

# Wireless Safety

March 2007

Whitepaper

## DECT™ & Bluetooth® Safety Overview

DECT and Bluetooth are both short-range radio technology which transmit at a much lower output power than a typical mobile phone. According to current scientific knowledge, there are no known health risks associated with DECT or Bluetooth headsets and the power they transmit falls well below permissible safety limits.

### Transmit Output Power

A typical 900MHz GSM mobile phone has an average power of up to **250mW**.

An typical DECT telephony handset Transmit power is much less at just **10.43mW** ( $250\text{mW} \times (417\text{us} / 10000\text{us})$ ) whilst a Plantronics DECT headset Transmit power is typically a mere **0.26mW** ( $6.3\text{mW} \times (417\text{us} / 10000\text{us})$ ).

Bluetooth headsets transmit at even lower levels, given a range of 10m versus up to 100m for DECT.

**Put another way, Plantronics DECT and Bluetooth headsets output about 0.1% of the transmit power of a typical mobile phone and 2.5% of the power of a typical DECT handset.**

## Safety Limits and SAR

For radio devices it has become standard to measure the Specific Absorption Rate (SAR) of the product. SAR testing is an effective method of quantifying the amount of energy absorbed into biological tissue, particularly the human body.

The majority of SAR testing is focused on the head where the current limits for uncontrolled exposure are **2W/kg** for 10g Volume Averaged SAR for Europe, Japan and Korea.

A SAR value is not usually specified for DECT or Bluetooth headsets as the transmit power is so low as to guarantee a SAR value well below the basic test limits. As such, these headsets meet the exclusion conditions of the European Standards for this type of testing, such as ES 59005 and EN50360/EN50361.

Although there is no requirement to do so, Plantronics has commissioned independent testing, with results clearly showing that the SAR levels are far below those required to comply with international standards:

- SAR for a mobile phone: typically **0.3 to 1.5 W/kg** for 10g Volume Averaged
- SAR for a Plantronics CS60 DECT headset: **0.0006 W/kg** for 10g Volume Averaged
- SAR for a Plantronics M3000 Bluetooth headset – **0.03 W/kg** for 10g Volume Averaged

**The above figures show that a typical Plantronics Bluetooth or DECT headset operates at in the range of just 0.03% to 1.5% of the recommended European SAR limit. Considering typical mobiles phones operate in the range between 15% and 75% of the SAR limit, it can clearly be seen that headsets are very low powered.**

In fact, the SAR values for headsets are so low that accurate measurement is actually quite difficult.

Plantronics Bluetooth and DECT headsets comply with relevant global standards. Throughout the European Union, the relevant standard for mobile phones and other devices worn close to the head is EN 50360.

**An additional factor to consider is that all current specifications require testing to be performed at the maximum power of the device.**

In most scenarios, when Bluetooth headsets are worn outside of a phone call, for instance when a user is expecting an incoming call, the headset goes into a very low average power mode, significantly decreasing RF exposure over longer periods. DECT headsets use a *listening* mode when not on an active call, so do not transmit at all in these situations.

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The following organizations have set exposure limits for acceptable RF safety via SAR levels, based on thorough examination of scientific evidence:

- The American National Standards Institute (ANSI)..
- The International Commission on Non-Ionizing Radiation Protection (ICNIRP), based in Munich, a non-profit making scientific body.
- In the UK, the National Radiological Protection Board (NRPB).

Standards of measurement have been set by:

- European Committee for Electro technical Standardisation (CENELEC)
- Institute of Electrical and Electronics Engineers (IEEE)

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