

# EXMIRE MICRO SYRINGE

- Microsyringe
- Auto Sampler Diluter Syringe
- Needle
- Nozzle/Probe
- Stainless Pipe
- Valve

Welcome to Ito Corporation. Our company was founded in 1980 as a specialist producer of micro syringes. Now we manufacture and sell not only micro syringes, but also other products for the suction and discharge of liquids and gases, from pipes to nozzles.

Since its founding, our company's philosophy has been to serve and contribute to society. Our products act as a pipeline between the company and our customers, and to society as a whole. In that sense, we believe that satisfying our customers with high quality products and good service are the best way to ensure an open, strong pipeline. Ito Corporation's products are used in a wide variety of fields, from analytical chemistry to medicine, pharmaceuticals, food products, the environment, semiconductors, dyes, and more.

We feel confident in our own small way; we are making a contribution to society. We are keenly aware of our responsibility to provide both products that meet the needs of the times and timely service.

Although the company is still small, our high ideals and collective youthful force give us the drive to handle advanced technology, and we have a very dynamic corporate culture. We obtained ISO 9001 certification in 1994. Our aim is to devote further efforts to providing a stable supply of high quality products, and to apply intensive effort to the development of new products. Thank you for your continued support in the future.



President & C.E.O. **Yoshio Ito**



Nishi-Fuji Factory



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# Feature of EXMIRE Micro Syringe

## **EXMIRE micro syringe meets the more sophisticated needs of analysis technique with our high quality and service.**

Precision fitting means we are one step closer to the ultimate in airtight seals. Pressure resistance is 0.3Mpa. Accurate sample injection and ease of motion is realized by the smooth surface of barrel ID and plunger OD.

### ■ **Precise easy-to read calibration**

Material of glass does not vary across the ages. Superior air tightness and precise scale makes precise sample injection. A section of opal glass is inserted below the capillary tube for easy reading.

### ■ **Calibration within $\pm 1\%$ accuracy**

Air tightness is influenced by fitting between barrel ID and plunger OD. The facing surface of the barrel and plunger of Exmire micro syringe for liquid is buffed to a mirrorlike finish to obtain the highest accuracy and to provide the smoothest plunger action. (Volume accuracy for MS\*01U and MS\*05 is within  $\pm 2\%$ )

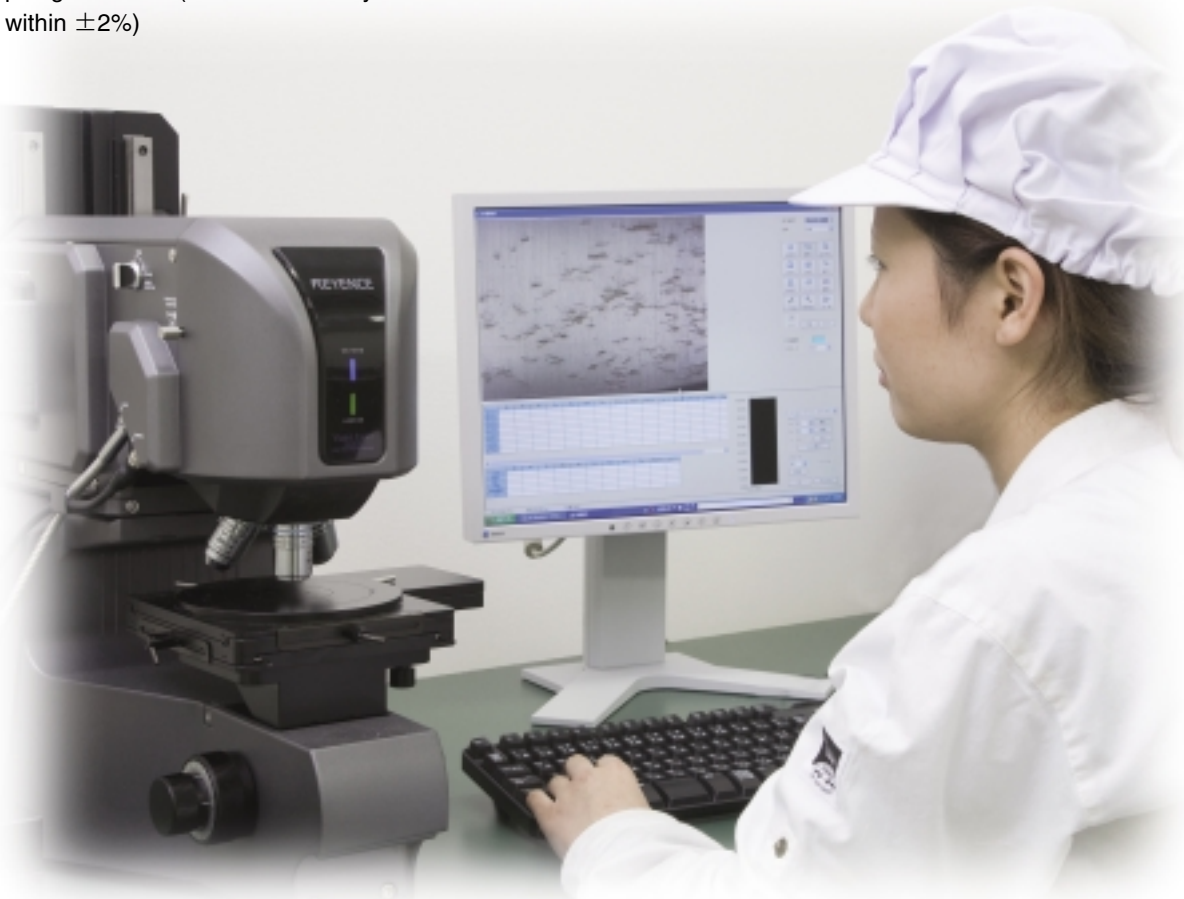
### ■ **No problem with air bubbles**

Precision fitting prevents the formation of air bubbles. Should any accidentally form inside the barrel, they are easily ejected by placing the needle tip in the sample liquid and moving the plunger up and down several times.

Exmire syringe is able to be used in clinical laboratories, especially as a dropper in HLA and platelet transfusion crossmatch test.

### ■ **Certificate of volume accuracy**

- General certificate
- Individual certificate



# USER GUIDELINE

## Instructions for use

Exmire micro syringe is a precision product, it should be treated according to the guidelines. If the plunger is stroked several times in the dry condition of barrel ID, it leads to poor plunger motion.

### <For suction and injection of sample>

- For accurate injections, perform suction slightly more than the required volume and then push plunger down so that plunger tip matches the right graduation line.

### <For cleaning>

- Wash more than 10 times immediately after use by organic solvent which will dissolve the sample.
- Rinse off cleaning solution as soon as possible and do not leave micro syringe soaking in cleaning solution.
- To clean the MS\*01U and MS\*05, first dismantle, and then clean each part separately. The plunger should always be removed before taking off the needle. Be careful not to bend the plunger.
- When the plunger's movement is not smooth, do not move the plunger by force. Keep micro syringe in alcohol for about 10-15 minutes. Then remove the plunger slowly and clean off the dirt with clean gauze. For cleaning, syringe cleaning kit will be very convenient and useful.(ref. P20)

### <Drying and refrigeration>

- To dry, remove the plunger and set temperature at 60°C or lower.
- To refrigerate, lower the temperature gradually to reduce contraction stress.

### <Maintenance>

- To be kept in a clean case at room temperature.
- Do not touch the plunger with bare hands.

## Material for each part

EXMIRE micro syringe is constructed of the following materials in view of chemical resistance.

Barrel body	borosilicate glass hard glass
Plunger	Ni-Ti alloy SUS304
Tip	PTFE, Bridged structure PTFE PE
Needle	SUS304 SUS316 SUS316L

### <Plunger interchange>

- As best size of plunger made of SUS and Ni-Ti alloy is chosen for the each barrel to ensure the precision fitting, plunger alone can not be interchangeable.
- Plunger with PTFE tip is able to be interchanged. Tip for change is available also.

### <MS\*01U, MS\*05>

- Needle for MS\*01U and MS\*05 for ultratrace amount of liquid injection is not interchangeable, because it is non dead volume type.



# Super Elastic Plunger Models

**New era of micro syringe. Super elastic plunger made of Ti-Ni alloy has strong chemical resistance and superior flexibility.**



■ Super elastic plunger is made of special Ti-Ni alloy which has superior flexibility and does not have any problem with friction damage caused by plunger bending. It simply springs back, if the plunger is bent. No problems with cleaning. Plunger can be wound into a coil of  $\phi$  16mm.

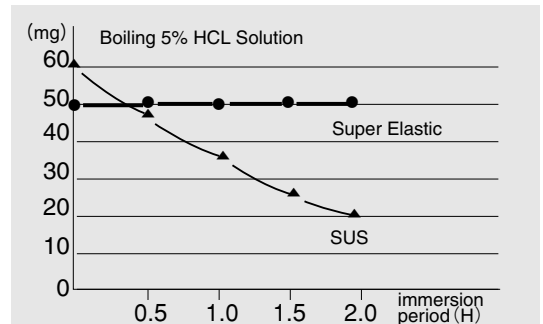
■ **Superior chemical resistance**

Ti-Ni alloy is stronger and more resistant to acids, alkalis and salt solutions than stainless steel.

■ **Accuracy and reproducibility of injection is within  $\pm 1\%$ .**

■ **3-colored index labels**

Syringe can be color coded to relate to sample type or user. 3-colored index labels are enclosed.



Immerse plunger (Super Elastic and SUS) in 5 % boiling HCL solution and compare the weight change.

	Code No.	Volume ( $\mu$ l)	Minimum Calibr. ( $\mu$ l)	Needle Specifications			
				Type	O.D. (mm)	I.D. (mm)	Length (mm)
Fixed Needle	MS*E05	5	0.1	N-50-BF	0.52	0.13	50
	MS*E10U	10	0.1	N-50-BF	0.52	0.13	50
Interchangeable Needle	MS*NE05	5	0.1	N-50-BF	0.52	0.13	50
	MS*NE10U	10	0.1	N-50-BF	0.52	0.13	50
Fixed Needle	MS*E05R	5	0.1	N-51-R	0.715	0.18	51
	MS*E10R	10	0.2	N-51-R	0.715	0.18	51
Interchangeable Needle	MS*NE05R	5	0.1	N-51-R	0.715	0.18	51
	MS*NE10R	10	0.2	N-51-R	0.715	0.18	51
Fixed Needle	MS*E05WTS	5	0.1	N-50-W	0.52	0.13	50
	MS*E10WTS	10	0.2	N-50-W	0.52	0.13	50
Interchangeable Needle	MS*NE05WTS	5	0.1	N-50-W	0.52	0.13	50
	MS*NE10WTS	10	0.2	N-50-W	0.52	0.13	50

# Standard Models

## MS\*01U/ 05 (non dead volume)



Micro syringe for ultratrace volume and high accuracy analysis.  $1\mu\text{l}$  and  $5\mu\text{l}$  is available. As the plunger reach travels to the very tip of the needle, this type of syringe has no dead space and high reproducibility is expected. Each part, cylinder, needle, plunger, plunger head, all are able to be disassembled and cleaned easily.

Code No.	Volume ( $\mu\text{l}$ )	Minimum Calibr. ( $\mu\text{l}$ )	Needle Specifications		
			Type	Length (mm)	Dead volume ( $\mu\text{l}$ )
MS*01U	1	0.01	N-50-R12	50	0
MS*05	5	0.1	S-75-R17	75	0

(Notice)

- For thick sample injection, take more than 30 seconds.
- All parts coming into direct contact with liquid are made of stainless steel (SUS316), and should not be used with highly acidic substances.
- Needle can be disassembled, but is not interchangeable. Only fixed needle type is available.

## MS\*Standard type



Standard type with fixed or interchangeable needles. There are 7 types of volumes between  $5\mu\text{l}$  and  $500\mu\text{l}$ . Volume accuracy and reproducibility is within  $\pm 1\%$ . High-precision processing technology ensures smooth plunger action and airtightness. For interchangeable needle type, all needle with standard hub can be replaced only by screwing to syringe. Special PTFE seal in the needle base prevents leakage.

Code No.	Volume ( $\mu\text{l}$ )	Minimum Calibr. ( $\mu\text{l}$ )	Needle Specifications		
			Type	Length (mm)	Dead volume ( $\mu\text{l}$ )
MS*X05	5	0.1	N-50-BF	50	$0.9\pm 0.3$
MS*10U	10	0.1	N-50-BF	50	$0.9\pm 0.3$
MS*25	25	0.5	N-50-B	50	$1.7\pm 0.3$
MS*50	50	1.0	N-50-B	50	$1.7\pm 0.3$
MS*100	100	2.0	N-50-B	50	$1.7\pm 0.3$
MS*250	250	5.0	N-50-B(24G)	50	$3.6\pm 0.4$
MS*500	500	10.0	N-50-B(24G)	50	$3.6\pm 0.4$

Code No.	Volume ( $\mu\text{l}$ )	Minimum Calibr. ( $\mu\text{l}$ )	Needle Specifications		
			Type	Length (mm)	Dead volume ( $\mu\text{l}$ )
MS*N05	5	0.1	N-50-BF	50	$0.9\pm 0.3$
MS*N10U	10	0.1	N-50-BF	50	$0.9\pm 0.3$
MS*N25	25	0.5	N-50-B	50	$1.7\pm 0.3$
MS*N50	50	1.0	N-50-B	50	$1.7\pm 0.3$
MS*N100	100	2.0	N-50-B	50	$1.7\pm 0.3$
MS*N250	250	5.0	N-50-B	50	$3.6\pm 0.4$
MS*N500	500	10.0	N-50-B	50	$3.6\pm 0.4$

\*"MS\*N-" type has interchangeable needle.

# Plunger Support Syringe

## MS\*G type



- A special guide attachment protects the plunger from bending.
- Because the guide and plunger have the same length, its use facilitates repeat injections of fixed liquid volumes.
- The backstop position can be varied to allow injection of different volumes.
- If the guide holder is set in an incorrect angle, it can cause poor plunger movement.

Code No.	Volume (μl)	Minimum Calibr. (μl)	Needle Specifications		
			Type	Length (mm)	Dead Volume (μl)
MS*G05	5	0.1	N-50-BF	50	0.9±0.3
MS*G10U	10	0.1	N-50-BF	50	0.9±0.3
MS*G25	25	0.5	N-50-B	50	1.7±0.3
MS*G50	50	1.0	N-50-B	50	1.7±0.3
MS*G100	100	2.0	N-50-B	50	1.7±0.3
MS*G100L	100	2.0	N-50-B	50	1.7±0.3

Code No.	Volume (μl)	Minimum Calibr. (μl)	Needle Specifications		
			Type	Length (mm)	Dead Volume (μl)
MS*NG05	5	0.1	N-50-BF	50	0.9±0.3
MS*NG10U	10	0.1	N-50-BF	50	0.9±0.3
MS*NG25	25	0.5	N-50-B	50	1.7±0.3
MS*NG50	50	1.0	N-50-B	50	1.7±0.3
MS*NG100	100	2.0	N-50-B	50	1.7±0.3

\*MS\*N--"type has interchangeable needle.

## MS\*P type

- PTFE sleeve inserted into the rear of the barrel flange provides extra plunger support.
- Injections are always smooth with this PTFE sleeve, even if the plunger bends slightly.

Code No.	Volume (μl)	Minimum Calibr. (μl)	Needle Specifications		
			Type	Length (mm)	Dead Volume (μl)
MS*P05	5	0.1	N-50-BF	50	0.9±0.3
MS*P10U	10	0.1	N-50-BF	50	0.9±0.3

Code No.	Volume (μl)	Minimum Calibr. (μl)	Needle Specifications		
			Type	Length (mm)	Dead Volume (μl)
MS*NP05	5	0.1	N-50-BF	50	0.9±0.3
MS*NP10U	10	0.1	N-50-BF	50	0.9±0.3

\*MS\*N--"type has interchangeable needle.

## MS\*T type

- The three stage telescopic plunger guide made of stainless steel ensures smooth plunger action without bending during injection.
- Because a special backstop prevents the plunger blowing out of the syringe barrel, it can be easily cleaned.

Code No.	Volume (μl)	Minimum Calibr. (μl)	Needle Specifications		
			Type	Length (mm)	Dead Volume (μl)
MS*T05	5	0.1	N-50-BF	50	0.9±0.3
MS*T10U	10	0.1	N-50-BF	50	0.9±0.3

Code No.	Volume (μl)	Minimum Calibr. (μl)	Needle Specifications		
			Type	Length (mm)	Dead Volume (μl)
MS*NT05	5	0.1	N-50-BF	50	0.9±0.3
MS*NT10U	10	0.1	N-50-BF	50	0.9±0.3

\*MS\*N--"type has interchangeable needle.



# HPLC Syringe

- EXMIRE supplies a full range of HPLC syringes for sample injector of Rheodyne & Waters.
- An exclusive needle with specific length, diameter and special polished tip ensures a complete seal, preventing damage to needle seal and rotor.

## MS\*R type



Code No.		Volume (μl)	Minimum Calibr. (μl)	Needle Specifications		
Fixed Needle	Interchangeable Needle			O.D. (mm)	I.D. (mm)	Length (mm)
MS*R05	MS*NR05	5	0.1	0.715	0.18	51
MS*R10	MS*NR10	10	0.2	0.715	0.18	51
MS*R25	MS*NR25	25	0.5	0.715	0.18	51
MS*R50	MS*NR50	50	1.0	0.715	0.18	51
MS*R100	MS*NR100	100	2.0	0.715	0.18	51
MS-R250	MS*NR250	250	5.0	0.715	0.18	51
MS*R500	MS*NR500	500	10.0	0.715	0.18	51

## MS\*WTS type



Code No.		Volume (μl)	Minimum Calibr. (μl)	Needle Specifications		
Fixed Needle	Interchangeable Needle			O.D. (mm)	I.D. (mm)	Length (mm)
MS*05WTS	MS*N05WTS	5	0.1	0.52	0.13	50
MS*10WTS	MS*N10WTS	10	0.2	0.52	0.13	50
MS*25WTS	MS*N25WTS	25	0.5	0.52	0.18	50
MS*50WTS	MS*N50WTS	50	1.0	0.52	0.18	50
MS*100WTS	MS*N100WTS	100	2.0	0.52	0.18	50
MS*250WTS	MS*N250WTS	250	5.0	0.52	0.18	50
MS*500WTS	MS*N500WTS	500	10.0	0.52	0.18	50

# W Type Syringe

- Syringe with special stop and one-touch plunger lock
- The glass handle acts as an extra support to prevent bending of the narrow plunger.

### One touch plunger lock function

- Only to push lock tip, plunger is locked at the desired volume. From the sampling to injection, the accurate volume will keep.
- PTFE stopper prevents dropping out of plunger and ensure the smooth sampling and cleaning.

### Wide volume range

- Variety of volume is from 5  $\mu$ l to 100  $\mu$ l for GC and HPLC.
- Volume accuracy / repeatability :  $\pm 1\%$
- Pressure resistance: 0.3Mpa

### Prevention of plunger bending

- Thick support plunger prevents plunger bending.
- Each part can be easily disassembled and cleaned.
- 3 colors lock tip is useful for classification by use.

## MS\*W type

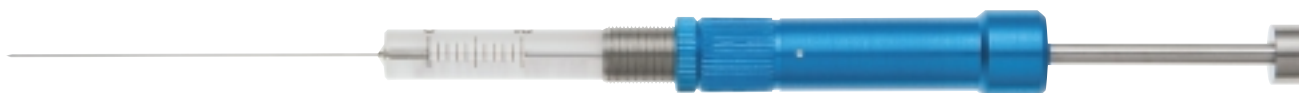


Application	Code No.		Volume ( $\mu$ l)	Minimum Calibr. ( $\mu$ l)	Needle Specifications		
	Fixed Needle	Interchangeable Needle			O.D. (mm)	I.D. (mm)	Length (mm)
GC	MS*W05	MS*NW05	5	0.1	0.52	0.13	50
	MS*W10	MS*NW10	10	0.2	0.52	0.13	50
	MS*W25	MS*NW25	25	0.5	0.52	0.18	50
	MS*W50	MS*NW50	50	1.0	0.52	0.18	50
	MS*W100	MS*NW100	100	2.0	0.52	0.18	50
HPLC Rheodyne	MS*W05R	MS*NW05R	5	0.1	0.715	0.18	51
	MS*W10R	MS*NW10R	10	0.2	0.715	0.18	51
	MS*W25R	MS*NW25R	25	0.5	0.715	0.18	51
	MS*W50R	MS*NW50R	50	1.0	0.715	0.18	51
	MS*W100R	MS*NW100R	100	2.0	0.715	0.18	51
Waters	MS*W05WTS	MS*NW05WTS	5	0.1	0.52	0.13	50
	MS*W10WTS	MS*NW10WTS	10	0.2	0.52	0.13	50
	MS*W25WTS	MS*NW25WTS	25	0.5	0.52	0.18	50
	MS*W50WTS	MS*NW50WTS	50	1.0	0.52	0.18	50
	MS*W100WTS	MS*NW100WTS	100	2.0	0.52	0.18	50

# Semi Standard Syringe

**EXMIRE offers a wide range of semi standard syringes which are manufactured based on the increasing demand for standard products. We try to meet the various needs of our customers.**

## MS\*SL type



The “Routine Work” syringe delivers identical micro volumes easily and repeatedly. It is adjustable by the screw and lock ring.

Code No.		Volume (μl)	Minimum Calibr. (μl)	Needle Specifications		
Fixed Needle	Interchangeable Needle			Type	Length (mm)	Dead volume (μl)
MS*2SL	MS*N2SL	2	0.2	N-50-BF	50	0.9±0.3
MS*5SL	MS*N5SL	5	0.5	N-50-B	50	1.7±0.3
MS*10SL	MS*N10SL	10	1.0	N-50-B	50	1.7±0.3

## MS\*C type



On-column injection syringe with SUS304 capillary needle.

Except for the standard length of 85mm, OD of 0.20mm, we will meet the requested dimensions.

Code No.	Volume (μl)	Minimum Calibr. (μl)	Needle Specifications		
			O.D. (mm)	I.D. (mm)	Length (mm)
MS*C05	5	0.1	0.20	0.08	85
MS*C10	10	0.2	0.20	0.08	85

# Auto Sampler Syringe

- $\pm 1\%$  of volume accuracy and repeatability.
- Accurate assembling of cylinder ID and plunger surface enable smooth plunger movement and easy maintenance of auto sampler.
- We will meet the various requests of customers with extensive lineups.

## MS\*AOC type (for Shimadzu)



Plunger Material	Code No.		Volume ( $\mu$ l)	Minimum Calibr. ( $\mu$ l)	Needle Specifications		
	Fixed Needle	Interchangeable Needle			O.D. (mm)	I.D. (mm)	Length (mm)
Super Elastic	MS*E05AOC23G	MS*NE05AOC23G	5	0.1	0.64	0.15	43
	MS*E05AOC26G	MS*NE05AOC26G	5	0.1	0.46	0.15	43
	MS*E05AOC23G/26G	MS*NE05AOC23G/26G	5	0.1	0.64/0.46	0.15	43
	MS*E10AOC23G	MS*NE10AOC23G	10	0.2	0.64	0.15	43
	MS*E10AOC26G	MS*NE10AOC26G	10	0.2	0.46	0.15	43
	MS*E10AOC23G/26G	MS*NE10AOC23G/26G	10	0.2	0.64/0.46	0.15	43
S U S	MS*05AOC23G	MS*N05AOC23G	5	0.1	0.64	0.15	43
	MS*05AOC26G	MS*N05AOC26G	5	0.1	0.46	0.15	43
	MS*05AOC23G/26G	MS*N05AOC23G/26G	5	0.1	0.64/0.46	0.15	43
	MS*10AOC23G	MS*N10AOC23G	10	0.2	0.64	0.15	43
	MS*10AOC26G	MS*N10AOC26G	10	0.2	0.46	0.15	43
	MS*10AOC23G/26G	MS*N10AOC23G/26G	10	0.2	0.64/0.46	0.15	43

**MS\*HP type (for Agilent 7673)**



Plunger Material	Code No.		Volume ( $\mu$ l)	Minimum Calibr. ( $\mu$ l)	Needle Specifications		
	Fixed Needle	Interchangeable Needle			O.D. (mm)	I.D. (mm)	Length (mm)
Super Elastic	MS*E05HP23G	MS*NE05HP23G	5	0.1	0.64	0.15	43
	MS*E05HP26G	MS*NE05HP26G	5	0.1	0.46	0.15	43
	MS*E05HP23G/26G	MS*NE05HP23G/26G	5	0.1	0.64/0.46	0.15	43
	MS*E10HP23G	MS*NE10HP23G	10	0.2	0.64	0.15	43
	MS*E10HP26G	MS*NE10HP26G	10	0.2	0.46	0.15	43
	MS*E10HP23G/26G	MS*NE10HP23G/26G	10	0.2	0.64/0.46	0.15	43
S U S	MS*05HP23G	MS*N05HP23G	5	0.1	0.64	0.15	43
	MS*05HP26G	MS*N05HP26G	5	0.1	0.46	0.15	43
	MS*05HP23G/26G	MS*N05HP23G/26G	5	0.1	0.64/0.46	0.15	43
	MS*10HP23G	MS*N10HP23G	10	0.2	0.64	0.15	43
	MS*10HP26G	MS*N10HP26G	10	0.2	0.46	0.15	43
	MS*10HP23G/26G	MS*N10HP23G/26G	10	0.2	0.64/0.46	0.15	43



# Gas Tight Syringe

## MS\*GF type (small gas tight)



Gas tight syringe for small capacity from 10  $\mu$ l to 100  $\mu$ l.

PTFE plunger tip enables use for both liquid and gas.

To replace the tip, "Tip Fixing Kit" is useful. (ref. P20)

Code No.		Volume ( $\mu$ l)	Minimum Calibr. ( $\mu$ l)	Needle Specifications	
Fixed Needle	Interchangeable Needle			Type	Length (mm)
MS*GF10	MS*GFN10	10	0.2	N-50-BF	50
MS*GF25	MS*GFN25	25	0.5	N-50-B	50
MS*GF50	MS*GFN50	50	1.0	N-50-B	50
MS*GF100	MS*GFN100	100	2.0	N-50-B	50

## MS\*GAN type (gas tight)



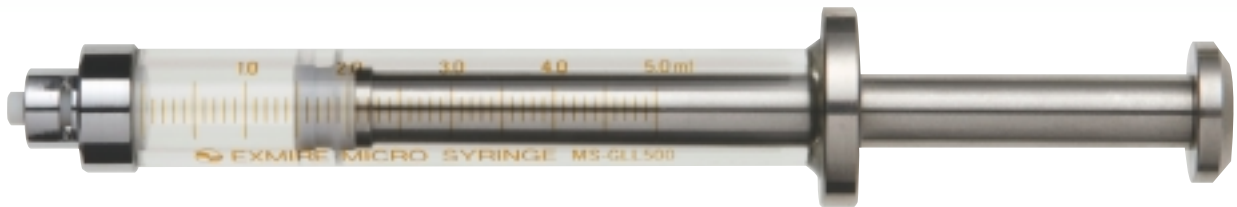
GAN type syringes only use interchangeable needles.

Hard glass with annealing treatment is used and uniformly polished ID realizes a stable high accuracy.

Code No.	Volume (ml)	Minimum Calibr. (ml)	Needle Specification		
			Type	Length (mm)	Dead Volume ( $\mu$ l)
MS*GAN025	0.25	0.005	G-30-B	30	2.2 $\pm$ 0.3
MS*GAN050	0.50	0.01	G-30-B	30	2.2 $\pm$ 0.3
MS*GAN100	1.0	0.02	G-30-B	30	2.2 $\pm$ 0.3
MS*GAN250	2.5	0.05	G-30-B	30	2.2 $\pm$ 0.3
MS*GAN500	5.0	0.10	G-30-B	30	2.2 $\pm$ 0.3
MS*GANX00	10.0	0.20	G-30-B	30	2.2 $\pm$ 0.3
MS*GAN2500	25.0	0.50	G-30-B	30	2.2 $\pm$ 0.3

The super-polished cylinder ID and precisely machined PTFE tip provide a complete gas and liquid seal up to 0.5Mpa.

### MS\*GLL type (Luer Lock)



Connect head conforms Standard Luer lock and widely used for the instrument such as autosampler, diluter etc.

All sample contact parts are made of borosilicate glass and PTFE. That is why GLL syringes provide excellent performance in those applications which require inertness.

Code No.	Volume (ml)	Minimum Calibr. (ml)	Max Volume Stroke (mm)
MS*GLL025	0.25	0.005	60
MS*GLL050	0.50	0.01	60
MS*GLL100	1.0	0.02	60
MS*GLL250	2.5	0.05	60
MS*GLL500	5.0	0.10	60
MS*GLLX00	10.0	0.20	60
MS*GLL2500	25.0	0.50	60

### MS\*UNF type (UNF Thread)



The UNF syringes can be used to interface with instruments that have 1/4-28 UNF threads.

The glass, polished to a mirror finish, perfect seal capable of holding a pressure.

All the products are constructed to avoid any leakage from the barrel to tip assembly.

Code No.	Volume (ml)	Minimum Calibr. (ml)	Max Volume Stroke (mm)
MS*UNF025	0.25	0.005	60
MS*UNF050	0.50	0.01	60
MS*UNF100	1.0	0.02	60
MS*UNF250	2.5	0.05	60
MS*UNF500	5.0	0.10	60
MS*UNFX00	10.0	0.20	60
MS*UNF2500	25.0	0.50	60

# Special Auto Sampler Syringe

**From the design adjusted to syringe to the syringe adjusted to customer's instrument.**



**Ito Corporation provides the best syringe to meet the requirements of each customer's instrument and system with the wealth of our technical know-how.**

EXMIRE syringes are used in various fields all over the world, such as the chromatograph and biochemical fields, medical inspection and industrial facilities in which accurate sampling is needed etc. We strive to receive high evaluations.

## **SPECIFICATION AND QUALITY**

The required quality of a syringe depends on the application and conditions of use. We have to take these conditions into consideration. At the design stage to produce the most suitable syringe.

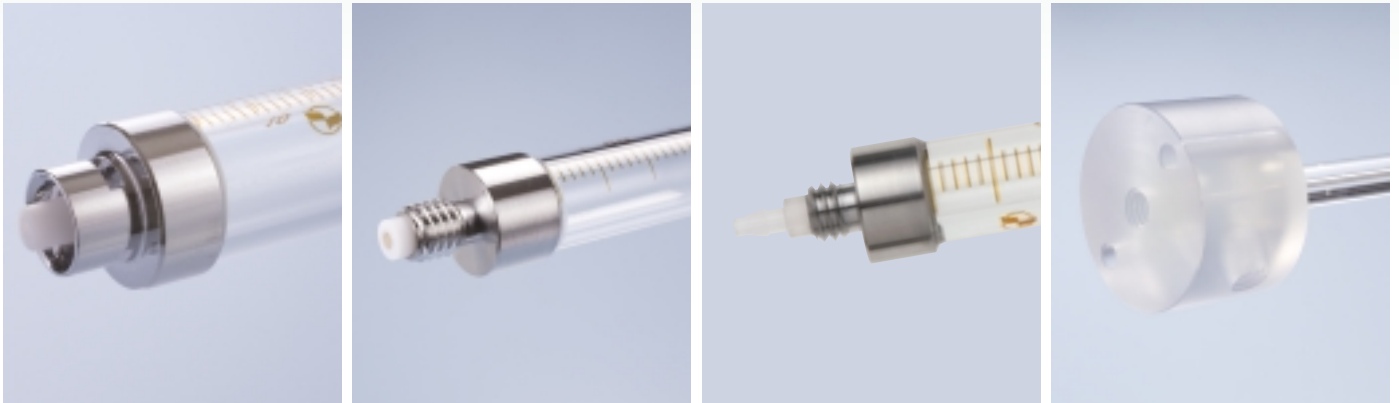
- kind of solution used
- cycle of piston movement of plunger
- operating temperature
- power of motor for plunger action
- method of fitting to the equipment
- tolerance of dimensions

## **ACCURACY**

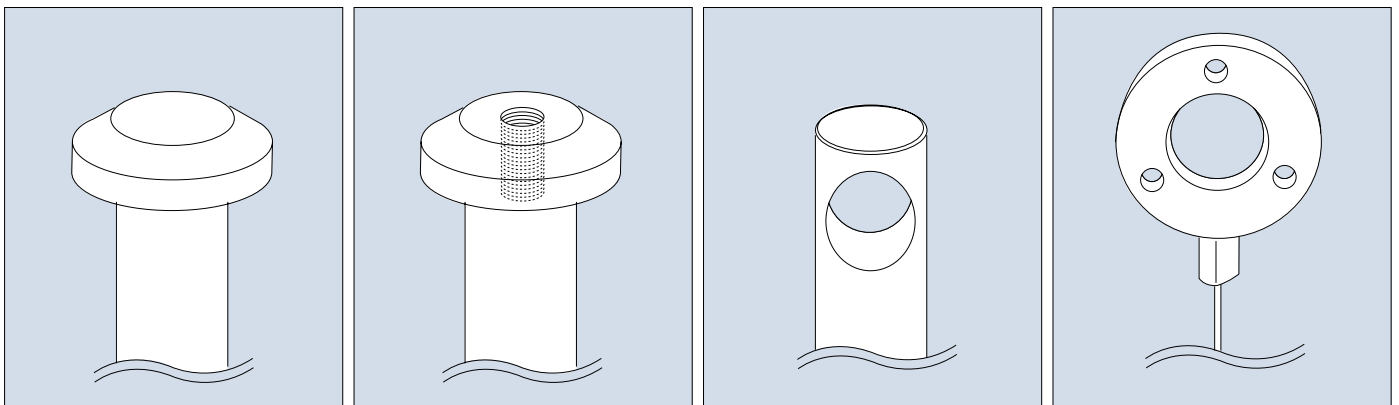
The annealed borosilicate glass barrel maintains stable and enduring sampling.

High uniformity of barrel dimension and mirror finished surface provide an accuracy and reproducibility within  $\pm 1\%$ . If you need even higher accuracy, we can supply special grade syringe to very precise specification.

## SYRINGE HEAD SHAPES



## PLUNGER HEAD SHAPES



### WIDE SELECTION OF DESIGNNS

Precision manufacture of each part (holder, glass barrel and plunger) ensures a smooth plunger action, accurate sampling and extended plunger PTFE tip life.

Our superior processing techniques in glass, metal and plastics can meet any original specifications.

A wide variety of materials are available for different applications.

- Stainless steel: SUS303, 304 and 316 etc.
- Plastic: PTFE, PCTFE etc.

### PLUNGER TIP LIFE TIME

The lifetime of the plunger tip is very important in automated systems. Sample leakage will affect injection accuracy.

EXMIRE syringes have superior plunger tips with extended lifetime through tip design and barrel smoothness. In order to maintain the quality, it is important that syringes are mounted correctly in the auto sampler.

#### ● TIP MATERIAL

- PTFE
- Bridged Structure PTFE
- PE

#### ●SELECTION OF TIP

With demand of the usage conditions, a special tip will be chosen after technical meeting with customer.

ex. Endurance, range of operating temperature, resistant of plunger motion, etc.

# Standard Interchangeable Needle

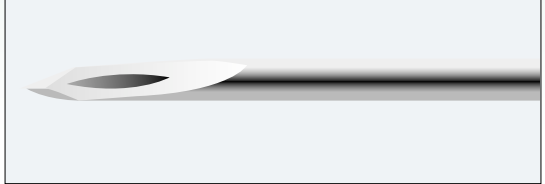
● EXMIRE Needles are made from 304 stainless steel tubing, easily and quickly attached with a simple screw section.

● Semi Lancet cutting of our standard needle point offers smooth septum penetration.

All EXMIRE interchangeable needles can fit all EXMIRE interchangeable type syringes.

(except Luer Lock type, HP type, AOC type)

Semi-lancet cut


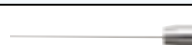


\*Ordering unit of all EXMIRE interchangeable needle(standard) is 5pcs.



## Standard Interchangeable Needle

Point style	Needle Base	O.D.(mm)	I.D.(mm)	Length(mm)	N-Type(Normal)		S-Type(Smaller tip φ)	
					Type	Code	Type	Code
B-style(Bent Point)	Standard	0.52 (N-type) 0.43/0.52 (S-type)	0.18	30	N-30-B	XX*MS01	–	–
				50	N-50-B	XX*MS11	S-50-B	XX*MS16
				75	N-75-B	XX*MS21	S-75-B	XX*MS26
				100	N-100-B	XX*MS31	S-100-B	XX*MS36
				115	N-115-B	XX*MS41	S-115-B	XX*MS46
R12-style(Regular 12)	Standard	0.52 (N-type) 0.43/0.52 (S-type)	0.13	50	N-50-BF	XX*MS11F	–	–
				50	N-50-R12	XX*MS13	S-50-R12	XX*MS18
				75	N-75-R12	XX*MS23	S-75-R12	XX*MS28
				100	N-100-R12	XX*MS33	S-100-R12	XX*MS38
C-style(Cut Point)	Standard	0.52	0.18	115	N-115-R12	XX*MS43	S-115-R12	XX*MS48
				30	N-30-C	XX*MS02		
				50	N-50-C	XX*MS12		
				75	N-75-C	XX*MS22		
SV-style(Side Vented)	Standard	0.52	0.18	100	N-100-C	XX*MS32		
				115	N-115-C	XX*MS42		
				50	N-50-SV	XX*MS15		
				75	N-75-SV	XX*MS25		
		0.52	0.18	100	N-100-SV	XX*MS35		
				115	N-115-SV	XX*MS45		



## Needle for GAN

B-style(Bent Point)	Standard	O.D.(mm)	I.D.(mm)	Length(mm)	Type	Code
		0.56	0.30	30	G-30-B	XX*MS61
				50	G-50-B	XX*MS61(50)



## Luer Lock Needle

B-style(Bent Point)	Luer Lock	O.D.(mm)	I.D.(mm)	Length(mm)	Type	Code
		0.56	0.30	50	–	XX*MSL

## HPLC Needle

C-style(Cut Point)	Standard	O.D.(mm)	I.D.(mm)	Length(mm)	Type	Code
		0.715	0.18	51	–	XX*MSR
		0.52		50		XX*MSW
		0.715		19		XX*MSV

## Needle for Autosampler

B-style(Bent Point)	HP/AOC	O.D.(mm)	I.D.(mm)	Length(mm)	Code	Code
		0.64	0.15	43	XX*MSAOC23	XX*MSHP23
		0.46			XX*MSAOC26	XX*MSHP26
		0.64/0.46			XX*MSAOC23/26	XX*MSHP23/26



# Special Interchangeable Needle

EXMIRE offers a wide variety of special needles for your specific applications.

Following specifications must be indicated in your order.

1. Needle gauge
2. Needle length(10mm to 1,000mm)
3. Point style
4. Type of hub (Standard, Luer lock)
5. Tubing Material (SUS304, SUS316\*, SUS316L\*)

\*Please refer to the size table at P30 for SUS316 and SUS316L.

## ■ Titanium Needle

We have several sizes of needles made of titanium. 22G is in our stock. For other sizes, please contact us.

■ Table of pipe for standard needle

(Material:SUS304)

Gauge	O.D. (mm)	I.D. (mm)
33G	0.20 ±0.02	0.07 ±0.03
32G	0.23 ±0.02	0.08 ±0.03
31G	0.27 ±0.02	0.10 ±0.03
30G	0.31 ±0.02	0.12 ±0.03
28G	0.36 ±0.02	0.17 ±0.03
27G	0.41 ±0.02	0.22 ±0.03
26G	0.46 ±0.02	0.26 ±0.03
25G	0.51 ±0.02	0.25 ±0.03
24G	0.56 ±0.02	0.30 ±0.03
23G	0.64 ±0.02	0.35 ±0.03
22G	0.72 ±0.02	0.41 ±0.03
21G	0.81 ±0.02	0.51 ±0.03
20G	0.89 ±0.02	0.59 ±0.03
19G	1.08 ±0.02	0.69 ±0.03
18G	1.25 ±0.02	0.82 ±0.03
17G	1.46 ±0.03	1.10 ±0.04
16G	1.65 ±0.03	1.24 ±0.04
15G	1.81 ±0.03	1.47 ±0.04
14G	2.11 ±0.03	1.69 ±0.04
Exmire Standard	0.52 ±0.02	0.18 ±0.02
Exmire Fine Needle	0.52 ±0.02	0.13 ±0.02
R	0.715 ±0.02	0.18 ±0.03
HP26	0.46 ±0.02	0.15 ±0.02
HP23	0.64 ±0.02	0.15 ±0.02

# Parts and Accessories

## PTFE tip

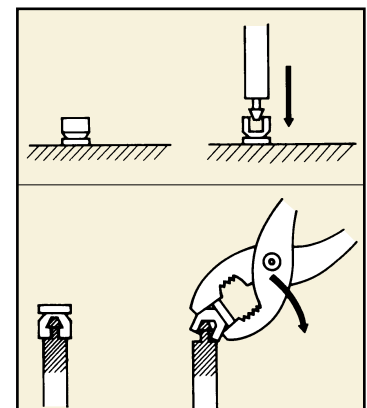
### PTFE tip for Gas Tight syringes



Code No.	Applicable Volume	Applicable syringe type
TEF001	10 $\mu$ l	MS*GF10, MS*GFN10
TEF002	25 $\mu$ l	MS*GF25, MS*GFN25,
TEF005	50 $\mu$ l	MS*GF50, MS*GFN50
TEF010	100 $\mu$ l	MS*GF100, MS*GFN100
TEF025	0.25ml	MS*GAN025, MS*GLL025
TEF050	0.50ml	MS*GAN050, MS*GLL050
TEF100	1.0ml	MS*GAN100, MS*GLL100
TEF250	2.5ml	MS*GAN250, MS*GLL250
TEF500	5.0ml	MS*GAN500, MS*GLL500
TEFX00	10.0ml	MS*GANX00, MS*GLLX00
TEF2500	25.0ml	MS*GAN2500, MS*GLL2500

### Fitting

- Put tip on a flat clean table.
- Keeping the plunger upright, push into the tip carefully.
- If the tip is mounted incorrectly, it may cause leakage or have a short life time.



### Removing

- TEF001 to TEF100 can be removed by tweezers.
- TEF250 to TEF2500: make a slit in the body of tip with a sharp knife, then remove by tweezers.

## Syringe Cleaning Kit

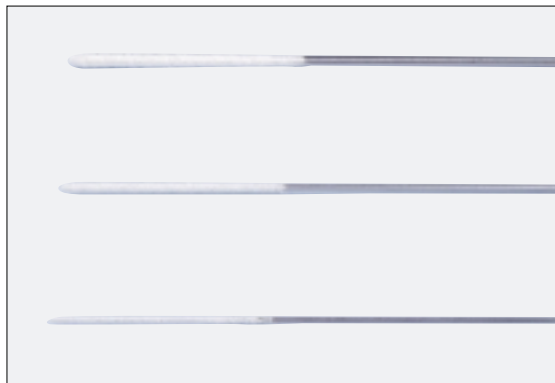
### Cleaning set for syringe and needle

- Cleaning bar is to clean the dirt of ID of syringe.
- There are 2 types depending on the syringe size and type.
  - A type : Syringe for 5  $\mu$ l, 10  $\mu$ l, AOC/HP type syringe
  - B type: Syringe for 25  $\mu$ l, 50  $\mu$ l, 100  $\mu$ l
- \* Cleaning bar for MS\*01U and MS\*05 is not available.
- Cleaning wire is to clear the clog of the needle.

#### A type

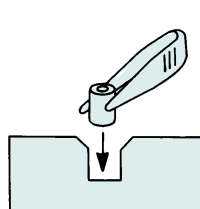
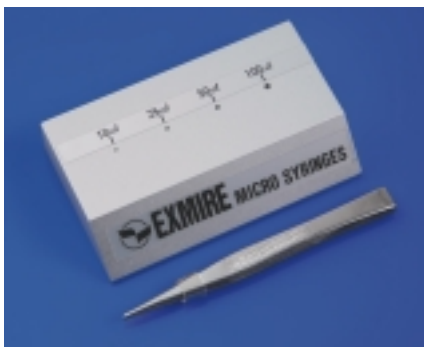


#### B type

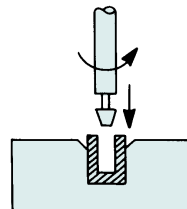


## Tip fixing kit (Code No. TK\*001)

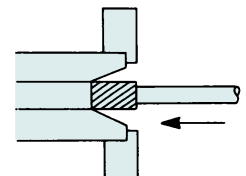
- There is no difficulty in fixing a small tip to a plunger with this tool.
- Fixing Kit offers simple and accurate fitting of small tips.
- Available for TEF001~TEF010(10  $\mu$ l~100  $\mu$ l)



■ Pick up the tip with the tweezers and insert it into the appropriate hole.



■ Keeping the plunger upright and twisting it slightly, insert it into the tip carefully.



■ Insert the plunger into the syringe slowly.

# Special technique for pipe/nozzle and other special products

Our high quality processing techniques including polished bores, tapering, and intricate shaping of various types and sizes of stainless pipes that can meet your specific requirements.

## Pipe/Nozzle

**POLISHED BORES**

P22

**EACH PROCESSING**

P23 · P24

Bending / Tapering / Tip Processing / Grooved Nozzle / Laser Welding

**RESIN NOZZLE**

P25

**SURFACE TREATMENT**

Metal Coating / PTFE Coating

P25

**PTFE TUBE JOINING**

P26

**ULTRA FINE PIPE**

P26

**CAPILLARY PIPE FOR LC**

P26

**HEATING NOZZLE**

P27 · P28

## Other products

**SWITCHING VALVE**

P29

**STIRRER**

P29

**Our Integrated system of production from pipe and most of parts processing, assembling to finished product will help you to meet special design for your application.**

**■ Provide you cleaner pipes**

If the impure substance is attached to the surface of pipe, it can not be easily removed. We reviewed the manufacturing process and developed technical know-how. We are manufacturing the pipe from the first stage with the greatest care so that we are able to offer high quality pipe to customers who are using it in the analytical field.

**■ Explore better surface roughness**

Even though the pipe is clean, it will lead to contamination and incomplete washing if the surface of pipe ID is rough. EXMIRE offers pipe with a mirror like finish. These pipes are environmentally friendly, because the washing time and the volume of rinse solution will be reduced.

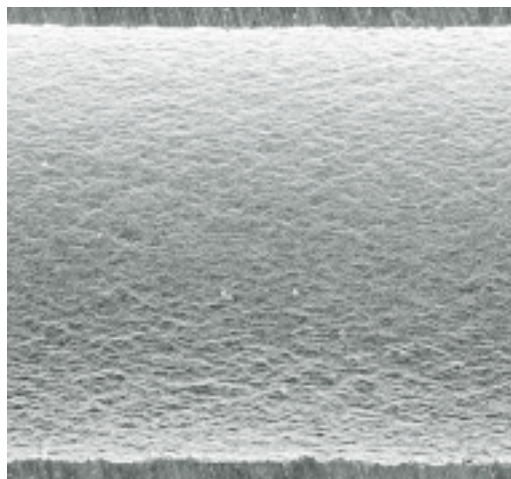
**POLISHED BORES**

**We have 2 types of pipe with good surface roughness of ID.**

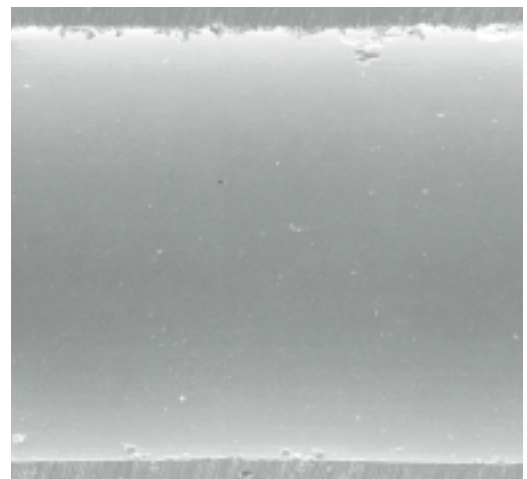
**● Inner polishing**

Polishing the ID of pipe with special technique.  
We apply the polishing technique for syringe to pipe polishing.

<Surface Roughness>  
Original pipe---Ra1.03μm  
After polish---Ra0.04μm



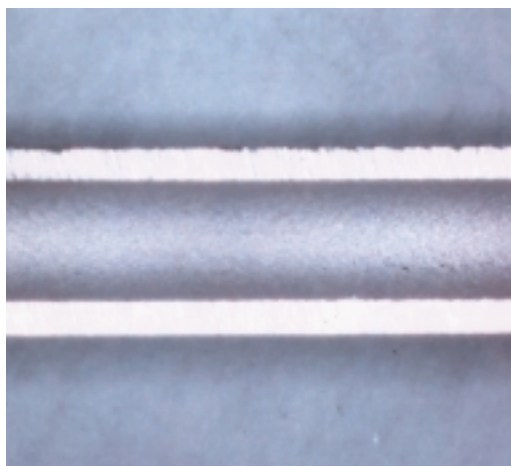
original pipe



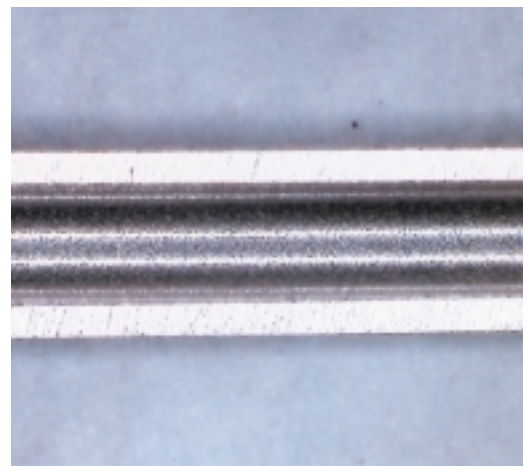
After polish

**● Mirror like pipe**

EXMIRE has special technique to make SUS316L pipe ID mirror-like in the process of production.  
(ID more than 0.5mm)



standard pipe



mirror-like pipe



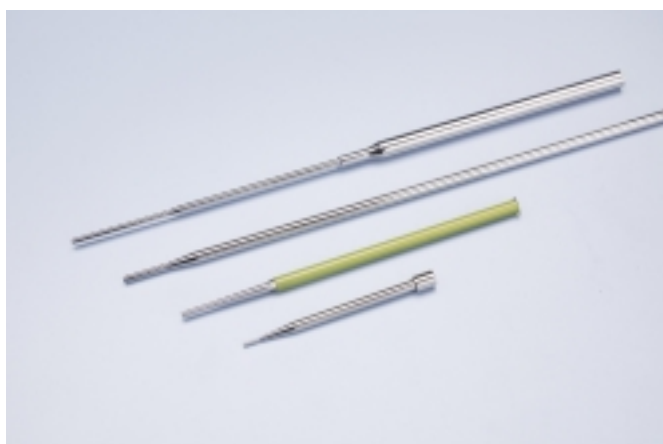
## BENDING

- EXMIRE pipe bent minimizing the flat below 10%, will ensure the maximal flow of liquid.
- Several types of bending, including rectangular and clamp, loop bending are available.
- Inner polished pipe is able to be bent.



## TAPERING

- EXMIRE pipe with taper greatly contributes to preventing drops and to improve the minute amount of dispensing.  
Taper angle:  $6^\circ$  ,  $12^\circ$  ,  $30^\circ$   
Greatest taper: Pipe OD from  $\phi 2.0\text{mm}$  to PIPE ID  $\phi 0.2\text{mm}$
- 1 step / 2 steps taper is available.
- Please ask for special angle.
- Pipe with polished ID is able to be tapered.



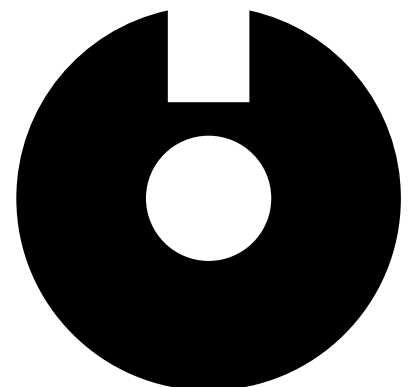
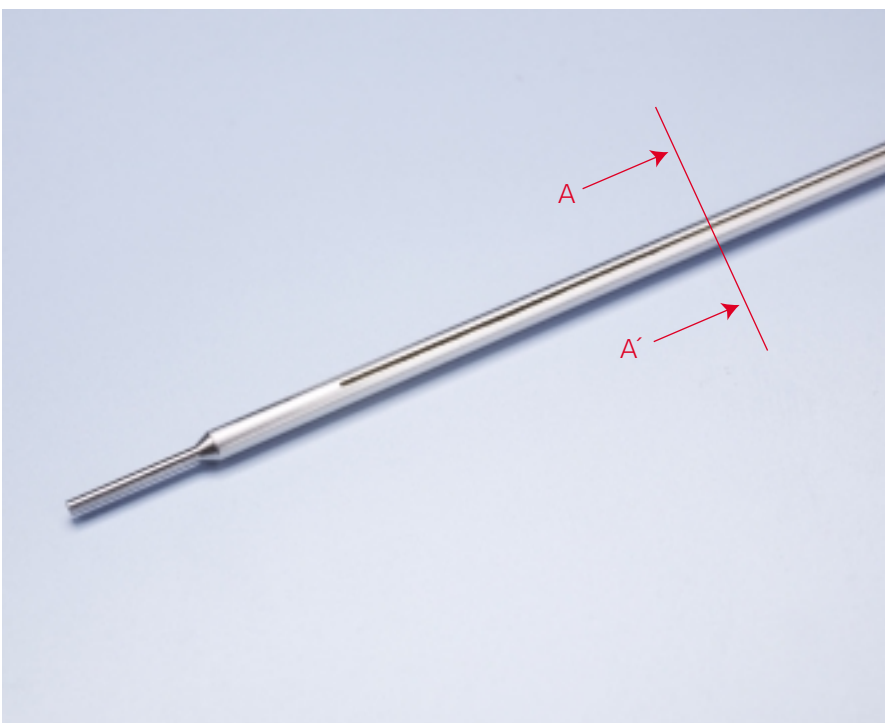
## TIP PROCESSING

- Tip processing to suck liquid in the bottle covered with rubber lid.
- This type of shape will avoid clogging of rubber.



## GROOVED NOZZLE

- Thick part of nozzle is grooved to release the air during thrusting to the bottle with lid.
- Groove measurement: width: about 0.3mm, depth: about 0.3mm
- Thickness of grooved part needs to be more than 0.15mm from ID.



A-A' cross-section view

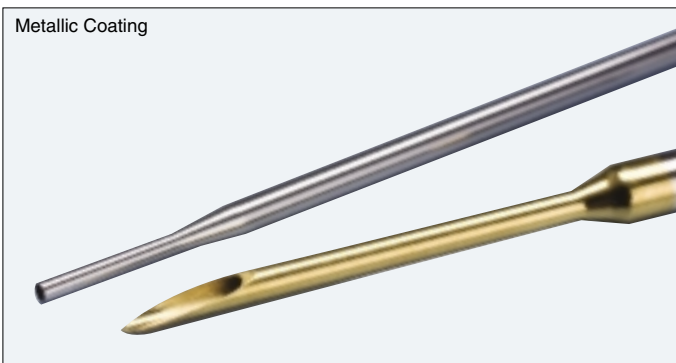
## RESIN NOZZLE

- Pipe made of PEEK resin is tapered and shaped to the nozzle.  
Pipe for liquid not suitable to Stainless.



## SURFACE TREATMENT

- PTFE coating and Metallic coating on the surface of pipe is available.  
Coatings improve the water-shedding and abrasion strength.
- There are 3 types of PTFE coating for different uses including water-shedding, isolation, heat resistant, adhesion etc.
  1. Black: high adhesion, withstand high temperature including for autoclave
  2. Gray: high water-shedding, effective against contamination
  3. Green: excellent isolationThickness of coating: from  $10\mu\text{m}$  to  $30\mu\text{m}$
- Metallic coating  
Metallic coating is effective against abrasion with its hardness and improves water-shedding.  
Thickness of coating: from  $1\mu\text{m}$  to  $10\mu\text{m}$



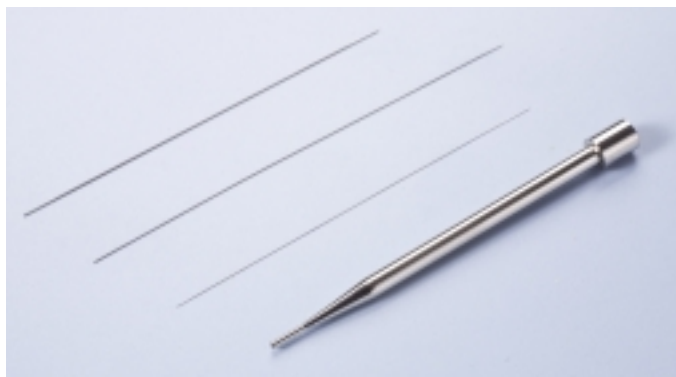
## PTFE TUBE JOINING

- PTFE tube is inserted into the metal pipe and the same effect as pipe with PTFE coating inside of pipe is expected.  
Pipe with PTFE tube has advantage of fluorine resin against used liquid.
- Minimum I.D. of PTFE tube: 0.2mm



## ULTRA FINE PIPE

- We will meet the growing need for ultra fine pipe with our high techniques.  
Minimum I.D: 0.03mm



## CAPILLARY PIPE FOR LC

- As capillary pipe is easy to bend, it allows flexible piping.

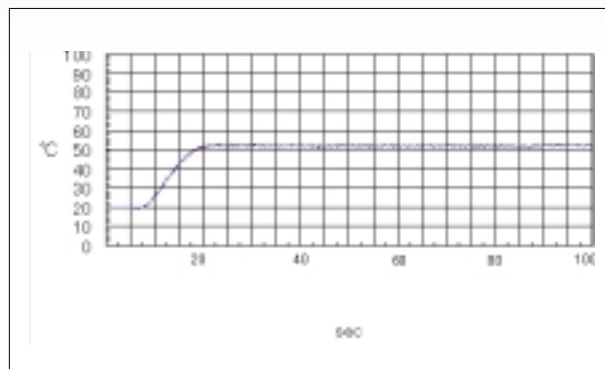
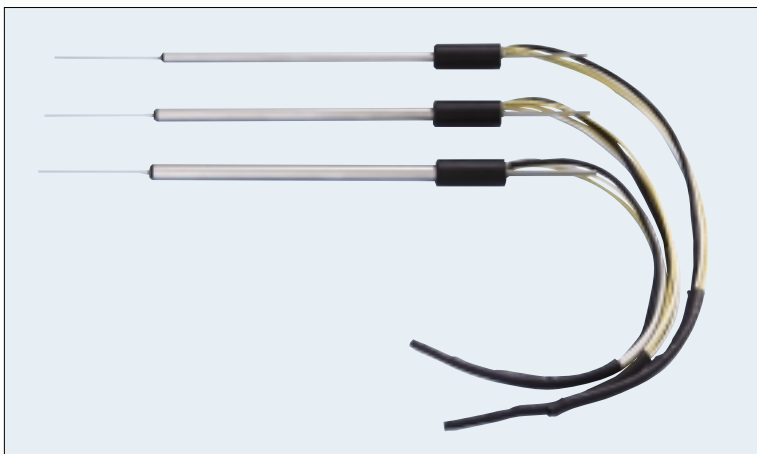
Pipe O.D:        both end: 1/16 inch  
                      Center: 0.5mm  
Pipe I.D:        0.13mm, 0.25mm  
Length(total):  105mm, 200mm, 280mm,  
                      400mm, 600mm

Contact us for other sizes.



## STANDARD HEATING NOZZLE

High quality nozzle contains heater with steady temperature rising and fluid level detection. 3 types of volume are available. These standard types of heating nozzle are able to be delivered at a reasonable price and short delivery time.



Feature of temperature rising for NH\*300  
Accuracy of temperature control: within  $\pm 1^{\circ}\text{C}$

Unit not defined: mm

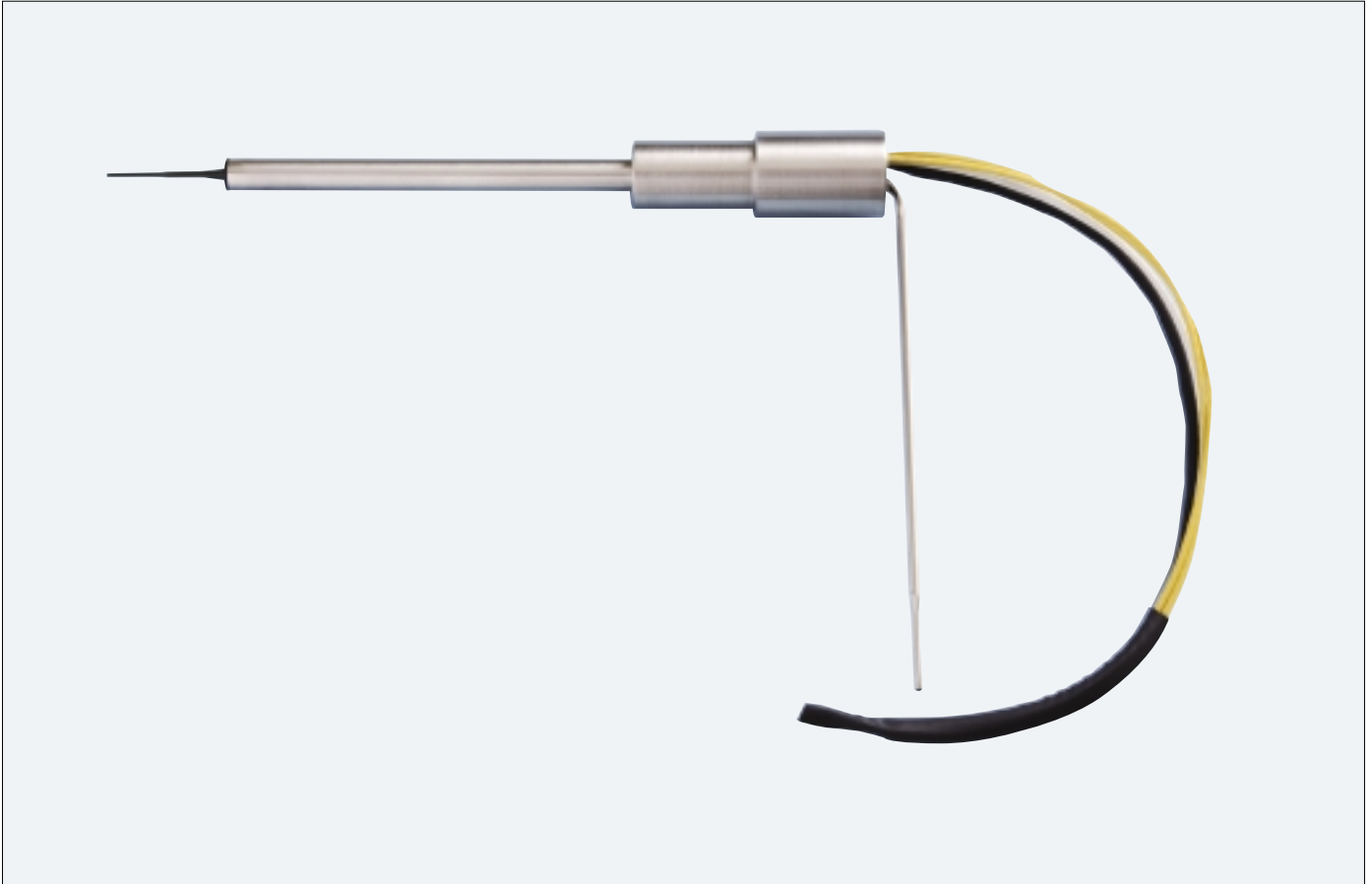
Code No.		NH*100	NH*200	NH*300			
Nozzle	Volume	100 $\mu\text{l}$	200 $\mu\text{l}$	300 $\mu\text{l}$			
	Material	SUS316 or SUS316L					
	Total length	200mm					
	Tip (wetted part)	O.D.	( $\phi$ 0.8)	( $\phi$ 1.04)	( $\phi$ 1.06)		
		I.D.	$\phi$ 0.6 $\pm$ 0.04	$\phi$ 0.7 $\pm$ 0.04	$\phi$ 0.8 $\pm$ 0.04		
		cut angle	90°				
		length(thin part)	35mm from taper ( $\pm$ 0.5)				
		surface roughness(O.D.)	$\nabla\nabla\nabla\nabla$ (Ra 0.2 $\mu\text{m}$ )				
	End (piping side)	surface roughness(I.D.)	Ra less than 0.1 $\mu\text{m}$				
		O.D.	$\phi$ 1.27 $\pm$ 0.02	$\phi$ 1.81 $\pm$ 0.03	$\phi$ 2.11 $\pm$ 0.03		
I.D.		$\phi$ 1.07 $\pm$ 0.03	$\phi$ 1.47 $\pm$ 0.03	$\phi$ 1.85 $\pm$ 0.03			
Appearance	External pipe	material	SUS316				
		O.D.	$\phi$ 4.0	$\phi$ 5.2	$\phi$ 6.0		
	Holder	material	POM (Black)				
		O.D.	$\phi$ 10.0				
Length	25mm						
Electrical specification	Heater part	Voltage	12V	24V			
		Volume	12W	24W			
		Resistance	12 $\Omega$	24 $\Omega$			
	Protection feature	Temperature fuse/102°C *Nonrecoverable after fuse melt-down					
	Temperature detection	Thermistor /Shibaura electronics corporation(PB7-43-01)NTC type					
	Liquid surface detection	Electric capacity with 2 wires					
	Wire	Heater	Yellow wire(AWG23, UL10504)2 pcs.				
Thermistor		White wire(AWG23, UL10504)2 pcs.					
Liquid surface detection		Twist pair wire with shield (AWG28, Style No.2794) Red:Nozzle / White:Electrode					
Length		150mm/ea(from the end of holder)					
Temperature rising ability	Continuously pouring water	Required time for $\Delta t$ 30°C *1)	within 20 sec.	within 30 sec.	within 20 sec.		
		Flow volume	1.2ml/min.	2.4ml/min.	3.6ml/min.		
	Suction and discharge	$\Delta t$ *2)	Heat up time	3 Sec.	24°C	18°C	25°C
				5 Sec.	28°C	26°C	30°C
				10 Sec.	34°C	31°C	39°C

\*1) The time required to raise discharged water 30°C, since the heater control turn on, keeping 20 $\pm$ 2°C water pouring with the volume stated in the above list and setting the operating temperature at 50°C.

\*2) The raise of sucked water in temperature of 20 $\pm$ 2°C before discharged, setting the operating temperature of thermistor at 50°C, with heater control always on.

## CUSTOMIZED HEATING NOZZLE

- We design and manufacture the heating nozzle with special requirements for the analysis instrument with high accuracy and performance upon your request.
- We will meet your needs with our wealth of integrated systems of production from pipe design, choice of heating specifications and liquid surface detection to finished product.



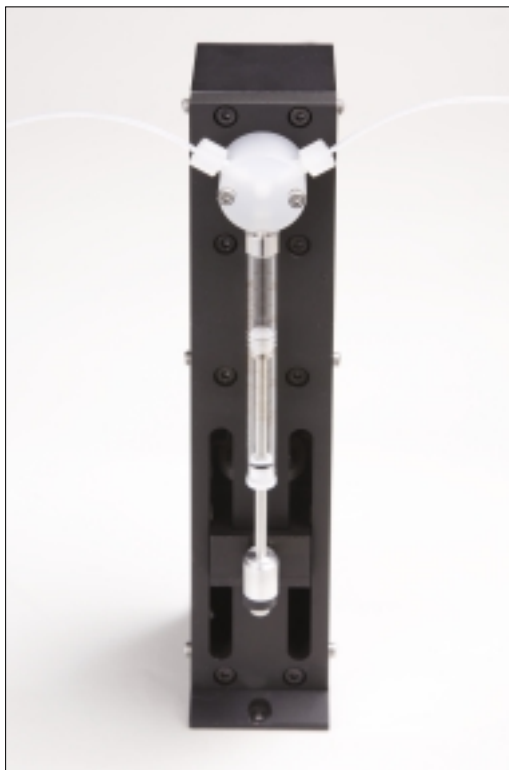
## VALVE



Valve to change over the liquid flow with motor.

- PCTFE and PTFE is used to the wetted material which have high performance on anti-corrosion.
- Compact and simple structure.
- Standard type has 3 port flow. We are able to manufacture 2 and 4 port flow types also.

Contact us for more detailed information.



## STIRRER



Small stirrer for sample and reagent etc.

- Material: SUS316, SUS316L
- PTFE Coating or mirror like polishing on the surface is available.

Contact us for more detailed specifications, including shapes and surface treatment.

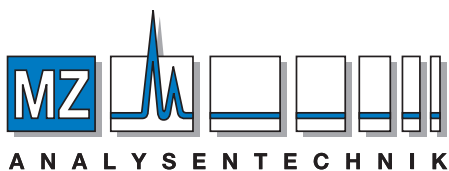


## TABLE OF STANDARD PIPE SIZE FOR NOZZLE

Material: SUS316L  
 The size with \* is SUS316

Gauge	O.D. (mm)	I.D. (mm)
Ultrafine 0.1	0.10±0.02	0.03±0.02
Ultrafine 0.15*	0.15±0.02	0.07±0.02
Ultrafine 0.2*	0.20±0.02	0.10±0.02
33G*	0.20±0.02	0.07±0.03
32G	0.23±0.02	0.08±0.03
31G	0.27±0.02	0.10±0.03
30G	0.31±0.02	0.12±0.03
29G	0.33±0.02	0.14±0.03
28G	0.36±0.02	0.17±0.03
27G	0.41±0.02	0.20±0.03
26G	0.46±0.02	0.24±0.03
25G	0.51±0.02	0.30±0.03
24G	0.56±0.02	0.34±0.03
23G	0.64±0.02	0.42±0.03
22G	0.72±0.02	0.51±0.03
21G	0.82±0.02	0.60±0.03
20G	0.90±0.02	0.68±0.03
19G	1.08±0.02	0.82±0.03
18G- I	1.20±0.02	0.94±0.03
18G- II	1.27±0.02	0.94±0.03
18G- III	1.27±0.02	1.07±0.03
17G	1.45±0.03	1.21±0.03
16G- I	1.65±0.03	1.34±0.03
16G- II	1.65±0.03	1.41±0.03
15G	1.81±0.03	1.47±0.03
14G	2.11±0.03	1.85±0.03
13G	2.40±0.03	2.08±0.03
12G	2.70±0.03	2.40±0.03

\*Please contact us for special sizes.



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