

PCJ Industries Co. Ltd.

# Measurement of Dynamic Insertion Loss of Duct Silencer

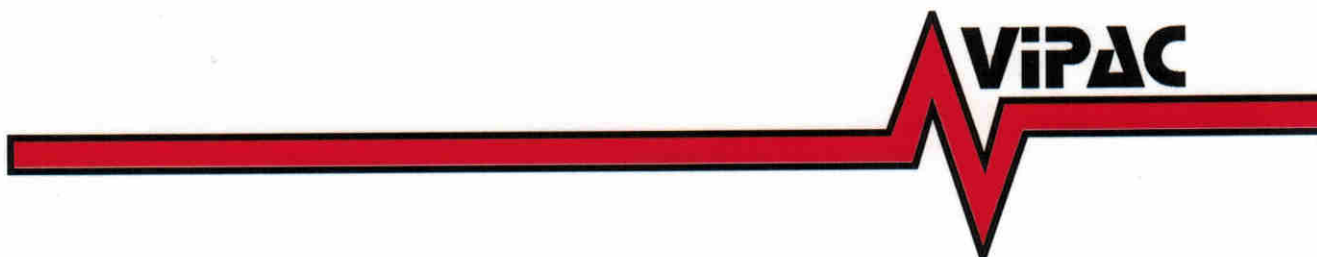
*This Laboratory is accredited by the National Association of Testing Authorities, Australia. The results reported herein have been determined in accordance with the terms of accreditation, and shall not be reproduced except in full.*



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

Prepared by  
Vipac Engineers & Scientists Ltd  
November, 2003

360154\_TRP\_002705\_00.doc



**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
<b>Dynamic Insertion Loss</b>									
<b>Duct Silencer No.1</b>									
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
<b>Duct Silencer No.2</b>									
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
<b>Duct Silencer No.3</b>									
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

This laboratory is accredited by the National Association of Testing Authorities, Australia.

The tests reported herein have been performed in accordance with its terms of accreditation. This document shall not be reproduced except in full.





Type : DS

Duct Silencer

**Dynamic Insertion loss Data**

Length  m ( ft )	Outlet Velocity	Octave Band Centre Frequency - Hz							
		63	125	250	500	1000	2000	4000	8000
	MPS ( FPM )	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 <sup>2</sup> )	inches  ( Ak - ft <sup>2</sup> )	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 <sup>3</sup> ( ft <sup>3</sup> )	kgs ( lbs )	m <sup>3</sup> ( ft <sup>3</sup> )	kgs ( lbs )	m <sup>3</sup> ( ft <sup>3</sup> )
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.