CYCO®

Exhaust Gas Cleaning System Nozzles

Dongguan Changyuan Spraying Technology Co.,Ltd.

Brief Introduction

Dongguan Changyuan Spraying Technology Limited Company, branding as CYCO, founded in 1997, is a professional manufacturer of spray nozzles and aftermarket sales. We are committed on research and design of industrial spray nozzles which includes full cone nozzles , hollow cone nozzles, spiral nozzles, air atomizing nozzles, tank washing nozzles and millions of different nozzles for over 22 years.

We are supplying many types of spray nozzles which are applied to marine scrubber for Exhaust Gas Cleaning System, such as spiral nozzle, short type full cone nozzle and large flowrate full cone nozzle which are made of plastic, silicone carbide, and stainless steel with various parameters.

Let us walk you through.

Contents

HOLLOW CONE / FULL CONE SPIRAL NOZZLE

Spraying Pattern

Spray pattern: solid cone & hollow cone spray

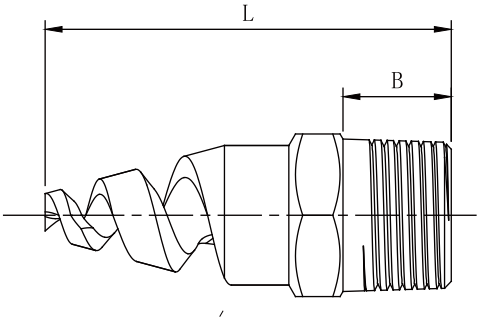
Spray angle : 60 °, 90 °, 120 °, 150 °, 170 °

Work pressure: 0.7-7 Bar

Flow rate range: 2.6l/min.- 6330l/min.

Thread size:1/4”-4”

Material: 254SMO , 316SS, 2205SS, 2507SS, PTFE, PVDF



Performance Data

Pipe connetion NPT or BSPT (out)	Spray angle (0.7 bar) 60°	90°	120°	150°	170°	Capacity Size	Orifice Size (mm)	Capacity (L/Min) 0.7 bar	1.5 bar	3 bar	7 bar	25 bar
1/4	●	●	●	●	●	07	2.4	2.6	3.9	5.5	8.4	16
	●	●	●	●	●	13	3.2	4.9	7.3	10.3	15.7	30
	●	●	●	●	●	20	4.0	7.6	11.2	15.8	24	46
3/8	●					07	2.4	2.6	3.9	5.5	8.4	16
	●					13	3.2	4.9	7.3	10.3	15.7	30
	●					20	4.0	7.6	11.2	15.8	24	46
	●	●	●	●	●	30	4.8	11.4	16.7	24	36	68
	●	●	●	●	●	40	5.6	15.1	22	32	48	91
	●	●	●	●	●	53	6.4	20	30	42	64	121
	●	●	●	●	●	82	7.9	31	46	65	99	187
1/2	●	●	●	●	●	120	9.5	45	67	95	145	270
	●	●	●	●	●	164	11.1	62	92	129	198	370
3/4	●	●	●	●	●	210	12.7	80	117	166	255	480
1	●	●	●	●	●	340	15.9	130	190	270	410	775
	●	●	●	●	●	470	19.1	179	260	370	565	1070
1-1/2	●	●	●	●	●	640	22.2	245	355	505	770	1460
	●	●	●	●	●	820	25.4	310	455	645	990	1870
	●	●	●	●	●	960	28.6	365	535	755	1160	2190
2	●	●	●	●	●	1400	34.9	535	780	1105	1690	3190
	●	●	●	●	●	1780	38.1	680	995	1405	2150	4060
3	●	●	●	●	●	2560	44.5	980	1430	2020	3090	5830
	●	●	●	●	●	3360	50.8	1280	1880	2650	4050	7660
4	●	●	●	●	●	5250	63.5	2000	2930	4140	6330	11960

Size

Nozzle inlet conn	Nozzle length (L) (mm)	Thread length (B) (mm)	Spray angle
1/4	53.9	12	60° 150° 170°
1/4	47.6	12	90° 120°
3/8	60.3	13	60° 150° 170°
3/8	47.6	13	90° 120°
1/2	79.4	16	60° 150° 170°
1/2	63.5	16	90° 120°
3/4	87.3	16	60° 150° 170°
3/4	69.9	16	90° 120°
1	116	20	60° 150° 170°
1	92.1	20	90° 120°
1 1/2	171	26	60° 150° 170°
1 1/2	111	26	90° 120°
2	175	35	60° to 170°
3	203	40	60° to 170°
4	229	40	60° 90° 120°

FLANGED SILICONE CARBIDE SPRAY NOZZLE

Spraying Pattern

The flanged spray nozzle, with a hollow cone spray pattern, fixs on the polyester flange, having a cuspidal structure which is made of carborundum. It also can be made of an alternative material. The flange connection size of this nozzle have 2",3" and 4". Under pressure of 0.7 bar, the flow rate are spread from 535l/min to 2000l/min. Spray angle: 2" is 60° to 180°, 3" and 4" are 60° to 120°.

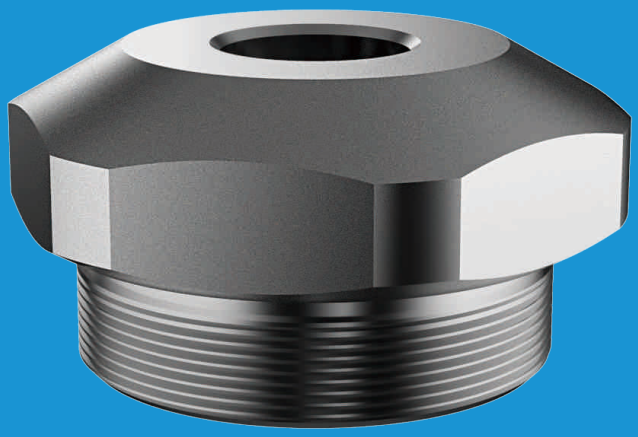
This high flow rate spray nozzle takes a great effect in pollution control, cooling and air infalting. Because of the big and fluent flow channel, it is seldom clogged.

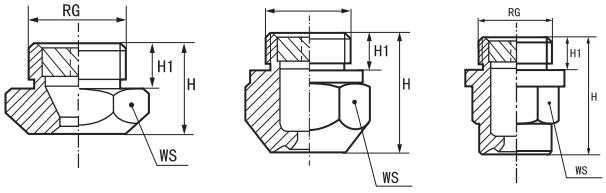
The crafty structural design can produce extremely uniform liquid coverage. With the flange which will provide more convenient installation and change.

Performance Data

Nozzle Inlet Conn	Spray angle (0.7 bar)				Capacity Size	Rated Orifice DIA (mm)	Capacity (l/min.)				
	60°	90°	120°	180°			0.7 bar	1.5 bar	3 bar	7 bar	25 bar
2 Inch Flange	●	●	●	●	1400	34.9	535	780	1105	1690	3190
	●	●	●	●	1780	38.1	680	995	1405	2150	4060
3 Inch Flange	●	●	●		2560	44.5	980	1430	2020	3090	5830
	●	●	●		3360	50.8	1280	1880	2650	4050	7660
4 Inch Flange	●	●	●		5250	63.5	2000	2930	4140	6330	11960

BBS/BBW SHORT TYPE FULL CONE NOZZLE





Spraying Pattern

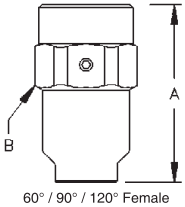
BBS/BBW series full cone nozzle is composed of nozzle body and special vane。 The special vane not only provides excellent atomization performance but also reduces the nozzle length effectively. The total length is reduced by 35% comparing to other types of full cone nozzles, which help to solve the installation problems with narrow space and reduce the cost of raw materials effectively.

Spray angle: 90°,120°
Work pressure: 0.7-10Bar
Flow rate range: 12.5l/min.-1415l/min
Thread size: 3/4”-4”
Material: 254SMO, 316SS, 2205SS, 2507SS, PVDF

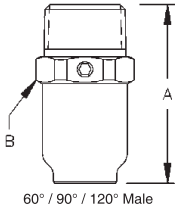
Performance Data

Spray Angle	Thread	Capacity Number	Orifice DIA (mm)	Maximum Free Particle Size (mm)	Capacity (l/min.) Under Different Pressure (Bar)								H (mm)	H1 (mm)	WS (mm)
					0.5	0.7	1.0	2.0	3.0	5.0	7.0	10			
90°	3/4″	039	6.1	3.0	12.5	14.7	17.6	24.9	30.5	39.4	46.6	55.7	22	10	32
		049	6.7	3.0	15.7	18.6	22.2	31.4	38.5	49.7	58.8	70.3			
		062	7.8	4.0	20.0	23.7	28.3	40.0	49.0	63.3	74.8	89.5			
	1″	078	9.0	4.0	24.9	29.5	35.2	49.8	61.0	78.7	93.2	111	27	12	40
		100	10.5	5.0	31.8	37.7	45.0	63.7	78.0	101	119	142			
	1-1/4″	157	12.5	6.0	50.2	59.4	71.0	100	123	159	188	225	30	14	50
	1-1/2″	248	16.0	6.0	79.2	93.7	112	158	194	250	296	354	35	16	60
	2″	396	20.0	7.0	127	150	179	253	310	400	474	566	45	18	75
		491	23.0	9.0	158	186	223	315	386	498	590	705			
	2-1/2″	626	25.0	12.0	200	237	283	400	490	633	748	895	52	22	90
		779	28.5	13.0	249	295	352	498	610	788	932	1114			
	3″	988	32.0	16.0	316	374	447	633	775	1001	1184	1415	60	24	110
120°	3/4″	063	7.9	3.0	20.0	23.7	28.3	40.0	49.0	63.3	74.8	89.5	38	11	32
	1″	100	13.7	6.0	31.8	37.7	45.0	63.7	78.0	101	119	142	47	15	40
	1-1/4″	157	12.7	6.0	50.2	59.4	71.0	100	123	159	188	225	62	19	50
	1-1/2″	248	16.0	6.0	79.2	93.7	112	158	194	250	296	354	77	21	50
	2″	396	20.0	10.0	127	150	179	253	310	400	474	566	99	24	60
		491	22.7	10.0	158	186	223	315	386	498	590	705			
	2-1/2″	626	25.5	12.0	200	237	283	400	490	633	748	895	123	27	75
		779	30.0	13.0	249	295	352	498	610	788	932	1114			
	3″	988	32.0	14.0	316	374	447	633	775	1001	1184	1415	150	30	85

DT FULL CONE MAX PASSAGE



60° / 90° / 120° Female



60° / 90° / 120° Male

Spraying Pattern

Design features:
1. Max passage for liquid
2. Internal removable vane
3. Male or female connections

Spray performance:
1. Spray pattern: Full cone with uniform distribution
2. Spray angle: 60°, 90°, and 120°
3. Flow rate: 6.26-8180 l/min.

Application:
1. Exhaust gas scrubber for Marine Industry
2. Cooling

Performance Data

DT Full Cone Max Passage

Full Cone, Narrow 60° (N), Medium 90° (M) and Wide 120° (W) Spray Angles, 3/4" to 6" Pipe Sizes, BSP or NPT

Nozzle Inlet Connect (in)	Nozle type	Spray Angle 60° 90° 120°	Capacity (l/min) 0.2 bar	0.3 bar	0.7 bar	1 bar	2 bar	3 bar	5 bar	7 bar	Rated Orifice Dia,(mm)	Rated Hole Dia,(mm)
3/4	2.5	60° 90°	6.25	7.57	11.3	13.3	18.5	22.3	28.4	33.3	4.76	4.83
	3	60° 90° 120°	7.50	9.08	13.5	16.0	22.1	26.8	34.1	39.9	5.16	
	4	60° 90° 120°	10.0	12.1	18.0	21.3	29.5	35.7	45.4	53.2	7.14	
	6	90° 120°	15.0	18.2	27.0	32.0	44.3	53.6	68.1	79.8	7.54	
	7	90° 120°	17.5	21.2	31.6	37.3	51.7	62.5	79.5	93.1	8.89	
1	4.2	60° 90°	10.5	12.7	18.9	22.4	31.0	37.5	47.7	55.9	6.35	6.35
	7	60° 90° 120°	17.5	21.2	31.6	37.3	51.7	62.5	79.5	93.1	8.33	7.87
	8	60° 90° 120°	20.0	24.2	36.1	42.6	59.1	71.5	90.9	106	8.89	7.87
	9	60° 90° 120°	22.5	27.2	40.6	48.0	66.4	80.4	102	120	10.2	7.87
	10	60° 90° 120°	25.0	30.3	45.1	53.3	73.8	89.3	114	133	10.7	7.87
	11	60° 90° 120°	27.5	33.3	49.6	58.6	81.2	98.3	125	146	11.2	7.87
	12	90° 120°	30.0	36.3	54.1	64.0	88.6	107	136	160	11.7	7.87
1 1/4	6	60° 90°	15.0	18.2	27.0	32.0	44.3	53.6	68.1	79.8	7.62	7.62
	10	60° 90°	25.0	30.3	45.1	53.3	73.8	89.3	114	133	9.92	9.65
	12	60° 90° 120°	30.0	36.3	54.1	64.0	88.6	107	136	160	10.7	9.65
	14	60° 90° 120°	35.0	42.4	63.1	74.6	103	125	159	186	11.7	9.65
	16	60° 90° 120°	40.0	48.4	72.1	85.3	118	143	182	213	12.3	9.65
	17	60° 90° 120°	42.5	51.5	76.6	90.6	126	152	193	226	13.5	9.65
	20	90° 120°	50.0	60.5	90.1	107	148	179	227	266	15.9	9.65

Performance Data

DT Full Cone Max Passage

Full Cone, Narrow 60° (N), Medium 90° (M) and Wide 120° (W) Spray Angles, 3/4" to 6" Pipe Sizes, BSP or NPT

Nozzle Inlet Connect (in)	Nozle type	Spray Angles 60° 90° 120°	Capacity (l/min.) 0.2 bar	0.3 bar	0.7 bar	1 bar	2 bar	3 bar	5 bar	7 bar	Rated Orifice Dia,(mm)	Rated Hole Dia,(mm)
1 1/2	10	60° 90°	25.0	30.3	45.1	53.3	73.8	89.3	114	133	9.92	9.53
	16	60° 90° 120°	40.0	48.4	72.1	85.3	118	143	182	213	13.5	9.53
	20	60° 90° 120°	50.0	60.5	90.1	107	148	179	227	266	14.3	10.4
	24	60° 90° 120°	60.0	72.6	108	128	177	214	273	319	15.9	10.4
	29	90° 120°	72.5	87.8	131	155	214	259	329	386	17.5	10.4
	30	90° 120°	75.0	90.8	135	160	221	268	341	399	19.1	10.4
2	17	60° 90°	42.5	51.5	76.6	90.9	126	152	193	226	12.3	12.2
	30	60° 90° 120°	75.0	90.8	135	160	221	268	341	399	16.3	14.2
	35	60° 90° 120°	87.6	106	158	187	258	313	397	466	18.3	14.2
	40	60° 90° 120°	100	121	180	213	295	357	454	532	19.8	14.2
	47	60° 90° 120°	118	142	212	251	347	420	534	625	24.6	14.2
	50	60° 90° 120°	125	151	225	266	369	447	568	665	27.9	14.2
	60	90° 120°	150	182	270	320	443	536	681	798	29.0	19.1
2 1/2	25	60° 90°	62.5	75.7	113	133	185	223	284	333	15.5	15.5
	50	60° 90°	125	151	225	266	369	447	568	665	22.1	19.1
	60	60° 90° 120°	150	182	270	320	443	536	681	798	24.4	19.1
	70	60° 90° 120°	175	212	316	373	517	625	795	931	27.2	19.1
	80	60° 90° 120°	200	242	361	426	591	715	909	1060	29.2	19.1
	90	90° 120°	225	272	406	480	664	804	1020	1200	32.3	19.1
3	42	60° 90°	105	127	189	224	310	375	477	559	19.1	19.1
	58	60° 90°	145	176	261	309	428	518	659	772	22.9	22.9
	80	60° 90° 120°	200	242	361	426	591	715	909	1060	27.9	25.4
	90	60° 90° 120°	225	272	406	480	664	804	1020	1200	30.6	25.4
	95	60° 90° 120°	238	288	428	506	701	849	1080	1260	28.6	25.4
	100	60° 90 120°	250	303	451	533	738	893	1140	1330	34.1	25.4
	117	60° 90° 120°	293	354	527	624	864	1050	1330	1560	36.1	25.4
	120	60° 90° 120°	300	363	541	640	886	1070	1360	1600	38.1	25.4
	135	90° 120°	338	409	608	720	997	1210	1530	1800	41.7	25.4
4	125	60° 90°	313	378	563	666	923	1120	1420	1660	34.3	33.8
	130	60° 90°	325	393	586	693	960	1160	1480	1730	35.1	
	160	60° 90°	400	484	721	853	1180	1430	1820	2130	40.6	
	180	60° 90° 120°	450	545	811	959	1330	1610	2040	2390	43.7	
	188	60° 90° 120°	470	569	847	1000	1390	1680	2140	2500	42.9	
	200	60° 90 120°	500	605	901	1070	1480	1790	2270	2660	47.6	
	210	60° 90° 120°	525	636	947	1120	1550	1880	2390	2790	51.6	
	250	90° 120°	625	757	1130	1330	1850	2230	2840	3330	57.0	
6	350	60° 90° 120°	876	1060	1580	1860	2580	3130	3980	4660	66.0	35.1
	480	90° 120°	1200	1450	2160	2560	3540	4290	5450	6390	71.1	42.9
	615	90° 120°	1540	1860	2770	3280	4540	5490	6980	8180	76.2	42.9

DP FULL CONE MAX FREE PASSAGE

Design features

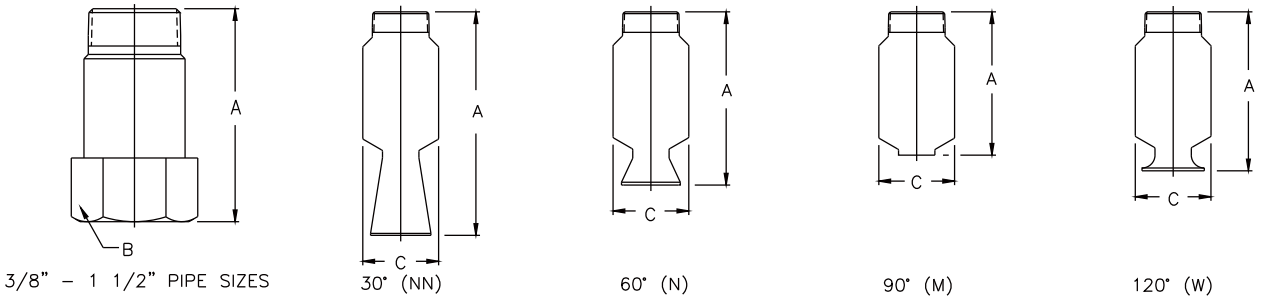
1. Full cone nozzle with largest free passage
2. Two special S-style internal vanes
3. Male or female connection
4. Flange connection available

Spray performance

1. Spray pattern: Full cone
2. Spray angles: 30°, 60°, 90° and 120°
3. Flow rate: 2.65-3701.73 l/min.

Application

1. Exhaust gas scrubber for Marine Industry
2. Cooling



DP FULL CONE MAX FREE PASSAGE

DP Flow Rates And Dimensions

Full Cone ,extra Narrow 30° (Nn),Narrow 60° (N) , Medium 90° (M)And Wide 120° (W) Spray Angles, 3/8 " To 4 " Pipe Size.

Male Or Female Pipe Size	Nozzle Number	GALLONS PER MINUTE @ PSI										Approx. Free Passage Dia.(In)	Approx.dimensions(In.) overallength (Max)					Wt (lbs.) Metal
		3 PSI	5 PSI	7 PSI	10 PSI	15 PSI	20 PSI	30 PSI	40 PSI	60 PSI	80 PSI		30° A	60° A	90° A	120° A	B	
3/8	125	0.70	0.89	1.04	1.23	1.49	1.70	2.06	2.35	2.85	3.26	0.125						0.19
	156	1.11	1.41	1.65	1.95	2.36	2.70	3.27	3.74	4.52	5.18	0.156	–	1.50	1.50	1.50	0.88	0.19
	187	1.60	2.03	2.38	2.82	3.41	3.90	4.72	5.40	6.54	7.48	0.188						0.16
1/2	187	1.60	2.03	2.38	2.82	3.41	3.90	4.72	5.40	6.54	7.48	0.188						0.28
	218	2.54	3.32	3.79	4.48	5.42	6.20	7.50	8.59	10.4	11.9	0.219	–	1.88	1.88	1.88	1.00	0.25
	250	2.87	3.65	4.27	5.05	6.11	7.00	8.47	9.70	11.7	13.4	0.250						0.25
3/4	281	3.53	4.48	5.25	6.21	7.51	8.60	10.4	11.9	14.4	16.5	0.281						0.50
	312	4.26	5.42	6.35	7.51	9.08	10.4	12.6	14.4	17.4	20.0	0.290						0.50
	343	5.21	6.62	7.75	9.17	11.1	12.7	15.4	17.6	21.3	24.4	0.344	4.00	2.50	2.50	2.50	1.25	0.44
	375	6.15	7.82	9.16	10.8	13.1	15.0	18.1	20.8	25.1	28.8	0.375						0.44
1	375	6.15	7.82	9.16	10.8	13.1	15.0	18.1	20.8	25.1	28.8	0.375						0.78
	406	7.38	9.38	11.0	13.0	15.7	18.0	21.8	24.9	30.2	34.5	0.406	4.38	2.94	2.94	2.94	1.50	0.72
	437	8.61	10.9	12.8	15.2	18.3	21.0	25.4	29.1	35.2	40.3	0.438						0.72
1 1/4	437	8.61	10.9	12.8	15.2	18.3	21.0	25.4	29.1	35.2	40.3	0.438						
	500	11.1	14.1	16.5	19.5	23.6	27.0	32.7	37.4	45.2	51.8	0.500						
	531	12.3	15.6	18.3	21.7	26.2	30.0	36.3	41.6	50.3	57.6	0.531	5.38	3.38	3.38	3.38	2.00	1.34
	562	13.5	17.2	20.1	23.8	28.8	33.0	39.9	45.7	55.3	63.3	0.562						
1 1/2	562	13.5	17.2	20.1	23.8	28.8	33.0	39.9	45.7	55.3	63.3	0.550						
	593	15.4	19.5	22.9	27.1	32.8	37.5	45.4	51.9	62.8	71.9	0.594						
	625	16.4	20.8	24.4	28.9	34.9	40.0	48.4	55.4	67.0	76.7	0.625	7.25	4.38	4.38	4.38	2.25	2.00
	656	19.9	25.3	29.6	35.0	42.4	48.5	58.7	67.2	81.3	93.0	0.656						
	687	20.9	26.6	31.1	36.8	44.6	51.0	61.7	70.6	85.5	97.8	0.688						
2	750	25.4	32.3	37.9	44.8	54.2	62.0	75.0	85.9	104	119	0.750						
	812	27.9	35.4	41.5	49.1	59.4	68.0	82.3	94.2	114	130	0.813	8.25	7.19	6.30	6.30	2.69	3.50
	875	34.4	43.8	51.3	60.6	73.4	84.0	102	116	141	161	0.875						
	937	38.5	49.0	57.4	67.9	82.1	94.0	114	130	158	180	0.938	9.00	7.63	6.00	6.50	3.25	
	1000	45.1	57.3	67.2	79.4	96.1	110	133	152	184	211	1.00	10.3	7.63	6.00	6.75	3.25	3.75
	1125	55.3	70.4	82.4	97.5	118	135	163	187	226	259	1.12						
2 1/2	1000	45.1	57.3	67.2	79.4	96.1	110	133	152	184	211	1.00						
	1125	55.3	70.4	82.4	97.5	118	135	163	187	226	259	1.12	12.0	9.63	6.50	7.13	3.25	4.50
	1250	66.4	84.4	98.9	117	142	162	196	224	271	311	1.24						
	1375	79.5	101	118	140	169	194	235	269	325	372	1.37	13.0	10.5	8.38	7.00	4.00	6.25
	1500	97.6	124	145	172	208	238	288	330	399	457	1.50						
3	1500	97.6	124	145	172	208	238	288	330	399	457	1.46						
	1625	115	146	171	202	245	280	339	388	469	537	1.62	13.5	11.0	9.00	9.88	4.75	7.25
	1750	131	167	195	231	280	320	387	443	536	614	1.75						
4	1750	131	167	195	231	280	320	387	443	536	614	1.75						
	1875	148	188	220	260	314	360	436	499	603	691	1.87	16.0	10.7	8.88	9.81	4.78	8.00
	2000	173	220	258	305	369	422	511	585	707	810	1.96						
	2125	193	245	287	339	411	470	569	651	788	902	2.12	16.0	14.7	11.6	12.7	6.06	16.0
	2250	209	266	311	368	446	510	617	706	855	978	2.25						

MATERIAL INTRODUCTION

Stainless Steel

254SMO

254SMO is one kind of Austenitic stainless steel, which with good corrosion resistense, normally they are used for sea desalination and gas desulfurization and denitrification.

316SS/316L

Cold denaturation, welding process performance, and perfect high-temperature strength, while 316L is slightly poor in high-temperature performance, but its corrosion resistance is better than 316SS, and low in carbon rate and contains 2%-3% of molybdenum, which improves the corrosion resistance of reductive salt and various inorganic and organic acids, alkaline and salt, and high-temperature strength.

Silicone Carbide

Made of ceramic materials, silicone carbide has the characteristics of high temperature resistance, oxidation resistance, high strength, extreme cold resistance, good thermal shock resistance, low temperature deformation, good thermal conductivity, wear and corrosion resistance.

Duplex Stainless Steel

2205

2205 belongs to austenitic ferrite duplex stainless steel with excellent corrosion resistance and strength characteristics. Comparing to SUS 316L and SUS 317L, 2205 is more resistant to partial corrosion which can be used in full set of chemical equipment, sea water desalination equipment.

2205 is widely used as a material for chemical equipment. It can also be applied to complete set of desalination equipment, sea water pump and other seawater environment, complete set of paper making equipment, chemical tanker, smoke extraction and desulphurization device, as well as Bridges with high requirements of strength and corrosion resistance.

Stainless steel

Duplex stainless steel

Plastic material

Silicone Carbide

2507

2507 is a ferrite-austenite (duplex) stainless steel that combines many of the best properties of ferritic and austenite steels. With a point corrosion index (PRE) higher than 40, it is a super duplex stainless steel with excellent corrosion resistance and strength characteristics. Due to the high content of chromium and molybdenum in the steel, it has excellent resistance to point corrosion, crack corrosion and uniform corrosion. The bi-directional microstructure ensures that the steel has a high resistance to stress corrosion and fracture, as well as high mechanical strength.

2507 is widely used in Chemical equipment, chemical ship, sea water desalination equipment, sea water pump, etc.

Plastic Material

PVDF(Polyvinylidene Fluoride)

PVDF has the strongest toughness, low friction coefficient, strong resistance of corrosion, agin, weather and radiation and other characteristics in fluoroplastic.

PTFE (Teflon)

Atmospheric aging resistance, radiation resistance and low permeability, the surface and performance remain unchanged even long-term exposure to the atmosphere .

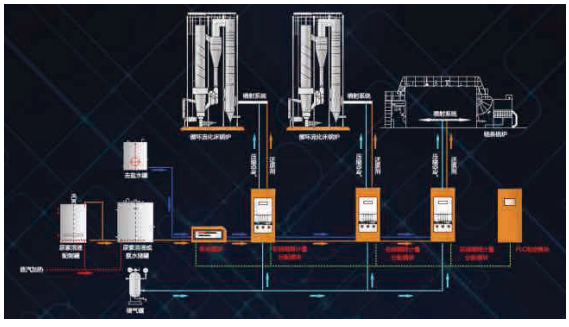
Incombustible: only the oxygen index is below 90.

Resistance to acid and base: Insoluble in strong acids, bases and organic solvents.

Oxidation resistance: resist the corrosion of strong oxidants.

Acid base: neutral

PRODUCT APPLICATION



Schematic diagram of exhaust gas

Steamship plant exhaust gas

Cement plant flue gas desulfurization and denitration

Power plant flue gas desulfurization and denitration

QUALITY GUARANTEE

Salt spray tester

Used for testing raw materials and other corrosion properties.

Material analysis

All raw materials are analyzed by material spectrum.

Quadratic element measuring instrument

Small holes and other precision size detection.

Coordinate measuring machine(CMM)

Ensure the product dimensional accuracy, positioning accuracy, geometric accuracy and the contour accuracy.

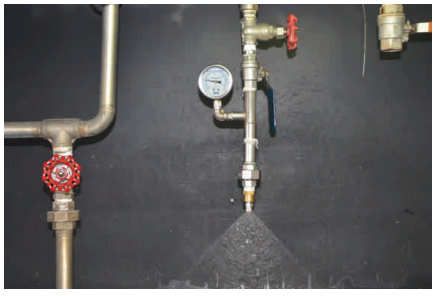
01 **Incoming inspection**

02 **IPQC**

03 **Finished goods inspection**

04 **Delivery inspection**

QUALITY GUARANTEE



Low flow rate testing worktable

Applied for testing of low flow rate spray nozzle, including angle, flow rate, performance (Full testing for spraying performance).

Medium flow rate testing equipment

Applied for testing of medium flow rate spray nozzle, including angle, flow rate, performance.

Large flow rate testing equipment

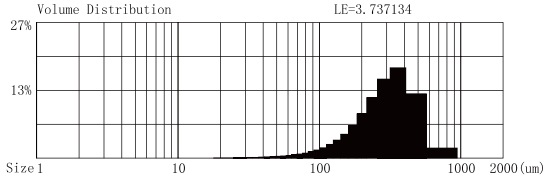
Applied for testing of large flow rate desulfuration spray nozzle, including angle, flow rate, performance, The pressure range 0-10 bar, flow rate range 200-2500l/min.

laser particle analyzer

The laser particle analyzer measures the droplet diameter size distribution by light scattering method.The particle size distribution is obtained by measuring the spatial angle distribution of the scattered light at a predetermined angle range at a fixed wavelength.

Droplet Testing Report

Nozzle Type	1/2SPJT-90120-316SS	Liquid Capacity(l/min)	
Water Pressure(MPa)	0.16	Air Capacity(l/min)	
Air Pressure(MPa)		Center Distance(mm)	
Test Height(mm)	470	Date of Test	
Test Instrument	LSA-III Lsaer Particle Sizer		12SPJT-90120-316SS-01



Size(um)		Volume%	Total%
14.3	16.0	0.0	0.0
16.0	17.9	0.1	0.1
17.9	20.0	0.1	0.1
20.0	22.3	0.1	0.2
22.3	24.8	0.1	0.3
24.8	27.5	0.1	0.4
27.5	30.5	0.1	0.6
30.5	33.7	0.2	0.7
33.7	37.2	0.2	0.9
37.2	40.9	0.3	1.2
40.9	44.7	0.3	1.5

Size(um)		Volume%	Total%
44.7	48.9	0.3	1.8
48.9	53.4	0.4	2.3
53.4	58.2	0.5	2.7
58.2	63.5	0.6	3.3
63.5	69.3	0.7	4.0
69.3	75.9	0.9	4.9
75.9	83.2	1.1	6.0
83.2	91.6	1.3	7.3
91.6	101.2	1.7	9.0
101.2	112.5	2.2	11.2
112.5	125.7	2.8	14.0

Size(um)		Volume%	Total%
125.7	141.5	3.7	17.7
141.5	160.8	4.9	22.6
160.8	184.9	6.6	29.2
184.9	216.0	9.0	38.2
216.0	257.9	12.3	50.4
257.9	317.6	16.1	66.5
317.6	410.1	18.3	84.8
410.1	574.1	13.1	97.9
574.1	948.6	2.1	100.0
948.6	558.4	0.0	100.0
X=304.2	N=2.1	F=800	

D(V,0.1)=106.33 um D(V,0.5)=256.41 um D(V,0.9)=475.17 um
SMD=190.15 um D43=276.03 um SPAN= 1.44

Test Result					
Testing		Auditing		Vising	
Remark	12SPJT-90120-316SS-01				

Changyuan Spraying & Purification Technology Co.,Ltd. Quality Control Department
R&D by Modern Optical Instrument Research Institude of Tianjin University

CERTIFICATES

CERTIFICATE OF REGISTRATION

This is to certify that:

Dongguan Changyuan Spraying Technology Co.,Ltd

No. 52, Jingfu Road, Xiabian Industrial Area, Chang'an Town, Dongguan, Guangdong, 523880, China

Operates a

QUALITY MANAGEMENT SYSTEM

Which complies with the requirements of

IATF 16949:2016

For the following scope of registration:

The design and manufacture of nozzle, the manufacture of hardware.

Certificate No.: AUTO40293
IATF Database No.: 0323004

Issue Date: 9 August 2018
Expiry Date: 8 August 2021

Kevin Goodwin
General Manager Technical Services
SAI Global Assurance

George Azedo
Automotive Technical Manager

Registered by:
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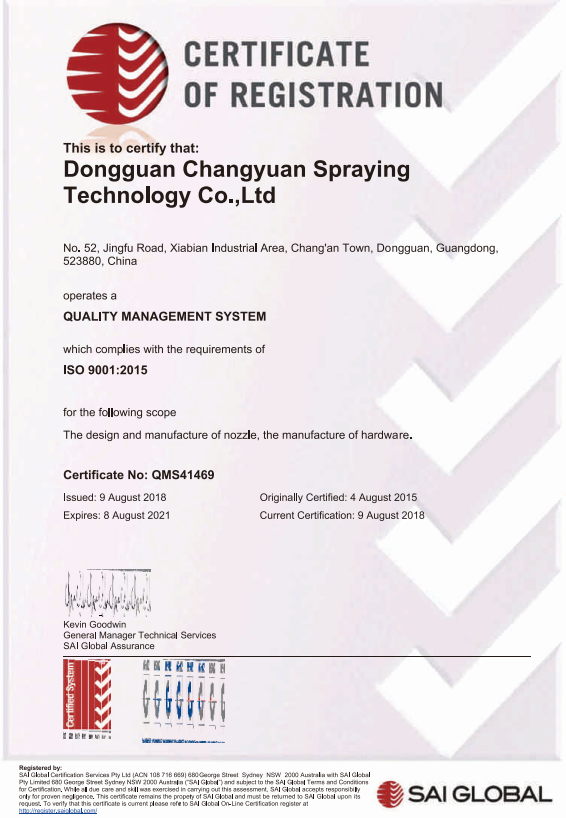

CERTIFICATE OF REGISTRATION

This is to certify that:

Dongguan Changyuan Spraying Technology Co.,Ltd

No. 52, Jingfu Road, Xiabian Industrial Area, Chang'an Town, Dongguan, Guangdong, 523880, China

operates a

QUALITY MANAGEMENT SYSTEM

which complies with the requirements of

ISO 9001:2015

for the following scope

The design and manufacture of nozzle, the manufacture of hardware.

Certificate No: QMS41469

Issued: 9 August 2018
Expires: 8 August 2021

Originally Certified: 4 August 2015
Current Certification: 9 August 2018

Kevin Goodwin
General Manager Technical Services
SAI Global Assurance

Registered by:
SAI Global Certification Services Pty Ltd (ACN 108 716 669) 680George Street Sydney NSW 2000 Australia with SAI Global Pty Limited 680 George Street Sydney NSW 2000 Australia ("SAI Global") and subject to the SAI Global Terms and Conditions for Certification. While all due care and skill was exercised in carrying out this assessment, SAI Global accepts responsibility only for proven negligence. This certificate remains the property of SAI Global and must be returned to SAI Global upon its request. To verify that this certificate is current please refer to SAI Global On-Line Certification register at http://register.saiglobal.com/

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