

LTE

Fourth Generation Mobile Communications



**Mobile Manufacturers
Forum**

To cater for the enormous growth in the transfer of wireless data, fourth generation (4G) mobile communications devices and networks are being introduced. Long Term Evolution, or LTE as it is referred to, is a standardized technology that has been designed to offer greater capacity and speed over the mobile network to address the increasing data demands of mobile devices. LTE uses the latest antenna technologies to transmit data in different ways than previous generations of mobile communication technologies and is also extremely efficient in its use of the available spectrum.

This brochure is designed to help answer any questions relating to health and safety that you may have in relation to this technology.

Terminology guide

1G: First generation systems were analog and designed for voice transfer. AMPS, NMT, and TACS, are some of the terms used to refer to the different first generation network systems used around the world. Currently only a few analog systems remain in existence.

2G: Second generation systems, for example GSM, are digital and are capable of providing voice/ data/fax transfer as well as a range of other value-added services. Evolutions of second generation systems via technologies such as HSCSD (High Speed Circuit Switched Data) and GPRS (General Packet Radio Service), also known as 2.5G referring to their bridging role between second and third generation systems, enable services that require higher data rates.

3G: Third generation mobile communication systems use high-speed data transfer and state-of-the-art radio terminal technology, enabling multimedia and other dynamic features.

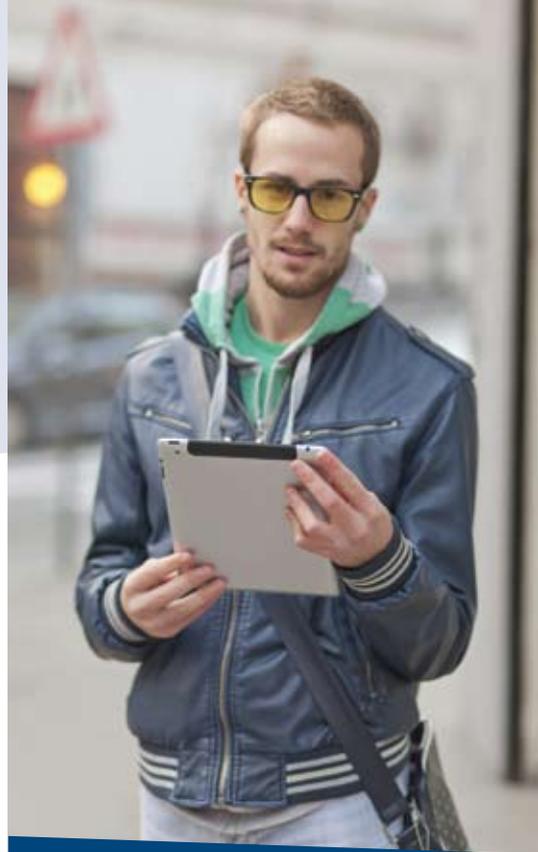
4G: LTE is a global standard for the fourth generation of mobile broadband. LTE has been developed to offer even greater capacity and speed over the mobile network to cater for the enormous growth in mobile data and the number of users.



Do these newer technologies pose new health concerns?

New technologies are built on the knowledge accumulated over many years, and are subject to the same safety standards that have applied for years to mobile phones and base stations. Research on radio waves and health dates back more than 60 years and the scientific knowledge in this area continues to grow.

At a more general level, it is important to note that many national and international health agencies monitor this issue. They include the World Health Organization (WHO) and independent standard-setting organizations. None of these bodies has asserted that mobile devices and base stations pose a health risk.



Are there safety standards that cover these new technologies?

Yes. Like other systems used for mobile or wireless communications, they are covered by science-based safety standards that are designed to protect all members of the community. All products will continue to be designed, manufactured and tested to meet all applicable safety standards.



Is past or current research relevant for new technologies?

With advances in technology and the introduction of new services, some people understandably wonder whether today's science is applicable and relevant to tomorrow's mobile communications networks. The mobile phone industry believes that past and present research on possible health effects will continue to provide a sound scientific basis for addressing questions about mobile communications and health. The research in this area covers a wide range of frequencies and radio signal types. It has produced no substantiated evidence of health effects that vary from one frequency or signal type to the next at output levels used in mobile communications. In addition, international standards and guidelines establish substantial margins of protection from any known adverse health effects associated with exposure to radio waves. These standards and guidelines span the full range of frequencies and signal types used for commercial mobile communications networks. This provides a sound basis for confidence in the safety of present and future technologies.

Have exposure levels from base stations been measured?

A large number of surveys have been undertaken in different countries measuring the electromagnetic fields emitted by base stations, to ensure they are in compliance with national and international standards, with many of these publicly available. More recently, a comparative analysis of data from these surveys obtained from more than 20 countries found that exposures at ground level in public areas are a small fraction of the exposure limits (the global average was 5500 times below the international guidelines) and that the levels vary little between countries, technologies and over time. Importantly, the study found that the environmental levels have remained essentially constant despite the increasing number of base stations and deployment of additional mobile technologies.



What do the experts say?

While the International Agency for Research on Cancer (IARC) has classified radio frequency electromagnetic fields as 'possibly carcinogenic to humans', the World Health Organization also updated their fact sheet on mobile phones, which stated:

A large number of studies have been performed over the last two decades to assess whether mobile phones pose a potential health risk. To date, no adverse health effects have been established as being caused by mobile phone use.

This is also consistent with the advice contained in the WHO fact sheet on base stations and wireless communication networks which states:

Considering the very low exposure levels and research results collected to date, there is no convincing scientific evidence

that the weak RF signals from base stations and wireless networks cause adverse health effects.

Other expert bodies and health agencies have reached similar conclusions to those of the WHO, such as:

Available data do not indicate any risks related to exposure to RF from base stations or radio or TV antennas. Taking into account also the low levels of exposure that these sources give rise to, health effects from transmitters are unlikely.

Swedish Independent Expert Group on EMF, 7th EMF Report, 2010

The scientific consensus is that, apart from the increased risk of a road accident due to mobile phone use when driving, there is no clear evidence of adverse health effects from the use of mobile phones or from phone masts.

United Kingdom Health Protection Agency, 2010



Where can I go for further information?

There are a large number of independent sources of information available. The most comprehensive resource on the topic is provided by the:

- World Health Organization (WHO)'s International EMF Project:

[www.who.int/peh-emf/]

In addition, many health and regulatory agencies around the world provide advice to consumers, including:

- Health Council of the Netherlands
[www.gr.nl/engels/welcome/frameset.htm]
- Swedish Radiation Protection Authority
[www.ssi.se/english/index.htm]
- U.K. Health Protection Agency
[www.hpa.org.uk/]
- Australian Radiation Protection and Nuclear Safety Agency
[www.arpana.gov.au/]

What is the MMF?

The MMF is an international association of telecommunications equipment manufacturers with an interest in mobile or wireless communications. To learn more about the MMF please visit our website www.mmfai.info or follow us on twitter: [www.twitter.com/mmfupdates](https://twitter.com/mmfupdates)

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