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# OTTO Communications, *Division of OTTO Engineering, Inc.*

2 East Main St., Carpentersville, IL., 60110 \* Internet Web Page: [www.ottoeng.com](http://www.ottoeng.com)

Direct Phone: [1] 847-654-8388 Main Phone: 888/234-6886

Fax: [1] 847-428-1956

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**Date:** July 3, 2001

**Pages:** 1

**From:** Scott Bolanowski  
Director of Quality Systems  
[scott.bolanowski@ottoeng.com](mailto:scott.bolanowski@ottoeng.com)

**Subject:** OTTO Heavy Duty Headsets: NRR Rating of 24 dB of noise attenuation rating.

To Whom It May Concern:

This will certify the all OTTO Over the Head and Behind the Head Heavy Duty Headsets have been tested and qualified to the 24 dB Noise Attenuation Level.

The testing was conducted according to ANSI S3.19-1974 and ANSI S12.6-1984 by a laboratory fully accredited by the National Institute of Standards and Technology (NIST) National Voluntary Laboratory Accreditation Program.

Complete test reports are on record. Relevant data is shown below.

## **OTTO H.D. Over The Head Headset = 24 dB NRR**

| Center Frequency in HZ   | 125  | 250  | 500  | 1000 | 2000 | 3150 | 4000 | 6300 | 8000 |
|--------------------------|------|------|------|------|------|------|------|------|------|
| Mean attenuation in dB   | 19.3 | 22.1 | 30.7 | 36.9 | 34.5 | 32.8 | 38.5 | 38.1 | 34.4 |
| Standard Deviation in dB | 3.3  | 2.3  | 3.5  | 3.2  | 2.8  | 3.1  | 4.8  | 3.8  | 2.5  |

## **OTTO H.D. Behind The Head Headset = 24 dB NRR**

| Center Frequency in HZ   | 125  | 250  | 500  | 1000 | 2000 | 3150 | 4000 | 6300 | 8000 |
|--------------------------|------|------|------|------|------|------|------|------|------|
| Mean attenuation in dB   | 17.1 | 20.9 | 28.6 | 35.8 | 34.7 | 37.6 | 40.4 | 39.3 | 36.3 |
| Standard Deviation in dB | 3.0  | 3.2  | 2.7  | 3.8  | 2.9  | 2.2  | 2.7  | 2.6  | 3.0  |

INDIVIDUAL AND SUMMARY ATTENUATION DATA FOR  
FOR HEARING PROTECTIVE DEVICES

TEST METHOD: ANSI S3.19-1974  
 MANUFACTURER: **OTTO Communications**  
 MODEL: FH 10/20 TYPE 1 SEAL

POSITION: OH  
 DATE: 5/26/98  
 TEST ID #: P938A

FREQUENCY IN HERTZ

| SUBJECT | 125 | 250 | 500 | 1000 | 2000 | 3150 | 4000 | 6300 | 8000 |
|---------|-----|-----|-----|------|------|------|------|------|------|
| 1       | 22  | 21  | 34  | 41   | 36   | 31   | 40   | 37   | 34   |
|         | 19  | 22  | 34  | 42   | 35   | 32   | 45   | 38   | 33   |
|         | 21  | 20  | 35  | 37   | 30   | 35   | 45   | 40   | 32   |
| 2       | 25  | 21  | 31  | 32   | 33   | 38   | 45   | 35   | 37   |
|         | 27  | 25  | 31  | 32   | 34   | 38   | 44   | 34   | 34   |
|         | 21  | 23  | 31  | 34   | 33   | 39   | 43   | 34   | 34   |
| 3       | 22  | 25  | 37  | 40   | 32   | 36   | 44   | 43   | 35   |
|         | 20  | 23  | 33  | 41   | 35   | 32   | 41   | 42   | 35   |
|         | 19  | 23  | 36  | 41   | 33   | 31   | 40   | 41   | 35   |
| 4       | 19  | 23  | 32  | 41   | 38   | 31   | 39   | 39   | 32   |
|         | 19  | 24  | 30  | 40   | 35   | 31   | 34   | 39   | 37   |
|         | 21  | 25  | 30  | 38   | 37   | 28   | 35   | 38   | 36   |
| 5       | 18  | 21  | 32  | 39   | 38   | 33   | 39   | 37   | 35   |
|         | 17  | 22  | 34  | 40   | 37   | 35   | 39   | 39   | 34   |
|         | 20  | 19  | 31  | 41   | 43   | 36   | 36   | 35   | 35   |
| 6       | 16  | 18  | 29  | 34   | 36   | 31   | 32   | 34   | 33   |
|         | 14  | 17  | 27  | 33   | 34   | 30   | 31   | 32   | 34   |
|         | 15  | 20  | 30  | 35   | 32   | 29   | 33   | 35   | 35   |
| 7       | 15  | 23  | 38  | 36   | 31   | 30   | 43   | 42   | 36   |
|         | 21  | 24  | 30  | 38   | 31   | 39   | 41   | 43   | 41   |
|         | 18  | 27  | 34  | 32   | 31   | 33   | 49   | 43   | 36   |
| 8       | 17  | 23  | 26  | 36   | 32   | 31   | 32   | 36   | 35   |
|         | 19  | 23  | 28  | 37   | 34   | 32   | 36   | 38   | 33   |
|         | 15  | 19  | 26  | 37   | 32   | 33   | 36   | 39   | 32   |
| 9       | 16  | 21  | 27  | 31   | 38   | 32   | 35   | 33   | 32   |
|         | 18  | 22  | 29  | 37   | 36   | 34   | 38   | 34   | 39   |
|         | 18  | 20  | 26  | 34   | 37   | 30   | 37   | 33   | 35   |
| 10      | 20  | 26  | 27  | 38   | 32   | 33   | 38   | 44   | 33   |
|         | 25  | 22  | 29  | 38   | 35   | 35   | 35   | 45   | 28   |
|         | 24  | 22  | 25  | 34   | 34   | 27   | 30   | 42   | 32   |

|           |      |      |      |      |      |      |      |      |      |
|-----------|------|------|------|------|------|------|------|------|------|
| MEANS     | 19.3 | 22.1 | 30.7 | 36.9 | 34.5 | 32.8 | 38.5 | 38.1 | 34.4 |
| STD. DEV. | 3.3  | 2.3  | 3.5  | 3.2  | 2.8  | 3.1  | 4.8  | 3.8  | 2.5  |

NRR = 24 dB

HEADBAND FORCE = 2.4 LBS

*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: **OTTO Communications**  
 MODEL: FH 10/20 TYPE 1 SEAL  
 POSITION: OH

DATE: 5/26/98  
 TEST ID#: P938A

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

| Center Frequency<br>in Hz | Mean Attenuation<br>in dB | Group Attenuation<br>in dB | Standard Deviation<br>in dB |
|---------------------------|---------------------------|----------------------------|-----------------------------|
| 125                       | 19.3                      | 41.4                       | 3.3                         |
| 250                       | 22.1                      |                            | 2.3                         |
| 500                       | 30.7                      | 173.5                      | 3.5                         |
| 1000                      | 36.9                      |                            | 3.2                         |
| 2000                      | 34.5                      |                            | 2.8                         |
| 3150                      | 32.8                      |                            | 3.1                         |
| 4000                      | 38.5                      | 72.5                       | 4.8                         |
| 6300                      | 38.1                      |                            | 3.8                         |
| 8000                      | 34.4                      |                            | 2.5                         |

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 and ANSI S12.6-1984 by the National Institute of Standards and Technology (NIST) National Voluntary Laboratory Accreditation Program (NVLAP).

Kevin L. Michael  
 Kevin L. Michael, Ph.D.  
 President

5/26/98  
 Date

INDIVIDUAL AND SUMMARY ATTENUATION DATA FOR  
HEARING PROTECTIVE DEVICES

TEST METHOD: ANSI S3.19-1974  
MANUFACTURER: **OTTO Communications**  
MODEL: 111-0082-50

POSITION: BH  
DATE: 10/2/98  
TEST ID #: P960A

FREQUENCY IN HERTZ

| SUBJECT | 125 | 250 | 500 | 1000 | 2000 | 3150 | 4000 | 6300 | 8000 |
|---------|-----|-----|-----|------|------|------|------|------|------|
| 1       | 19  | 27  | 31  | 37   | 35   | 36   | 40   | 42   | 42   |
|         | 23  | 24  | 28  | 38   | 32   | 32   | 41   | 36   | 37   |
|         | 22  | 26  | 31  | 43   | 33   | 39   | 37   | 39   | 38   |
| 2       | 23  | 22  | 33  | 41   | 37   | 35   | 46   | 41   | 37   |
|         | 22  | 23  | 37  | 39   | 37   | 37   | 44   | 41   | 39   |
|         | 19  | 25  | 31  | 37   | 37   | 41   | 42   | 39   | 37   |
| 3       | 14  | 13  | 26  | 29   | 27   | 38   | 40   | 37   | 34   |
|         | 14  | 15  | 23  | 31   | 27   | 35   | 41   | 35   | 32   |
|         | 13  | 19  | 25  | 31   | 28   | 39   | 40   | 38   | 33   |
| 4       | 15  | 18  | 30  | 33   | 36   | 41   | 43   | 42   | 38   |
|         | 12  | 16  | 27  | 29   | 35   | 39   | 41   | 41   | 36   |
|         | 15  | 19  | 25  | 32   | 35   | 40   | 46   | 40   | 37   |
| 5       | 16  | 22  | 28  | 35   | 38   | 39   | 41   | 41   | 39   |
|         | 13  | 21  | 29  | 35   | 35   | 38   | 40   | 41   | 41   |
|         | 18  | 23  | 31  | 37   | 38   | 38   | 38   | 42   | 40   |
| 6       | 18  | 21  | 28  | 39   | 35   | 37   | 37   | 37   | 34   |
|         | 19  | 20  | 26  | 42   | 37   | 37   | 39   | 37   | 35   |
|         | 21  | 20  | 27  | 35   | 36   | 36   | 39   | 39   | 35   |
| 7       | 18  | 22  | 30  | 36   | 36   | 35   | 38   | 36   | 34   |
|         | 16  | 19  | 29  | 35   | 34   | 37   | 36   | 33   | 32   |
|         | 15  | 20  | 29  | 36   | 38   | 33   | 38   | 37   | 32   |
| 8       | 16  | 21  | 28  | 34   | 34   | 39   | 35   | 36   | 37   |
|         | 17  | 23  | 29  | 40   | 37   | 38   | 40   | 41   | 40   |
|         | 18  | 21  | 26  | 35   | 33   | 39   | 37   | 37   | 37   |
| 9       | 15  | 21  | 27  | 39   | 34   | 39   | 40   | 43   | 39   |
|         | 18  | 23  | 31  | 40   | 34   | 39   | 43   | 40   | 39   |
|         | 18  | 23  | 27  | 40   | 35   | 41   | 43   | 44   | 39   |
| 10      | 16  | 19  | 27  | 30   | 37   | 35   | 42   | 41   | 32   |
|         | 15  | 19  | 28  | 34   | 35   | 39   | 43   | 41   | 31   |
|         | 16  | 24  | 30  | 32   | 39   | 37   | 43   | 42   | 33   |

|           |      |      |      |      |      |      |      |      |      |
|-----------|------|------|------|------|------|------|------|------|------|
| MEANS     | 17.0 | 20.9 | 28.6 | 35.8 | 34.7 | 37.6 | 40.4 | 39.3 | 36.3 |
| STD. DEV. | 3.0  | 3.2  | 2.7  | 3.8  | 2.9  | 2.2  | 2.7  | 2.6  | 3.0  |

NRR = 24 dB HEADBAND FORCE = 2.7 LBS

*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: **OTTO Communications**  
 MODEL: 111-0082-50  
 POSITION: BH

DATE: 10/2/98  
 TEST ID#: P960A

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

| Center Frequency<br>in Hz | Mean Attenuation<br>in dB | Group Attenuation<br>in dB | Standard Deviation<br>in dB |
|---------------------------|---------------------------|----------------------------|-----------------------------|
| 125                       | 17.0                      | 38.0                       | 3.0                         |
| 250                       | 20.9                      |                            | 3.2                         |
| 500                       | 28.6                      |                            | 2.7                         |
| 1000                      | 35.8                      |                            | 3.8                         |
| 2000                      | 34.7                      | 177.1                      | 2.9                         |
| 3150                      | 37.6                      |                            | 2.2                         |
| 4000                      | 40.4                      |                            | 2.7                         |
| 6300                      | 39.3                      | 75.6                       | 2.6                         |
| 8000                      | 36.3                      |                            | 3.0                         |

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 and ANSI S12.6-1984 by the National Institute of Standards and Technology (NIST) National Voluntary Laboratory Accreditation Program (NVLAP).

Kevin L. Michael  
 Kevin L. Michael, Ph.D.  
 President

10/5/98  
 Date