



# Testing of Hearing Protectors

Test items: **Cool-Earplugs**

Type: **Reusable earplug with three sizes**

Customer: **Cool-Earplugs**  
**Stationsstraat 36,**  
**6114 GD Susteren**  
**Nederland**

Applied methods: **EN 352-2:2002, EN 13819-1:2002, EN 13819-2:2002**



Cool-Earplugs in drie kleuren

  
Erkki Rajamäki  
Senior Specialist

  
Jani Raami  
Occupational Hygiene Engineer



## 1. Description and identification of test items

Cool-Earplugs ear-plugs were supplied by the manufacturer on 6 October, 2014. Test items were intact.

| <b>Model:</b>         | <b>Number of samples:</b> |
|-----------------------|---------------------------|
| Cool-Earplugs (red)   | 25 pairs                  |
| Cool-Earplugs (green) | 30 pairs                  |
| Cool-Earplugs (blue)  | 25 pairs                  |

## 2. Testing

Tests were performed according to standard EN 352-2:2002 during 6 October 2014 – 3 November 2014 in the testing laboratories of Safety of Technologies and Protection team of Finnish Institute of Occupational Health.

## 3. Test results

### 3.1. The mass of the ear-plugs

The mean mass of each ear-plug was 0,4 g for every sizes.

### 3.1 Sizing and adjustability (EN 352-2 Clause 4.1)

The range of Cool-Earplugs was

| <b>Model:</b> | <b>Size:</b> |
|---------------|--------------|
| Cool-Earplugs | 6 mm – 8 mm  |

### 3.3 Resistance to damage when dropped (EN 352-2, Clause 4.3.2)

Resistance to damage was measured from 5 specimens of each size. The ear-plug did not crack or become detached.



### 3.4 Sound attenuation (EN 352-2, Clause 4.3.6, EN 13819-2, Clause 4.2)

Sound attenuation of Cool-Earplugs was tested with 16 test persons using all sizes. Sound attenuation characteristics are tabulated below.

| Frequency (Hz)   | 63   | 125  | 250  | 500  | 1000 | 2000 | 3150 | 4000 | 6300 | 8000 |
|------------------|------|------|------|------|------|------|------|------|------|------|
| Mean attenuation | 24,7 | 26,0 | 25,9 | 25,0 | 29,2 | 33,6 | 34,9 | 30,6 | 33,1 | 29,2 |
| St.dev. (dB)     | 5,7  | 5,8  | 4,8  | 5,6  | 4,3  | 4,4  | 4,6  | 5,4  | 5,6  | 7,1  |
| APV (84%)        | 19,0 | 20,2 | 21,2 | 19,4 | 24,8 | 29,3 | 30,3 | 25,2 | 27,5 | 22,2 |

H<sub>84</sub> 26 dB

M<sub>84</sub> 23 dB

L<sub>84</sub> 22 dB

SNR<sub>84</sub> 25 dB

Minimum attenuation requirement:

| Frequency in Hz | 125 | 250 | 500 | 1000 | 2000 | 4000 | 8000 |
|-----------------|-----|-----|-----|------|------|------|------|
| in dB           | 5   | 8   | 10  | 12   | 12   | 12   | 12   |

### 3.5 Ignitability (EN 352-2, Clause 4.3.5)

Ear-plugs did not ignite or continue to glow after removal of the heated rod.

### 3.6 Materials and construction (EN 352-2, Clause 4.2)

According to visual inspection all parts of the product were such that they are not liable to cause physical damage to wearer when fitted and used according to the manufacturer's instructions. The removal of plugs did not require the use of tools.



#### 4. Summary of the test results

The summary of the test results is given in Table 4.1.

Table 4.1. Summary for Cool-Earplugs

| Test                              | Requirement                 | Pass / Fail              |
|-----------------------------------|-----------------------------|--------------------------|
| Resistance to damage when dropped | EN 352-2 Clause 4.3.2       | Test items pass the test |
| Sound attenuation                 | EN 352-2:2002, Clause 4.3.6 | Test items pass the test |
| Ignitability                      | EN 352-2:2002, Clause 4.3.5 | Test items pass the test |

#### End of test report