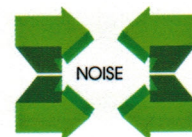


PCJ Industries Co. Ltd.

Measurement of Dynamic Insertion Loss of Duct Silencer

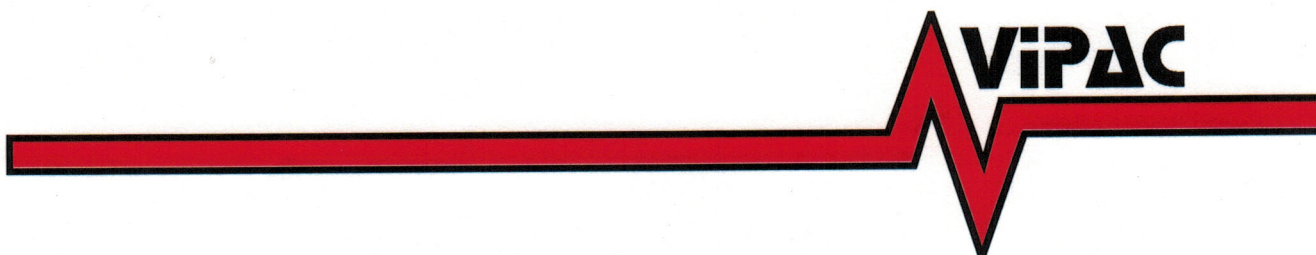
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N.A.T.A. Report No. 360154-03

Prepared by
Vipac Engineers & Scientists Ltd
November, 2003

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**TEST CERTIFICATE****MEASUREMENT OF DYNAMIC INSERTION LOSS OF DUCT SILENCERS**

SUPPLIED BY: PCJ INDUSTRIES CO LTD
TESTED BY: VIPAC ENGINEERS & SCIENTISTS LTD
TEST DATE: 12 - 13 / 11 / 2003
CLIENT: PCJ INDUSTRIES CO LTD
UNIT: Duct Silencer; Trade Mark: "STREAM AIR"; Type: DS
Sizes: Duct Silencer No.1 = 450mm x 450mm x 1000mm
Duct Silencer No.2 = 450mm x 450mm x 1500mm
Duct Silencer No.3 = 450mm x 450mm x 2000mm

STANDARD: AS 1277 "Acoustics-Measurement Procedures for Ducted Silencers"

**DYNAMIC INSERTION LOSS, dB
OCTAVE BAND CENTRE FREQUENCY**

Q (L/S)	Ps (Pa)	*63	125	250	500	1000	2000	4000	8000
Dynamic Insertion Loss									
Duct Silencer No.1									
300	0	1	8	12	28	37	35	22	17
500	1	2	8	11	27	36	34	22	17
700	2	1	8	11	27	36	34	21	17
Duct Silencer No.2									
300	0.5	4	10	18	41	44	45	32	25
500	3	4	11	17	42	43	44	33	25
700	5	4	11	18	41	44	44	32	25
Duct Silencer No.3									
300	1	5	13	24	47	46	48	38	31
500	5	5	12	24	47	46	48	39	32
700	12	5	13	23	46	47	48	39	32

LEGEND

Qs - Primary Air Flow Rate (l/s)
Ps - Supply Static Pressure (Pa)
* - NATA accreditation does not cover 63 Hz


Zarko Drinic
PROJECT ENGINEER

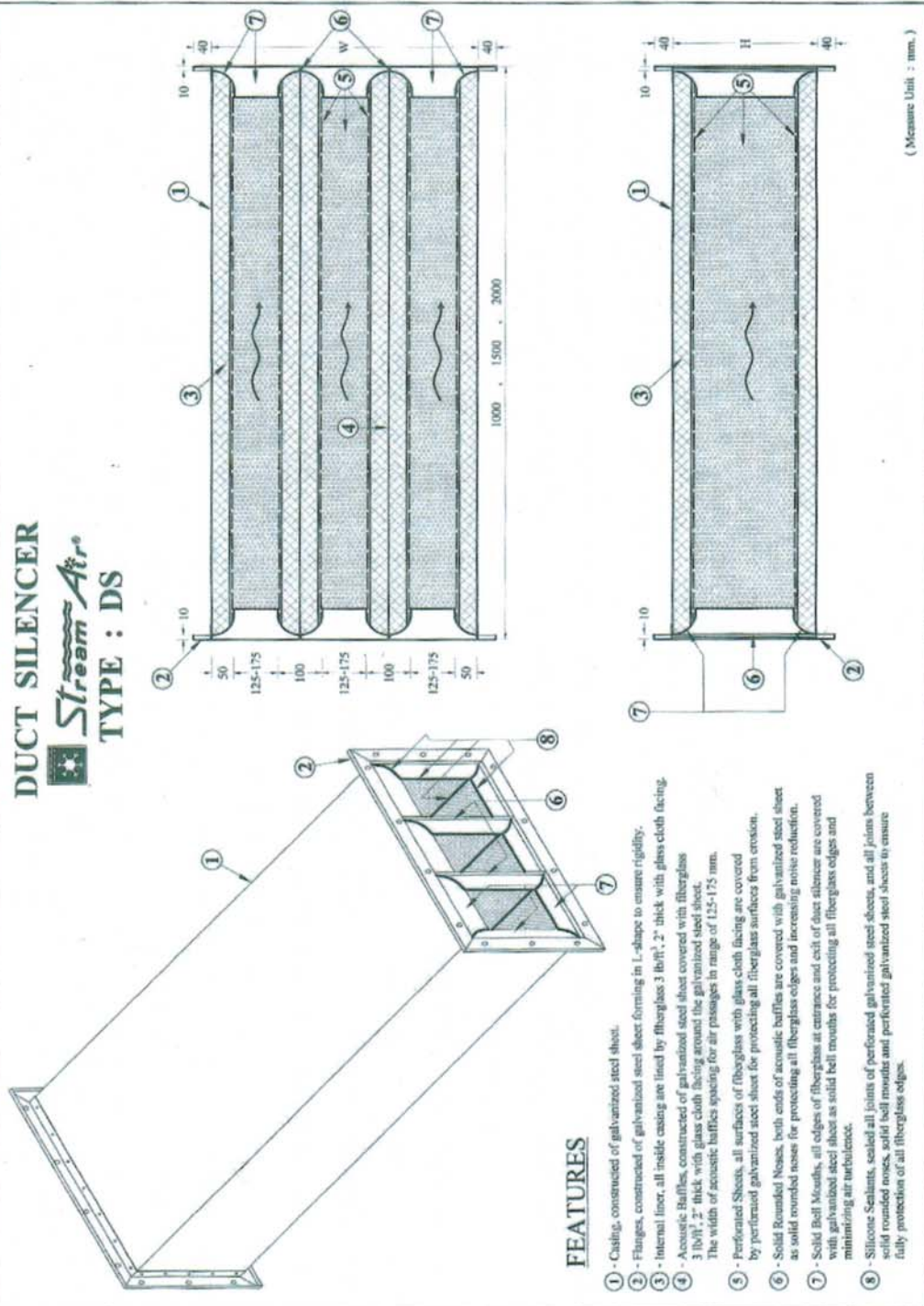

Norm Broner
N.A.T.A. SIGNATORY

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DUCT SILENCER

Stream Air
TYPE : DS



FEATURES

- ① - Casing, constructed of galvanized steel sheet.
- ② - Flanges, constructed of galvanized steel sheet forming in L-shape to ensure rigidity.
- ③ - Internal liner, all inside casing are lined by fiberglass 3 lb/ft², 2" thick with glass cloth facing.
- ④ - Acoustic Baffles, constructed of galvanized steel sheet covered with fiberglass 3 lb/ft², 2" thick with glass cloth facing around the galvanized steel sheet. The width of acoustic baffles spacing for air passages in range of 125-175 mm.
- ⑤ - Perforated Sheets, all surfaces of fiberglass with glass cloth facing are covered by perforated galvanized steel sheet for protecting all fiberglass surfaces from erosion.
- ⑥ - Solid Rounded Noses, both ends of acoustic baffles are covered with galvanized steel sheet as solid rounded noses for protecting all fiberglass edges and increasing noise reduction.
- ⑦ - Solid Bell Mouths, all edges of fiberglass at entrance and exit of duct silencer are covered with galvanized steel sheet as solid bell mouths for protecting all fiberglass edges and minimizing air turbulence.
- ⑧ - Silicone Sealants, sealed all joints of perforated galvanized steel sheets, and all joints between solid rounded noses, solid bell mouths and perforated galvanized steel sheets to ensure fully protection of all fiberglass edges.



Type : DS

Duct Silencer

Dynamic Insertion loss Data

Length m (ft)	Outlet Velocity MPS (FPM)	Octave Band Centre Frequency - Hz							
		63	125	250	500	1000	2000	4000	8000
		Dynamic Insertion Loss - dB							
1.0 (3.28)	3.409 (671)	1	8	12	28	37	35	22	17
	5.682 (1119)	2	8	11	27	36	34	22	17
	7.955 (1566)	1	8	11	27	36	34	21	17
1.5 (4.92)	3.409 (671)	4	10	18	41	44	45	32	25
	5.682 (1119)	4	11	17	42	43	44	33	25
	7.955 (1566)	4	11	18	41	44	44	32	25
2.0 (6.56)	3.409 (671)	5	13	24	47	46	48	38	31
	5.682 (1119)	5	12	24	47	46	48	39	32
	7.955 (1566)	5	13	23	46	47	48	39	32



Type : DS

Duct Silencer

Performance Data

Listed Size		Outlet Velocity MPS (FPM)	3 (591)	4 (787)	5 (984)	6 (1181)	7 (1977)	8 (1575)
mm. (Ak - m ²)	inches (Ak - ft ²)	Length - m (ft)	Static Pressure Drop, Ps - Pa (in.wg.)					
		1.0 (3.28)	0.0 (0.000)	0.3 (0.001)	0.7 (0.003)	1.1 (0.004)	1.6 (0.006)	2.0 (0.008)
		1.5 (4.92)	0.0 (0.000)	1.2 (0.005)	2.3 (0.009)	3.3 (0.013)	4.2 (0.017)	5.0 (0.020)
		2.0 (6.56)	0.6 (0.002)	1.8 (0.007)	3.5 (0.014)	5.8 (0.023)	8.7 (0.035)	12.2 (0.049)
450 x 450 (0.088)	18" x 18" (0.947)	CMS (CFM)	0.264 (560)	0.352 (745)	0.440 (932)	0.528 (1118)	0.616 (1872)	0.704 (1492)
600 x 300 (0.080)	24" x 12" (0.861)	CMS (CFM)	0.240 (509)	0.320 (678)	0.400 (847)	0.480 (1017)	0.560 (1702)	0.640 (1356)
700 x 400 (0.120)	28" x 16" (1.292)	CMS (CFM)	0.360 (764)	0.480 (1017)	0.600 (1271)	0.720 (1526)	0.840 (2554)	0.960 (2035)
800 x 400 (0.150)	32" x 16" (1.615)	CMS (CFM)	0.450 (954)	0.600 (1271)	0.750 (1589)	0.900 (1907)	1.050 (3193)	1.200 (2544)
800 x 500 (0.200)	32" x 20" (2.153)	CMS (CFM)	0.600 (1272)	0.800 (1694)	1.000 (2119)	1.200 (2543)	1.400 (4256)	1.600 (3391)
900 x 500 (0.200)	36" x 20" (2.153)	CMS (CFM)	0.600 (1272)	0.800 (1694)	1.000 (2119)	1.200 (2543)	1.400 (4256)	1.600 (3391)
900 x 600 (0.250)	36" x 24" (2.691)	CMS (CFM)	0.750 (1590)	1.000 (2118)	1.250 (2648)	1.500 (3178)	1.750 (5320)	2.000 (4238)
1000 x 500 (0.240)	40" x 20" (2.583)	CMS (CFM)	0.720 (1527)	0.960 (2033)	1.200 (2542)	1.440 (3051)	1.680 (5107)	1.920 (4068)
1000 x 600 (0.300)	40" x 24" (3.229)	CMS (CFM)	0.900 (1908)	1.200 (2541)	1.500 (3177)	1.800 (3813)	2.100 (6384)	2.400 (5086)
1000 x 750 (0.390)	40" x 30" (4.198)	CMS (CFM)	1.170 (2481)	1.560 (3304)	1.950 (4131)	2.340 (4958)	2.730 (8299)	3.120 (6612)
1100 x 600 (0.350)	44" x 24" (3.767)	CMS (CFM)	1.050 (2226)	1.400 (2965)	1.750 (3707)	2.100 (4449)	2.450 (7447)	2.800 (5933)
1100 x 750 (0.455)	44" x 30" (4.898)	CMS (CFM)	1.365 (2895)	1.820 (3855)	2.275 (4820)	2.730 (5785)	3.185 (9683)	3.640 (7714)
1100 x 900 (0.560)	44" x 36" (6.028)	CMS (CFM)	1.680 (3563)	2.240 (4744)	2.800 (5932)	3.360 (7119)	3.920 (11917)	4.480 (9494)
1200 x 600 (0.350)	48" x 24" (3.767)	CMS (CFM)	1.050 (2226)	1.400 (2965)	1.750 (3707)	2.100 (4449)	2.450 (7447)	2.800 (5933)
1200 x 750 (0.455)	48" x 30" (4.898)	CMS (CFM)	1.365 (2895)	1.820 (3855)	2.275 (4820)	2.730 (5785)	3.185 (9683)	3.640 (7714)
1200 x 900 (0.56)	48" x 36" (6.028)	CMS (CFM)	1.680 (3563)	2.240 (4744)	2.800 (5932)	3.360 (7119)	3.920 (11917)	4.480 (9494)
1350 x 750 (0.553)	54" x 30" (5.952)	CMS (CFM)	1.659 (3518)	2.212 (4684)	2.765 (5857)	3.318 (7029)	3.871 (11767)	4.424 (9374)
1350 x 900 (0.680)	54" x 36" (7.319)	CMS (CFM)	2.040 (4326)	2.720 (5760)	3.400 (7202)	4.080 (8644)	4.760 (14470)	5.440 (11527)
1350 x 1000 (0.765)	54" x 40" (8.234)	CMS (CFM)	2.295 (4866)	3.060 (6480)	3.825 (8102)	4.590 (9724)	5.355 (16279)	6.120 (12969)
1500 x 900 (0.720)	60" x 36" (7.750)	CMS (CFM)	2.160 (4580)	2.880 (6099)	3.600 (7626)	4.320 (9153)	5.040 (15322)	5.760 (12206)
1500 x 1000 (0.810)	60" x 40" (8.719)	CMS (CFM)	2.430 (5153)	3.240 (6862)	4.050 (8579)	4.860 (10297)	5.670 (17237)	6.480 (13732)
1500 x 1050 (0.855)	60" x 42" (9.203)	CMS (CFM)	2.565 (5439)	3.420 (7243)	4.275 (9056)	5.130 (10869)	5.985 (18194)	6.840 (14495)
1500 x 1200 (0.990)	60" x 48" (10.656)	CMS (CFM)	2.970 (6298)	3.960 (8386)	4.950 (10486)	5.940 (12585)	6.930 (21067)	7.920 (16783)
1650 x 1000 (0.945)	66" x 40" (10.172)	CMS (CFM)	2.835 (6012)	3.780 (8005)	4.725 (10009)	5.670 (12013)	6.615 (20110)	7.560 (16021)
1650 x 1050 (0.998)	66" x 42" (10.742)	CMS (CFM)	2.994 (6349)	3.992 (8454)	4.990 (10570)	5.988 (12686)	6.986 (21237)	7.984 (16919)
1650 x 1200 (1.155)	66" x 48" (12.432)	CMS (CFM)	3.465 (7347)	4.620 (9784)	5.775 (12233)	6.930 (14682)	8.085 (24578)	9.240 (19580)
1800 x 1200 (1.210)	72" x 48" (13.024)	CMS (CFM)	3.630 (7697)	4.840 (10250)	6.050 (12816)	7.260 (15381)	8.470 (25748)	9.680 (20513)
1800 x 1350 (1.375)	72" x 54" (14.800)	CMS (CFM)	4.125 (8747)	5.500 (11648)	6.875 (14563)	8.250 (17479)	9.625 (29260)	11.000 (23310)
1800 x 1500 (1.540)	72" x 60" (16.576)	CMS (CFM)	4.620 (9796)	6.160 (13045)	7.700 (16311)	9.240 (19576)	10.780 (32771)	12.320 (26107)
2000 x 1350 (1.500)	80" x 54" (16.146)	CMS (CFM)	4.500 (9542)	6.000 (12707)	7.500 (15888)	9.000 (19068)	10.500 (31921)	12.000 (25430)
2000 x 1500 (1.680)	80" x 60" (18.083)	CMS (CFM)	5.040 (10687)	6.720 (14231)	8.400 (17794)	10.080 (21356)	11.760 (35750)	13.440 (28481)



Type : DS

Duct Silencer

Physical Data

Listed Size		Length - m (ft)					
		1.0 (3.28)		1.5 (4.92)		2.0 (6.56)	
		Weight	Volume	Weight	Volume	Weight	Volume
mm.	inches	kgs (lbs)	m ³ (ft ³)	kgs (lbs)	m ³ (ft ³)	kgs (lbs)	m ³ (ft ³)
450 x 450	18" x 18"	36 (79)	0.2 (7)	50 (110)	0.3 (11)	64 (141)	0.4 (14)
600 x 300	24" x 12 "	33 (73)	0.2 (7)	46 (101)	0.3 (11)	59 (130)	0.4 (14)
700 x 400	28" x 16'	47 (104)	0.3 (11)	65 (143)	0.4 (14)	79 (174)	0.6 (21)
800 x 400	32" x 16"	50 (110)	0.3 (11)	70 (154)	0.5 (18)	89 (196)	0.6 (21)
800 x 500	32" x 20"	56 (123)	0.4 (14)	73 (161)	0.6 (21)	90 (198)	0.8 (28)
900 x 500	36" x 20"	67 (148)	0.5 (18)	94 (207)	0.7 (25)	121 (267)	0.9 (32)
900 x 600	36" x 24"	75 (165)	0.5 (18)	106 (234)	0.8 (28)	136 (300)	1.1 (39)
1000 x 500	40" x 20"	70 (154)	0.5 (18)	99 (218)	0.8 (28)	127 (280)	1.0 (35)
1000 x 600	40" x 24"	78 (172)	0.6 (21)	110 (243)	0.9 (32)	141 (311)	1.2 (42)
1000 x 750	40" x 30"	90 (198)	0.8 (28)	127 (280)	1.1 (39)	164 (362)	1.5 (53)
1100 x 600	44" x 24"	80 (176)	0.7 (25)	114 (251)	1.0 (35)	147 (324)	1.3 (46)
1100 x 750	44" x 30"	93 (205)	0.8 (28)	131 (289)	1.2 (42)	169 (373)	1.7 (60)
1100 x 900	44" x 36"	105 (231)	1.0 (35)	148 (326)	1.5 (53)	191 (421)	2.0 (71)
1200 x 600	48" x 24"	93 (205)	0.7 (25)	132 (291)	1.1 (39)	170 (375)	1.4 (49)
1200 x 750	48" x 30"	106 (234)	0.9 (32)	152 (335)	1.4 (49)	196 (432)	1.8 (64)
1200 x 900	48" x 36"	121 (267)	1.1 (39)	172 (379)	1.6 (57)	222 (489)	2.2 (78)
1350 x 750	54" x 30"	114 (251)	1.0 (35)	161 (355)	1.5 (53)	208 (459)	2.0 (71)
1350 x 900	54" x 36"	127 (280)	1.2 (42)	176 (388)	1.8 (64)	232 (511)	2.4 (85)
1350 x 1000	54" x 40"	136 (300)	1.4 (49)	194 (428)	2.0 (71)	251 (553)	2.7 (95)
1500 x 900	60" x 36"	145 (320)	1.4 (49)	207 (456)	2.0 (71)	267 (589)	2.7 (95)
1500 x 1000	60" x 40"	155 (342)	1.5 (53)	220 (485)	2.3 (81)	286 (631)	3.0 (106)
1500 x 1050	60" x 42"	163 (359)	1.6 (57)	232 (511)	2.4 (85)	300 (661)	3.2 (113)
1500 x 1200	60" x 48"	178 (392)	1.8 (64)	254 (560)	2.7 (95)	328 (723)	3.6 (127)
1650 x 1000	66" x 40"	160 (353)	1.7 (60)	227 (500)	2.5 (88)	294 (648)	3.3 (117)
1650 x 1050	66" x 42"	166 (366)	1.7 (60)	237 (522)	2.6 (92)	307 (677)	3.5 (124)
1650 x 1200	66" x 48"	183 (403)	2.0 (71)	260 (573)	3.0 (106)	337 (743)	4.0 (141)
1800 x 1200	72" x 48"	207 (456)	2.2 (78)	295 (650)	3.2 (113)	382 (842)	4.3 (152)
1800 x 1350	72" x 54"	229 (505)	2.4 (85)	327 (721)	3.6 (127)	424 (935)	4.9 (173)
1800 x 1500	72" x 60"	247 (545)	2.7 (95)	353 (778)	4.1 (145)	458 (1010)	5.4 (191)
2000 x 1350	80" x 54"	256 (564)	2.7 (95)	366 (807)	4.1 (145)	474 (1045)	5.4 (191)
2000 x 1500	80" x 60"	277 (611)	3.0 (106)	389 (858)	4.5 (159)	462 (1019)	6.0 (212)

Note : Weight and Volume values shown are approximate values only.