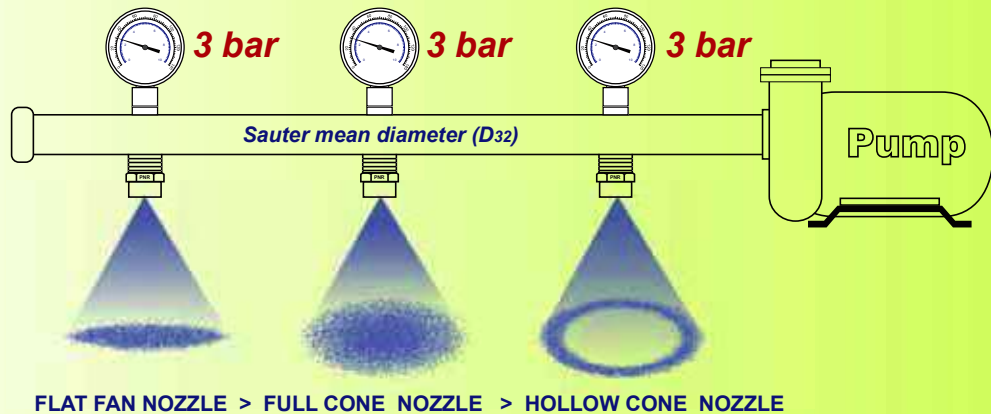


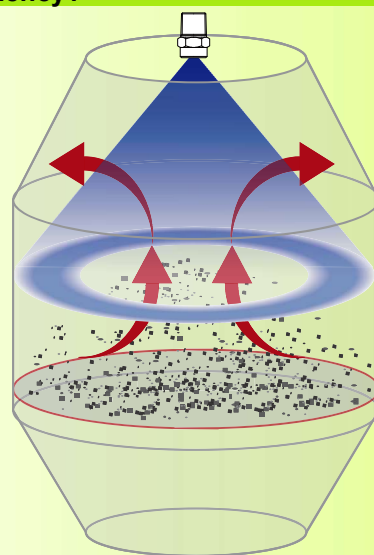


Mist spray

Hollow cone nozzles provide a finely atomized mist and a very uniform hollow cone spray pattern. They are ideal to capture suspended particles and offer higher performances than other nozzles with same operating pressure and capacity. These nozzles are widely used for their efficiency in cooling and cleaning of gases, dust control, absorption processes and air-humidification.



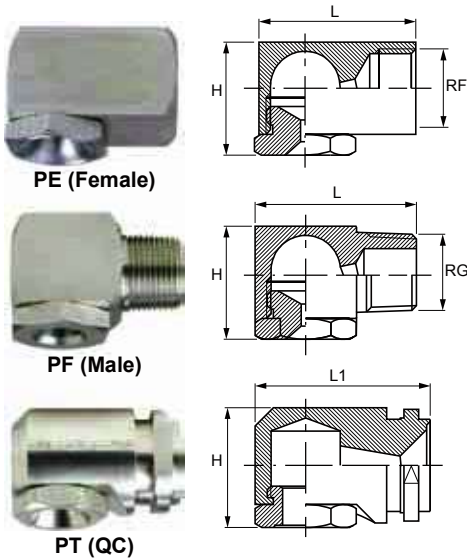
Poor gas scrub efficiency?



Hollow cone nozzles produce a ring-shaped spray pattern where all the liquid jet is concentrated on the outer edge of the ring. Users may fear that offset nozzles do not catch all suspended particles because air flows through directly from the centre. Hollow cone nozzles are the solution to this problem as their fine mist spray provides a better scrubbing effect.

Accurate offset settings

The correct positioning of hollow cone nozzles is of vital importance. There are matrix and offset settings. Please see on page 18 for more information.

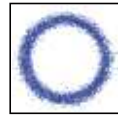


STANDARD ANGLE SPRAY NOZZLES

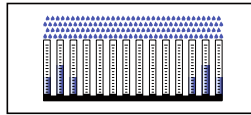
PE/PF hollow cone nozzles generate a ring-shaped spray pattern with finely atomized droplets and work on the tangential flow principle. Inside these nozzles there is an axial groove that injects the liquid tangentially into the vortex chamber where the strong centrifugal force produces a high rotational velocity and generates a finely atomized liquid flow. As these nozzles have a large inside free passage and no swirl insert, they offer the maximum resistance to clogging. PE/PF nozzles are widely used in many production processes and their variety of spray angles and capacities make them suitable for all kinds of working environments.

Thread specification

Female thread (PE series): BSPT, NPT
Male thread (PF series): BSP, NPT



Spray section



Concave distribution



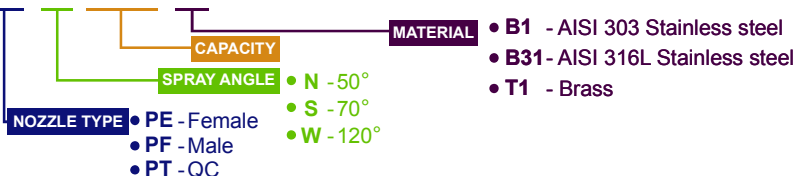
STANDARD ANGLE SPRAY NOZZLES

Spray Angle	RF RG inch	PEN Female	PFN Male	PTN QC	Code	DE mm	DU mm	Capacity at different pressure values (l/min)								Dimensions (mm)			
								0.5	0.7	1.0	2.0	3.0	5.0	7.0	10	H	L	L1	
50°	3/8"		•	•	2180	5.9	7.9	7.35	8.69	10.4	14.7	18.0	23.2	27.5	32.9	24	34	35	
					2220	7.5	7.9	8.98	10.6	12.7	18.0	22.0	28.4	33.6	40.2				
					2390	8.7	9.5	15.9	18.8	22.5	31.8	39.0	50.3	59.6	71.2				
70°	1/8"		•	•	0390	0.79	1.2	0.16	0.19	0.23	0.32	0.39	0.50	0.60	0.71	19	24	26	
					0780	1.6	1.6	0.32	0.38	0.45	0.64	0.78	1.01	1.19	1.42				
					1160	2.0	2.0	0.65	0.77	0.92	1.31	1.60	2.07	2.44	2.92				
					1230	2.4	2.4	0.94	1.11	1.33	1.88	2.30	2.97	3.51	4.20				
					1390	3.2	3.2	1.59	1.88	2.25	3.18	3.90	5.03	5.96	7.12				
					1630	4.0	4.0	2.57	3.04	3.64	5.14	6.30	8.13	9.62	11.5				
	1/4"		•	•	•	0781	1.6	1.6	0.32	0.38	0.45	0.64	0.78	1.01	1.19	1.42	23	32	32
						1161	2.0	2.0	0.65	0.77	0.92	1.31	1.60	2.07	2.44	2.92			
						1231	2.4	2.4	0.94	1.11	1.33	1.88	2.30	2.97	3.51	4.20			
						1391	3.6	3.6	1.59	1.88	2.25	3.18	3.90	5.03	5.96	7.12			
						1631	4.0	4.0	2.57	3.04	3.64	5.14	6.30	8.13	9.62	11.5			
						1781	4.8	4.4	3.18	3.77	4.50	6.37	7.80	10.1	11.9	14.2			
	3/8"		•	•	•	1392	3.6	3.2	1.59	1.88	2.25	3.18	3.90	5.03	5.96	7.12	24	34	35
						1632	4.4	4.0	2.57	3.04	3.64	5.14	6.30	8.13	9.62	11.5			
						1782	5.2	4.4	3.18	3.77	4.50	6.37	7.80	10.1	11.9	14.2			
						2118	5.9	5.6	4.78	5.65	6.75	9.55	11.7	15.1	17.9	21.4			
						2157	7.1	6.4	6.41	7.58	9.06	12.8	15.7	20.3	24.0	28.7			
						2196	7.5	7.5	8.00	9.47	11.3	16.0	19.6	25.3	29.9	35.8			
	1/2"		•	•	•	2230	8.3	7.9	9.39	11.1	13.3	18.8	23.0	29.7	35.1	42.0	31	50	50
						2197	9.5	6.4	8.00	9.47	11.3	16.0	19.6	25.3	29.9	35.8			
						2231	9.5	7.5	9.39	11.1	13.3	18.8	23.0	29.7	35.1	42.0			
						2310	9.5	9.1	12.7	15.0	17.9	25.3	31.0	40.0	47.4	56.6			
						2391	9.5	11.1	15.9	18.8	22.5	31.8	39.0	50.3	59.6	71.2			
						2470	9.5	13.1	19.2	22.7	27.1	38.4	47.0	60.7	71.8	85.8			
	3/4"		•	•	•	2311	12.7	7.9	12.7	15.0	17.9	25.3	31.0	40.0	47.4	56.6	39	55	58
						2392	12.7	9.5	15.9	18.8	22.5	31.8	39.0	50.3	59.6	71.2			
						2471	12.7	11.1	19.2	22.7	27.1	38.4	47.0	60.7	71.8	85.8			
						2550	12.7	12.7	22.5	26.6	31.8	44.9	55.0	71.0	84.0	100			
2630						12.7	14.3	25.7	30.4	36.4	51.4	63.0	81.3	96.2	115				
2700						12.7	14.7	28.6	33.8	40.4	57.2	70.0	90.4	107	128				
2780						12.7	15.9	31.8	37.7	45.0	63.7	78.0	101	119	142				
2860						12.7	17.1	35.1	41.5	49.7	70.2	86.0	111	131	157				
2940						12.7	18.3	38.4	45.4	54.3	76.8	94.0	121	144	172				

HOW TO MAKE UP THE NOZZLE CODE

EX.: PES 1160 B1

PE S 1160 XX



WIDE ANGLE SPRAY NOZZLES

120°	RF RG inch	PEW Female	PFW Male	PTW QC	Code	DE mm	DU mm	Capacity at different pressure values								Dimensions mm					
								(l/min) (bar)								H	L	L1			
								0.5	0.7	1.0	2.0	3.0	5.0	7.0	10						
1/8"	•	•	•	•	0390	0.79	1.2	0.16	0.19	0.23	0.32	0.39	0.50	0.60	0.71	19	24	26			
					0780	1.6	1.6	0.32	0.38	0.45	0.64	0.78	1.01	1.19	1.42						
					1200	2.0	2.8	0.82	0.97	1.15	1.63	2.00	2.58	3.06	3.65						
					1230	2.4	2.8	0.94	1.11	1.33	1.88	2.30	2.97	3.51	4.20						
					1270	2.4	3.2	1.10	1.30	1.56	2.20	2.70	3.49	4.12	4.93						
					1320	2.0	4.4	1.31	1.55	1.85	2.61	3.20	4.13	4.89	5.84						
	•	•	•	•	1390	3.2	3.2	1.59	1.88	2.25	3.18	3.90	5.03	5.96	7.12						
					1510	3.2	4.4	2.08	2.46	2.94	4.16	5.10	6.58	7.79	9.31						
					1700	4.0	4.4	2.86	3.38	4.04	5.72	7.00	9.04	10.7	12.8						
					0781	1.6	1.6	0.32	0.38	0.45	0.64	0.78	1.01	1.19	1.42				23	32	32
					1130	1.6	3.2	0.53	0.63	0.75	1.06	1.30	1.68	1.99	2.37						
					1160	1.6	4.4	0.65	0.77	0.92	1.31	1.60	2.07	2.44	2.92						
1190	1.6	5.6	0.78	0.92	1.10	1.55	1.90	2.45	2.90	3.47											
1271	2.0	3.2	1.10	1.30	1.56	2.20	2.70	3.49	4.12	4.93											
1321	2.0	4.4	1.31	1.55	1.85	2.61	3.20	4.13	4.89	5.84											
3/8"	•	•	•	•	1512	3.6	4.4	2.08	2.46	2.94	4.16	5.10	6.58	7.79	9.31	24	34	35			
					1601	3.6	5.6	2.45	2.90	3.46	4.90	6.00	7.75	9.17	11.0						
					1702	4.4	4.4	2.86	3.38	4.04	5.72	7.00	9.04	10.7	12.8						
					1781	5.2	4.4	3.18	3.77	4.50	6.37	7.80	10.1	11.9	14.2						
					1861	4.4	5.6	3.51	4.15	4.97	7.02	8.60	11.1	13.1	15.7						
					1941	5.2	5.6	3.84	4.54	5.43	7.68	9.40	12.1	14.4	17.2						
	•	•	•	•	2102	4.4	7.5	4.16	4.93	5.89	8.33	10.2	13.2	15.6	18.6						
					2110	5.2	6.0	4.49	5.31	6.35	8.98	11.0	14.2	16.8	20.1						
					2118	6.0	5.6	4.78	5.65	6.75	9.55	11.7	15.1	17.9	21.4						
					2133	6.0	6.0	5.43	6.42	7.68	10.9	13.3	17.2	20.3	24.3						
					2157	7.1	6.0	6.41	7.58	9.06	12.8	15.7	20.3	24.0	28.7						
					2172	6.0	7.9	7.02	8.31	9.93	14.0	17.2	22.2	26.3	31.4						
1/2"	•	•	•	2196	7.5	7.5	8.00	9.47	11.3	16.0	19.6	25.3	29.9	35.8							
				2220	7.5	7.9	8.98	10.6	12.7	18.0	22.0	28.4	33.6	40.2							
3/4"	•	•	•	2391	9.5	11.1	15.9	18.8	22.5	31.8	39.0	50.3	59.6	71.2	31	50	50				
		•	•	2630	12.7	14.3	25.7	30.4	36.4	51.4	63.0	81.3	96.2	115	39	55	58				

HOLLOW CONE NOZZLES

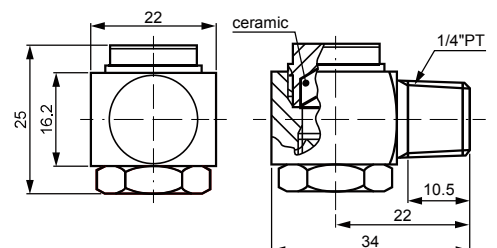
(STARCH NOZZLE) **PFS 1122 F5**

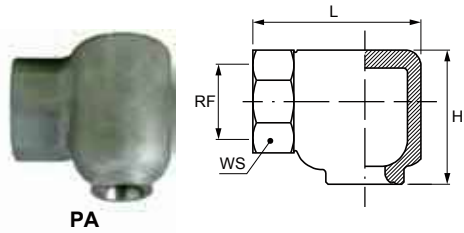
STARCH NOZZLE

In papermaking, the application of starch by spraying is a very common process aid used to provide additional paper strength and to improve the quality, surface and printability of the paper. Our **PFS 1122 F5** is a nozzle specially designed for spraying starch. Its bottom part in ceramic provides an excellent wear-resistance and its internal vaneless design minimizes clogging.



75°	RF inch	Code	D mm	Capacity at different pressure values								(l/min) (bar)
				(l/min) (bar)								
				0.5	0.7	1.0	2.0	3.0	5.0	7.0	10	
	1/4"	1122	2.0	0.51	0.59	0.72	1.00	1.22	1.55	1.86	2.22	





PA

TANGENTIAL NOZZLES

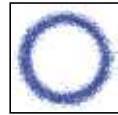
PA/PB tangential nozzles generate a hollow cone spray pattern of finely atomized droplets and work on the tangential flow principle. They are designed with a tangential method of atomization. Inside these nozzles there is an axial groove that injects the liquid tangentially into the vortex chamber where the strong centrifugal force produces a high rotational velocity and generates a finely atomized liquid flow. As these nozzles have a large free passage inside and no swirl insert, they offer the maximum resistance to clogging. PA/PB nozzles are widely used in exhaust scrubbers and are suitable to spray flows with particles.

Typical applications

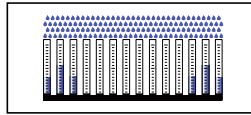
Washing: exhaust scrubbers, desulfuration, denitrification

Cooling: cooling of high temperature gas, product cooling

Thread specification: BSP, NPT (on request)



Spray section



Concave distribution



PB

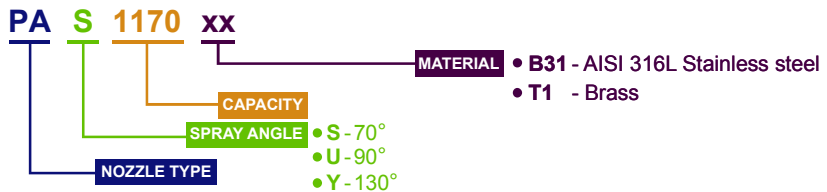
HOLLOW CONE NOZZLES

Code	RF inch	DE mm	DU mm	Capacity at different pressure values									Dimensions mm			
				0.3	0.5	0.7	1.0	2.0	3.0	5.0	7.0	10	H	L	WS	
70°	PAS 1170 xx	3/8"	3.5	2.0	0.54	0.69	0.82	0.98	1.39	1.70	2.19	2.60	3.10	27	37	22
90°	PAU 1390 xx	3/8"	4.0	3.8	1.23	1.59	1.88	2.25	3.18	3.90	5.03	5.96	7.12			
	PAU 1670 xx	1/2"	5.6	5.2	2.12	2.74	3.24	3.87	5.47	6.70	8.65	10.2	12.2	38	46	27
	PAU 1850 xx		5.7	6.0	2.69	3.47	4.11	4.91	6.94	8.50	11.0	13.0	15.5			
	PAU 2115 xx		6.6	6.9	3.64	4.69	5.56	6.64	9.39	11.5	14.8	17.6	21.0			
	PAU 2220 xx	3/4"	8.5	9.0	6.96	8.98	10.6	12.7	18.0	22.0	28.4	33.6	40.2	48	60	36
	PAU 2320 xx		9.5	11.5	10.1	13.1	15.5	18.5	26.1	32.0	41.3	48.9	58.4			
	PAU 2420 xx		9.6	14.0	13.3	17.1	20.3	24.2	34.3	42.0	54.2	64.2	76.7			
	PAU 2730 xx	1"	20x10	13.7	23.1	29.8	35.3	42.1	59.6	73.0	94.2	112	133	60	75	46
	PAU 2970 xx			16.5	30.7	39.6	46.9	56.0	79.2	97.0	125	148	177			
	PAU 3147 xx	1 1/2"	32x16	19.5	46.5	60.0	71.0	84.9	120	147	190	225	268	90	93	60
PAU 3194 xx			22.0	61.3	79.2	93.7	112	158	194	250	296	354				
PAU 3244 xx	2"	35x20	26.5	77.2	99.6	118	141	199	244	315	373	445	127	117	80	
PAU 3294 xx			28.5	93.0	120	142	170	240	294	380	449	537				
PAU 3364 xx	2 1/2"	25x40	29.5	115	149	176	210	297	364	470	556	665	156	140	100	
PAU 3490 xx			36.5	155	200	237	283	400	490	633	748	895				
PAU 3605 xx			45.0	191	247	292	349	494	605	781	924	1105				
130°	PBY 1390 xx	3/8"	3.0	4.5	1.23	1.59	1.88	2.25	3.18	3.90	5.03	5.96	7.12	27	37	22
	PBY 1850 xx		4.4	7.5	2.69	3.47	4.11	4.91	6.94	8.50	11.0	13.0	15.5			
	PBY 1980 xx	1/2"	4.0	12.0	3.10	4.00	4.73	5.66	8.00	9.80	12.7	15.0	17.9	35	46	27
	PBY 2128 xx		4.7	12.0	4.05	5.23	6.18	7.39	10.5	12.8	16.5	19.6	23.4			
	PBY 2208 xx		6.5	12.0	6.58	8.49	10.0	12.0	17.0	20.8	26.9	31.8	38.0			
	PBY 2220 xx	3/4"	6.1	15.0	6.96	8.98	10.6	12.7	18.0	22.0	28.4	33.6	40.2	50	60	36
	PBY 2320 xx		6.5	19.0	10.1	13.1	15.5	18.5	26.1	32.0	41.3	48.9	58.4			
	PBY 2420 xx		8.0	19.0	13.3	17.1	20.3	24.2	34.3	42.0	54.2	64.2	76.7			
	PBY 2730 xx	1"	13.4	26.0	23.1	29.8	35.3	42.1	59.6	73.0	94.2	112	133	60	93	47
	PBY 2970 xx		14.0	26.0	30.7	39.6	46.9	56.0	79.2	97.0	125	148	177			
	PBY 3147 xx	1 1/2"	15.0	37.0	46.5	60.0	71.0	84.9	120	147	190	225	268	75	111	60
	PBY 3194 xx		19.5	37.0	61.3	79.2	93.7	112	158	194	250	296	354			
	PBY 3244 xx	2"	22.0	45.0	77.2	99.6	118	141	199	244	315	373	445	91	140	75
PBY 3294 xx		27.1	45.0	93.0	120	142	170	240	294	380	449	537				
PBY 3364 xx	2 1/2"	25.5	64.0	115	149	176	210	297	364	470	556	665	128	193	90	
PBY 3490 xx		33.0	64.0	155	200	237	283	400	490	633	748	895				
PBY 3605 xx		38.0	64.0	191	247	292	349	494	605	781	924	1105				
PBY 3665 xx		43.0	64.0	210	271	321	384	543	665	859	1016	1214				

THREAD SIZE AND MATERIALS
The table on the right side shows thread size and materials

Material	3/8"	1/2"	3/4"	1"	1 1/2"	2"	2 1/2"
B31- AISI 316L SS				•	•	•	•
T1 - Brass	•	•	•	•			

HOW TO MAKE UP THE NOZZLE CODE
EX.: PAS 1170 B31



MOULDED PLASTIC NOZZLES

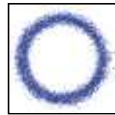
PN/PO series hollow cone nozzles made by plastic moulding, offer a high chemical resistance and low prices. They are tangential nozzles and produce a hollow cone spray of atomized droplets. As they have a large free passage and no swirling vane inside their body, they are highly clog-resistant. PN/PO nozzles are efficient, cost-effective and widely used in many processing lines. Moreover, they can be easily assembled in large quantity onto pipe manifolds.



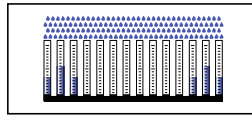
Thread specification

Male thread (PO series): BSPT
Female thread (PN series): BSP

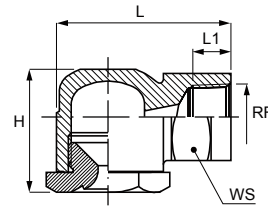
Max operation temperature: 90°C



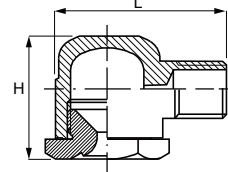
Spray section



Concave distribution



PN - Female



PO - Male

HOLLOW CONE NOZZLES

Spray Angle	RF	PNS	POS	Code	DE	DU	Capacity at different pressure values (l/min) (bar)										Dimensions mm			
	RG	Female	Male				0.5	0.7	1.0	2.0	3.0	5.0	7.0	10	H	L	L1	WS		
70°	3/8"	•	•	1170	2.4	2.5	0.69	0.82	0.98	1.39	1.70	2.19	2.60	3.10	31	44	20	22		
80°	3/8"	•	•	1260	2.7	3.3	1.06	1.26	1.50	2.12	2.60	3.36	3.97	4.75	31	44	20	22		
90°	3/8"	•	•	1390	3.6	2.8	1.59	1.88	2.25	3.18	3.90	5.03	5.96	7.12	31	44	20	22		
		•	•	1670	3.6	6.0	2.74	3.24	3.87	5.47	6.70	8.65	10.2	12.2						
		•	•	1850	4.4	5.2	3.47	4.11	4.91	6.94	8.50	11.0	13.0	15.5						
		•	•	2115	4.8	6.0	4.69	5.56	6.64	9.39	11.5	14.8	17.6	21.0						
		•	•	2220	6.4	9.1	8.98	10.6	12.7	18.0	22.0	28.4	33.6	40.2						
	•	•	2320	6.4	13.1	13.1	15.5	18.5	26.1	32.0	41.3	48.9	58.4	42	55	35	30			
•	•	2398	9.1	11.1	16.2	19.2	23.0	32.5	39.8	51.4	60.8	72.7								
130°	3/8"	•	•	1170	2.0	2.5	0.69	0.82	0.98	1.39	1.70	2.19	2.60	3.10	31	44	20	22		
		•	•	1260	2.0	3.2	1.06	1.26	1.50	2.12	2.60	3.36	3.97	4.75						
		•	•	1390	3.6	3.2	1.59	1.88	2.25	3.18	3.90	5.03	5.96	7.12						
		•	•	1460	3.6	4.0	1.88	2.22	2.66	3.76	4.60	5.94	7.03	8.40						
		•	•	1570	3.6	5.0	2.33	2.75	3.29	4.65	5.70	7.36	8.71	10.4						
		•	•	1670	3.6	6.0	2.74	3.24	3.87	5.47	6.70	8.65	10.2	12.2						
		•	•	1850	4.4	5.6	3.47	4.11	4.91	6.94	8.50	11.0	13.0	15.5						
		•	•	1980	4.4	6.0	4.00	4.73	5.66	8.00	9.80	12.7	15.0	17.9						
		•	•	2128	4.8	6.0	5.23	6.18	7.39	10.5	12.8	16.5	19.6	23.4						
		•	•	2208	6.4	7.1	8.49	10.0	12.0	17.0	20.8	26.9	31.8	38.0						
	•	•	2220	6.4	8.7	8.98	10.6	12.7	18.0	22.0	28.4	33.6	40.2							
	1/2"	•	•	2129	9.1	4.6	5.23	6.18	7.39	10.5	12.8	16.5	19.6	23.4	42	55	35	30		
		•	•	2209	9.1	6.4	8.49	10.0	12.0	17.0	20.8	26.9	31.8	38.0						
		•	•	2221	9.1	7.1	8.98	10.6	12.7	18.0	22.0	28.4	33.6	40.2						
		•	•	2320	9.1	8.7	13.1	15.5	18.5	26.1	32.0	41.3	48.9	58.4						
•		•	2420	9.1	10.3	17.1	20.3	24.2	34.3	42.0	54.2	64.2	76.7							

PO MALE THREAD NOZZLES

ZPB fastening clamps in plastic usually connect to 3/8" female threads. They are flexible, durable and low cost. Please see more on page 86.

TYPICAL APPLICATIONS

Washing: exhaust scrubbers, parts cleaning, pre-treatment in coating process, dust and foam control, filter spraying

Cooling: wire cooling, plastic pipe cooling

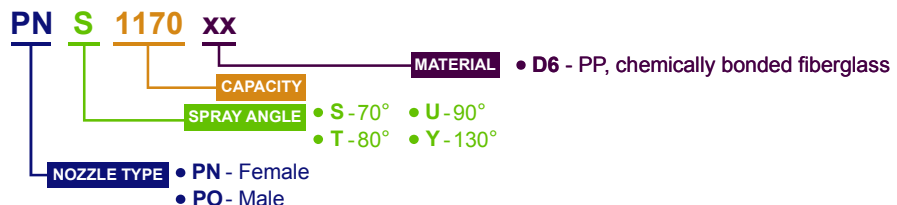
Other applications: humidification systems, etc.



PN (Female) + ZPB Plastic pipe clamp

HOW TO MAKE UP THE NOZZLE CODE

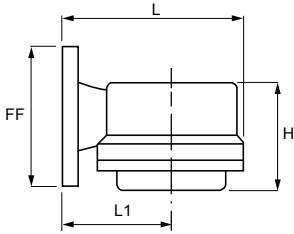
EX.: PNS 1170 D6



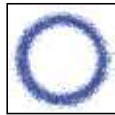


TANGENTIAL NOZZLES / LARGE FLOW RATES

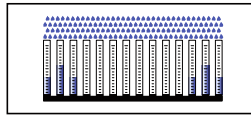
PR nozzles produce a hollow cone spray pattern based on the tangential jet principle generating atomized flows with large flow rates. They have a vaneless and large free inside passage and offer a considerable resistance to clogging and high performances.



- **Flange**
DIN2633-ND16, JIS
- **Typical applications**
Desulfurization
Denitrification
Exhaust scrubbers
Coke quenching towers



Spray section



Concave distribution

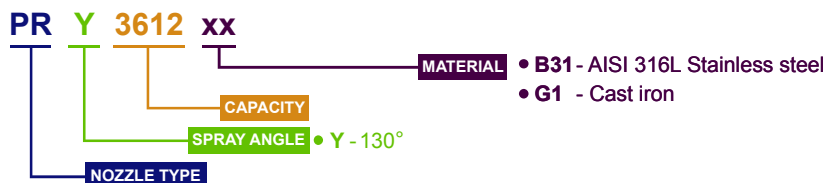


HOLLOW CONE NOZZLES

130°	Code	DN inch	DE mm	DU mm	Capacity at different pressure values (l/min) (bar)					Dimensions mm			
					0.5	1.0	2.0	3.0	5.0	FF	H	L	L1
130°	PRY 3612 xx	3"	31.0	90	250	353	500	612	790	200	157	250	150
	PRY 3685 xx		34.0	90	280	395	559	685	884				
	PRY 3771 xx		36.5	90	315	445	630	771	995				
	PRY 3869 xx		39.5	90	355	502	710	869	1122				
	PRY 3979 xx		40.0	90	400	565	799	979	1264				
	PRY 4110 xx		43.0	90	449	635	898	1100	1420				
	PRY 4122 xx	50.0	90	498	704	996	1220	1575					
	PRY 4153 xx	57.0	90	625	883	1249	1530	1975					
	PRY 4195 xx	4"	60.0	145	796	1126	1592	1950	2517	220	242	355	200
	PRY 4244 xx		70.0	145	996	1409	1992	2440	3150				
	PRY 4306 xx		79.0	145	1249	1767	2498	3060	3950				
	PRY 4385 xx		87.0	145	1572	2223	3144	3850	4970				

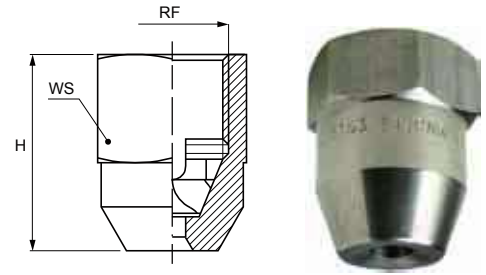
HOW TO MAKE UP THE NOZZLE CODE

EX.: PRY 3612 B31



IN LINE SPRAY / INSIDE VANE

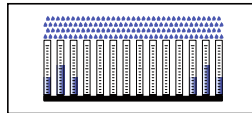
RA nozzles are tangential hollow cone nozzles that produce a finely atomized spray in line with the inlet supply pipe. In their body there is a carefully machined swirl vane with two spiral grooves which produce a wide range of capacities, starting from very low values. The strong centrifugal force inside the vortex chamber creates a high speed rotation of the liquid flow producing an atomized mist. For small capacity RA nozzles we suggest to place a suitable filter before their inlet orifice to avoid clogging.



■ Thread specification: BSP, NPT



Spray section



Concave distribution

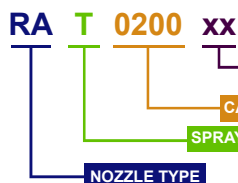
Code	RF inch	D mm	D1 mm	Capacity at different pressure values									Dimensions mm	
				0.5	0.7	1.0	2.0	3.0	5.0	7.0	10	H	WS	
80°	1/8"	1.0	0.5	0.08	0.10	0.12	0.16	0.20	0.26	0.31	0.37	18	17	
				0.16	0.19	0.23	0.32	0.39	0.50	0.60	0.71			
60°	3/8"	1.1	0.6	0.20	0.24	0.28	0.40	0.49	0.63	0.75	0.89	29	22	
				0.31	0.37	0.44	0.63	0.77	0.99	1.18	1.41			
				0.50	0.59	0.70	1.00	1.22	1.58	1.86	2.23			
90°	3/8"	3.0	1.0	0.85	1.00	1.20	1.70	2.08	2.69	3.18	3.80	29	22	
				1.25	1.48	1.77	2.50	3.06	3.95	4.67	5.59			
				2.00	2.37	2.83	4.00	4.90	6.33	7.48	8.95			
				2.50	2.96	3.53	5.00	6.12	7.90	9.35	11.2			
				3.15	3.73	4.46	6.30	7.72	9.97	11.8	14.1			
				4.25	5.02	6.00	8.49	10.4	13.4	15.9	19.0			
	1/2"	5.0	1.8	2.00	2.37	2.83	4.00	4.90	6.33	7.48	8.95	36	27	
					2.66	3.18	4.50	5.51	7.11	8.42	10.1			
					2.80	3.31	3.96	5.60	6.86	8.86	10.5			12.5
					4.00	4.73	5.66	8.00	9.80	12.7	15.0			17.9
					5.59	6.62	7.91	11.2	13.7	17.7	20.9			25.0
	6.3	2.0	4.00	6.25	7.39	8.83	12.5	15.3	19.8	23.4	27.9			
				7.39	8.83	12.5	15.3	19.8	23.4	27.9				
				8.00	9.47	11.3	16.0	19.6	25.3	29.9	35.8			
				8.00	9.47	11.3	16.0	19.6	25.3	29.9	35.8			

Typical applications

- Cooling:** gas, products, pipes cooling
- Washing:** exhaust scrubbers, parts washing
- Other applications:** dust control, humidification and air refreshing systems

HOW TO MAKE UP THE NOZZLE CODE

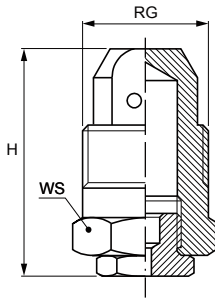
EX.: RAT 0200 B31



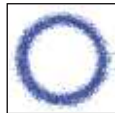
- NOZZLE TYPE**
- SPRAY ANGLE**
 - T - 80°
 - Q - 60°
 - U - 90°
- CAPACITY**
- MATERIAL**
 - B31 - AISI 316L Stainless steel
 - T1 - Brass
 - B1 - AISI 303 Stainless steel (optional)

IN LINE SPRAY / VANELESS

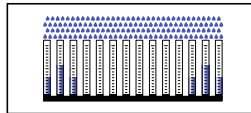
These nozzles, designed with no inside whirling vane and a wide unobstructed passage, produce a hollow cone spray pattern, and are highly resistant to clogging. The liquid flow enters at high speed through the top eccentric orifice into the nozzle swirl chamber where the strong centrifugal force generates finely atomized droplets. These nozzles, the ideal choice for dust control applications, are particularly suitable for coal dust suppression and for this reason they are called "miner's nozzles".



■ Thread specification: BSPT, NPT



Spray section



Concave distribution



HOLLOW CONE NOZZLES

Code	RG inch	D mm	D1 mm	Capacity at different pressure values								Dimensions mm	
				0.5	0.7	1.0	2.0	3.0	5.0	7.0	10	H	WS
60°	3/8"	2.0	2.0	0.65	0.77	0.92	1.31	1.60	2.07	2.44	2.92	31	17
		2.4	2.4	0.94	1.11	1.33	1.88	2.30	2.97	3.51	4.20		
		3.3	2.9	1.59	1.88	2.25	3.18	3.90	5.03	5.96	7.12		
		3.9	3.8	2.57	3.04	3.64	5.14	6.30	8.13	9.62	11.5		
		4.4	4.0	3.18	3.77	4.50	6.37	7.80	10.1	11.9	14.2		
4.4	*4.0	4.49	5.31	6.35	8.98	11.0	14.2	16.8	20.1				
70°	1/2"	3.3	3.2	1.59	1.88	2.25	3.18	3.90	5.03	5.96	7.12	37	22
		4.0	4.0	2.57	3.04	3.64	5.14	6.30	8.13	9.62	11.5		
		4.5	4.5	3.18	3.77	4.50	6.37	7.80	10.1	11.9	14.2		
		5.1	*4.4	4.82	5.70	6.81	9.63	11.8	15.2	18.0	21.5		
		6.1	*4.7	6.45	7.63	9.12	12.9	15.8	20.4	24.1	28.8		
	7.1	*5.2	7.96	9.42	11.3	15.9	19.5	25.2	29.8	35.6			
	3/4"	3.3	3.3	1.59	1.88	2.25	3.18	3.90	5.03	5.96	7.12	43	32
		4.2	4.2	2.57	3.04	3.64	5.14	6.30	8.13	9.62	11.5		
		4.7	4.5	3.18	3.77	4.50	6.37	7.80	10.1	11.9	14.2		
		5.4	5.4	4.82	5.70	6.81	9.63	11.8	15.2	18.0	21.5		
6.4		6.4	6.45	7.63	9.12	12.9	15.8	20.4	24.1	28.8			
7.7	7.1	7.96	9.42	11.3	15.9	19.5	25.2	29.8	35.6				
9.5	*7.1	15.9	18.8	22.5	31.8	39.0	50.3	59.6	71.2				
80°	1 1/2"	10.0	*7.9	12.7	15.0	17.9	25.3	31.0	40.0	47.4	56.6	69	50
		9.5	*9.5	15.9	18.8	22.5	31.8	39.0	50.3	59.6	71.2		
		11.1	*9.5	19.2	22.7	27.1	38.4	47.0	60.7	71.8	85.8		
		12.7	*9.5	22.5	26.6	31.8	44.9	55.0	71.0	84.0	100		
		14.3	*9.5	25.7	30.4	36.4	51.4	63.0	81.3	96.2	115		
		15.0	*9.5	28.6	33.8	40.4	57.2	70.0	90.4	107	128		
		15.9	*9.5	31.8	37.7	45.0	63.7	78.0	101	119	142		
		17.1	*9.5	35.1	41.5	49.7	70.2	86.0	111	131	157		
		18.3	*9.5	38.4	45.4	54.3	76.8	94.0	121	144	172		

* Double inlet orifice

Typical applications

Cooling: gas cooling, product cooling, pipe cooling

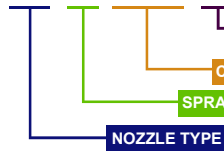
Washing: exhaust scrubbers, product cleaning

Other applications: dust control, humidification systems, sterilization

HOW TO MAKE UP THE NOZZLE CODE

EX.: RBQ 1160 B1

RB Q 1160 xx



MATERIAL

- B1 - AISI 313 Stainless steel
- T1 - Brass
- B31 - AISI 316L Stainless steel (optional)

CAPACITY

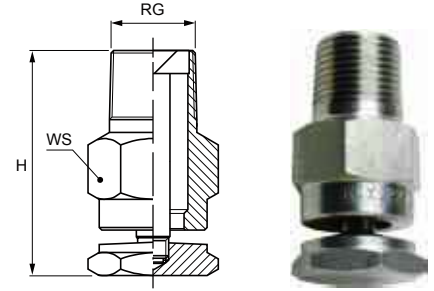
SPRAY ANGLE

- Q - 60°
- S - 70°
- T - 80°

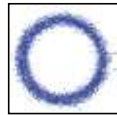
NOZZLE TYPE

IN LINE SPRAY

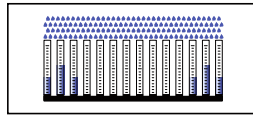
RC type deflected nozzles produce a ring-shaped hollow cone spray pattern, in line with the nozzle inlet supply pipe. The water flow hits the deflection cap fixed onto the nozzle outlet orifice producing small droplets, very wide spray angles and uniform distribution. The deflection cap determines the various deflection angles. This nozzles are highly efficient and clog resistant.



■ Thread specification: BSPT, NPT



Spray section



Concave distribution

°	RG inch		Code	Capacity at different pressure values								Dimensions mm		
	1/4"	3/8"		0.5	0.7	1.0	2.0	3.0	5.0	7.0	10	H	WS	
150°	•		RCY 1780 xx	3.18	3.77	4.50	6.37	7.80	10.1	11.9	14.2	33	17	
	•		RCY 2117 xx	4.82	5.70	6.81	9.63	11.8	15.2	18.0	21.5			
	•		RCY 2157 xx	6.41	7.58	9.06	12.8	15.7	20.3	24.0	28.7			
	•		RCY 2196 xx	7.96	9.42	11.3	15.9	19.5	25.2	29.8	35.6			
		•		RCY 2230 xx	9.39	11.1	13.3	18.8	23.0	29.7	35.1	42.0	44	22
		•		RCY 2270 xx	11.0	13.0	15.6	22.0	27.0	34.9	41.2	49.3		
	•		RCY 2310 xx	12.7	15.0	17.9	25.3	31.0	40.0	47.4	56.6			
	•		RCY 2350 xx	14.3	16.9	20.2	28.6	35.0	45.2	53.5	63.9			
	•		RCY 2390 xx	15.9	18.8	22.5	31.8	39.0	50.3	59.6	71.2			
180°	•		RCZ 1780 xx	3.18	3.77	4.50	6.37	7.80	10.1	11.9	14.2	33	17	
	•		RCZ 2117 xx	4.82	5.70	6.81	9.63	11.8	15.2	18.0	21.5			
	•		RCZ 2157 xx	6.41	7.58	9.06	12.8	15.7	20.3	24.0	28.7			
	•		RCZ 2196 xx	7.96	9.42	11.3	15.9	19.5	25.2	29.8	35.6			
		•		RCZ 2230 xx	9.39	11.1	13.3	18.8	23.0	29.7	35.1	42.0	44	22
		•		RCZ 2270 xx	11.0	13.0	15.6	22.0	27.0	34.9	41.2	49.3		
	•		RCZ 2310 xx	12.7	15.0	17.9	25.3	31.0	40.0	47.4	56.6			
	•		RCZ 2350 xx	14.3	16.9	20.2	28.6	35.0	45.2	53.5	63.9			
	•		RCZ 2390 xx	15.9	18.8	22.5	31.8	39.0	50.3	59.6	71.2			

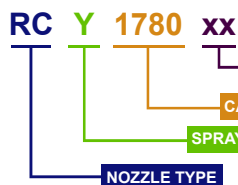
Typical applications

Washing: exhaust scrubbers, small tanks, pipes interiors

Other applications: pipes coating, dust control, fire protection

HOW TO MAKE UP THE NOZZLE CODE

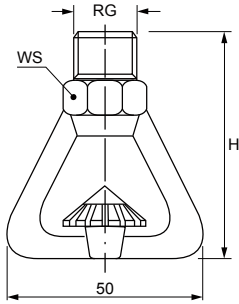
EX.: RCY 1780 B1



MATERIAL

- **B1** - AISI 313 Stainless steel
- **T1** - Brass
- **B31** - AISI 316L Stainless steel (optional)

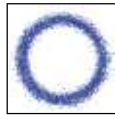
- **Y** - 150°
- **Z** - 180°



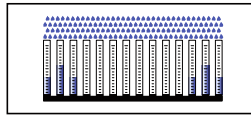
DEFLECTED SPRAY

RO hollow cone deflected spray nozzles are specially designed for fire-fighting engineering. They produce an excellent water atomization and their deflected jet assures a wide spray coverage. The spray pattern is formed by the liquid flowing from the nozzle orifice over the surface of the below deflector with a special slotted design. All RO nozzles are certified by the EU fire regulations.

- **Thread specification:** BSPT, NPT
- **Typical applications**
Fire-fighting: fire extinguishing, cooling
Other applications: tank cleaning, exhaust scrubbers



Spray section



Concave distribution



HOLLOW CONE NOZZLES



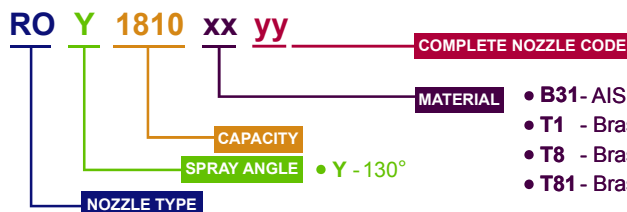
Code	RG inch	D mm	Capacity at different pressure values (l/min) (bar)						WS mm	H mm	
			1.0	3.0	5.0	6.0	7.0	10.0			
130°	ROY 1810 xx yy	1/2"	3.0	4.8	8.1	10.3	11.3	12.2	14.5	25	65
	ROY 2115 xx yy		3.5	6.7	11.5	14.9	16.4	17.6	20.5		
	ROY 2156 xx yy		4.0	9.0	15.6	20.0	22.0	24.0	29.0		
	ROY 2198 xx yy		4.5	11.5	19.8	25.0	28.0	30.0	36.0		
	ROY 2270 xx yy		5.0	15.8	27.0	35.0	39.0	42.0	50.0		
	ROY 2300 xx yy		5.5	18.0	30.0	40.0	44.0	48.0	57.0		
	ROY 2390 xx yy		6.0	23.0	39.0	50.0	55.0	60.0	71.0		
	ROY 2470 xx yy		6.5	27.0	47.0	61.0	66.0	72.0	86.0		
	ROY 2550 xx yy		7.0	31.0	55.0	72.0	77.0	84.0	91.0		
	ROY 2700 xx yy		8.0	41.0	70.0	92.0	103	112	130		
	ROY 2910 xx yy		9.0	52.0	91.0	117	129	140	165		
ROY 3110 xx yy		10.0	64.0	110	139	152	165	200			
ROY 3164 xx yy		12.0	95.0	164	214	236	255	290			
130°	ROY 1811 xx yy	3/4"	3.0	4.8	8.1	10.3	11.3	12.2	14.5	27	65
	ROY 2116 xx yy		3.5	6.7	11.5	14.9	16.4	17.6	20.5		
	ROY 2157 xx yy		4.0	9.0	15.6	20.0	22.0	24.0	29.0		
	ROY 2199 xx yy		4.5	11.5	19.8	25.0	28.0	30.0	36.0		
	ROY 2271 xx yy		5.0	15.8	27.0	35.0	39.0	42.0	50.0		
	ROY 2301 xx yy		5.5	18.0	30.0	40.0	44.0	48.0	57.0		
	ROY 2391 xx yy		6.0	23.0	39.0	50.0	55.0	60.0	71.0		
	ROY 2471 xx yy		6.5	27.0	47.0	61.0	66.0	72.0	86.0		
	ROY 2551 xx yy		7.0	31.0	55.0	72.0	77.0	84.0	91.0		
	ROY 2701 xx yy		8.0	41.0	70.0	92.0	103	112	130		
	ROY 2911 xx yy		9.0	52.0	91.0	117	129	140	165		
ROY 3111 xx yy		10.0	64.0	110	139	152	165	200			
ROY 3165 xx yy		12.0	95.0	164	214	236	255	290			

COMPLETE NOZZLE CODE

Code	Connection	Filter material	
		Copper	SS
FB	BSP/BSPT	•	
FN	NPT	•	
GB	BSP/BSPT		•
GN	NPT		•
SN	NPT	NO FILTER	

HOW TO MAKE UP THE NOZZLE CODE

EX.: ROY 1810 B31FB

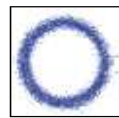


- **B31** - AISI 316L Stainless steel
- **T1** - Brass
- **T8** - Brass, nickel plated
- **T81** - Brass, electroless nickel plated

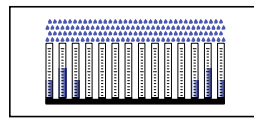
HYDRAULIC ATOMIZERS

RX/RZ series hydraulic nozzles deliver a very finely atomized hollow cone spray, even at low pressure values. They contain a precisely machined insert with narrow passages that can be easily disassembled for cleaning in case of obstruction. Clogging can be avoided placing a fine mesh strainer on the main manifold or using an individual filter.

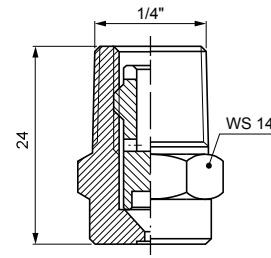
- **Thread specification:** BSPT, NPT
- **Typical applications**
dust control, humidification, deodorant spray, disinfectant liquid spray, exhaust scrubbers



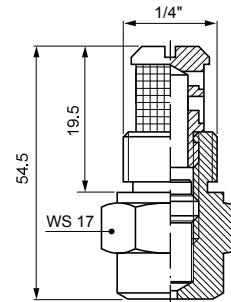
Spray section



Concave distribution



RX



RZ (+VEF)



VEF THREADED FILTERS

We suggest to use a VEF threaded filter to protect the nozzle against clogging.

ADDITIONAL SPRAY ANGLES

The spray angle of the RZQ nozzles is 60° with orifice dimensions larger than 1.0 mm. Please see additional angles in the table below.

RZF	RZM	RZQ	RZU
30°	45°	60°	90°

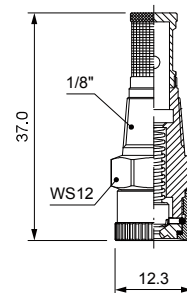
Code	D mm	Capacity (l/hour) at different pressure values (bar)										
		1.5	2.0	3.0	4.0	5.0	6.0	10	15	20	50	
80°	RXT 0060 xx	0.50	2.55	2.94	3.60	4.16	4.65	5.09	6.57	8.05	9.30	14.7
	RXT 0100 xx	0.50	4.24	4.90	6.00	6.93	7.75	8.49	11.0	13.4	15.5	24.5
	RXT 0130 xx	0.70	5.52	6.37	7.80	9.01	10.1	11.0	14.2	17.4	20.1	31.8
	RXT 0190 xx	0.70	8.06	9.31	11.4	13.2	14.7	16.1	20.8	25.5	29.4	46.5
	RXT 0250 xx	1.00	10.6	12.2	15.0	17.3	19.4	21.2	27.4	33.5	38.7	61.2
	RXT 0380 xx	1.00	16.1	18.6	22.8	26.3	29.4	32.2	41.6	51.0	58.9	93.1
	RXT 0510 xx	1.50	21.6	25.0	30.6	35.3	39.5	43.3	55.9	68.4	79.0	125
	RXT 0650 xx	1.60	27.6	31.8	39.0	45.0	50.3	55.2	71.2	87.2	101	159
	RXT 0780 xx	1.90	33.1	38.2	46.8	54.0	60.4	66.2	85.4	105	121	191
	RXT 0910 xx	1.90	38.6	44.6	54.6	63.0	70.5	77.2	99.7	122	141	223
	RXT 1116 xx	1.90	49.2	56.8	69.6	80.4	89.9	98.4	127	156	180	284
	RXT 1143 xx	1.90	60.7	70.1	85.8	99.1	111	121	157	192	222	350
	RXT 1166 xx	2.20	70.4	81.3	99.6	115	129	141	182	223	257	407

Code	D mm	Capacity (l/min) at different pressure values (bar)										
		1.5	2.0	3.0	4.0	5.0	6.0	10	15	20	50	
60°	RZQ 0080 xx	0.45	0.06	0.07	0.08	0.09	0.10	0.11	0.15	0.18	0.21	0.33
	RZQ 0120 xx	0.55	0.08	0.10	0.12	0.14	0.15	0.17	0.22	0.27	0.31	0.49
	RZQ 0250 xx	0.80	0.18	0.20	0.25	0.29	0.32	0.35	0.46	0.56	0.65	1.02
	RZQ 0390 xx	1.00	0.28	0.32	0.39	0.45	0.50	0.55	0.71	0.87	1.01	1.59
	RZQ 0560 xx	1.20	0.40	0.46	0.56	0.65	0.72	0.79	1.02	1.25	1.45	2.29
	RZQ 0780 xx	1.40	0.55	0.64	0.78	0.90	1.01	1.10	1.42	1.74	2.01	3.18
	RZQ 1100 xx	1.60	0.71	0.82	1.00	1.15	1.29	1.41	1.83	2.24	2.58	4.08
	RZQ 1140 xx	1.90	0.99	1.14	1.40	1.62	1.81	1.98	2.56	3.13	3.61	5.72
	RZQ 1170 xx	2.10	1.20	1.39	1.70	1.96	2.19	2.40	3.10	3.80	4.39	6.94
	RZQ 1200 xx	2.30	1.41	1.63	2.00	2.31	2.58	2.83	3.65	4.47	5.16	8.16

SISTER PRODUCTS

RXY 0620 C7 nozzles produce a very finely atomized spray with a wide angle. Their special tip in hard ceramic and internal swirl vane ensure a long service life and high resistance to wear. The nozzle body and filter are in Stainless Steel 316L. These nozzles are particularly suitable for chemical working environments and use a 120 Mesh filter to avoid clogging. Their special design ensure easy cleaning and simple servicing.

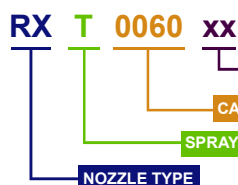
Code	D mm	Capacity (l/min) at different pressure values (bar)						
		1.5	2.0	2.5	3.0	4.0	5.0	
145°	RXY 0620 C7	1.96	0.44	0.51	0.57	0.62	0.72	0.80



RXY 0620 C7

HOW TO MAKE UP THE NOZZLE CODE

EX.: RXT 0060 B1



- **B1** - AISI 303 Stainless steel (RX)
- **B31**- AISI 316L Stainless steel (RZ)
- **C7** - AISI 316 Stainless steel+Ceramic (RX)
- **T1** - Brass