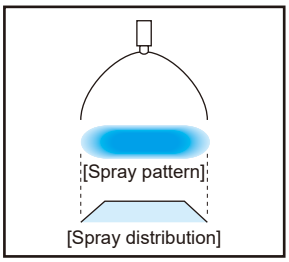
# Ultra-Thick Even Flat Spray
# Semi-fine, Semi-coarse Fog Nozzles

**DDA**



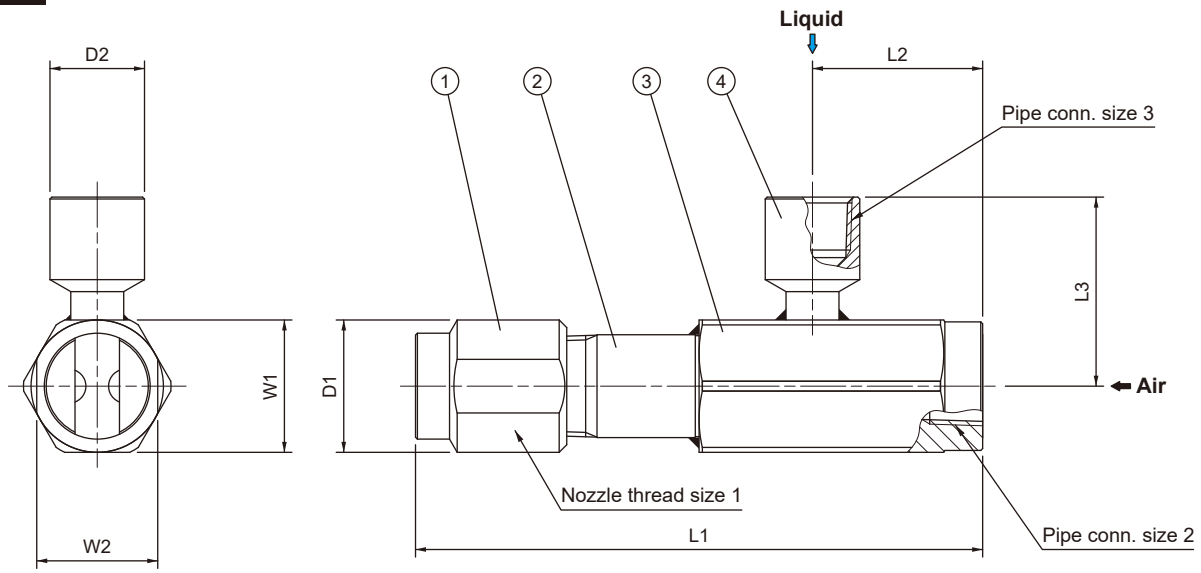

■Thick even flat spray pneumatic nozzle producing a large volume of semi-fine atomization with a mean droplet diameter of 50 µm or more.*1
■Thicker flat spray pattern covers wider area.
■Large turn-down ratio with minimal variation in spray angle.
■Spray droplet size is uniform across the entire spray area.
■Even distribution suitable for multiple-nozzle arrangements.
■Large free passage diameter minimizes clogging.

*1) Droplet diameter measured by the Fraunhofer diffraction method.
Please see pages 7–8 for comparison with laser Doppler method.

## APPLICATIONS

■Cooling: Steel plates, steel pieces, steel pipes, castings

## DRAWING




■COMPONENTS AND MATERIALS

| No. | Components | Standard materials |
|---|---|---|
| 1 | Nozzle body | S303 |
| 2 | Pipe | S304 |
| 3 | Mixing adaptor | S304 |
| 4 | Liquid socket | S304 |

Component #2 is not included for the DDA series with Rc1/4 pipe connection size.

## DIMENSIONS

| Nozzle thread size 1 | Pipe connection sizes 2 & 3*2 | L1*3 (mm) | L2 (mm) | L3 (mm) | W1 (mm) | W2 (mm) | øD1 (mm) | øD2 (mm) | Weight*4 (g) |
|---|---|---|---|---|---|---|---|---|---|
| Rc1/8 | Rc1/4 | 70 | 32.5 | 40 | 24 | 16 | 18 | 16 | 170 |
| Rc1/4 | | 70 | 32.5 | 40 | 24 | 16 | 18 | 16 | 180 |
| Rc1/2 | Rc1/2 | 130 | 40 | 50 | 27 | 25 | 28 | 25 | 450 |
| Rc3/4 | | 150 | 45 | 50 | 35 | 32 | 35 | 25 | 650 |

*2) Pipe connection sizes for air and liquid are the same.
*3) L1 shows the standard length, which is the shortest, and the longest length is 1,500 mm.

*4) Each weight shows DDA with standard length (L1).
For longer lengths, add the corresponding weight for each 100 mm of length as listed below.

| Nozzle thread size 1 | Weight per 100 mm |
|---|---|
| Rc1/8 | 50 g |
| Rc1/4 | 80 g |
| Rc1/2 | 160 g |
| Rc3/4 | 220 g |

## PERFORMANCE DATA

| Spray angle code | | Spray capacity code | Nozzle thread size 1 | Pipe conn. size 2,3 | Air press. (MPa) | Spray capacity (L/min) & Air consumption (L/min, Normal) | | | | | | | | | | Mean droplet diameter (μm) | | Free passage diameter (mm) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | Liquid pressure (MPa) | | | | | | | | | | | | | | |
| | | | | | | 0.07 | | 0.1 | | 0.2 | | 0.4 | | 0.7 | | | | | | |
| Width | Thick-ness | | | | | Liquid | Air | Liquid | Air | Liquid | Air | Liquid | Air | Liquid | Air | Immersion sampling method | Fraunhofer diffraction method | Tip orifice | Adaptor | |
| | | | | | | | | | | | | | | | | | | | Liquid | Air |
| 125 | 20 | 70 | Rc 1/4 | Rc 1/4 | 0.1 | 1.51 | 29 | 2.22 | 24 | — | — | — | — | — | — | 200–300 | 100–150 | 2.4 | 2.2 | 1.5 |
| | | | | | 0.2 | 1.39 | 47 | 2.02 | 47 | 3.18 | 45 | 5.13 | 33 | 7.07 | 18 | | | | | |
| | | | | | 0.3 | 1.29 | 63 | 1.84 | 63 | 2.92 | 63 | 4.77 | 55 | 6.66 | 41 | | | | | |
| | | | | | 0.4 | 1.19 | 79 | 1.70 | 79 | 2.70 | 79 | 4.42 | 77 | 6.29 | 64 | | | | | |
| 110 | 25 | 36 | Rc 1/4 | Rc 1/4 | 0.1 | 0.87 | 34 | 1.20 | 34 | 1.87 | 31 | — | — | — | — | 200–300 | 100–150 | 2.0 | 1.7 | 1.5 |
| | | | | | 0.2 | 0.75 | 50 | 1.10 | 50 | 1.76 | 49 | 2.80 | 44 | 3.70 | 36 | | | | | |
| | | | | | 0.3 | 0.63 | 66 | 1.00 | 66 | 1.66 | 66 | 2.64 | 64 | 3.64 | 57 | | | | | |
| | | | | | 0.4 | 0.50 | 82 | 0.90 | 82 | 1.55 | 82 | 2.50 | 82 | 3.60 | 76 | | | | | |
| | 20 | 50 | Rc 1/4 | Rc 1/4 | 0.1 | 1.20 | 46 | 1.62 | 46 | 2.72 | 41 | — | — | — | — | 200–300 | 100–150 | 2.4 | 2.0 | 1.8 |
| | | | | | 0.2 | 1.00 | 69 | 1.47 | 69 | 2.45 | 65 | 3.86 | 55 | 5.13 | 43 | | | | | |
| | | | | | 0.3 | 0.80 | 92 | 1.28 | 92 | 2.17 | 91 | 2.56 | 85 | 5.04 | 72 | | | | | |
| | | | | | 0.4 | 0.60 | 114 | 1.10 | 114 | 1.93 | 114 | 3.30 | 111 | 4.86 | 99 | | | | | |
| 100 | 45 | 470 | Rc 3/4 | Rc 1/2 | 0.1 | 8.79 | 220 | 15.6 | 170 | — | — | — | — | — | — | 120–350 | 60–175 | 6.0 | 5.8 | 4.1 |
| | | | | | 0.2 | 5.86 | 370 | 12.2 | 330 | 20.2 | 280 | — | — | — | — | | | | | |
| | | | | | 0.3 | 3.45 | 490 | 9.66 | 480 | 15.5 | 443 | 32.1 | 285 | — | — | | | | | |
| | | | | | 0.4 | 1.21 | 610 | 7.07 | 610 | 12.9 | 587 | 20.7 | 491 | 46.3 | 240 | | | | | |
| | 45 | 580 | Rc 3/4 | Rc 1/2 | 0.1 | 12.6 | 278 | 18.8 | 213 | — | — | — | — | — | — | 140–400 | 70–200 | 7.0 | 6.5 | 4.7 |
| | | | | | 0.2 | 6.87 | 500 | 12.2 | 462 | 24.2 | 336 | — | — | — | — | | | | | |
| | | | | | 0.3 | — | — | — | — | 17.9 | 550 | 38.9 | 325 | — | — | | | | | |
| | | | | | 0.4 | — | — | — | — | — | — | 32.5 | 535 | 57.3 | 190 | | | | | |
| | 15 | 25 | Rc 1/8 | Rc 1/4 | 0.1 | — | — | — | — | — | — | — | — | — | — | 30–200 | 15–100 | 2.0 | 1.9 | 1.8 |
| | | | | | 0.2 | — | — | — | — | 1.05 | 37 | — | — | — | — | | | | | |
| | | | | | 0.3 | — | — | — | — | 0.34 | 87 | 2.20 | 24 | — | — | | | | | |
| | | | | | 0.4 | — | — | — | — | — | — | 1.30 | 75 | — | — | | | | | |
| 80 | 20 | 14 | Rc 1/4 | Rc 1/4 | 0.1 | 0.36 | 19 | 0.50 | 19 | 0.71 | 19 | 1.11 | 18 | 1.40 | 17 | 70–150 | 35–75 | 2.0 | 1.1 | 1.2 |
| | | | | | 0.2 | 0.29 | 29 | 0.46 | 29 | 0.68 | 29 | 1.10 | 28 | 1.41 | 27 | | | | | |
| | | | | | 0.3 | 0.22 | 39 | 0.41 | 39 | 0.65 | 39 | 1.08 | 39 | 1.42 | 37 | | | | | |
| | | | | | 0.4 | 0.14 | 49 | 0.37 | 49 | 0.62 | 49 | 1.06 | 49 | 1.43 | 48 | | | | | |
| | 20 | 37 | Rc 1/4 | Rc 1/4 | 0.1 | 0.93 | 33 | 1.35 | 32 | 2.02 | 30 | 3.01 | 24 | 3.74 | 17 | 200–300 | 100–150 | 2.8 | 1.7 | 1.5 |
| | | | | | 0.2 | 0.80 | 51 | 1.23 | 51 | 1.92 | 50 | 2.90 | 47 | 3.74 | 41 | | | | | |
| | | | | | 0.3 | 0.68 | 68 | 1.12 | 68 | 1.83 | 68 | 2.80 | 65 | 3.74 | 61 | | | | | |
| | | | | | 0.4 | 0.57 | 84 | 1.00 | 84 | 1.74 | 84 | 2.72 | 83 | 3.74 | 80 | | | | | |
| | 20 | 50 | Rc 1/4 | Rc 1/4 | 0.1 | 1.06 | 44 | 1.70 | 41 | 2.78 | 32 | — | — | — | — | 200–300 | 100–150 | 2.8 | 2.0 | 1.8 |
| | | | | | 0.2 | 0.86 | 71 | 1.40 | 70 | 2.37 | 65 | 3.79 | 48 | 4.95 | 35 | | | | | |
| | | | | | 0.3 | 0.67 | 96 | 1.18 | 95 | 2.05 | 92 | 3.40 | 82 | 4.84 | 62 | | | | | |
| | | | | | 0.4 | 0.50 | 121 | 0.92 | 121 | 1.68 | 119 | 3.06 | 111 | 4.70 | 89 | | | | | |
| 75 | 25 | 230 | Rc 1/2 | Rc 1/2 | 0.1 | 4.48 | 133 | 7.03 | 116 | — | — | — | — | — | — | 120–300 | 60–150 | 4.0 | 4.1 | 2.9 |
| | | | | | 0.2 | 3.50 | 207 | 5.76 | 199 | 10.4 | 168 | 16.2 | 104 | — | — | | | | | |
| | | | | | 0.3 | 2.54 | 271 | 4.58 | 268 | 9.27 | 249 | 15.1 | 200 | 22.3 | 110 | | | | | |
| | | | | | 0.4 | 1.61 | 330 | 3.47 | 330 | 8.33 | 320 | 14.1 | 278 | 21.7 | 191 | | | | | |

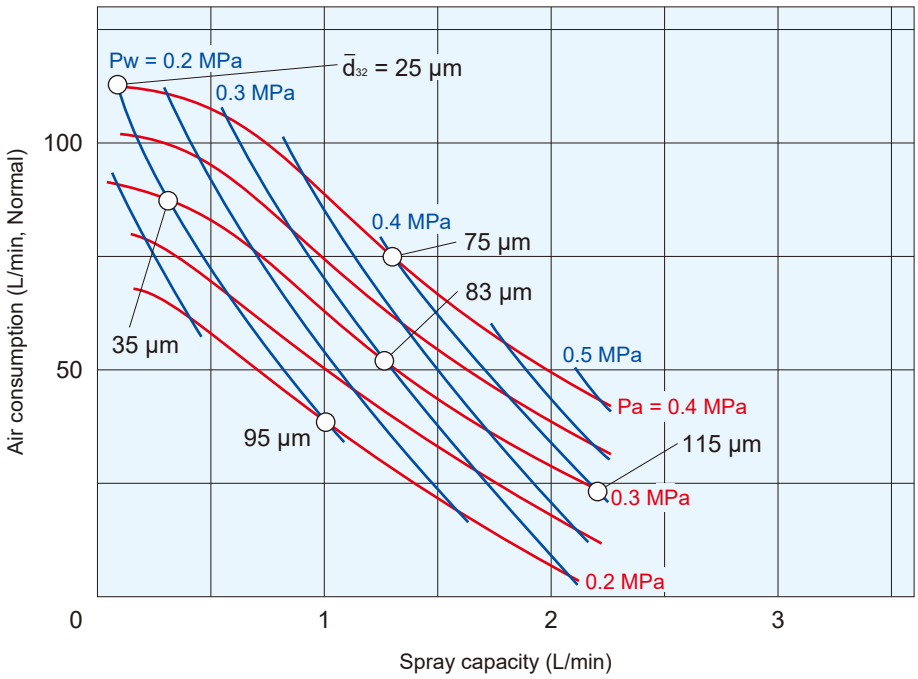
Note: Criteria for spray angle measurement differs depending on nozzle codes.

## FLOW-RATE DIAGRAMS

Nozzle No.: DDA1001525

■How to read the chart

1. The spray capacity shown is for one nozzle.
2. Red lines (—) represent compressed air pressures Pa in MPa.
   Blue lines (—) represent liquid pressures Pw in MPa.
3. Droplet diameter $\bar{d}_{32}$ is Sauter mean diameter measured by the immersion sampling method.




DDA

## HOW TO ORDER

To inquire about or order a specific product please refer to this coding system.

<Example> 1/4 DDA 1252070 × (70) S303-n

| 1/4 | DDA | 125 | 20 | 70 | × | ( | 70 | ) | S303 | - | n |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Nozzle thread size 1 | | Spray angle code (Width) | Spray angle code (Thickness) | Spray capacity code | | | Total length L1 | | Material of nozzle body | | Code of bent pipe*6 |

**■1/8**
**■1/4**
**■1/2**
**■3/4**

**■125**
**■110**
**■100**
**■80**
**■75**

**■45**
**■25**
**■20**
**■15**

**■14**
〜
**■580**

**■Standard (70–150)*5**
**■Max. 1500**

(*6This code will be determined upon receipt of an inquiry.)

*5Standard total length L1 varies with Nozzle thread size 1.
See the table of DIMENSIONS on page 76.