

# Philips Oral Healthcare LLC

## RF Exposure Exemption Report

### SCOPE OF WORK

RF Exposure Exemption Evaluation – Rechargeable Electric Toothbrush Handle, Model: HX856W and HX856B

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## RF Exposure Exemption Evaluation Report

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Product Designation: Rechargeable Electric Toothbrush Handle

Model: HX856W and HX856B

Standards: 47CFR 1.1307(b)(3)

RSS-102 Issue 6

for

Philips Oral Healthcare LLC

**Tested by:**

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## 1 Introduction and Conclusion

The evaluation indicated in section 2.0 were performed on the product constructed as described in section 4.0. The remaining sections are the verbatim text from the actual evaluation during the investigation. These sections include the evaluation name, the specified Method, and Results. No additions, deviations, or exclusions have been made from the standard(s) unless specifically noted.

Based on the results of our investigation, we have concluded the product evaluated **complies** with the requirements of the standard(s) indicated. The results obtained in this report pertain only to the item(s) evaluated. Intertek does not make any claims of compliance for samples or variants which were not evaluated.

## 2 Evaluation Summary

| Section | Test full name                                               | Result    |
|---------|--------------------------------------------------------------|-----------|
| 3       | Client Information                                           | -         |
| 4       | Description of Equipment Under Evaluation and Variant Models | -         |
| 5       | FCC SAR Test Exclusion                                       | Compliant |
| 6       | ISED Canada SAR Test Exclusion                               | Compliant |
| 7       | Revision History                                             | -         |

## 3 Client Information

This EUT was evaluated at the request of:

**Client:** Philips Oral Healthcare LLC  
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Bothell, WA 98021 USA

**Contact:** Patrick Erickson  
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## **4 Description of Equipment Under Test and Variant Models**

### **4.1 Description of Equipment Under Test (provided by client)**

Philips Oral Healthcare LLC supplied the following description of the EUT:

The Philips HX856W and HX856B are rechargeable electric toothbrushes that is inductively charged. Bluetooth connectivity allows the toothbrush to be connected to an app which provides real-time guidance on pressure, motion, position, duration and frequency of brushing. The toothbrush also tracks the brush head usage through RFID to alert the user when the heads need to be replaced.

## 4.2 Variant Models

The following variant models have been identified by the manufacturer as being electrically identical models, depopulated models, or with reasonable similarity to the model(s) tested. Intertek does not make any claims of compliance for samples or variants which were not tested.

| Description                                     | Model                                                                                          | Remarks                                                                                                                                                                                 |
|-------------------------------------------------|------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Full Set product type reference</b>          | HX81nn, HX82nn, HX83nn, HX84nn, HX85nn, HX88nn, HX91nn, HX92nn, HX93nn, HX94nn, HX95nn, HX98nn | Where n can be a number from 0 to 9 indicating different product configurations for marketing purpose only                                                                              |
| <b>Electric Toothbrush Handles Codes</b>        | HX855x, HX856x, HX987x, HX988x                                                                 | Where x can be a letter from A to Z indicating different color handles<br>If x = W or P, handle tube is made of Terblend NM-11<br>All other letters, handle tube is made of Terlux 2802 |
| <b>Electric Toothbrush Base Charger</b>         | CBA62nn                                                                                        | Where n can be a number from 0 to 9 indicating different color and finish                                                                                                               |
| <b>Electric Toothbrush Travel Charging Case</b> | HYTC1n, HYTC2n, HYTC3n                                                                         | Where n can be a number from 0 to 9 indicating different color and finish<br>n = 1 or 2 manufactured by Dongguan Aohai Technology Co.,Ltd.<br>n = 3 – 9 manufactured by PI Electronics  |
| <b>Wall Adaptor</b>                             | WAA1001, WAA2001                                                                               | 1001 = White<br>2001 = Black                                                                                                                                                            |

|                 |                                                                                                                        |
|-----------------|------------------------------------------------------------------------------------------------------------------------|
| <b>HVIN/PMN</b> | HX855B, HX855G, HX855L, HX855P, HX855W, HX856B, HX856G, HX856L, HX856P, HX856W, HX987L, HX987W, HX988B, HX988M, HA988W |
|-----------------|------------------------------------------------------------------------------------------------------------------------|

## 5 RF Exposure Exemption Evaluation (FCC)

### 5.1 Determination of exemption [FCC 1.1307(b)(3)]

- (i) For single RF sources (i.e., any single fixed RF source, mobile device, or portable device, as defined in paragraph (b)(2) of this section): A single RF source is exempt if:
- (A) The available maximum time-averaged power is no more than 1 mW, regardless of separation distance. This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(ii)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(ii)(A);
  - (B) Or the available maximum time-averaged power or effective radiated power (ERP), whichever is greater, is less than or equal to the threshold  $P_{th}$  (mW) described in the following formula. This method shall only be used at separation distances (cm) from 0.5 centimeters to 40 centimeters and at frequencies from 0.3 GHz to 6 GHz (inclusive).  $P_{th}$  is given by;

$$P_{th} \text{ (mW)} = \begin{cases} ERP_{20 \text{ cm}} (d/20 \text{ cm})^x & d \leq 20 \text{ cm} \\ ERP_{20 \text{ cm}} & 20 \text{ cm} < d \leq 40 \text{ cm} \end{cases}$$

Where

$$x = -\log_{10} \left( \frac{60}{ERP_{20 \text{ cm}} \sqrt{f}} \right) \text{ and } f \text{ is in GHz;}$$

and

$$ERP_{20 \text{ cm}} \text{ (mW)} = \begin{cases} 2040f & 0.3 \text{ GHz} \leq f < 1.5 \text{ GHz} \\ 3060 & 1.5 \text{ GHz} \leq f \leq 6 \text{ GHz} \end{cases}$$

$d$  = the separation distance (cm);

- (C) Or using Table 1 and the minimum separation distance (R in meters) from the body of a nearby person for the frequency (f in MHz) at which the source operates, the ERP (watts) is no more than the calculated value prescribed for that frequency. For the exemption in Table 1 to apply, R must be at least  $\lambda/2\pi$ , where  $\lambda$  is the free-space operating wavelength in meters. If the ERP of a single RF source is not easily obtained, then the available maximum time-averaged power may be used in lieu of ERP if the physical dimensions of the radiating structure(s) do not exceed the electrical length of  $\lambda/4$  or if the antenna gain is less than that of a half-wave dipole (1.64 linear value).

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

| RF Source frequency (MHz) | Threshold ERP (watts)                |
|---------------------------|--------------------------------------|
| 0.3 – 1.34                | 1,920 R <sup>2</sup>                 |
| 1.34 – 30                 | 3,450 R <sup>2</sup> /f <sup>2</sup> |
| 30 – 300                  | 3.83 R <sup>2</sup>                  |
| 300 – 1,500               | 0.0128 R <sup>2</sup> f              |
| 1,500 – 100,000           | 19.2 R <sup>2</sup>                  |

(ii) For multiple RF sources: Multiple RF sources are exempt if:

- (A) The available maximum time-averaged power of each source is no more than 1 mW and there is a separation distance of two centimeters between any portion of a radiating structure operating and the nearest portion of any other radiating structure in the same device, except if the sum of multiple sources is less than 1 mW during the time-averaging period, in which case they may be treated as a single source (separation is not required). This exemption may not be used in conjunction with other exemption criteria other than those in paragraph (b)(3)(i)(A) of this section. Medical implant devices may only use this exemption and that in paragraph (b)(3)(i)(A).
- (B) In the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation.

$$\sum_{i=1}^a \frac{P_i}{P_{th,i}} + \sum_{j=1}^b \frac{ERP_j}{ERP_{th,j}} + \sum_{k=1}^c \frac{Evaluated_k}{Exposure Limit_k} \leq 1$$

Where:

$a$  = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(B) of this section for  $P_{th}$ , including existing exempt transmitters and those being added.

$b$  = number of fixed, mobile, or portable RF sources claiming exemption using paragraph (b)(3)(i)(C) of this section for Threshold ERP, including existing exempt transmitters and those being added.

$c$  = number of existing fixed, mobile, or portable RF sources with known evaluation for the specified minimum distance including existing evaluated transmitters.

$P_i$  = the available maximum time-averaged power or the ERP, whichever is greater, for fixed, mobile, or portable RF source  $i$  at a distance between 0.5 cm and 40 cm (inclusive).

$P_{th,i}$  = the exemption threshold power ( $P_{th}$ ) according to paragraph (b)(3)(i)(B) of this section for fixed, mobile, or portable RF source  $i$ .

$ERP_j$  = the ERP of fixed, mobile, or portable RF source  $j$ .

$ERP_{th,j}$  = exemption threshold ERP for fixed, mobile, or portable RF source  $j$ , at a distance of at least  $\lambda/2\pi$  according to the applicable formula of paragraph (b)(3)(i)(C) of this section.

$Evaluated_k$  = the maximum reported SAR or MPE of fixed, mobile, or portable RF source  $k$  either in the device or at the transmitter site from an existing evaluation at the location of exposure.

$Exposure Limit_k$  = either the general population/uncontrolled maximum permissible exposure (MPE) or specific absorption rate (SAR) limit for each fixed, mobile, or portable RF source  $k$ , as applicable

from § 1.1310 of this chapter.

## 5.2 Exemption Evaluation

| Frequency (MHz) | Peak FS @ 10m (dBμV/m) | EIRP (dBm) | EIRP (mW)  | Note                                                    |
|-----------------|------------------------|------------|------------|---------------------------------------------------------|
| 13.56           | 22.63                  | -62.14     | 0.00000037 | FS measurement was taken from Report #106398251MPK-006. |

| Frequency (MHz) | Peak RF Power (dBm) | Antenna Gain <sup>1</sup> (dBi) | EIRP (dBm) | EIRP (mW) | Note                                                                   |
|-----------------|---------------------|---------------------------------|------------|-----------|------------------------------------------------------------------------|
| 2402 – 2480     | -3.55               | 2.5                             | -1.05      | 0.785     | Conducted power measurements were taken from report # 106398251MPK-001 |

<sup>1</sup>As declared by the manufacturer.

The maximum combined EIRP of -62.14 dBm (0.00000037 mW) for RFID and -1.05 dBm (0.785 mW) for BLE is less than 1 mW.

According to FCC §1.1307(b)(3)(i), the device is exempt in fixed, mobile, or portable device exposure conditions.

## 5.3 Evaluation Results

The sample evaluated was found to Comply. The maximum conducted power is less than 1 mW.

## 6 RF Exposure Exemption Evaluation (ISED)

### 6.1 Determination of SAR exemption [RSS-102 Section 6.3, Table 11]

Table 11: Power limits for exemption from routine SAR evaluation based on the separation distance

| Frequency (MHz) | ≤ 5 mm (mW) | 10 mm (mW) | 15 mm (mW) | 20 mm (mW) | 25 mm (mW) | 30 mm (mW) | 35 mm (mW) | 40 mm (mW) | 45 mm (mW) | > 50 mm (mW) |
|-----------------|-------------|------------|------------|------------|------------|------------|------------|------------|------------|--------------|
| ≤ 300           | 45          | 116        | 139        | 163        | 189        | 216        | 246        | 280        | 319        | 362          |
| 450             | 32          | 71         | 87         | 104        | 124        | 147        | 175        | 208        | 248        | 296          |
| 835             | 21          | 32         | 41         | 54         | 72         | 96         | 129        | 172        | 228        | 298          |
| 1900            | 6           | 10         | 18         | 33         | 57         | 92         | 138        | 194        | 257        | 323          |
| 2450            | 3           | 7          | 16         | 32         | 56         | 89         | 128        | 170        | 209        | 245          |
| 3500            | 2           | 6          | 15         | 29         | 50         | 72         | 94         | 114        | 134        | 158          |
| 5800            | 1           | 5          | 13         | 23         | 32         | 41         | 54         | 74         | 102        | 128          |

## 6.2 Exemption Evaluation

### RFID

| Frequency (MHz) | Peak FS @ 10m (dBμV/m) | EIRP (dBm) | EIRP (mW)  | Separation Distance (mm) | Power limits for exemption (mW) | Note                                                    |
|-----------------|------------------------|------------|------------|--------------------------|---------------------------------|---------------------------------------------------------|
| 13.56           | 22.63                  | -62.14     | 0.00000037 | ≤5                       | 45                              | FS measurement was taken from report #106398251MPK-006. |

### BLE

| Frequency (MHz) | Peak RF Power (dBm) | Antenna Gain (dBi) | EIRP (dBm) | EIRP (mW) | Separation Distance (mm) | Power limits for exemption (mW) | Note                                                                  |
|-----------------|---------------------|--------------------|------------|-----------|--------------------------|---------------------------------|-----------------------------------------------------------------------|
| 2402 – 2480     | -3.55               | 2.5                | -1.05      | 0.785     | ≤5                       | 2                               | Conducted power measurements were taken from report #106398251MPK-001 |

The EIRP of the RFID radio (0.00000037mW) is less than the limit of 45 mW.

The EIRP of the BLE radio (0.785 mW) is less than the limit of 2 mW.

According to RSS-102 Section 6.3, the device is exempt from SAR evaluation.

### 6.3 SAR calculation for RSS-102 Issue 6

RSS-102 Issue 6 Section 7.1.8 SAR estimation for exempted transmitters:

$$SAR_{estimated} = \frac{P_{max}}{P_{max,exemption}} \times 0.25 \times SAR_{limit} W/kg$$

- $P_{max}$  is the maximum power level including tune-up tolerance for the exempted transmitter
- $P_{max,exemption}$  is the maximum power level of exemption at the same frequency and distance for the exempted transmitter
- $SAR_{limit}$  is the applicable SAR limit (e.g. 1.6 W/kg for 1 g or 4 W/kg for 10 g)

| Radio | Frequency Range (MHz) | EIRP <sup>1</sup> (dBm) | P <sub>max</sub> (mW) | Distance (mm) | SAR <sub>limit</sub> (W/kg) | SAR estimated (W/kg) | P <sub>max, exemption</sub> (mW) |
|-------|-----------------------|-------------------------|-----------------------|---------------|-----------------------------|----------------------|----------------------------------|
| RFID  | 13.56                 | -62.14                  | 0.00000037            | 5             | 1.6                         | 0.00000000329        | 45                               |
| BLE   | 2420 – 2480           | -1.05                   | 0.785                 | 5             | 1.6                         | 0.157                | 2                                |

No duty cycle was considered.

#### 6.4 Total Exposure Ratio

The exposure ratio (ER) resulting from SAR-based exempted transmitters can be calculated using equation

$$ER_{therm>10\text{ MHz},u} = \frac{SAR_{estimated,u}}{SAR_{limit,u}}, 10\text{ MHz} < f_u \leq 6\text{ GHz}$$

where:

- $SAR_{estimated,u}$  is the SAR value of the exempted u-th transmitter/test frequency (refer to section 7.1.8)
- $SAR_{limit,u}$  is the basic restriction limit that is applicable for the u-th transmitter and
- $f_u$  is the operating frequency / test frequency of the u-th transmitter

The thermal total exposure ratio (TER)

$$\begin{aligned} TER_{therm} &= ER_{therm \leq 10\text{ MHz}} \\ &+ \sum_{t=1}^T ER_{therm>10\text{ MHz},t} + \sum_{u=1}^U ER_{therm>10\text{ MHz},u} \\ &+ \sum_{v=1}^V ER_{therm>10\text{ MHz},v} + \sum_{w=1}^W ER_{therm>10\text{ MHz},w} \\ &+ \sum_{x=1}^X ER_{therm>10\text{ MHz},x} + \sum_{y=1}^Y ER_{therm>10\text{ MHz},y} \\ &+ \sum_{z=1}^Z ER_{exempted_{1mW},z} \end{aligned}$$

Where:

- $T$  is the number of simultaneously operating transmitters for which an assessment against the basic restriction for SAR may have been performed (refer to section 8.2.2.1)
- $U$  is the number of simultaneously operating exempted transmitters for which an estimate against the basic restriction for SAR may have been performed (refer to section 8.2.2.1)
- $V$  is the number of simultaneously operating transmitters for which an assessment against the basic restriction for APD may have been performed (refer to section 8.2.2.2)
- $W$  is the number of simultaneously operating exempted transmitters for which an estimate against the basic restriction for APD may have been performed (refer to section 8.2.2.2)
- $X$  is the number of simultaneously operating transmitters (operating between 6 GHz and 30 GHz) for which an assessment against the IPD level may have been performed (refer to section 8.2.2.3)
- $Y$  is the number of simultaneously operating transmitters (operating between 30 GHz and 300 GHz) for which an assessment against the IPD level may have been performed (refer to section 8.2.2.3) and
- $Z$  is the number of simultaneously operating transmitters for which the 1 mW exemption as outlined in section 6.5 applies (refer to section 8.2.2.4)

| Radio | Frequency Range (MHz) | SAR <sub>estimated</sub> (W/kg) | SAR <sub>limit, u</sub> (W/kg) | ER <sub>therm</sub> | TER <sub>therm</sub> |
|-------|-----------------------|---------------------------------|--------------------------------|---------------------|----------------------|
| RFID  | 13.56                 | 0.00000000329                   | 1.6                            | 0.00000000206       | 0.0981               |
| BLE   | 2402 – 2480           | 0.157                           | 1.6                            | 0.0981              |                      |

TER<sub>therm</sub> is less than 1 so the EUT is compliant to SAR-PD-Exposure limits.

## 6.5 Evaluation Results

The sample evaluated was found to Comply. The EUT is exempt from routine SAR evaluation and TER<sub>therm</sub> is ≤1.

**7 Revision History**

| Revision Level | Date              | Report Number    | Prepared By | Reviewed By | Notes                                                                            |
|----------------|-------------------|------------------|-------------|-------------|----------------------------------------------------------------------------------|
| 0              | February 24, 2026 | 106398251MPK-014 | AM          | AC          | Original Issue                                                                   |
| 1              | April 21, 2026    | 106398251MPK-014 | AM          | AC          | Added list of HVINs<br>Updated Antenna Gain<br>and corresponding<br>measurements |