



Flat fan
nozzles

Flat fan nozzles

- Belt cleaning
- Coating
- Steam cleaning
- Degreasing
- High pressure cleaning
- Gravel washing
- Cooling
- Surface treatment
- Phosphating
- Rain curtains
- Foam control
- Foam spraying
- Lubrication
- Filter cleaning
- Spray cleaning
- Washing processes
- and many others...



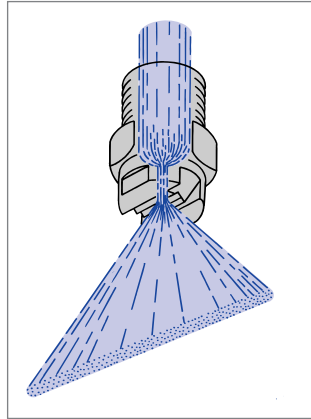
Flat fan nozzles

Lechler flat fan nozzles stand for uniform liquid distribution and jet pressures. Particularly powerful jets are generated with spray angles up to 60°. Nozzles with small flow rates are especially suited for humidifying and spraying in general. The flow geometry of the nozzle allows to produce accurate, compact jets, available with different liquid distribution patterns.

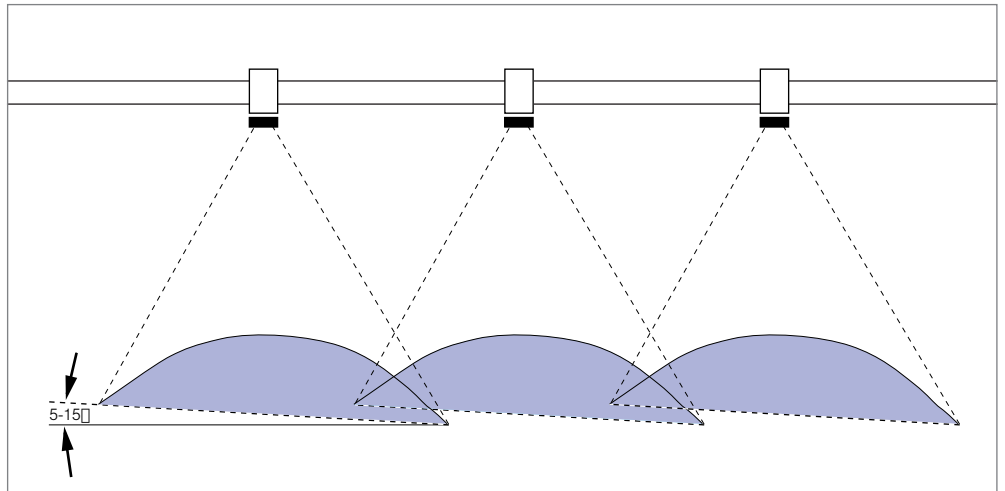
Basically, Lechler flat fan nozzles are designed for parabolic liquid distribution. Unaffected by transient pressures, they are suited for universal application. Their performance data are exactly defined. Operational values, such as flow rates, spray width, jet thickness and liquid distribution are readily available for a great variety of feed pressures. There are also special-design nozzles with rectangular or trapezoidal distribution of liquid.

Simple and cost-saving fixing attachments, as for instance dove-tail guides and eyelet clamps, considerably facilitate assembling and aligning of the nozzles.

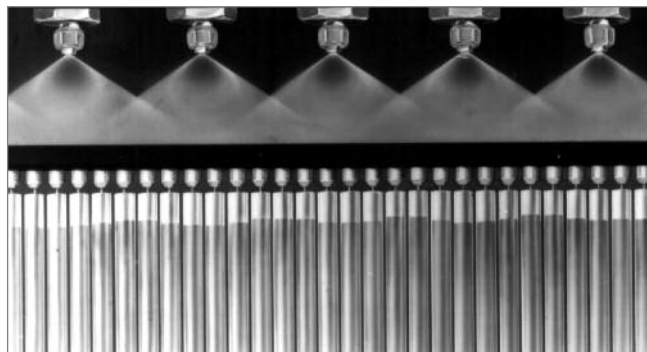
For all cleaning operations, in steelmaking and in many other fields of surface treatment, in short, wherever powerful, uniform water jets are required, Lechler flat fan nozzles constitute a decisive basis for achieving reliable process results.



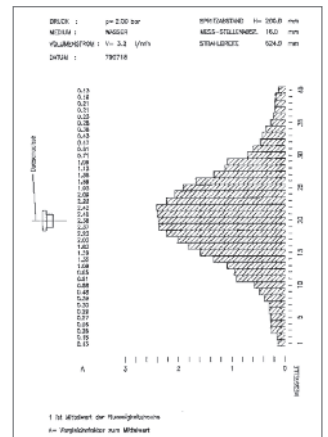
The **tongue-type nozzle** design represents a special kind of flat fan nozzle. With this nozzle type, the flat fan spray pattern is produced by a solid stream, impinging upon and deflecting from an outside deflector plate. As a result, a powerful, sharply delimited flat jet is shaped. The deflector plate has the form of a tongue, which determines the spray angle formation. Due to large free cross-sections, tongue-type nozzles are particularly clog-proof.



Arrangement of nozzles








Total liquid distribution



Liquid distribution single nozzle








Flat fan nozzles

Low-pressure nozzles	Series		\dot{V} [l/min] at $p = 2$ bar	Connection	Application/ Design	Page
	632	20° 30° 45° 60° 75° 90° 120°	0,05 – 22,40	1/8 BSPT 1/4 BSPT	Spray cleaning, surface treatment, filter cleaning, belt cleaning, lubricating, coating. Standard design with conical, self sealing thread.	4.8
	610	20° 30° 45° 60° 75° 90° 120°	0,05 – 4,00	1/8 BSPP	Cleaning installations, cooling headers, spray pipes. Compact design, suited for narrow installation conditions.	4.11
	612	20° 30° 45° 60° 75° 90° 120°	0,05 – 16,00	1/4 BSPP	Cleaning installations, cooling headers, spray pipes. Compact design, suited for narrow installation conditions.	4.13
	616 617	20° 30° 45° 60° 90° 120°	6,30 – 63,00	3/4 BSPP	Cleaning installations, rain curtains, gravel washing, spray pipes, foam spraying, roll cooling, cooling of rolled stock.	4.15



Flat fan nozzles

Low-pressure nozzles	Series		\dot{V} [l/min] at p = 2 bar	Connection	Application/ Design	Page
	652	20° 60° 30° 75° 45° 90° 120°	0,05 – 16,00	Assembly with 3/8" lock nut	Spray cleaning, surface treatment, filter cleaning, belt cleaning, lubricating, coating. Easy nozzle changing. Simple jet alignment.	4.17
	656	20° 60° 30° 75° 45° 90° 120°	6,30 – 40,00	Assembly with 3/4" lock nut	Cleaning installations, gravel washing, cooling headers, spray pipes, roll cooling cooling of rolled stock. Easy nozzle changing. Simple jet alignment.	4.19
	660	20° 60° 30° 75° 45° 90° 120°	0,05 – 10,00	Assembly with 3/8" lock nut and dove-tail guide	Cleaning installations, cool- ing headers, spray pipes. Automatic jet alignment, due to dove-tail guide.	4.21
	664 665	20° 60° 30° 75° 45° 90° 120°	6,30 – 63	Assembly with 3/4" lock nut and dove-tail guide	Cleaning installations, cool- ing headers, spray pipes, roll cooling cooling of rolled stock. Automatic jet alignment, due to dove-tail guide.	4.23
	638	30° 75° 45° 90° 60° 120°	0,08 – 25,00	Assembly with TWISTLOC quick connection	Belt cleaning, surface treatment, cleaning, coating processes. Quick and easy assembly, adjusted spray direction.	4.26



Flat fan nozzles

Low-pressure nozzles		Series		\dot{V} [l/min] at $p = 2$ bar	Connection	Application/ Design	Page
	646	20° 30° 60° 90° 120°		0,32 – 3,15	Assembly with bayonet quick release system	Belt cleaning, surface treatment, cleaning, coating processes. Quick and easy assembly, adjusted spray direction.	4.28
Tongue-type nozzles		Series		\dot{V} [l/min] at $p = 2$ bar	Connection	Application/ Design	Page
	688 689	45°		8,00 – 31,50	3/8 BSPT 3/4 BSPP	Cleaning, washing and phosphating process. Particularly clog proof.	4.30
	686	90° 140°		0,63 – 28,00	1/8 BSPT 1/4 BSPT 3/8 BSPT	Foam control in storage tanks and sewage treatment plants, for cleaning and washing pro- cess. Particularly clog proof.	4.31
	684	140°		0,50 – 10,00	Assembly with 3/8" lock nut	Foam control in storage tanks and sewage treatment plants, for cleaning and washing process. Particularly clog proof.	4.32
			 <p>Assembly with lock nut</p>				





Flat fan nozzles

High pressure nozzles	Series		\dot{V} [l/min] at $p = 80$ bar	Connection	Application/ Design	Page
	602	20°	4,04 – 60,00	1/8 BSPT 1/4 BSPT NPT 1/8 NPT 1/4 Assembly with 3/8" lock nut	High pressure cleaning, steam cleaning.	4.33
	608	30°				
	652	45°				
		60°				
Swivelling nozzles	Series		\dot{V} [l/min] at $p = 2$ bar	Connection	Application/ Design	Page
	676/677 MEMO- SPRAY®	60°	4,00 – 31,50	Assembly with clamp for the following pipe sizes: 1 1/4", 1 1/2".	Cleaning problems, phos- phating, degreasing, rinsing in surface treatment techniques. Ball joint, omnidirectional swivelling range of 20°. Simple quick assembling. Easy adjusting and cleaning.	4.34
		70°				
	676 „Easy-Clip“	60°	6,30 – 20,00	Assembly with clip for the following pipe sizes: 1", 1 1/4", 1 1/2", 2"	Cleaning problems, phos- phating, degreasing, rinsing in surface treatment techniques. Ball joint, omnidirectional swivelling range of 30°. Simple quick assembling. Easy adjusting and cleaning.	4.35
	676	20° 30° 45° 60° 75° 90° 120°	0,05 – 10,00	3/8 BSPP Weld base	Cleaning, cooling and lubri- cating process. Swivelling nozzle to meet exact jet alignment requi- rements. Omnidirectional swivelling range of 30°.	4.36



Flat fan nozzles

Nozzle for pressing into pipes	Series		\dot{V} [l/min] at $p = 2$ bar	Connection	Application/ Design	Page
	612.xxx.5E.03	90° 120°	0,63 – 4,00	For pressing into pipes	Cleaning and rinsing operations, dish washing machines. For pressing into pipes	4.39

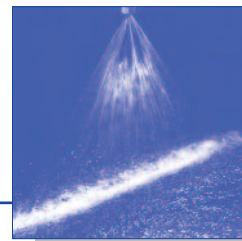
Descaling nozzles

	<p>Descaling nozzle Series 666</p> <p>Upon request. Please ask for our brochure "Nozzles for descaling".</p>		<p>Descaling nozzles SCALEMASTER® – the standard in descaling technology.</p> <p>Upon request: Please ask for our brochures "SCALEMASTER®".</p> 
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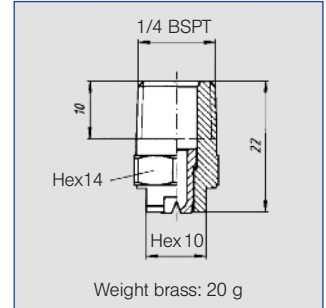
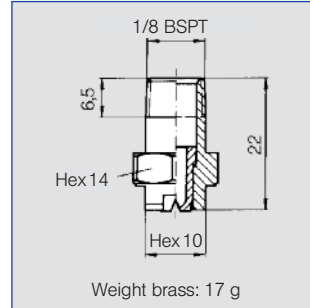
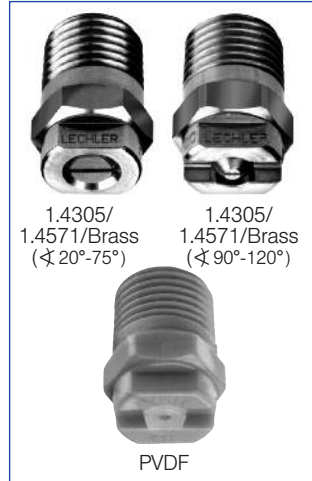
Flat fan nozzles

Series 632



Standard design with conical, self-sealing thread connection. Stable spray angle. Uniform, parabolical distribution of liquid. Spray pipes equipped with these nozzles show an extremely uniform total distribution of liquid.

Applications:
Spray cleaning, surface treatment, filter cleaning, belt cleaning, lubricating, coating.



Spray angle	Ordering no.						A ∅ [mm]	E ∅ [mm]	V̇ [l/min]							Spray width B at p = 2 bar	
	Type	Material-no.				Code			p [bar]								
		16	17	30	5E												
		1.4305/303 SS	1.4571/316 SS	Brass	PVDF				1/8 BSPT	1/4 BSPT	0,5	1,0	2,0	[US gal./min] at 40 psi	3,0	5,0	10,0
20°	632.301	○	○	○	○	CA CC	0,70	0,60	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	65	120
	632.361	○	○	○	○	CA CC	1,00	0,80	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	70	130
	632.441	○	○	○	○	CA CC	1,35	1,10	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	75	145
	632.481	○	○	○	○	CA CC	1,50	1,20	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	75	150
30°	632.302	○	○	○	○	CA CC	0,60	0,50	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	120	235
	632.362	○	○	○	○	CA CC	1,00	0,70	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	120	235
	632.402	○	○	○	○	CA CC	1,20	0,90	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	120	235
	632.482	○	○	○	○	CA CC	1,50	1,10	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	120	235
	632.562	○	○	○	○	CA CC	2,00	1,50	1,25	1,77	2,50	0,78	3,06	3,95	5,59	120	235
	632.642	○	○	○	-	CC	2,50	1,80	2,00	2,83	4,00	1,24	4,90	6,33	8,94	120	240
	632.722	○	○	○	-	CC	3,00	2,40	3,15	4,46	6,30	1,95	7,72	9,96	14,09	125	240
	632.762	○	○	○	-	CC	3,50	2,70	4,00	5,66	8,00	2,48	9,80	12,65	17,89	125	240
632.802	○	○	○	-	CC	4,00	3,10	5,00	7,07	10,00	3,10	12,25	15,81	22,36	130	250	
45°	632.303	○	○	○	-	CA CC	0,70	0,50	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	150	270
	632.363	○	○	○	○	CA CC	1,00	0,60	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	155	280
	632.403	○	○	○	○	CA CC	1,20	0,90	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	175	320
	632.483	○	○	○	○	CA CC	1,50	1,10	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	180	340
	632.563	○	○	○	○	CA CC	2,00	1,40	1,25	1,77	2,50	0,78	3,06	3,95	5,59	185	355
	632.643	○	○	○	○	CA CC	2,50	1,80	2,00	2,83	4,00	1,24	4,90	6,33	8,94	195	370
	632.723	○	○	○	-	CC	3,00	2,40	3,15	4,46	6,30	1,95	7,72	9,96	14,09	200	375
	632.763	○	○	○	-	CC	3,50	2,60	4,00	5,66	8,00	2,48	9,80	12,65	17,89	200	380
	632.803	○	○	○	-	CC	4,00	3,00	5,00	7,07	10,00	3,10	12,25	15,81	22,36	205	385

A = Equivalent bore diameter · E = narrowest free cross section
*Differing spray pattern
Subject to technical modifications.

Continued on next page.

Example	Type	+	Material no.	+	Code	=	Ordering no.
for ordering:	632.301	+	16	+	CA	=	632.301.16.CA

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to „Accessories“.



Flat fan nozzles

Series 632



Spray angle	Ordering no.						A Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray width B at p = 2 bar		
	Type	Material-no.				Code			p [bar]							H= 250 mm	H= 500 mm	
		16	17	30	5E	1/8 BSPT			1/4 BSPT	0,5	1,0	2,0	3,0	5,0	7,0			10,0
		1.4305/303 SS	1.4571/316 SS	Ms	PVDF													
60°	632. 304	○	○	○	○	CA	CC	0,70	0,40	0,16*	0,23*	0,32	0,39	0,51	0,60	0,72	215	425
	632. 334	○	○	○	○	CA	CC	0,90	0,50	0,22*	0,32*	0,45	0,55	0,71	0,84	1,01	220	440
	632. 364	○	○	○	○	CA	CC	1,00	0,60	0,31*	0,44*	0,63	0,77	1,00	1,18	1,40	230	460
	632. 404	○	○	○	○	CA	CC	1,20	0,80	0,50*	0,71	1,00	1,23	1,58	1,87	2,24	245	485
	632. 444	○	○	○	○	CA	CC	1,35	0,90	0,62*	0,88	1,25	1,53	1,98	2,34	2,80	255	495
	632. 484	○	○	○	○	CA	CC	1,50	1,00	0,80*	1,13	1,60	1,96	2,53	2,99	3,58	260	510
	632. 514	○	○	○	○	CA	CC	1,65	1,10	0,95*	1,34	1,90	2,33	3,00	3,56	4,25	270	520
	632. 564	○	○	○	○	CA	CC	2,00	1,30	1,25	1,77	2,50	3,06	3,95	4,68	5,59	280	535
	632. 604	○	○	○	○	CA	CC	2,20	1,50	1,58	2,23	3,15	3,86	4,98	5,89	7,04	290	550
	632. 644	○	○	○	○	-	CC	2,50	1,60	2,00	2,83	4,00	4,90	6,33	7,48	8,94	295	565
	632. 674	○	○	○	○	-	CC	2,70	1,80	2,38	3,36	4,75	5,82	7,51	8,89	10,62	300	575
	632. 724	○	○	○	○	-	CC	3,00	2,10	3,15	4,46	6,30	7,72	9,96	11,79	14,09	305	590
	632. 764	○	○	○	-	-	CC	3,50	2,30	4,00	5,66	8,00	9,80	12,65	14,97	17,89	310	595
	632. 804	○	-	○	○	-	CC	4,00	2,60	5,00	7,07	10,00	12,25	15,81	18,71	22,36	310	595
632. 844	○	-	○	○	-	CC	4,50	3,00	6,25	8,84	12,50	15,31	19,76	23,39	27,95	310	590	
632. 884	○	-	○	○	-	CC	5,00	3,40	8,00	11,31	16,00	19,60	25,30	29,93	35,78	300	570	
632. 944	-	-	○	○	-	CC	5,70	4,40	11,20	15,84	22,40	27,43	35,42	41,91	50,09	300	570	
75°	632. 145	○	-	○	-	CA	CC	0,16	0,30	-	0,04*	0,05	0,06	0,08	0,09	0,11	280	550
	632. 165	○	-	○	-	CA	CC	0,20	0,34	-	0,05*	0,07	0,08	0,10	0,12	0,15	290	560
	632. 185	○	-	○	-	CA	CC	0,35	0,20	-	0,06*	0,08	0,10	0,13	0,15	0,18	300	575
	632. 215	○	-	○	-	CA	CC	0,40	0,20	-	0,08*	0,11	0,14	0,18	0,21	0,25	300	580
	632. 245	○	-	○	-	CA	CC	0,50	0,30	-	0,12*	0,16	0,20	0,26	0,30	0,36	310	585
	632. 275	○	-	○	-	CA	CC	0,60	0,30	0,11*	0,16*	0,22	0,27	0,35	0,41	0,49	310	590
90°	632. 216	○	-	○	-	CA	CC	0,40	0,20	-	0,08*	0,11	0,14	0,18	0,21	0,25	370	700
	632. 276	○	-	○	-	CA	CC	0,60	0,30	0,11*	0,16*	0,22	0,27	0,35	0,41	0,49	375	720
	632. 306	○	○	○	○	CA	CC	0,70	0,40	0,16*	0,23*	0,32	0,39	0,51	0,60	0,72	380	740
	632. 336	○	○	○	○	CA	CC	0,90	0,50	0,22*	0,32*	0,45	0,55	0,71	0,84	1,01	415	800
	632. 366	○	○	○	○	CA	CC	1,00	0,50	0,31*	0,44*	0,63	0,77	1,00	1,18	1,41	420	810
	632. 406	○	○	○	○	CA	CC	1,20	0,70	0,50*	0,71	1,00	1,23	1,58	1,87	2,24	430	820
	632. 446	○	○	○	○	CA	CC	1,35	0,80	0,62*	0,88	1,25	1,53	1,98	2,34	2,80	435	830
	632. 486	○	○	○	○	CA	CC	1,50	0,80	0,80*	1,13	1,60	1,96	2,53	2,99	3,58	440	835
	632. 516	○	○	○	○	CA	CC	1,65	0,90	0,95*	1,34	1,90	2,33	3,00	3,56	4,25	440	840
	632. 566	○	○	○	○	CA	CC	2,00	1,10	1,25	1,77	2,50	3,06	3,95	4,68	5,59	445	850
	632. 606	○	○	○	○	CA	CC	2,20	1,20	1,58	2,23	3,15	3,86	4,98	5,89	7,04	450	860
	632. 646	○	○	○	○	-	CC	2,50	1,30	2,00	2,83	4,00	4,90	6,33	7,48	8,94	455	865
	632. 676	○	○	○	○	-	CC	2,70	1,40	2,38	3,36	4,75	5,82	7,51	8,89	10,62	465	875
	632. 726	○	○	○	○	-	CC	3,00	1,70	3,15	4,46	6,30	7,72	9,96	11,79	14,09	470	885
	632. 766	○	○	○	○	-	CC	3,50	1,90	4,00	5,66	8,00	9,80	12,65	14,97	17,89	475	890
	632. 806	○	-	○	○	-	CC	4,00	2,40	5,00	7,07	10,00	12,25	15,81	18,71	22,36	480	900
	632. 846	-	-	-	○	-	CC	4,50	2,40	6,25	8,84	12,50	15,31	19,76	23,39	27,95	480	900
	632. 886	○	-	○	○	-	CC	5,00	3,10	8,00	11,31	16,00	19,60	25,30	29,93	35,78	480	910

A = Equivalent bore diameter · E = narrowest free cross section
 *Differing spray pattern
 Subject to technical modifications.

Continued on next page.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to „Accessories“.

Example Type + Material no. + Code = Ordering no.
 for ordering: 632. 304. + 16 + CA = 632. 304. 16. CA

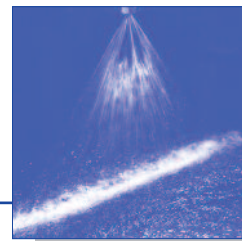
Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$





Flat fan nozzles

Series 632



Spray angle	Ordering no.						A Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray width B at p = 2 bar	
	Type	Material-no.				Code			p [bar]							 H= 250 mm H= 500 mm	
		16 1.4305/303 SS	17 1.4571/316 SS	30 Brass	5E PVDF				1/8 BSPT	1/4 BSPT	0,5	1,0	2,0	3,0	5,0		
120°	632. 187	○	-	○	-	CA CC	0,35	0,20	-	0,06*	0,08	0,10	0,13	0,15	0,18	630	1200
	632. 217	○	-	○	-	CA CC	0,40	0,20	-	0,08*	0,11	0,14	0,18	0,21	0,25	640	1210
	632. 247	○	-	○	-	CA CC	0,50	0,20	-	0,12*	0,16	0,20	0,26	0,30	0,36	650	1230
	632. 277	○	-	○	-	CA CC	0,60	0,30	-	0,16*	0,22	0,27	0,35	0,41	0,49	660	1250
	632. 307	○	-	○	○	CA CC	0,70	0,30	0,16*	0,23*	0,32	0,39	0,51	0,60	0,72	660	1250
	632. 337	○	○	○	○	CA CC	0,90	0,40	0,22*	0,32*	0,45	0,55	0,71	0,84	1,01	670	1270
	632. 367	○	○	○	○	CA CC	1,00	0,50	0,31*	0,44*	0,63	0,77	1,00	1,18	1,41	670	1270
	632. 407	○	○	○	○	CA CC	1,20	0,60	0,50*	0,71	1,00	1,23	1,58	1,87	2,24	670	1270
	632. 447	○	○	○	○	CA CC	1,35	0,60	0,62*	0,88	1,25	1,53	1,98	2,34	2,80	675	1270
	632. 487	○	○	○	○	CA CC	1,50	0,60	0,80*	1,13	1,60	1,96	2,53	2,99	3,58	680	1275
	632. 517	○	○	○	○	CA CC	1,65	0,90	0,95*	1,34	1,90	2,33	3,00	3,56	4,25	685	1280
	632. 567	○	○	○	○	CA CC	2,00	0,90	1,25	1,77	2,50	3,06	3,95	4,68	5,59	690	1285
	632. 607	○	○	○	○	CA CC	2,20	1,10	1,58	2,23	3,15	3,86	4,98	5,89	7,04	700	1300
	632. 647	○	○	○	-	CC	2,50	1,30	2,00	2,83	4,00	4,90	6,33	7,48	8,94	700	1300
	632. 677	○	○	○	○	CC	2,70	1,40	2,38	3,36	4,75	5,82	7,51	8,89	10,62	720	1330
	632. 727	○	○	○	○	CC	3,00	1,60	3,15	4,46	6,30	7,72	9,96	11,79	14,09	740	1360
632. 767	○	○	○	○	CC	3,50	1,70	4,00	5,66	8,00	9,80	12,65	14,97	17,89	760	1400	
632. 807	-	-	○	-	CC	4,00	2,00	5,00	7,07	10,00	12,25	15,81	18,71	22,36	790	1450	
632. 847	-	-	-	○	CC	4,50	2,30	6,25	8,84	12,50	15,31	19,76	23,39	27,95	790	1450	

A = Equivalent bore diameter · E = narrowest free cross section

*Differing spray pattern

Subject to technical modifications.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities.

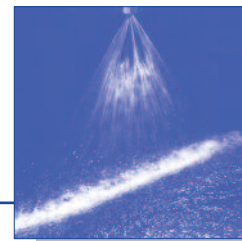
For complete assembly accessories, please refer to „Accessories“.

Example Type + Material no. + Code = Ordering no.
for ordering: 632. 187. + 16 + CA = 632. 187. 16. CA



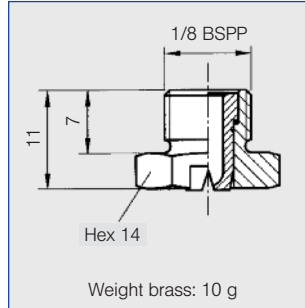
Flat fan nozzles

Series 610



Compact design, suitable for narrow installation conditions. Stable spray angle. Uniform parabolic distribution of liquid.

Applications:
Cleaning installations, cooling headers, spray pipes.



Spray angle	Ordering no.		A Ø [mm]	E Ø [mm]	V̇ [l/min]								Spray width B at p = 2 bar		
	Type	Mat.-no.			p [bar]								 H = 250 mm H = 500 mm		
		16 1.4305/303 SS			30 Brass	0,5	1,0	2,0	[US gal./min] at 40 psi	3,0	5,0	10,0			
20°	610. 301	○	○	0,70	0,60	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	65	125	
	610. 361	○	○	1,00	0,80	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	65	125	
	610. 441	○	○	1,35	1,10	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	65	125	
	610. 481	○	○	1,50	1,20	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	65	125	
30°	610. 302	○	○	0,70	0,50	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	115	230	
	610. 362	○	○	1,00	0,70	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	115	230	
	610. 402	○	○	1,20	0,90	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	115	230	
	610. 482	○	○	1,50	1,10	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	115	230	
	610. 562	○	○	2,00	1,50	1,25	1,77	2,50	0,78	3,06	3,95	5,59	115	230	
45°	610. 303	○	○	0,70	0,50	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	185	340	
	610. 363	○	○	1,00	0,60	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	185	340	
	610. 403	○	○	1,20	0,90	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	185	340	
	610. 483	○	○	1,50	1,10	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	185	340	
	610. 563	○	○	2,00	1,40	1,25	1,77	2,50	0,78	3,06	3,95	5,59	185	340	
	610. 643	○	○	2,50	1,80	2,00	2,83	4,00	1,24	4,90	6,33	8,94	185	340	
60°	610. 304	○	○	0,70	0,40	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	275	525	
	610. 334	○	○	0,90	0,50	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	275	525	
	610. 364	○	○	1,00	0,60	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	275	525	
	610. 404	○	○	1,20	0,80	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	275	525	
	610. 444	○	○	1,35	0,90	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	280	530	
	610. 484	○	○	1,50	1,00	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	280	530	
	610. 514	○	○	1,65	1,10	0,95*	1,34	1,90	0,59	2,33	3,00	4,25	280	530	
	610. 564	○	○	2,00	1,30	1,25	1,77	2,50	0,78	3,06	3,95	5,59	280	530	
75°	610. 145	○	○	0,16	0,30	-	0,04*	0,05	0,02	0,06	0,08	0,11	285	550	
	610. 165	○	○	0,20	0,34	-	0,05*	0,07	0,02	0,08	0,10	0,15	285	555	
	610. 185	○	○	0,35	0,20	-	0,06*	0,08	0,11	0,10	0,13	0,18	290	560	
	610. 215	○	○	0,40	0,20	-	0,08*	0,11	0,03	0,14	0,18	0,25	290	560	
	610. 245	○	○	0,50	0,30	-	0,12*	0,16*	0,05	0,20	0,26	0,36	290	560	
	610. 275	○	○	0,60	0,30	0,11*	0,16*	0,22	0,07	0,27	0,35	0,49	290	560	

A = Equivalent bore diameter · E = narrowest free cross section

*Differing spray pattern

Subject to technical modifications.

Continued on next page.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to „Accessories“.

Example	Type	+	Material no.	=	Ordering no.
for ordering:	610. 301	+	16	=	610. 301. 16

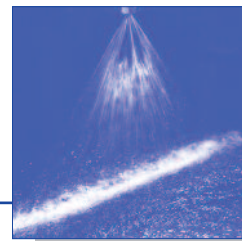
Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$





Flat fan nozzles

Series 610



Spray angle	Ordering no.		A ∅ [mm]	E ∅ [mm]	V̇ [l/min]							Spray width B at p = 2 bar		
	Type	Mat.-no.			p [bar]									
		16 1.4305/303 SS			30 Brass	0,5	1,0	2,0	[US gal/ min] at 40 psi	3,0	5,0			10,0
90°	610. 216	○	○	0,40	0,20	-	0,08	0,11	0,03	0,14	0,18	0,25	380	670
	610. 276	○	○	0,60	0,30	0,11*	0,16*	0,22	0,07	0,27	0,35	0,49	450	795
	610. 306	○	○	0,70	0,40	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	450	795
	610. 336	○	○	0,90	0,50	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	450	795
	610. 366	○	○	1,00	0,50	0,31*	0,44*	0,63	0,20	0,77	1,00	1,41	450	795
	610. 406	○	○	1,20	0,70	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	450	800
	610. 446	○	○	1,35	0,80	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	450	800
	610. 486	○	○	1,50	0,80	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	450	800
	610. 516	○	○	1,65	0,90	0,95*	1,34	1,90	0,59	2,33	3,00	4,25	450	800
	610. 566	○	○	2,00	1,10	1,25	1,77	2,50	0,78	3,06	3,95	5,59	450	805
610. 606	○	○	2,20	1,20	1,58	2,23	3,15	0,98	3,86	4,98	7,04	450	805	
120°	610. 187	○	○	0,35	0,20	-	0,06	0,08	0,02	0,10	0,13	0,18	640	1220
	610. 217	○	○	0,40	0,20	-	0,08	0,11	0,03	0,14	0,18	0,25	650	1230
	610. 247	○	○	0,50	0,20	-	0,12	0,16	0,05	0,20	0,26	0,36	655	1245
	610. 277	○	○	0,60	0,30	-	0,16	0,22	0,07	0,27	0,35	0,49	655	1250
	610. 307	○	○	0,70	0,30	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	660	1260
	610. 337	○	○	0,90	0,40	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	660	1260
	610. 367	○	○	1,00	0,50	0,31*	0,44*	0,63	0,20	0,77	1,00	1,41	660	1265
	610. 407	○	○	1,20	0,60	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	660	1270
	610. 447	○	○	1,35	0,60	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	665	1270
	610. 487	○	○	1,50	0,60	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	665	1270
	610. 517	○	○	1,65	0,90	0,95*	1,34	1,90	0,59	2,33	3,00	4,25	670	1275
	610. 567	○	○	2,00	0,90	1,25	1,77	2,50	0,78	3,06	3,95	5,59	670	1280
	610. 607	○	○	2,20	1,10	1,58	2,23	3,15	0,98	3,86	4,98	7,04	675	1285

A = Equivalent bore diameter · E = narrowest free cross section
 *Differing spray pattern
 Subject to technical modifications.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to „Accessories“.

Example	Type	+	Material no.	=	Ordering no.
for ordering:	610. 216	+	16	=	610. 216. 16



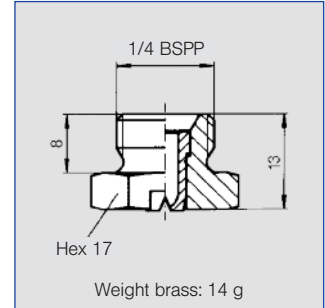
Flat fan nozzles

Series 612



Compact design, suitable for narrow installation conditions. Stable spray angle. Uniform parabolic distribution of liquid.

Applications:
Cleaning installations, cooling headers spray pipes.



Spray angle	Ordering no.				A ∅ [mm]	E ∅ [mm]	V̇ [l/min]							Spray width B at p = 2 bar	
	Type	Material-no.					p [bar]								
		16 1.4305/303 SS	17 1.4571/316 SS	30 Brass			0,5	1,0	2,0	[US gal./ min] at 40 psi	3,0	5,0	10,0		
20°	612. 301	○	○	○	0,70	0,60	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	75	150
	612. 361	○	○	○	1,00	0,80	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	80	150
	612. 441	○	○	○	1,30	1,10	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	80	155
	612. 481	○	○	○	1,50	1,20	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	80	155
30°	612. 302	○	○	○	0,60	0,50	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	85	140
	612. 362	○	○	○	1,00	0,70	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	95	160
	612. 402	○	○	○	1,20	0,90	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	105	190
	612. 482	○	○	○	1,50	1,10	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	120	225
	612. 562	○	○	○	2,00	1,50	1,25	1,77	2,50	0,78	3,06	3,95	5,59	135	240
	612. 642	○	○	○	2,50	1,80	2,00	2,83	4,00	1,24	4,90	6,33	8,94	145	285
	612. 722	○	○	○	3,00	2,40	3,15	4,46	6,30	1,95	7,72	9,96	14,09	150	290
	612. 762	○	○	○	3,50	2,70	4,00	5,66	8,00	2,48	9,80	12,65	17,89	150	290
612. 802	○	○	○	4,00	3,10	5,00	7,07	10,00	3,10	12,25	15,81	22,36	150	290	
45°	612. 303	○	○	○	0,70	0,50	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	160	315
	612. 363	○	○	○	1,00	0,60	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	170	340
	612. 403	○	○	○	1,20	0,90	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	175	345
	612. 483	○	○	○	1,50	1,10	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	195	375
	612. 563	○	○	○	2,00	1,40	1,25	1,77	2,50	0,78	3,06	3,95	5,59	190	365
	612. 643	○	○	○	2,50	1,80	2,00	2,83	4,00	1,24	4,90	6,33	8,94	190	365
	612. 723	○	○	○	3,00	2,40	3,15	4,46	6,30	1,95	7,72	9,96	14,09	195	370
	612. 763	○	○	○	3,50	2,60	4,00	5,66	8,00	2,48	9,80	12,65	17,89	195	370
	612. 803	○	○	○	4,00	3,00	5,00	7,07	10,00	3,10	12,25	15,81	22,36	195	370
	60°	612. 304	○	○	○	0,70	0,40	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	245
612. 334		○	○	○	0,90	0,50	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	250	495
612. 364		○	○	○	1,00	0,60	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	255	500
612. 404		○	○	○	1,20	0,80	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	260	510
612. 444		○	○	○	1,35	0,90	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	260	510
612. 484		○	○	○	1,50	1,00	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	270	525
612. 514		○	○	○	1,65	1,10	0,95*	1,34	1,90	0,59	2,33	3,00	4,25	260	510
612. 564		○	○	○	2,00	1,30	1,25	1,77	2,50	0,78	3,06	3,95	5,59	260	505
612. 604		○	○	○	2,20	1,50	1,58	2,23	3,15	0,98	3,86	4,98	7,04	265	505
612. 644		○	○	○	2,50	1,60	2,00	2,83	4,00	1,24	4,90	6,33	8,94	265	505
612. 674		○	○	○	2,70	1,80	2,38	3,36	4,75	1,47	5,82	7,51	10,62	265	505
612. 724		○	○	○	3,00	2,10	3,15	4,46	6,30	1,95	7,72	9,96	14,09	265	505
612. 764		○	○	○	3,50	2,30	4,00	5,66	8,00	2,48	9,80	12,65	17,89	260	500
612. 804		○	○	○	4,00	2,60	5,00	7,07	10,00	3,10	12,25	15,81	22,36	255	490
612. 884		○	-	○	5,00	3,40	8,00	11,31	16,00	4,96	19,60	25,30	35,78	255	490

A = Equivalent bore diameter · E = narrowest free cross section
*Differing spray pattern. Subject to technical modifications.

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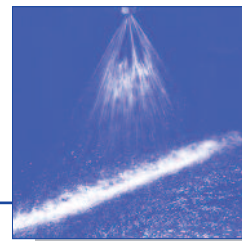
Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$





Flat fan nozzles

Series 612



Spray angle	Ordering no.				A ∅ [mm]	E ∅ [mm]	V̇ [l/min]						Spray width B at p = 2 bar		
	Type	Material-no.					p [bar]								
		16 1.4305/303 SS	17 1.4571/316 SS	30 Brass			0,5	1,0	2,0	[US gal/ min] at 40 psi	3,0	5,0			10,0
75°	612. 145	○	-	○	0,16	0,30	-	0,04*	0,05	0,02	0,06	0,08	0,11	300	580
	612. 165	○	-	○	0,20	0,34	-	0,05*	0,07	0,02	0,08	0,10	0,15	310	590
	612. 185	○	-	○	0,35	0,20	-	0,06*	0,08	0,02	0,10	0,13	0,18	320	600
	612. 215	○	-	○	0,40	0,20	-	0,08*	0,11	0,03	0,14	0,18	0,25	325	610
	612. 245	○	-	○	0,50	0,30	-	0,12*	0,16	0,05	0,20	0,26	0,36	330	615
	612. 275	○	-	○	0,60	0,30	0,11*	0,16*	0,22	0,07	0,27	0,35	0,49	340	630
90°	612. 216	○	-	○	0,40	0,20	-	0,08*	0,11	0,03	0,14	0,18	0,25	420	820
	612. 276	○	-	○	0,60	0,30	0,11*	0,16*	0,22	0,07	0,27	0,35	0,49	420	820
	612. 306	○	○	○	0,70	0,40	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	425	840
	612. 336	○	○	○	0,90	0,50	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	425	840
	612. 366	○	○	○	1,00	0,50	0,31*	0,44*	0,63	0,20	0,77	1,00	1,41	425	835
	612. 406	○	○	○	1,20	0,70	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	425	835
	612. 446	○	○	○	1,35	0,80	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	425	835
	612. 486	○	○	○	1,50	0,80	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	425	830
	612. 516	○	○	○	1,65	0,90	0,95*	1,34	1,90	0,59	2,33	3,00	4,25	425	830
	612. 566	○	○	○	2,00	1,10	1,25	1,77	2,50	0,78	3,06	3,95	5,59	425	825
	612. 606	○	○	○	2,20	1,20	1,58	2,23	3,15	0,98	3,86	4,98	7,04	425	820
	612. 646	○	○	○	2,50	1,30	2,00	2,83	4,00	1,24	4,90	6,33	8,94	425	820
	612. 676	○	○	○	2,70	1,40	2,38	3,36	4,75	1,47	5,82	7,51	10,62	425	815
	612. 726	○	○	○	3,00	1,70	3,15	4,46	6,30	1,95	7,71	9,96	14,09	425	810
	612. 766	○	○	○	3,50	1,90	4,00	5,66	8,00	2,48	9,80	12,65	17,89	425	810
612. 806	○	-	○	4,00	2,40	5,00	7,07	10,00	3,10	12,25	15,81	22,36	425	805	
120°	612. 187	○	-	○	0,35	0,20	-	0,06*	0,08	0,02	0,10	0,13	0,18	610	1140
	612. 217	○	-	○	0,40	0,20	-	0,08*	0,11	0,03	0,14	0,18	0,25	615	1150
	612. 247	○	-	○	0,50	0,20	-	0,12*	0,16	0,05	0,20	0,26	0,36	620	1160
	612. 277	○	-	○	0,60	0,30	-	0,16*	0,22	0,07	0,27	0,35	0,49	620	1170
	612. 307	○	-	○	0,70	0,30	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	625	1175
	612. 337	○	○	○	0,90	0,40	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	630	1180
	612. 367	○	○	○	1,00	0,40	0,31*	0,44*	0,63	0,20	0,77	1,00	1,41	635	1190
	612. 407	○	○	○	1,20	0,60	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	640	1195
	612. 447	○	○	○	1,35	0,60	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	645	1200
	612. 487	○	○	○	1,50	0,60	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	650	1200
	612. 517	○	○	○	1,65	0,90	0,95*	1,34	1,90	0,59	2,33	3,00	4,25	650	1205
	612. 567	○	○	○	2,00	0,90	1,25	1,77	2,50	0,78	3,06	3,95	5,59	655	1210
	612. 607	○	○	○	2,20	1,10	1,58	2,23	3,15	0,98	3,86	4,98	7,04	660	1215
	612. 647	○	○	○	2,50	1,30	2,00	2,83	4,00	1,24	4,90	6,33	8,94	660	1220
	612. 677	○	○	○	2,70	1,40	2,38	3,36	4,75	1,47	5,82	7,51	10,62	665	1230
	612. 727	○	○	○	3,00	1,60	3,15	4,46	6,30	1,95	7,71	9,96	14,09	675	1245
	612. 767	○	○	○	3,50	1,70	4,00	5,66	8,00	2,48	9,80	12,65	17,89	680	1260
	612. 807	○	-	○	4,00	2,00	5,00	7,07	10,00	3,10	12,25	15,81	22,36	690	1280

A = Equivalent bore diameter · E = narrowest free cross section
 *Differing spray pattern
 Subject to technical modifications.

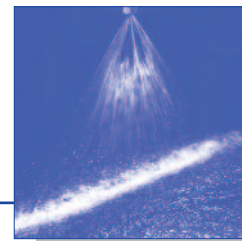
The folded page at the end of the catalogue will give you a survey on the various assembly possibilities.
 For complete assembly accessories, please refer to „Accessories“.

Example	Type	+	Material no.	=	Ordering no.
for ordering:	612. 145	+	16	=	612. 145. 16



Flat fan nozzles

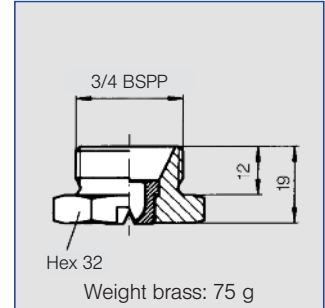
Series 616 / 617



Uniform, parabolic distribution of liquid. Increased non-clogging features, more jet power, less fog.

Applications:

Cleaning installations, rain curtains, gravel washing, spray pipes, foam spraying, roll cooling, cooling of rolled stock.



Spray angle	Ordering no.				A ∅ [mm]	E ∅ [mm]	V̇ [l/min]							Spray width B at p = 2 bar	
	Type	Material-no.					p [bar]							Diagram	
		16 1.4305/303 SS	17 1.4571/316 SS	30 Brass			0,5	1,0	2,0	[US gal./min] at 40 psi	3,0	5,0	10,0	H = 250 mm	H = 500 mm
20°	616. 721	○	○	○	3,00	2,50	3,15	4,45	6,30	1,95	7,72	9,96	14,09	80	140
	616. 801	○	○	○	4,00	3,20	5,00	7,07	10,00	3,10	12,25	15,81	22,36	80	145
	616. 881	○	○	○	5,00	4,00	8,00	11,31	16,00	4,96	19,60	25,30	35,78	80	145
	616. 921	○	○	○	5,50	4,40	10,00	14,14	20,00	6,20	24,49	31,62	44,72	80	145
	616. 961	○	○	○	6,00	5,10	12,50	17,68	25,00	7,75	30,62	39,53	55,90	80	145
30°	616. 722	○	○	○	3,00	2,40	3,15	4,45	6,30	1,95	7,72	9,96	14,09	120	230
	616. 762	○	○	○	3,50	2,70	4,00	5,66	8,00	2,48	9,80	12,65	17,89	120	230
	616. 802	○	○	○	4,00	3,10	5,00	7,07	10,00	3,10	12,25	15,81	22,36	120	235
	616. 882	○	○	○	5,00	4,00	8,00	11,31	16,00	4,96	19,60	25,30	35,78	120	235
	616. 922	○	○	○	5,50	4,40	10,00	14,14	20,00	6,20	24,49	31,62	44,72	120	235
	616. 962	○	-	○	6,00	5,00	12,50	17,68	25,00	7,75	30,62	39,53	55,90	125	240
45°	616. 723	○	○	○	3,00	2,40	3,15	4,45	6,30	1,95	7,72	9,96	14,09	175	330
	616. 763	○	○	○	3,50	2,60	4,00	5,66	8,00	2,48	9,80	12,65	17,89	175	330
	616. 803	○	○	○	4,00	3,00	5,00	7,07	10,00	3,10	12,25	15,81	22,36	175	335
	616. 843	○	○	○	4,50	3,40	6,25	8,84	12,50	3,88	15,31	19,76	27,95	180	335
	616. 883	○	○	○	5,00	3,80	8,00	11,31	16,00	4,96	19,60	25,30	35,78	185	350
	616. 923	○	○	○	5,50	4,20	10,00	14,14	20,00	6,20	24,49	31,62	44,72	190	360
60°	616. 963	○	○	○	6,00	4,40	12,50	17,68	25,00	7,75	30,62	39,53	55,90	200	375
	616. 724	○	○	○	3,00	2,10	3,15	4,45	6,30	1,95	7,72	9,96	14,09	295	575
	616. 764	○	○	○	3,50	2,30	4,00	5,66	8,00	2,48	9,80	12,65	17,89	300	580
	616. 804	○	○	○	4,00	2,60	5,00	7,07	10,00	3,10	12,25	15,81	22,36	300	580
	616. 844	○	○	○	4,50	3,00	6,25	8,84	12,50	3,88	15,31	19,76	27,95	300	580
	616. 884	○	○	○	5,00	3,40	8,00	11,31	16,00	4,96	19,60	25,30	35,78	300	580
	616. 924	○	○	○	5,50	4,10	10,00	14,14	20,00	6,20	24,49	31,62	44,72	300	580
	616. 964	○	○	○	6,00	4,20	12,50	17,68	25,00	7,75	30,62	39,53	55,90	300	580
90°	617. 044	○	-	○	8,00	5,50	20,00	28,28	40,00	12,41	48,99	63,25	89,44	300	580
	617. 124	-	-	○	10,00	7,40	31,50	44,55	63,00	19,54	77,16	99,61	140,87	300	580
	616. 726	○	○	○	3,00	1,70	3,15	4,45	6,30	1,95	7,72	9,96	14,09	540	1000
	616. 766	○	○	○	3,50	1,90	4,00	5,66	8,00	2,48	9,80	12,65	17,89	550	1010
	616. 806	○	○	○	4,00	2,40	5,00	7,07	10,00	3,10	12,25	15,81	22,36	550	1010
	616. 846	○	○	○	4,50	2,40	6,25	8,84	12,50	3,88	15,31	19,76	27,95	550	1020
616. 886	○	○	○	5,00	3,10	8,00	11,31	16,00	4,96	19,60	25,30	35,78	550	1020	
616. 926	○	○	○	5,50	3,60	10,00	14,14	20,00	6,20	24,49	31,62	44,72	555	1025	
616. 966	○	○	○	6,00	3,90	12,50	17,68	25,00	7,75	30,62	39,53	55,90	560	1030	

A = Equivalent bore diameter · E = narrowest free cross section
Subject to technical modifications.

Continued on next page.

Example for ordering:	Type	+	Material no.	=	Ordering no.
	616. 721	+	16	=	616. 721. 16

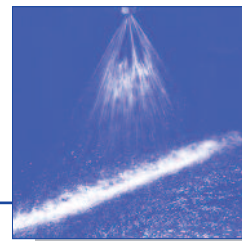
Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 \cdot \sqrt{\frac{p_2}{p_1}}$





Flat fan nozzles

Series 616 / 617



Spray angle	Ordering no.			A ∅ [mm]	E ∅ [mm]	V̇ [l/min]							Spray width B at p = 2 bar		
	Type	Material-no.				p [bar]							 H = 250 mm H = 500 mm		
		16 1.4305/303 SS	17 1.4571/316 SS			30 Brass	0,5	1,0	2,0	[US gal/ min] at 40 psi	3,0	5,0			10,0
120°	616. 727	○	○	○	3,00	1,60	3,15	4,45	6,30	1,95	7,72	9,96	14,09	975	1755
	616. 767	○	○	○	3,50	1,70	4,00	5,66	8,00	2,48	9,80	12,65	17,89	970	1750
	616. 807	○	○	○	4,00	2,00	5,00	7,07	10,00	3,10	12,25	15,81	22,36	965	1740
	616. 887	○	○	○	5,00	2,60	8,00	11,31	16,00	4,96	19,60	25,30	35,78	955	1730
	616. 927	○	○	○	5,50	2,90	10,00	14,14	20,00	6,20	24,49	31,62	44,72	950	1720
	616. 967	-	-	○	6,00	3,20	12,50	17,68	25,00	7,75	30,62	39,53	55,90	950	1720
	617. 047	-	-	○	8,00	4,40	20,00	28,28	40,00	12,41	48,99	63,25	89,44	950	1720

A = Equivalent bore diameter · E = narrowest free cross section
Subject to technical modifications.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to „Accessories“.

Example	Type	+	Material no.	=	Ordering no.
for ordering:	616. 727	+	16	=	616. 727. 16



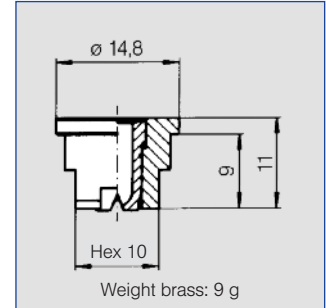
Flat fan nozzles for retaining nut Series 652



**Assembly with retaining nut.
Easy nozzle changing, simple
jet alignment. Uniform, para-
bolic distribution of liquid.
Spray pipes equipped with
these nozzles show an extre-
mely uniform total liquid dis-
tribution.**

Applications:

Spray cleaning, surface treat-
ment, filter cleaning, belt clean-
ing, lubricating, coating.



Spray angle	Ordering no.				A ∅ [mm]	E ∅ [mm]	V̇ [l/min]							Spray width B at p = 2 bar		
	Type	Material-no.					p [bar]							 H = 250 mm H = 500 mm		
		16 1.4305/303 SS	17 1.4571/316 SS	30 Brass			5E PVDF	0,5	1,0	2,0	[US gal/ min] at 40 psi	3,0	5,0			10,0
20°	652. 301	○	○	○	○	0,70	0,60	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	65	125
	652. 361	○	○	○	○	1,00	0,80	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	65	125
	652. 441	○	○	○	○	1,35	1,10	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	65	125
	652. 481	○	○	○	○	1,50	1,20	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	65	125
30°	652. 302	○	○	○	○	0,60	0,50	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	115	230
	652. 362	○	○	○	○	1,00	0,70	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	115	230
	652. 402	○	○	○	○	1,20	0,90	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	115	230
	652. 482	○	○	○	○	1,50	1,10	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	115	230
	652. 562	○	○	○	○	2,00	1,50	1,25	1,77	2,50	0,78	3,06	3,95	5,59	115	230
	652. 642	○	○	○	-	2,50	1,80	2,00	2,83	4,00	1,24	4,90	6,33	8,94	120	230
	652. 722	○	○	○	-	3,00	2,40	3,15	4,46	6,30	1,95	7,72	9,96	14,09	120	235
	652. 762	○	○	○	-	3,50	2,70	4,00	5,66	8,00	2,48	9,80	12,65	17,89	120	235
652. 802	○	○	○	-	4,00	3,10	5,00	7,07	10,00	3,10	12,25	15,81	22,36	120	240	
45°	652. 303	○	○	○	-	0,70	0,50	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	180	340
	652. 363	○	○	○	-	1,00	0,60	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	185	340
	652. 403	○	○	○	-	1,20	0,90	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	185	340
	652. 483	○	○	○	-	1,50	1,10	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	185	340
	652. 563	○	○	○	-	2,00	1,40	1,25	1,77	2,50	0,78	3,06	3,95	5,59	185	340
	652. 643	○	○	○	-	2,50	1,80	2,00	2,83	4,00	1,24	4,90	6,33	8,94	185	345
	652. 723	○	○	○	-	3,00	2,40	3,15	4,46	6,30	1,95	7,72	9,96	14,09	190	355
	652. 763	○	○	○	-	3,50	2,60	4,00	5,66	8,00	2,48	9,80	12,65	17,89	190	355
652. 803	○	○	○	-	4,00	3,00	5,00	7,07	10,00	3,10	12,25	15,81	22,36	195	360	
60°	652. 304	○	○	○	○	0,70	0,40	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	275	525
	652. 334	○	○	○	○	0,90	0,50	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	275	525
	652. 364	○	○	○	○	1,00	0,60	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	275	525
	652. 404	○	○	○	○	1,20	0,80	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	275	525
	652. 444	○	○	○	○	1,35	0,90	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	280	530
	652. 484	○	○	○	○	1,50	1,00	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	280	530
	652. 514	○	○	○	○	1,65	1,10	0,95*	1,34	1,90	0,59	2,33	3,00	4,25	280	530
	652. 564	○	○	○	○	2,00	1,30	1,25	1,77	2,50	0,78	3,06	3,95	5,59	280	525
	652. 604	○	○	○	○	2,20	1,50	1,58	2,23	3,15	0,98	3,86	4,98	7,04	280	520
	652. 644	○	○	○	○	2,50	1,60	2,00	2,83	4,00	1,24	4,90	6,33	8,94	275	520
	652. 674	○	○	○	-	2,70	1,80	2,38	3,36	4,75	1,47	5,82	7,51	10,62	275	520
	652. 724	○	○	○	○	3,00	2,10	3,15	4,46	6,30	1,95	7,72	9,96	14,09	275	520
	652. 764	○	○	○	-	3,50	2,30	4,00	5,66	8,00	2,48	9,80	12,65	17,89	270	515
	652. 804	○	-	-	○	4,00	2,60	5,00	7,07	10,00	3,10	12,25	15,81	22,36	270	510
	652. 844	○	-	-	○	4,50	3,00	6,25	8,84	12,50	3,88	15,31	19,76	27,95	270	510
	652. 884	○	-	○	-	5,00	3,40	8,00	11,31	16,00	4,96	19,60	25,30	35,78	270	505

A = Equivalent bore diameter · E = narrowest free cross section · *Differing spray pattern.

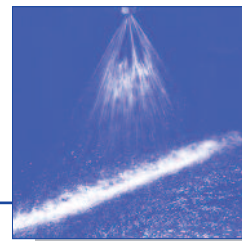
Continued on next page.

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$





Flat fan nozzles for retaining nut Series 652



Spray angle	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray width B at p = 2 bar		
	Type	Material-no.					p [bar]									
		16	17	30			5E	0,5	1,0	2,0	3,0	5,0	7,0			10,0
		1.4305	1.4571	Ms	PVDF									H = 250 mm	H = 500 mm	
75°	652. 145	○	-	○	-	0,16	0,30	-	0,04*	0,05	0,06	0,08	0,09	0,11	285	550
	652. 165	○	-	○	-	0,20	0,34	-	0,05*	0,07	0,08	0,10	0,12	0,15	285	555
	652. 185	○	-	○	-	0,35	0,20	-	0,06*	0,08	0,10	0,13	0,15	0,18	290	560
	652. 215	○	-	○	-	0,40	0,20	-	0,08*	0,11	0,14	0,18	0,21	0,25	290	560
	652. 245	○	-	○	-	0,50	0,30	-	0,12*	0,16	0,20	0,26	0,30	0,36	290	560
	652. 275	○	-	○	-	0,60	0,30	0,11*	0,16*	0,22	0,27	0,35	0,41	0,49	290	560
90°	652. 216	○	-	○	-	0,40	0,20	0,06	0,08*	0,11	0,14	0,18	0,21	0,25	380	760
	652. 276	○	-	○	-	0,60	0,30	0,11	0,16*	0,22	0,27	0,35	0,41	0,49	450	795
	652. 306	○	○	○	○	0,70	0,40	0,16*	0,23*	0,32	0,39	0,51	0,60	0,72	450	795
	652. 336	○	○	○	○	0,90	0,50	0,22*	0,32*	0,45	0,55	0,71	0,84	1,01	450	795
	652. 366	○	○	○	○	1,00	0,50	0,31*	0,44*	0,63	0,77	1,00	1,18	1,41	450	795
	652. 406	○	○	○	○	1,20	0,70	0,50*	0,71	1,00	1,23	1,58	1,87	2,24	450	800
	652. 446	○	○	○	○	1,35	0,80	0,62*	0,88	1,25	1,53	1,98	2,34	2,80	450	800
	652. 486	○	○	○	○	1,50	0,80	0,80*	1,13	1,60	1,96	2,53	2,99	3,58	450	800
	652. 516	○	○	○	○	1,65	0,90	0,95*	1,34	1,90	2,33	3,00	3,56	4,25	450	800
	652. 566	○	○	○	○	2,00	1,10	1,25	1,77	2,50	3,06	3,95	4,68	5,59	450	805
	652. 606	○	○	○	○	2,20	1,20	1,58	2,23	3,15	3,86	4,98	5,89	7,04	450	805
	652. 646	○	○	○	○	2,50	1,30	2,00	2,83	4,00	4,90	6,33	7,48	8,94	450	805
	652. 676	○	○	○	○	2,70	1,40	2,38	3,36	4,75	5,82	7,51	8,89	10,62	450	810
	652. 726	○	○	○	○	3,00	1,70	3,15	4,46	6,30	7,72	9,96	11,79	14,09	450	810
	652. 766	○	○	○	-	3,50	1,90	4,00	5,66	8,00	9,80	12,65	14,97	17,89	450	815
	652. 806	○	-	○	○	4,00	2,40	5,00	7,07	10,00	12,25	15,81	18,71	22,36	450	820
	652. 846	-	-	-	○	4,50	2,40	6,25	8,84	12,50	15,31	19,76	23,39	27,95	445	820
652. 886	○	-	○	○	5,00	3,10	8,00	11,31	16,00	19,60	25,30	29,93	35,78	450	835	
120°	652. 187	○	-	○	-	0,35	0,20	-	0,06*	0,08	0,10	0,13	0,15	0,18	640	1220
	652. 217	○	-	○	-	0,40	0,20	-	0,08*	0,11	0,14	0,18	0,21	0,25	650	1230
	652. 247	○	-	○	-	0,50	0,20	-	0,12*	0,16	0,20	0,26	0,30	0,36	655	1245
	652. 277	○	-	○	-	0,60	0,30	-	0,16*	0,22	0,27	0,35	0,41	0,49	655	1250
	652. 307	○	-	○	○	0,70	0,30	0,16*	0,23*	0,32	0,39	0,51	0,60	0,72	660	1260
	652. 337	○	○	○	○	0,90	0,40	0,22*	0,32*	0,45	0,55	0,71	0,84	1,01	660	1260
	652. 367	○	○	○	○	1,00	0,50	0,31*	0,44*	0,63	0,77	1,00	1,18	1,41	660	1265
	652. 407	○	○	○	○	1,20	0,60	0,50*	0,71	1,00	1,23	1,58	1,87	2,24	660	1270
	652. 447	○	○	○	○	1,35	0,60	0,62*	0,88	1,25	1,53	1,98	2,34	2,80	665	1270
	652. 487	○	○	○	○	1,50	0,60	0,80*	1,13	1,60	1,96	2,53	2,99	3,58	665	1270
	652. 517	○	○	○	○	1,65	0,90	0,95*	1,34	1,90	2,33	3,00	3,56	4,25	670	1275
	652. 567	○	○	○	○	2,00	0,90	1,25	1,77	2,50	3,06	3,95	4,68	5,59	670	1280
	652. 607	○	○	○	○	2,20	1,10	1,58	2,23	3,15	3,86	4,98	5,89	7,04	675	1285
	652. 647	○	○	○	-	2,50	1,30	2,00	2,83	4,00	4,90	6,33	7,48	8,94	680	1295
	652. 677	○	○	○	-	2,70	1,40	2,38	3,36	4,75	5,82	7,51	8,89	10,62	685	1300
	652. 727	○	○	○	○	3,00	1,60	3,15	4,46	6,30	7,72	9,96	11,79	14,09	695	1315
	652. 767	○	○	○	-	3,50	1,70	4,00	5,66	8,00	9,80	12,65	14,97	17,89	705	1330
	652. 847	-	-	-	○	4,50	2,30	6,25	8,84	12,50	15,31	19,76	23,39	27,95	800	1460
	652. 887	-	-	-	○	5,00	2,60	8,00	11,31	16,00	19,60	25,30	29,93	35,78	800	1460

A = Equivalent bore diameter · E = narrowest free cross section
 *Differing spray pattern
 Subject to technical modifications.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to „Accessories“.

Example for ordering:	Type	+	Material no.	=	Ordering no.
	652. 145	+	16	=	652. 145. 16

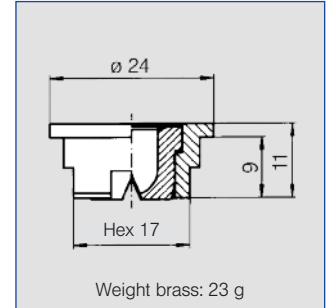


Flat fan nozzles for retaining nut Series 656



**Assembly with retaining nut.
Easy nozzle changing, simple
jet alignment. Uniform, para-
bolic distribution of liquid.
Increased non-clogging fea-
tures, more jet power, less
fog.**

Applications:
Cleaning installations, gravel
washing, cooling headers,
spray pipes, roll cooling, cool-
ing of rolled stock.



∠ Spray angle	Ordering no.				A ∅ [mm]	E ∅ [mm]	V̇ [l/min]							Spray width B at p = 2 bar	
	Type	Material-no.					p [bar]								
		16 1.4305/303 SS	17 1.4571/316 SS	30 Brass			0,5	1,0	2,0	[US gal./ min] at 40 psi	3,0	5,0	10,0		
20°	656. 721	○	○	○	3,00	2,50	3,15	4,45	6,30	1,95	7,72	9,96	14,09	110	205
	656. 801	○	○	○	4,00	3,20	5,00	7,07	10,00	3,10	12,25	15,81	22,36	110	205
	656. 881	○	○	○	5,00	4,00	8,00	11,31	16,00	4,96	19,60	25,30	35,78	110	205
	656. 921	○	○	○	5,50	4,40	10,00	14,14	20,00	6,20	24,49	31,62	44,72	110	205
	656.961	○	○	○	6,00	5,30	12,50	17,68	25,00	7,75	30,62	39,53	55,90	110	205
30°	656. 722	○	○	○	3,00	2,40	3,15	4,45	6,30	1,95	7,72	9,96	14,09	150	280
	656. 762	○	○	○	3,50	2,70	4,00	5,66	8,00	2,48	9,80	12,65	17,89	150	280
	656. 802	○	○	○	4,00	3,10	5,00	7,07	10,00	3,10	12,25	15,81	22,36	150	280
	656. 882	○	○	○	5,00	4,00	8,00	11,31	16,00	4,96	19,60	25,30	35,78	150	280
	656. 922	○	○	○	5,50	4,40	10,00	14,14	20,00	6,20	24,49	31,62	44,72	150	280
656. 962	○	-	○	6,00	5,00	12,50	17,68	25,00	7,75	30,62	39,53	55,90	150	280	
45°	656. 723	○	○	○	3,00	2,40	3,15	4,45	6,30	1,95	7,72	9,96	14,09	280	520
	656. 763	○	○	○	3,50	2,60	4,00	5,66	8,00	2,48	9,80	12,65	17,89	280	520
	656. 803	○	○	○	4,00	3,00	5,00	7,07	10,00	3,10	12,25	15,81	22,36	280	520
	656. 843	○	○	○	4,50	3,40	6,25	8,84	12,50	3,88	15,31	19,76	27,95	280	520
	656. 883	○	○	○	5,00	3,80	8,00	11,31	16,00	4,96	19,60	25,30	35,78	280	520
	656. 923	○	○	○	5,50	4,20	10,00	14,14	20,00	6,20	24,49	31,62	44,72	280	520
656. 963	○	○	○	6,00	4,40	12,50	17,68	25,00	7,75	30,62	39,53	55,90	280	520	
60°	656. 724	○	○	○	3,00	2,10	3,15	4,45	6,30	1,95	7,72	9,96	14,09	320	595
	656. 764	○	○	○	3,50	2,30	4,00	5,66	8,00	2,48	9,80	12,65	17,89	320	595
	656. 804	○	○	○	4,00	2,60	5,00	7,07	10,00	3,10	12,25	15,81	22,36	320	595
	656. 844	○	○	○	4,50	3,00	6,25	8,84	12,50	3,88	15,31	19,76	27,95	320	595
	656. 884	○	○	○	5,00	3,40	8,00	11,31	16,00	4,96	19,60	25,30	35,78	320	595
	656. 924	○	○	○	5,50	4,10	10,00	14,14	20,00	6,20	24,49	31,62	44,72	320	595
	656. 964	○	○	○	6,00	4,20	12,50	17,68	25,00	7,75	30,62	39,53	55,90	320	595
657. 044	-	-	○	8,00	5,50	20,00	28,28	40,00	12,41	48,99	63,25	89,44	320	595	
90°	656. 726	○	○	○	3,00	1,70	3,15	4,45	6,30	1,95	7,72	9,96	14,09	420	800
	656. 766	○	○	○	3,50	1,90	4,00	5,66	8,00	2,48	9,80	12,65	17,89	420	800
	656. 806	○	○	○	4,00	2,40	5,00	7,07	10,00	3,10	12,25	15,81	22,36	420	800
	656. 846	○	○	○	4,50	2,40	6,25	8,84	12,50	3,88	15,31	19,76	27,95	420	800
	656. 886	○	○	○	5,00	3,10	8,00	11,31	16,00	4,96	19,60	25,30	35,78	420	800
	656. 926	○	○	○	5,50	3,60	10,00	14,14	20,00	6,20	24,49	31,62	44,72	420	800
	656. 966	○	○	○	6,00	3,90	12,50	17,68	25,00	7,75	30,62	39,53	55,90	420	800
	657. 046	-	-	○	8,00	4,90	20,00	28,28	40,00	12,41	48,99	63,25	89,44	420	800

A = Equivalent bore diameter · E = narrowest free cross section
Subject to technical modifications.

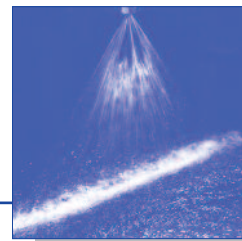
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Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$





Flat fan nozzles for retaining nut Series 656

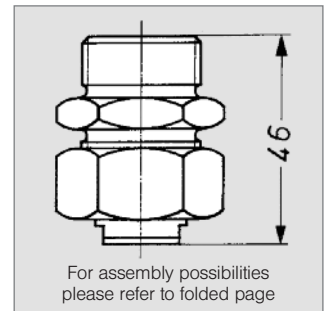


Spray angle	Ordering no.			A ∅ [mm]	E ∅ [mm]	V̇ [l/min]							Spray width B at p = 2 bar		
	Type	Material-no.				p [bar]							 H = 250 mm H = 500 mm		
		16 1.4305/303 SS	17 1.4571/316 SS			30 Brass	0,5	1,0	2,0	[US gal./ min] at 40 psi	3,0	5,0			10,0
120°	656. 727	○	○	○	3,00	1,60	3,15	4,45	6,30	1,95	7,72	9,96	14,09	1240	2150
	656. 767	○	○	○	3,50	1,70	4,00	5,66	8,00	2,48	9,80	12,65	17,89	1240	2150
	656. 807	○	○	○	4,00	2,00	5,00	7,07	10,00	3,10	12,25	15,81	22,36	1240	2150
	656. 887	○	○	○	5,00	2,60	8,00	11,31	16,00	4,96	19,60	25,30	35,78	1240	2150
	656. 927	○	○	○	5,50	2,90	10,00	14,14	20,00	6,20	24,49	31,62	44,72	1240	2150

A = Equivalent bore diameter · E = narrowest free cross section
Subject to technical modifications.

Example	Type	+	Material no.	=	Ordering no.
for ordering:	656. 727	+	16	=	656. 727. 16

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities.
For complete assembly accessories, please refer to „Accessories“.

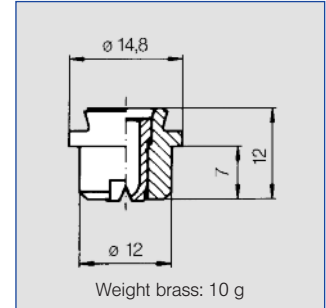




Flat fan nozzles with dove-tail guide Series 660



Assembly with retaining nut. Automatic jet alignment due to dove-tail guide. Stable spray angle. Uniform parabolic distribution of liquid. Spray pipes with these nozzles show an extremely uniform total liquid distribution.
Applications:
Cleaning installations, cooling headers, spray pipes.



Spray angle	Ordering no.				A ∅ [mm]	E ∅ [mm]	V̇ [l/min]							Spray width B at p = 2 bar	
	Type	Material-no.					p [bar]							 H = 250 mm H = 500 mm	
		16	17	30											
		1.4305/303 SS	1.4571/316 SS	Brass			0,5	1,0	2,0	[US gal./min] at 40 psi	3,0	5,0	10,0		
20°	660.301	○	○	○	0,70	0,60	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	60	110
	660.361	○	○	○	1,00	0,80	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	65	125
	660.441	○	○	○	1,35	1,10	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	65	125
	660.481	○	○	○	1,50	1,20	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	70	130
30°	660.302	○	○	○	0,60	0,50	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	110	205
	660.362	○	○	○	1,00	0,70	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	110	205
	660.402	○	○	○	1,20	0,90	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	110	205
	660.482	○	○	○	1,50	1,10	0,80*	1,13	1,60	0,50	1,96	2,53	3,57	110	210
660.562	○	○	○	2,00	1,50	1,25	1,76	2,50	0,78	3,06	3,95	5,59	110	210	
45°	660.303	○	○	○	0,70	0,50	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	180	340
	660.363	○	○	○	1,00	0,60	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	185	340
	660.403	○	○	○	1,20	0,90	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	185	340
	660.483	○	○	○	1,50	1,10	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	185	340
	660.563	○	○	○	2,00	1,40	1,25	1,76	2,50	0,78	3,06	3,95	5,59	190	345
	660.643	○	○	○	2,50	1,80	2,00	2,83	4,00	1,24	4,90	6,33	8,94	190	350
60°	660.304	○	○	○	0,70	0,40	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	275	525
	660.334	○	○	○	0,90	0,50	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	275	525
	660.364	○	○	○	1,00	0,60	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	275	525
	660.404	○	○	○	1,20	0,80	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	275	525
	660.444	○	○	○	1,35	0,90	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	275	525
	660.484	○	○	○	1,50	1,00	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	275	525
	660.514	○	○	○	1,65	1,10	0,95*	1,34	1,90	0,59	2,33	3,00	4,25	275	525
	660.564	○	○	○	2,00	1,30	1,25	1,77	2,50	0,78	3,06	3,95	5,59	275	525
	660.604	○	○	○	2,20	1,50	1,58	2,23	3,15	0,98	3,86	4,98	7,04	275	525
	660.644	○	○	○	2,50	1,60	2,00	2,83	4,00	1,24	4,90	6,33	8,94	275	525
660.724	○	○	○	3,00	2,10	3,15	4,46	6,30	1,95	7,72	9,96	14,09	275	520	
660.804	-	○	-	4,00	2,60	5,00	7,07	10,00	3,10	12,25	15,81	22,36	270	520	
75°	660.145	○	-	○	0,16	0,30	-	0,04*	0,05	0,02	0,06	0,08	0,11	320	600
	660.165	○	-	○	0,20	0,34	-	0,05*	0,07	0,02	0,08	0,10	0,15	330	620
	660.185	○	-	○	0,35	0,20	-	0,06*	0,08	0,02	0,10	0,13	0,18	335	625
	660.215	○	-	○	0,50	0,20	-	0,08*	0,11	0,03	0,14	0,18	0,25	340	630
	660.245	○	-	○	0,50	0,30	-	0,12*	0,16	0,05	0,20	0,26	0,36	345	640
	660.275	○	-	○	0,60	0,30	0,11*	0,16*	0,22	0,07	0,27	0,35	0,49	345	645

A = Equivalent bore diameter · E = narrowest free cross section
*Differing spray pattern

Continued on next page.

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$





Flat fan nozzles with dove-tail guide Series 660

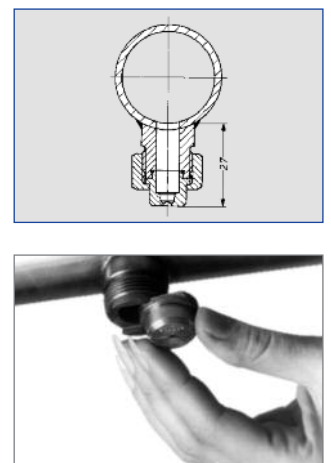
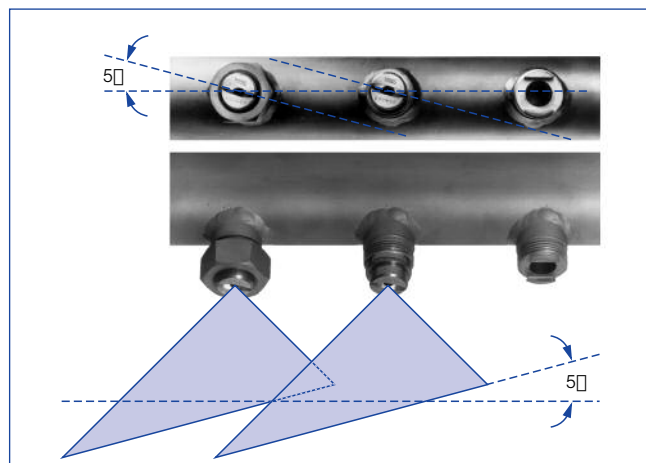
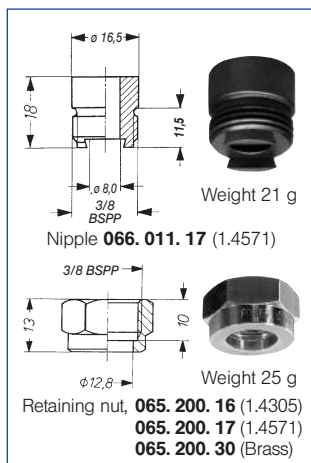


Spray angle	Ordering no.				A ∅ [mm]	E ∅ [mm]	V̇ [l/min]						Spray width B at p = 2 bar		
	Type	Material-no.					p [bar]						H =		
		16 1.4305/303 SS	17 1.4571/316 SS	30 Brass			0,5	1,0	2,0	[US gal/ min] at 40 psi	3,0	5,0	10,0	250 mm	500 mm
90°	660. 216	○	-	○	0,40	0,20	-	0,08*	0,11	0,03	0,14	0,18	0,25	500	900
	660. 276	○	-	○	0,60	0,30	0,11*	0,16*	0,22	0,07	0,27	0,35	0,49	500	900
	660. 306	○	○	○	0,70	0,40	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	515	930
	660. 336	○	○	○	0,90	0,50	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	515	930
	660. 366	○	○	○	1,00	0,50	0,31*	0,44*	0,63	0,20	0,77	1,00	1,41	515	930
	660. 406	○	○	○	1,20	0,70	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	515	930
	660. 446	○	○	○	1,35	0,80	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	510	925
	660. 486	○	○	○	1,50	0,80	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	510	925
	660. 516	○	○	○	1,65	0,90	0,95*	1,34	1,90	0,59	2,33	3,00	4,25	510	925
	660. 566	○	○	○	2,00	1,10	1,25	1,77	2,50	0,78	3,06	3,95	5,59	505	920
	660. 606	○	○	○	2,20	1,20	1,58	2,23	3,15	0,98	3,86	4,98	7,04	505	915
	660. 646	○	○	○	2,50	1,30	2,00	2,83	4,00	1,24	4,90	6,33	8,94	500	910
660. 676	○	○	○	2,70	1,40	2,38	3,36	4,75	1,47	5,82	7,51	10,62	495	905	
660. 726	○	○	○	3,00	1,70	3,15	4,46	6,30	1,95	7,72	9,96	14,09	490	900	
660. 806	-	○	○	4,00	2,40	5,00	7,07	10,00	3,10	12,25	15,81	22,36	470	875	
120°	660. 187	○	-	○	0,35	0,20	-	0,06*	0,08	0,02	0,10	0,13	0,18	650	1220
	660. 217	○	-	○	0,40	0,20	-	0,08*	0,11	0,03	0,14	0,18	0,25	655	1230
	660. 247	○	-	○	0,50	0,20	-	0,12*	0,16	0,05	0,20	0,26	0,36	655	1240
	660. 277	○	-	○	0,60	0,30	-	0,16*	0,22*	0,07	0,27	0,35	0,49	660	1250
	660. 307	○	-	○	0,70	0,30	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	660	1260
	660. 337	○	○	○	0,90	0,40	0,22*	0,32*	0,45	0,14	0,55	0,71	1,00	660	1260
	660. 367	○	○	○	1,00	0,40	0,31*	0,44*	0,63	0,20	0,77	1,00	1,41	660	1265
	660. 407	○	○	○	1,20	0,60	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	665	1270
	660. 447	○	○	○	1,35	0,60	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	670	1270
	660. 487	○	○	○	1,50	0,60	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	675	1270
	660. 517	○	○	○	1,65	0,90	0,95*	1,34	1,90	0,59	2,33	3,00	4,25	675	1275
	660. 567	○	○	○	2,00	0,90	1,25	1,77	2,50	0,78	3,06	3,95	5,59	685	1280
	660. 607	○	○	○	2,20	1,10	1,58	2,23	3,15	0,98	3,86	4,98	7,04	695	1285
	660. 647	○	-	○	2,50	1,30	2,00	2,83	4,00	1,24	4,90	6,33	8,94	705	1295
	660. 727	○	○	○	3,00	1,60	3,15	4,46	6,30	1,95	7,72	9,96	14,09	735	1315
660. 807	○	-	○	4,00	2,00	5,00	7,07	10,00	3,10	12,25	15,81	22,36	780	1345	

A = Equivalent bore diameter · E = narrowest free cross section
*Differing spray pattern

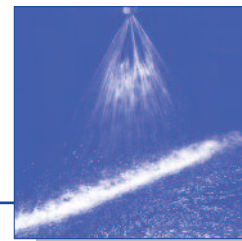
Example for ordering:	Type	+	Material no.	=	Ordering no.
	660. 216	+	16	=	660. 216. 16

Accessories





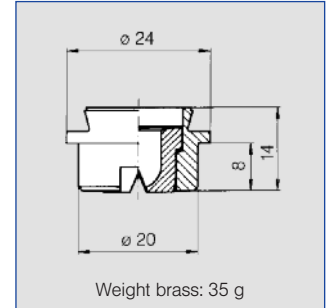
Flat fan nozzles with dove-tail guide Series 664 / 665



Assembly with retaining nut. Automatic jet alignment due to dove-tail guide. Stable spray angle. Uniform parabolic distribution of liquid. Spray pipes with these nozzles show an extremely uniform total liquid distribution.

Applications:

Cleaning installations, cooling headers, spray pipes, roll cooling, cooling of rolled stock.



Spray angle	Ordering no.			A ∅ [mm]	E ∅ [mm]	V̇ [l/min]							Spray width B at p = 2 bar		
	Type	Material-no.				p [bar]							H = 250 mm	H = 500 mm	
		16 1.4305/303 SS	17 1.4571/316 SS			30 Brass	0,5	1,0	2,0	[US gal./ min] at 40 psi	3,0	5,0			10,0
20°	664. 721	○	○	○	3,00	2,50	3,15	4,45	6,30	1,95	7,72	9,96	14,09	110	205
	664. 801	○	○	○	4,00	3,20	5,00	7,07	10,00	3,10	12,25	15,81	22,36	110	205
	664. 881	○	○	○	5,00	4,00	8,00	11,31	16,00	4,96	19,60	25,30	35,78	110	205
	664. 921	○	○	○	5,50	4,40	10,00	14,14	20,00	6,20	24,49	31,62	44,72	110	205
	664. 961	○	○	○	6,00	5,10	12,50	17,68	25,00	7,75	30,62	39,53	55,90	100	205
30°	664. 722	○	○	○	3,00	2,40	3,15	4,45	6,30	1,95	7,72	9,96	14,09	150	280
	664. 762	○	○	○	3,50	2,70	4,00	5,66	8,00	2,48	9,80	12,65	17,89	150	280
	664. 802	○	○	○	4,00	3,10	5,00	7,07	10,00	3,10	12,25	15,81	22,36	150	280
	664. 882	○	○	○	5,00	4,00	8,00	11,31	16,00	4,96	19,60	25,30	35,78	150	280
	664. 922	○	○	○	5,50	4,40	10,00	14,14	20,00	6,20	24,49	31,62	44,72	150	280
	664. 962	○	○	○	6,00	5,00	12,50	17,68	25,00	7,75	30,62	39,53	55,90	150	280
	665. 042	○	-	○	8,00	6,40	20,00	28,28	40,00	12,41	48,99	63,25	89,44	150	280
665. 122	-	-	○	10,00	8,20	31,50	44,55	63,00	19,54	77,16	99,61	140,87	150	280	
45°	664. 723	○	○	○	3,00	2,40	3,15	4,45	6,30	1,95	7,72	9,96	14,09	260	490
	664. 763	○	○	○	3,50	2,60	4,00	5,66	8,00	2,48	9,80	12,65	17,89	260	490
	664. 803	○	○	○	4,00	3,00	5,00	7,07	10,00	3,10	12,25	15,81	22,36	265	495
	664. 843	○	○	○	4,50	3,40	6,25	8,84	12,50	3,88	15,31	19,76	27,95	265	495
	664. 883	○	○	○	5,00	3,80	8,00	11,31	16,00	4,96	19,60	25,30	35,78	265	500
	664. 923	○	○	○	5,50	4,20	10,00	14,14	20,00	6,20	24,49	31,62	44,72	270	505
	664. 963	○	○	○	6,00	4,40	12,50	17,68	25,00	7,75	30,62	39,53	55,90	270	510
	665. 043	-	-	○	8,00	5,90	20,00	28,28	40,00	12,41	48,99	63,25	89,44	275	520
	665. 123	-	-	○	10,00	7,40	31,50	44,55	63,00	19,54	77,16	99,61	140,87	275	520
60°	664. 724	○	○	○	3,00	2,10	3,15	4,45	6,30	1,95	7,72	9,96	14,09	300	560
	664. 764	○	○	○	3,50	2,30	4,00	5,66	8,00	2,48	9,80	12,65	17,89	300	565
	664. 804	○	○	○	4,00	2,60	5,00	7,07	10,00	3,10	12,25	15,81	22,36	300	565
	664. 844	○	○	○	4,50	3,00	6,25	8,84	12,50	3,88	15,31	19,76	27,95	300	570
	664. 884	○	○	○	5,00	3,40	8,00	11,31	16,00	4,96	19,60	25,30	35,78	305	570
	664. 924	○	○	○	5,50	4,10	10,00	14,14	20,00	6,20	24,49	31,62	44,72	305	575
	664. 964	○	○	○	6,00	4,20	12,50	17,68	25,00	7,75	30,62	39,53	55,90	310	580
	665. 044	-	-	○	8,00	5,50	20,00	28,28	40,00	12,41	48,99	63,25	89,44	315	585
	665. 084	-	-	○	9,00	6,20	25,00	35,36	50,00	15,51	61,24	79,06	111,80	320	590
	665. 124	-	-	○	10,00	7,40	31,50	44,55	63,00	19,54	77,16	99,61	140,87	325	600

A = Equivalent bore diameter · E = narrowest free cross section
Subject to technical modifications.

Continued on next page.

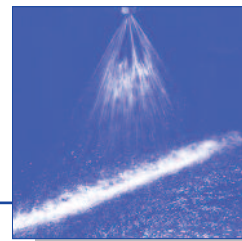
Example	Type	+	Material no.	=	Ordering no.
for ordering:	664. 721	+	16	=	664. 721. 16

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





Flat fan nozzles with dove-tail guide Series 664 / 665



Spray angle	Ordering no.			A ∅ [mm]	E ∅ [mm]	V̇ [l/min]							Spray width B at p = 2 bar		
	Type	Material-no.				p [bar]									
		16 1.4305/303 SS	17 1.4571/316 SS			30 Brass	0,5	1,0	2,0	[US gal/ min] at 40 psi	3,0	5,0			10,0
90°	664. 726	○	○	○	3,00	1,70	3,15	4,45	6,30	1,95	7,72	9,96	14,09	420	800
	664. 766	○	○	○	3,50	1,90	4,00	5,66	8,00	2,48	9,80	12,65	17,89	420	800
	664. 806	○	○	○	4,00	2,40	5,00	7,07	10,00	3,10	12,25	15,81	22,36	420	800
	664. 846	○	○	○	4,50	2,40	6,25	8,84	12,50	3,88	15,31	19,76	27,95	420	800
	664. 886	○	○	○	5,00	3,10	8,00	11,31	16,00	4,96	19,60	25,30	35,78	420	800
	664. 926	○	○	○	5,50	3,60	10,00	14,14	20,00	6,20	24,49	31,62	44,72	420	800
	664. 966	○	○	○	6,00	3,90	12,50	17,68	25,00	7,75	30,62	39,53	55,90	420	800
	665. 046	-	-	○	8,00	4,90	20,00	28,28	40,00	12,41	48,99	63,25	89,44	420	800
665. 126	-	-	○	10,00	6,40	31,50	44,55	63,00	19,54	77,16	99,61	140,87	420	800	
120°	664. 727	○	○	○	3,00	1,60	3,15	4,45	6,30	1,95	7,72	9,96	14,09	1240	2150
	664. 767	○	○	○	3,50	1,70	4,00	5,66	8,00	2,48	9,80	12,65	17,89	1240	2150
	664. 807	○	○	○	4,00	2,00	5,00	7,07	10,00	3,10	12,25	15,81	22,36	1240	2150
	664. 887	○	○	○	5,00	2,60	8,00	11,31	16,00	4,96	19,60	25,30	35,78	1240	2150
	664. 927	○	○	○	5,50	2,90	10,00	14,14	20,00	6,20	24,49	31,62	44,72	1240	2150
	664. 967	-	-	○	6,00	3,20	12,50	17,68	25,00	7,75	30,62	39,53	55,90	1240	2150
	665. 047	-	-	○	8,00	4,40	20,00	28,28	40,00	12,41	48,99	63,25	89,44	1240	2150

A = Equivalent bore diameter · E = narrowest free cross section
Subject to technical modifications.

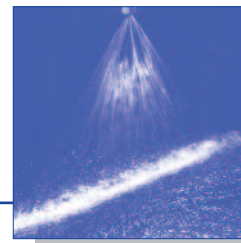
Example for ordering: Type 664. 726 + Material no. 16 = Ordering no. 664. 726. 16



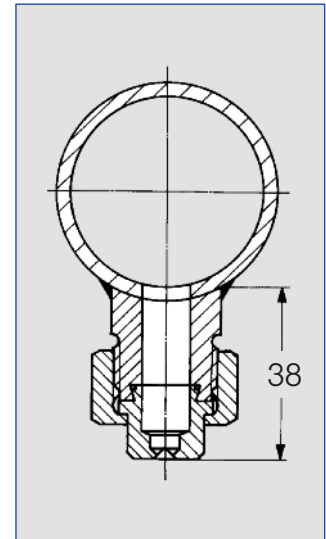
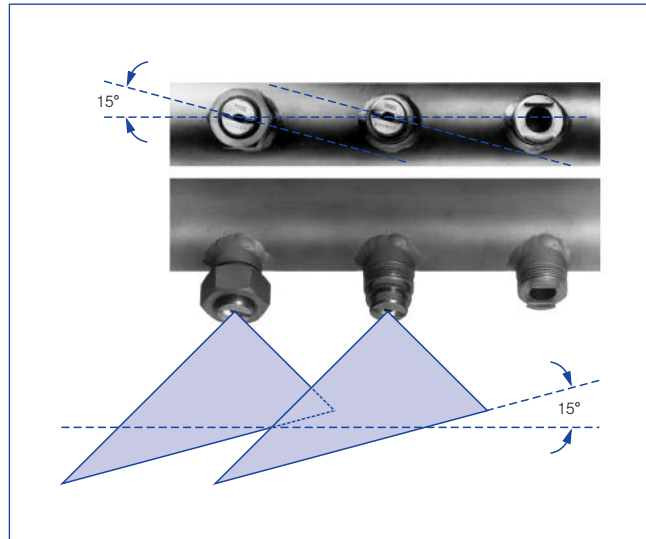
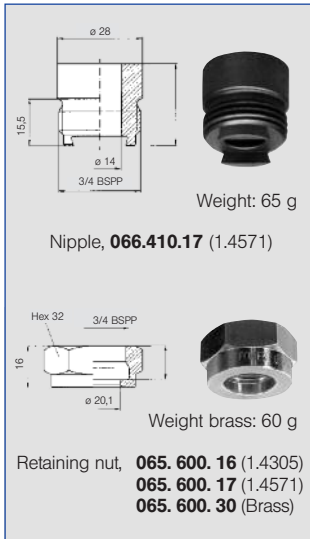
Accessories see next page.



Flat fan nozzles with dove-tail guide Series 664 / 665



Accessories



Pretreatment in a pickling line

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$

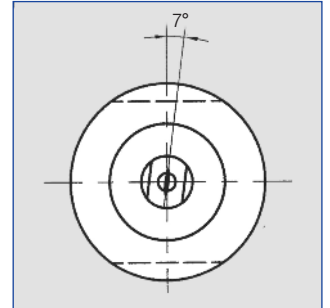
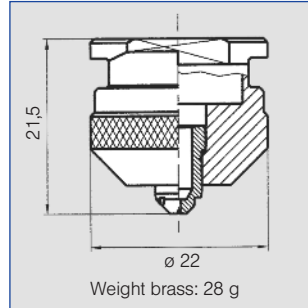


Flat fan nozzles with TWISTLOC-connection Series 638



Quick and easy assembly without tool by TWISTLOC connection. Adjusted spray direction. Uniform liquid distribution.

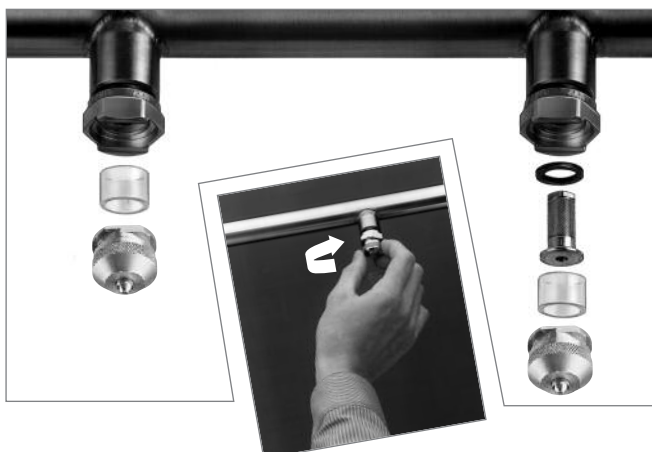
Applications:
Belt cleaning, surface treatment, cleaning, coating processes.



Spray angle	Ordering no.		A Ø [mm]	E Ø [mm]	\dot{V} [l/min]								Spray width B at p = 2 bar			
	Type	Mat.-no.			p [bar]								H = 250 mm		H = 500 mm	
		16 1.4305/303 SS			30 Brass	0,5	1,0	2,0	[US gal/ min] at 40 psi	3,0	5,0	10,0				
30°	638. 302	○	○	0,70	0,50	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	120	235		
	638. 362	○	○	1,00	0,70	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	120	235		
	638. 482	○	○	1,50	1,10	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	120	235		
	638. 562	○	○	2,00	1,50	1,25	1,77	2,50	0,78	3,06	3,95	5,59	120	235		
	638. 642	○	○	2,50	1,80	2,00	2,83	4,00	1,24	4,90	6,33	8,94	120	240		
	638. 722	○	○	3,00	2,40	3,15	4,46	6,30	1,95	7,72	9,96	14,09	125	240		
	638. 802	○	○	4,00	3,10	5,00	7,07	10,00	3,10	12,25	15,81	22,36	130	250		
	638. 882	○	○	5,00	4,00	8,00	11,31	16,00	4,96	19,54	25,30	35,78	130	250		
	638. 922	○	○	5,50	4,40	10,00	14,14	20,00	6,20	24,49	31,62	44,72	130	250		
638. 962	○	○	6,00	5,00	12,50	17,68	25,00	7,75	30,62	39,53	55,90	130	250			
45°	638. 303	○	○	0,70	0,50	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	150	270		
	638. 363	○	○	1,00	0,60	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	155	280		
	638. 483	○	○	1,50	1,10	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	180	340		
	638. 563	○	○	2,00	1,40	1,25	1,77	2,50	0,78	3,06	3,95	5,59	185	355		
	638. 643	○	○	2,50	1,80	2,00	2,83	4,00	1,24	4,90	6,33	8,94	195	370		
	638. 723	○	○	3,00	2,40	3,15	4,46	6,30	1,95	7,72	9,96	14,09	200	375		
	638. 803	○	○	4,00	3,00	5,00	7,07	10,00	3,10	12,25	15,81	22,36	205	385		
	638. 883	○	○	5,00	3,80	8,00	11,31	16,00	4,96	19,54	25,30	35,78	205	385		
	638. 923	○	○	5,50	4,20	10,00	14,14	20,00	6,20	24,49	31,62	44,72	205	385		
	638. 963	○	○	6,00	4,70	12,50	17,68	25,00	7,75	30,62	39,53	55,90	205	385		

A = Equivalent bore diameter · E = narrowest free cross section
*Differing spray pattern · Subject to technical modifications.

Continued on next page.



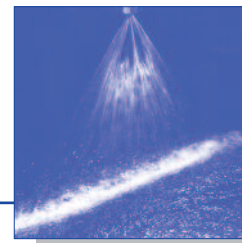
Example for ordering:	Type	+	Material no.	=	Ordering no.
	638. 302	+	16	=	638. 302. 16

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to „Accessories“.

Assembly accessories see page 10.2



Flat fan nozzles with TWISTLOC-connection Series 638



Spray angle	Ordering no.		A Ø [mm]	E Ø [mm]	V̇ [l/min]								Spray width B at p = 2 bar	
	Type	Mat.-no.			p [bar]								H =	
					16 1.4305/303 SS	30 Brass	0,5	1,0	2,0	[US gal./ min] at 40 psi	3,0	5,0	10,0	250 mm
60°	638. 304	○ ○	0,70	0,40	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	215	425	
	638. 334	○ ○	0,90	0,50	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	220	440	
	638. 364	○ ○	1,00	0,60	0,31*	0,44*	0,63	0,20	0,77	1,00	1,41	230	460	
	638. 404	○ ○	1,20	0,80	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	245	485	
	638. 484	○ ○	1,50	1,00	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	260	510	
	638. 564	○ ○	2,00	1,30	1,25	1,77	2,50	0,78	3,06	3,95	5,59	280	535	
	638. 604	○ ○	2,20	1,50	1,58	2,23	3,15	0,98	3,86	4,98	7,04	290	550	
	638. 644	○ ○	2,50	1,60	2,00	2,83	4,00	1,24	4,90	6,33	8,94	295	565	
	638. 724	○ ○	3,00	2,10	3,15	4,46	6,30	1,95	7,72	9,96	14,09	305	590	
	638. 764	○ ○	3,50	2,30	4,00	5,66	8,00	2,48	9,80	12,65	17,89	310	595	
	638. 804	○ ○	4,00	2,60	5,00	7,07	10,00	3,10	12,25	15,81	22,36	310	595	
	638. 884	○ ○	5,00	3,40	8,00	11,31	16,00	4,96	19,60	25,30	35,78	310	595	
638. 924	○ ○	5,50	4,10	10,00	14,14	20,00	6,20	24,50	31,62	44,72	310	595		
75°	638. 185	○ ○	0,35	0,20	-	0,06*	0,08	0,02	0,10	0,13	0,18	300	575	
	638. 215	○ ○	0,40	0,20	-	0,08*	0,11	0,03	0,14	0,18	0,25	300	580	
	638. 245	○ ○	0,50	0,30	-	0,12*	0,16	0,05	0,20	0,26	0,36	310	585	
90°	638. 306	○ ○	0,70	0,40	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	380	740	
	638. 336	○ ○	0,90	0,50	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	415	800	
	638. 366	○ ○	1,00	0,50	0,31*	0,44*	0,63	0,20	0,77	1,00	1,41	420	810	
	638. 406	○ ○	1,20	0,70	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	430	820	
	638. 486	○ ○	1,50	0,80	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	440	835	
	638. 566	○ ○	2,00	1,10	1,25	1,77	2,50	0,78	3,06	3,95	5,59	445	850	
	638. 606	○ ○	2,20	1,20	1,58	2,23	3,15	0,98	3,86	4,98	7,04	450	860	
	638. 646	○ ○	2,50	1,30	2,00	2,83	4,00	1,24	4,90	6,33	8,94	455	865	
	638. 726	○ ○	3,00	1,70	3,15	4,46	6,30	1,95	7,72	9,96	14,09	470	885	
	638. 766	○ ○	3,50	1,90	4,00	5,66	8,00	2,48	9,80	12,65	17,89	475	890	
	638. 806	○ ○	4,00	2,40	5,00	7,07	10,00	3,10	12,25	15,81	22,36	480	900	
	638. 886	○ ○	5,00	3,10	8,00	11,31	16,00	4,96	19,60	25,30	35,78	550	1020	
638. 926	○ ○	5,50	3,60	10,00	14,14	20,00	6,20	24,50	31,62	44,72	550	1020		
638. 966	○ ○	6,00	3,90	12,50	17,68	25,00	7,75	30,62	36,53	55,90	550	1020		
120°	638. 187	○ ○	0,35	0,20	-	0,06*	0,08	0,02	0,10	0,13	0,18	630	1200	
	638. 247	○ ○	0,50	0,20	-	0,12*	0,16	0,05	0,20	0,25	0,36	650	1230	
	638. 307	○ ○	0,70	0,30	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	660	1250	
	638. 337	○ ○	0,90	0,40	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	670	1270	
	638. 367	○ ○	1,00	0,50	0,31*	0,44*	0,63	0,20	0,77	1,00	1,41	670	1270	
	638. 407	○ ○	1,20	0,60	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	670	1270	
	638. 487	○ ○	1,50	0,60	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	680	1275	
	638. 567	○ ○	2,00	0,90	1,25	1,77	2,50	0,78	3,06	3,95	5,59	690	1285	
	638. 607	○ ○	2,20	1,10	1,58	2,23	3,15	0,98	3,86	4,98	7,04	700	1300	
	638. 647	○ ○	2,50	1,00	2,00	2,83	4,00	1,24	4,90	6,33	8,94	700	1300	
	638. 727	○ ○	3,00	1,60	3,15	4,46	6,30	1,95	7,72	9,96	14,09	740	1360	
	638. 767	○ ○	3,50	1,70	4,00	5,66	8,00	2,48	9,80	12,65	17,89	760	1400	
	638. 807	○ ○	4,00	2,00	5,00	7,07	10,00	3,10	12,25	15,81	22,36	790	1450	
	638. 887	○ ○	5,00	2,60	8,00	11,31	16,00	4,96	19,60	25,30	35,78	955	1730	
	638. 927	○ ○	5,50	2,90	10,00	14,14	20,00	6,20	24,50	31,62	44,72	955	1730	

A = Equivalent bore diameter · E = narrowest free cross section
*Differing spray pattern
Subject to technical modifications.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities.
For complete assembly accessories, please refer to „Accessories“.

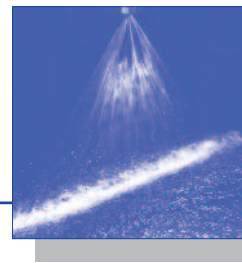
Example for ordering: Type 638. 304 + Material no. 16 = Ordering no. 638. 304. 16

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$



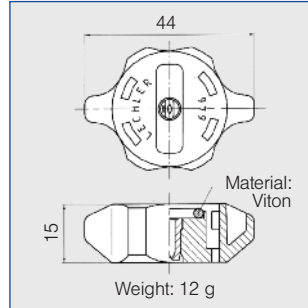


Flat fan nozzles with bayonet quick release cap Series 646



Quick and easy assembly with bayonet quick release cap. Adjusted spray direction. Uniform liquid distribution.

Applications:
Belt cleaning, surface treatment, cleaning, coating processes.



Spray angle	Ordering no.		A ∅ [mm]	E ∅ [mm]	V̇ [l/min]							Spray width B at p = 2 bar	
	Type	Mat- no. 5E			p [bar]								
					0,5	1,0	2,0	[US gal/ min] at 40 psi	3,0	5,0	10,0		
20°	646. 301	○	0,70	0,60	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	75	150
	646. 361	○	1,00	0,80	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	80	150
	646. 441	○	1,35	1,10	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	80	155
	646. 481	○	1,50	1,20	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	80	155
30°	646. 302	○	0,70	0,50	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	85	140
	646. 362	○	1,00	0,70	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	95	160
	646. 402	○	1,20	0,90	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	105	190
	646. 482	○	1,50	1,10	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	120	225
	646. 562	○	2,00	1,50	1,25	1,77	2,50	0,78	3,06	3,95	5,59	135	240
60°	646. 304	○	0,70	0,40	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	245	490
	646. 334	○	0,90	0,50	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	250	495
	646. 364	○	1,00	0,60	0,31*	0,44*	0,63	0,20	0,77	1,00	1,40	255	500
	646. 404	○	1,20	0,80	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	260	510
	646. 444	○	1,35	0,90	0,62	0,88	1,25	0,39	1,53	1,98	2,80	260	510
	646. 484	○	1,50	1,00	0,80	1,13	1,60	0,50	1,96	2,53	3,58	270	525
	646. 514	○	1,65	1,10	0,95	1,34	1,90	0,59	2,33	3,00	4,25	260	510
	646. 564	○	2,00	1,30	1,25	1,77	2,50	0,78	3,06	3,95	5,59	260	505
646. 604	○	2,20	1,50	1,58	2,23	3,15	0,98	3,86	4,98	7,04	265	505	
90°	646. 306	○	0,70	0,40	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	425	840
	646. 336	○	0,90	0,50	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	425	840
	646. 366	○	1,00	0,50	0,31*	0,44*	0,63	0,20	0,77	1,00	1,41	425	840
	646. 406	○	1,20	0,70	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	425	835
	646. 446	○	1,35	0,80	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	425	835
	646. 486	○	1,50	0,80	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	425	830
	646. 516	○	1,65	0,90	0,95*	1,34	1,90	0,59	2,33	3,00	4,25	425	830
	646. 566	○	2,00	1,10	1,25	1,77	2,50	0,78	3,06	3,95	5,59	425	825
	646. 606	○	2,20	1,20	1,58	2,23	3,15	0,98	3,86	4,98	7,04	425	820

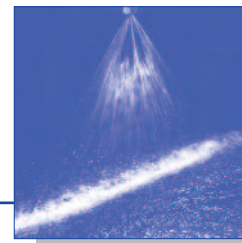
A = Equivalent bore diameter · E = narrowest free cross section
*Differing spray pattern
Subject to technical modifications.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities.
For complete assembly accessories, please refer to „Accessories“.

Example for ordering:	Type	+	Material no.	=	Ordering no.
	646. 301	+	5E	=	646. 301. 5E



Flat fan nozzles with bayonet quick release cap Series 646



Spray angle	Ordering no.		A ∅ [mm]	E ∅ [mm]	V̇ [l/min]							Spray width B at p = 2 bar	
	Type	Mat- no. 5E			p [bar]								
					0,5	1,0	2,0	[US gal./ min] at 40 psi	3,0	5,0	10,0		
120°	646. 307	○	0,70	0,30	0,16*	0,23*	0,32	0,10	0,39	0,51	0,72	625	1175
	646. 337	○	0,90	0,40	0,22*	0,32*	0,45	0,14	0,55	0,71	1,01	630	1180
	646. 367	○	1,00	0,50	0,31*	0,44*	0,63	0,20	0,77	1,00	1,41	635	1190
	646. 407	○	1,20	0,60	0,50*	0,71	1,00	0,31	1,23	1,58	2,24	640	1195
	646. 447	○	1,35	0,60	0,62*	0,88	1,25	0,39	1,53	1,98	2,80	645	1200
	646. 487	○	1,50	0,60	0,80*	1,13	1,60	0,50	1,96	2,53	3,58	650	1200
	646. 517	○	1,65	0,90	0,95*	1,34	1,90	0,59	2,33	3,00	4,25	650	1205
	646. 567	○	2,00	0,90	1,25	1,77	2,50	0,78	3,06	3,95	5,59	655	1210
	646. 607	○	2,20	1,10	1,58	2,23	3,15	0,98	3,86	4,98	7,04	660	1215

A = Equivalent bore diameter · E = narrowest free cross section
 *Differing spray pattern
 Subject to technical modifications.

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities.
 For complete assembly accessories, please refer to „Accessories“.

Example	Type	+	Material no.	=	Ordering no.
for ordering:	646. 307	+	5E	=	646. 307. 5E



Assembly accessories see page 10.3

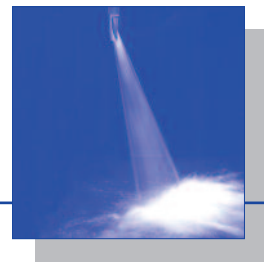
Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$





Tongue-type nozzles

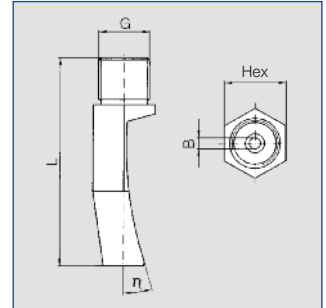
Series 688 / 689



Hard, sharp flat fan, narrowly delimited jet pattern. Not prone to clogging.

Applications:

Cleaning, washing, degreasing and phosphating, preparation techniques.

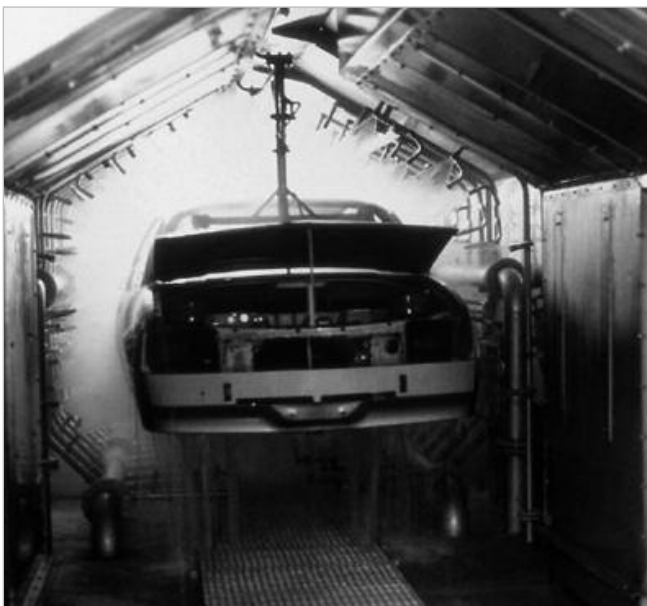


Spray angle	η	Ordering no.					B \emptyset [mm]	\dot{V} [l/min]				Dimensions		Weight (1.4305)	Spray width B at p = 2 bar	
		Type	Material-no		Code			p [bar]				L [mm]	Hex [mm]		H	
			16	5E				0,5	1,0	2,0	5,0				H = 250 mm	H = 500 mm
			1.4305/303 SS	PVDF	3/8 BSPT	3/4 BSPP										
45°	35°	688. 763	○	-	CE	-	3,0	4,00	5,66	8,00	12,65	43	19	114 g	220	440
	30°	688. 843	○	-	CE	-	3,8	6,25	8,84	12,50	19,76	50	19	133 g	220	440
	29°	688. 923	○	-	CE	-	4,8	10,00	14,14	20,00	31,62	59	22	247 g	220	440
	25°	689. 003	○	○	-	90	6,0	15,75	22,27	31,50	49,81	65/74	24/27	470 g	250	490

B = Bore diameter

Example	Type	+	Material no.	+	Code	=	Ordering no.
for ordering:	688. 763	+	16	+	CE	=	688. 763. 16. CE

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to „Accessories“.



Phosphating line



Tongue-type nozzles

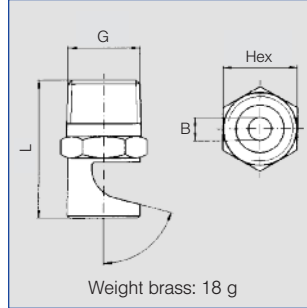
Series 686

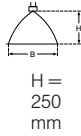


Wide flat fan with a sharply delimited jet pattern. Particularly clog-proof.

Applications:

Foam control in storage tanks and sewage treatment plants, cleaning and washing process, requiring powerful and concentrated water jets.



Spray angle	η	Ordering no.							B Ø [mm]	\dot{V} [l/min]			Dimensions								Spray width B at p = 2 bar  H = 250 mm		
		Type	Material-no.			Code				p [bar]			L [mm]				Hex [mm]						
			16 1.4305/303 SS	30 Brass	5E PVDF	1/8 BSPT	1/4 BSPT	3/8 BSPT		1/2 BSPT	1,0	2,0	5,0	R1/8	R1/4	R3/8	R1/2	R1/8	R1/4	R3/8		R1/2	
90°	75°	686. 406	-	○	-	CA	-	-	-	1,00	0,71	1,00	1,58	23	-	-	-	11	-	-	-	525	
	40°	686. 886	○	-	-	-	CC	-	-	4,20	11,31	16,00	25,30	-	36	-	-	-	17	-	-	530	
	40°	686. 926	○	-	-	-	-	CE	-	4,70	14,14	20,00	31,62	-	-	39	-	-	-	17	-	530	
140°	75°	686. 368	○	○	-	CA	-	-	-	0,80	0,45	0,63	1,00	23	-	-	-	11	-	-	-	1360	
		686. 408	○	○	-	CA	-	-	-	1,00	0,71	1,00	1,58	23	-	-	-	11	-	-	-	1370	
		686. 448	○	○	-	-	-	CC	-	-	1,20	0,88	1,25	1,98	-	28	-	-	-	14	-	-	1370
		686. 488	○	○	-	CA	CC	-	-	1,30	1,13	1,60	2,53	23	28	-	-	11	14	-	-	-	1370
		686. 528	○	○	-	CA	CC	-	-	1,50	1,41	2,00	3,16	23	28	-	-	11	14	-	-	-	1370
		686. 568	○	○	○	CA	-	-	-	1,70	1,77	2,50	3,59	23	-	-	-	11	-	-	-	-	1370
		686. 608	○	○	-	CA	CC	-	-	1,90	2,23	3,15	4,98	23	28	-	-	11	14	-	-	-	1370
		686. 648	○	○	-	-	CC	-	-	2,20	2,83	4,00	6,32	-	28	-	-	-	14	-	-	-	1370
		686. 688	○	○	-	CA	CC	-	-	2,40	3,54	5,00	7,91	23	28	-	-	11	14	-	-	-	1370
		686. 768	○	○	-	-	CC	-	-	3,00	5,66	8,00	12,65	-	28	-	-	-	14	-	-	-	1370
		686. 808	○	○	-	CA	CC	-	-	3,40	7,07	10,00	15,81	23	28	-	-	11	14	-	-	-	1370
		686. 828	○	○	-	-	CC	-	-	3,60	7,92	11,20	17,71	-	28	-	-	-	14	-	-	-	1370
		686. 848	○	○	-	-	CC	-	-	3,80	8,80	12,50	19,76	-	28	-	-	-	14	-	-	-	1370
		686. 868	○	○	-	-	CC	-	-	4,00	9,90	14,00	22,14	-	28	-	-	-	14	-	-	-	1370
		686. 888	○	○	-	-	CC	-	-	4,20	11,31	16,00	25,30	-	28	-	-	-	14	-	-	-	1370
		686. 908	○	○	-	-	CC	-	-	4,50	12,73	18,00	28,46	-	28	-	-	-	14	-	-	-	1370
		686. 928	○	-	-	-	-	CE	-	-	4,70	14,14	20,00	31,62	-	-	32	-	-	-	17	-	1370
686. 968	-	○	-	-	-	CE	CG	5,30	17,68	25,00	39,53	-	-	-	32	40	-	-	17	22	1370		
686. 988	○	-	-	-	-	CE	CG	5,60	19,80	28,00	44,27	-	-	-	32	40	-	-	17	22	1370		

B = bore diameter

Can also be used for air or saturated steam (see page 6.7)

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to „Accessories“.

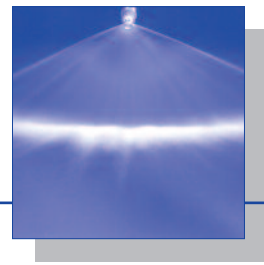
Example: Type + Material no. + Code = Ordering no.
for ordering 686. 406 + 30 + CA = 686. 406. 30. CA

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$





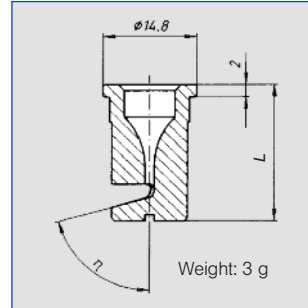
Tongue-type nozzles for retaining nut Series 684




**Assembly with retaining nut.
Wide flat fan with a sharply
delimited spray pattern.
Particularly clog-proof. Easy
nozzle changing, simple jet
alignment.**

Applications:

Foam control in storage tanks
and sewage treatment plants.
Cleaning and washing process,
requiring powerful and concen-
trated water jets.



Spray angle	η	Ordering no.		Colour	B \emptyset [mm]	\dot{V} [l/min]			L [mm]	Spray width B at $p = 2$ bar  H = 250 mm	
		Type	Mat- no.			p [bar]					
						56	5E	1,0			2,0
140°	75°	684. 348	○ -	green	0,7	0,35*	0,50	0,79	20	1360	
	75°	684. 368	○ ○	yellow	0,8	0,45*	0,63	1,00	20	1360	
	75°	684. 408	○ -	blue	1,0	0,71	1,00	1,58	20	1370	
	75°	684. 448	○ -	red	1,2	0,88	1,25	1,98	20	1370	
	75°	684. 488	○ ○	brown	1,3	1,13	1,60	2,53	20	1370	
	75°	684. 528	○ -	grey	1,5	1,41	2,00	3,16	20	1370	
	75°	684. 568	○ ○	white	1,7	1,77	2,50	3,95	19	1370	
	75°	684. 608	○ -	light blue	1,9	2,23	3,15	4,98	19	1370	
	75°	684. 688	○ -	green	2,4	3,54	5,00	7,91	17	1370	
	75°	684. 728	○ ○	black	2,7	4,45	6,30	9,96	17	1370	
	75°	684. 808	○ -	purple	3,4	7,07	10,00	15,81	16	1370	

B = bore diameter · * Differing spray pattern

Example	Type	+	Material no.	=	Ordering no.
for ordering:	684. 348	+	56	=	684. 348. 56

The folded page at the end of the catalogue will give you a survey on the various assembly possibilities. For complete assembly accessories, please refer to „Accessories“.





High pressure flat fan nozzles

Series 602 / 608 / 652



Sharp uniform flat fan with an extremely narrow jet depth.

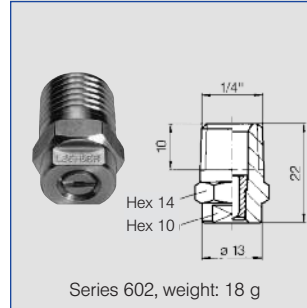
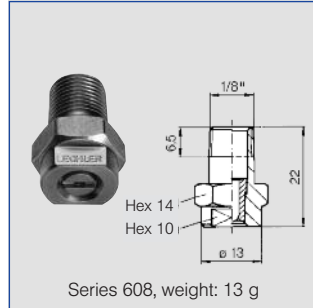
Applications:

High pressure cleaners, steam jet cleaners

Materials:

Nozzle body: stainless steel
1.4305/303 SS

Insert: hardened
stainless steel
1.4034 S



[US gal/min.] at 40 psi	Nozzle-Code			Flow rate code				A Ø [mm]	ṽ [l/min]						
	Connection			Spray angle					p [bar]						
	1/8"	1/4"	nut	↘15°	↘30°	↘45°	↘60°		40	60	80	100	120	150	200
02	608	602	652	361	362	363	364	1,00	2,86	3,50	4,04	4,52	4,95	5,53	6,39
025	608	602	652	381	382	383	384	1,10	3,54	4,33	5,00	5,59	6,12	6,85	7,91
03	608	602	652	401	402	403	404	1,18	4,31	5,28	6,10	6,82	7,47	8,35	9,64
034	608	602	652	411	412	413	414	1,30	4,95	6,06	7,00	7,83	8,57	9,59	11,07
04	608	602	652	451	452	453	454	1,35	5,80	7,10	8,20	9,17	10,04	11,23	12,97
045	608	602	652	471	472	473	474	1,40	6,51	7,97	9,20	10,29	11,27	12,60	14,55
05	608	602	652	481	482	483	484	1,55	7,29	8,92	10,30	11,52	12,62	14,11	16,29
055	608	602	652	501	502	503	504	1,60	7,96	9,74	11,25	12,58	13,78	15,41	17,79
06	608	602	652	521	522	523	524	1,72	8,70	10,66	12,31	13,76	15,07	16,85	19,46
065	608	602	652	531	532	533	534	1,75	9,38	11,49	13,26	14,83	16,25	18,16	20,97
07	608	602	652	541	542	543	544	1,80	10,06	12,32	14,22	15,90	17,42	19,47	22,49
075	608	602	652	551	552	553	554	1,90	10,75	13,16	15,20	16,99	18,62	20,81	24,04
08	608	602	652	571	572	573	574	2,05	11,48	14,06	16,23	18,15	19,88	22,23	25,67
09	608	602	652	591	592	593	594	2,10	13,01	15,93	18,40	20,57	22,53	25,19	29,09
10	608	602	652	601	602	603	604	2,30	14,43	17,76	20,40	22,81	24,99	27,94	32,26
125	-	602	652	641	642	643	644	2,50	17,82	21,82	25,20	28,17	30,86	34,51	39,85
15	-	602	652	671	672	673	674	2,70	21,35	26,15	30,20	33,76	36,98	41,35	47,74
175	-	602	652	701	702	703	704	3,00	25,03	30,66	35,40	39,58	43,36	48,47	55,97
20	-	602	652	-	-	723	724	3,05	28,85	35,33	40,80	45,62	49,97	55,87	64,52
30	-	602	652	-	-	793	-	3,90	42,43	51,96	60,00	67,08	73,48	82,16	94,88

A = Equivalent bore diameter

Connection Code	Connection	p _{max} [bar]
A3.00	BSPT	ca. 350
A3.07	NPT	ca. 350
A3.29	Lock nut	ca. 200

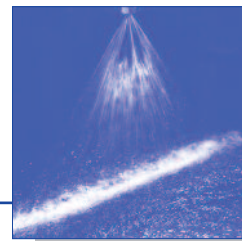
Example for ordering: Nozzle code + Flow rate code + Connection code = Ordering no.
602 + 361 + A3.07 = 602.361.A3.07
(Flat fan; 20°; 4,52 l/min. at 100 bar; 1/4" NPT)

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$





MEMOSPRAY® – The intelligent nozzle system for surface treatment



Maintaining of the adjusted spray direction by the “memory effect”. Very easy handling without the need for special tools. Especially pressure resistant pipe connector.

Application:

Degreasing, phosphating in surface treatment, cleaning.

Materials:

Nozzles: Polypropylene, high-

grade steel, ceramics

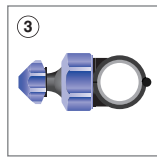
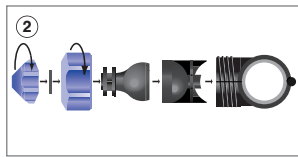
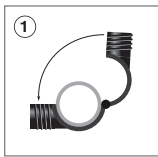
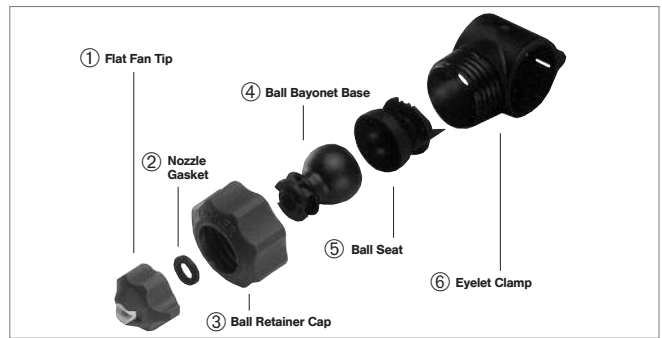
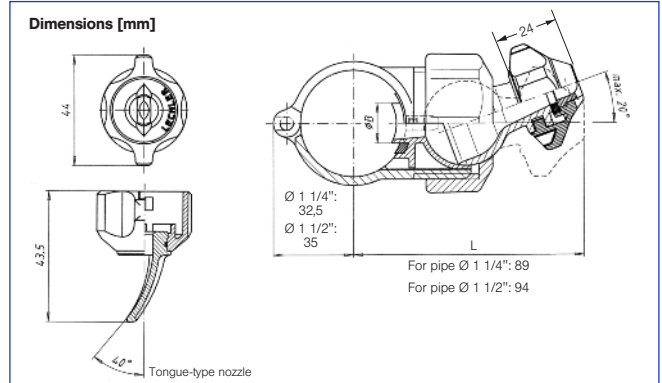
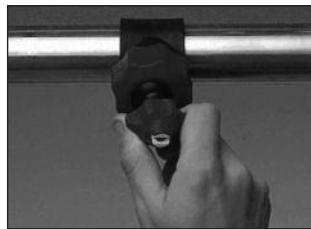
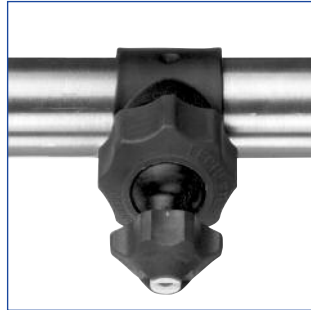
Eyelet clamp: Polypropylene

glass fibre-reinforced

All other components:

Polypropylene.

Can also be combined with Easy-Clip (see page 4.35)



Type	Ordering no.	Material							E Ø [mm]	Flow Rate [l/min] at p [bar]							Weight [g]									
		8F	E8	53	6M	6C	5E	7A		1,0	1,5	2,0	2,5	3,0	4,0	5,0	PP/ 303 SS	PP/ceramics	PP	PVDF	EPDM					
		Housing: PP Insert: 303 SS	Housing: PP Insert: ceramics	Housing: PP Insert: ceramics	PP reinforced	EPDM	PVDF	Viton																		
1 Flat Fan Tip	676. 644. xx. 40	○	-	-	-	-	-	-	60°	1,6	2,83	3,46	4,00	4,47	4,90	5,66	6,33	15	-	-	-	-				
	676. 724. xx. 40	○	-	-	-	-	-	-	60°	2,1	4,46	5,46	6,30	7,04	7,72	8,91	9,96	15	-	-	-	-				
	676. 764. xx. 40	○	-	-	-	-	-	-	60°	2,3	5,66	6,93	8,00	8,94	9,80	11,31	12,65	15	-	-	-	-				
	676. 804. xx. 40	○	-	-	-	-	-	-	60°	2,6	7,07	8,66	10,00	11,18	12,25	14,14	15,81	15	-	-	-	-				
	676. 844. xx. 40	○	-	-	-	-	-	-	60°	3,0	8,84	10,82	12,50	13,97	15,31	17,67	19,76	15	-	-	-	-				
	676. 884. xx. 40	○	○	○	○	-	-	-	60°	3,4	11,31	13,86	16,00	17,89	19,60	22,63	25,30	15	10	8	-	-				
	676. 924. xx. 40	○	○	○	○	-	-	-	60°	4,1	14,14	17,32	20,00	22,36	24,49	28,28	31,62	15	10	8	-	-				
	676. 964. xx. 40	○	○	○	○	-	-	-	60°	4,2	17,68	21,65	25,00	27,95	30,62	35,36	39,53	15	10	8	-	-				
	676. 004. xx. 40	○	○	○	○	-	-	-	60°	4,7	22,27	27,28	31,50	35,22	38,58	44,55	49,81	15	10	8	-	-				
Tongue Nozzle	677. 005. xx. 41	-	-	-	-	-	○	-	70°	6,0	22,27	27,28	31,50	35,22	38,58	44,55	49,81	-	-	-	11	-				
2 Nozzle Gasket	095. 015. xx. 05. 65. 0	-	-	-	-	○	-	○	for nozzles 676.644 to 676.764													-	-	-	-	1
	095. 015. xx. 05. 56. 0	-	-	-	-	○	-	○	for nozzles 676.804 to 677.005													-	-	-	-	1
3 Ball Retainer Cap	067. 600. xx. 40	-	-	○	-	-	-	-										-	-	18	-	-				
4 Ball Bayonet Base	067. 630. xx. 40	-	-	○	-	-	-	-										-	-	12	-	-				
5 Ball Seat for Eyelet Clamp No. 067.631.xx.40.00.0	067. 631. xx. 40. 22. 0	-	-	-	○	-	-	-	Bore-diameter B = 13,8 mm, pipe-Ø = 1 1/4"													-	-	9	-	-
	067. 631. xx. 40. 02. 0	-	-	-	○	-	-	-	Bore-diameter B = 16,0 mm, pipe-Ø = 1 1/4"													-	-	11	-	-
	067. 631. xx. 40. 12. 0	-	-	-	○	-	-	-	Bore-diameter B = 19,8 mm, pipe-Ø = 1 1/4"													-	-	13	-	-
6 Ball Seat for Eyelet Clamp No. 067.631.xx.50.00.0	067. 631. xx. 50. 22. 0	-	-	-	○	-	-	-	Bore-diameter B = 13,8 mm, pipe-Ø = 1 1/2"													-	-	9	-	-
	067. 631. xx. 50. 02. 0	-	-	-	○	-	-	-	Bore-diameter B = 16,0 mm, pipe-Ø = 1 1/2"													-	-	11	-	-
	067. 631. xx. 50. 12. 0	-	-	-	○	-	-	-	Bore-diameter B = 19,8 mm, pipe-Ø = 1 1/2"													-	-	13	-	-
6 Eyelet Clamp	067. 631. xx. 40. 00. 0	-	-	○	-	-	-	-	For pipe-diameter 1 1/4" (Outer diameter 44 mm)													-	-	31	-	-
	067. 631. xx. 50. 00. 0	-	-	○	-	-	-	-	For pipe-diameter 1 1/2" (Outer diameter 51 mm)													-	-	33	-	-

E = narrowest free cross section

Further nozzle sizes on request.

Example Type + Material-no = Ordering no.
for ordering: 676. 644. xx. 40 + 8F = 676. 644. 8F. 40





Flat fan ball joint

„Easy-Clip“



Quick and easy assembly with clamp. No tools required. Allround swivelling by 30°. Easy adjustment and cleaning.

Applications:

Degreasing, phosphating in surface treatment.

Materials:

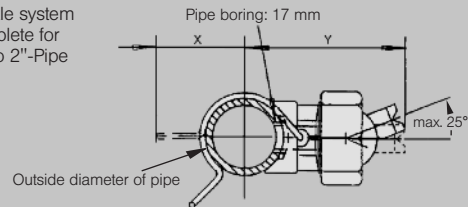
Clamp: Stainless steel 1.4310

Sealing: EPDM

all other components: glass reinforced polypropylene



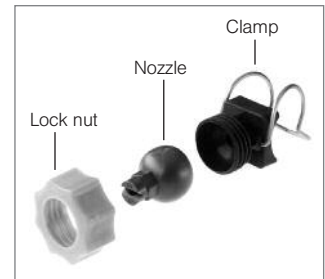
Nozzle system complete for 1"- to 2"-Pipe



Pipe ø	p _{max}	X	Y	Weight
1" (33,4 mm)	2 bar	43,2 mm	81,5 mm	63 g
1 1/4" (42,2 mm)	2 bar	48,0 mm	86,5 mm	66 g
1 1/2" (48,3 mm)	2 bar	51,3 mm	88,8 mm	70 g
2" (60,3 mm)	2 bar	57,2 mm	94,9 mm	75 g

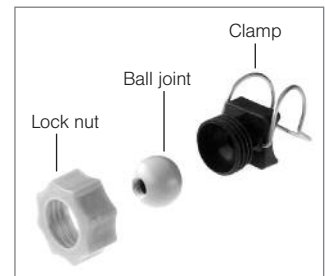
Nozzle system complete (with clamp for 1 1/4"- pipe and lock nut)

Ordering no.	Colour nozzle	↗	V̇ [l/min]				
			p [bar]				
			0,5	1,0	1,5	2,0	2,5
676. 724. 53. 31	grey	60°	3,15	4,45	5,45	6,30	7,04
676. 804. 53. 31	purple		5,00	7,07	8,66	10,00	11,18
676. 844. 53. 31	yellow		6,25	8,84	10,83	12,50	13,98
676. 884. 53. 31	red		8,00	11,31	13,85	16,00	17,89
676. 924. 53. 31	green		10,00	14,14	17,32	20,00	22,36



Ball joint system complete (with clamp for 1 1/4"- pipe and lock nut)

Ordering no.	Colour ball	Nozzle connection	For nozzle series
092. 081. 53. AD	beige	1/4 BSPP	460, 544, 632
092. 081. 53. AF	beige	3/8 BSPP	422, 460, 688



Components

Nozzle

Ordering no.	Colour	↗	V̇ [l/min]				
			p [bar]				
			0,5	1,0	1,5	2,0	2,5
676. 724. 53. 30. 01	grey	60°	3,15	4,45	5,45	6,30	7,04
676. 804. 53. 30. 01	purple		5,00	7,07	8,66	10,00	11,18
676. 844. 53. 30. 01	yellow		6,25	8,84	10,83	12,50	13,98
676. 884. 53. 30. 01	red		8,00	11,31	13,85	16,00	17,89
676. 924. 53. 30. 01	green		10,00	14,14	17,32	20,00	22,36

Can also be combined with MEMOSPRAY (see page 4.34)

Ball joint

Ordering no.	Colour	Nozzle connection	For nozzle series
092. 080. 53. AD. 01	beige	1/4" BSPP	460, 544, 632
092. 080. 53. AF. 01	beige	3/8" BSPP	422, 460, 688

Clamp complete (with clip and sealing)

Ordering no.	for pipe size
092. 080. 53. 00	1"
092. 081. 53. 00	1 1/4"
092. 082. 53. 00	1 1/2"
092. 083. 53. 00	2"

Lock nut

Ordering no.
092. 080. 53. 00. 02

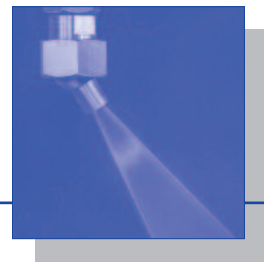
Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$





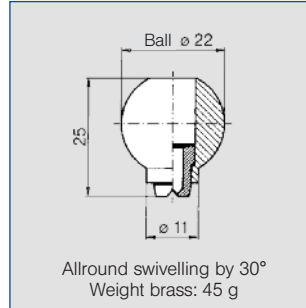
Flat fan nozzles with ball joint

Series 676



Swivelling nozzle for precise adjusting of jet direction. No gaskets necessary. Long, unproblematic service life.

Applications:
Cleaning, cooling, lubricating.



Spray angle	Ordering no.		A Ø [mm]	E Ø [mm]	V̇ [l/min]						Spray width B at p = 2 bar		
	Type	Mat.-no.			p [bar] (p _{max} = 30 bar)						H = 250 mm H = 500 mm		
		16 1.4305/303 SS			30 Brass	0,5	1,0	2,0	3,0	5,0	10,0	B	H
20°	676. 301	○	○	0,70	0,60	0,16*	0,23*	0,32	0,39	0,51	0,72	65	120
	676. 361	○	○	1,00	0,80	0,31*	0,44*	0,63	0,77	1,00	1,40	70	130
	676. 441	○	○	1,35	1,10	0,62*	0,88	1,25	1,53	1,98	2,80	75	145
	676. 481	○	○	1,50	1,20	0,80*	1,13	1,60	1,96	2,53	3,58	75	150
30°	676. 302	○	○	0,70	0,50	0,16*	0,23*	0,32	0,39	0,51	0,72	120	235
	676. 362	○	○	1,00	0,70	0,31*	0,44*	0,63	0,77	1,00	1,40	120	235
	676. 402	○	○	1,20	0,90	0,50*	0,71	1,00	1,23	1,58	2,24	120	235
	676. 482	○	○	1,50	1,10	0,80*	1,13	1,60	1,96	2,53	3,58	120	235
	676. 562	○	○	2,00	1,50	1,25	1,77	2,50	3,06	3,95	5,59	120	235
	676. 642	○	○	2,50	1,80	2,00	2,83	4,00	4,90	6,33	8,94	120	240
	676. 722	○	○	3,00	2,40	3,15	4,46	6,30	7,72	9,96	14,09	125	240
676. 762	○	○	3,50	2,70	4,00	5,66	8,00	9,80	12,65	17,89	125	245	
676. 802	○	○	4,00	3,10	5,00	7,07	10,00	12,25	15,81	22,36	130	250	
45°	676. 303	○	○	0,70	0,50	0,16*	0,23*	0,32	0,39	0,51	0,72	150	270
	676. 363	○	○	1,00	0,60	0,31*	0,44*	0,63	0,77	1,00	1,40	155	280
	676. 403	○	○	1,20	0,90	0,50*	0,71	1,00	1,23	1,58	2,24	175	320
	676. 483	○	○	1,50	1,10	0,80	1,13	1,60	1,96	2,53	3,58	180	340
	676. 563	○	○	2,00	1,40	1,25	1,77	2,50	3,06	3,95	5,59	185	355
	676. 643	○	○	2,50	1,80	2,00	2,83	4,00	4,90	6,33	8,94	195	370
	676. 723	○	○	3,00	2,40	3,15	4,46	6,30	7,72	9,96	14,09	200	375
	676. 763	○	○	3,50	2,60	4,00	5,66	8,00	9,80	12,65	17,89	200	380
676. 803	○	○	4,00	3,00	5,00	7,07	10,00	12,25	15,81	22,36	205	385	
60°	676. 304	○	○	0,70	0,40	0,16*	0,23*	0,32	0,39	0,51	0,72	215	425
	676. 334	○	○	0,90	0,50	0,22*	0,32*	0,45	0,55	0,71	1,01	220	440
	676. 364	○	○	1,00	0,60	0,31*	0,44*	0,63	0,77	1,00	1,40	230	460
	676. 404	○	○	1,20	0,80	0,50*	0,71	1,00	1,23	1,58	2,24	245	485
	676. 444	○	○	1,35	0,90	0,62*	0,88	1,25	1,53	1,98	2,80	255	495
	676. 484	○	○	1,50	1,00	0,80*	1,13	1,60	1,96	2,53	3,58	260	510
	676. 514	○	○	1,65	1,10	0,95*	1,34	1,90	2,33	3,00	4,25	270	520
	676. 564	○	○	2,00	1,30	1,25	1,77	2,50	3,06	3,95	5,59	280	535
	676. 604	○	○	2,20	1,50	1,58	2,23	3,15	3,86	4,98	7,04	290	550
	676. 644	○	○	2,50	1,60	2,00	2,83	4,00	4,90	6,33	8,94	295	565
	676. 674	○	○	2,70	1,80	2,38	3,36	4,75	5,82	7,51	10,62	300	575
	676. 724	○	○	3,00	2,10	3,15	4,46	6,30	7,72	9,96	14,09	305	590
	676. 764	○	○	3,50	2,30	4,00	5,66	8,00	9,80	12,65	17,89	310	595

A = Equivalent bore diameter · E = narrowest free cross section
*Differing spray pattern

Continuation of table and accessories on next page.



Flat fan nozzles with ball joint

Series 676



Spray angle	Ordering no.		A ∅ [mm]	E ∅ [mm]	\dot{V} [l/min]						Spray width B at p = 2 bar		
	Type	Mat.-no.			p [bar] (p _{max} = 30 bar)						H =		
		16 1.4305/303 SS			30 Brass	0,5	1,0	2,0	3,0	5,0	10,0	250 mm	500 mm
75°	676. 145	○	○	0,16	0,30	-	0,04*	0,05	0,06	0,08	0,11	280	550
	676. 165	○	○	0,20	0,34	-	0,05*	0,07	0,08	0,10	0,15	290	560
	676. 185	○	○	0,35	0,20	-	0,06*	0,08	0,10	0,13	0,18	300	575
	676. 215	○	○	0,40	0,20	-	0,08*	0,11	0,14	0,18	0,25	300	580
	676. 245	○	○	0,50	0,30	-	0,12*	0,16	0,20	0,26	0,30	310	585
	676. 275	○	○	0,60	0,30	0,11*	0,16*	0,22	0,27	0,35	0,49	310	590
90°	676. 216	○	○	0,40	0,20	-	0,08*	0,11	0,14	0,18	0,25	370	700
	676. 276	○	○	0,60	0,30	0,11*	0,16*	0,22	0,27	0,35	0,49	375	720
	676. 306	○	○	0,70	0,40	0,16*	0,23*	0,32	0,39	0,51	0,72	380	740
	676. 336	○	○	0,90	0,50	0,22*	0,32*	0,45	0,55	0,71	1,01	415	800
	676. 366	○	○	1,00	0,50	0,31*	0,44*	0,63	0,77	1,00	1,40	420	810
	676. 406	○	○	1,20	0,70	0,50*	0,71	1,00	1,23	1,58	2,24	430	820
	676. 446	○	○	1,35	0,80	0,62*	0,88	1,25	1,53	1,98	2,80	435	830
	676. 486	○	○	1,50	0,80	0,80*	1,13	1,60	1,96	2,53	3,58	440	835
	676. 516	○	○	1,65	0,90	0,95*	1,34	1,90	2,33	3,00	4,25	440	840
	676. 566	○	○	2,00	1,10	1,25	1,77	2,50	3,06	3,95	5,59	445	850
	676. 606	○	○	2,20	1,20	1,58	2,23	3,15	3,86	4,98	7,04	450	860
	676. 646	○	○	2,50	1,30	2,00	2,83	4,00	4,90	6,33	8,94	455	865
676. 676	○	○	2,70	1,40	2,38	3,36	4,75	5,82	7,51	10,62	465	875	
676. 726	○	○	3,00	1,70	3,15	4,46	6,30	7,72	9,96	14,09	470	885	
120°	676. 187	○	○	0,35	0,20	-	0,06*	0,08	0,10	0,13	0,18	630	1200
	676. 217	○	○	0,40	0,20	-	0,08*	0,11	0,14	0,18	0,25	640	1210
	676. 247	○	○	0,50	0,20	-	0,12*	0,16	0,20	0,26	0,36	650	1230
	676. 277	○	○	0,60	0,30	-	0,16*	0,22	0,27	0,35	0,49	660	1250
	676. 307	○	○	0,70	0,30	0,16*	0,23*	0,32	0,39	0,51	0,72	660	1250
	676. 337	○	○	0,90	0,40	0,22*	0,32*	0,45	0,55	0,71	1,01	670	1270
	676. 367	○	○	1,00	0,50	0,31*	0,44*	0,63	0,77	1,00	1,40	670	1270
	676. 407	○	○	1,20	0,60	0,50*	0,71	1,00	1,23	1,58	2,24	670	1270
	676. 447	○	○	1,35	0,60	0,62*	0,88	1,25	1,53	1,98	2,80	675	1270
	676. 487	○	○	1,50	0,60	0,80*	1,13	1,60	1,96	2,53	3,58	680	1275
	676. 517	○	○	1,65	0,90	0,95*	1,34	1,90	2,33	3,00	4,25	685	1280
	676. 567	○	○	2,00	0,90	1,25	1,77	2,50	3,06	3,95	5,59	690	1285
	676. 607	○	○	2,20	1,10	1,58	2,23	3,15	3,86	4,98	7,04	700	1300
	676. 647	○	○	2,50	1,30	2,00	2,83	4,00	4,90	6,33	8,94	700	1300
	676. 677	○	○	2,70	1,40	2,38	3,36	4,75	5,82	7,51	10,62	720	1330
	676. 727	○	○	3,00	1,60	3,15	4,46	6,30	7,72	9,96	14,09	740	1360
676. 767	○	○	3,50	1,70	4,00	5,66	8,00	9,80	12,65	17,89	760	1400	

A = Equivalent bore diameter · E = narrowest free cross section
 *Differing spray pattern

Accessories see next page.

Example	Type	+	Material no.	=	Ordering no.
for ordering:	676. 145	+	16	=	676. 145. 16

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$





Flat fan nozzles with ball joint

Series 676



Accessories

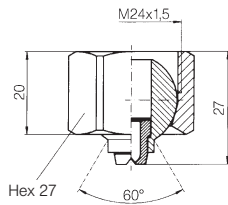
Retaining nut

092. 020. 16. 00. 02

Material: 1.4305/303 SS

092. 020. 30. 00. 02

Material: Brass



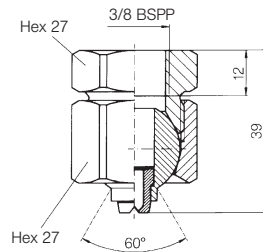
Socket

092. 020. 16. AF. 03

Material: 1.4305/303 SS

092. 020. 30. AF. 03

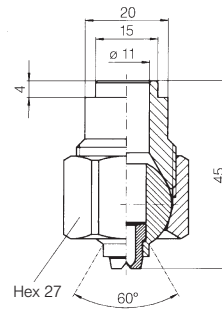
Material: Brass



Welding nipple

092. 020. 17. 00. 04

Material: 1.4571/316 SS





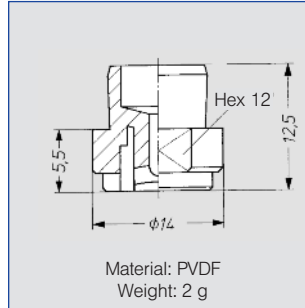
Flat fan nozzles for pressing into pipes

Series 612. XXX. 5E. 03



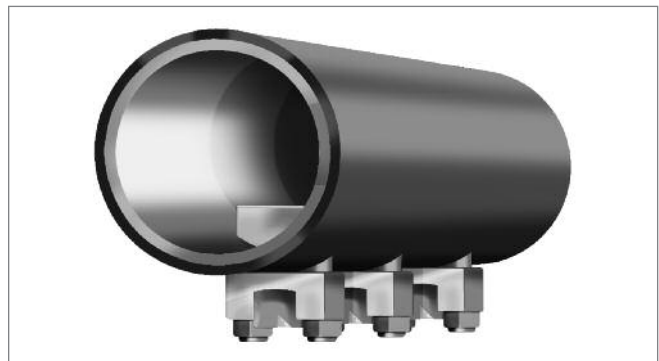
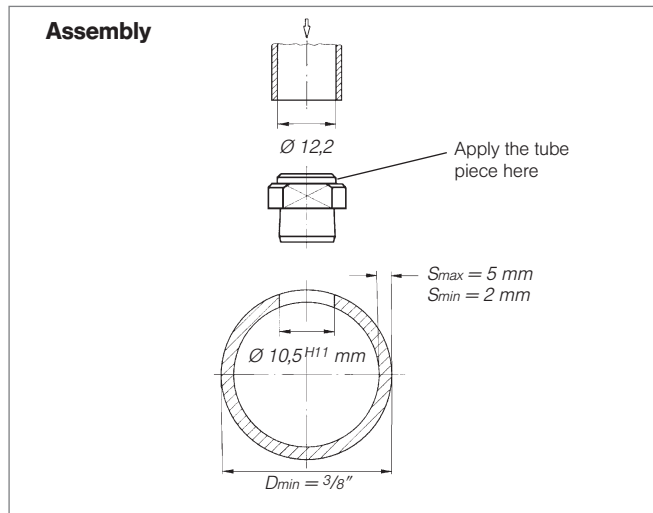
**For pressing into pipes.
Stable spray pattern. Uniform
parabolic distribution of
liquid.**

Applications:
Cleaning and rinsing, dish
washing.



Spray angle	Ordering no.		A ∅ [mm]	E ∅ [mm]	\dot{V} [l/min]								Spray width B at p = 3 bar	
	Type	Mat- no. 5E. 03			p [bar] Pmax = 2 bar									
					PVDF	0,3	0,5	0,7	1,0	1,5	2,0	2,5	3,0	H = 250 mm
90°	612. 366	○	1,0	0,5	0,24	0,31	0,37	0,44	0,55	0,63	0,70	0,77	505	980
	612. 486	○	1,5	0,6	0,62	0,80	0,95	1,13	1,39	1,60	1,79	1,96	525	1020
120°	612. 487	○	1,5	0,6	0,62	0,80	0,95	1,13	1,39	1,60	1,79	1,96	800	1460
	612. 647	○	2,5	1,2	1,55	2,00	2,37	2,83	3,46	4,00	4,47	4,90	800	1460

A = Equivalent bore diameter · E = narrowest free cross section



Assembly:
Drill pipe (∅ 10 mm), ream to ∅ 10,5^{H11} mm, adjust, put tube (∅ 12,2 mm) on nozzle and drive in with a rubber mallet. Flow velocity in the pipe max. 2–3 m/s.

Example	Type	+	Material no.	=	Ordering no.
for ordering:	612. 486	+	5E. 03	=	612. 486. 5E.03

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$



