

**Remarkable 5 $\mu$ m syringe type atomizer**

**Model No. SA-01**

**Instructions**

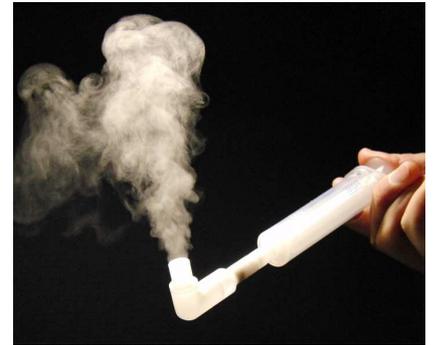
 **Nozzle Network Co.,Ltd. Japan**

## Remarkable 5µm syringe type atomizer [SA-01] Instructions

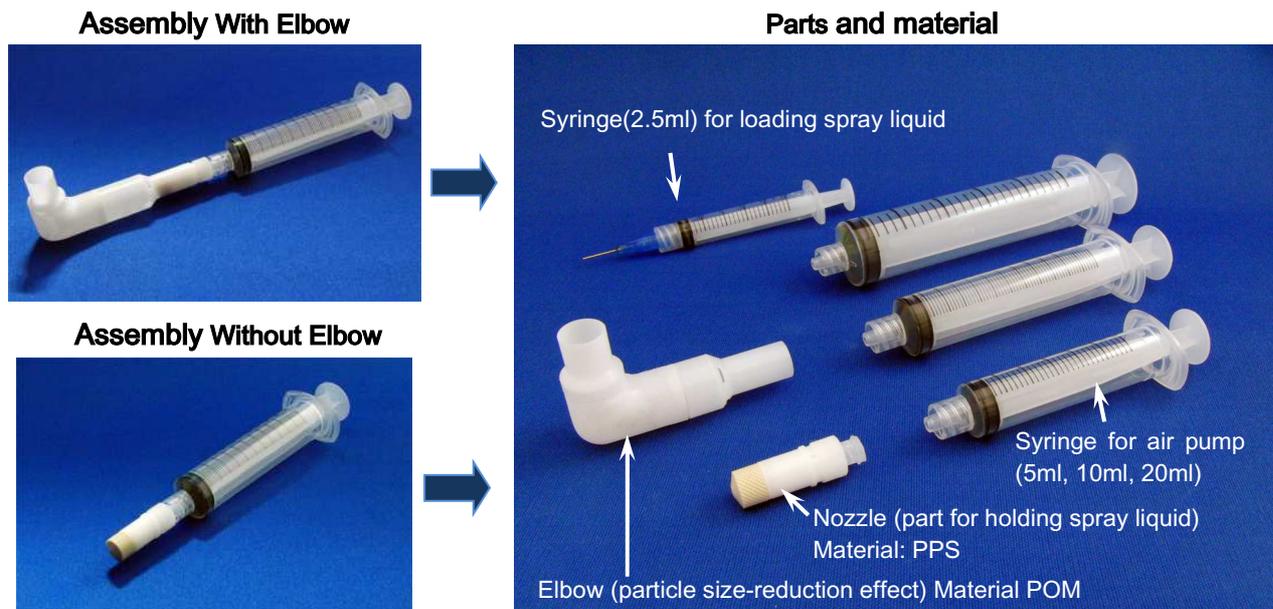
This principle of atomization, which can easily produce a 5µm fog, does not yet exist elsewhere in the world. (Patent pending)

### 1. Features of the syringe type atomizer

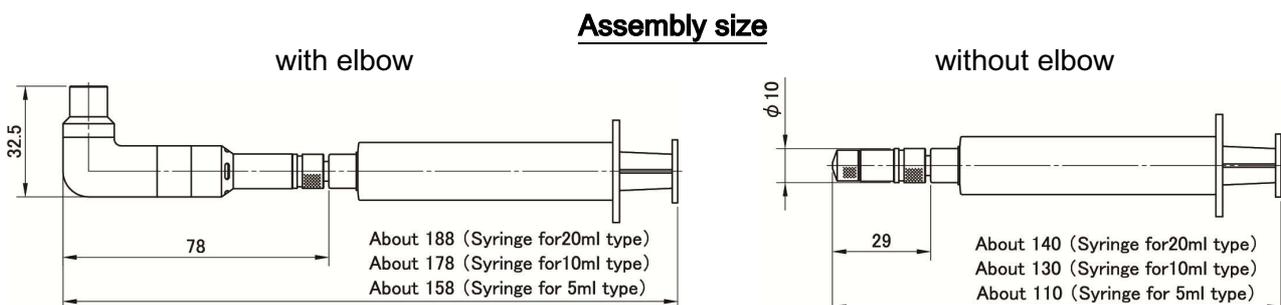
- i. Needs no electricity. Syringe operated air-pressure driven atomizing nozzle.
- ii. New atomization principle allows a small volume of air from a syringe to generate a 5µm fog.
- iii. Can be used repeatedly.
- iv. We can make trial products of this low-cost disposable-type device for your company, and then we will (with certain conditions attached) cede the technology to you for high volume production.



### 2. Components of the product and material



The 2.5 ml syringe for loading spray liquid is unnecessary in a disposable-type product because the liquid can be preloaded into the device during manufacture.



### 3. Choice of atomization performance

#### Choose atomization performance by syringe size or accessories.

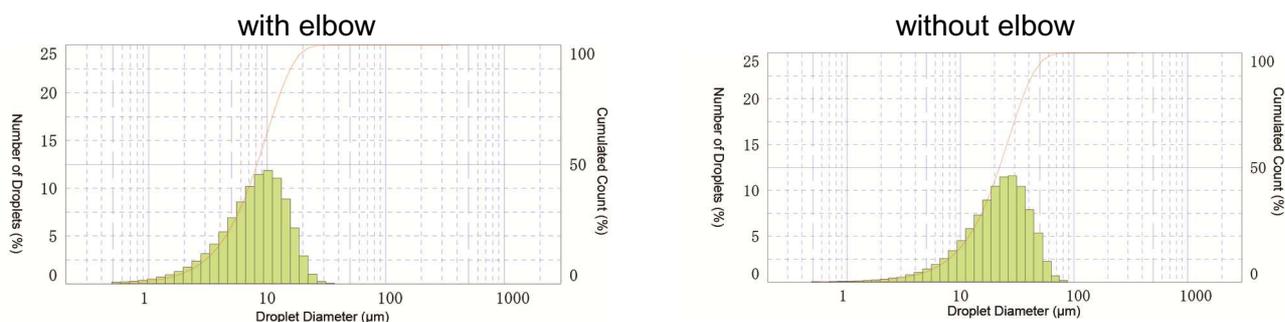
- This performance is measured by atomizing purified water. (Please refer to the following table.)
- Performance will vary depending on the force applied to the syringe plunger, and the viscosity and density of the liquid to be atomized.
- Performance of actual product might differ slightly from that shown in chart below.

Item		Fine particle atomization (with elbow (caution 1))	Coarse particle atomization (without elbow)	
Construction and atomization				
Syringe for air pump  <b>5ml type</b>	flow rate of atomization (Number of discharges and flow rate of atomization which can be produced repeatedly by a single loading of spray liquid.)	<b>5.77</b> $\mu\text{L}$ ( $\mu\text{L}/\text{three pushes}$ )	<b>55.62</b> $\mu\text{L}$ ( $\mu\text{L}/\text{three pushes}$ )	
		<b>1.92</b> $\mu\text{L}$ ( $\mu\text{L}/\text{one push}$ )	<b>18.54</b> $\mu\text{L}$ ( $\mu\text{L}/\text{one push}$ )	
	Average diameter of the particles ( $\mu\text{m}$ ) <i>(caution 2)</i>	<b>SMD</b>	<b>5.21</b>	<b>13.13</b>
		<b>VMD</b>	<b>8.56</b>	<b>22.34</b>
<b>D50</b>		<b>7.75</b>	<b>20.39</b>	
Syringe for air pump  <b>10ml type</b>	flow rate of atomization (Number of discharges and flow rate of atomization which can be produced repeatedly by a single loading of spray liquid.)	<b>6.50</b> $\mu\text{L}$ ( $\mu\text{L}/\text{two pushes}$ )	<b>53.72</b> $\mu\text{L}$ ( $\mu\text{L}/\text{two pushes}$ )	
		<b>3.25</b> $\mu\text{L}$ ( $\mu\text{L}/\text{one push}$ )	<b>26.86</b> $\mu\text{L}$ ( $\mu\text{L}/\text{one push}$ )	
	Average diameter of the particles ( $\mu\text{m}$ )	<b>SMD</b>	<b>5.66</b>	<b>14.58</b>
		<b>VMD</b>	<b>9.52</b>	<b>23.69</b>
<b>D50</b>		<b>8.58</b>	<b>21.90</b>	
Syringe for air pump  <b>20ml type</b>	flow rate of atomization (Number of discharges and flow rate of atomization which can be produced repeatedly by a single loading of spray liquid.)	<b>7.17</b> $\mu\text{L}$ ( $\mu\text{L}/\text{one push}$ )	<b>52.98</b> $\mu\text{L}$ ( $\mu\text{L}/\text{one push}$ )	
	Average diameter of the particles ( $\mu\text{m}$ )	<b>SMD</b>	<b>5.92</b>	<b>15.99</b>
		<b>VMD</b>	<b>9.50</b>	<b>24.76</b>
<b>D50</b>		<b>8.70</b>	<b>22.16</b>	

**(Caution 1)** When the atomizer has an elbow, some accumulation of liquid will occur in the elbow during use, so please drain in a timely fashion.

**(Caution 2)** Regarding the kind and average diameter of the particles  
 SMD: Sauter Mean Diameter (Volume / Surface area mean diameter)  
 VMD: Volume Mean Diameter (MMAD approximation)  
 D50: Volume Median Diameter

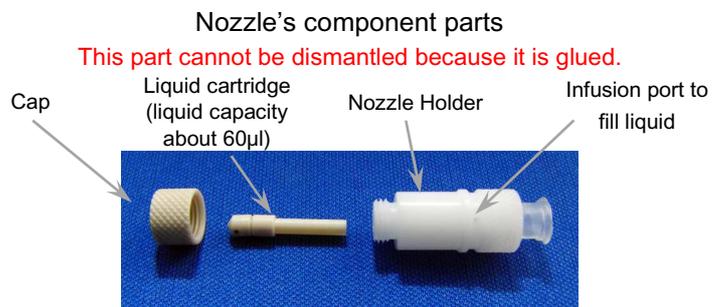
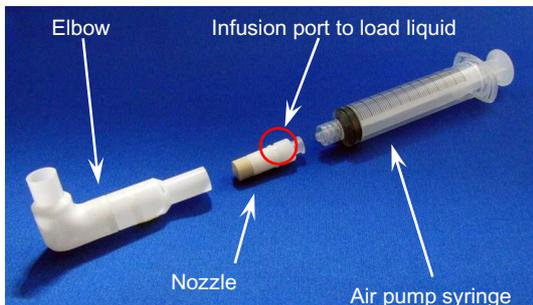
#### Example of particle size distribution



## 4. Description

Please study the following description of parts before using this product.

### 4-1. Description of parts

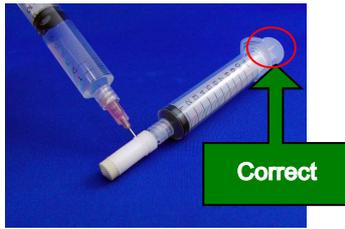


When the liquid is introduced via the Infusion port, which is on the side of nozzle body, it can be injected into the liquid cartridge.

### 4-2. Operating procedure

<b>Step 1</b>	<p><b>Choice of syringe size for air pump</b></p> <p>In the case of a 20ml syringe, the liquid cartridge will be emptied with a single push of the plunger rod.</p> <p>In the case of a 10ml syringe, spray twice or three times by repeating steps 4 and 5.</p>	
<b>Step 2</b>	<p><b>Infuse liquid</b></p> <ul style="list-style-type: none"> <li>* To fill the nozzle with the liquid to be sprayed, use a 2.5ml adjunctive syringe (size 2.5ml) to introduce the liquid via the infusion port on the side of the nozzle.</li> <li>* The nozzle is filled when a drop of liquid comes out of its end.</li> <li>* The smallest free passage diameter of the nozzle's liquid orifice is <math>\phi 0.15\text{mm}</math>.</li> </ul> <p>Foreign matter should not be allowed to enter and clog the nozzle because it cannot be dismantled for clearing.</p> <ul style="list-style-type: none"> <li>* Please avoid the use of any liquid which is strongly corrosive, or which dries and solidifies.</li> </ul>	
<b>Step 3</b>	<p><b>Choose with or without elbow</b></p> <p>The elbow is easily attached to or detached from the nozzle.</p>	
<b>Step 4</b>	<p><b>Pull the syringe plunger rod</b></p> <p>Gently pull out the syringe plunger rod.</p>	
<b>Step 5</b>	<p><b>Atomize fog by pushing the plunger rod</b></p> <ul style="list-style-type: none"> <li>* A single moderately firm burst of pressure on the plunger rod produces atomization.</li> <li>* As the fog is very fine, it is best observed in brightly lit or backlit conditions. (Please refer to step 4-3 for how to observe fog.)</li> </ul>	
<b>Step 6</b>	<p><b>Drain the elbow</b></p> <p>When the syringe is fitted with the elbow, condensed liquid will accumulate inside the elbow. Please empty it out on a timely basis.</p>	

Please follow the instructions below; otherwise a normal fog will not result.



Push the plunger rod in fully before introducing the liquid.



Do not introduce the liquid with the plunger rod pulled out.

#### 4-3. How to observe fog

Fine fog might not be readily observable in sunlight or under interior illumination.

Fog is best observed against bright back-lighting.

Interior illumination



Back-lighting



## Caution

1. Please understand that the specifications of this product might be changed without notice.
2. Because the fine fog generated by this product evaporates immediately after spraying, please do not use liquids that might be harmful to humans.
3. Please do not administer to living things. (Please confer with us in advance when medical use is being considered.)
4. Please do not use the product in any way that violates applicable statutes.
5. Nozzle Network Co., Ltd. will not be held liable in any way for any problems that may arise as a result of use of this product.