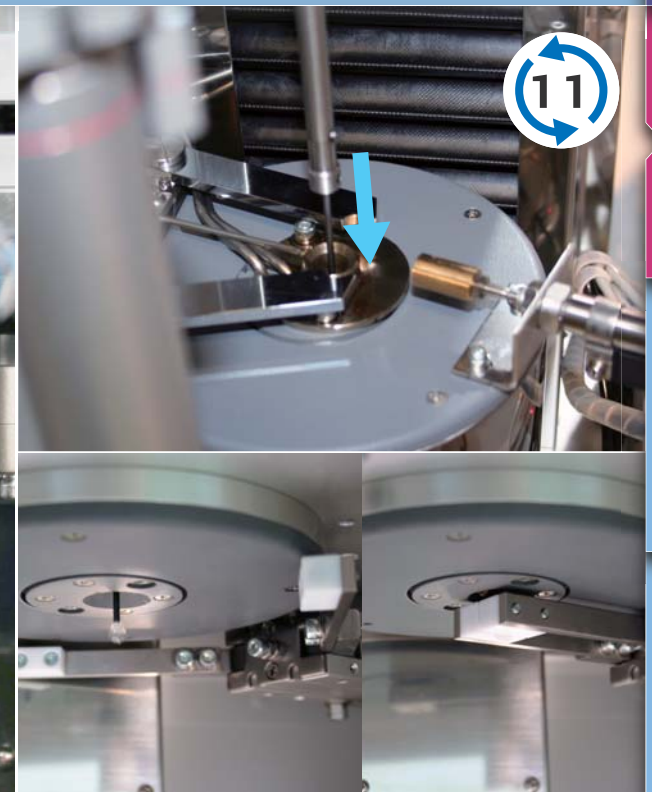
AUTOMATIC CLEANING



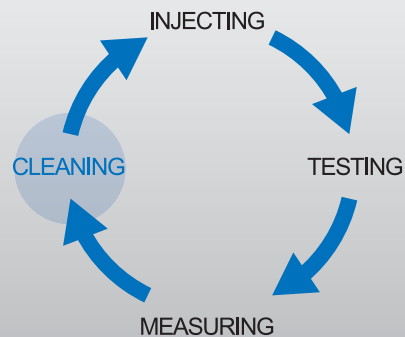
The Cylinder Cleaned Automatically with the Cylinder Cleaning Rod



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.1

Automation

Point.2

Robot Arm

Point.3

Cleaning

Point.4

Repeatability

Point.5

Extensibility

SIMPLICITY & EFFICIENCY

ROBOT ARM

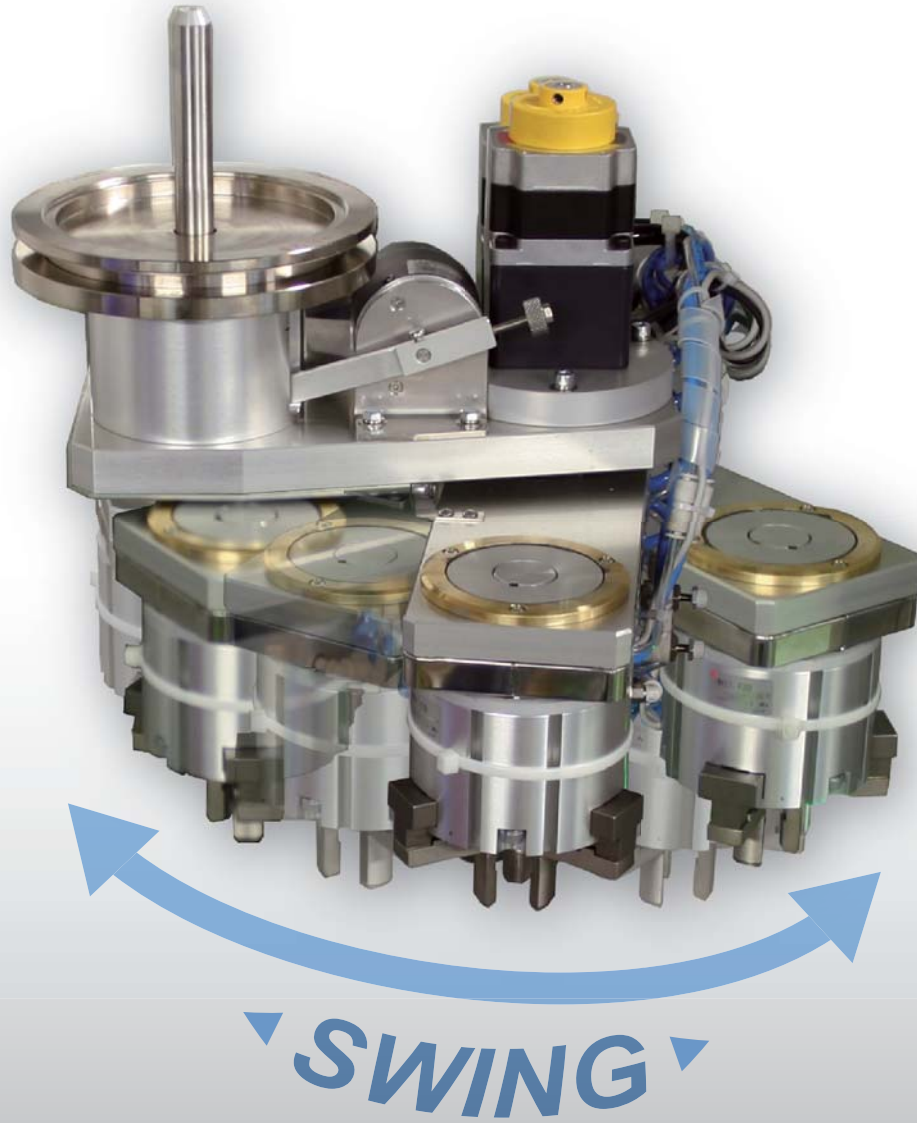
The 'ROBOT ARM' is the main part of the machine and have a various function as grab, push, drag, and twist the rod to run the Testing and Cleaning.

The No.120-SAS-2000 **Eliminates Complicated Movements** that Usual Automatic Machines tend to have. The **Simple Movement** of the No.120-SAS-2000 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**.



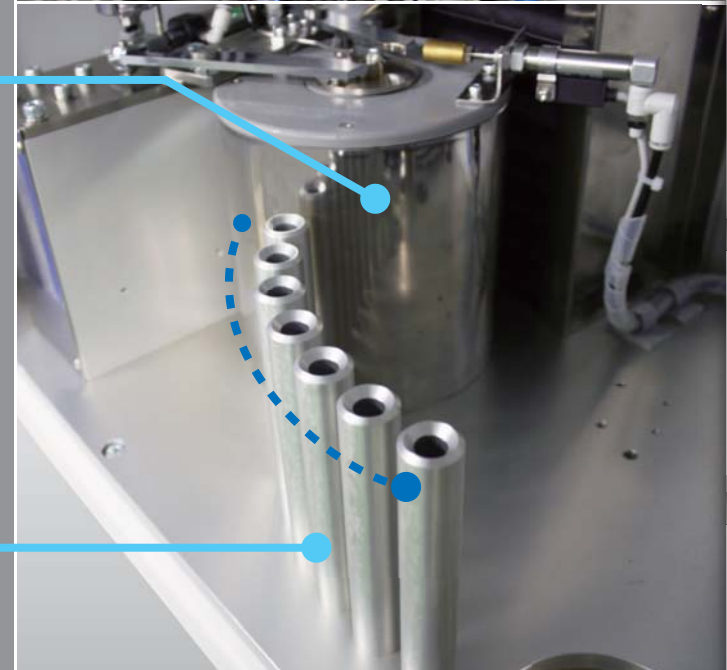
ROTARY MOTION



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

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

The Rod Holders are Aligned on the Flow Line of the Robot Arm



Point.1

Automation

Point.2

Robot Arm

Point.3

Cleaning

Point.4

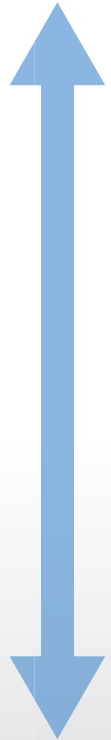
Repeatability

Point.5

Extensibility

VERTICAL MOTION

UP



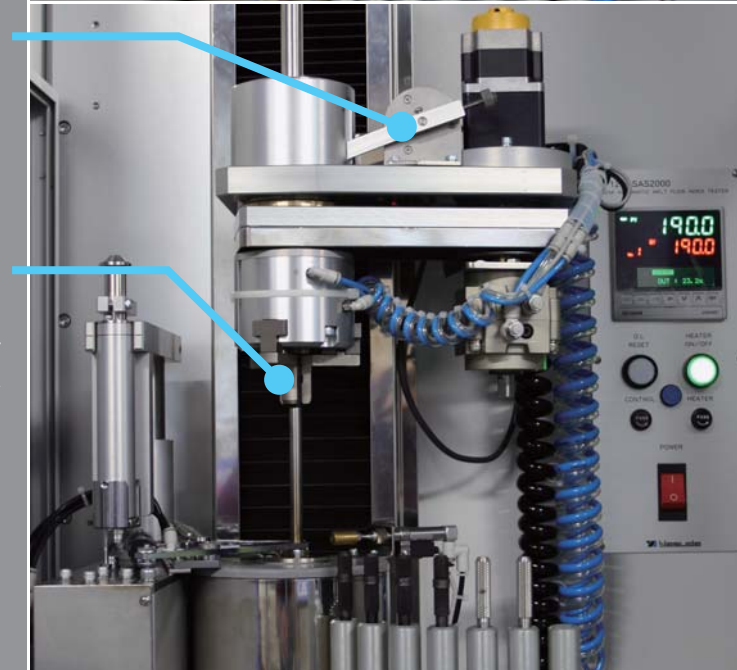
DOWN



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

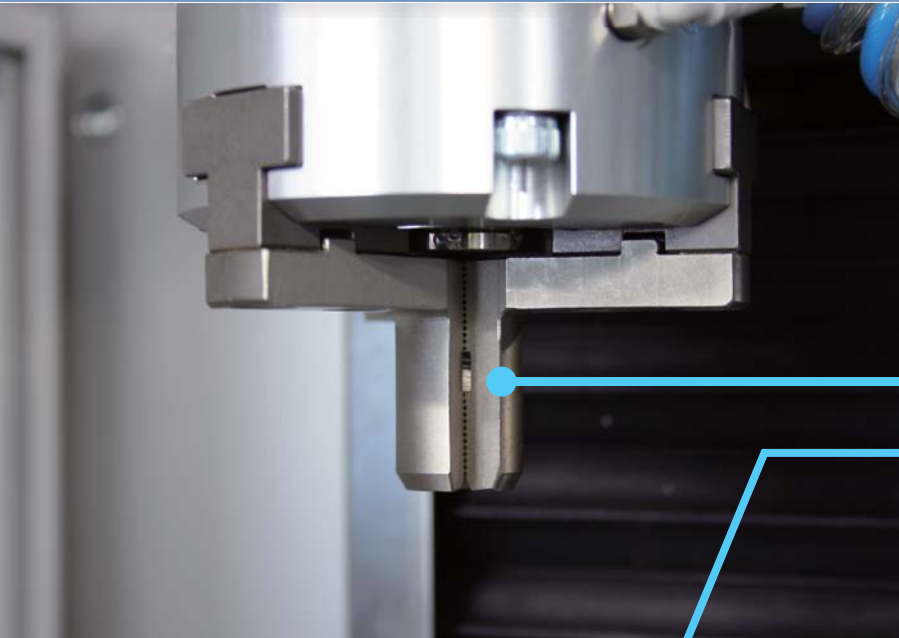


The Encoder Built in the Robot Arm Measures the Traveling Distance of the Piston

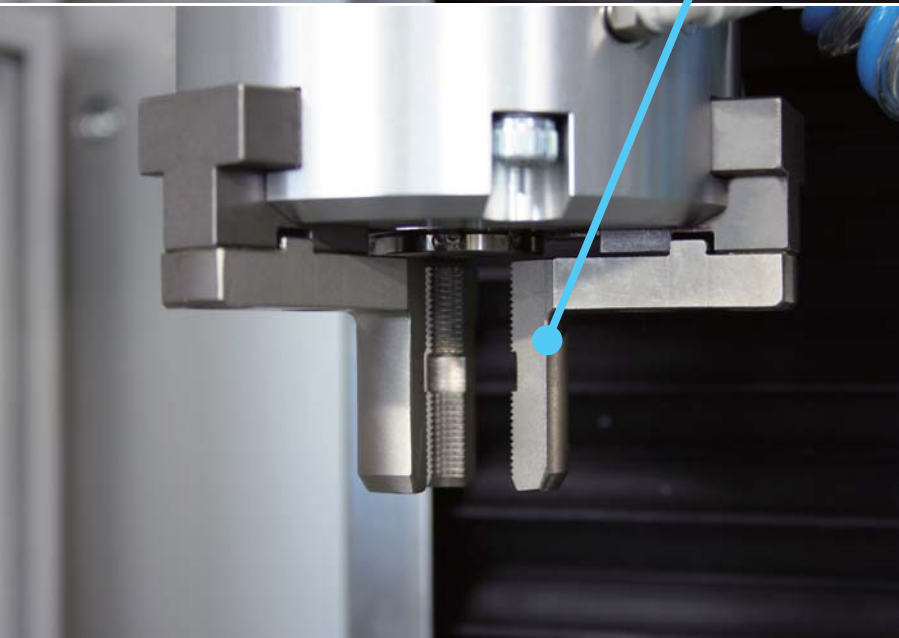


The Sample is Pushed in at the same Pushing Power Every Time, which Eliminates Human Error and Provides Stable Test Data

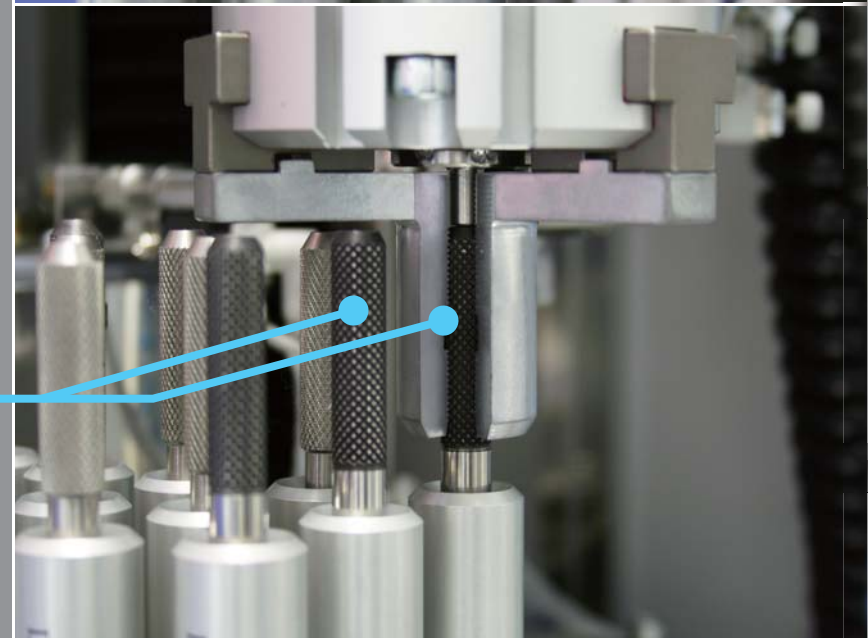
ARM CHUCK GRABING MOTION



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



Point.1

Automation

Point.2

Robot Arm

Point.3

Cleaning

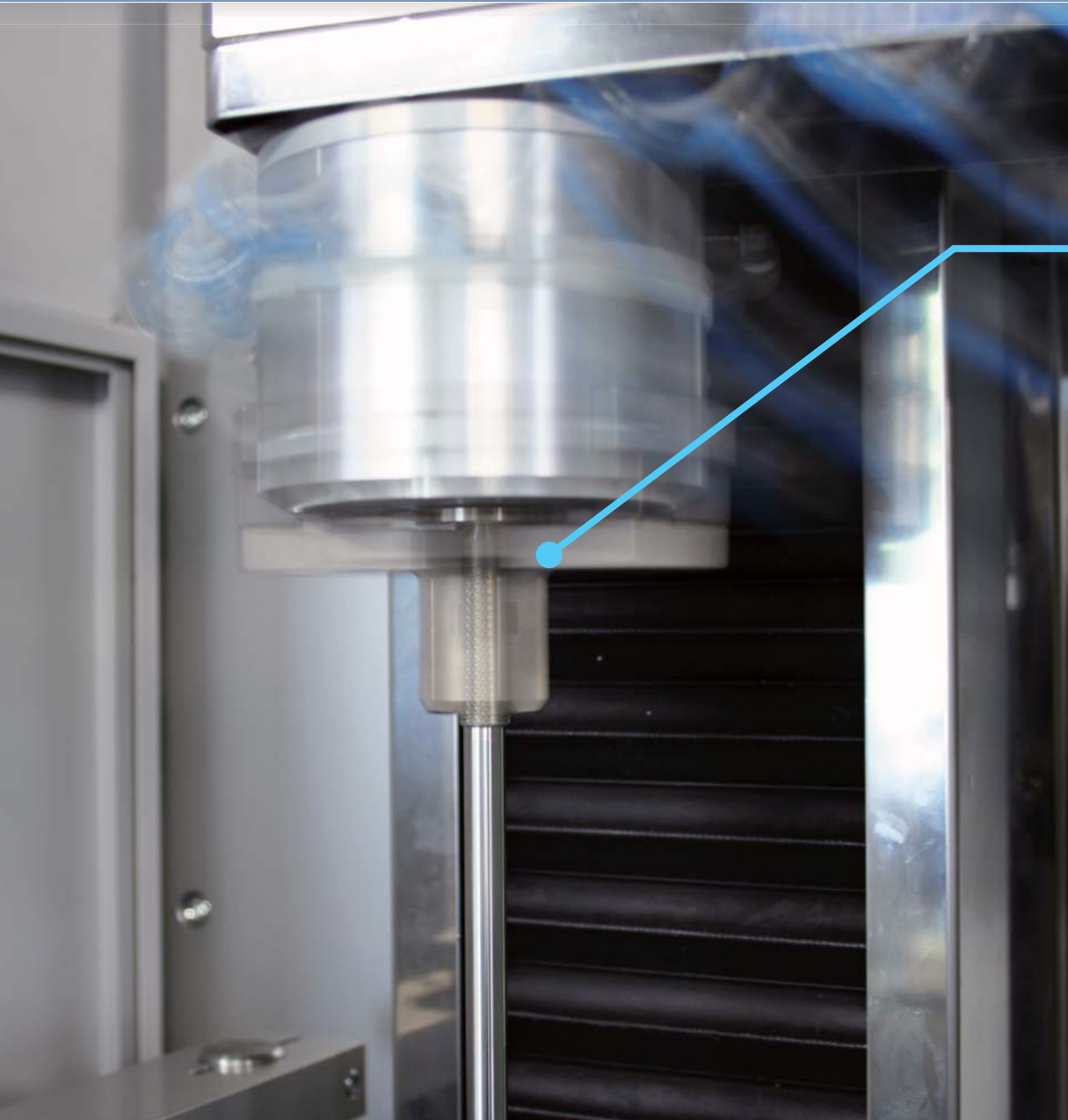
Point.4

Repeatability

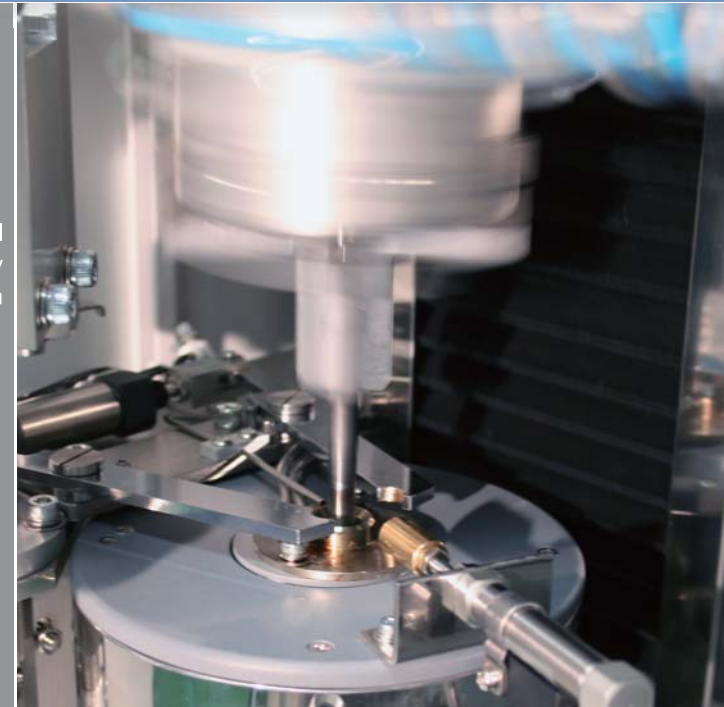
Point.5

Extensibility

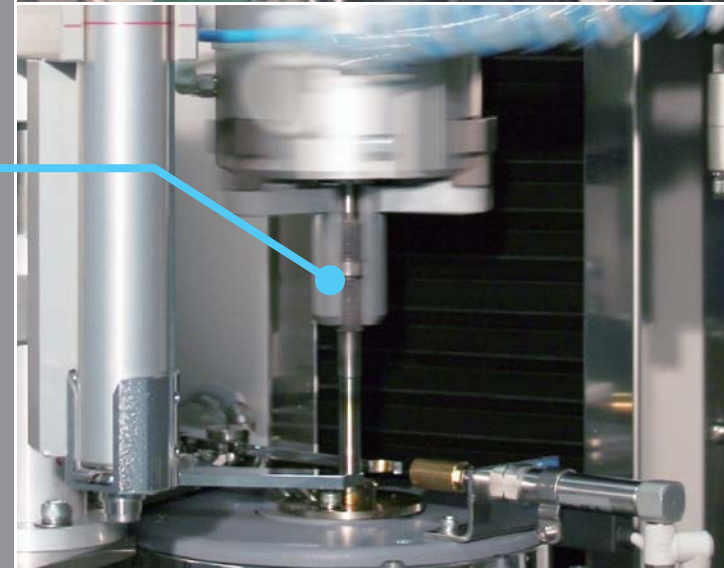
ARM CHUCK TWIST



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



The Cylinder and the Die is Cleaned, Combining the Up and Down Movements of the Robot Arm



Pick Up!

SAMPLE CUP



Sample Cup

One Key Factor that **Enables** the YASUDA SEIKI No.120-SAS-2000 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



Filling



Inserting the Sample Injecting Rod



Setting the Sample Cup



Automatic Cylinder Feeding

Point.1

Automation

Point.2

Robot Arm

Point.3

Cleaning

Point.4

Repeatability

Point.5

Extensibility

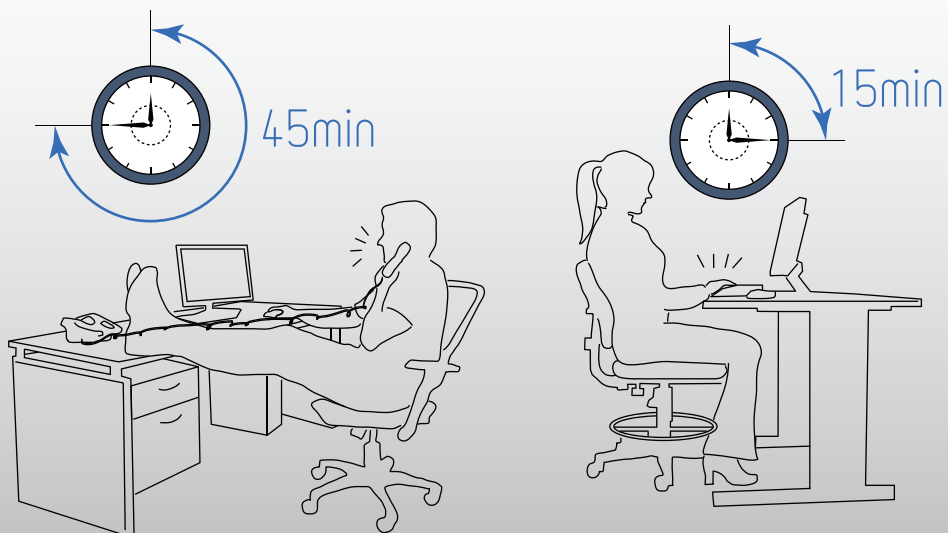
The High Repeatability in the Test Result can not be Realized with out Robust Cleaning. The Robot Arm **Completely Cleans both the Cylinder and the Die**. Not only does the Robot Arm Completely Cleans the System, it is **Conducted FULLY AUTOMATIC**.



Test & Cleaning Time = **Time to do Other Work**

1 Test and Cleaning Cycle on the No.120-SAS-2000 is about **15 minutes**.

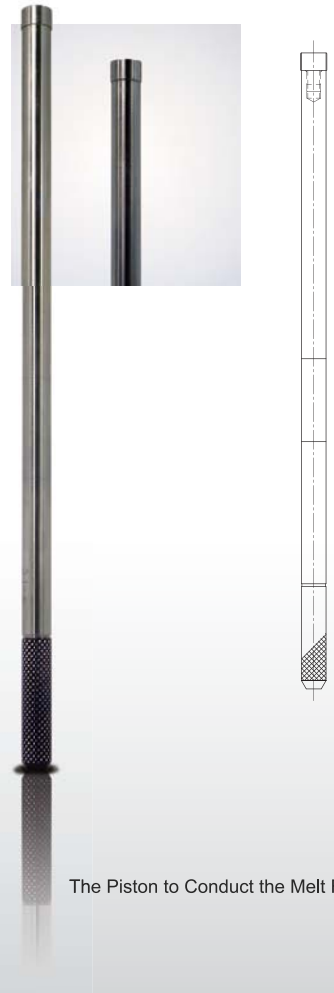
The 3 Hanging System, which FULLY Conducts Test and Cleaning for 3 Test Samples Requires about **45 minutes**.



Let's Take a Look on the Unique Cleaning Rods

UNIQUE PISTON AND CLEANING RODS

Piston Rod



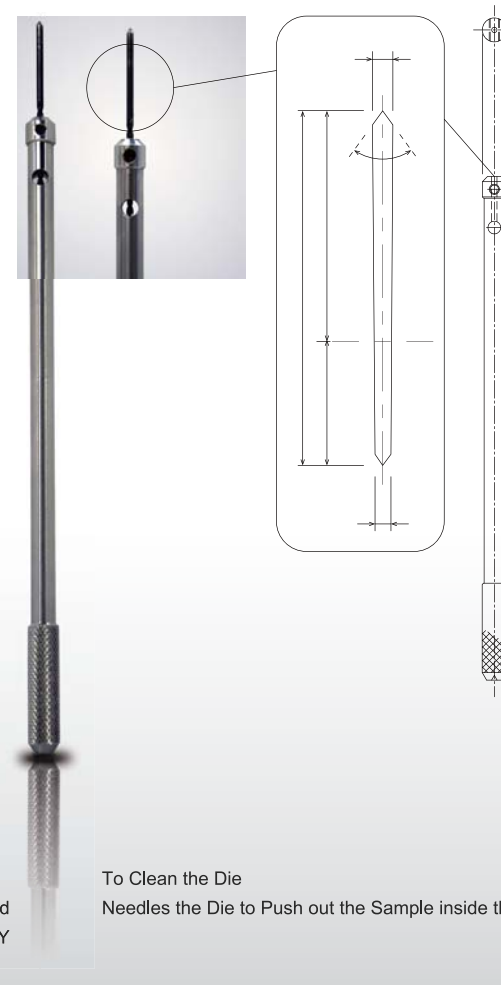
The Piston to Conduct the Melt Flow Test

Cylinder Cleaning Rod



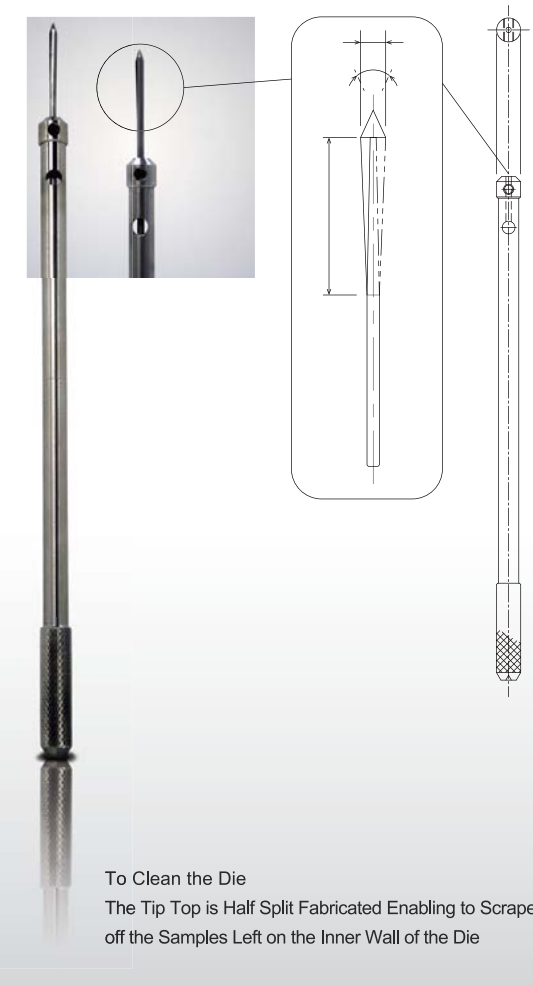
To Clean the Cylinder
Just Wrapping the Gauze and Setting it to the Rod Holder, and the Robot Arm will AUTOMATICALLY Clean the Cylinder

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

Point.1

Automation

Point.2

Robot Arm

Point.3

Cleaning

Point.4

Repeatability

Point.5

Extensibility

CYLINDER CLEANING



Attach the Gauze to the Cylinder Cleaning Rod using the Heat of the Cylinder



Set the Cylinder Cleaning Rod with the Gauze Attached to the Rod Holder



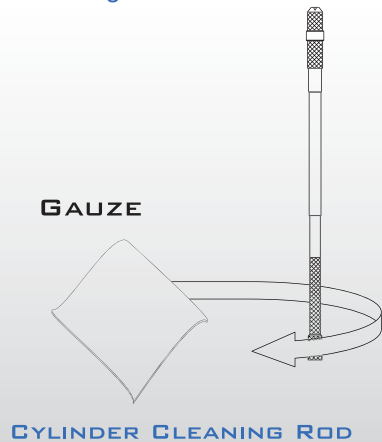
The Robot Arm AUTOMATICALLY Choses the Cleaning Rod to Clean the Cylinder



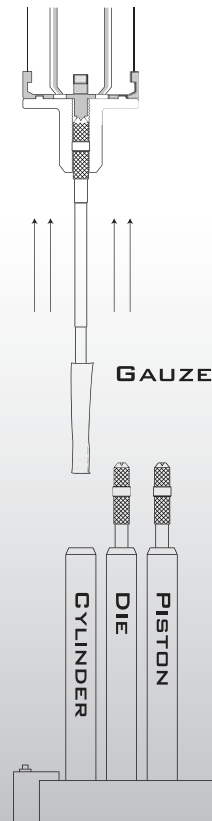
The Robot Arm Repeatedly Twists and Elevates to Clean the Cylinder (Maximum 4 times)

Cylinder Cleaning

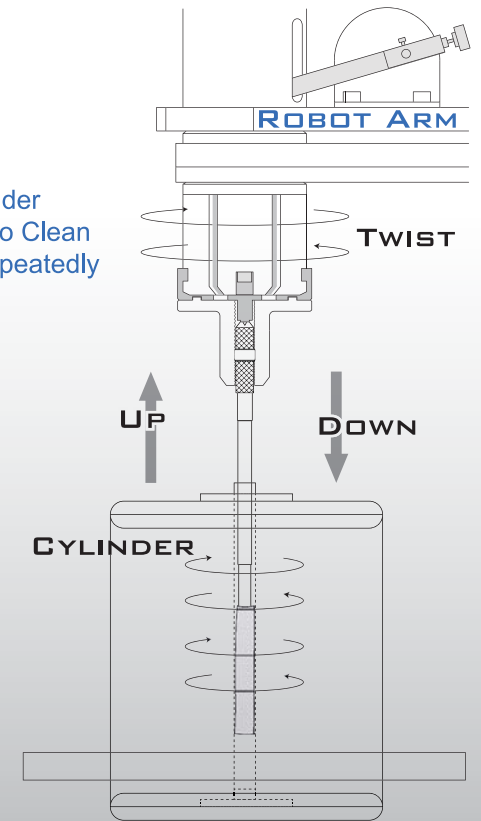
Setting the Gauze



The Robot Arm AUTOMATICALLY Selects the Cylinder Cleaning Rod



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



DIE CLEANING



Cleaning the Die with 2 Different Die Cleaning Rods



Straight type



Half Split type



The Die Tip Top Cleaning Scissor to Wipe off the Sample on the Tip Top of the Die Cleaning Rod

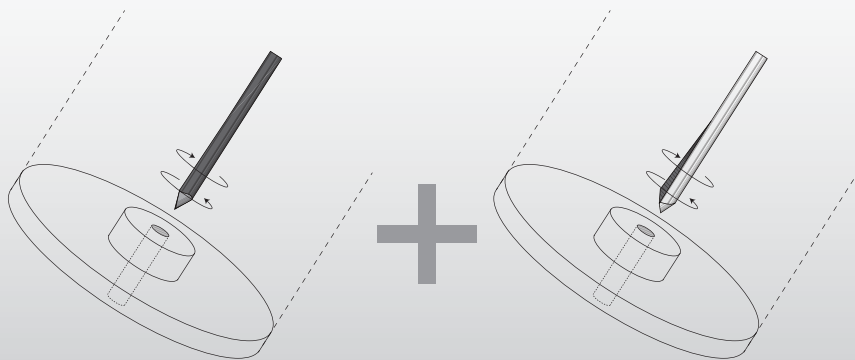


Die Cleaning

Using Both the Straight and Half Split Die Cleaning Rods

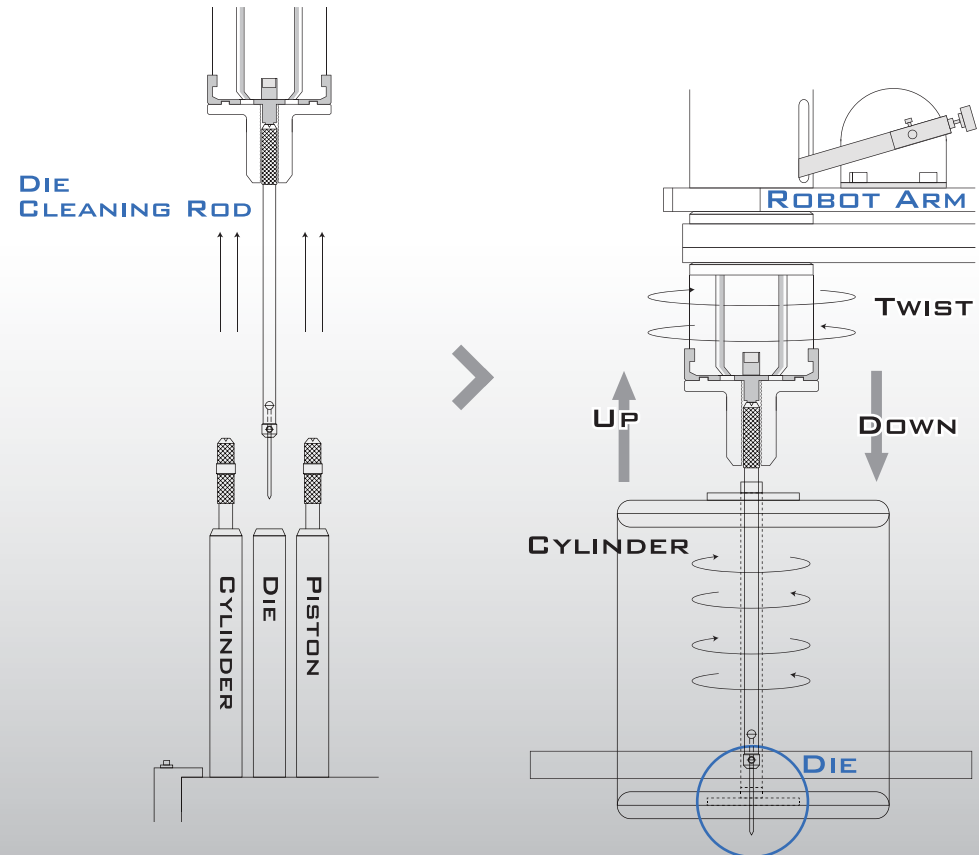
CLEANING ROD STRAIGHT TYPE

CLEANING ROD HALF-SPLIT TYPE



YASUDA ORIGINAL DIE

YASUDA ORIGINAL DIE



Point.1

Automation

Point.2

Robot Arm

Point.3

Cleaning

Point.4

Repeatability

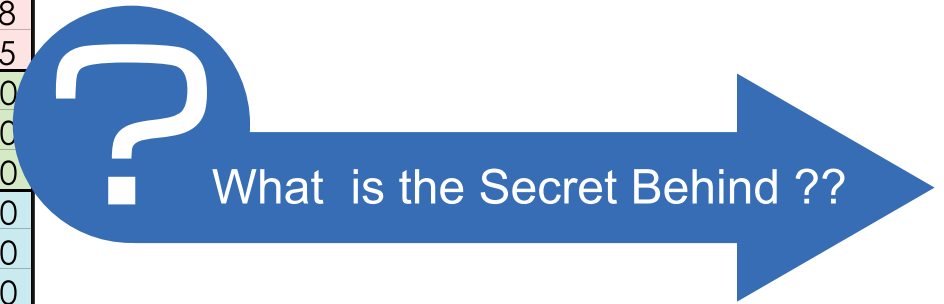
Point.5

Extensibility

Test Condition

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

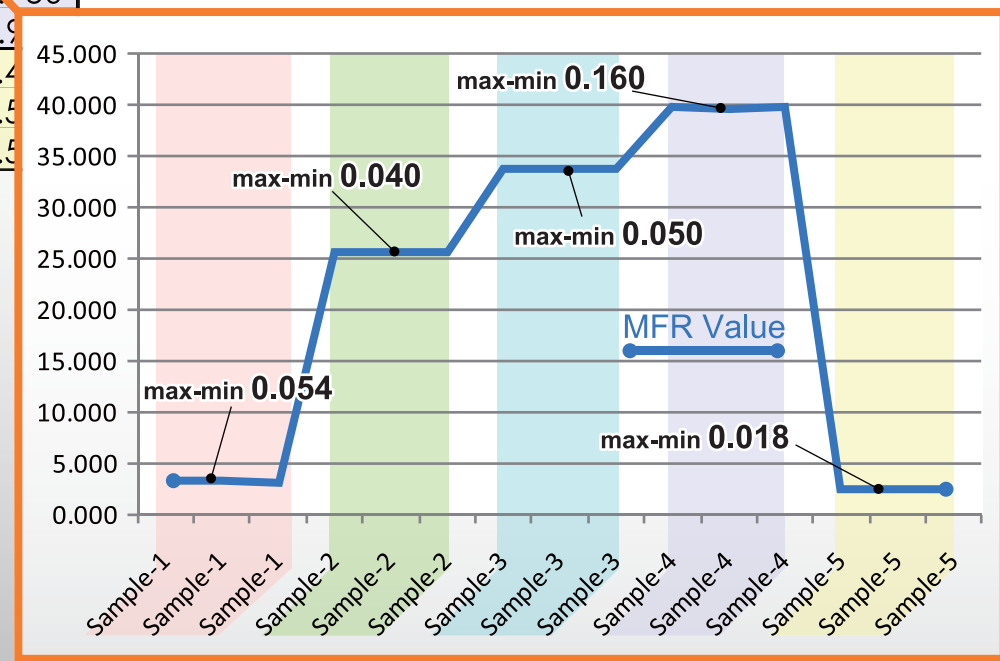
| SAMPLE ID | DENSITY | MFR | MVR |
|-----------|---------|--------|--------|
| Sample-1 | 0.739 | 3.257 | 4.408 |
| Sample-1 | 0.739 | 3.287 | 4.448 |
| Sample-1 | 0.739 | 3.233 | 4.375 |
| Sample-2 | 0.739 | 25.600 | 34.640 |
| Sample-2 | 0.739 | 25.610 | 34.650 |
| Sample-2 | 0.739 | 25.640 | 34.690 |
| 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 | 53.930 |
| Sample-5 | 0.739 | 2.572 | 3.400 |
| Sample-5 | 0.739 | 2.590 | 3.500 |
| Sample-5 | 0.739 | 2.591 | 3.500 |



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-SAS-2000 has the Ability to Repeatedly Produce the Same Test Result.

The Reason why the No.120-SAS-2000 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.1

Automation

Point.2

Robot Arm

Point.3

Cleaning

Point.4

Repeatability

Point.5

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



Automatic A-Method System

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



Piston / Die Cleaning Rod Cleaning

Cleans off the Test Sample on the Piston and Die Cleaning Rod with the Brass Brush



3 Hangings

The No.120-SAS-2000 can be Upgraded to a Maximum of 3 Hangings. This System is Recommended for Operators with Heavy Amount of Test Samples



MEET THE NEEDS



1 Cycle Fully AUTOMATIC
B-Method



1 Cycle Fully AUTOMATIC
A & B-Method



3 Cycle Fully AUTOMATIC
B-Method



3 Cycle Fully AUTOMATIC
A & B-Method

OPTIONS

Standard Spec

+ A-Method Automatic Cutting
(Not Including the Weighing)

+ Automatic Weight Changing
+ 3 hanging

+ Automatic Weight Changing
+ 3 hanging
+ A-Method Automatic Cutting
Automatic Weighing and Data
Processing

Point.1

Automation

Point.2

Robot Arm

Point.3

Cleaning

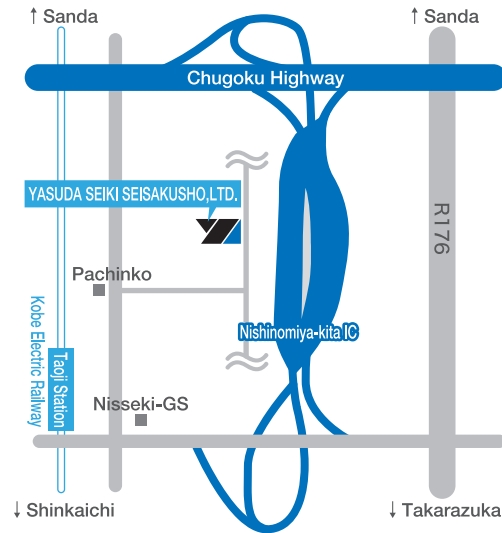
Point.4

Repeatability

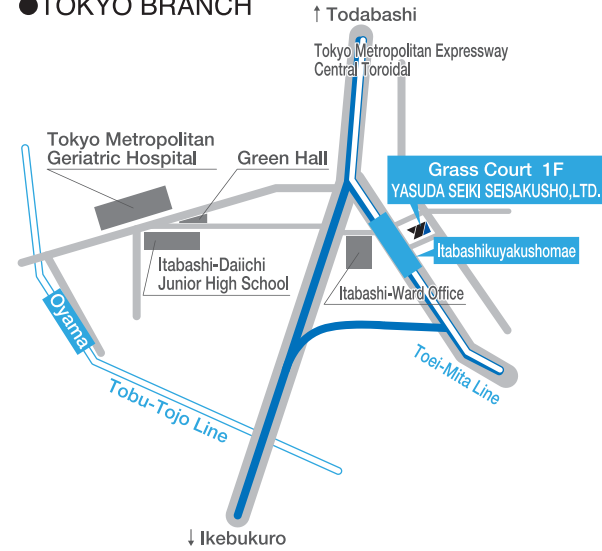
Point.5

Extensibility

● HEAD OFFICE · FACTORY



● TOKYO BRANCH



Head Office

121-1, Shimoyamaguchi, Yamaguchi-cho, Nishinomiya-city,
Hyogo 651-1412, Japan
Tel.(+81) 78-907-1511 Fax.(+81) 78-907-1522
E-mail : general@yasuda-seiki.co.jp

Tokyo Office

9-14-101 3-Chome, Itabashi, Itabashi-ku,
Tokyo 173-0004, Japan
Tel.(+81) 3-3579-8995 Fax.(+81) 3-3579-8997
E-mail : tokyo@yasuda-seiki.co.jp