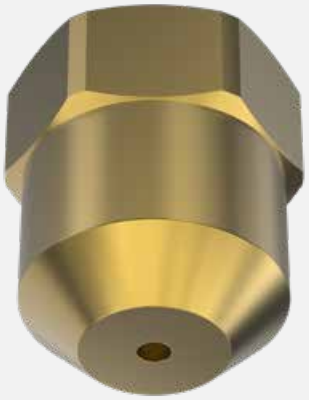
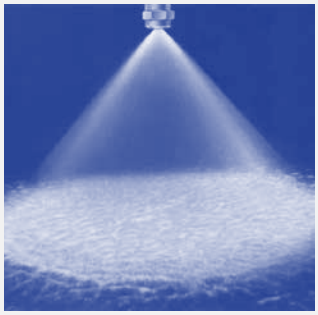
Axial-flow full cone nozzles
Series 486

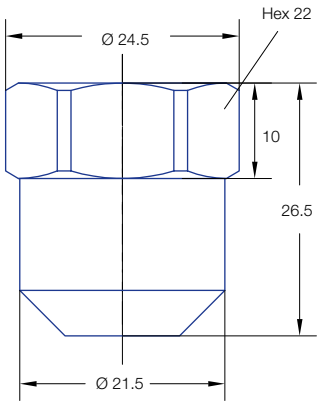
Series 486

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 (l/min) pressure (bar)					
	Type	Mat. no. 30 Brass	Mat. no. 1C 304 SS	Thread R 3/8" female		1	2	2,8	5	7	10
45°	**486.443**	○	○	**AF**	1545L	0.9	1.3	1.5	1.9	2.3	2.7
	486.493	○	○	**AF**	2045L	1.3	1.7	2.0	2.6	3.0	3.5
	486.533	○	○	**AF**	2545L	1.6	2.1	2.5	3.2	3.8	4.4
	486.563	○	○	**AF**	3045L	1.9	2.6	3.0	3.9	4.5	5.3
	486.593	○	○	**AF**	3545L	2.2	3.0	3.5	4.5	5.3	6.2
	486.613	○	○	**AF**	4045L	2.5	3.4	4.0	5.2	6.0	7.1
	486.633	○	○	**AF**	4545L	2.8	3.9	4.5	5.8	6.8	8.0
	486.653	○	○	**AF**	5045L	3.1	4.3	5.0	6.5	7.6	8.9
	486.663	○	○	**AF**	5545L	3.5	4.7	5.5	7.1	8.3	9.8
	486.683	○	○	**AF**	6045L	3.8	5.2	6.0	7.8	9.1	10.6
	486.713	○	○	**AF**	7045L	4.4	6.0	7.0	9.1	10.6	12.4
	486.733	○	○	**AF**	8045L	5.0	6.9	8.0	10.4	12.1	14.2
	486.783	○	○	**AF**	10045L	6.3	8.6	10.0	13.0	15.1	17.7
	486.813	○	○	**AF**	12045L	7.6	10.3	12.0	15.6	18.1	21.3
65°	**486.394**	○	○	**AF**	1065L	0.6	0.9	1.0	1.3	1.5	1.8
	486.454	○	○	**AF**	1665L	1.0	1.4	1.6	2.1	2.4	2.8
	486.524	○	○	**AF**	2065L	1.3	1.7	2.0	2.6	3.0	3.5
	486.534	○	○	**AF**	2565L	1.6	2.1	2.5	3.2	3.8	4.4
	486.564	○	○	**AF**	3065L	1.9	2.6	3.0	3.9	4.5	5.3
	486.594	○	○	**AF**	3565L	2.2	3.0	3.5	4.5	5.3	6.2
	486.604	○	○	**AF**	3865L	2.4	3.3	3.8	4.9	5.7	6.7
	486.614	○	○	**AF**	4065L	2.5	3.4	4.0	5.2	6.0	7.1
	486.624	○	○	**AF**	4265L	2.6	3.6	4.2	5.5	6.3	7.4
	486.634	○	○	**AF**	4565L	2.8	3.9	4.5	5.8	6.8	8.0
	486.654	○	○	**AF**	5065L	3.1	4.3	5.0	6.5	7.6	8.9
	486.664	○	○	**AF**	5565L	3.5	4.7	5.5	7.1	8.3	9.8
	486.684	○	○	**AF**	6065L	3.8	5.2	6.0	7.8	9.1	10.6
	486.704	○	○	**AF**	6565L	4.1	5.6	6.5	8.4	9.8	11.5
	486.714	○	○	**AF**	7065L	4.4	6.0	7.0	9.1	10.6	12.4
	486.724	○	○	**AF**	7565L	4.7	6.4	7.5	9.7	11.3	13.3
	486.734	○	○	**AF**	8065L	5.0	6.9	8.0	10.4	12.1	14.2
	486.744	○	○	**AF**	8565L	5.3	7.3	8.5	11.0	12.8	15.1
	486.764	○	○	**AF**	9565L	6.0	8.2	9.5	12.3	14.3	16.8
	486.774	○	○	**AF**	10065L	6.3	8.6	10.0	13.0	15.1	17.7
	486.814	○	○	**AF**	12065L	7.6	10.3	12.0	15.6	18.1	21.3
	486.844	○	○	**AF**	14665L	9.2	12.5	14.6	19.0	22.1	25.9
	486.854	○	○	**AF**	15065L	9.4	12.9	15.0	19.5	22.7	26.6
	486.864	○	○	**AF**	16565L	10.4	14.2	16.5	21.4	24.9	29.3

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

Example of ordering:	Type	+	Material no.	=	Ordering no.
	486.443	+	**30**	=	**486.443.30.AF**

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \left(\frac{p_2}{p_1}\right)^{0.45}$
(≤ 10 bar)

Axial-flow full cone nozzles
Series 486

Spray angle	Ordering no.				Code	Flow rate (l/min) pressure (bar)					
	Type	Mat. no. 30 Brass	Mat. no. 1C 304 SS	Thread R 3/8z female		1	2	2,8	5	7	10
90°	**486.446**	○	○	**AF**	1590L	0.9	1.3	1.5	1.9	2.3	2.7
	486.496	○	○	**AF**	2090L	1.3	1.7	2.0	2.6	3.0	3.5
	486.536	○	○	**AF**	2590L	1.6	2.1	2.5	3.2	3.8	4.4
	486.566	○	○	**AF**	3090L	1.9	2.6	3.0	3.9	4.5	5.3
	486.596	○	○	**AF**	3590L	2.2	3.0	3.5	4.5	5.3	6.2
	486.606	○	○	**AF**	3890L	2.4	3.3	3.8	4.9	5.7	6.7
	486.616	○	○	**AF**	4090L	2.5	3.4	4.0	5.2	6.0	7.1
	486.636	○	○	**AF**	4590L	2.8	3.9	4.5	5.8	6.8	8.0
	486.646	○	○	**AF**	4690L	2.9	4.0	4.6	6.0	6.9	8.2
	486.656	○	○	**AF**	5090L	3.1	4.3	5.0	6.5	7.6	8.9
	486.686	○	○	**AF**	6090L	3.8	5.2	6.0	7.8	9.1	10.6
	486.706	○	○	**AF**	6590L	4.1	5.6	6.5	8.4	9.8	11.5
	486.726	○	○	**AF**	7590L	4.7	6.4	7.5	9.7	11.3	13.3
	486.736	○	○	**AF**	8090L	5.0	6.9	8.0	10.4	12.1	14.2
	486.766	○	○	**AF**	9590L	6.0	8.2	9.5	12.3	14.3	16.8
	486.786	○	○	**AF**	10090L	6.3	8.6	10.0	13.0	15.1	17.7
	486.816	○	○	**AF**	12090L	7.6	10.3	12.0	15.6	18.1	21.3
	486.846	○	○	**AF**	14690L	9.2	12.5	14.6	19.0	22.1	25.9

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

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \left(\frac{p_2}{p_1}\right)^{0.45}$ (≤ 10 bar)

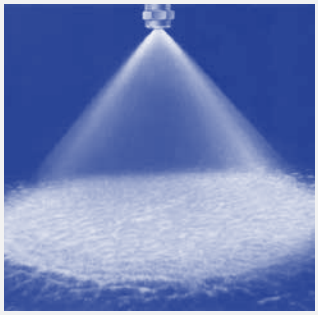
Axial-flow full cone nozzles
Series 490

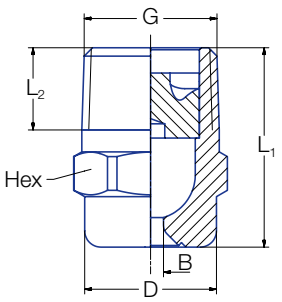
Series 490

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

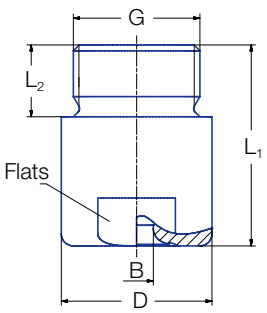
Applications:
Strand cooling in billet casters, strand narrow side cooling in slab casters, spray cooling of billet moulds, spray cooling of EAF electrodes after use.

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.





Code
CC-CG



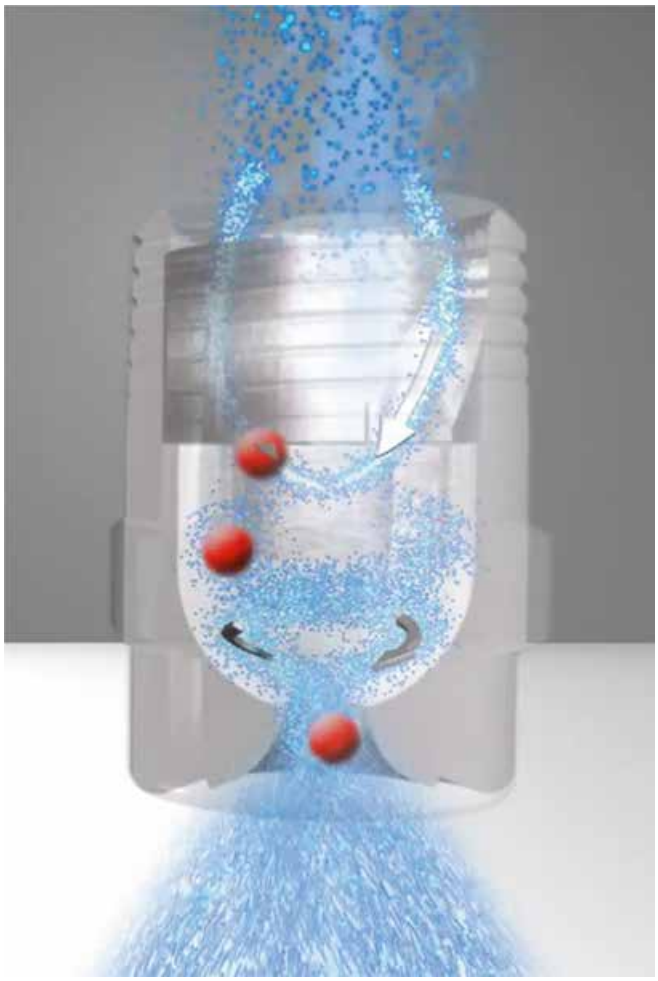
Code
AK-AM

Code	Dimensions [mm]					Weight Brass
	G	L_1	L_2	D	Hex/Flats	
CA	1/8 BSPT	18.0	6.5	10.0	11	13 g
CC	1/4 BSPT	22.0	10.0	13.0	14	16 g
CE	3/8 BSPT	24.5	10.0	16.0	17	30 g
CE	3/8 BSPT	30.0	10.0	16.0	17	50 g
CG	1/2 BSPT	32.5	13.0	21.0	22	60 g
CG	1/2 BSPT	43.5	13.0	21.0	22	85 g

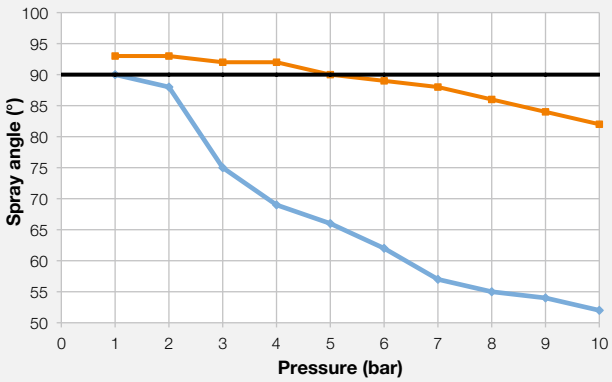
Subject to technical modification.
In a critical installation situation, please ask for the exact dimensions.

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 undercooling of strand corners and centre section means quality improvements



For a feature video, please refer to
www.lechler.de/videos/series490



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

Solid particle passing through 490 nozzle serie

Solid particle passing through conventional axial full cone nozzle

Axial-flow full cone nozzles
Series 490

Spray angle	Ordering no.								B Ø [mm]	E Ø [mm]	$\dot{V}$ [l/min]							Spray diameter D at p = 2 bar	
	Type	Mat. no.			Code						p [bar]							H = 200 mm	H = 500 mm
		1Y 316L SS	30 Brass	T8 Brass/316L SS	1/8 BSPT	1/4 BSPT	3/8 BSPT	1/2 BSPT			0.5	1.0	2.0	3.0	5.0	7.0	10.0		
45°	**490.403**	○	○	○	**CA**	**-**	**-**	**-**	1.25	1.25	0.57	0.76	1.00	1.18	1.44	1.65	1.90	160	400
	490.443	○	○	○	**CA**	**CC**	**-**	**-**	1.40	1.40	0.72	0.95	1.25	1.47	1.80	2.06	2.38	160	400
	490.523	○	○	○	**CA**	**CC**	**-**	**-**	1.70	1.70	1.15	1.52	2.00	2.35	2.89	3.30	3.81	160	400
	490.563	○	○	○	**-**	**CC**	**-**	**-**	1.80	1.80	1.44	1.89	2.50	2.94	3.61	4.13	4.76	160	400
	490.603	○	○	○	**-**	**CC**	**CE**	**-**	2.00	2.00	1.81	2.39	3.15	3.70	4.54	5.20	6.00	160	400
	490.643	○	○	○	**-**	**CC**	**CE**	**-**	2.45	2.45	2.30	3.03	4.00	4.70	5.77	6.60	7.61	160	400
	490.683	○	○	○	**-**	**CC**	**CE**	**-**	2.55	5.55	2.87	3.79	5.00	5.88	7.21	8.25	9.52	160	400
	490.703	○	○	○	**-**	**-**	**CE**	**-**	2.65	2.65	3.22	4.24	5.60	6.59	8.08	9.24	10.66	160	400
	490.723	○	○	○	**-**	**-**	**CE**	**-**	2.85	2.85	3.62	4.77	6.30	7.41	9.09	10.40	11.99	160	400
	490.783	○	○	○	**-**	**-**	**-**	**CG**	3.45	3.45	5.17	6.82	9.00	10.58	12.98	14.85	17.12	160	400
	490.843	○	○	○	**-**	**-**	**-**	**CG**	3.80	3.80	7.18	9.47	12.50	14.70	18.03	20.63	23.80	160	400
60°	**490.404**	○	○	○	**CA**	**-**	**-**	**-**	1.15	1.15	0.57	0.76	1.00	1.18	1.44	1.65	1.90	220	560
	490.444	○	○	○	**CA**	**-**	**-**	**-**	1.25	1.25	0.72	0.95	1.25	1.47	1.80	2.06	2.38	220	560
	490.484	○	○	○	**CA**	**-**	**-**	**-**	1.45	1.45	0.92	1.21	1.60	1.88	2.31	2.64	3.05	220	560
	490.524	○	○	○	**CA**	**CC**	**CE**	**-**	1.60	1.60	1.15	1.52	2.00	2.35	2.89	3.30	3.81	220	560
	490.564	○	○	○	**CA**	**CC**	**CE**	**-**	1.80	1.80	1.44	1.89	2.50	2.94	3.61	4.13	4.76	220	560
	490.604	○	○	○	**CA**	**CC**	**CE**	**-**	2.05	2.05	1.81	2.39	3.15	3.70	4.54	5.20	6.00	220	560
	490.644	○	○	○	**-**	**CC**	**CE**	**-**	2.30	2.30	2.30	3.03	4.00	4.70	5.77	6.60	7.61	220	560
	490.684	○	○	○	**-**	**CC**	**CE**	**-**	2.60	2.60	2.87	3.79	5.00	5.88	7.21	8.25	9.52	220	560
	490.704	○	○	○	**-**	**-**	**CE**	**-**	2.75	2.75	3.22	4.24	5.60	6.59	8.08	9.24	10.66	220	560
	490.724	○	○	○	**-**	**CC**	**CE**	**-**	2.95	2.80	3.62	4.77	6.30	7.41	9.09	10.40	11.99	220	560
	490.744	○	○	○	**-**	**-**	**CE**	**-**	3.05	3.05	4.08	5.38	7.10	8.35	10.24	11.72	13.52	220	560
	490.764	○	○	○	**-**	**-**	**CE**	**-**	3.25	3.25	4.59	6.06	8.00	9.41	11.54	13.20	15.22	220	560
	490.784	○	○	○	**-**	**-**	**CE**	**-**	3.50	3.50	5.17	6.82	9.00	10.58	12.98	14.85	17.12	220	560
	490.804	○	○	○	**-**	**-**	**CE**	**-**	3.70	3.70	5.74	7.58	10.00	11.76	14.43	16.51	19.04	220	560
	490.844	○	○	○	**-**	**-**	**-**	**CG**	4.05	4.05	7.18	9.47	12.50	14.70	18.03	20.63	23.80	220	560
	490.884	○	○	○	**-**	**-**	**-**	**CG**	4.65	4.65	9.19	12.13	16.00	18.82	23.08	26.41	30.46	220	560

B = Bore diameter · E = narrowest free cross section

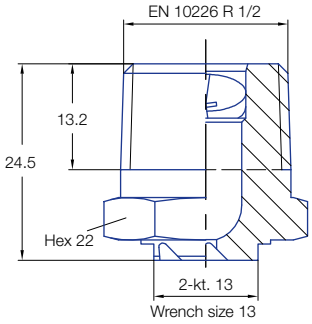
Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \left(\frac{p_2}{p_1}\right)^{0.4}$ (≤ 10 bar)

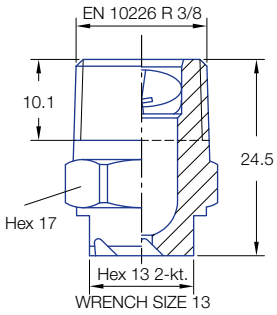
Oval full cone nozzle
Series 400.291

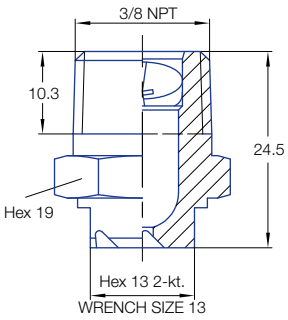
Series 400.291

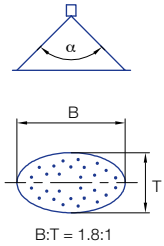
Oval full cone spray pattern
90° x 60°
Spray width: 90°
Spray depth: 60°

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.









Ordering no.	Thread				Narrowest cross section [mm]	Flow rate [l/min] pressure (bar)					
	3/8 NPT	R 1/2"	R 3/8"	R 3/8" secured		1	2	3	5	7	10
400.291.30.X6	○	-	○	○	1.05	1.5	2.0	2.4	3.1	3.6	4.3
400.291.30.X4	○	-	○	○	1.25	2.0	2.7	3.3	4.2	4.9	5.8
400.291.30.X5	○	○	○	○	1.45	2.4	3.4	4.1	5.2	6.1	7.2
400.291.30.X0	○	○	○	○	1.7	3.2	4.4	5.3	6.8	8.0	9.4
400.291.30.X1	○	-	○	-	1.95	4.2	5.9	7.1	9.0	10.5	12.5
400.291.30.X2	○	-	○	-	2.15	4.9	6.8	8.3	10.5	12.3	14.5
400.291.30.X7	-	-	○	-	3.2	11.5	16.0	19.3	24.6	28.8	34.1

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

Example of ordering:	Type	+	Thread	=	Ordering no.
	400.291.30.X6	+	**3/8 NPT**	=	**400.291.30.16**

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \left(\frac{p_2}{p_1}\right)^{0.47}$ (≤ 10 bar)

Flat fan nozzle with dove-tail alignment
Series 660

Series 660

Assembly with retaining nut. Self aligning jet with dove-tail 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

Available also with rectangular liquid distribution for single nozzle arrangement (per roller gap) or widepitches 660.xxx.xx.90.

Available also with 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.

Special nozzle types:

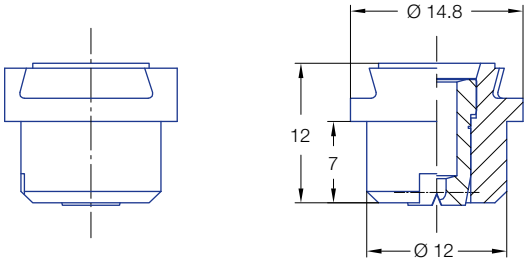
Type + Material No. + Special No

Special No:
00= standard nozzle

74 = flat jet parallel to dove tail

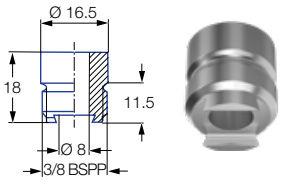
90 = rectangular liquid distribution

96 = flat jet parallel to dove tail + rectangular liquid distribution



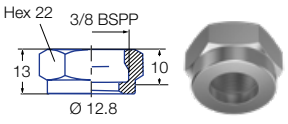
Flat jet 5° offset against dove-tail

Accessories



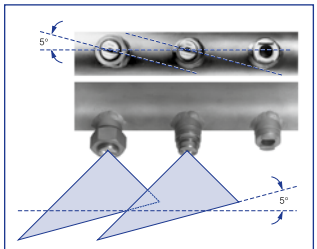
Weight 21 g

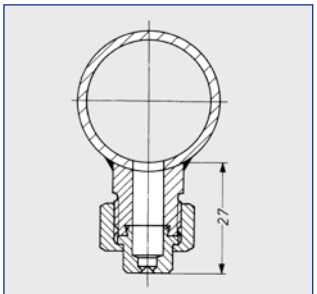
Nipple **066.011.17** (316Ti SS)



Weight 25 g

Retaining nut:
065.200.16 (303 SS)
065.200.17 (316Ti SS)
065.200.5E (PVDF)





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

Spray angle	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]						
	Type	Mat. no.					p [bar]						
		16 303 SS	17[1] 316Ti SS/ 316L SS	30 Brass			0.5	1.0	2.0	[US gal./ min] at 40 psi	3.0	5.0	10.0
45°	**660.403**	○	○	○	1.20	0.90	0.50*	0.71	1.00	0.31	1.23	1.58	2.24
	660.483	○	○	○	1.50	1.10	0.80*	1.13	1.60	0.50	1.96	2.53	3.58
	660.563	○	○	○	2.00	1.40	1.25	1.76	2.50	0.78	3.06	3.95	5.59
	660.643	○	○	○	2.50	1.80	2.00	2.83	4.00	1.24	4.90	6.33	8.94
60°	**660.404**	○	○	○	1.20	0.80	0.50*	0.71	1.00	0.31	1.23	1.58	2.24
	660.444	○	○	○	1.35	0.90	0.62*	0.88	1.25	0.39	1.53	1.98	2.80
	660.484	○	○	○	1.50	1.00	0.80*	1.13	1.60	0.50	1.96	2.53	3.58
	660.514	○	○	○	1.65	1.10	0.95*	1.34	1.90	0.59	2.33	3.00	4.25
	660.564	○	○	○	2.00	1.30	1.25	1.77	2.50	0.78	3.06	3.95	5.59
	660.604	○	○	○	2.20	1.50	1.58	2.23	3.15	0.98	3.86	4.98	7.04
	660.644	○	○	○	2.50	1.60	2.00	2.83	4.00	1.24	4.90	6.33	8.94
	660.724	○	○	○	3.00	2.10	3.15	4.46	6.30	1.95	7.72	9.96	14.09
	660.804	○	-	○	4.00	2.60	5.00	7.07	10.00	3.10	12.25	15.81	22.36
90°	**660.446**	○	○	○	1.35	0.80	0.62*	0.88	1.25	0.39	1.53	1.98	2.80
	660.486	○	○	○	1.50	0.80	0.80*	1.13	1.60	0.50	1.96	2.53	3.58
	660.516	○	○	○	1.65	0.90	0.95*	1.34	1.90	0.59	2.33	3.00	4.25
	660.566	○	○	○	2.00	1.10	1.25	1.76	2.50	0.78	3.06	3.95	5.59
	660.606	○	○	○	2.20	1.20	1.58	2.23	3.15	0.98	3.86	4.98	7.04
	660.646	○	○	○	2.50	1.30	2.00	2.83	4.00	1.24	4.90	6.33	8.94
	660.676	○	○	○	2.70	1.40	2.38	3.36	4.75	1.47	5.82	7.51	10.62
	660.726	○	○	○	3.00	1.70	3.15	4.46	6.30	1.95	7.72	9.96	14.09
	660.806	-	○	○	4.00	2.40	5.00	7.07	10.00	3.10	12.25	15.81	22.36
120°	**660.517**	○	○	○	1.65	0.90	0.95*	1.34	1.90	0.59	2.33	3.00	4.25
	660.567	○	○	○	2.00	0.90	1.25	1.77	2.50	0.78	3.06	3.95	5.59
	660.607	○	○	○	2.20	1.10	1.58	2.23	3.15	0.98	3.86	4.98	7.04
	660.647	○	○	○	2.50	1.30	2.00	2.83	4.00	1.24	4.90	6.33	8.94
	660.727	○	○	○	3.00	1.60	3.15	4.46	6.30	1.95	7.72	9.96	14.09
	660.807	○	-	○	4.00	2.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36

[1] We reserve the right to deliver 316Ti SS or 316L SS under the material no. 17.
A = Equivalent bore diameter · E = narrowest free cross section
* Differing spray pattern

Example of ordering:	Type	+	Material no.	=	Ordering no.
	660.404	+	**16**	=	**660.404.16**

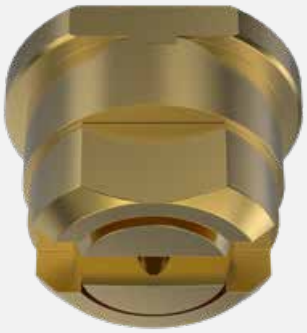
Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \sqrt{\frac{p_2}{p_1}}$

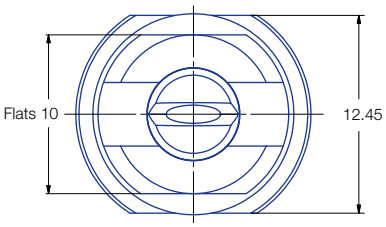
Flat fan nozzle with double-flat alignment
Series 6M2

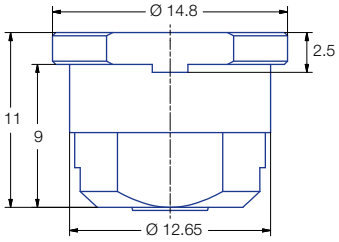
Series 6M2

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.

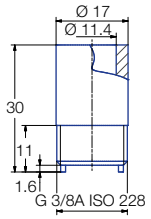
Applications:
Multi nozzle arrangements for strand cooling in foot roller area of slab casters where space is limited.
Multi nozzle arrangements in segments for water only secondary cooling in stainless steel slab casters with low water flow rates.



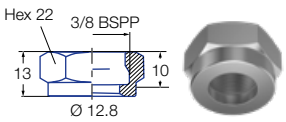




Accessories



Nipple :
06M.210.17.00.00 (AISI 316Ti)



Weight 25 g

Retaining nut:
065.200.16 (AISI 303)
065.200.17 (AISI 316Ti)
065.200.30 (Brass)

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

Spray angle	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]						
	Type	Mat. no.					p [bar]						
		16 303 SS	17[1] 316Ti SS/ 316L SS	30 Brass			0.5	1.0	2.0	[US gal./ min] at 40 psi	3.0	5.0	10.0
45°	**6M2.403**	○	○	○	1.20	0.90	0.50*	0.71	1.00	0.31	1.23	1.58	2.24
	6M2.483	○	○	○	1.50	1.10	0.80*	1.13	1.60	0.50	1.96	2.53	3.58
	6M2.563	○	○	○	2.00	1.40	1.25	1.77	2.50	0.78	3.06	3.95	5.59
	6M2.643	○	○	○	2.50	1.80	2.00	2.83	4.00	1.24	4.90	6.33	8.94
	6M2.723	○	○	○	3.00	2.40	3.15	4.46	6.30	1.95	7.72	9.96	14.09
	6M2.763	○	○	○	3.50	2.60	4.00	5.66	8.00	2.48	9.80	12.65	17.89
	6M2.803	○	○	○	4.00	3.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36
60°	**6M2.404**	○	○	○	1.20	0.80	0.50*	0.71	1.00	0.31	1.23	1.58	2.24
	6M2.444	○	○	○	1.35	0.90	0.62*	0.88	1.25	0.39	1.53	1.98	2.80
	6M2.484	○	○	○	1.50	1.00	0.80*	1.13	1.60	0.50	1.96	2.53	3.58
	6M2.514	○	○	○	1.65	1.10	0.95*	1.34	1.90	0.59	2.33	3.00	4.25
	6M2.564	○	○	○	2.00	1.30	1.25	1.77	2.50	0.78	3.06	3.95	5.59
	6M2.604	○	○	○	2.20	1.50	1.58	2.23	3.15	0.98	3.86	4.98	7.04
	6M2.644	○	○	○	2.50	1.60	2.00	2.83	4.00	1.24	4.90	6.33	8.94
	6M2.674	○	○	○	2.70	1.80	2.38	3.36	4.75	1.47	5.82	7.51	10.62
	6M2.724	○	○	○	3.00	2.10	3.15	4.46	6.30	1.95	7.72	9.96	14.09
	6M2.764	○	○	○	3.50	2.30	4.00	5.66	8.00	2.48	9.80	12.65	17.89
	6M2.804	○	○	○	4.00	2.60	5.00	7.07	10.00	3.10	12.25	15.81	22.36
	6M2.844	○	-	-	4.50	3.00	6.25	8.84	12.50	3.88	15.31	19.76	27.95
	6M2.884	○	-	○	5.00	3.40	8.00	11.31	16.00	4.96	19.60	25.30	35.78
90°	**6M2.446**	○	○	○	1.35	0.80	0.62*	0.88	1.25	0.39	1.53	1.98	2.80
	6M2.486	○	○	○	1.50	0.80	0.80*	1.13	1.60	0.50	1.96	2.53	3.58
	6M2.516	○	○	○	1.65	0.90	0.95*	1.34	1.90	0.59	2.33	3.00	4.25
	6M2.566	○	○	○	2.00	1.10	1.25	1.77	2.50	0.78	3.06	3.95	5.59
	6M2.606	○	○	○	2.20	1.20	1.58	2.23	3.15	0.98	3.86	4.98	7.04
	6M2.646	○	○	○	2.50	1.30	2.00	2.83	4.00	1.24	4.90	6.33	8.94
	6M2.676	○	○	○	2.70	1.40	2.38	3.36	4.75	1.47	5.82	7.51	10.62
	6M2.726	○	○	○	3.00	1.70	3.15	4.46	6.30	1.95	7.72	9.96	14.09
	6M2.766	○	○	○	3.50	1.90	4.00	5.66	8.00	2.48	9.80	12.65	17.89
	6M2.806	○	○	○	4.00	2.40	5.00	7.07	10.00	3.10	12.25	15.81	22.36
	6M2.846	-	-	○	4.50	2.40	6.25	8.84	12.50	3.88	15.31	19.76	27.95
	6M2.886	○	-	○	5.00	3.10	8.00	11.31	16.00	4.96	19.60	25.30	35.78
120°	**6M2.517**	○	○	○	1.65	0.90	0.95*	1.34	1.90	0.59	2.33	3.00	4.25
	6M2.567	○	○	○	2.00	0.90	1.25	1.77	2.50	0.78	3.06	3.95	5.59
	6M2.607	○	○	○	2.20	1.10	1.58	2.23	3.15	0.98	3.86	4.98	7.04
	6M2.647	○	○	○	2.50	1.30	2.00	2.83	4.00	1.24	4.90	6.33	8.94
	6M2.677	○	○	○	2.70	1.40	2.38	3.36	4.75	1.47	5.82	7.51	10.62
	6M2.727	○	○	○	3.00	1.60	3.15	4.46	6.30	1.95	7.72	9.96	14.09
	6M2.767	○	○	○	3.50	1.70	4.00	5.66	8.00	2.48	9.80	12.65	17.89
	6M2.807	○	-	○	4.00	2.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36
	6M2.847	-	-	-	4.50	2.30	6.25	8.84	12.50	3.88	15.31	19.76	27.95
	6M2.887	-	-	-	5.00	2.60	8.00	11.31	16.00	4.96	19.60	25.30	35.78

[1] We reserve the right to deliver 316Ti SS oder 316L SS under the material no. 17.
A = equivalent bore diameter · E = narrowest free cross section
* differing spray pattern
Subject to technical modifications.

Example of ordering:	Type	+	Material no.	=	Ordering no.
	6M2.404	+	**16**	=	**6M2.404.16**

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

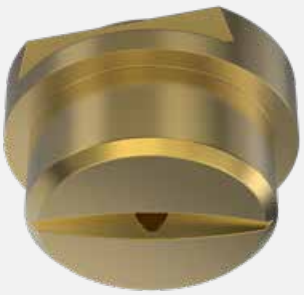
Flat fan nozzle with dove-tail alignment
Series 664/665

Series 664 / 665

Assembly with retaining nut. Self aligning jet with dove-tail 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:

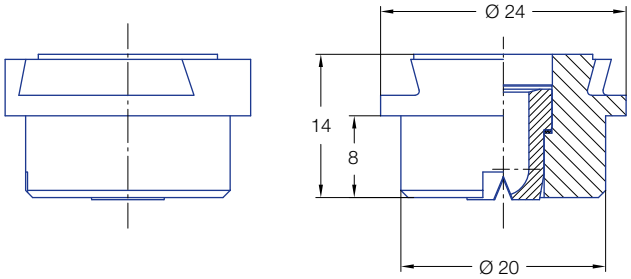
Type + Material No. + Special No

Special No:
00= standard nozzle

74 = flat jet parallel to dove tail

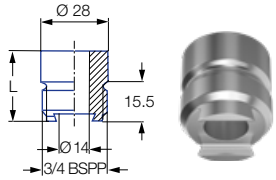
90 = rectangular liquid distribution

96 = flat jet parallel to dove tail + rectangular liquid distribution



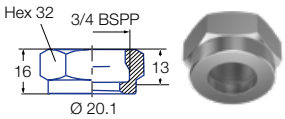
Flat jet 15° offset against dove-tail

Accessories



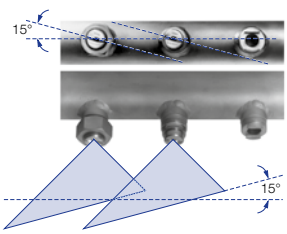
Weight: 65 g

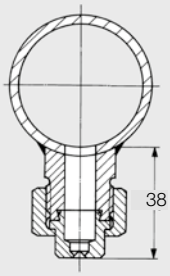
Nipple, **066.410.17** (316Ti SS)



Weight brass 60 g

Retaining nut: **065.600.16** (303 SS)
065.600.17 (316Ti SS)
065.600.30 (Brass)





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

Spray angle	Ordering no.				A Ø [mm]	E Ø [mm]	V̇ [l/min]						
		Mat. no.					p [bar]						
	Type	16 303 SS	17[1] 316Ti SS/ 316L SS	30 Brass			0.5	1.0	2.0	[US gal./ min] at 40 psi	3.0	5.0	10.0
45°	**664.723**	○	○	○	3.00	2.40	3.15	4.45	6.30	1.95	7.72	9.96	14.09
	664.763	○	○	○	3.50	2.60	4.00	5.66	8.00	2.48	9.80	12.65	17.89
	664.803	○	○	○	4.00	3.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36
	664.843	○	○	○	4.50	3.40	6.25	8.84	12.50	3.88	15.31	19.67	27.95
	664.883	○	○	○	5.00	3.80	8.00	11.31	16.00	4.96	19.60	25.30	35.78
	664.923	○	○	○	5.50	4.20	10.00	14.14	20.00	6.20	24.49	31.62	44.72
	664.963	○	○	○	6.00	4.40	12.50	17.68	25.00	7.75	30.62	39.53	55.90
	665.043	-	-	○	8.00	5.90	20.00	28.28	40.00	12.41	48.99	63.25	89.44
60°	**664.724**	○	○	○	3.00	2.10	3.15	4.45	6.30	1.95	7.72	9.96	14.09
	664.764	○	○	○	3.50	2.30	4.00	5.66	8.00	2.48	9.80	12.65	17.89
	664.804	○	○	○	4.00	2.60	5.00	7.07	10.00	3.10	12.25	15.81	22.36
	664.844	○	○	○	4.50	3.00	6.25	8.84	12.50	3.88	15.31	19.67	27.95
	664.884	○	○	○	5.00	3.40	8.00	11.31	16.00	4.96	19.60	25.30	35.78
	664.924	○	○	○	5.50	4.10	10.00	14.14	20.00	6.20	24.49	31.62	44.72
	664.964	○	○	○	6.00	4.20	12.50	17.68	25.00	7.75	30.62	39.53	55.90
	665.044	○	○	○	8.00	8.00	20.00	28.28	40.00	12.41	48.99	63.25	89.44
	665.064	○	○	○	8.00	8.00	22.50	31.84	45.00	13.96	55.15	71.20	100.69
	665.084	-	○	○	9.00	6.20	25.00	35.36	50.00	15.50	61.24	79.06	111.80
	665.124	-	-	○	10.00	7.40	31.50	44.55	63.00	19.56	77.16	99.61	140.87
90°	**664.726**	○	○	○	3.00	1.70	3.15	4.45	6.30	1.95	7.72	9.96	14.09
	664.766	○	○	○	3.50	1.90	4.00	5.66	8.00	2.48	9.80	12.65	17.89
	664.806	○	○	○	4.00	2.40	5.00	7.07	10.00	3.10	12.25	15.81	22.36
	664.846	○	○	○	4.50	2.40	6.25	8.84	12.50	3.88	15.31	19.67	27.95
	664.886	○	○	○	5.00	3.10	8.00	11.31	16.00	4.96	19.60	25.30	35.78
	664.926	○	○	○	5.50	3.60	10.00	14.14	20.00	6.20	24.49	31.62	44.72
	664.966	○	○	○	6.00	3.90	12.50	17.68	25.00	7.75	30.62	39.53	55.90
	665.046	-	-	○	8.00	4.90	20.00	28.28	40.00	12.41	48.99	63.25	89.44
	665.126	-	-	○	10.00	6.40	31.50	44.55	63.00	19.56	77.16	99.61	140.87
120°	**664.727**	○	○	○	3.00	1.60	3.15	4.45	6.30	1.95	7.72	9.96	14.09
	664.767	○	○	○	3.50	1.70	4.00	5.66	8.00	2.48	9.80	12.65	17.89
	664.807	○	○	○	4.00	2.00	5.00	7.07	10.00	3.10	12.25	15.81	22.36
	664.847	○	○	○	4.50	2.30	6.25	8.84	12.50	3.88	15.31	19.67	27.95
	664.887	○	○	○	5.00	2.60	8.00	11.31	16.00	4.96	19.60	25.30	35.78
	664.927	○	○	○	5.50	2.90	10.00	14.14	20.00	6.20	24.49	31.62	44.72
	664.967	-	-	○	6.00	3.20	12.50	17.68	25.00	7.75	30.62	39.53	55.90
	665.047	-	-	○	8.00	4.40	20.00	28.28	40.00	12.41	48.99	63.25	89.44

[1]We reserve the right to deliver 316Ti SS oder 316L SS under the material no. 17.
A = equivalent bore diameter · E = narrowest free cross section
* differing spray pattern
Subject to technical modifications.

Example of ordering:	Type	+	Material no.	=	Ordering no.
	664.724	+	**16**	=	**664.724.16**

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

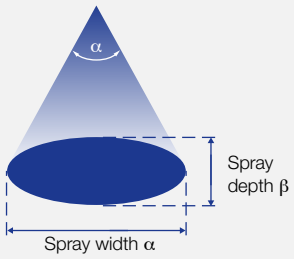
Flat fan nozzle with increased spray depth and dove-tail alignment
Series 600.280

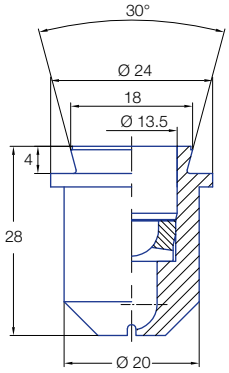
Series 600.280

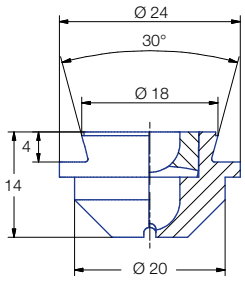
Assembly with 3/4” retaining nut. Self aligning jet with dove-tail design with 0° offset angle secures correct spray position for optimal strand surface quality and easy maintenance.

- Typically with trapezoid liquid distribution
- Available in 14 mm short and in 28 mm 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.

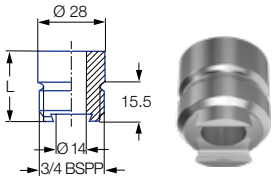






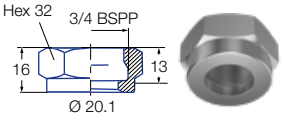
Flat jet parallel to dove-tail

Accessories



Weight: 65 g

Nipple, **066.410.17** (316Ti SS)



Weight brass 60 g

Retaining nut: **065.600.16** (303 SS)
065.600.17 (316Ti SS)
065.600.30 (Brass)

Spray angle	Ordering no. Type	Material no. 16 303 SS	Material no. 30 Brass	Spray depth angle [°]	Length [mm]	Narrowest cross section [mm]	Flow rate [l/min] pressure (bar) 1	2	3	5	7	10
60°	**600.280.xx.34**	○	○	12	28	3	12.0	16.6	20.1	25.6	30.0	35.5
	600.280.xx.32	○	○	15	28	3	12.0	16.6	20.1	25.6	30.0	35.5
	600.280.xx.28	○	○	20	28	2.5	8.5	11.8	14.3	18.2	21.3	25.2
	600.280.xx.29	○	○	20	28	3	11.7	16.3	19.7	25.0	29.3	34.6
	600.280.xx.30	○	○	20	28	3.6	15.0	20.7	25.1	31.9	37.4	44.2
	600.280.xx.33	○	○	25	28	4	16.0	22.2	26.8	34.1	39.9	47.2
	600.280.xx.83	○	○	40	28	1	1.3	1.8	2.1	2.7	3.2	3.7
	600.280.xx.12	○	○	40	28	1	1.9	2.6	3.1	4.0	4.7	5.5
	600.280.xx.11	○	○	40	28	1	2.1	2.9	3.5	4.5	5.3	6.2
	600.280.xx.22	○	○	40	28	2.1	4.7	6.5	7.9	10.0	11.7	13.9
	600.280.xx.21	○	○	40	28	2.5	6.1	8.5	10.2	13.0	15.2	18.0
70°	**600.280.xx.17**	○	○	40	28	1	1.3	1.8	2.2	2.8	3.3	3.9
	600.280.xx.15	○	○	40	28	1.1	1.9	2.6	3.1	4.0	4.7	5.5
	600.280.xx.84	○	○	40	28	1.8	3.1	4.3	5.2	6.6	7.7	9.1
75°	**600.280.xx.82**	○	○	15	28	1.8	5.7	7.9	9.5	12.1	14.2	16.8
	600.280.xx.16	○	○	15	28	1.7	6.1	8.5	10.2	13.0	15.2	18.0
	600.280.xx.19	○	○	30	28	1.6	3.3	4.6	5.5	7.0	8.2	9.7
	600.280.xx.26	○	○	30	28	1.7	4.1	5.7	6.9	8.8	10.3	12.2

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \left(\frac{p_2}{p_1}\right)^{0.47}$ (≤ 10 bar)

Spray angle	Ordering no.			Spray depth angle [°]	Length [mm]	Narrowest cross section [mm]	Flow rate [l/min] pressure (bar)					
	Type	Material no. 16 303 SS	Material no. 30 Brass				1	2	3	5	7	10
80°	**600.280.xx.64**	○	○	20	28	1.4	2.0	2.8	3.4	4.3	5.0	6.0
	600.280.xx.74	○	○	20	28	1.5	2.3	3.1	3.8	4.8	5.6	6.6
	600.280.xx.51	○	○	25	28	1.6	10.0	13.9	16.8	21.4	25.1	29.6
	600.280.xx.42	○	○	30	14	1	2.3	3.1	3.8	4.8	5.6	6.6
90°	**600.280.xx.77**	○	○	20	28	1	4.5	6.2	7.6	9.6	11.2	13.3
	600.280.xx.14	○	○	20	28	1.1	4.9	6.8	8.3	10.5	12.3	14.5
	600.280.xx.08	○	○	20	28	2.2	8.5	11.8	14.3	18.2	21.3	25.2
	600.280.xx.03	○	○	20	28	2.1	9.6	13.3	16.0	20.4	23.9	28.3
	600.280.xx.05	○	○	20	28	2.5	11.6	16.1	19.5	24.8	29.0	34.4
	600.280.xx.09	○	○	20	28	2	11.7	16.3	19.7	25.0	29.3	34.6
	600.280.xx.10	○	○	20	28	2.7	15.0	20.7	25.1	31.9	37.4	44.2
	600.280.xx.62	○	○	27	28	1.6	4.6	6.4	7.7	9.8	11.5	13.6
	600.280.xx.69	○	○	27	28	2.3	7.0	9.7	11.7	14.9	17.5	20.6
	600.280.xx.68	○	○	27	28	2.95	8.5	11.8	14.3	18.2	21.3	25.2
	600.280.xx.72	○	○	27	28	2.7	12.9	17.9	21.6	27.5	32.2	38.1
	600.280.xx.76	○	○	27	28	2.7	15.1	20.9	25.2	32.1	37.6	44.5
	600.280.xx.13	○	○	30	14	1	1.3	1.8	2.1	2.7	3.2	3.7
	600.280.xx.97	○	○	30	28	1.2	1.9	2.7	3.2	4.1	4.8	5.7
	600.280.xx.92	○	○	30	14	1.2	2.0	2.7	3.3	4.2	4.9	5.8
	600.280.xx.41	○	○	30	14	1.6	3.3	4.6	5.5	7.0	8.2	9.7
	600.280.xx.95	○	○	30	28	1.7	3.3	4.6	5.5	7.0	8.2	9.7
	600.280.xx.90	○	○	30	14	1.7	3.4	4.7	5.7	7.2	8.4	10.0
	600.280.xx.27	○	○	30	28	1.9	5.1	7.0	8.5	10.8	12.7	15.0
	600.280.xx.63	○	○	30	28	2.3	5.8	8.1	9.8	12.4	14.5	17.2
	600.280.xx.45	○	○	30	28	2.3	8.3	11.4	13.8	17.6	20.6	24.4
	600.280.xx.66	○	○	30	28	2.15	11.6	16.1	19.5	24.8	29.0	34.4
	600.280.xx.24	○	○	30	40	2.15	11.6	16.1	19.5	24.8	29.0	34.4
	600.280.xx.73	○	○	35	28	2.3	7.6	10.5	12.7	16.1	18.9	22.3
	600.280.xx.81	○	○	40	28	1.7	1.9	2.7	3.2	4.1	4.8	5.7
	600.280.xx.79	○	○	40	28	1.6	3.0	4.2	5.0	6.4	7.5	8.9
	600.280.xx.80	○	○	40	28	1.7	3.9	5.4	6.5	8.3	9.7	11.5
	600.280.xx.78	○	○	40	28	2.5	7.3	10.1	12.3	15.6	18.3	21.6
100°	**600.280.xx.53**	○	○	15	56	2.5	11.8	16.4	19.8	25.2	29.5	34.9
	600.280.xx.44	○	○	15	28	2.7	20.0	27.8	33.6	42.7	50.0	59.1
	600.280.xx.85	○	○	25	28	1.4	4.1	5.7	6.8	8.7	10.2	12.1
	600.280.xx.50	○	○	25	28	1.6	4.9	6.8	8.3	10.5	12.3	14.5
	600.280.xx.07	○	○	25	28	2.3	11.6	16.1	19.5	24.8	29.0	34.4
	600.280.xx.88	○	○	30	14	1.2	2.0	2.7	3.3	4.2	4.9	5.8
	600.280.xx.58	○	○	30	14	1.7	3.5	4.8	5.8	7.4	8.7	10.2
	600.280.xx.57	○	○	30	14	1.8	4.8	6.7	8.1	10.3	12.1	14.3
	600.280.xx.40	○	○	30	28	1.6	5.1	7.0	8.5	10.8	12.7	15.0
	600.280.xx.56	○	○	30	14	1.9	6.1	8.5	10.2	13.0	15.2	18.0
	600.280.xx.55	○	○	30	14	2.5	7.4	10.3	12.4	15.8	18.5	21.9
	600.280.xx.36	○	○	30	14	2.6	8.9	12.4	14.9	19.0	22.3	26.3
	600.280.xx.59	○	○	40	28	2.6	7.8	10.9	13.1	16.7	19.6	23.1
	600.280.xx.35	○	○	40	28	2.6	8.8	12.2	14.8	18.8	22.0	26.0
	600.280.xx.37	○	○	40	28	2.7	14.2	19.6	23.8	30.2	35.4	41.8
	600.280.xx.23	○	○	50	28	1.85	1.9	2.6	3.1	4.0	4.7	5.5
	600.280.xx.31	○	○	50	28	1.3	3.2	4.5	5.4	6.9	8.1	9.6
105°	**600.280.xx.02**	○	○	23	14	1.1	3.3	4.6	5.5	7.0	8.2	9.7
	600.280.xx.00	○	○	23	14	1.3	4.7	6.5	7.9	10.0	11.7	13.9
	600.280.xx.01	○	○	23	14	1.4	6.1	8.5	10.2	13.0	15.2	18.0
	600.280.xx.04	○	○	23	14	1.3	7.5	10.4	12.6	16.0	18.7	22.2
	600.280.xx.65	○	○	27	28	1.05	2.0	2.8	3.4	4.3	5.0	6.0
	600.280.xx.67	○	○	27	28	1.4	2.9	4.0	4.9	6.2	7.3	8.6
112°	**600.280.xx.43**	○	○	30	28	2.4	9.3	12.9	15.6	19.8	23.2	27.4

Material 17 (316Ti/316L SS) on request

Example of ordering:	Type	+	Material no.	=	Ordering no.
	600.280.xx.64	+	**16**	=	**600.280.16.64**

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \left(\frac{p_2}{p_1}\right)^{0.47}$
(≤ 10 bar)

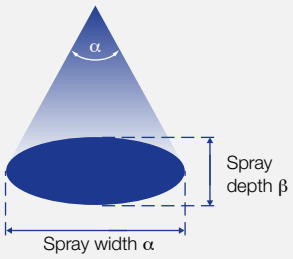
Flat fan nozzle with increased spray depth and dove-tail alignment
Series 600.366

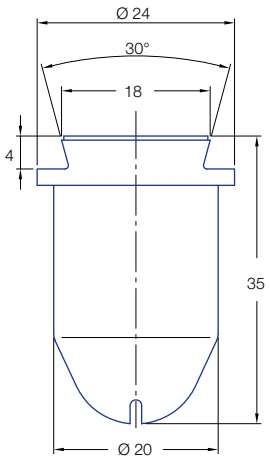
Series 600.366

High impact version with peak center liquid distribution.

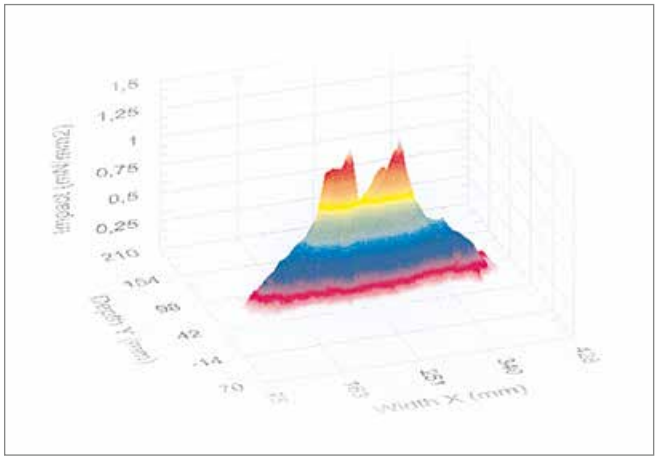
Assembly with 3/4" retaining nut. Self aligning jet with dove-tail design with 0° offset angle secures correct spray position for optimal strand surface quality and easy maintenance.

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

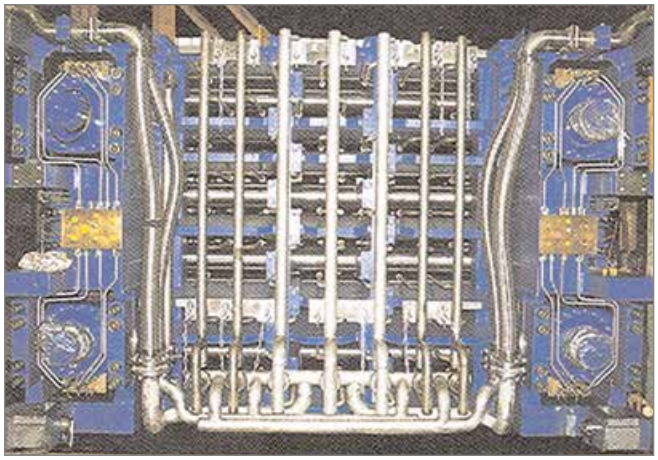




Flat jet parallel to dove-tail



Typical impact measurement of high impact version



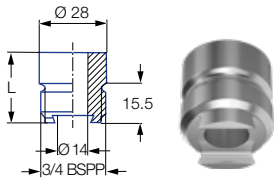
Position-controlled segements for LCR operation of a CSP plant, pre-assembled in the work shop.

Spray angle	Ordering no.			Spray depth angle [°]	Narrowest cross section [mm]	Flow rate [l/min] pressure (bar)					
	Type	Material no. 16 303 SS	Material no. 30 Brass			1	2	3	5	7	10
68°	**600.366.xx.53**	○	○	19	1.1	1.3	1.8	2.2	2.8	3.3	3.9
	600.366.xx.55	○	○	19	1.3	2.0	2.8	3.4	4.3	5.0	6.0
69°	**600.366.xx.70**	○	○	26	1	0.9	1.2	1.5	1.9	2.2	2.6
	600.366.xx.72	○	○	26	1.4	2.4	3.3	4.0	5.1	6.0	7.1
70°	**600.366.xx.50**	○	○	20	1.4	2.7	3.7	4.5	5.7	6.7	7.9
	600.366.xx.13	○	○	30	1.9	2.8	3.8	4.6	5.9	6.9	8.2
	600.366.xx.51	○	○	20	2	3.3	4.6	5.5	7.0	8.2	9.7
	600.366.xx.14	○	○	30	1.9	4.9	6.8	8.2	10.4	12.2	14.4
74°	**600.366.xx.54**	○	○	19	1.3	1.7	2.3	2.8	3.6	4.2	5.0
	600.366.xx.56	○	○	19	1.4	3.0	4.2	5.0	6.4	7.5	8.9
75°	**600.366.xx.60**	○	○	26	1.9	4.6	6.4	7.8	9.9	11.6	13.7
80°	**600.366.xx.71**	○	○	26	1.2	1.6	2.2	2.7	3.4	4.0	4.7
	600.366.xx.61	○	○	26	1.9	5.4	7.4	9.0	11.4	13.4	15.8
82°	**600.366.xx.52**	○	○	28	1.7	4.9	6.8	8.2	10.4	12.2	14.4
83°	**600.366.xx.30**	○	○	20	1.8	3.3	4.6	5.6	7.1	8.3	9.8
90°	**600.366.xx.36**	○	○	20	1.4	4.3	5.9	7.2	9.1	10.7	12.6
	600.366.xx.37	○	○	20	1.8	6.4	8.9	10.8	13.7	16.0	19.0
102°	**600.366.xx.48**	○	○	32	1.6	4.3	5.9	7.2	9.1	10.7	12.6
105°	**600.366.xx.49**	○	○	25	1	1.7	2.3	2.8	3.6	4.2	5.0
	600.366.xx.23	○	○	20	1	2.0	2.7	3.3	4.2	4.9	5.8
	600.366.xx.28	○	○	20	1	2.7	3.7	4.5	5.7	6.7	7.9
	600.366.xx.40	○	○	20	1.25	3.3	4.6	5.5	7.0	8.2	9.7
	600.366.xx.00	○	○	35	1.8	3.3	4.6	5.6	7.1	8.3	9.8
	600.366.xx.44	○	○	20	1.7	4.5	6.2	7.5	9.5	11.1	13.2
	600.366.xx.41	○	○	20	1.8	4.9	6.8	8.2	10.4	12.2	14.4
	600.366.xx.21	○	○	20	2	5.0	7.0	8.4	10.7	12.5	14.8
	600.366.xx.01	○	○	35	2	5.0	7.0	8.4	10.7	12.5	14.8
	600.366.xx.42	○	○	20	1.7	6.3	8.8	10.6	13.5	15.8	18.7
	600.366.xx.22	○	○	20	2.2	6.7	9.3	11.2	14.3	16.8	19.8
	600.366.xx.02	○	○	35	2.2	6.7	9.3	11.2	14.3	16.8	19.8
	600.366.xx.43	○	○	20	2	8.1	11.2	13.6	17.3	20.3	24.0
	600.366.xx.03	○	○	35	2.5	8.4	11.6	14.0	17.8	20.8	24.7
	600.366.xx.45	○	○	20	2.1	10.1	14.0	16.9	21.5	25.2	29.8
108°	**600.366.xx.80**	○	○	32	2.3	8.5	11.8	14.2	18.1	21.2	25.1
	600.366.xx.81	○	○	32	2.3	9.8	13.5	16.4	20.8	24.4	28.8
110°	**600.366.xx.47**	○	○	28	1.1	2.8	3.8	4.6	5.9	6.9	8.2

Material 17 (316Ti/316L SS) on request

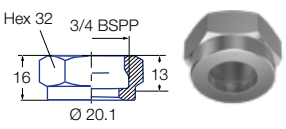
Example of ordering:	Type	+	Material no.	=	Ordering no.
	600.366.xx.53	+	**16**	=	**600.366.16.53**

Accessories



Weight: 65 g

Nipple, **066.410.17** (316Ti SS)



Weight brass 60 g

Retaining nut: **065.600.16** (303 SS)
065.600.17 (316Ti SS)
065.600.30 (Brass)

Conversion formula for the above series: $\dot{V}_2 = \dot{V}_1 * \left(\frac{p_2}{p_1}\right)^{0.47}$
(≤ 10 bar)

Spray angle	Ordering no.								B Ø [mm]	E Ø [mm]	V̇ [l/min]							Spray diameter D at p = 2 bar	
	Type	Mat. no.			Code						p [bar]								
		1Y 316L SS	30 Brass	T8 Brass/316L SS	1/8 BSPT	1/4 BSPT	3/8 BSPT	1/2 BSPT			0.5	1.0	2.0	3.0	5.0	7.0	10.0	H = 200 mm	H = 500 mm
90°	**490.406**	○	○	○	**CA**	-	-	-	1.20	1.20	0.57	0.76	1.00	1.18	1.44	1.65	1.90	380	860
	490.446	○	○	○	**CA**	-	-	-	1.30	1.30	0.72	0.95	1.25	1.47	1.80	2.06	2.38	380	860
	490.486	○	○	○	**CA**	-	-	-	1.45	1.45	0.92	1.21	1.60	1.88	2.31	2.64	3.05	380	860
	490.506	○	○	○	-	**CC**	-	-	1.65	1.65	1.03	1.36	1.80	2.12	2.60	2.97	3.43	380	860
	490.526	○	○	○	**CA**	-	-	-	1.70	1.55	1.15	1.52	2.00	2.35	2.89	3.30	3.81	380	860
	490.566	○	○	○	**CA**	-	-	-	1.90	1.90	1.44	1.89	2.50	2.94	3.61	4.13	4.76	380	860
	490.606	○	○	○	**CA**	**CC**	**CE**	-	2.10	2.05	1.81	2.39	3.15	3.70	4.54	5.20	6.00	380	860
	490.646	○	○	○	-	**CC**	**CE**	-	2.40	2.40	2.30	3.03	4.00	4.70	5.77	6.60	7.61	390	960
	490.686	○	○	○	-	**CC**	**CE**	-	2.70	2.70	2.87	3.79	5.00	5.88	7.21	8.25	9.52	390	960
	490.706	○	○	○	-	-	**CE**	-	2.75	2.75	3.22	4.24	5.60	6.59	8.08	9.24	10.66	390	960
	490.726	○	○	○	-	**CC**	**CE**	-	3.20	2.80	3.62	4.77	6.30	7.41	9.09	10.40	11.99	390	960
	490.746	○	○	○	-	-	**CE**	-	3.15	3.15	4.08	5.38	7.10	8.35	10.24	11.72	13.52	390	960
	490.766	○	○	○	-	-	**CE**	-	3.40	3.40	4.59	6.06	8.00	9.41	11.54	13.20	15.22	390	960
	490.806	○	○	○	-	-	**CE**	-	3.90	3.90	5.74	7.58	10.00	11.76	14.43	16.51	19.04	390	960
	490.846	○	○	○	-	-	**CE**	-	4.65	4.00	7.18	9.47	12.50	14.70	18.03	20.63	23.80	390	960
	490.886	○	○	○	-	-	-	**CG**	5.45	4.50	9.19	12.13	16.00	18.82	23.08	26.41	30.46	390	960
	490.926	○	○	○	-	-	-	**CG**	5.90	4.50	11.49	15.16	20.00	23.52	28.85	33.01	38.07	390	960
120°	**490.368**	○	○	○	**CA**	-	-	-	0.85	0.65	0.36	0.48	0.63	0.74	0.91	1.04	1.20	680	1220
	490.408	○	○	○	**CA**	-	-	-	1.20	1.20	0.57	0.76	1.00	1.18	1.44	1.65	1.90	680	1220
	490.448	○	○	○	**CA**	-	-	-	1.30	1.30	0.72	0.95	1.25	1.47	1.80	2.06	2.38	680	1220
	490.488	○	○	○	**CA**	-	-	-	1.45	1.45	0.92	1.21	1.60	1.88	2.31	2.64	3.05	680	1220
	490.528	○	○	○	**CA**	-	-	-	1.70	1.70	1.15	1.52	2.00	2.35	2.89	3.30	3.81	680	1220
	490.568	○	○	○	**CA**	-	-	-	1.90	1.90	1.44	1.89	2.50	2.94	3.61	4.13	4.76	680	1220
	490.608	○	○	○	**CA**	**CC**	-	-	2.10	2.05	1.81	2.39	3.15	3.70	4.54	5.20	6.00	680	1220
	490.648	○	○	○	-	**CC**	**CE**	-	2.40	2.40	2.30	3.03	4.00	4.70	5.77	6.60	7.61	680	1330
	490.688	○	○	○	-	**CC**	**CE**	-	2.75	2.75	2.87	3.79	5.00	5.88	7.21	8.25	9.52	680	1330
	490.708	○	○	○	-	-	**CE**	-	2.75	2.75	3.22	4.24	5.60	6.59	8.08	9.24	10.66	680	1330
	490.728	○	○	○	-	**CC**	**CE**	-	3.20	2.80	3.62	4.77	6.30	7.41	9.09	10.40	11.99	680	1330
	490.748	○	○	○	-	-	**CE**	-	3.20	3.20	4.08	5.38	7.10	8.35	10.24	11.72	13.52	680	1330
	490.768	○	○	○	-	-	**CE**	-	3.45	3.45	4.59	6.44	8.00	9.41	11.54	13.20	15.22	680	1330
	490.808	○	○	○	-	-	**CE**	-	3.90	3.90	5.74	7.58	10.00	11.76	14.43	16.51	19.04	680	1330
	490.848	○	○	○	-	-	CE	-	4.70	4.00	7.18	9.47	12.50	14.70	18.03	20.63	23.80	680	1330
	490.888	○	○	○	-	-	-	**CG**	5.10	4.50	9.19	12.13	16.00	18.82	23.08	26.41	30.46	680	1330
	490.928	○	○	○	-	-	-	**CG**	5.80	4.75	11.49	15.16	20.00	23.52	28.85	33.01	38.07	680	1330

B = Bore diameter · E = narrowest free cross section

Example for ordering:	Type 490.406	+	Material no. 1Y	+	Code CA	=	Ordering no. 490.406.1Y.CA

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