Axial-flow full cone nozzles
Series 490 / 491

Series 490 / 491

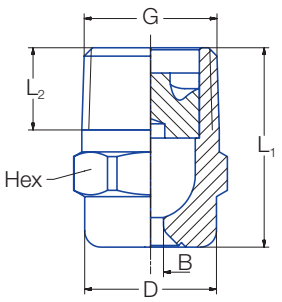
Non-clogging nozzle design. Stable spray angle. Particularly even liquid distribution.

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.

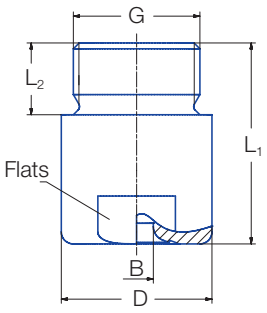
Remark:
Material combination **T8** brass for the nozzle housing and AISI 316L for the vane, or completely made from AISI 316L **1Y** is recommended if the nozzles will be exposed to high temperatures for longer periods of time.

Series 490

Series 491



Code
CC-CG



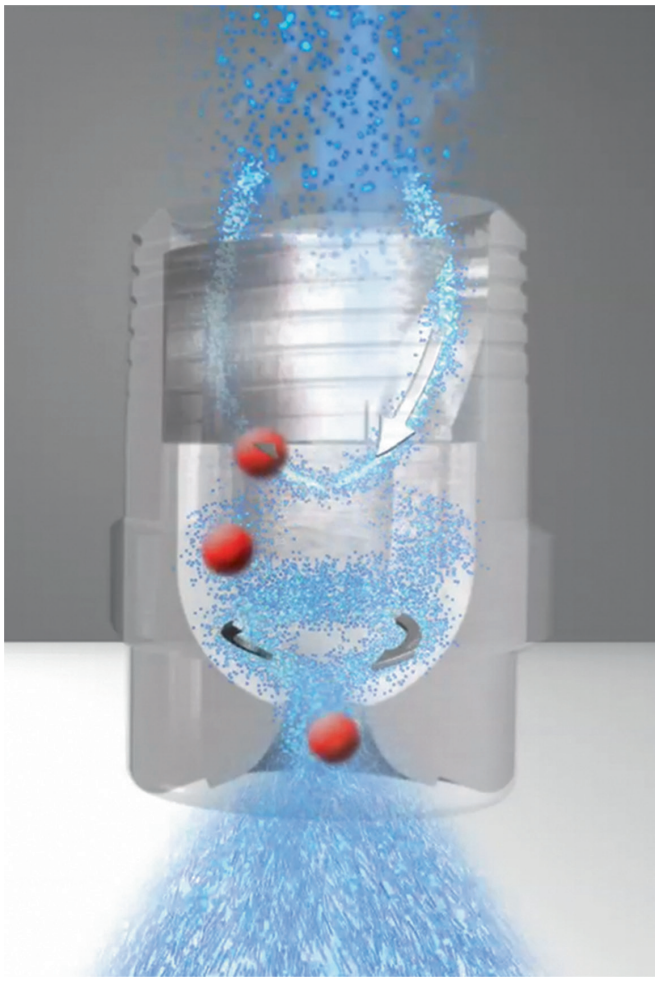
Code
AK-AM

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
AK	3/4 BSPP	42.0	15.0	32.0	27	190 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 under cooling of strand corners and centre section means quality improvements



Solid particle passing through 490 nozzle serie

Solid particle passing through conventional axial full cone nozzle

Axial-flow full cone nozzles
Series 490 / 491

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]							H = 200 mm	H = 500 mm
		1Y AISI 316L	30 Brass	T8 Brass/AISI 316L	1/8 BSPT	1/4 BSPT	3/8 BSPT	1/2 BSPT	3/4 BSPP			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	○	○	○	-	**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
	490.924	○	○	○	-	-	-	-	**AK**	5.20	5.20	11.49	15.16	20.00	23.52	28.85	33.01	38.07	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)

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 AISI 316L	30 Brass	T8 Brass/AISI 316L	1/8 BSPT	1/4 BSPT	3/8 BSPT	1/2 BSPT	3/4 BSPP			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
	490.726	○	○	○	-	**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
	490.728	○	○	○	-	**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)