

# Michael & Associates, Inc.

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June 26, 2009 Hearing Protective Device Test Report Number Q1941A Revision 0



Clemco Industries  
Attn: Thomas Enger  
One Cable Car Drive  
Washington, MO 63090

Date of Sample Receipt: 6/18/09  
Date of Sample test: 6/18/09 – 6/25/09


Attenuation measurements have been performed according to the American National Standards Institute (ANSI) Specifications, ANSI S3.19-1974, using the experimenter-fit protocol, on the Clemco Apollo 600 DLX Abrasive Blasting Endorsed Supplied Air Respirator (test ID Q1941A). For these tests, the air hose was blocked and the test subjects breathed through a 3/8 inch diameter thin-walled tube that extended under the hood. The specified threshold measurement data were obtained using ten normal-hearing listeners, six male and four female. These listeners were selected from a standby group of about 35 volunteers, mostly graduate students, who regularly serve as listeners for measurements of this kind.

The measurements were made in a room designed for this purpose. All acoustic characteristics of the room meet the requirements outlined in ANSI S3.19-1974. The ambient noise levels in this room are below the limits specified in ANSI S3.19-1974, and open ear thresholds are used on a continuing basis to monitor the background noise levels. An automatic recording attenuator was used to record both open and occluded ear thresholds.

Each of ten subjects was tested three times at each of nine test frequencies. The attached Tables show grand mean attenuation values in decibels (dB) for each test signal along with group attenuation values. Standard deviations (S.D.) for the 30 different attenuation determinations for each test signal are also given. The results presented in this report pertain to the samples tested only.

Michael & Associates is accredited by the National Institute of Standards and Technology (NIST) National Laboratory Accreditation Program (NVLAP) for tests performed according to ANSI S3.19-1974 and ANSI S12.6-1997. These accreditation criteria encompass the requirements of international standard ISO 17025. This report may only be reproduced or transmitted electronically in its' entirety. This report shall not be used to claim product endorsement by NIST, NVLAP or by any agency of the U.S. Government. All measurement equipment are calibrated with instrumentation traceable to the NIST.

*Use these laboratory-derived attenuation data for comparison purposes only. The amount of protection afforded in field use is often significantly lower depending on how the protectors are fitted and worn.*

  
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Kevin Michael, Ph.D.  
President

6/26/09  
\_\_\_\_\_  
Date

Individual and Summary Attenuation Data for  
Hearing Protective Devices

Test Method: ANSI S3.19-1974  
Manufacturer Clemco  
Model: Apollo 600 DLX

Position: Helmet  
Date: 6/26/09  
Test ID # Q1941A

SUBJECT	FREQUENCY IN HERTZ								
	125	250	500	1000	2000	3150	4000	6300	8000
1	14	15	8	16	25	30	35	47	45
	14	9	6	20	25	32	34	42	46
	18	11	7	17	24	29	28	48	42
2	18	13	11	8	16	27	25	35	30
	16	8	12	13	17	26	28	31	33
	21	13	9	15	20	19	23	28	33
3	15	18	13	18	30	31	42	52	50
	22	13	18	19	26	34	39	44	37
	14	15	10	22	25	32	41	43	44
4	10	11	6	10	18	32	31	41	35
	9	7	10	11	19	35	33	42	38
	9	9	6	12	21	35	35	42	37
5	14	14	11	13	24	29	31	39	37
	13	14	12	15	21	27	30	40	37
	13	17	14	14	21	25	33	37	34
6	10	8	9	13	13	19	28	28	24
	10	8	10	14	15	21	24	28	26
	10	7	9	14	20	24	30	36	28
7	12	16	7	15	21	29	32	39	42
	11	18	16	16	18	26	29	39	41
	11	18	12	12	18	27	26	36	39
8	21	17	14	16	20	27	33	43	41
	16	16	15	19	20	29	34	44	37
	16	17	17	17	25	30	35	41	37
9	11	11	9	12	23	26	31	34	30
	12	6	9	15	23	27	30	34	30
	11	5	9	13	18	33	32	36	30
10	12	10	12	14	17	24	32	36	34
	16	10	14	16	19	25	30	39	39
	14	14	14	18	21	25	30	35	38
MEANS	13.8	12.3	10.9	14.9	20.8	27.7	31.4	38.5	36.4
STD. DEV.	3.6	3.9	3.2	3.0	3.7	4.2	4.4	5.8	6.2

NRR = 9 dB

*Use these laboratory-derived data for comparison purposes only. The amount of protection afforded in field use is often significantly lower depending on how the protectors are fitted and worn.*

Manufacturer: Clemco  
Model: Apollo 600 DLX  
Position: Helmet

Date: 6/26/09  
Test ID: Q1941A

Measurements were made according to American National Standards Institute Specifications ANSI S3.19-1974.

Center Frequency in Hz	Mean Attenuation in dB	Group Attenuation in dB	Standard Deviation in dB
125	13.8	26.0	3.6
250	12.3		3.9
500	10.9		3.2
1000	14.9		3.0
2000	20.8	105.7	3.7
3150	27.7		4.2
4000	31.4		4.4
6300	38.5	74.9	5.8
8000	36.4		6.2

Test Item: Q1941A



These data were obtained through measurements made at the laboratories of Michael & Associates, Inc., State College, PA , USA. Michael & Associates, Inc., is accredited to test to ANSI S3.19-1974, ANSI S12.6-1997 and AS/NZS 1270:2002 by the National Institute of Standards and Technology (NIST) National Voluntary Laboratory Accreditation Program (NVLAP).

Kevin L. Michael, Ph.D.  
President

6/26/09

Date