

DETECTAMET

Technical Data Sheet

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413

Expand-A-Band 2/3 flange earplugs



Technical Data Sheet Applicable To:

413-S101-X07	Detectable Expand-A-Band 2 Flange Blue Pack of 30
413-S101-P03	Detectable Expand-A-Band 2 Flange Red Pack of 30
413-S102-X07	Detectable Expand-A-Band 3 Flange Blue Pack of 30
413-S101-P03-X07	Detectable Expand-A-Band 3 Flange Red Pack of 30

Industry Usage:

This unique, fully detectable earplug system has adjustable band to provide comfortable pressure of earplug into the ear canal for the user.

Features and Benefits:

- Metal Detectable & X-ray Visible
- Two or three flange protection
- Two flange: SNR 23db (EN352-2:2020)
- Three flange: SNR 22db (EN352-2:2020)
- Adjustable band for altering pressure into ear canal to suit user
- Intelligent design prevents contact with surfaces when not in use
- Ergonomic for a perfect fit
- Earplugs made from latex free silicone rubber

Material and Compliance information:

Regulation 2016/425 Module C2 testing of earplugs as referenced.

Samples of hearing protectors, reference "Expand-A-Band" [under the chin mode] were received by SATRA for testing in accordance with ANSI S3.19:1974

Property	Units	Typical Value	Test Method
Hardness	Shore A	67	ASTM D2240
Tensile Strength	MPa	9.0	BS ISO 37
Elongation to break	%	340	BS ISO 37
Tear Strength	N/mm	15.7	BS ISO 34-1 method C
Compression Set 25% for 24hrs @ 150c	%	14.1	BS 903 pt A6 type B
Magnetic Pull	Mm	6.5	SEWI/700 ISS 2
Temperature	C	-60 to 200	

Colour Dark Blue 60 Shore

The above product contains only ingredients that are listed by the American food and drugs administration (FDA) under the 21 CFR number 177-2600 & EC1935/2004

Conclusions

Standard	Clause/Property	Result
BS EN 352-2:2020	4.3.6 Minimum attenuation	Pass

Testing

Testing was carried out in accordance with BS EN 352-2:2002

Unless otherwise specified either in the individual test method or in this report, samples were tested 'as received', after conditioning, and tested under normal ambient conditions

Test results BS EN 352-2:2020

Clause/Test	Requirement	Test Results	UoM (See Note 1)	Result
4.3.6 Minimum Attenuation	When tested in accordance with EN 13819-2:2020, 4.2, the values (Mf – Sf) of the ear-plugs shall not be less than the values shown in table 1 of BS EN 352-2:2020. See note 1	The ear-plugs met the minimum attenuation requirements of BS EN 352-2:2020 (see Appendix A)	31%	Pass

Additional Information / Notes Table 1 of BS EN 352-2:2020

Frequency (Hz)	125	250	500	1000	2000	4000	8000
Mf – Sf (in dB)	5	8	10	12	12	12	12

Note 1: Documentation to be assessed as part of the technical file during the EU type Examination assessment

Note 2: 'UoM' denotes estimated uncertainty of Measurement for stated test results. This uncertainty value is based on a standard uncertainty multiplied by a coverage factor $k = 2$, which provides for a confidence level of approximately 95%

Appendix: Subjective Attenuation Testing

BS EN 24869-1:1993 (ISO 4869-1:1990) specifies a subjective method for measuring the attenuation of hearing protection at the threshold of hearing. This method was applied to the samples provided for testing.

Test subjects

The testing was conducted on sixteen test subjects, as specified by the test standard. The subject composed both males and females over a wide range of ages. All subjects were audiometrically screened in accordance with clause 4.4.1 of BS EN 24869-1:1993 prior to the test.

Fitting

Manufacturer's instructions were provided to the test subjects and followed during the fitting of the device. Guidance was also available from the test engineer.

Test procedure

The procedure specified in BS EN 24869-1:1993, 4.5 was followed.

- Two flange: SNR 23db (EN352-2:2020)

		Frequency (Hz) / Attenuation (dB, re. 2×10^{-5} Pa)							
Subject	Sample	63	125	250	500	1000	2000	4000	8000
A	1	6	6	8	8	14	26	26	26
B	2	24	20	20	22	28	38	34	30
C	3	22	20	26	26	26	34	38	32
D	4	32	32	26	28	24	32	34	36
E	5	28	22	22	20	34	28	36	36
F	6	34	24	24	32	32	36	44	36
G	7	18	20	24	16	24	36	32	44
H	8	22	30	26	28	28	32	48	48
I	9	24	24	24	24	24	32	30	24
J	10	26	28	22	28	26	32	46	40
K	11	18	16	18	26	26	36	42	34
L	12	18	14	18	22	20	24	28	28
M	13	28	24	28	30	32	38	48	38
N	14	16	22	18	18	18	24	36	32
O	15	8	8	14	18	20	26	26	22
P	16	20	22	22	22	24	36	40	42
Mean Attenuation		21.5	20.8	21.3	23.0	25.0	31.9	36.8	34.3
Standard deviation		7.6	7.1	5.2	6.1	5.3	4.9	7.4	7.3
Assumed protection (a=1)		13.9	13.7	16.1	16.9	19.7	27.0	29.4	27.0
Assumed protection (a=2)		6.3	6.6	10.9	10.8	14.4	22.1	22.0	19.7

Subject	Sample	H	M	L	SNR
A	1	21.5	12.8	9.4	16.2
B	2	33.0	26.3	22.6	29.1
C	3	32.5	27.5	25.7	30.6
D	4	30.9	26.4	26.6	29.8
E	5	30.7	25.9	22.9	28.5
F	6	36.7	32.2	27.6	34.7
G	7	20.7	21.8	20.2	25.5
H	8	33.6	29.2	28.30	32.5
I	9	28.0	25.3	24.6	27.3
J	10	32.7	27.6	25.5	30.9
K	11	33.7	26.4	21.1	29.4
L	12	24.7	21.5	19.4	24.1
M	13	38.0	32.6	29.4	35.5
N	14	24.6	19.5	18.9	23.0
O	15	24.4	20.0	15.1	22.2
P	16	32.4	25.0	23.2	28.7
Mean attenuation		30.5	25.0	22.5	28.0
Standard deviation		4.7	5.0	5.2	4.9
Assumed protection (a=1)		25.8	20.0	17.3	23.1
Nominal value		26	20	17	23

- Three flange: SNR 22db (EN352-2:2020)

		Frequency (Hz) / Attenuation (dB, re. 2×10^{-5} Pa)							
Subject	Sample	63	125	250	500	1000	2000	4000	8000
A	1	14	12	12	14	20	24	26	26
B	2	16	16	20	18	26	36	38	46
C	3	22	20	24	28	20	26	26	38
D	4	34	36	30	28	24	42	42	46
E	5	24	16	24	18	22	24	32	38
F	6	32	30	28	30	26	32	32	48
G	7	12	22	18	18	22	32	32	40
H	8	18	22	20	30	24	28	26	42
I	9	24	30	26	26	26	30	26	40
J	10	20	24	18	20	22	24	38	36
K	11	18	14	16	22	24	34	38	32
L	12	24	22	20	20	20	20	28	16
M	13	40	34	36	36	38	40	52	42
N	14	14	16	22	18	20	12	30	28
O	15	18	20	24	26	22	34	28	30
P	16	18	20	20	20	20	32	34	34
Mean Attenuation		21.8	22.1	22.4	23.3	23.5	29.4	33.0	36.4
Standard deviation		7.8	7.1	5.8	6.0	4.5	7.6	7.2	8.5
Assumed protection (a=1)		14.0	15.0	16.6	17.3	19.0	21.8	25.8	27.9
Assumed protection (a=2)		6.2	7.9	10.8	11.3	14.5	14.2	18.6	19.4

Subject	Sample	H	M	L	SNR
A	1	24.2	18.2	14.5	21.0
B	2	32.9	23.5	20.2	27.0
C	3	25.5	22.5	23.0	25.4
D	4	33.4	26.7	27.7	31.0
E	5	25.9	21.7	20.4	24.7
F	6	31.5	28.1	28.4	31.1
G	7	29.3	21.9	19.8	25.5
H	8	27.4	25.4	23.5	27.5
I	9	28.3	26.7	26.6	28.6
J	10	26.2	22.3	20.5	25.2
K	11	31.5	23.9	18.9	27.0
L	12	20.0	20.3	20.3	20.9
M	13	41.5	38.4	36.8	40.9
N	14	15.0	16.8	17.7	17.8
O	15	28.5	24.4	23.9	27.4
P	16	28.3	21.7	20.7	25.4
Mean attenuation		28.1	23.9	22.7	26.7
Standard deviation		5.9	4.9	5.3	5.2
Assumed protection (a=1)		22.2	19.0	17.4	21.5
Nominal value		22	19	17	22

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