

Flat fan nozzle with dovetail alignment Series 660

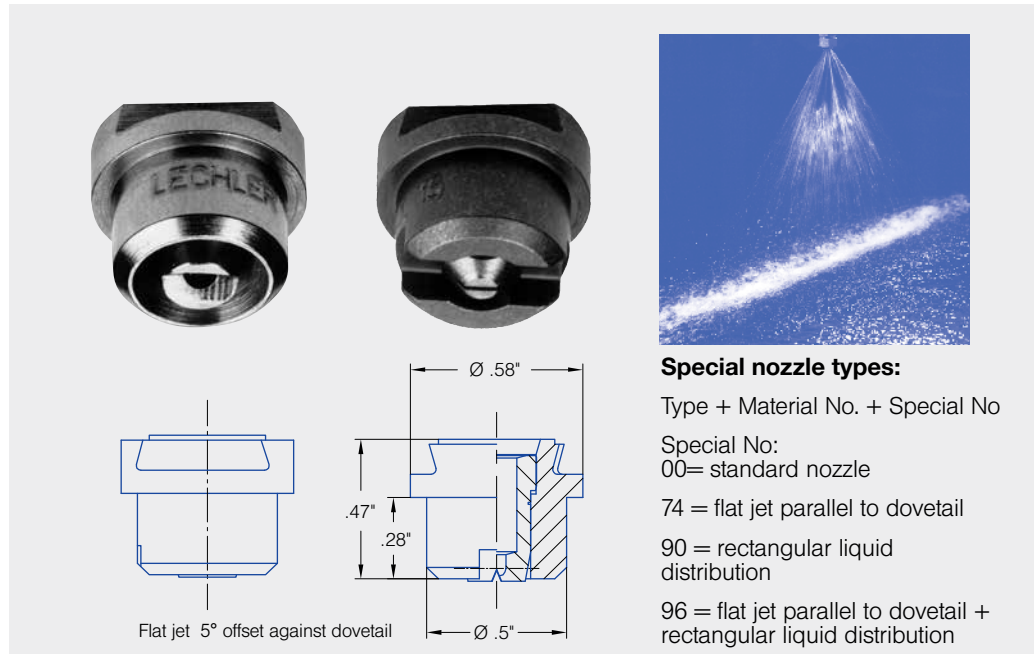
Series 660

Assembly with retaining nut. Self-aligning jet with dovetail design secures correct spray position for optimal strand surface quality and easy maintenance. Standard version with parabolic liquid distribution.

Applications:

Multi nozzle arrangements for strand cooling in foot roller area of slab casters where space is limited. Multi nozzle arrangements in segments for water only secondary cooling in stainless steel slab casters with low water flow rates.

- Standard offset angle 5° built into the nozzle
- 0° offset angle available on request 660.xxx.xx.74



Special nozzle types:

Type + Material No. + Special No


Special No:
00= standard nozzle

74 = flat jet parallel to dovetail

90 = rectangular liquid distribution

96 = flat jet parallel to dovetail + rectangular liquid distribution

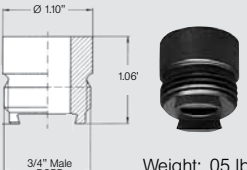
Spray angle	Ordering no.			Equivalent Orifice diam. (in.)	Free passage (in.)	Flow Rate (Gallons Per Minute)						Spray Coverage @ 30 psi			
	Type	Material no.				psi	psi	liters per minute 10 bar	20 psi	2 psi	40 psi	60 psi	80 H=10"	100 H=20"	
		303 SS 16	316 SS 17 ¹												Brass 30
20°	660.301	○	○	○	.028	.024	.05	.07	.32	.10	.12	.14	.16	2	4
	660.361	○	○	○	.039	.032	.10	.14	.63	.20	.24	.28	.31	3	5
	660.441	○	○	○	.053	.043	.19	.27	1.3	.39	.48	.55	.61	3	5
	660.481	○	○	○	.059	.047	.25	.35	1.6	.50	.61	.70	.78	3	5
30°	660.302	○	○	○	.024	.020	.05	.07	.32	.10	.12	.14	.16	4	8
	660.362	○	○	○	.039	.028	.10	.14	.63	.20	.24	.28	.31	4	8
	660.402	○	○	○	.047	.035	.16	.22	1.0	.31	.38	.44	.49	4	8
	660.482	○	○	○	.059	.043	.25	.35	1.6	.50	.61	.70	.78	4	8
45°	660.562	○	○	○	.079	.059	.39	.55	2.5	.78	.95	1.1	1.2	4	8
	660.303	○	○	○	.028	.020	.05	.07	.32	.10	.12	.14	.16	7	13
	660.363	○	○	○	.039	.024	.10	.14	.63	.20	.24	.28	.31	7	13
	660.403	○	○	○	.047	.035	.16	.22	1.0	.31	.38	.44	.49	7	13
60°	660.483	○	○	○	.059	.043	.25	.35	1.6	.50	.61	.70	.78	7	13
	660.563	○	○	○	.079	.055	.39	.55	2.5	.78	.95	1.1	1.2	7	14
	660.643	○	○	○	.099	.071	.62	.88	4.0	1.2	1.5	1.8	2.0	7	14
	660.304	○	○	○	.028	.016	.05	.07	.32	.10	.12	.14	.16	11	21
75°	660.334	○	○	○	.035	.020	.07	.10	.45	.14	.17	.20	.22	11	21
	660.364	○	○	○	.039	.024	.10	.14	.63	.20	.24	.28	.31	11	21
	660.404	○	○	○	.047	.032	.16	.22	1.0	.31	.38	.44	.49	11	21
	660.444	○	○	○	.053	.035	.19	.27	1.3	.39	.48	.55	.61	11	21
	660.484	○	○	○	.059	.039	.25	.35	1.6	.50	.61	.70	.78	11	21
	660.514	○	○	○	.065	.043	.29	.42	1.9	.59	.72	.83	.93	11	21
	660.564	○	○	○	.079	.051	.39	.55	2.5	.78	.95	1.1	1.2	11	21
	660.604	○	○	○	.087	.059	.49	.69	3.2	.98	1.2	1.4	1.5	11	21
	660.644	○	○	○	.099	.063	.62	.88	4.0	1.2	1.5	1.8	2.0	11	21
	660.724	○	○	○	.118	.083	.98	1.4	6.3	2.0	2.4	2.8	3.1	11	20
75°	660.804	-	○	○	.158	.102	1.6	2.2	10.0	3.1	3.8	4.4	4.9	11	20
	660.145	○	-	○	.008	.005	.01	.01	.05	.02	.02	.02	.02	13	24
	660.165	○	-	○	.008	.003	.01	.01	.07	.02	.03	.03	.03	13	24
	660.185	○	-	○	.008	.006	.01	.02	.09	.02	.03	.03	.04	13	25
	660.215	○	-	○	.020	.008	.02	.02	.11	.03	.04	.05	.05	13	25
	660.245	○	-	○	.020	.300	.02	.03	.16	.05	.06	.07	.08	14	25
660.275	○	-	○	.024	.300	.03	.05	.22	.07	.08	.10	.11	14	25	

Spray angle 	Ordering no.			Equivalent Orifice diam. (in.)	Free passage (in.)	Flow Rate (Gallons Per Minute)							Spray Coverage @ 30 psi		
	Type	Material no.				10 psi	20 psi	liters per minute 2 bar	40 psi	60 psi	80 psi	100 psi	H=10"	H=20"	
		303 SS 16	316 SS 17												Brass 30
90°	660.216	○	-	○	.016	.200	.017	.024	.11	.034	.042	.048	.054	20	35
	660.276	○	-	○	.024	.300	.034	.05	.22	.07	.08	.10	.11	20	35
	660.306	○	○	○	.028	.016	.05	.07	.32	.10	.12	.14	.16	20	37
	660.336	○	○	○	.035	.020	.07	.10	.45	.14	.17	.20	.22	20	37
	660.366	○	○	○	.039	.020	.10	.14	.63	.20	.24	.28	.31	20	37
	660.406	○	○	○	.047	.028	.16	.22	1.0	.31	.38	.44	.49	20	37
	660.446	○	○	○	.053	.032	.19	.27	1.3	.39	.48	.55	.61	20	36
	660.486	○	○	○	.059	.032	.25	.35	1.6	.50	.61	.70	.78	20	36
	660.516	○	○	○	.065	.035	.29	.42	1.9	.59	.72	.83	.93	20	36
	660.566	○	○	○	.079	.043	.39	.55	2.5	.78	.95	1.1	1.2	20	36
	660.606	○	○	○	.087	.047	.49	.69	3.2	.98	1.2	1.4	1.5	20	36
	660.646	○	○	○	.099	.051	.62	.88	4.0	1.2	1.5	1.8	2.0	20	36
	660.676	○	○	○	.106	.055	.74	1.0	4.8	1.5	1.8	2.1	2.3	19	36
	660.726	○	○	○	.118	.067	.98	1.4	6.3	2.0	2.4	2.8	3.1	19	35
660.806	○	○	○	.158	.095	1.6	2.2	10.0	3.1	3.8	4.4	4.9	19	34	
120°	660.187	○	-	○	.014	.008	.012	.018	.08	.025	.030	.035	.039	26	48
	660.217	○	-	○	.016	.008	.017	.024	.11	.034	.042	.048	.054	26	48
	660.247	○	-	○	.020	.008	.025	.035	.16	.05	.06	.07	.08	26	49
	660.277	○	-	○	.024	.012	.034	.05	.22	.07	.08	.10	.11	26	49
	660.307	○	-	○	.028	.012	.05	.07	.32	.10	.12	.14	.16	26	50
	660.337	○	○	○	.035	.016	.07	.10	.45	.14	.17	.20	.22	26	50
	660.367	○	○	○	.039	.016	.10	.14	.63	.20	.24	.28	.31	26	50
	660.407	○	○	○	.047	.024	.16	.22	1.0	.31	.38	.44	.49	26	50
	660.447	○	○	○	.053	.024	.19	.27	1.3	.39	.48	.55	.61	26	50
	660.487	○	○	○	.059	.024	.25	.35	1.6	.50	.61	.70	.78	27	50
	660.517	○	○	○	.065	.035	.29	.42	1.9	.59	.72	.83	.93	27	50
	660.567	○	○	○	.079	.035	.39	.55	2.5	.78	.95	1.1	1.2	27	50
	660.607	○	○	○	.087	.043	.49	.69	3.2	.98	1.2	1.4	1.5	27	51
	660.647	○	○	○	.099	.051	.62	.88	4.0	1.2	1.5	1.8	2.0	28	51
	660.727	○	○	○	.118	.063	.99	1.4	6.4	2.0	2.4	2.8	3.1	29	52
	660.807	○	-	○	.158	.079	1.6	2.2	10.0	3.1	3.8	4.4	4.9	31	53

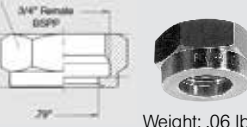
Example Type + Material no. = Ordering no.
for ordering: 660.306 + 16 = 660.306.16

1) We reserve the right to deliver material 316 SS or 316L SS, if we show the material code 17.

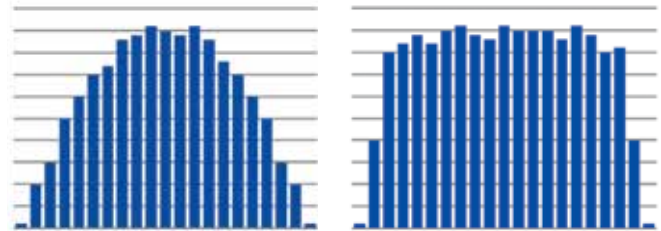
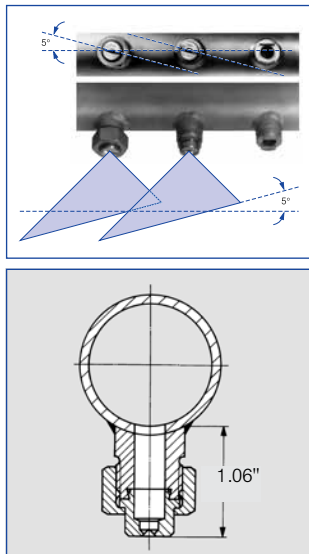
Accessories



Weight: .05 lb.
Nipple **066.011.17** (316 SS)



Weight: .06 lb.
Retaining nut **065.200.16** (303 SS)
065.200.17 (316 SS)
065.200.30 (Brass)



Standard spray water distribution (left) and rectangular spray water distribution (right)

Available with

- Rectangular liquid distribution for single nozzle arrangement (per roller gap) or wide pitches 660.xxx.xx.90.
- Rectangular liquid distribution combined with 0° offset angle for single nozzle arrangement (per roller gap) or wide pitches 660.xxx.xx.96 in narrow roller gaps.

Conversion formula for the above series: $V_2 = V_1 \sqrt{\frac{P_2}{P_1}}$

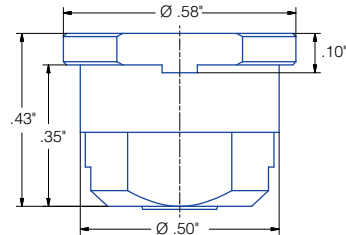
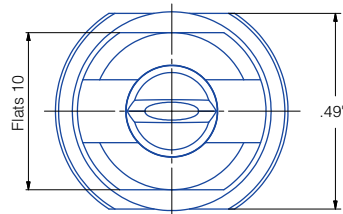
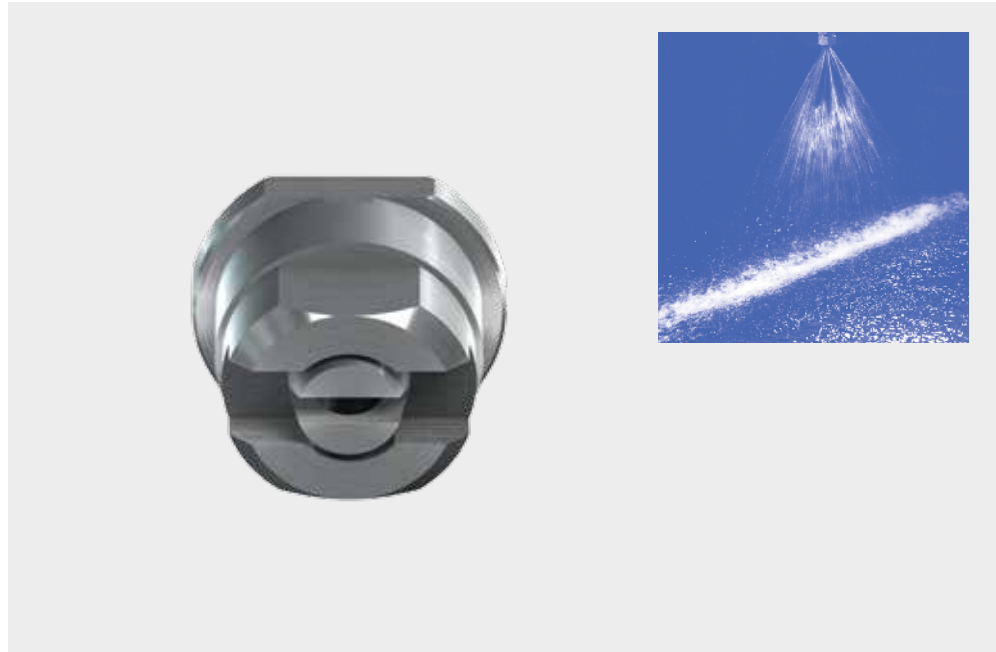
Flat fan nozzle with double-flat alignment Series 6M2


Series 6M2

Assembly with retaining nut. Self aligning jet with double-flat design secures correct spray position for optimal strand surface quality and easy maintenance. Standard version with parabolic liquid distribution.

Applications:


Multi-nozzle arrangements for strand cooling in foot roller area of slab casters where space is limited. Multi-nozzle arrangements in segments for water only secondary cooling in stainless steel slab casters with low water flow rates.



Spray angle 	Ordering no.				Equivalent Orifice diam. (in.)	Free passage (in.)	Flow Rate (Gallons Per Minute)						
	Type	Mat. no.					73 psi	14.5 psi	29 psi	40 psi	43.5 psi	72.5 psi	145 psi
		AISI 303 16	AISI 316TI 17 ¹	AISI 316L 30									
45°	6M2. 403	○	○	○	.05	.35	.13	.19	.26	.31	.32	.42	.59
	6M2. 483	○	○	○	.06	.04	.21	.30	.42	.5	.52	.67	.95
	6M2. 563	○	○	○	.08	.06	.33	.47	.66	.78	.81	1.04	1.48
	6M2. 643	○	○	○	.10	.07	.53	0.75	1.06	1.24	1.29	1.67	2.36
	6M2. 723	○	○	○	.12	.09	.83	1.18	1.66	1.95	2.04	2.63	3.72
	6M2. 763	○	○	○	.14	.10	1.06	1.50	2.11	2.48	2.59	3.34	4.73
	6M2. 803	○	○	○	.16	.12	1.32	1.87	2.64	3.1	3.24	4.18	5.91

¹We reserve the right to deliver AISI 316TI or AISI 316L under the material no. 17.

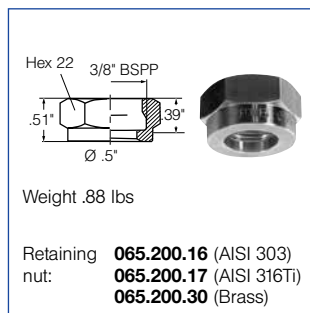
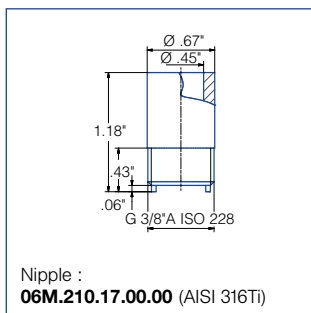
Continued on next page.

Spray angle 	Ordering no.				Equivalent Orifice diam. (in.)	Free passage (in.)	Flow Rate (Gallons Per Minute)						
	Type	Mat. no.					7.3 psi	14.5 psi	29 psi	40 psi	43.5 psi	72.5 psi	145 psi
		16 AISI 303	17 ¹ AISI 316Ti AISI 316L	30 Brass									
60°	6M2. 404	○	○	○	.05	.03	.13	.19	.26	.31	.32	.42	.59
	6M2. 444	○	○	○	.05	.04	.16	.23	.33	.39	.40	.52	.74
	6M2. 484	○	○	○	.06	.04	.21	.30	.42	.5	.52	.67	.95
	6M2. 514	○	○	○	.06	.04	.25	.35	.50	.59	.62	.79	1.12
	6M2. 564	○	○	○	.08	.05	.33	.47	.66	.78	.81	1.04	1.48
	6M2. 604	○	○	○	.09	.06	.42	.59	.83	.98	1.02	1.32	1.86
	6M2. 644	○	○	○	.10	.06	.53	.75	1.06	1.24	1.29	1.67	2.36
	6M2. 674	○	○	○	.11	.07	.63	.89	1.25	1.47	1.54	1.98	2.81
	6M2. 724	○	○	○	.12	.08	.83	1.18	1.66	1.95	2.04	2.63	3.72
	6M2. 764	○	○	○	.14	.09	1.06	1.50	2.11	2.48	2.59	3.34	4.73
	6M2. 804	○	○	○	.16	.10	1.32	1.87	2.64	3.1	3.24	4.18	5.91
6M2. 844	○	-	-	.18	.12	1.65	2.34	3.30	3.88	4.04	5.22	7.38	
6M2. 884	○	-	○	.20	.13	2.11	2.99	4.23	4.96	5.18	6.68	9.45	
90°	6M2. 446	○	○	○	.05	.03	.16	.23	.33	0.39	.40	.52	.74
	6M2. 486	○	○	○	.06	.03	.21	.30	.42	0.5	.52	.67	.95
	6M2. 516	○	○	○	.06	.04	.25	.35	.50	0.59	.62	.79	1.12
	6M2. 566	○	○	○	.08	.04	.33	.47	.66	0.78	.81	1.04	1.48
	6M2. 606	○	○	○	.09	.05	.42	.59	.83	0.98	1.02	1.32	1.86
	6M2. 646	○	○	○	.10	.05	.53	.75	1.06	1.24	1.29	1.67	2.36
	6M2. 676	○	○	○	.11	.06	.63	.89	1.25	1.47	1.54	1.98	2.81
	6M2. 726	○	○	○	.12	.07	.83	1.18	1.66	1.95	2.04	2.63	3.72
	6M2. 766	○	○	○	.14	.07	1.06	1.50	2.11	2.48	2.59	3.34	4.73
	6M2. 806	○	○	○	.16	.09	1.32	1.87	2.64	3.1	3.24	4.18	5.91
	6M2. 846	-	-	○	.18	.09	1.65	2.34	3.30	3.88	4.04	5.22	7.38
6M2. 886	○	-	○	.20	.12	2.11	2.99	4.23	4.96	5.18	6.68	9.45	
120°	6M2. 517	○	○	○	.06	.04	.25	.35	.50	.59	.62	.79	1.12
	6M2. 567	○	○	○	.08	.04	.33	.47	.66	.78	.81	1.04	1.48
	6M2. 607	○	○	○	.09	.04	.42	.59	.83	.98	1.02	1.32	1.86
	6M2. 647	○	○	○	.10	.05	.53	.75	1.06	1.24	1.29	1.67	2.36
	6M2. 677	○	○	○	.11	.06	.63	.89	1.25	1.47	1.54	1.98	2.81
	6M2. 727	○	○	○	.12	.06	.83	1.18	1.66	1.95	2.04	2.63	3.72
	6M2. 767	○	○	○	.14	.07	1.06	1.50	2.11	2.48	2.59	3.34	4.73
	6M2. 807	○	-	○	.16	.08	1.32	1.87	2.64	3.1	3.24	4.18	5.91
	6M2. 847	-	-	-	.18	.09	1.65	2.34	3.30	3.88	4.04	5.22	7.38
	6M2. 887	-	-	-	.20	.10	2.11	2.99	4.23	4.96	5.18	6.68	9.45

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

Example of ordering: Type **6M2. 404** + Material no. **16** = Ordering no. **6M2. 404. 16**

Accessories



Conversion formula for the above series: $V_2 = V_1 \sqrt{\frac{P_2}{P_1}}$

Flat fan nozzle with dovetail alignment

Series 664 / 665

Series 664 / 665

Assembly with retaining nut. Self aligning jet with dovetail design secures correct spray position for optimal strand surface quality and easy maintenance. Standard version with parabolic liquid distribution.

Applications:

Multi and single nozzle arrangements in segments for water only secondary cooling.

- Standard offset angle 15° built into the nozzle
- 0° offset angle available on request 664.xxx.xx.74 or 665.xxx.xx.74

Available also with rectangular liquid distribution for single nozzle arrangement (per roller gap) or wide pitches 664.xxx.xx.90 or 665.xxx.xx.90

Available also with rectangular liquid distribution combined with 0° offset angle for single nozzle arrangement (per roller gap) or wide pitches 664.xxx.xx.96 665.xxx.xx.96 in narrow roller gaps.



Special nozzle types:

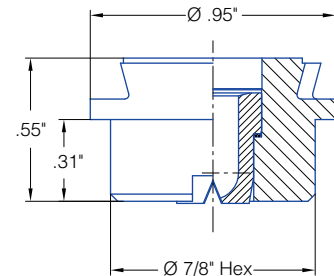
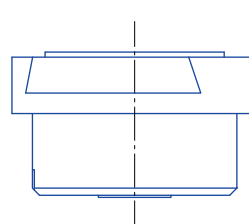
Type + Material No. + Special No

Special No:
00= standard nozzle

74 = flat jet parallel to dovetail

90 = rectangular liquid distribution

96 = flat jet parallel to dovetail + rectangular liquid distribution




Flat jet 15° offset against dovetail

Spray angle	Ordering no.				Equivalent Orifice diam. (in.)	Free passage (in.)	Flow Rate (Gallons Per Minute)						Spray Coverage @ 30 psi		
	Type	Material no.					10 psi	20 psi	liters per minute 2 bar	40 psi	60 psi	80 psi	100 psi	H=10"	H=20"
		303 SS 16	316 SS 17 ¹⁾	Brass 30											
20°	664. 721	○	○	○	.118	.099	.98	1.4	6.3	2.0	2.4	2.8	3.1	4	8
	664. 801	○	○	○	.158	.126	1.6	2.2	10.0	3.1	3.8	4.4	4.9	4	8
	664. 881	○	○	○	.197	.158	2.5	3.5	16.0	5.0	6.1	7.0	7.8	4	8
	664. 921	○	○	○	.217	.173	3.1	4.4	20.0	6.2	7.6	8.8	9.8	4	8
	664. 961	○	○	○	.236	.201	3.9	5.5	25.0	7.8	9.5	11.0	12.3	4	8
30°	664. 722	○	○	○	.118	.095	.98	1.4	6.3	2.0	2.4	2.8	3.1	6	11
	664. 762	○	○	○	.138	.106	1.2	1.8	8.0	2.5	3.0	3.5	3.9	6	11
	664. 802	○	○	○	.158	.122	1.6	2.2	10.0	3.1	3.8	4.4	4.9	6	11
	664. 882	○	○	○	.197	.158	2.5	3.5	16.0	5.0	6.1	7.0	7.8	6	11
	664. 922	○	○	○	.217	.173	3.1	4.4	20.0	6.2	7.6	8.8	9.8	6	11
	664. 962	○	○	○	.236	.197	3.9	5.5	25.0	7.8	9.5	11.0	12.3	6	11
	665. 042	○	-	○	.315	.252	6.2	8.8	40.0	12.4	15.2	17.6	19.6	6	11
665. 122	-	-	○	.394	.323	9.8	13.8	63.0	19.5	23.9	27.6	30.9	6	11	

1) We reserve the right to deliver material 316 SS or 316L SS, if we show the material code 17.

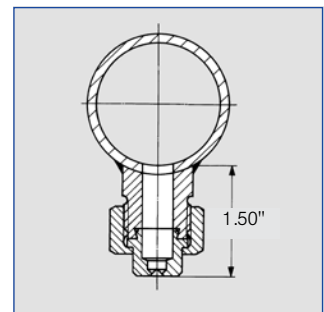
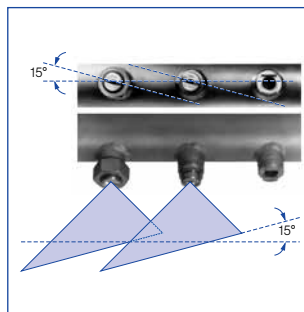
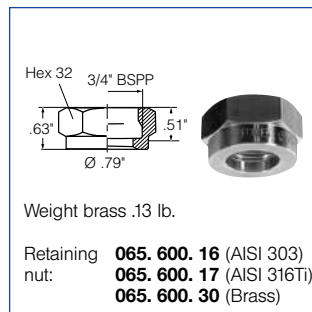
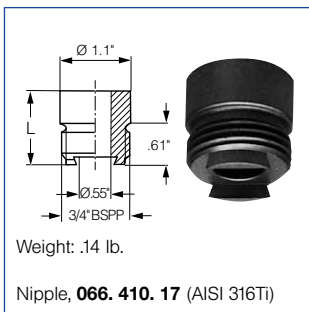
Continued on next page.

Spray angle 	Ordering no.			Equivalent Orifice diam. (in.)	Free passage (in.)	Flow Rate (Gallons Per Minute)						Spray Coverage @ 30 psi			
	Type	Material no.				10 psi	20 psi	liters per minute 2 bar	40 psi	60 psi	80 psi	100 psi	H=10"	H=20"	
		16 <small>303 SS</small>	17 ¹⁾ <small>316 SS</small>												30 <small>Brass</small>
45°	664. 723	○	○	○	.118	.095	.98	1.4	6.3	2.0	2.4	2.8	3.1	10	19
	664. 763	○	○	○	.138	.102	1.2	1.8	8.0	2.5	3.0	3.5	3.9	10	19
	664. 803	○	○	○	.158	.118	1.6	2.2	10.0	3.1	3.8	4.4	4.9	10	19
	664. 843	○	○	○	.177	.134	1.9	2.7	12.5	3.9	4.8	5.5	6.1	10	19
	664. 883	○	○	○	.197	.150	2.5	3.5	16.0	5.0	6.1	7.0	7.8	10	20
	664. 923	○	○	○	.217	.165	3.1	4.4	20.0	6.2	7.6	8.8	9.8	11	20
	664. 963	○	○	○	.236	.043	3.9	5.5	25.0	7.8	9.5	11.0	12.3	11	20
	665. 043	-	-	○	.315	.232	6.2	8.8	40.0	12.4	15.2	17.6	19.6	11	20
60°	664. 724	○	○	○	.118	.083	.98	1.4	6.3	2.0	2.4	2.8	3.1	12	22
	664. 764	○	○	○	.138	.091	1.2	1.8	8.0	2.5	3.0	3.5	3.9	12	22
	664. 804	○	○	○	.158	.102	1.6	2.2	10.0	3.1	3.8	4.4	4.9	12	22
	664. 844	○	○	○	.177	.118	1.9	2.7	12.5	3.9	4.8	5.5	6.1	12	22
	664. 884	○	○	○	.197	.134	2.5	3.5	16.0	5.0	6.1	7.0	7.8	12	22
	664. 924	○	○	○	.217	.162	3.1	4.4	20.0	6.2	7.6	8.8	9.8	12	23
	664. 964	○	○	○	.236	.165	3.9	5.5	25.0	7.8	9.5	11.0	12.3	12	23
	665. 044	○	○	○	.315	.217	6.2	8.8	40.0	12.4	15.2	17.6	19.6	12	23
90°	664. 726	○	○	○	.118	.200	.98	1.4	6.3	2.0	2.4	2.8	3.1	17	31
	664. 766	○	○	○	.138	.300	1.2	1.8	8.0	2.5	3.0	3.5	3.9	17	31
	664. 806	○	○	○	.158	.095	1.6	2.2	10.0	3.1	3.8	4.4	4.9	17	31
	664. 846	○	○	○	.177	.095	1.9	2.7	12.5	3.9	4.8	5.5	6.1	17	31
	664. 886	○	○	○	.197	.122	2.5	3.5	16.0	5.0	6.1	7.0	7.8	17	31
	664. 926	○	○	○	.217	.142	3.1	4.4	20.0	6.2	7.6	8.8	9.8	17	31
	664. 966	○	○	○	.236	.154	3.9	5.5	25.0	7.8	9.5	11.0	12.3	17	31
	665. 046	-	-	○	.315	.193	6.2	8.8	40.0	12.4	15.2	17.6	19.6	17	31
120°	664. 727	○	○	○	.118	.063	.98	1.4	6.3	2.0	2.4	2.8	3.1	49	85
	664. 767	○	○	○	.138	.067	1.2	1.8	8.0	2.5	3.0	3.5	3.9	49	85
	664. 807	○	○	○	.158	.079	1.6	2.2	10.0	3.1	3.8	4.4	4.9	49	85
	664. 887	○	○	○	.197	.102	2.5	3.5	16.0	5.0	6.1	7.0	7.8	49	85
	664. 927	○	○	○	.217	.114	3.1	4.4	20.0	6.2	7.6	8.8	9.8	49	85
	664. 967	-	-	○	.236	.126	3.9	5.5	25.0	7.8	9.5	11.0	12.3	49	85
	665. 047	-	-	○	.315	.173	6.2	8.8	40.0	12.4	15.2	17.6	19.6	49	85

Example Type + Material no. = Ordering no.
for ordering: 664. 727 + 16 = 664. 727. 16

1) We reserve the right to deliver material 316 SS, if we show the material code 17.

Accessories



Flat fan nozzle with increased spray depth and dovetail alignment

Series 600.280

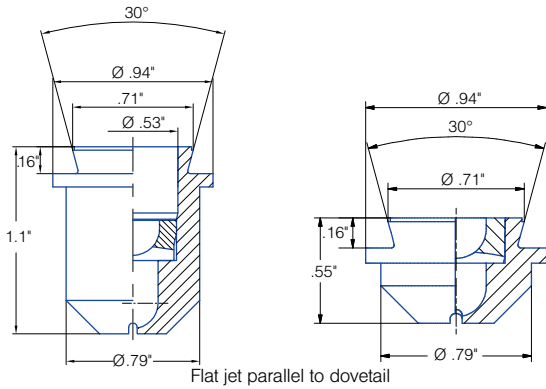
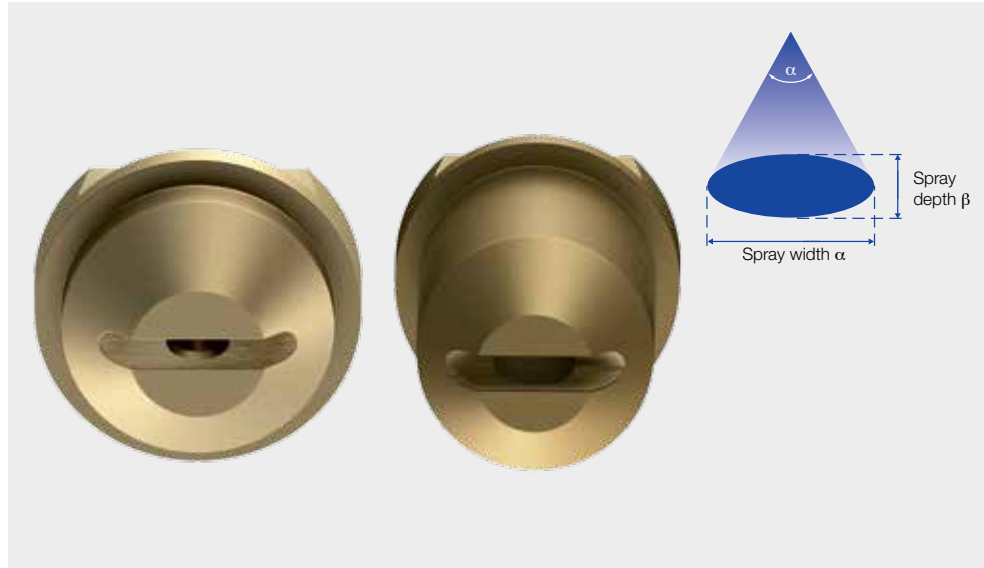
Series 600.280

Assembly with 3/4" retaining nut. Self-aligning jet with dovetail design with 0° offset angle secures correct spray position for optimal strand surface quality and easy maintenance.

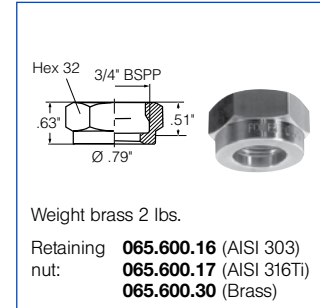
- Typically with trapezoid liquid distribution
- Available in .55" short and in 1.1" long version

Applications:


Single and multi nozzle arrangements in segments for water only secondary cooling in bloom and slab casters. Also suitable for vertical spray positions such as narrow side cooling in slab casters or vertical spray cooling in bloom casters.



Accessories



Spray angle	Ordering no.	Mat. no.		Spray depth angle [°]	Length [in]	Narrowest cross section [in]	Flow Rate (Gallons Per Minute)						
		Type	16				30	10 psi	20 psi	liters per minute 2 bar	40 psi	80 psi	100 psi
			303 SS				Brass						
60°	600.280.xx.34	○	○	12	1.1	.12	2.66	3.68	16.60	5.10	7.07	7.85	
	600.280.xx.32	○	○	15	1.1	.12	2.66	3.68	16.60	5.10	7.07	7.85	
	600.280.xx.28	○	○	20	1.1	.1	1.89	2.62	11.80	3.63	5.02	5.58	
	600.280.xx.29	○	○	20	1.1	.12	2.61	3.62	16.30	5.01	6.94	7.71	
	600.280.xx.30	○	○	20	1.1	.14	3.32	4.59	20.70	6.36	8.81	9.79	
	600.280.xx.33	○	○	25	1.1	.16	3.56	4.93	22.20	6.82	9.45	10.49	
	600.280.xx.83	○	○	40	1.1	.04	0.29	0.40	1.80	0.55	0.77	0.85	
	600.280.xx.12	○	○	40	1.1	.04	0.42	0.58	2.60	0.80	1.11	1.23	
	600.280.xx.11	○	○	40	1.1	.04	0.46	0.64	2.90	0.89	1.23	1.37	
	600.280.xx.22	○	○	40	1.1	.08	1.04	1.44	6.50	2.00	2.77	3.07	
600.280.xx.21	○	○	40	1.1	.1	1.36	1.89	8.50	2.61	3.62	4.02		
70°	600.280.xx.17	○	○	40	1.1	.04	0.29	0.40	1.80	0.55	0.77	0.85	
	600.280.xx.15	○	○	40	1.1	.04	0.42	0.58	2.60	0.80	1.11	1.23	
	600.280.xx.84	○	○	40	1.1	.07	0.69	0.95	4.30	1.32	1.83	2.03	
75°	600.280.xx.82	○	○	15	1.1	.07	1.27	1.75	7.90	2.43	3.36	3.73	
	600.280.xx.16	○	○	15	1.1	.07	1.36	1.89	8.50	2.61	3.62	4.02	
	600.280.xx.19	○	○	30	1.1	.06	0.74	1.02	4.60	1.41	1.96	2.17	
	600.280.xx.26	○	○	30	1.1	.07	0.91	1.26	5.70	1.75	2.43	2.69	

Spray angle 	Ordering no.		Spray depth angle [°]	Length [in]	Narrowest cross section [in]	Flow Rate (Gallons Per Minute)						
	Type	Mat. no.				10 psi	20 psi	liters per minute 2 bar	40 psi	80 psi	100 psi	
		16 303 SS										30 Brass
80°	600.280.xx.64	○	○	20	1.1	.06	0.45	0.62	2.80	0.86	1.19	1.32
	600.280.xx.74	○	○	20	1.1	.06	0.50	0.69	3.10	0.95	1.32	1.47
	600.280.xx.51	○	○	25	1.1	.06	2.23	3.08	13.90	4.27	5.92	6.57
	600.280.xx.42	○	○	30	.55	.04	0.50	0.69	3.10	0.95	1.32	1.47
90°	600.280.xx.77	○	○	20	1.1	.04	0.99	1.38	6.20	1.91	2.64	2.93
	600.280.xx.14	○	○	20	1.1	.04	1.09	1.51	6.80	2.09	2.89	3.21
	600.280.xx.08	○	○	20	1.1	.09	1.89	2.62	11.80	3.63	5.02	5.58
	600.280.xx.03	○	○	20	1.1	.08	2.13	2.95	13.30	4.09	5.66	6.29
	600.280.xx.05	○	○	20	1.1	.10	2.58	3.57	16.10	4.95	6.85	7.61
	600.280.xx.09	○	○	20	1.1	.08	2.61	3.62	16.30	5.01	6.94	7.71
	600.280.xx.10	○	○	20	1.1	.11	3.32	4.59	20.70	6.36	8.81	9.79
	600.280.xx.62	○	○	27	1.1	.06	1.03	1.42	6.40	1.97	2.72	3.03
	600.280.xx.69	○	○	27	1.1	.09	1.55	2.15	9.70	2.98	4.13	4.59
	600.280.xx.68	○	○	27	1.1	.12	1.89	2.62	11.80	3.63	5.02	5.58
	600.280.xx.72	○	○	27	1.1	.11	2.87	3.97	17.90	5.50	7.62	8.46
	600.280.xx.76	○	○	27	1.1	.11	3.35	4.64	20.90	6.42	8.90	9.88
	600.280.xx.13	○	○	30	.55	.04	0.29	0.40	1.80	0.55	0.77	0.85
	600.280.xx.97	○	○	30	1.1	.05	0.43	0.60	2.70	0.83	1.15	1.28
	600.280.xx.92	○	○	30	.55	.05	0.43	0.60	2.70	0.83	1.15	1.28
	600.280.xx.41	○	○	30	.55	.06	0.74	1.02	4.60	1.41	1.96	2.17
	600.280.xx.95	○	○	30	1.1	.07	0.74	1.02	4.60	1.41	1.96	2.17
	600.280.xx.90	○	○	30	.55	.07	0.75	1.04	4.70	1.44	2.00	2.22
	600.280.xx.27	○	○	30	1.1	.07	1.12	1.55	7.00	2.15	2.98	3.31
	600.280.xx.63	○	○	30	1.1	.09	1.30	1.80	8.10	2.49	3.45	3.83
	600.280.xx.45	○	○	30	1.1	.09	1.83	2.53	11.40	3.50	4.85	5.39
	600.280.xx.66	○	○	30	1.1	.08	2.58	3.57	16.10	4.95	6.85	7.61
	600.280.xx.24	○	○	30	1.6	.08	2.58	3.57	16.10	4.95	6.85	7.61
	600.280.xx.73	○	○	35	1.1	.09	1.68	2.33	10.50	3.23	4.47	4.96
	600.280.xx.81	○	○	40	1.1	.07	0.43	0.60	2.70	0.83	1.15	1.28
	600.280.xx.79	○	○	40	1.1	.06	0.67	0.93	4.20	1.29	1.79	1.99
	600.280.xx.80	○	○	40	1.1	.07	0.86	1.20	5.40	1.66	2.30	2.55
	600.280.xx.78	○	○	40	1.1	.10	1.62	2.24	10.10	3.10	4.30	4.77
100°	600.280.xx.53	○	○	15	2.2	.10	2.63	3.64	16.40	5.04	6.98	7.75
	600.280.xx.44	○	○	15	1.1	.11	4.45	6.17	27.80	8.54	11.83	13.14
	600.280.xx.85	○	○	25	1.1	.06	0.91	1.26	5.70	1.75	2.43	2.69
	600.280.xx.50	○	○	25	1.1	.06	1.09	1.51	6.80	2.09	2.89	3.21
	600.280.xx.07	○	○	25	1.1	.09	2.58	3.57	16.10	4.95	6.85	7.61
	600.280.xx.88	○	○	30	.55	.05	0.43	0.60	2.70	0.83	1.15	1.28
	600.280.xx.58	○	○	30	.55	.07	0.77	1.06	4.80	1.48	2.04	2.27
	600.280.xx.57	○	○	30	.55	.07	1.07	1.49	6.70	2.06	2.85	3.17
	600.280.xx.40	○	○	30	1.1	.06	1.12	1.55	7.00	2.15	2.98	3.31
	600.280.xx.56	○	○	30	.55	.07	1.36	1.89	8.50	2.61	3.62	4.02
	600.280.xx.55	○	○	30	.55	.10	1.65	2.29	10.30	3.17	4.38	4.87
	600.280.xx.36	○	○	30	.55	.10	1.99	2.75	12.40	3.81	5.28	5.86
	600.280.xx.59	○	○	40	1.1	.10	1.75	2.42	10.90	3.35	4.64	5.15
	600.280.xx.35	○	○	40	1.1	.10	1.95	2.71	12.20	3.75	5.19	5.77
	600.280.xx.37	○	○	40	1.1	.11	3.14	4.35	19.60	6.02	8.34	9.27
	600.280.xx.23	○	○	50	1.1	.07	0.42	0.58	2.60	0.80	1.11	1.23
	600.280.xx.31	○	○	50	1.1	.05	0.72	1.00	4.50	1.38	1.92	2.13
	105°	600.280.xx.02	○	○	23	.55	.04	0.74	1.02	4.60	1.41	1.96
600.280.xx.00		○	○	23	.55	.05	1.04	1.44	6.50	2.00	2.77	3.07
600.280.xx.01		○	○	23	.55	.06	1.36	1.89	8.50	2.61	3.62	4.02
600.280.xx.04		○	○	23	.55	.05	1.67	2.31	10.40	3.20	4.43	4.92
600.280.xx.65		○	○	27	1.1	.04	0.45	0.62	2.80	0.86	1.19	1.32
600.280.xx.67		○	○	27	1.1	.06	0.64	0.89	4.00	1.23	1.70	1.89
112°	600.280.xx.43	○	○	30	1.1	.09	2.07	2.86	12.90	3.96	5.49	6.10

Conversion formula for the above series: $V_2 = V_1 \sqrt{\frac{P_2}{P_1}}$

Materials: 30 (Brass), 16 (stainless steel) on request.
Other nozzle types on request.



Flat fan nozzle with increased spray depth and dovetail alignment

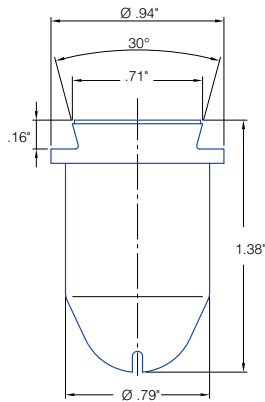
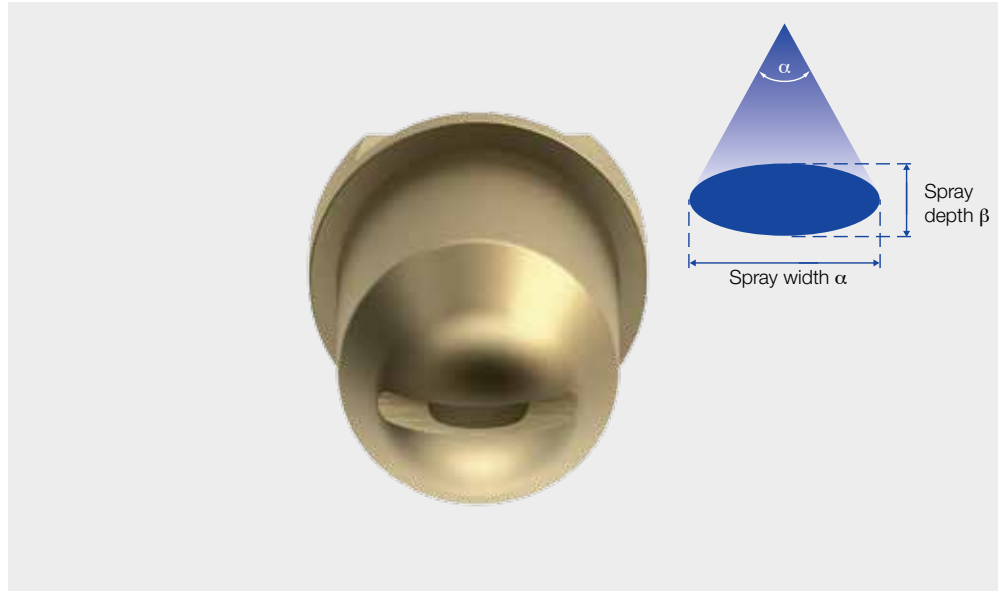
Series 600.366

Series 600.366

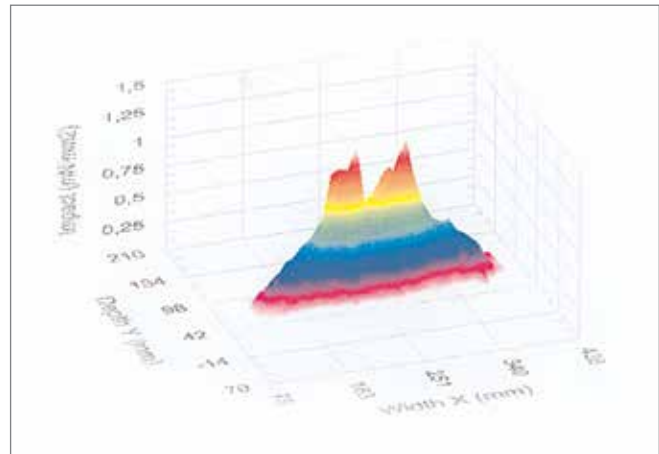
High impact version with peak center liquid distribution.

Assembly with 3/4" retaining nut. Self aligning jet with dovetail design with 0° offset angle secures correct spray position for optimal strand surface quality and easy maintenance.

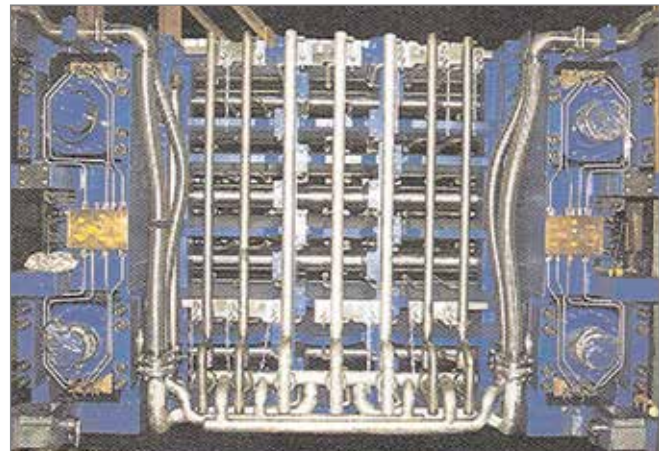
Applications:
Multi nozzle arrangements in segments for water only secondary cooling, especially in thin slab high speed casters.




Flat jet parallel to dovetail



Typical impact measurement of high impact version

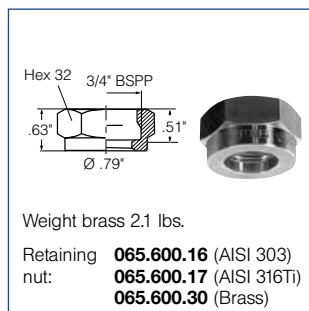


Position-controlled segments for LCR operation of a CSP plant, pre-assembled in the work shop.

Spray angle 	Ordering no.		Spray depth angle [°]	Length [in]	Narrowest cross section [in]	Flow Rate (Gallons Per Minute)					
	Type	Mat. no.				10 psi	20 psi	liters per minute 2 bar	40 psi	80 psi	100 psi
		16 303 SS	30 Brass								
68°	600.366.xx.53	○ ○	68	19	.04	0.29	0.40	1.80	0.55	0.77	0.85
	600.366.xx.55	○ ○	68	19	.05	0.45	0.62	2.80	0.86	1.19	1.32
69°	600.366.xx.70	○ ○	69	26	.04	0.19	0.27	1.20	0.37	0.51	0.57
	600.366.xx.72	○ ○	69	26	.06	0.53	0.73	3.30	1.01	1.40	1.56
70°	600.366.xx.50	○ ○	70	20	.06	0.59	0.82	3.70	1.14	1.57	1.75
	600.366.xx.13	○ ○	70	30	.07	0.61	0.84	3.80	1.17	1.62	1.80
	600.366.xx.51	○ ○	70	20	.08	0.74	1.02	4.60	1.41	1.96	2.17
	600.366.xx.14	○ ○	70	30	.07	1.09	1.51	6.80	2.09	2.89	3.21
74°	600.366.xx.54	○ ○	74	19	.05	0.37	0.51	2.30	0.71	0.98	1.09
	600.366.xx.56	○ ○	74	19	.06	0.67	0.93	4.20	1.29	1.79	1.99
75°	600.366.xx.60	○ ○	75	26	.07	1.03	1.42	6.40	1.97	2.72	3.03
80°	600.366.xx.71	○ ○	80	26	.05	0.35	0.49	2.20	0.68	0.94	1.04
	600.366.xx.61	○ ○	80	26	.07	1.19	1.64	7.40	2.27	3.15	3.50
82°	600.366.xx.52	○ ○	82	28	.07	1.09	1.51	6.80	2.09	2.89	3.21
83°	600.366.xx.30	○ ○	83	20	.07	0.74	1.02	4.60	1.41	1.96	2.17
90°	600.366.xx.36	○ ○	90	20	.06	0.95	1.31	5.90	1.81	2.51	2.79
	600.366.xx.37	○ ○	90	20	.07	1.43	1.97	8.90	2.74	3.79	4.21
102°	600.366.xx.48	○ ○	102	32	.06	0.95	1.31	5.90	1.81	2.51	2.79
105°	600.366.xx.49	○ ○	105	25	.04	0.37	0.51	2.30	0.71	0.98	1.09
	600.366.xx.23	○ ○	105	20	.04	0.43	0.60	2.70	0.83	1.15	1.28
	600.366.xx.28	○ ○	105	20	.04	0.59	0.82	3.70	1.14	1.57	1.75
	600.366.xx.40	○ ○	105	20	.05	0.74	1.02	4.60	1.41	1.96	2.17
	600.366.xx.00	○ ○	105	35	.07	0.74	1.02	4.60	1.41	1.96	2.17
	600.366.xx.44	○ ○	105	20	.07	0.99	1.38	6.20	1.91	2.64	2.93
	600.366.xx.41	○ ○	105	20	.07	1.09	1.51	6.80	2.09	2.89	3.21
	600.366.xx.21	○ ○	105	20	.08	1.12	1.55	7.00	2.15	2.98	3.31
	600.366.xx.01	○ ○	105	35	.08	1.12	1.55	7.00	2.15	2.98	3.31
	600.366.xx.42	○ ○	105	20	.07	1.41	1.95	8.80	2.70	3.75	4.16
	600.366.xx.22	○ ○	105	20	.09	1.49	2.06	9.30	2.86	3.96	4.40
	600.366.xx.02	○ ○	105	35	.09	1.49	2.06	9.30	2.86	3.96	4.40
	600.366.xx.43	○ ○	105	20	.08	1.79	2.48	11.20	3.44	4.77	5.29
	600.366.xx.03	○ ○	105	35	.10	1.86	2.57	11.60	3.56	4.94	5.48
600.366.xx.45	○ ○	105	20	.08	2.24	3.11	14.00	4.30	5.96	6.62	
108°	600.366.xx.80	○ ○	108	32	.09	1.89	2.62	11.80	3.63	5.02	5.58
	600.366.xx.81	○ ○	108	32	.09	2.16	3.00	13.50	4.15	5.75	6.38
110°	600.366.xx.47	○ ○	110	28	.04	0.61	0.84	3.80	1.17	1.62	1.80

Other nozzle types on request.

Accessories



Conversion formula for the above series: $V_2 = V_1 \sqrt{\frac{P_2}{P_1}}$

Axial-flow full cone nozzles

Series 490

Series 490

Non-clogging nozzle design. Stable spray angle. Particularly even liquid distribution.

Applications:

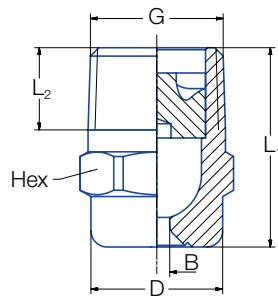
Strand cooling in billet casters, strand narrow side cooling in slab casters, spray cooling of billet molds, spray cooling of EAF electrodes after use.

Remark:

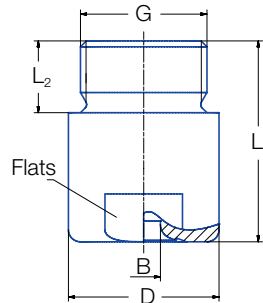
Material combination **T8** brass for the nozzle housing and AISI 316L for the vane, or completely made from AISI 316L **1Y** is recommended if the nozzles will be exposed to high temperatures for longer periods of time.



Series 490



Code
BC-BG



Code
BK-BM

Code	Dimensions (in.)					Weight Brass
	G	L ₁	L ₂	D	Hex/Flat	
BC	1/4 NPT	0.87	0.39	0.51	9/16	.04
BE	3/8 NPT	0.96	0.39	0.63	11/16	.07
BE	3/8 NPT	1.18	0.39	0.63	11/16	.11
BG	1/2 NPT	1.28	0.51	0.83	14/16	.13
BG	1/2 NPT	1.71	0.51	0.83	14/16	.19
BK	3/4 NPT	1.65	0.59	1.26	1-1/16	.42
BK	3/4 NPT	1.97	0.59	1.26	1-1/16	.44
BM	1 NPT	2.20	0.67	1.57	1-7/16	.77

Subject to technical modification.

In a critical installation situation, please ask for the exact dimensions.

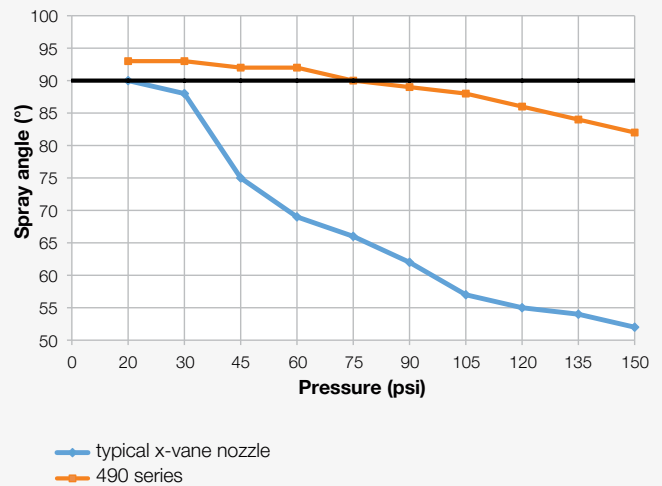
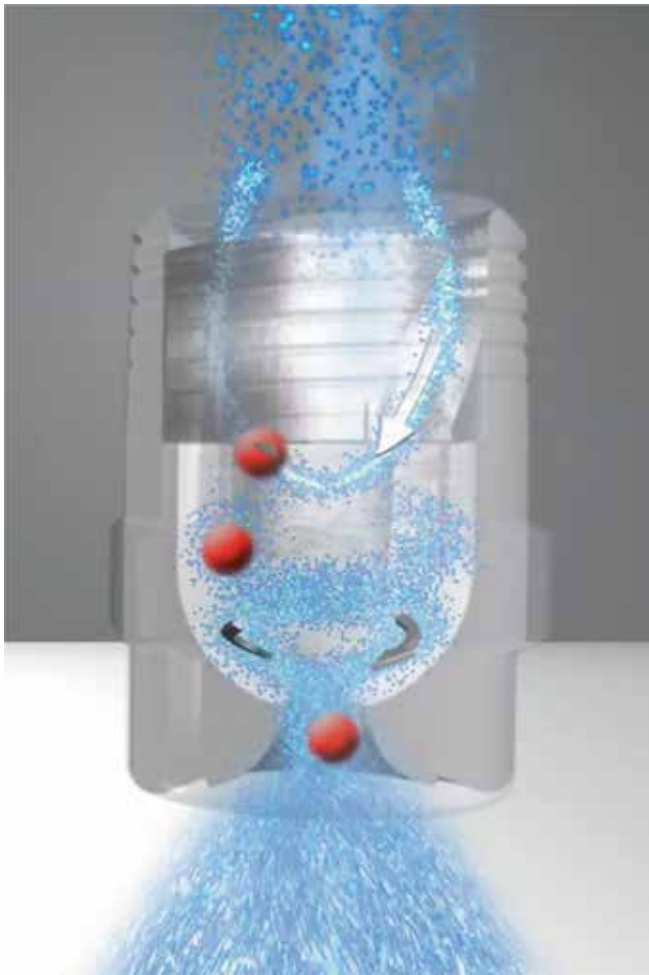
New nozzle generation with an innovative internal design providing the nozzle with:

30 % to 40 % larger compared to conventional axial full cone nozzles
Non clogging characteristics due to larger free cross sections

Extended machine availability and reduced maintenance costs

Stable spray angle over pressure range

No over- or under cooling of strand corners and center section improves quality



Spray angle of 490 series compared to typical x-vane nozzle for various water pressures





Solid particle passing through 490 nozzle series





Solid particle passing through conventional axial full cone nozzle

Axial-flow full cone nozzles

Series 490

Spray angle 	Ordering no.								Orifice diam. (in.)	Free Passage (in.)	Flow Rate (Gallons Per Minute)							Spray Diam. D (in.) @ 30 psi 		
	Type	Mat. no.			Connection						10 psi	20 psi	liters per minute 2 bar	40 psi	80 psi	100 psi	150 psi	H=8"	H=20"	
		1Y	30	Brass/ AISI 316L T8	Male NPT															
					1/8"	1/4"	3/8"	1/2"												3/4"
45°	490. 403	○	○	○	BA	-	-	-	-	.049	.049	.17	.23	1.00	.30	.40	.43	.51	6	16
	490. 443	○	○	○	-	BC	-	-	-	.06	.06	.19	.25	1.25	.39	.48	.54	.63	6	16
	490. 523	○	○	○	BA	-	-	-	-	.067	.067	.35	.46	2.00	.60	.79	.87	1.02	6	16
	490. 563	○	○	○	-	BC	-	-	-	.07	.07	.38	.5	2.5	.78	.95	1.09	1.25	6	16
	490. 603	○	○	○	-	BC	BE	-	-	.079	.079	.54	.72	3.15	.95	1.25	1.37	1.61	6	16
	490. 643	-	○	○	-	-	BE	-	-	.096	.098	.69	.91	4.00	1.20	1.59	1.73	2.04	6	16
	490. 683	-	○	○	-	-	BE	-	-	.100	.100	.86	1.14	5.00	1.50	1.98	2.17	2.55	6	16
	490. 703	-	○	○	-	-	BE	-	-	.104	.104	.97	1.27	5.60	1.68	2.22	2.43	2.85	6	16
	490. 723	○	○	○	-	-	BE	-	-	.112	.112	1.09	1.43	6.30	1.89	2.50	2.73	3.21	6	16
	490. 783	-	○	○	-	-	-	BG	-	.136	.136	1.55	2.05	9.00	2.70	3.57	3.90	4.58	6	16
490. 843	-	○	○	-	-	-	BG	-	.150	.150	2.16	2.85	12.50	3.76	4.96	5.42	6.37	6	16	
60°	490. 404	○	○	○	BA	-	-	-	-	.045	.045	.17	0.23	1.00	.30	.40	.43	0.51	9	22
	490. 444	○	-	○	BA	-	-	-	-	.049	.049	.22	0.29	1.25	.38	.49	.54	0.64	9	22
	490. 484	○	○	○	BA	-	-	-	-	.057	.057	.28	0.36	1.60	.48	.63	.69	0.82	9	22
	490. 524	○	○	○	BA	-	-	-	-	.063	.063	.35	0.46	2.00	.60	.79	.87	1.02	9	22
	490. 564	○	○	○	BA	-	-	-	-	.071	.071	.43	0.57	2.50	.75	.99	1.08	1.27	9	22
	490. 604	○	○	○	BA	BC	BE	-	-	.081	.081	.54	0.72	3.15	.95	1.25	1.37	1.61	9	22
	490. 644	○	○	○	-	BC	BE	-	-	.091	.091	.69	0.91	4.00	1.20	1.59	1.73	2.04	9	22
	490. 684	○	○	○	-	BC	BE	-	-	.102	.102	.86	1.14	5.00	1.50	1.98	2.17	2.55	9	22
	490. 704	○	○	○	-	-	BE	-	-	.11	.11	.85	1.12	5.6	1.74	2.13	2.44	2.82	9	22
	490. 724	○	○	○	-	BC	BE	-	-	.112	.110	1.09	1.43	6.30	1.89	2.50	2.73	3.21	9	22
	490. 744	○	○	○	-	-	BE	-	-	.12	.12	1.08	1.42	7.10	2.21	2.71	3.1	3.57	9	22
	490. 764	○	○	○	-	-	BE	-	-	.128	.128	1.38	1.82	8.00	2.40	3.17	3.47	4.08	9	22
	490. 804	○	○	○	-	-	BE	-	-	.146	.146	1.72	2.28	10.00	3.00	3.97	4.34	5.10	9	22
	490. 844	○	○	○	-	-	-	BG	-	.159	.159	2.16	2.85	12.50	3.76	4.96	5.42	6.37	9	22
	490. 884	○	○	○	-	-	-	BG	-	.183	.183	2.76	3.64	16.00	4.81	6.34	6.94	8.16	9	22
	490. 924	○	○	○	-	-	-	BK	-	.205	.205	3.45	4.56	20.00	6.01	7.93	8.67	10.20	9	22

Continued on next page.

Spray angle 	Ordering no.								Orifice diam. (in.)	Free Passage (in.)	Flow Rate (Gallons Per Minute)							Spray Diam. D (in.) @ 30 psi 		
	Type	Mat. no.			Connection						10 psi	20 psi	liters per minute 2 bar	40 psi	80 psi	100 psi	150 psi	H=8"	H=20"	
		1Y	30	T8	Male NPT															
					1/8"	1/4"	3/8"	1/2"												3/4"
90°	490.406	○	○	○	BA	-	-	-	-	.047	.047	.17	.23	1.00	.30	.40	.43	.51	15	34
	490.446	-	○	○	BA	-	-	-	-	.051	.051	.22	.29	1.25	.38	.49	.54	.64	15	34
	490.486	○	○	○	BA	-	-	-	-	.057	.057	.28	.36	1.60	.48	.63	.69	.82	15	34
	490.506	○	○	○	-	BC	-	-	-	.06	.06	.27	.36	1.80	.56	.69	.78	.91	15	34
	490.526	○	○	○	BA	-	-	-	-	.067	.067	.35	.46	2.00	.60	.79	.87	1.02	15	34
	490.566	○	○	○	BA	-	-	-	-	.075	.075	.43	.57	2.50	.75	.99	1.08	1.27	15	34
	490.606	○	○	○	BA	-	BE	-	-	.081	.081	.54	.72	3.15	.95	1.25	1.37	1.61	15	34
	490.646	○	○	○	-	BC	BE	-	-	.094	.094	.69	.91	4.00	1.20	1.59	1.73	2.04	15	38
	490.686	○	○	○	-	BC	BE	-	-	.106	.106	.86	1.14	5.00	1.50	1.98	2.17	2.55	15	38
	490.726	○	○	○	-	BC	BE	-	-	.126	.110	1.09	1.43	6.30	1.89	2.50	2.73	3.21	15	38
	490.746	○	○	○	-	-	BE	-	-	.124	.124	1.23	1.62	7.10	2.13	2.82	3.08	3.62	15	38
	490.766	○	○	○	-	-	BE	-	-	.134	.134	1.38	1.82	8.00	2.40	3.17	3.47	4.08	15	38
	490.806	○	○	○	-	-	BE	-	-	.154	.154	1.72	2.28	10.00	3.00	3.97	4.34	5.10	15	38
	490.846	○	○	○	-	-	BE	-	-	.183	.157	2.16	2.85	12.50	3.76	4.96	5.42	6.37	15	38
	490.886	○	○	○	-	-	-	BG	-	.215	.177	2.76	3.64	16.00	4.81	6.34	6.94	8.16	15	38
490.926	○	○	○	-	-	-	BG	-	.232	.177	3.45	4.56	20.00	6.01	7.93	8.67	10.20	15	38	
120°	490.368	○	○	○	BA	-	-	-	-	.033	.026	.11	.14	.63	.19	.25	.27	.32	27	48
	490.408	○	○	○	BA	-	-	-	-	.047	.047	.17	.23	1.00	.30	.40	.43	.51	27	48
	490.448	○	○	○	BA	-	-	-	-	.051	.051	.22	.29	1.25	.38	.49	.54	.64	27	48
	490.488	○	○	○	BA	-	-	-	-	.057	.057	.28	.36	1.60	.48	.63	.69	.82	27	48
	490.528	○	○	○	BA	-	-	-	-	.067	.067	.35	.46	2.00	.60	.79	.87	1.02	27	48
	490.568	○	○	○	BA	-	-	-	-	.075	.075	.43	.57	2.50	.75	.99	1.08	1.27	27	48
	490.608	○	○	○	-	-	-	-	-	.083	.081	.54	.72	3.15	.95	1.25	1.37	1.61	27	48
	490.648	○	○	○	-	BC	BE	-	-	.094	.094	.69	.91	4.00	1.20	1.59	1.73	2.04	27	52
	490.688	○	○	○	-	BC	BE	-	-	.108	.108	.86	1.14	5.00	1.50	1.98	2.17	2.55	27	52
	490.728	○	○	○	-	BC	BE	-	-	.126	.110	1.09	1.43	6.30	1.89	2.50	2.73	3.21	27	52
	490.748	○	○	○	-	-	BE	-	-	.126	.126	1.23	1.62	7.10	2.13	2.82	3.08	3.62	27	52
	490.768	○	○	○	-	-	BE	-	-	.136	.136	1.38	1.82	8.00	2.40	3.17	3.47	4.08	27	52
	490.808	○	○	○	-	-	BE	-	-	.154	.154	1.72	2.28	10.00	3.00	3.97	4.34	5.10	27	52
	490.848	○	○	○	-	-	BE	-	-	.185	.157	2.16	2.85	12.50	3.76	4.96	5.42	6.37	27	52
	490.888	○	○	○	-	-	-	BG	-	.201	.177	2.76	3.64	16.00	4.81	6.34	6.94	8.16	27	52
490.928	○	○	○	-	-	-	BG	-	.228	.228	3.45	4.56	20.00	6.01	7.93	8.67	10.20	27	52	

Example Type + Material no. + Conn. = Ordering no.
for ordering: 490.368 + 1Y + BA = 490.368.1Y.BA

Axial-flow full cone nozzles

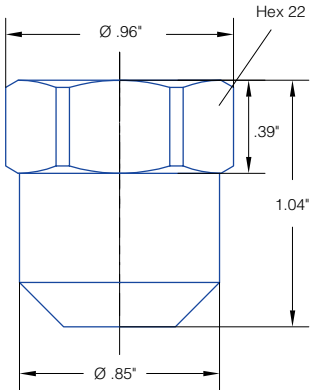
Series 486


Series 486

The classical full cone nozzles with R 3/8" female thread connection. Circular uniform full cone spray pattern.

Applications:

Very common in "Concast" billet casters.




Spray angle 	Ordering no.				Code	Flow Rate (Gallons Per Minute)					
	Type	Mat. no.		Thread R 3/8" female		10 psi	20 psi	liters per minute 2.8 bar	40 psi	80 psi	100 psi
		30 Brass	1C AISI 304								
45°	486. 443	○	○	AF	1545L	0.18	0.25	1.30	0.34	0.47	0.52
	486. 493	○	○	AF	2045L	0.24	0.33	1.70	0.45	0.61	0.67
	486. 533	○	○	AF	2545L	0.30	0.40	2.10	0.55	0.75	0.83
	486. 563	○	○	AF	3045L	0.37	0.50	2.60	0.68	0.93	1.03
	486. 593	○	○	AF	3545L	0.42	0.58	3.00	0.79	1.08	1.19
	486. 613	○	○	AF	4045L	0.48	0.65	3.40	0.89	1.22	1.35
	486. 633	○	○	AF	4545L	0.55	0.75	3.90	1.02	1.40	1.55
	486. 653	○	○	AF	5045L	0.60	0.83	4.30	1.13	1.54	1.70
	486. 663	○	○	AF	5545L	0.66	0.90	4.70	1.23	1.68	1.86
	486. 683	○	○	AF	6045L	0.73	1.00	5.20	1.36	1.86	2.06
	486. 713	○	○	AF	7045L	0.84	1.15	6.00	1.57	2.15	2.38
	486. 733	○	○	AF	8045L	0.97	1.33	6.90	1.81	2.47	2.73
	486. 783	○	○	AF	10045L	1.21	1.65	8.60	2.26	3.08	3.41
	486. 813	○	○	AF	12045L	1.45	1.98	10.30	2.70	3.69	4.08
65°	486. 394	○	○	AF	1065L	0.14	0.19	1.0	0.26	0.36	0.40
	486. 454	○	○	AF	1665L	0.23	0.31	1.6	0.42	0.57	0.63
	486. 494	○	○	AF	2065L	0.28	0.38	2.0	0.52	0.72	0.79
	486. 524	○	○	AF	2065L	0.28	0.38	2.0	0.52	0.72	0.79
	486. 534	○	○	AF	2565L	0.35	0.48	2.5	0.66	0.90	0.99
	486. 564	○	○	AF	3065L	0.42	0.58	3.00	0.79	1.08	1.19
	486. 565	○	○	AF	3065L	0.42	0.58	3.0	0.79	1.08	1.19
	486. 594	○	○	AF	3565L	0.49	0.67	3.5	0.92	1.25	1.39
	486. 604	○	○	AF	3865L	0.53	0.73	3.8	1.00	1.36	1.51
	486. 614	○	○	AF	4065L	0.56	0.77	4.0	1.05	1.43	1.59
	486. 624	○	○	AF	4265L	0.59	0.81	4.2	1.10	1.51	1.66
	486. 634	○	○	AF	4565L	0.63	0.86	4.5	1.18	1.61	1.78
	486. 654	○	○	AF	5065L	0.70	0.96	5.0	1.31	1.79	1.98
	486. 664	○	○	AF	5565L	0.77	1.06	5.5	1.44	1.97	2.18
	486. 674	○	○	AF	5565L	0.77	1.06	5.5	1.44	1.97	2.18
	486. 684	○	○	AF	6065L	0.84	1.15	6.0	1.57	2.15	2.38
	486. 704	○	○	AF	6065L						
	486. 714	○	○	AF	7065L	0.84	1.15	6.00	1.57	2.15	2.38
	486. 724	○	○	AF	7565L						
	486. 734	○	○	AF	8065L	0.97	1.33	6.90	1.81	2.47	2.73
	486. 744	○	○	AF	8565L						
	486. 764	○	○	AF	9565L	1.41	1.92	10	2.62	3.58	3.96
	486. 774	○	○	AF	10065L	1.21	1.65	8.60	2.26	3.08	3.41
	486. 814	○	○	AF	12065L	1.69	2.31	12.0	3.15	4.30	4.76
	486. 844	○	○	AF	14665L	2.05	2.80	14.6	3.83	5.23	5.79
	486. 854	○	○	AF	15065L						
486. 864	○	○	AF	16565L	1.45	1.98	10.30	2.70	3.69	4.08	

Other nozzle types on request.
Pressure-flow diagrams on request.

Axial-flow full cone nozzles

Series 486

Spray angle 	Ordering no.				Code	Flow Rate (Gallons Per Minute)					
	Type	Mat. no.		Thread R 3/8" female		10 psi	20 psi	liters per minute 2.8 bar	40 psi	80 psi	100 psi
		30 Brass	1C AISI 304								
65°	486. 704	○	○	AF	6565L	0.91	1.25	6.5	1.71	2.33	2.58
	486. 714	○	○	AF	7065L	0.98	1.34	7.0	1.84	2.51	2.77
	486. 724	○	○	AF	7565L	1.05	1.44	7.5	1.97	2.69	2.97
	486. 734	○	○	AF	8065L	1.13	1.54	8.0	2.10	2.87	3.17
	486. 744	○	○	AF	8565L	1.20	1.63	8.5	2.23	3.05	3.37
	486. 764	○	○	AF	9565L	1.34	1.83	9.5	2.49	3.41	3.77
	486. 774	○	○	AF	10065L	1.41	1.92	10.0	2.62	3.58	3.96
	486. 814	○	○	AF	12065L	1.69	2.31	12.0	3.15	4.30	4.76
	486. 844	○	○	AF	14665L	2.05	2.80	14.6	3.83	5.23	5.79
	486. 854	○	○	AF	15065L	2.11	2.88	15.0	3.94	5.38	5.95
486. 864	○	○	AF	16565L	2.32	3.17	16.5	4.33	5.92	6.54	
90°	486. 446	○	○	AF	1590L	0.21	0.29	1.5	0.39	0.54	0.59
	486. 496	○	○	AF	2090L	0.28	0.38	2	0.52	0.72	0.79
	486. 536	○	○	AF	2590L	0.35	0.48	2.5	0.66	0.90	0.99
	486. 566	○	○	AF	3090L	0.42	0.58	3.0	0.79	1.08	1.19
	486. 596	○	○	AF	3590L	0.49	0.67	3.5	0.92	1.25	1.39
	486. 606	○	○	AF	3890L	0.53	0.73	3.8	1.00	1.36	1.51
	486. 616	○	○	AF	4090L	0.56	0.77	4.0	1.05	1.43	1.59
	486. 636	○	○	AF	4590L	0.63	0.86	4.5	1.18	1.61	1.78
	486. 646	○	○	AF	4690L	0.70	0.95	4.6	1.30	1.78	1.97
	486. 656	○	○	AF	5090L	0.70	0.96	5.0	1.31	1.79	1.98
	486. 686	○	○	AF	6090L	0.84	1.15	6.0	1.57	2.15	2.38
	486. 706	○	○	AF	6590L	0.91	1.25	6.5	1.71	2.33	2.58
	486. 726	○	○	AF	7590L	1.05	1.44	7.5	1.97	2.69	2.97
	486. 736	○	○	AF	8090L	1.13	1.54	8.0	2.10	2.87	3.17
	486. 766	○	○	AF	9590L	1.34	1.83	9.5	2.49	3.41	3.77
	486. 776	○	○	AF	10090L	1.41	1.92	10	2.62	3.58	3.96
	486. 806	○	○	AF	10090L	1.41	1.92	10	2.62	3.58	3.96
	486. 816	○	○	AF	12090L	1.69	2.31	12.0	3.15	4.30	4.76
	486. 846	○	○	AF	14690L	2.05	2.80	14.6	3.83	5.23	5.79

Other nozzle types on request.
Pressure-flow diagrams on request.

Oval full cone nozzle

Series 400.291

Series 400.291

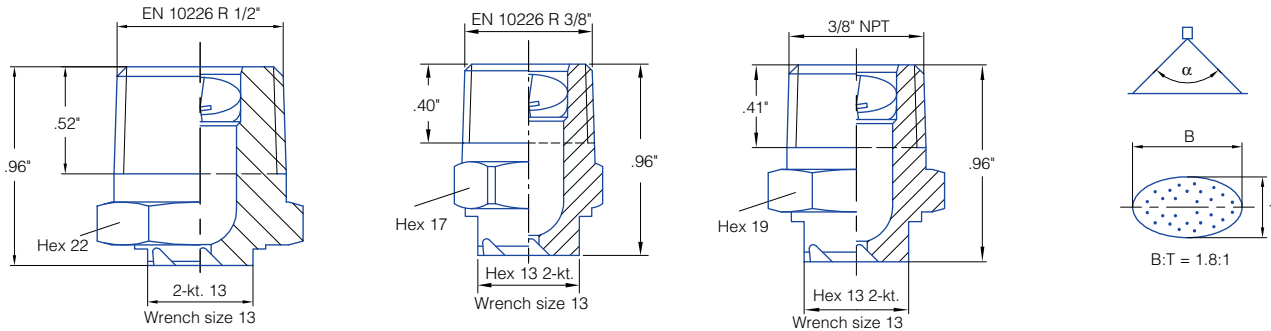
Oval full cone spray pattern
90° x 60°

Applications:

Single and multi nozzle arrangements in segments for water only secondary cooling in bloom and slab casters. Ideal for foot roller spray positions in order to prevent mould edge erosion by replacing flat fan nozzles. Also suitable for vertical spray positions such as narrow side cooling in slab casters or vertical spray cooling in bloom casters.



Series 400.291



Ordering no.	Thread				Narrowest cross section (in.)	Flow Rate (Gallons Per Minute)					
	3/8 NPT	R 1/2"	R 3/8"	R 3/8" secured		10 psi	20 psi	liters per minute 2 bar	40 psi	80 psi	100 psi
400. 291. 30. X6	○	-	○	○	.04	0.32	0.44	2.00	0.61	0.85	0.95
400. 291. 30. X4	○	-	○	○	.05	0.43	0.60	2.70	0.83	1.15	1.28
400. 291. 30. X5	○	○	○	○	.06	0.54	0.75	3.40	1.04	1.45	1.61
400. 291. 30. X0	○	○	○	○	.07	0.70	0.98	4.40	1.35	1.87	2.08
400. 291. 30. X1	○	-	○	-	.08	0.95	1.31	5.90	1.81	2.51	2.79
400. 291. 30. X2	○	-	○	-	.08	1.09	1.51	6.80	2.09	2.89	3.21
400. 291. 30. X7	-	-	○	-	.13	2.56	3.55	16.00	4.92	6.81	7.56

Materials: 30 (Brass), 16 (stainless steel) on request.
Other nozzle types on request.
Pressure-flow diagrams on request.

3/8 NPT: X=1
R 1/2: X=7
R 3/8: X=0
3/8 NPT secured: X=5

To complete the final ordering no., please replace "X" by the corresponding NPT / R value.

Conversion formula for the above series: $V_2 = V_1 \sqrt{\frac{P_2}{P_1}}$