

## 413 – Expand-A-Band 2 Flange Earplugs

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### Declaration of Compliance Statement – 413 – Expand-A-Band 2 Flange Earplugs

Product Code	Product Description
413-S101-P03	Detectable Expand-A-Band 2 Flange Red Pack of 30
413-S101-X07	Detectable Expand-A-Band 2 Flange Blue Pack of 30

### Technical Report

Regulation 2016/425 Module C2 testing of earplugs referenced as 410-P20-S101-x18 2 flange silicone earplugs with blue cord, normal diameter 9-13mm

### Work Requested

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†.

### Data of Detectable Silicone Extruded Cord

Property	Units	Typical Value	Test Method
<b>Hardness</b>	SHORE A	67	ASTM D2240
<b>Tensile Strength</b>	MPa	9.0	BS ISO 37
<b>Elongation to Break</b>	%	340	BS ISO 37
<b>Tear Strength</b>	N/mm	15.7	BS ISO 34-1 method C
<b>Compression Set 25% for 24hrs @ 150c</b>	%	14.1	BS 903 pt A6 type B
<b>Magnetic Pull</b>	Mm	6.5	SEWI/700 ISS 2
<b>Temperature</b>	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 352-2:2002	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.

## Hearing protectors referenced 410-P20-S102-x18

### Test Results BS EN 352-2: 2002

Clause / Test	Requirement	Test Results	UoM (See Note 1)	Result
<b>4.3.6 Minimum attenuation</b>	When tested in accordance with EN 13819-2:2002, 4.2, the values ( $M_f - S_f$ ) of the ear-plugs shall not be less than the values shown in table 1 of BS EN 352-2:2002. See note 1.	The ear-plugs met the minimum attenuation requirements of BS EN 352-2:2002 (see Appendix A).	31%	Pass

### Additional Information / Notes Table 1 of BS EN 352-2:2002

Frequency (Hz)	125	250	500	1000	2000	4000	8000
$M_f - S_f$ (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 subjects comprised 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.

## Results

		Frequency, Hz / Attenuation, dB re 20 µPa							
Subject	Sample	63	125	250	500	1000	2000	4000	8000
A	1	26	24	24	26	30	32	32	22
B	2	6	6	8	10	16	24	20	12
C	3	10	10	4	10	18	22	22	16
D	4	24	28	22	24	28	34	32	38
E	5	16	20	20	26	22	34	34	42
F	6	24	20	22	16	24	34	32	32
G	7	18	22	22	24	22	24	32	14
H	8	22	18	18	22	22	36	32	28
<b>Mean attenuation</b>		18.3	18.5	17.5	19.5	22.8	30.0	29.5	25.5
<b>Standard deviation</b>		7.2	7.2	7.4	6.7	4.7	5.7	5.3	11.3
<b>Assumed protection</b>		11.0	11.3	10.1	12.8	18.1	24.3	24.2	14.2

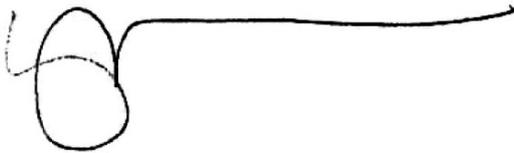
SNR= 19

H= 20

M= 17

L= 13

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