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## What is EMC?

EMC (ElectroMagnetic Compatibility) is concerned with the prevention of interference that can occur between electrical and electronic products or systems. Any electrical apparatus has the ability to generate interference or be affected by interference.

You cannot use a mobile phone on a plane, in a hospital or at a petrol station because the phone is an intentional transmitter. The concern is that equipment in these environments may pick up the signals that are transmitted by a mobile phone and be misinterpreted as intended signals within that equipment, which could then have highly dangerous consequences. This is the reason behind these restrictions.

Intentional transmitters are not the only source of potential interference for other systems. All electrical products can transmit, and, for the most part, this happens unintentionally. A hairdryer can produce a snowy picture on a television. The start and stop functions of a microwave oven can produce clicks on a radio. These are typical incidents of interference. However, there are sometimes much more serious interference incidents from unintentional transmitters. Floor buffers used in a hospital corridor have "flat-lined" a patient, resulting in the patient taken to the morgue, while still alive! Cash registers in shops on Air Force bases have forced helicopters to crash land. And the use of a drilling tool in a restricted area that has caused robotics machinery to kill a nearby worker.

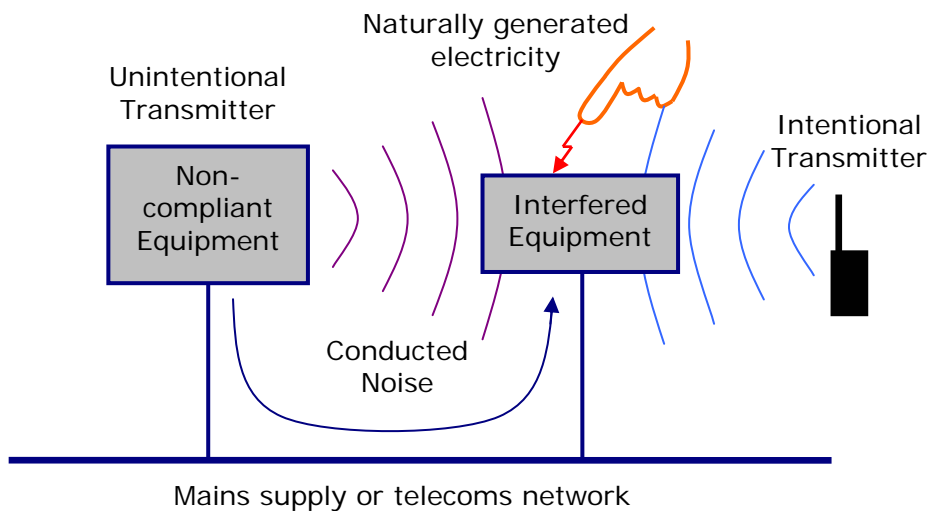
Then what about static and lightning strikes? These are natural sources of electricity that can also affect the operation of products or systems.

All of these phenomena are considered when testing for EMC.

Therefore, if a product passes the appropriate EMC tests, then it is considered to be Electromagnetically Compatible for its intended environment and should therefore not interfere with other products, nor should other products within that environment affect it.

From 1st January 1996, European Directive 89/336/EC (which is soon to be replaced with 2004/108/EC) was enforced to make EMC a legal

requirement for manufacturers of electrical and electronic products and systems to implement prior to sale in the EU. This Directive has many routes to compliance, but the most common requires that a representative or the manufacturer declare that the product or system is compliant by applying the appropriate standards and testing to those standards. The product or system can then be CE marked. There are limits for emissions from a product and minimum performance requirements for the immunity of a product, which if met offer the safest route to conformity with the Directive for a manufacturer.



Outside of the EU, many countries, for example, the USA, China and Japan, have their own and slightly different EMC legal requirements, all requiring testing to be performed, and the product to be appropriately marked for sale in that country.

We need products to meet EMC requirements for another important reason. Without mass compliance, broadcast reception can be significantly deteriorated. Improved sensitivity design in the reception circuitry of television or radio products would not eliminate the noise generated by nearby products. Such noise cannot be filtered out if it is at the same frequency as the intended signal. Therefore, in order to maintain the same coverage of service in a noisier environment, the broadcaster has no option but to increase the transmission power, which in turn would then interfere with more products. This is the potential future situation that EMC enforcement is trying to avoid and it is known as "interference chaos". Add to this the health issues that increased transmission power would almost certainly create and EMC becomes a highly important compliance requirement.