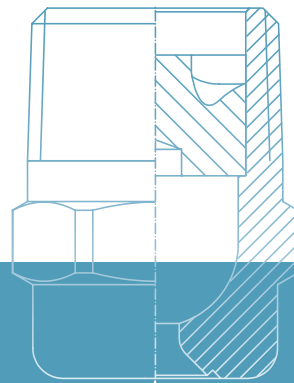
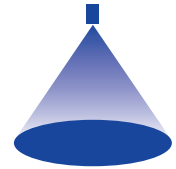


➤➤ FULL CONE NOZZLES

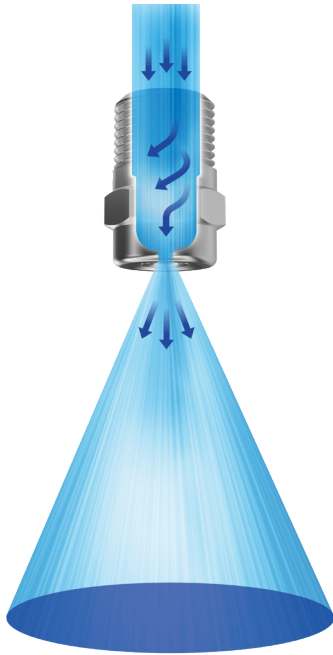


➤ FULL CONE NOZZLES OVERVIEW OF TYPES



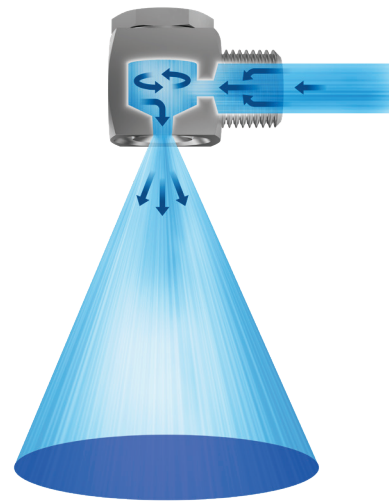
Lechler full cone nozzles are characterised by uniform liquid distribution over the entire circular impact area and are used, among other things, for surface spraying, in cleaning and washing processes and also in chemical process engineering. Full cone nozzles come in a variety of sizes and are made available as an axial full cone or a tangential full cone design. For special applications, unique types are made available, e.g. cluster head nozzles and deflector-plate nozzles.

Axial-flow full cone nozzles



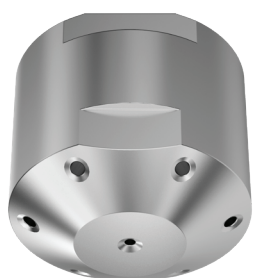
- Axial flow
- Uniform liquid distribution
- Full surface impact
- Extensive flow rate range
- Extensive range of spray angles
- Standard materials:
Stainless steel 316Ti/316L, Brass, PVDF (special material available on request)

Tangential-flow full cone nozzles



- Tangential flow
- Uniform liquid distribution
- Full surface impact
- Maximum free passage making less susceptible to clogging
- Stable spray angle
- Standard materials:
Stainless steel 316L, Brass, PVDF (special material available on request)

Cluster head nozzles



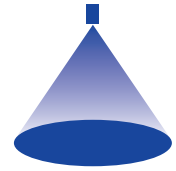
- Axial flow
- Multi-nozzle spray head
- Full surface impact
- Atomized spray – very fine droplets
- Small droplet sizes
- Enlarged droplet surface area
- Standard materials:
Stainless steel 316Ti/316L, Brass
(special material available on request)









Deflector-plate nozzles



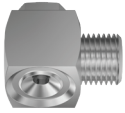





- Axial flow
- Large impact area
- Large free cross sections
- Standard materials:
Stainless steel 316Ti/316L, Brass
(special material available on request)

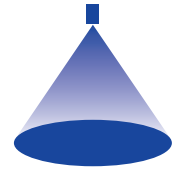
FULL CONE NOZZLES OVERVIEW OF SERIES



| | | Axial-flow full cone nozzles | | | |
|---|------------------------------------|---|---|---|---|
| | |  |  |  |  |
| Series | | 490/491 | 460/461 | 405 | 403 |
| Information on page | | 84 | 87 | 89 | 90 |
|  Flow rate at p = 2 bar | Very low < 5 l/min | • | • | | |
| | Low 5 l/min–25 l/min | • | • | | |
| | Medium 25 l/min–80 l/min | • | • | | |
| | High 80 l/min–400 l/min | | | • | |
| | Very high > 400 l/min | | | | • |
|  Spray angle | Small 45° | • | | | |
| | Medium 60°–90° | • | • | • | • |
| | Large ≥ 120° | • | • | • | • |
|  Nozzle material | Stainless steel | • | | • | • |
| | Brass | • | | • | |
| | Plastic | | • | | |
|  Nozzle connection | | 1/8 BSPT 1/4 BSPT 3/8 BSPT 1/2 BSPT 3/4 BSPP 1 BSPP | 1/8 BSPT 1/4 BSPT 3/8 BSPT 1/2 BSPT 3/4 BSPT 3/4 BSPP 1 BSPP | 1 1/4 BSPP 1 1/2 BSPP 2 BSPP | 2 1/2 BSPP 3 BSPP 3 1/2 BSPP 4 BSPP |

| | | Tangential-flow full cone nozzles | | Cluster head nozzles | Deflector-plate nozzles |
|---|---|---|---|---|---|
|  |  |  |  |  |  |
| 419 | 468 | 422/423 | 422 with bayonet quick-release system | 502/503 | 524/525 |
| 91 | 92 | 93/95 | 97 | 98 | 99 |
| | • | • | • | • | |
| | • | • | | • | • |
| | | • | | • | • |
| • (at p = 1 bar) | | • | | | • |
| • (at p = 1 bar) | | | | | |
| | | | | | |
| • | • | • | • | • | |
| • | • | • | • | • | • |
| • | • | • | | • | • |
| | • | • | | • | • |
| | • | • | • | | |
| 2 BSPP 2 1/2 BSPP 3 BSPP | Assembly with retaining nut 3/8 BSPP | 1/4 BSPT 3/8 BSPT 1/2 BSPT 3/4 BSPT 1 BSPT | Assembly with bayonet quick-release system | 1/2 BSPP 3/4 BSPP | 1/2 BSPP |

➤ Axial-flow full cone nozzles Series 490/491



Features:

- Extremely uniform liquid distribution
- Very stable spray angle
- Non clogging due to large free cross sections

Applications:

- Cleaning and washing processes
- Surface spraying
- Chemical process engineering
- Foam control

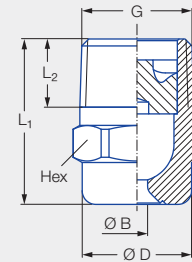


Figure 1

Series 490/491

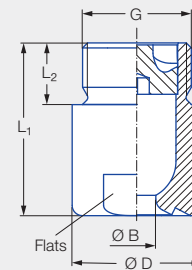


Figure 2

| Code | Figure | G | Dimensions [mm] | | | | Weight [g] (brass) |
|-----------|--------|----------|-----------------|----------------|------|-----------|--------------------|
| | | | L ₁ | L ₂ | Ø D | Hex/Flats | |
| CA | 1 | 1/8 BSPT | 18.0 | 6.5 | 10.0 | 11 | 13.0 |
| CC | 1 | 1/4 BSPT | 22.0 | 10.0 | 13.0 | 14 | 16.0 |
| CE | 1 | 3/8 BSPT | 24.5 | 10.0 | 16.0 | 17 | 30.0 |
| CE | 1 | 3/8 BSPT | 30.0 | 10.0 | 16.0 | 17 | 50.0 |
| CG | 1 | 1/2 BSPT | 32.5 | 13.0 | 21.0 | 22 | 60.0 |
| CG | 1 | 1/2 BSPT | 43.5 | 13.0 | 21.0 | 22 | 85.0 |
| AK | 2 | 3/4 BSPP | 42.0 | 15.0 | 32.0 | 27 | 190.0 |
| AM | 2 | 1 BSPP | 56.0 | 17.0 | 40.0 | 36 | 350.0 |

| Spray angle | Ordering no. | | | | | | | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | | | Spray diameter D [mm] (at p = 2 bar) | | |
|-------------|----------------|----------------------|-------|-----------|-----------|-----------------------|-----------|----------|----------------------|--------------------------------------|------------------|------|------|--------------|-------|-------|-------|--------------------------------------|-----|------|
| | Type | Mat. no. | | Code | | | | | | | p [bar] | | | | | | | H = 250 [mm] H = 500 [mm] | | |
| | | 1Y | 30 | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPP | | | 1 BSPP | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 | 7.0 | | | 10.0 |
| | | Stainless steel 316L | Brass | | | | | | | | | | | | | | | | | |
| 45° | 490.403 | ● | ● | CA | | | | | | 1.25 | 1.25 | 0.57 | 0.76 | 1.00 | 1.18 | 1.44 | 1.65 | 1.90 | 200 | 400 |
| | 490.523 | ● | ● | CA | | | | | | 1.70 | 1.70 | 1.15 | 1.52 | 2.00 | 2.35 | 2.89 | 3.30 | 3.81 | 200 | 410 |
| | 490.603 | ● | ● | | CC | CE¹ | | | | 2.00 | 2.00 | 1.81 | 2.39 | 3.15 | 3.70 | 4.54 | 5.20 | 6.00 | 200 | 410 |
| | 490.643 | ● | ● | | CC | CE¹ | | | | 2.45 | 2.45 | 2.30 | 3.03 | 4.00 | 4.70 | 5.77 | 6.60 | 7.61 | 200 | 410 |
| | 490.683 | | ● | | | CE | | | | 2.55 | 2.55 | 2.87 | 3.79 | 5.00 | 5.88 | 7.21 | 8.25 | 9.52 | 210 | 410 |
| | 490.703 | | ● | | | CE | | | | 2.65 | 2.65 | 3.22 | 4.24 | 5.60 | 6.59 | 8.08 | 9.24 | 10.66 | 210 | 420 |
| | 490.723 | ● | ● | | | CE | | | | 2.85 | 2.85 | 3.62 | 4.77 | 6.30 | 7.41 | 9.09 | 10.40 | 11.99 | 210 | 420 |
| | 490.783 | | ● | | | | CG | | | 3.45 | 3.45 | 5.17 | 6.82 | 9.00 | 10.58 | 12.98 | 14.85 | 17.13 | 210 | 430 |
| | 490.843 | | ● | | | | CG | | | 3.80 | 3.80 | 7.18 | 9.47 | 12.50 | 14.70 | 18.03 | 20.63 | 23.80 | 220 | 430 |

¹ Only available in material 30.

| Spray angle | Ordering no. | | | | | | | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | | Spray diameter D [mm] (at p = 2 bar) | | | |
|-------------|--------------|----------------------|-------|----------|----------|----------|----------|----------|----------------------|--------------------------------------|------------------|-------|-------|-------|--------|--------|--------------------------------------|--------------|-------|-------|
| | Type | Mat. no. | | Code | | | | | | | p [bar] | | | | | | H = 250 [mm] | H = 500 [mm] | | |
| | | 1Y | 30 | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPT | | | 1 BSPT | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 | | | 7.0 | 10.0 |
| | | Stainless steel 316L | Brass | | | | | | | | | | | | | | | | | |
| 60° | 490.404 | ● | ● | CA | | | | | | 1.15 | 1.15 | 0.57 | 0.76 | 1.00 | 1.18 | 1.44 | 1.65 | 1.90 | 260 | 520 |
| | 490.444 | ● | | CA | | | | | | 1.25 | 1.25 | 0.72 | 0.95 | 1.25 | 1.47 | 1.80 | 2.06 | 2.38 | 260 | 520 |
| | 490.484 | ● | ● | CA | | | | | | 1.45 | 1.45 | 0.92 | 1.21 | 1.60 | 1.88 | 2.31 | 2.64 | 3.05 | 260 | 520 |
| | 490.524 | ● | ● | CA | | | | | | 1.60 | 1.60 | 1.15 | 1.52 | 2.00 | 2.35 | 2.89 | 3.30 | 3.81 | 270 | 530 |
| | 490.564 | ● | ● | CA | | | | | | 1.80 | 1.80 | 1.44 | 1.89 | 2.50 | 2.94 | 3.61 | 4.13 | 4.76 | 270 | 530 |
| | 490.604 | ● | ● | CA | CC | CE | | | | 2.05 | 2.05 | 1.81 | 2.39 | 3.15 | 3.70 | 4.54 | 5.20 | 6.00 | 270 | 540 |
| | 490.644 | ● | ● | | CC | CE | | | | 2.30 | 2.30 | 2.30 | 3.03 | 4.00 | 4.70 | 5.77 | 6.60 | 7.61 | 270 | 540 |
| | 490.684 | ● | ● | | CC | CE | | | | 2.60 | 2.60 | 2.87 | 3.79 | 5.00 | 5.88 | 7.21 | 8.25 | 9.52 | 280 | 550 |
| | 490.724 | ● | ● | | CC | CE | | | | 2.95 | 2.80 | 3.62 | 4.77 | 6.30 | 7.41 | 9.09 | 10.40 | 11.99 | 280 | 560 |
| | 490.764 | ● | ● | | | CE | | | | 3.25 | 3.25 | 4.59 | 6.06 | 8.00 | 9.41 | 11.54 | 13.20 | 15.23 | 290 | 560 |
| | 490.804 | ● | ● | | | CE | | | | 3.70 | 3.70 | 5.74 | 7.58 | 10.00 | 11.76 | 14.43 | 16.51 | 19.04 | 290 | 570 |
| | 490.844 | ● | ● | | | | CG | | | 4.05 | 4.05 | 7.18 | 9.47 | 12.50 | 14.70 | 18.03 | 20.63 | 23.80 | 290 | 570 |
| | 490.884 | ● | ● | | | | CG | | | 4.65 | 4.65 | 9.19 | 12.13 | 16.00 | 18.82 | 23.08 | 26.41 | 30.46 | 300 | 580 |
| | 490.924 | ● | ● | | | | | AK | | 5.20 | 5.20 | 11.49 | 15.16 | 20.00 | 23.52 | 28.85 | 33.01 | 38.07 | 300 | 590 |
| | 490.964 | ● | ● | | | | | AK | | 5.80 | 5.80 | 14.36 | 18.95 | 25.00 | 29.40 | 36.07 | 41.26 | 47.59 | 300 | 590 |
| | 491.044 | ● | ● | | | | | | AM | 7.25 | 7.25 | 22.97 | 30.31 | 40.00 | 47.04 | 57.71 | 66.02 | 76.15 | 300 | 600 |
| 491.084 | ● | ● | | | | | | AM | 8.15 | 8.15 | 28.72 | 37.89 | 50.00 | 58.80 | 72.13 | 82.53 | 95.18 | 300 | 600 | |
| 90° | 490.406 | ● | ● | CA | | | | | | 1.20 | 1.20 | 0.57 | 0.76 | 1.00 | 1.18 | 1.44 | 1.65 | 1.90 | 490 | 880 |
| | 490.446 | | ● | CA | | | | | | 1.30 | 1.30 | 0.72 | 0.95 | 1.25 | 1.47 | 1.80 | 2.06 | 2.38 | 490 | 900 |
| | 490.486 | ● | ● | CA | | | | | | 1.45 | 1.45 | 0.92 | 1.21 | 1.60 | 1.88 | 2.31 | 2.64 | 3.05 | 500 | 900 |
| | 490.526 | ● | ● | CA | | | | | | 1.70 | 1.55 | 1.15 | 1.52 | 2.00 | 2.35 | 2.89 | 3.30 | 3.81 | 500 | 910 |
| | 490.566 | ● | ● | CA | | | | | | 1.90 | 1.90 | 1.44 | 1.89 | 2.50 | 2.94 | 3.61 | 4.13 | 4.76 | 510 | 920 |
| | 490.606 | ● | ● | CA | | CE | | | | 2.10 | 2.05 | 1.81 | 2.39 | 3.15 | 3.70 | 4.54 | 5.20 | 6.00 | 510 | 930 |
| | 490.646 | ● | ● | | CC | CE | | | | 2.40 | 2.40 | 2.30 | 3.03 | 4.00 | 4.70 | 5.77 | 6.60 | 7.61 | 520 | 950 |
| | 490.686 | ● | ● | | CC | CE | | | | 2.70 | 2.70 | 2.87 | 3.79 | 5.00 | 5.88 | 7.21 | 8.25 | 9.52 | 520 | 960 |
| | 490.726 | ● | ● | | CC | CE | | | | 3.20 | 2.80 | 3.62 | 4.77 | 6.30 | 7.41 | 9.09 | 10.40 | 11.99 | 530 | 970 |
| | 490.746 | ● | ● | | | CE | | | | 3.15 | 3.15 | 4.08 | 5.38 | 7.10 | 8.35 | 10.24 | 11.72 | 13.52 | 530 | 980 |
| | 490.766 | ● | ● | | | CE | | | | 3.40 | 3.40 | 4.59 | 6.06 | 8.00 | 9.41 | 11.54 | 13.20 | 15.23 | 540 | 980 |
| | 490.806 | ● | ● | | | CE | | | | 3.90 | 3.90 | 5.74 | 7.58 | 10.00 | 11.76 | 14.43 | 16.51 | 19.04 | 550 | 990 |
| | 490.846 | ● | ● | | | CE | | | | 4.65 | 4.00 | 7.18 | 9.47 | 12.50 | 14.70 | 18.03 | 20.63 | 23.80 | 550 | 1,000 |
| | 490.886 | ● | ● | | | | CG | | | 5.45 | 4.50 | 9.19 | 12.13 | 16.00 | 18.82 | 23.08 | 26.41 | 30.46 | 550 | 1,010 |
| | 490.926 | ● | ● | | | | CG | | | 5.90 | 4.50 | 11.49 | 15.16 | 20.00 | 23.52 | 28.85 | 33.01 | 38.07 | 560 | 1,010 |
| | 490.966 | ● | ● | | | | CG | AK | | 6.55 | 4.85 | 14.36 | 18.95 | 25.00 | 29.40 | 36.07 | 41.26 | 47.59 | 560 | 1,020 |
| | 491.006 | ● | ● | | | | | AK | | 7.55 | 5.50 | 18.09 | 23.87 | 31.50 | 37.05 | 45.45 | 51.99 | 59.97 | 560 | 1,030 |
| | 491.046 | ● | ● | | | | | AK | | 8.60 | 6.60 | 22.97 | 30.31 | 40.00 | 47.04 | 57.71 | 66.02 | 76.15 | 560 | 1,040 |
| | 491.086 | ● | ● | | | | | | AM | 9.45 | 7.25 | 28.72 | 37.89 | 50.00 | 58.80 | 72.13 | 82.53 | 95.18 | 560 | 1,040 |
| 491.126 | ● | ● | | | | | | AM | 10.40 | 8.00 | 36.18 | 47.75 | 63.00 | 74.09 | 90.89 | 103.98 | 119.93 | 560 | 1,040 | |
| 491.146 | ● | | | | | | | AM | 11.00 | 7.50 | 40.78 | 53.81 | 71.00 | 83.50 | 102.43 | 117.19 | 135.16 | 560 | 1,040 | |
| 120° | 490.368 | ● | ● | CA | | | | | | 0.85 | 0.65 | 0.36 | 0.48 | 0.63 | 0.74 | 0.91 | 1.04 | 1.20 | 700 | 1,240 |
| | 490.408 | ● | ● | CA | | | | | | 1.20 | 1.20 | 0.57 | 0.76 | 1.00 | 1.18 | 1.44 | 1.65 | 1.90 | 720 | 1,260 |
| | 490.448 | ● | ● | CA | | | | | | 1.30 | 1.30 | 0.72 | 0.95 | 1.25 | 1.47 | 1.80 | 2.06 | 2.38 | 740 | 1,280 |
| | 490.488 | ● | ● | CA | | | | | | 1.45 | 1.45 | 0.92 | 1.21 | 1.60 | 1.88 | 2.31 | 2.64 | 3.05 | 760 | 1,300 |
| | 490.528 | ● | ● | CA | | | | | | 1.70 | 1.70 | 1.15 | 1.52 | 2.00 | 2.35 | 2.89 | 3.30 | 3.81 | 780 | 1,320 |
| | 490.568 | ● | ● | CA | | | | | | 1.90 | 1.90 | 1.44 | 1.89 | 2.50 | 2.94 | 3.61 | 4.13 | 4.76 | 800 | 1,340 |





| Spray angle | Ordering no. | | | | | | | | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | | | Spray diameter D [mm] (at p = 2 bar) | |
|-------------|--------------|----------------------|-------|----------|----------|----------|----------|----------|--------|----------------------|--------------------------------------|------------------|-------|--------------|-------|--------|--------|--------|--------------------------------------|--------------|
| | Type | Mat. no. | | Code | | | | | | | | p [bar] | | | | | | | H = 250 [mm] | H = 500 [mm] |
| | | 1Y | 30 | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPP | 1 BSPP | | | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 | 7.0 | 10.0 | | |
| | | Stainless steel 316L | Brass | | | | | | | | | | | | | | | | | |
| 120° | 490.608 | ● | ● | CA | | | | | | 2.10 | 2.05 | 1.81 | 2.39 | 3.15 | 3.70 | 4.54 | 5.20 | 6.00 | 820 | 1,370 |
| | 490.648 | ● | ● | | CC | CE | | | | 2.40 | 2.40 | 2.30 | 3.03 | 4.00 | 4.70 | 5.77 | 6.60 | 7.61 | 840 | 1,400 |
| | 490.688 | ● | ● | | CC | CE | | | | 2.75 | 2.75 | 2.87 | 3.79 | 5.00 | 5.88 | 7.21 | 8.25 | 9.52 | 850 | 1,430 |
| | 490.728 | ● | ● | | CC | CE | | | | 3.20 | 2.80 | 3.62 | 4.77 | 6.30 | 7.41 | 9.09 | 10.40 | 11.99 | 860 | 1,470 |
| | 490.748 | ● | ● | | | CE | | | | 3.20 | 3.20 | 4.08 | 5.38 | 7.10 | 8.35 | 10.24 | 11.72 | 13.52 | 870 | 1,500 |
| | 490.768 | ● | ● | | | CE | | | | 3.45 | 3.45 | 4.59 | 6.06 | 8.00 | 9.41 | 11.54 | 13.20 | 15.23 | 880 | 1,530 |
| | 490.808 | ● | ● | | | CE | | | | 3.90 | 3.90 | 5.74 | 7.58 | 10.00 | 11.76 | 14.43 | 16.51 | 19.04 | 900 | 1,580 |
| | 490.848 | ● | ● | | | CE | | | | 4.70 | 4.00 | 7.18 | 9.47 | 12.50 | 14.70 | 18.03 | 20.63 | 23.80 | 910 | 1,630 |
| | 490.888 | ● | ● | | | | | CG | | 5.10 | 4.50 | 9.19 | 12.13 | 16.00 | 18.82 | 23.08 | 26.41 | 30.46 | 920 | 1,680 |
| | 490.928 | ● | ● | | | | | CG | | 5.80 | 4.75 | 11.49 | 15.16 | 20.00 | 23.52 | 28.85 | 33.01 | 38.07 | 930 | 1,700 |
| | 490.968 | ● | ● | | | | | CG | AK | 6.65 | 4.85 | 14.36 | 18.95 | 25.00 | 29.40 | 36.07 | 41.26 | 47.59 | 930 | 1,710 |
| | 491.048 | ● | ● | | | | | | AK | 9.10 | 5.85 | 22.97 | 30.31 | 40.00 | 47.04 | 57.71 | 66.02 | 76.15 | 930 | 1,730 |
| | 491.128 | ● | ● | | | | | | AM | 10.80 | 7.75 | 36.18 | 47.75 | 63.00 | 74.09 | 90.89 | 103.98 | 119.93 | 930 | 1,740 |
| | 491.148 | ● | | | | | | | AM | 11.40 | 7.65 | 40.78 | 53.81 | 71.00 | 83.50 | 102.43 | 117.19 | 135.16 | 930 | 1,750 |

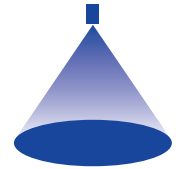
Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \left(\frac{p_2}{p_1}\right)^{0.4}$
 (≤ 10 bar)

Ordering Type + Material no. + Code = Ordering no.
 example: 490.608 + 1Y + CA = 490.608.1Y.CA



Assembly accessories can be found in Chapter 9 "Accessories".

➤ Axial-flow full cone nozzles Series 460/461



Features:

- Extremely uniform liquid distribution

Applications:

- Cleaning and washing processes
- Cooling
- Surface spraying
- Chemical process engineering



Series 460/461

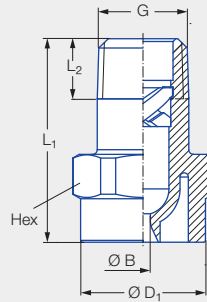


Figure 1

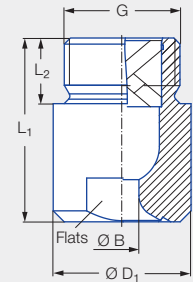


Figure 2

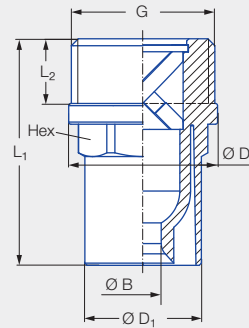




Figure 3

| Code | Figure | G | Dimensions [mm] | | | | | Weight [g] |
|------|--------|----------|-----------------|----------------|------------------|------------------|-----------|------------|
| | | | L ₁ | L ₂ | Ø D ₁ | Ø D ₂ | Hex/Flats | |
| CA | 1 | 1/8 BSPT | 22.0 | 6.5 | 13.0 | – | 14 | 2.7 |
| CC | 1 | 1/4 BSPT | 22.0 | 9.7 | 13.0 | – | 14 | 3.3 |
| CE | 1 | 3/8 BSPT | 30.0 | 10.0 | 17.0 | – | 17 | 6.4 |
| CG | 1 | 1/2 BSPT | 43.5 | 13.2 | 22.0 | – | 22 | 14.5 |
| CK | 2 | 3/4 BSPT | 42.0 | 15.0 | 31.5 | – | 27 | 19.9 |
| AK | 2 | 3/4 BSPP | 42.0 | 15.0 | 31.5 | – | 27 | 24.3 |
| AM | 3 | 1 BSPP | 52.5 | 15.0 | 27.0 | 34.5 | 27 | 34.4 |

| Spray angle | Ordering no. | | | | | | | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | | Spray diameter D [mm] (at p = 2 bar) | | | | |
|-------------|--------------|----------|------|----------|----------|----------|----------|----------|----------------------|--------------------------------------|------------------|--------|-------|-------|-------|-------|---|-------|-----|-----|------|
| | Type | Mat. no. | Code | | | | | | | | p [bar] | | | | | |  | | | | |
| | | | 5E | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPT | | | 3/4 BSPP | 1 BSPP | 0.5 | 1.0 | 2.0 | 3.0 | | | 5.0 | 7.0 | 10.0 |
| | | | | | | | | | | | | | | | | | PVDF | | | | |
| 60° | 460.524 | ● | CA | | | | | | | 1.60 | 1.60 | 1.15 | 1.52 | 2.00 | 2.35 | 2.89 | 3.30 | 3.81 | 210 | 380 | |
| | 460.644 | ● | CC | | | | | | | 2.40 | 1.90 | 2.30 | 3.03 | 4.00 | 4.70 | 5.77 | 6.60 | 7.61 | 240 | 420 | |
| | 460.724 | ● | CC | | | | | | | 2.80 | 2.10 | 3.15 | 4.45 | 6.30 | 7.72 | 8.91 | 9.96 | 14.09 | 260 | 450 | |
| | 460.964 | ● | | | | | | AK | | 5.80 | 4.90 | 14.36 | 18.95 | 25.00 | 29.40 | 36.07 | 41.26 | 47.59 | 310 | 560 | |





| Spray angle | Ordering no. | | | | | | | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | | | Spray diameter D [mm] (at p = 2 bar) | | | |
|-------------|--------------|----------------|----------|----------|----------|----------|----------|----------|----------------------|--------------------------------------|------------------|-------|--------------|--------------|-------|-------|--------|---|------|--------------|--------------|
| | Type | Mat. no. | Code | | | | | | | | p [bar] | | | | | | |  | | | |
| | | 5E | 1/8 BSPT | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPT | 3/4 BSPP | | | 1 BSPP | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 | 7.0 | | 10.0 | H = 250 [mm] | H = 500 [mm] |
| | | PVDF | | | | | | | | | | | | | | | | | | | |
| 90° | 460.326 | ● | CA | | | | | | | 0.80 | 0.55 | 0.23 | 0.30 | 0.40 | 0.47 | 0.58 | 0.66 | 0.76 | 430 | 750 | |
| | 460.406 | ● | CA | | | | | | | 1.20 | 0.85 | 0.57 | 0.76 | 1.00 | 1.18 | 1.44 | 1.65 | 1.90 | 440 | 780 | |
| | 460.486 | ● | CA | | | | | | | 1.45 | 1.20 | 0.92 | 1.21 | 1.60 | 1.88 | 2.31 | 2.64 | 3.05 | 450 | 800 | |
| | 460.526 | ● | CA | | | | | | | 1.65 | 1.30 | 1.15 | 1.52 | 2.00 | 2.35 | 2.89 | 3.30 | 3.81 | 450 | 820 | |
| | 460.606 | ● | CA | | CE | | | | | 2.05 | 1.45 | 1.81 | 2.39 | 3.15 | 3.70 | 4.54 | 5.20 | 6.00 | 470 | 850 | |
| | 460.646 | ● | | CC | | | | | | 2.30 | 1.80 | 2.30 | 3.03 | 4.00 | 4.70 | 5.77 | 6.60 | 7.61 | 480 | 870 | |
| | 460.726 | ● | | | CE | | | | | 2.95 | 2.00 | 3.62 | 4.77 | 6.30 | 7.41 | 9.09 | 10.40 | 11.99 | 500 | 900 | |
| | 460.746 | ● | | | CE | | | | | 3.30 | 1.90 | 4.08 | 5.38 | 7.10 | 8.35 | 10.24 | 11.72 | 13.52 | 510 | 910 | |
| | 460.766 | ● | | | CE | | | | | 3.30 | 2.40 | 4.59 | 6.06 | 8.00 | 9.41 | 11.54 | 13.20 | 15.23 | 510 | 910 | |
| | 460.806 | ● | | | CE | | | | | 3.70 | 2.70 | 5.74 | 7.58 | 10.00 | 11.76 | 14.43 | 16.51 | 19.04 | 520 | 920 | |
| | 460.846 | ● | | | CE | | | | | 4.05 | 3.20 | 7.18 | 9.47 | 12.50 | 14.70 | 18.03 | 20.63 | 23.80 | 520 | 930 | |
| | 460.886 | ● | | | CE | CG | | | | 4.70 | 3.10 | 9.19 | 12.13 | 16.00 | 18.82 | 23.08 | 26.41 | 30.46 | 520 | 930 | |
| | 460.926 | ● | | | | CG | | | | 5.10 | 2.80 | 11.49 | 15.16 | 20.00 | 23.52 | 28.85 | 33.01 | 38.07 | 520 | 940 | |
| | 460.966 | ● | | | | CG | | | | 5.80 | 3.80 | 14.36 | 18.95 | 25.00 | 29.40 | 36.07 | 41.26 | 47.59 | 520 | 940 | |
| | 461.006 | ● | | | | CG | | | | 6.40 | 3.80 | 18.09 | 23.87 | 31.50 | 37.05 | 45.45 | 51.99 | 59.97 | 520 | 940 | |
| 461.046 | ● | | | | | CK | | | 7.20 | 5.30 | 22.97 | 30.31 | 40.00 | 47.04 | 57.71 | 66.02 | 76.15 | 520 | 950 | | |
| 461.086 | ● | | | | | | AM | | 8.40 | 5.00 | 25.00 | 35.36 | 50.00 | 61.24 | 70.71 | 79.06 | 111.80 | 530 | 950 | | |
| 120° | 460.368 | ● | CA | | | | | | | 0.95 | 0.65 | 0.32 | 0.45 | 0.63 | 0.77 | 0.89 | 1.00 | 1.41 | 650 | 1,030 | |
| | 460.408 | ● | CA | | | | | | | 1.20 | 0.85 | 0.57 | 0.76 | 1.00 | 1.18 | 1.44 | 1.65 | 1.90 | 680 | 1,100 | |
| | 460.488 | ● | CA | | | | | | | 1.50 | 1.00 | 0.92 | 1.21 | 1.60 | 1.88 | 2.31 | 2.64 | 3.05 | 700 | 1,160 | |
| | 460.528 | ● | CA | | | | | | | 1.65 | 1.20 | 1.15 | 1.52 | 2.00 | 2.35 | 2.89 | 3.30 | 3.81 | 710 | 1,200 | |
| | 460.608 | ● | CA | | | | | | | 2.10 | 1.40 | 1.81 | 2.39 | 3.15 | 3.70 | 4.54 | 5.20 | 6.00 | 730 | 1,270 | |
| | 460.648 | ● | | CC | | | | | | 2.45 | 1.60 | 2.30 | 3.03 | 4.00 | 4.70 | 5.77 | 6.60 | 7.61 | 750 | 1,310 | |
| | 460.728 | ● | | | CE | | | | | 3.10 | 1.90 | 3.62 | 4.77 | 6.30 | 7.41 | 9.09 | 10.40 | 11.99 | 780 | 1,380 | |
| | 460.748 | ● | | | CE | | | | | 3.30 | 1.90 | 4.08 | 5.38 | 7.10 | 8.35 | 10.24 | 11.72 | 13.52 | 790 | 1,400 | |
| | 460.768 | ● | | | CE | | | | | 3.50 | 1.90 | 4.59 | 6.06 | 8.00 | 9.41 | 11.54 | 13.20 | 15.23 | 790 | 1,410 | |
| | 460.808 | ● | | | CE | | | | | 3.80 | 2.40 | 5.74 | 7.58 | 10.00 | 11.76 | 14.43 | 16.51 | 19.04 | 810 | 1,430 | |
| | 460.848 | ● | | | CE | | | | | 4.20 | 2.70 | 7.18 | 9.47 | 12.50 | 14.70 | 18.03 | 20.63 | 23.80 | 820 | 1,450 | |
| | 460.888 | ● | | | | CG | | | | 4.60 | 3.10 | 9.19 | 12.13 | 16.00 | 18.82 | 23.08 | 26.41 | 30.46 | 830 | 1,470 | |
| | 460.968 | ● | | | | CG | | | | 5.90 | 4.10 | 14.36 | 18.95 | 25.00 | 29.40 | 36.07 | 41.26 | 47.59 | 850 | 1,500 | |
| | 461.048 | ● ¹ | | | | | CK | | | 7.60 | 4.90 | 22.97 | 30.31 | 40.00 | 47.04 | 57.71 | 66.02 | 76.15 | 870 | 1,530 | |

¹ Material PP (mat. no. 53).

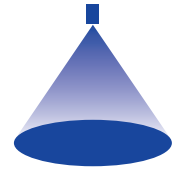
Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \left(\frac{p_2}{p_1}\right)^{0.4}$
(≤ 10 bar)

Ordering Type + Material no. + Code = Ordering no.
example: 460.326 + 5E + CA = 460.326.5E.CA



Assembly accessories can be found in Chapter 9 "Accessories".

➤ Axial-flow full cone nozzles Series 405

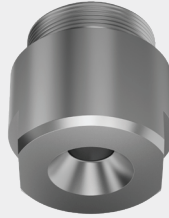


Features:

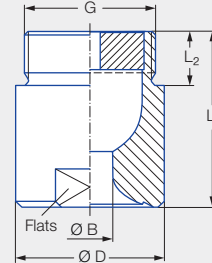
- Extremely uniform liquid distribution

Applications:

- Surface spraying
- Chemical process engineering
- Cleaning and washing processes
- Water treatment



Series 405




| Code | G | Dimensions [mm] | | | | Weight [kg] (brass) |
|-----------|------------|-----------------|----------------|------|-------|---------------------|
| | | L ₁ | L ₂ | Ø D | Flats | |
| AP | 1 1/4 BSPP | 50.0 | 19.0 | 49.0 | 41 | 0.5 |
| AR | 1 1/2 BSPP | 60.0 | 19.0 | 59.0 | 50 | 0.9 |
| AV | 2 BSPP | 78.0 | 24.0 | 68.0 | 60 | 1.6 |

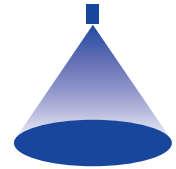
| Spray angle | Ordering no. | | | | | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | | Spray diameter D [mm] (at p = 2 bar) | |
|-------------|----------------|----------------------|-------|------------|------------|-----------|----------------------|--------------------------------------|------------------|-----|-----|------------|-----|-----|--------------------------------------|----------------|
| | Type | Mat. no. | | Code | | | | | p [bar] | | | | | | H = 500 [mm] | H = 1,000 [mm] |
| | | 1Y | 30 | 1 1/4 BSPP | 1 1/2 BSPP | 2 BSPP | | | 0.3 | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 | | |
| | | Stainless steel 316L | Brass | | | | | | | | | | | | | |
| 60° | 405.204 | ● | ● | AP | | | 11.2 | 5.8 | 47 | 57 | 76 | 100 | 118 | 144 | 600 | 1,140 |
| | 405.284 | ● | ● | | AR | | 14.3 | 7.0 | 75 | 92 | 121 | 160 | 188 | 231 | 630 | 1,210 |
| | 405.324 | ● | ● | | | AV | 16.4 | 7.5 | 94 | 115 | 152 | 200 | 235 | 289 | 650 | 1,250 |
| | 405.364 | ● | ● | | | AV | 18.4 | 8.5 | 117 | 144 | 189 | 250 | 294 | 361 | 650 | 1,250 |
| | 405.404 | ● | ● | | | AV | 20.0 | 7.0 | 147 | 181 | 239 | 315 | 370 | 454 | 650 | 1,250 |
| 90° | 405.206 | ● | ● | AP | | | 12.0 | 5.0 | 47 | 57 | 76 | 100 | 118 | 144 | 1,120 | 2,100 |
| | 405.286 | ● | ● | | AR | | 15.2 | 6.2 | 75 | 92 | 121 | 160 | 188 | 231 | 1,120 | 2,100 |
| | 405.326 | ● | ● | | | AV | 17.2 | 7.7 | 94 | 115 | 152 | 200 | 235 | 289 | 1,120 | 2,100 |
| | 405.366 | ● | ● | | | AV | 19.5 | 8.7 | 117 | 144 | 189 | 250 | 294 | 361 | 1,120 | 2,100 |
| | 405.406 | ● | ● | | | AV | 22.0 | 9.5 | 147 | 181 | 239 | 315 | 370 | 454 | 1,120 | 2,100 |
| 120° | 405.208 | ● | ● | AP | | | 12.7 | 5.0 | 47 | 57 | 76 | 100 | 118 | 144 | 1,850 | 3,050 |
| | 405.288 | ● | ● | | AR | | 16.0 | 6.6 | 75 | 92 | 121 | 160 | 188 | 231 | 1,900 | 3,150 |
| | 405.328 | ● | ● | | | AV | 17.8 | 7.9 | 94 | 115 | 152 | 200 | 235 | 289 | 1,900 | 3,200 |
| | 405.368 | ● | ● | | | AV | 20.1 | 8.8 | 117 | 144 | 189 | 250 | 294 | 361 | 1,900 | 3,200 |
| | 405.408 | ● | ● | | | AV | 22.4 | 9.1 | 147 | 181 | 239 | 315 | 370 | 454 | 1,900 | 3,200 |

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \left(\frac{p_2}{p_1}\right)^{0.4}$
(≤ 10 bar)

Ordering Type + Material no. + Code = Ordering no.
example: 405.204 + 1Y + AP = 405.204.1Y.AP

 Assembly accessories can be found in Chapter 9 "Accessories".

➤ Axial-flow full cone nozzles Series 403

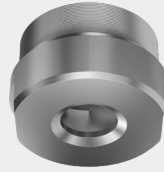


Features:

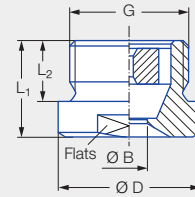
- Extremely uniform liquid distribution

Applications:

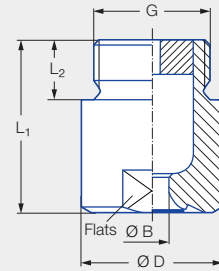
- Surface spraying
- Spraying over packings
- Chemical process engineering
- Cleaning and washing processes
- Cooling



Series 403



90° version



120° version

90° version

| Type | G | Dimensions [mm] | | | | Weight [kg] |
|------------------------|------------|-----------------|----------------|-------|-------|-------------|
| | | L ₁ | L ₂ | Ø D | Flats | |
| 403.446/403.486 | 2 1/2 BSPP | 52.0 | 27.0 | 83.0 | 75 | 1.3 |
| 403.526 | 3 BSPP | 60.0 | 30.0 | 98.0 | 85 | 2.0 |
| 403.606 | 3 1/2 BSPP | 70.0 | 32.0 | 118.0 | 105 | 3.6 |

120° version

| Type | G | Dimensions [mm] | | | | Weight [kg] |
|------------------------|------------|-----------------|----------------|-------|-------|-------------|
| | | L ₁ | L ₂ | Ø D | Flats | |
| 403.448/403.488 | 2 1/2 BSPP | 124.0 | 27.0 | 83.0 | 75 | 3.2 |
| 403.528 | 3 BSPP | 153.0 | 30.0 | 98.0 | 85 | 5.4 |
| 403.608 | 3 1/2 BSPP | 156.0 | 32.0 | 118.0 | 105 | 8.3 |
| 403.628 | 4 BSPP | 165.0 | 36.0 | 128.0 | 110 | 9.6 |

| Spray angle | Ordering no. | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | | | Spray diameter D [mm] (at p = 2 bar) | |
|-------------|----------------|----------|----------------------|--------------------------------------|------------------|-----|-----|--------------|-------|-------|-------|--------------------------------------|-------|
| | Type | Mat. no. | | | p [bar] | | | | | | | H = 500 [mm] H = 1,000 [mm] | |
| | | 1Y | | | 0.3 | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 | 7.0 | | |
| 90° | 403.446 | ● | 25.0 | 12.0 | 187 | 230 | 303 | 400 | 470 | 577 | 660 | 1,000 | 1,780 |
| | 403.486 | ● | 29.5 | 12.0 | 234 | 287 | 379 | 500 | 588 | 721 | 825 | 1,000 | 1,780 |
| | 403.526 | ● | 32.0 | 13.8 | 295 | 362 | 477 | 630 | 741 | 909 | 1,040 | 1,000 | 1,780 |
| | 403.606 | ● | 40.0 | 15.0 | 468 | 574 | 758 | 1,000 | 1,176 | 1,443 | 1,651 | 1,000 | 1,780 |
| 120° | 403.448 | ● | 25.5 | 10.0 | 187 | 230 | 303 | 400 | 470 | 577 | 660 | 1,700 | 2,930 |
| | 403.488 | ● | 29.5 | 11.0 | 234 | 287 | 379 | 500 | 588 | 721 | 825 | 1,700 | 2,930 |
| | 403.528 | ● | 32.0 | 15.0 | 295 | 362 | 477 | 630 | 741 | 909 | 1,040 | 1,700 | 2,930 |
| | 403.608 | ● | 42.0 | 12.0 | 468 | 574 | 758 | 1,000 | 1,176 | 1,443 | 1,651 | 1,700 | 2,930 |
| | 403.628 | ● | 45.0 | 15.0 | 585 | 718 | 947 | 1,250 | 1,470 | 1,803 | 2,063 | 1,700 | 2,930 |

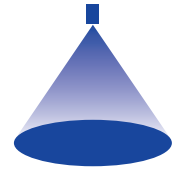
Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \left(\frac{p_2}{p_1}\right)^{0.4}$
(≤ 10 bar)

Ordering Type + Material no. = Ordering no.
example: 403.446 + 1Y = 403.446.1Y

Assembly accessories can be found in Chapter 9 "Accessories".

➤ Axial-flow full cone nozzles

Series 419 FreeFlow



Features:

- Non clogging due to very large free cross sections
- Very stable spray angle
- Uniform liquid distribution

Applications:

- Cleaning and washing processes
- Dust control
- Absorption
- Distillation

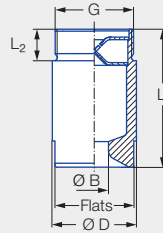


Figure 1

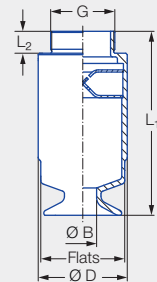



Figure 2

Series 419


| Type | Code | Figure | G | Dimensions [mm] | | | | Weight [kg] |
|---------|------|--------|------------|-----------------|----------------|-------|-------|-------------|
| | | | | L ₁ | L ₂ | Ø D | Flats | |
| 419.3xx | AV | 1 | 2 BSPP | 105.0 | 24.0 | 64.0 | 60 | 1.2 |
| 419.4xx | AV | 2 | 2 BSPP | 163.0 | 24.0 | 80.0 | 75 | 2.0 |
| 419.51x | AV | 2 | 2 BSPP | 199.0 | 24.0 | 102.0 | 95 | 3.7 |
| 419.51x | AY | 2 | 2 1/2 BSPP | 202.0 | 27.0 | 102.0 | 95 | 3.8 |
| 419.54x | AY | 2 | 2 1/2 BSPP | 202.0 | 27.0 | 102.0 | 95 | 3.8 |
| 419.57x | AY | 2 | 2 1/2 BSPP | 231.0 | 27.0 | 115.0 | 105 | 5.2 |
| 419.57x | LA | 2 | 3 BSPP | 233.0 | 30.0 | 115.0 | 105 | 5.2 |
| 419.6xx | LA | 2 | 3 BSPP | 252.0 | 30.0 | 122.0 | 115 | 5.4 |

| Spray angle ¹ | Ordering no. | | | | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | Spray diameter D [mm] (at p = 1 bar) | |
|--------------------------|--------------|----------|----------------------|--------|------------|----------------------|--------------------------------------|------------------|-----|-----|-------|-------|---|-------|
| | Type | Mat. no. | Code | | | | | p [bar] | | | | |  H = 500 [mm] H = 1,000 [mm] | |
| | | 1Y | Stainless steel 316L | 2 BSPP | 2 1/2 BSPP | | | 3 BSPP | 0.3 | 0.5 | 1.0 | 2.0 | | |
| 90° | 419.366 | ● | AV | | | 19.0 | 17.5 | 117 | 143 | 189 | 249 | 360 | 1,200 | 2,200 |
| | 419.396 | ● | AV | | | 21.2 | 17.5 | 140 | 172 | 227 | 300 | 432 | 1,200 | 2,200 |
| | 419.446 | ● | AV | | | 24.0 | 20.5 | 187 | 230 | 303 | 400 | 577 | 1,200 | 2,200 |
| | 419.486 | ● | AV | | | 29.0 | 20.5 | 234 | 287 | 379 | 500 | 721 | 1,200 | 2,200 |
| | 419.516 | ● | AV | AY | | 29.2 | 24.1 | 281 | 345 | 455 | 600 | 866 | 1,200 | 2,200 |
| | 419.546 | ● | | AY | | 33.0 | 24.1 | 332 | 408 | 538 | 710 | 1,024 | 1,200 | 2,200 |
| | 419.576 | ● | | AY | LA | 35.0 | 27.2 | 398 | 488 | 644 | 850 | 1,226 | 1,200 | 2,200 |
| | 419.606 | ● | | | LA | 37.5 | 30.1 | 468 | 574 | 758 | 1,000 | 1,443 | 1,200 | 2,200 |
| | 419.626 | ● | | | LA | 43.0 | 30.1 | 585 | 718 | 947 | 1,250 | 1,803 | 1,200 | 2,200 |
| 120° | 419.368 | ● | AV | | | 21.0 | 17.4 | 117 | 143 | 189 | 249 | 360 | 1,660 | 2,900 |
| | 419.398 | ● | AV | | | 24.2 | 17.4 | 140 | 172 | 227 | 300 | 432 | 1,660 | 2,900 |
| | 419.448 | ● | AV | | | 24.5 | 20.5 | 187 | 230 | 303 | 400 | 577 | 1,660 | 2,900 |
| | 419.488 | ● | AV | | | 29.5 | 20.5 | 234 | 287 | 379 | 500 | 721 | 1,660 | 2,900 |
| | 419.518 | ● | AV | AY | | 29.2 | 24.1 | 281 | 345 | 455 | 600 | 866 | 1,660 | 2,900 |
| | 419.548 | ● | | AY | | 34.0 | 24.1 | 332 | 408 | 538 | 710 | 1,024 | 1,660 | 2,900 |
| | 419.578 | ● | | AY | LA | 35.0 | 28.6 | 398 | 488 | 644 | 850 | 1,226 | 1,660 | 2,900 |
| | 419.608 | ● | | | LA | 38.0 | 32.2 | 468 | 574 | 758 | 1,000 | 1,443 | 1,660 | 2,900 |
| | 419.628 | ● | | | LA | 43.5 | 32.2 | 585 | 718 | 947 | 1,250 | 1,803 | 1,660 | 2,900 |

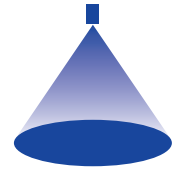
¹ Spray angle at 1 bar.

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \left(\frac{p_2}{p_1}\right)^{0.4}$
(≤ 10 bar)

Ordering Type + Material no. + Code = Ordering no.
example: 419.366 + 1Y + AV = 419.366.1Y.AV

 Assembly accessories can be found in Chapter 9 "Accessories".

➤ Axial-flow full cone nozzles Series 468



Features:

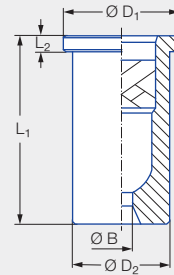
- Extremely uniform liquid distribution
- Assembly with retaining nut

Applications:

- Surface spraying
- Chemical process engineering
- Cleaning and washing processes
- Water treatment



Series 468




| Code | Dimensions [mm] | | | Weight [g] (brass) |
|--------------------------------------|-----------------|------------------|------------------|--------------------|
| | L ₂ | Ø D ₁ | Ø D ₂ | |
| Assembly with retaining nut 3/8 BSPP | 2.00 | 14.80 | 12.65 | 18.00 |

| Spray angle | Ordering no. | | | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | L ₁ [mm] | V̇ water [l/min] | | | | | | Spray diameter D [mm] (at p = 2 bar) | |
|-------------|--------------|-----------------|----|----|----------------------|--------------------------------------|---------------------|------------------|------|--------------|-------|-------|-------|--------------------------------------|--------------|
| | Type | Mat. no. | | | | | | p [bar] | | | | | | H = 250 [mm] | H = 500 [mm] |
| | | 17 ¹ | 30 | 5E | | | | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 | 10.0 | | |
| 60° | 468.604 | ● | ● | | 2.05 | 1.40 | 18.00 | 1.81 | 2.39 | 3.15 | 3.70 | 4.54 | 6.00 | 280 | 560 |
| | 468.644 | | ● | ● | 2.40 | 1.90 | 24.50 | 2.30 | 3.03 | 4.00 | 4.70 | 5.77 | 7.61 | 290 | 570 |
| | 468.684 | | ● | | 2.60 | 2.00 | 24.50 | 2.87 | 3.79 | 5.00 | 5.88 | 7.21 | 9.52 | 300 | 580 |
| | 468.724 | ● | ● | | 2.90 | 2.00 | 24.50 | 3.62 | 4.77 | 6.30 | 7.41 | 9.09 | 11.99 | 310 | 590 |
| 90° | 468.526 | ● | ● | ● | 1.65 | 1.30 | 18.00 | 1.15 | 1.52 | 2.00 | 2.35 | 2.89 | 3.81 | 460 | 780 |
| | 468.846 | ● | ● | | 4.05 | 3.20 | 24.50 | 7.18 | 9.47 | 12.50 | 14.70 | 18.03 | 23.80 | 500 | 920 |
| 120° | 468.368 | | ● | | 0.95 | 0.70 | 18.00 | 0.36 | 0.48 | 0.63 | 0.74 | 0.91 | 1.20 | 740 | 1,750 |
| | 468.408 | ● | ● | | 1.20 | 0.85 | 18.00 | 0.57 | 0.76 | 1.00 | 1.18 | 1.44 | 1.90 | 740 | 1,750 |
| | 468.488 | ● | ● | | 1.50 | 1.00 | 18.00 | 0.92 | 1.21 | 1.60 | 1.88 | 2.31 | 3.05 | 740 | 1,750 |
| | 468.528 | ● | ● | | 1.65 | 1.20 | 18.00 | 1.15 | 1.52 | 2.00 | 2.35 | 2.89 | 3.81 | 740 | 1,750 |

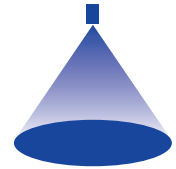
¹ We reserve the right to supply material 316Ti or 316L under material no. 17.

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \left(\frac{p_2}{p_1}\right)^{0.4}$
(≤ 10 bar)

Ordering Type + Material no. = Ordering no.
example: 468.604 + 17 = 468.604.17

 Assembly accessories can be found in Chapter 9 "Accessories".

➤ Tangential-flow full cone nozzles stainless steel/brass version Series 422/423



Features:

- Tangentially arranged supply of liquid
- Without swirl inserts
- Non-clogging
- Stable spray angle
- Uniform liquid distribution

Applications:

- Surface spraying
- Cooling
- Cleaning and washing processes
- Foam control

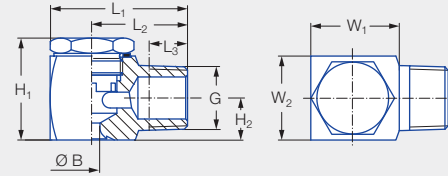
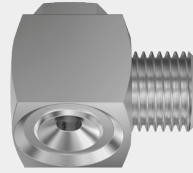


Figure 1

Series 422/423

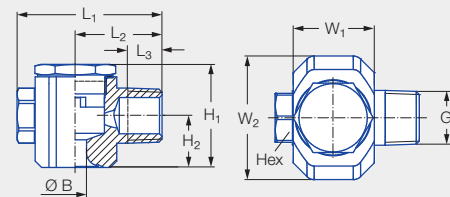
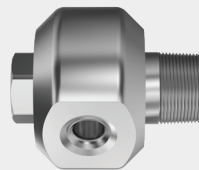


Figure 2

| Code | Figure | G | Dimensions [mm] | | | | | | | | Weight [g] (stainless steel 316L) |
|-----------|--------|----------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----|---|
| | | | H ₁ | H ₂ | L ₁ | L ₂ | L ₃ | W ₁ | W ₂ | Hex | |
| CC | 1 | 1/4 BSPT | 21.0 | 8.0 | 28.0 | 20.0 | 9.7 | 15.6 | 16.0 | – | 44.0 |
| CE | 1 | 3/8 BSPT | 26.7 | 11.0 | 36.0 | 25.0 | 10.1 | 23.2 | 22.0 | – | 101.0 |
| CG | 2 | 1/2 BSPT | 40.0 | 20.0 | 56.0 | 33.5 | 13.2 | 32.0 | 48.0 | 19 | 370.0 |
| CK | 2 | 3/4 BSPT | 57.0 | 23.5 | 65.5 | 38.5 | 14.5 | 40.0 | 63.0 | 27 | 830.0 |
| CM | 2 | 1 BSPT | 66.0 | 27.3 | 85.0 | 48.5 | 16.8 | 55.0 | 78.0 | 36 | 1.581.0 |

| Spray angle | Ordering no. | | | | | | | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | | Spray diameter D [mm] (at p = 2 bar) | |
|----------------|----------------|----------------------|-------|-----------|-----------|----------|----------|---------|----------------------|--------------------------------------|------------------|--------------|--------------|--------------|--------------|-------|---|------|
| | Type | Mat. no. | | Code | | | | p [bar] | | | | | | H = 250 [mm] | H = 500 [mm] | | | |
| | | 1Y | 30 | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPT | 1 BSPT | | | 0.5 | 1.0 | 2.0 | | | 3.0 | 5.0 | 10.0 |
| | | Stainless steel 316L | Brass | | | | | | | | | | | | | | | |
| 60° | 422.644 | ● | ● | | CE | | | | 3.00 | 3.00 | 2.00 | 2.83 | 4.00 | 4.90 | 6.32 | 8.94 | 300 | 580 |
| 90° | 422.406 | ● | ● | CC | | | | | 1.40 | 1.40 | 0.50 | 0.71 | 1.00 | 1.22 | 1.58 | 2.24 | 430 | 800 |
| | 422.486 | ● | | CC | | | | | 1.85 | 1.85 | 0.80 | 1.13 | 1.60 | 1.96 | 2.53 | 3.58 | 450 | 820 |
| | 422.566 | ● | ● | CC | | | | | 2.25 | 2.25 | 1.25 | 1.77 | 2.50 | 3.06 | 3.95 | 5.59 | 470 | 840 |
| | 422.606 | ● | ● | | CE | | | | 2.55 | 2.55 | 1.57 | 2.23 | 3.15 | 3.86 | 4.98 | 7.04 | 480 | 860 |
| | 422.646 | ● | ● | | CE | | | | 2.90 | 2.90 | 2.00 | 2.83 | 4.00 | 4.90 | 6.32 | 8.94 | 500 | 880 |
| | 422.726 | | ● | | CE | | | | 3.70 | 3.70 | 3.15 | 4.45 | 6.30 | 7.72 | 9.96 | 14.09 | 520 | 910 |
| | 422.766 | ● | | | CE | | | | 4.15 | 4.15 | 4.00 | 5.66 | 8.00 | 9.80 | 12.65 | 17.89 | 520 | 910 |
| | 422.806 | | ● | | CE | | | | 4.65 | 4.65 | 5.00 | 7.07 | 10.00 | 12.25 | 15.81 | 22.36 | 520 | 910 |
| | 422.846 | ● | ● | | CE | | | | 5.30 | 5.30 | 6.25 | 8.84 | 12.50 | 15.31 | 19.76 | 27.95 | 520 | 910 |
| | 422.886 | ● | ● | | CE | | | | 5.85 | 5.85 | 8.00 | 11.31 | 16.00 | 19.60 | 25.30 | 35.78 | 520 | 910 |
| 422.966 | ● | | | | CG | | | 8.00 | 8.00 | 12.50 | 17.68 | 25.00 | 30.62 | 39.53 | 55.90 | 520 | 910 | |





| Spray angle | Ordering no. | | | | | | | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | | Spray diameter D [mm] (at p = 2 bar) | |
|-------------|--------------|----------------------|-------|----------|----------|----------|----------|--------|----------------------|--------------------------------------|------------------|---------------|--------------|--------|--------|--------|--------------------------------------|--------------|
| | Type | Mat. no. | | Code | | | | | | | p [bar] | | | | | | H = 250 [mm] | H = 500 [mm] |
| | | 1Y | 30 | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPT | 1 BSPT | | | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 | 10.0 | | |
| | | Stainless steel 316L | Brass | | | | | | | | | | | | | | | |
| 120° | 422.488 | | ● | CC | | | | | 1.90 | 1.90 | 0.80 | 1.13 | 1.60 | 1.96 | 2.53 | 3.58 | 670 | 1,200 |
| | 422.568 | ● | ● | CC | | | | | 2.45 | 2.40 | 1.25 | 1.77 | 2.50 | 3.06 | 3.95 | 5.59 | 700 | 1,230 |
| | 422.608 | | ● | | CE | | | | 2.70 | 2.70 | 1.57 | 2.23 | 3.15 | 3.86 | 4.98 | 7.04 | 710 | 1,250 |
| | 422.728 | ● | ● | | CE | | | | 4.00 | 3.90 | 3.15 | 4.45 | 6.30 | 7.72 | 9.96 | 14.09 | 770 | 1,360 |
| | 422.808 | ● | | | CE | | | | 4.90 | 4.90 | 5.00 | 7.07 | 10.00 | 12.25 | 15.81 | 22.36 | 830 | 1,490 |
| | 422.848 | ● | ● | | CE | | | | 5.30 | 5.30 | 6.25 | 8.84 | 12.50 | 15.31 | 19.76 | 27.95 | 860 | 1,550 |
| | 422.888 | ● | ● | | CE | | | | 6.60 | 6.00 | 8.00 | 11.31 | 16.00 | 19.60 | 25.30 | 35.78 | 880 | 1,570 |
| | 422.928 | ● | | | | CG | | | 7.30 | 7.30 | 10.00 | 14.14 | 20.00 | 24.49 | 31.62 | 44.72 | 890 | 1,580 |
| | 422.968 | ● | ● | | | CG | | | 8.00 | 8.00 | 12.50 | 17.68 | 25.00 | 30.62 | 39.53 | 55.90 | 890 | 1,590 |
| | 423.008 | ● | | | | CG | | | 8.70 | 8.70 | 15.75 | 22.27 | 31.50 | 38.58 | 49.81 | 70.44 | 890 | 1,590 |
| | 423.128 | ● | | | | | CK | | 12.70 | 12.30 | 31.50 | 44.55 | 63.00 | 77.16 | 99.61 | 140.87 | 890 | 1,590 |
| 423.208 | ● | | | | | | CM | 17.00 | 16.00 | 50.00 | 70.71 | 100.00 | 122.47 | 158.11 | 223.61 | 890 | 1,590 | |

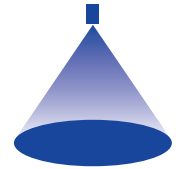
Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. + Code = Ordering no.
 example: 422.488 + 30 + CC = 422.488.30.CC



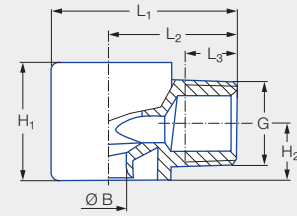
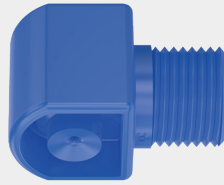
Assembly accessories can be found in Chapter 9 "Accessories".

➤ Tangential-flow full cone nozzles, plastic version Series 422/423



Features:

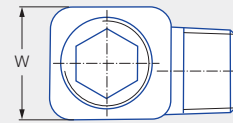
- Tangentially arranged supply of liquid
- Without swirl inserts
- Non-clogging
- Stable spray angle
- Uniform liquid distribution
- High chemical resistance



Applications:

- Surface spraying
- Cooling
- Cleaning and washing processes
- Foam control

Series 422/423



| Code | G | Dimensions [mm] | | | | | | Weight [g] |
|-----------|----------|-----------------|----------------|----------------|----------------|----------------|------|------------|
| | | H ₁ | H ₂ | L ₁ | L ₂ | L ₃ | W | |
| CC | 1/4 BSPT | 16.0 | 8.0 | 28.0 | 20.0 | 9.8 | 16.0 | 7.0 |
| CE | 3/8 BSPT | 23.0 | 11.2 | 36.0 | 25.0 | 10.1 | 22.0 | 16.0 |
| CG | 1/2 BSPT | 38.0 | 19.2 | 49.5 | 33.5 | 13.2 | 32.0 | 40.0 |
| CK | 3/4 BSPT | 50.0 | 24.5 | 58.5 | 38.5 | 18.5 | 41.0 | 50.0 |

| Spray angle | Ordering no. | | | | | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | | Spray diameter D [mm] (at p = 2 bar) | |
|-------------|----------------|----------|-----------|-----------|----------|-----------|----------------------|--------------------------------------|------------------|-------|--------------|-------|-------|--------|--------------------------------------|--------------|
| | Type | Mat. no. | Code | | | | | | p [bar] | | | | | | H = 250 [mm] | H = 500 [mm] |
| | | 5E | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPT | | | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 | 10.0 | | |
| 60° | 422.724 | ● | | CE | | | 3.60 | 3.60 | 3.15 | 4.45 | 6.30 | 7.72 | 9.96 | 14.09 | 320 | 560 |
| 90° | 422.406 | ● | CC | | | | 1.50 | 1.45 | 0.50 | 0.71 | 1.00 | 1.22 | 1.58 | 2.24 | 530 | 900 |
| | 422.566 | ● | CC | | | | 2.30 | 2.20 | 1.25 | 1.77 | 2.50 | 3.06 | 3.95 | 5.59 | 530 | 920 |
| | 422.606 | ● | | CE | | | 2.60 | 2.50 | 1.58 | 2.23 | 3.15 | 3.86 | 4.98 | 7.04 | 540 | 920 |
| | 422.646 | ● | | CE | | | 3.00 | 2.90 | 2.00 | 2.83 | 4.00 | 4.90 | 6.32 | 8.94 | 540 | 930 |
| | 422.726 | ● | | CE | | | 3.70 | 3.60 | 3.15 | 4.45 | 6.30 | 7.72 | 9.96 | 14.09 | 550 | 950 |
| | 422.806 | ● | | CE | | | 4.65 | 4.60 | 5.00 | 7.07 | 10.00 | 12.25 | 15.81 | 22.36 | 560 | 980 |
| | 422.846 | ● | | CE | | | 5.30 | 5.30 | 6.25 | 8.84 | 12.50 | 15.31 | 19.76 | 27.95 | 560 | 990 |
| | 422.886 | ● | | CE | | | 5.80 | 5.80 | 8.00 | 11.31 | 16.00 | 19.60 | 25.30 | 35.78 | 570 | 1,010 |
| | 422.926 | ● | | | | CG | 7.30 | 7.30 | 10.00 | 14.14 | 20.00 | 24.49 | 31.62 | 44.72 | 570 | 1,030 |
| | 422.966 | ● | | | | CG | 8.00 | 8.00 | 12.50 | 17.68 | 25.00 | 30.62 | 39.53 | 55.90 | 580 | 1,040 |
| | 423.006 | ● | | | | CG | 8.70 | 8.70 | 15.75 | 22.27 | 31.50 | 38.58 | 49.81 | 70.44 | 580 | 1,040 |
| | 423.126 | ● | | | | CK | 12.00 | 12.00 | 31.50 | 44.55 | 63.00 | 77.16 | 99.61 | 140.87 | 580 | 1,050 |





| Spray angle | Ordering no. | | | | | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | | Spray diameter D [mm] (at p = 2 bar) | |
|-------------|--------------|----------|----------|----------|----------|----------|----------------------|--------------------------------------|------------------|-------|-------|-------|--------|-------|--------------------------------------|--------------|
| | Type | Mat. no. | Code | | | | | | p [bar] | | | | | | H = 250 [mm] | H = 500 [mm] |
| | | 5E | 1/4 BSPT | 3/8 BSPT | 1/2 BSPT | 3/4 BSPT | | | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 | 10.0 | | |
| | | PVDF | | | | | | | | | | | | | | |
| 120° | 422.408 | ● | CC | | | | 1.50 | 1.45 | 0.50 | 0.71 | 1.00 | 1.22 | 1.58 | 2.24 | 670 | 1,200 |
| | 422.448 | ● | CC | | | | 1.65 | 1.60 | 0.63 | 0.88 | 1.25 | 1.53 | 1.98 | 2.80 | 680 | 1,210 |
| | 422.488 | ● | CC | | | | 1.90 | 1.90 | 0.80 | 1.13 | 1.60 | 1.96 | 2.53 | 3.58 | 680 | 1,230 |
| | 422.568 | ● | CC | | | | 2.40 | 2.40 | 1.25 | 1.77 | 2.50 | 3.06 | 3.95 | 5.59 | 700 | 1,260 |
| | 422.728 | ● | | CE | | | 4.00 | 3.90 | 3.15 | 4.45 | 6.30 | 7.72 | 9.96 | 14.09 | 770 | 1,400 |
| | 422.888 | ● | | CE | | | 6.60 | 6.00 | 8.00 | 11.31 | 16.00 | 19.60 | 25.30 | 35.78 | 940 | 1,590 |
| | 422.968 | ● | | | CG | | 8.00 | 8.00 | 12.50 | 17.68 | 25.00 | 30.62 | 39.53 | 55.90 | 960 | 1,620 |
| | 423.008 | ● | | | CG | | 8.70 | 8.70 | 15.75 | 22.27 | 31.50 | 38.58 | 49.81 | 70.44 | 970 | 1,630 |
| 423.128 | ● | | | | CK | 12.70 | 12.30 | 31.50 | 44.55 | 63.00 | 77.16 | 99.61 | 140.87 | 990 | 1,660 | |

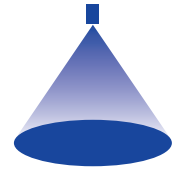
Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. + Code = Ordering no.
 example: 422.408 + 5E + CC = 422.408.5E.CC



Assembly accessories can be found in Chapter 9 "Accessories".

➤ Tangential-flow full cone nozzles, plastic version with bayonet quick-release system Series 422

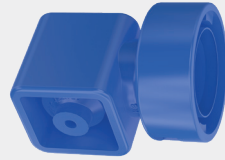


Features:

- Without swirl inserts
- Non-clogging
- Stable spray angle
- Simple and quick assembly
- Uniform liquid distribution
- High chemical resistance

Applications:

- Surface spraying
- Cooling
- Cleaning and washing processes
- Foam control



Series 422

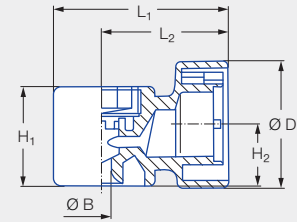
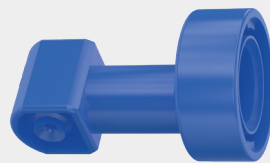


Figure 1

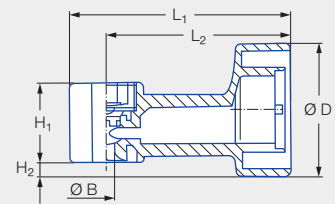




Figure 2

| Type | Code | Figure | Dimensions [mm] | | | | | Weight [g] (PVDF) |
|-------------------------|------|--------|-----------------|----------------|----------------|----------------|------|-------------------|
| | | | H ₁ | H ₂ | L ₁ | L ₂ | Ø D | |
| 422,644/422,606/422,608 | KB | 1 | 23.0 | 14.0 | 40.0 | 29.0 | 29.5 | 20.0 |
| 422,406/422,408/422,528 | KB | 2 | 17.5 | 3.5 | 48.0 | 40.0 | 29.5 | 14.0 |

| Spray angle | Ordering no. | | | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | | Spray diameter D [mm] (at p = 2 bar) | | |
|-------------|--------------|----------|----|----------------------|--------------------------------------|------------------|------------------------------|------|------|------|------|--------------------------------------|--|-------|
| | Type | Mat. no. | | | | Code | p [bar] | | | | | |  H = 250 [mm] H = 500 [mm] | |
| | | 5E | 53 | | | | | | | | | | | |
| | | PVDF | PP | | | | Bayonet quick-release system | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 | 10.0 | |
| 60° | 422.644 | | ● | KB | 2.90 | 2.90 | 2.00 | 2.83 | 4.00 | 4.90 | 6.32 | 8.94 | 250 | 490 |
| 90° | 422.406 | ● | | KB | 1.50 | 1.45 | 0.50 | 0.71 | 1.00 | 1.22 | 1.58 | 2.24 | 530 | 900 |
| | 422.606 | ● | | KB | 2.60 | 2.50 | 1.58 | 2.23 | 3.15 | 3.86 | 4.98 | 7.04 | 540 | 920 |
| 120° | 422.408 | ● | | KB | 1.50 | 1.45 | 0.50 | 0.71 | 1.00 | 1.22 | 1.58 | 2.24 | 670 | 1,140 |
| | 422.528 | ● | | KB | 2.10 | 2.00 | 1.00 | 1.41 | 2.00 | 2.45 | 3.16 | 4.47 | 690 | 1,220 |
| | 422.608 | ● | | KB | 2.60 | 2.50 | 1.58 | 2.23 | 3.15 | 3.86 | 4.98 | 7.04 | 710 | 1,260 |

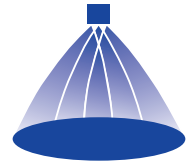
Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. + Code = Ordering no.
example: 422.644 + 53 + KB = 422.644.53.KB

 Assembly accessories can be found in Chapter 9 "Accessories".

Cluster head nozzles

Series 502/503

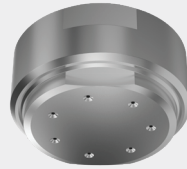


Features:

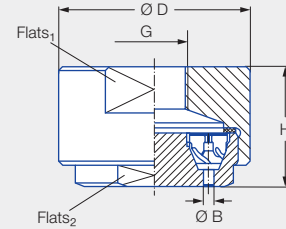
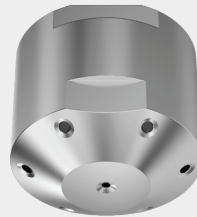
- Fine, uniform atomization
- Stable spray angle
- Space-saving installation
- Maintenance-friendly design
- High temperature and chemical resistance

Applications:

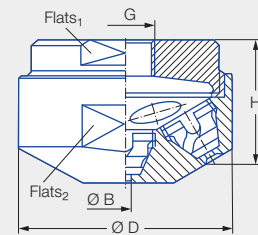
- Chlorine precipitation
- Absorption
- Dust suppression
- Degassing of liquids
- Desuperheating



Series 502/503



70° version



130° version

70° version

| G | Dimensions [mm] | | | | Weight [g] (brass) |
|----------|-----------------|------|--------------------|--------------------|--------------------|
| | H | Ø D | Flats ₁ | Flats ₂ | |
| 1/2 BSPP | 25.0 | 50.0 | 46 | 38 | 250.0 |
| 3/4 BSPP | 46.0 | 75.0 | 65 | 55 | 870.0 |

130° version


| G | Dimensions [mm] | | | | Weight [g] (brass) |
|----------|-----------------|------|--------------------|--------------------|--------------------|
| | H | Ø D | Flats ₁ | Flats ₂ | |
| 1/2 BSPP | 28.0 | 40.0 | 27 | 36 | 150.0 |
| 3/4 BSPP | 53.0 | 60.0 | 50 | 55 | 410.0 |

| Spray angle | Ordering no. | | | BSPP | Bore diameter B [mm] | Narrowest free cross sections Ø [mm] | V̇ water [l/min] | | | | | Spray diameter D [mm] (at p = 2 bar) | |
|-------------|--------------|-----------------|----|------|----------------------|--------------------------------------|------------------|-------|-------|-------|--------|--------------------------------------|----------------|
| | Type | Mat. no. | | | | | p [bar] | | | | | H = 500 [mm] | H = 1,000 [mm] |
| | | 17 ¹ | 30 | | | | 0.5 | 1.0 | 2.0 | 5.0 | 10.0 | | |
| 70° | 502.445 | | ● | 1/2 | 0.90 | 0.50 | – | – | 1.25 | 1.98 | 2.80 | 270 | 360 |
| | 502.985 | ● | | 3/4 | 3.30 | 2.00 | 14.00 | 19.80 | 28.00 | 44.27 | 62.61 | 610 | 1,000 |
| | 503.065 | ● | | 3/4 | 4.90 | 2.00 | 22.50 | 31.82 | 45.00 | 71.15 | 100.62 | 920 | 1,520 |
| 130° | 502.448 | ● | ● | 1/2 | 0.90 | 0.50 | – | – | 1.25 | 1.98 | 2.80 | 310 | 370 |
| | 502.548 | ● | ● | 1/2 | 1.80 | 0.50 | – | 1.58 | 2.24 | 3.54 | 5.01 | 450 | 570 |
| | 502.748 | ● | ● | 3/4 | 1.90 | 2.00 | 3.55 | 5.02 | 7.10 | 11.23 | 15.88 | 1,110 | 1,400 |
| | 502.838 | ● | ● | 3/4 | 2.90 | 2.00 | 5.90 | 8.34 | 11.80 | 18.66 | 26.39 | 1,500 | 2,060 |
| | 502.908 | ● | ● | 3/4 | 4.00 | 2.00 | 9.00 | 12.73 | 18.00 | 28.46 | 40.25 | 1,770 | 2,650 |
| | 503.028 | ● | ● | 3/4 | 4.20 | 2.00 | 17.75 | 25.10 | 35.50 | 56.13 | 79.38 | 2,050 | 3,150 |
| | 503.118 | ● | ● | 3/4 | 6.50 | 2.00 | 30.00 | 42.43 | 60.00 | 94.87 | 134.16 | 2,300 | 3,550 |

¹ We reserve the right to supply material 316Ti or 316L under material no. 17.

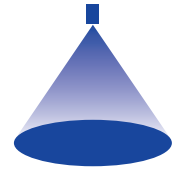
Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.
example: 502.445 + 30 = 502.445.30

 Assembly accessories can be found in Chapter 9 "Accessories".

Deflector-plate nozzles

Series 524/525

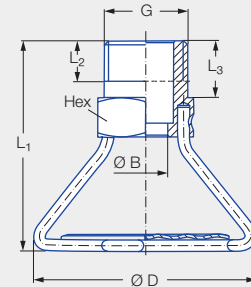


Features:

- Full cone atomization
- Large impact area
- Non-clogging

Applications:

- Fire fighting
- Sprinkling
- Dust suppression



Series 524/525

| G | Dimensions [mm] | | | | | Weight [g] (brass) |
|----------|-----------------|----------------|----------------|------|-----|--------------------|
| | L ₁ | L ₂ | L ₃ | Ø D | Hex | |
| 1/2 BSPP | 53.5 | 11.0 | 14.5 | 56.0 | 24 | 68.0 |

| Spray angle | Ordering no. | | | Bore diameter B [mm] | V̇ water [l/min] | | | | | | Spray diameter D [mm] (at p = 2 bar) | |
|-------------|--------------|-----------------|----|----------------------|------------------|-------|--------|--------|--------|--------|--------------------------------------|----------------|
| | Type | Mat. no. | | | p [bar] | | | | | | H = 1,000 [mm] | H = 3,000 [mm] |
| | | 17 ¹ | 30 | | 0.5 | 1.0 | 2.0 | 3.0 | 5.0 | 10.0 | | |
| 180° | 524.809 | ● | ● | 4.00 | 5.00 | 7.07 | 10.00 | 12.25 | 15.81 | 22.36 | 3,800 | 4,300 |
| | 525.049 | ● | ● | 8.00 | 20.00 | 28.28 | 40.00 | 48.99 | 63.25 | 89.44 | 10,000 | 11,500 |
| | 525.109 | | ● | 9.30 | 28.00 | 39.60 | 56.00 | 89.59 | 88.54 | 125.22 | 10,500 | 12,750 |
| | 525.169 | | ● | 10.90 | 40.00 | 56.57 | 80.00 | 97.98 | 126.49 | 178.89 | 10,500 | 14,500 |
| | 525.229 | | ● | 12.20 | 56.00 | 79.20 | 112.00 | 137.17 | 177.09 | 250.44 | 7,500 | 11,500 |
| | 525.269 | ● | ● | 12.30 | 70.00 | 98.99 | 140.00 | 171.46 | 221.36 | 313.05 | 7,000 | 12,000 |

¹ We reserve the right to supply material 316Ti or 316L under material no. 17.

Conversion formula for this series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$

Ordering Type + Material no. = Ordering no.
example: 524.809 + 17 = 524.809.17

Assembly accessories can be found in Chapter 9 "Accessories".

