Furniture Industry Research Association

Electrical accessories incorporated into furniture - a guide to the UK Regulations

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FIRA International Limited
on behalf of the **Furniture Industry Research Association**
Maxwell Road, Stevenage, Hertfordshire, SG1 2EW, United Kingdom
Tel: +44(0)1438 777 700, Email: info@fira.co.uk

Contents

Foreword

This guide has been prepared by FIRA International Ltd on behalf of the Furniture Industry Research Association.

This document is a guide for designers and manufacturers of furniture incorporating electrical accessories. It does not replace any legislative documents that are available and is simply additional information to help achieve compliance. As such, the regulations and relevant supporting documentation (details of which can be found at the end of this document) must also be understood.

The dates and titles of standards and regulations referenced within this document were current at the time of publication. It is advised that advice be sought on the status of these and any other applicable documentation when assessing product conformity.

All efforts have been made to ensure this document is correct at the time of going to press. The opinions and advice expressed are given in good faith. However, the authors cannot be held responsible for any action resulting from the content of this guide as the ultimate interpretation of the regulations rests with the courts. Where serious doubt occurs professional legal opinion should be sought.

For the purposes of this guide, and with specific reference to the placing of product on the market, making available any products and distribution of products etc. this is only considered to the extent that it relates to placing product for use on the EU market. This may of course change in the event of a Brexit no-deal situation.

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Any amendments or revisions made to this document are recorded here:

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1. Introduction

There is an increasing number of furniture products sold in the domestic and contract markets that are designed using ‘off the shelf’ electrical components to enhance the features beyond that normally considered important for furniture (strength, durability and comfort). These ‘lifestyle’ enhancements commonly include power outlets, USB outlets, Wi-Fi induction chargers, short range wireless communication controllers and Bluetooth connected speakers / devices.

By incorporating these features into the completed product, furniture manufacturers need to ensure that their furniture complies with any applicable EU Directives and understand CE marking of the completed product and that of the individual components used. Consideration should also be given to the installation and wiring of these accessories into the product to ensure conformance to national and international regulations.

This guide covers the basic background to CE marking and is then split into three sections covering the following topics:

Installation and Wiring Regulations for Furniture

The first section of this guide covers the requirements for wiring and installation in the UK and includes information on the regulations related to internal / external wiring specifications which should be noted by designers.

Directives for CE marking and National Standards related to completed products

The main EU Directives related to completed furniture incorporating accessories with information on the related standards required for compliance.

CE marking of Individual Accessories

Explanation of the CE marking requirements related to critical components which the manufacturer should be checking at the early design stage to assess suitability to be used in final product design as an accessory.

The guide then finishes with a route to compliance for CE marking and an Appendix detailing some common furniture incorporating electrical accessories and associated Directives and standards.

Please note for the purposes of this document that the term ‘manufacturer’ also refers to the ‘Authorised Representative’ which is defined in Section 2.

Exclusions

This guide does not cover those products that fall under the scope of the Machinery Directive. These products are covered in FIRA guides:-

- Electrically Actuated Furniture for the Domestic Market – a guide to UK regulations
- Electrically Powered Office Furniture – a guide to UK regulations

This guide does not cover ‘fixed’ furniture in buildings which are subject to the ‘Building Regulations’ as explained in Section 4.

2. Terms and definitions

The following brief list contains some of the key phrases and their definitions associated with electrical installation, accessories and CE marking.

Manufacturer: a person who designs or manufactures product with a view to it being placed on the market under that person's own name or trademark; or for that person's own use in an EEA state; or if there is no such person, the person who first places that product on the EU market or puts it into service.

Authorised Representative: if the manufacturer is not based in the EU an 'authorised representative' can be appointed by them to take responsibility for CE marking. The authorised representative will often be an importer, distributor or buyer of the furniture products. The definition of an authorised representative is a person established in an EEA state who has received a written mandate from the manufacturer to perform, on the manufacturer's behalf, all or part of the obligations and formalities imposed on manufacturers (either as "manufacturers" or "responsible persons") in connection with the Directives.

Responsible Person: referred to in the Directives as "manufacturers or their authorised representatives" – see definitions above.

CE mark: this is the declaration from the manufacturer or the manufacturer's authorised representative indicating that the product has undergone all necessary evaluation procedures and meets the essential requirements of the applicable CE marking Directives.

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Declaration of Conformity: as well as placing the CE mark on the product and producing Technical Documentation (File), the manufacturer/manufacturer's authorised representative must also produce and sign a Declaration of Conformity. This is a single-page document summarising the CE marking process that has been followed.

Directives: these are legal documents published by the European Commission that lay down requirements for Member State governments to include in their National laws. The CE marking Directives can be rather vague and the legislative structure they set up includes specific provision for standards to be written to contain the working detail.

Essential requirements/essential safety requirements/ESRs: ESRs are the main points in the Directives that must be met before you can claim compliance with the Directive. They are generally expanded in detail in Harmonised standards, although above all you must always meet the ESRs of the Directive.

Harmonisation/Harmonised standards: Harmonisation is a term commonly used where a European standard has been specifically developed, by a recognised EU standards organisation at the request of the European Commission, to enable the application of EU legislation. Once harmonised and listed in the Official Journal of the EU (OJEU) in regards to a particular CE Directive/Regulation, these standards are considered to be sufficient to be used to demonstrate compliance with the essential requirements covered by those standards. As such, these standards offer a "presumption of conformity"

NOTE care should be taken when using harmonised standards as they, for various reasons, don't always address all of the applicable essential requirements. An example of this is where a product employs features/functions not addressed by the 'generic' product standard. The new thinking is that

the risk assessment should demonstrate how any such gaps have been addressed (and how all applicable essential requirements have been met).

Technical documentation: whoever placed the CE mark on the product shall have the necessary documentation to demonstrate that the essential requirements of the applicable Directives have been met. This information, including design specifications, test results and assessment history, is compiled to form the 'technical documentation', otherwise known as the Technical File.

Radio communication: defined in the Radio Equipment Directive (RED) as communication by means of radio waves

Radiodetermination: defined in RED as the determination of the position, velocity and/or other characteristics of an object, or the obtaining of information relating to those parameters, by means of the propagation properties of radio waves.

Radio Waves: defined in RED as electromagnetic waves of frequencies lower than 3 000 GHz, propagated in space without artificial guide.

Short Range Device (SRD): Radio equipment which provides either uni-directional or bi-directional communication which has low capability of causing interference to other radio equipment. SRDs use either integral, dedicated or external antennas and all modes of modulation can be permitted subject to compliance with relevant standards. For Short Range Devices individual licenses are normally not required.

Electrical Accessory: means an integral device associated with the electrical wiring of a domestic installation. An electrical domestic accessory is a basic part used in wiring either for protection & adjustment or for the control of the electrical circuits or for a combination of these functions

3. Background

3.1 Introduction to CE Marking

The CE marking of a product was introduced in the early 90's and is a key indicator of a product's compliance with EU legislation regarding safety, health and environmental protection. The CE mark on a product ensures the free movement of products within the European Economic Area (EEA). A series of specific European Directives, referred to as "New Approach" Directives, are the legal basis of CE marking and aim to harmonise requirements and remove potential barriers to allow free trade in the European Union. The CE mark itself does not indicate that a product was made in the EU, nor is it a guarantee of safety/health or quality.

By affixing the CE mark to a product a manufacturer is declaring, at its sole responsibility, that the product conforms to the legal requirements which allows free movement and sale of the product throughout the EEA.

Responsibility for CE marking lies with whoever first places the product on the market in the EU. This could be an EU-based manufacturer, the importer of a product made outside the EU, or the manufacturer's EU Authorised Representative. The EU office of a non – EU manufacturer doesn't necessarily have any responsibility for CE marking unless the product is sold through / by them, in which case they may be the importer (if they are the first person placing the product on the EU market) or distributor, or have been appointed as authorised representative.

The manufacturer of a product affixes CE marking to it but has to take certain obligatory steps before the product can bear a CE mark. A manufacturer's obligations relating to each of the applicable Directives are detailed in the following pages. Many of the obligations are the same for each Directive and follow a common approach known as the NLF (New Legislative Framework) which consisted of three different items of legislation, one of which was the common framework for CE marking (EU decision no. 768/2008/EU). A helpful guide called 'The 'Blue Guide' on the implementation of EU products rules 2016 can be found at http://ec.europa.eu/DocsRoom/documents/18027/

There are rules underlying the procedure to affix CE marking and specific routes to compliance for different products and accessories. This guide will allow a manufacturer to determine if it has fully covered all the design, technical and testing aspects related to specific products and accessories incorporated into furniture.

It is also important to note other legal requirements for consumer products, including compliance with the General Product Safety Directive (GPSD) (2001/95/EC). Whilst still a "New Approach" Directive, the GPSD is not a CE marking Directive. The GPSD either applies entirely to a product, if no CE marking Directives apply, or partially, if CE marking Directives are applicable to a product but do not cover the safety of all functions or technology.

3.2 European Directives, Harmonised Standards and IEC Standards

The transposition of Directives and Harmonised standards into National laws makes them legally binding and mandatory within EU Member States. Only products and components that comply with the essential requirements may be placed on the EU market or made available and subject to unimpeded movement. Harmonised European standards (hEN) which have been transposed into National standards correspond to these required essential requirements. Products and components

manufactured in compliance with harmonised standards shall, as such, be recognised as conforming to the corresponding essential requirements.

IEC standards are developed by the International Electrotechnical Commission which is an international standards organisation that prepares and publishes International standards for all electrical, electronic and related technologies – collectively known as "electro technology". These IEC standards developed at an international level are used by CENELEC as the basis for creating harmonised standards aligned with the EU Directives within the EEA. CENELEC is the European Committee for Electro technical standardization and is responsible for standardization in the electro technical engineering field within the EEA.

3.3 Electrical Products / Components and related CE Marking Directives

CE marking is required in the EU (28 member states) and also European Free Trade Association (EFTA) countries (including Norway, Iceland and Lichtenstein) plus Switzerland (by virtue of a mutual recognition agreement). Turkey has adopted some CE marking Directives as an accession state because of other bi-lateral agreements. If the product is to be placed on the market or made available in these markets, CE marking applies if the product or component is covered by one or more of the European CE marking Directives. There is no defined category for furniture but many furniture products incorporating electrical accessories do fall into one or more of these Directives by virtue of their design and functionality.

With respect to furniture incorporating electrical components a manufacturer must determine which Directives are applicable and note that there may be several Directives that have to be taken into consideration. The product can only be placed on the EU market when it complies with the provisions of all the applicable Directives. Generally, the Directives related to furniture and individual components are those described below.

Product and components manufactured within the EU but destined to be sold outside of the EU do not need to comply with CE Marking Directives and do not need to be CE Marked. It is, however, essential to ensure that product and components are safe and comply with essential safety requirements within the country in which they are being sold.

4. Installation and Wiring Regulations for Furniture

It is important for a manufacturer to consider the installation and routing of the cabling inside the furniture interconnecting the electrical system that has been incorporated. For the purposes of this guide the installation boundary is considered to be at the point of the socket connected to the permanent electrical network in the building of its placement. The rationale for this is explained in 4.1 below.

4.1 Fixed Wiring Regulations

BS 7671:2018 Requirements for Electrical Installations. IET Wiring Regulations

This national standard is the UK's main electrical safety standard to which all electrical installations should conform. It sets out regulations which apply to the design, erection and verification of electrical installations, and to additions and alterations to existing installations. Despite the title, the standard itself is not a statutory document. It sets the standard for how electrical installations should be carried out in the UK (and many other countries) and aids compliance with legislation such as the requirements of the Electricity at Work Regulations 1989.

In the UK, BS 7671 covers the fixed electrical installation from the origin of the installation to the end of the final circuit and/or the point of connection to current using equipment and not equipment supplied from a plug and socket arrangement. Approved Document 'P' defines an electrical installation as "fixed electrical cables or fixed electrical equipment located on the consumer's side of the electricity supply meter", and states that the installation of fixed equipment is within the Scope of Part P (Approved Document P 2006) even where the connection is by a 13A plug and socket arrangement. Contractors and DIY installers should consider building regulations when building fixed furniture in dwellings, such as kitchens and bathrooms.

To put this into context, in terms of this guide and the relationship with furniture, the definition of furniture (Oxford Dictionary) is *'the moveable contents of a building that makes it suitable for living or use".* From this definition we can conclude that furniture is anything that can be picked up and moved around. When it comes to fitted kitchens or bedroom furniture these items are permanently fixed furniture and cannot be considered 'moveable' therefore BS 7671 would apply to fitted furniture and the requirements for fixed wiring installations would be applicable.

The accepted boundary of BS 7671 for non-fixed furniture is that it finishes at the plug and socket, i.e. installations connected to the supply by means of a plug and socket. From the point of view of an installation in use in a dwelling or domestic setting, the building regulations require that reasonable provision is made during the design stage to protect persons from injury. A duty of care exists.

NOTE *The Building Regulations and therefore requirements for fixed furniture are beyond the scope of this guide.*

4.2 Electricity at Work Regulations 1989

The Electricity at Work Regulations 1989 came into force on 1 April 1990. The purpose of the Regulation is to require precautions to be taken against the risk of death or personal injury from electricity in work activities.

Regulation 4 of The Electricity at Work Regulations 1989 requires that:

- All systems shall at all times be of such construction as to prevent, so far as is reasonably practicable, danger.
- As may be necessary to prevent danger, all systems shall be maintained to prevent, so far as is reasonably practicable, such danger.
- Every work activity, including operation, use and maintenance of a system so far as is reasonably practicable, to danger.
- Any equipment provided under these Regulations for the purpose of protecting persons at work on or near electrical equipment shall be suitable for the use for which it is provided, be maintained in a condition suitable for that use, and be properly used.

Therefore, where parts of an installation are not covered by a British standard, there is still a requirement to ensure that the system is safe.

4.3 Office and Educational Furniture

BS 6396:2008+A1:2015 - Electrical systems in office furniture and educational furniture. Specification

This national standard is associated with the installation of electrical equipment within office and educational furniture. All electrical systems and installations within the work environment must comply with the statutory regulation – "Electricity at Work Regulations" described previously in section 4.2. Failure to comply with statutory regulations may lead to a criminal prosecution. BS 6396 was established to provide a specification for the safe installation and use of electrical systems in or on furniture used in these environments where the electrical system is connected to the mains supply using a 13A plug. BS 6396:2008 outlines the manufacturing standards for all equipment to be used with office or educational furniture.

This standard describes the testing requirements for single phase electrical power distribution systems in furniture operating at a max rated voltage of 250V AC connected to the fixed wiring of the permanent installation of the building by a 13A fused plug and socket outlet conforming to BS 1363. The standard also explains requirements for routing of cables through the furniture.

NOTE – the standard does not apply to:-

- Electrical appliances used with or within an article of office furniture or educational furniture, for which appropriate standards would be available for the individual components.
- Power distribution systems that are permanently connected to the building installation. Where power cables are permanently wired into the building ring main they are covered by BS 7671 – the IEE Wiring Regulations. See section 4.1.
- Special purpose workstations in laboratories or workshops.

4.3.1 General Requirements

- All furniture must be fit for purpose and be structurally sound and stable, this is normally demonstrated by testing to current strength and stability standards.
    - Safety and stability of office furniture: BS EN 527-2 and BS EN 527-3.
    - Safety and stability of screens: BS EN 1023-2 and BS EN 1023-3.
    - Safety and stability of educational furniture: BS EN 1729-2.

- All components should conform to the British standards relevant to those products and used within their ratings.
- All parts of the electrical distribution system should be prevented from overcurrent and the user should never be exposed to hazardous voltages, even if there is a failure of insulation.
- No single item of equipment plugged into the outlets should have a rated current exceeding 5A
- The construction of the furniture should be:
    - Unearthed – where the electrical system installed meets the requirements for reinforced or double insulation (and there is no provision for an earth connection); or
    - Earthed – where the furniture has provision for the metal components to be connected to the supply earth.

4.3.2 Design Requirements

- There shall be no user access to parts at hazardous voltage. A test probe is used to assess access.
- Exposed conductive parts that can acquire hazardous voltages due to failure of insulation should be connected to a protective earth terminal or use double insulation in its design
- Where a furniture power distribution system is connected to an existing building socket outlet which does not have residual current device (RCD) protection, the furniture socket outlets shall be protected by means of a 30 mA RCD incorporated in the furniture power distribution system.
- A corrosion resistant earth terminal should be provided for furniture that is intended to be earthed.
- Any mains power cable entering the desk should be less than 2 m in length and should feature a cable clamp at the inlet to the desk to prevent undue strain on the cable.
- The maximum rating of the electrical distribution system should be no more than 13 amps, and the number of sockets used is limited to four (if rated no more than 5A each) or six (if rated no more than 3.15A each).
- The power sockets and connectors need to be orientated, placed or provided with a means to protect them from water spillage such as knocking over a cup of coffee.
- There should be no sharp edges on any of the equipment or furniture in contact with any cabling to prevent damage in use.
- Holes or apertures through which cables pass should be suitably shaped or sized so cables can be fed through without difficulty.
- Power cabling needs to be segregated from data cables. This is achieved either by having a 50mm gap between power and data cables, dedicated separate channels for power and data cables, cable screening of individual services or insulating all cables for the highest voltage present in the system.
- The cable management system should be constructed so that any gaps between ducts should not exceed 150mm.
- Once the system is installed in an office the installation also needs to be checked for continuity, polarity, earth continuity and insulation resistance.

4.3.3 Marking requirements

In addition to the physical requirements the standard also requires that instructions and markings be supplied with the product.

A desk needs a permanent label attached to it detailing the rating of the system and where instructions on safe operation can be found. Full details of the requirements are contained in the standard. It should be noted that the label must be permanent, that is it cannot be removed without destroying it, and the text cannot be removed by rubbing with water or petroleum spirit. In addition the minimum size of any character must be 2mm. This does not mean a 2mm typeface used by printers, but a typeface where the lower case characters are a minimum of 2mm in height.

Finally adequate instructions for the safe installation and use of the equipment must be supplied as a separate leaflet. Once again the standard contains the minimum details required.

It should be noted that the above standard BS 6396 applies only to educational and office furniture in the workplace, there may be other items of furniture in the workplace such as cupboards and shop display cases, in which electrical equipment such as luminaries, installation couplers, socket-outlets, switching devices and wiring systems are installed. In this case refer to the statutory regulations.

4.3.4 International furniture standard for other market sectors (Domestic)

IEC 60364-7-713:2013. Low-voltage electrical installations. Requirements for special installations or locations. Furniture

This International standard applies to wiring systems within furniture (and similar fitments) which are connected to an electrical installation. The examples cited in the standard include beds, cupboards, display cases which have incorporated in their design electrical equipment such as luminaires, installation couplers, switching devices, socket outlets and general wiring systems. The standard applies to all kinds of furniture regardless of the connection to the electrical installation of the building as long as the furniture involved is not subject to another more specific IEC standard.

The requirements of the standard apply to electrical equipment in furniture connected to a supply with a nominal voltage not exceeding 230V and a total current not exceeding 32A. Electrical appliances are excluded from the scope of this standard as this type of appliance, where designed for installation in furniture, is subject to other IEC and harmonised standards. Examples of electrical appliances in this category would include refrigerators, TV receivers, radios installed in the furniture and connected via plugs and socket outlets to the electrical installation of the building.

The definition of furniture from IEC 60364-7-713 is:

Movable or immovable articles such as desks, chairs, tables and work benches, cupboards and beds which are used in domestic, commercial and industrial premises for activities associated with work or leisure.

The main areas that the standard covers is:-

- Protection against Electric Shock
- Residual Current Protection Devices (Electrical furniture should be protected by RCD)
- Wiring Systems selection

The selection of the wiring used should be noted against appropriate wiring standards (i.e. BS EN 50525). The wiring system connecting the furniture to the electrical installation should be:-

- If connected to building by installation coupler, a rigid cable should be used
- Plug and socket connections should use insulated cable

Any furniture designed to be moved should be wired using flexible cable. Any cable and cords that are incorporated inside the structure of the furniture should also follow the rules outlined in the standard which states

'Cables and cords should be suitably protected against damage. They shall be securely fixed to the furniture or located in cable ducting, cable trunking, conduit or channels formed in the construction of the furniture.'

The standard also covers electrical accessories designed into the furniture, specifically flush mounted and surface mounted boxes must comply with BS EN 60670-1. With reference to liquids and spillages on accessories the standards states that

'Electrical accessories must orientated or provided with a means to prevent the risk of electrical hazards via liquid spillage that can be reasonably expected'.

5. Common CE marking directives and national standards related to furniture incorporating electrical accessories

5.1 Low Voltage Directive (LVD) (2014/35/EU)

5.1.1 Introduction

The Low Voltage Directive 2014/35/EU replaced the previous Directive 2006/95/EC from 20th April 2016. The LVD applies to all electrical products and equipment designed for use with a voltage rating of between 50V and 1000V for alternating current (AC) and between 75V and 1500V for direct current (DC) and whose hazards are primarily of an electrical nature (Consumer goods with a voltage below 50V for AC or 75V for direct current are dealt with by the General Product Safety Directive 2001/95/EC).

This will include the majority of furniture incorporating electrical accessories connected to a domestic power supply. The LVD includes CE marking requirements and has been implemented into UK law as part of the Electrical Equipment (Safety) Regulations 2016.

The essential requirements and obligations for manufacturers outlined by the Directive are that electrical equipment may only be placed on the EU market if it:

- has been constructed in accordance with good engineering practice and does not endanger the safety of persons or property
- is used in applications for which it is intended

5.1.2 Related Harmonised Standards – LVD

The application of any standard for any product safety Directive like the LVD is optional at the manufacturer's choice, but if the product fully meets the requirements of a standard harmonised for that Directive then the manufacturer may simplify the conformity assessment process and reduce the burden of the technical file. If a relevant standard exists but the manufacturer chooses not to apply it in full the onus would be on the manufacturer to show, potentially in much more detail, how the relevant essential requirements (safety objectives) have been met. It should be remembered that enforcing authorities may use the harmonised standard(s) as a guide in assessing compliance with the essential requirements.

For furniture incorporating electrical accessories the associated standards for manufacturers to consider are:-

BS EN 60335-1:2012+A13:2017 Household and similar electrical appliances. Safety. General requirements

BS EN 60335-1 gives general requirements to ensure the safety of household appliances and similar electrical appliances – providing the rated voltage is not more than 250 V for single-phase and 480 V for other appliances. It is the first part in the EN 60335 series and is intended to be used in conjunction with subsequent parts intended to cover more specific products. The scope of the standard makes reference to 'similar' electrical appliances meaning that this standard also covers appliances used in offices, shops, hotels and other residential type environments. These requirements for electrical safety look to cover common hazards of household and similar equipment and electrically-operated devices that could cause injury to persons in and around the environment it

is placed in. The use of appliances by unsupervised children, or young children playing with electrical household equipment, is not covered in this standard.

BS EN 60065:2014+A11:2017 Audio, video and similar electronic apparatus. Safety requirements

This European standard covers the principle safety objectives for electrical equipment designed for use within certain voltage limits. The scope of the standard is relevant to manufacturers of audio, video and similar electronic apparatus. The main aim of the standard is to protect people and the surroundings of the apparatus, such as preventing injury or damage from electric shock, excessive temperatures, radiation, mechanical hazards and fire.

Note: Whilst the above standard still provides a presumption of conformity to the LVD, it has since been superseded by EN 62368-1:2014 (Audio/video, information and communication technology equipment - Part 1: Safety requirements)

BS EN 50525-1:2011 Electric cables. Low voltage energy cables of rated voltages up to and including 450/750 V (U0/U). General requirements

This European standard t gives general requirements for rigid and flexible energy cables of rated voltages U0/U up to and including 450/750 V a.c., used in power installations and with domestic and industrial appliances and equipment. It is part of the BS EN 50525 series of standards. The standard aims to help manufacturers ensure cables are safe and reliable when properly selected, installed and used and sets out those characteristics and manufacturing requirements that affect safety. It also gives methods for checking cables against these requirements. Cables that meet the requirements of BS EN 50525 satisfy the safety objectives of the LVD.

Related special requirements for certain type of cables are contained in the part 2 suite of standards i.e. for PVC type use supplementary standard **BS EN 50525-2-11:2011 (**Electric cables. Low voltage energy cables of rated voltages up to and including 450/750V (U0/U). Cables for general applications. Flexible cables with thermoplastic PVC insulation). Harmonized cable needs to be manufactured in accordance with the EN 50525 cable standards. When checking the marking printed on cables there is usually a number denoting cable type, e.g. H05VV-F. The “H” means it meets the harmonized cable standard (EN 50525-1).

BS EN 60670-1:2005+A1:2013 Boxes and enclosures for electrical accessories for household and similar fixed electrical installations. General requirements

This European standard applies to boxes, enclosures and parts of enclosures for electrical accessories with a rated voltage not exceeding 1000 V a.c. and 1500 V d.c. that are intended for household or similar fixed electrical installations either indoors or outdoors. The scope includes enclosures which are an integral part of an electrical accessory and protection for that accessory against external influences (for example mechanical ingress of solid objects or water, etc.) covered by the relevant standard for the accessory.

BS EN 61643-11:2012+A11:2018 Low-voltage surge protective devices. Surge protective devices connected to low-voltage power systems. Requirements and test methods

and

BS EN 61643-21:2001+A2:2013 Low voltage surge protective devices. Surge protective devices connected to telecommunications and signalling networks. Performance requirements and testing methods

These two European standards cover the performance parameters required in Surge Protective Devices (SPD's). These parts of the BS EN 61643 series of standards apply to all SPDs providing protection against lightning (direct and indirect) and transient over-voltages. BS EN 61643-11 covers AC mains protection, for 50/60 Hz AC power circuits and equipment rated up to 1000 V_{RMS} AC and 1500 V DC while BS EN 61643-21 covers telecommunications and signalling networks with nominal system voltages up to 1000 V_{RMS} AC and 1500 V DC.

Within these parts to the standard the following is defined:

- The electrical requirements for SPDs, including voltage protection and current limiting levels, status indication and minimum test performance
- The mechanical requirements for SPDs, to ensure an appropriate quality of connection, and mechanical stability when mounted
- The safety performance of the SPD, including its mechanical strength and its ability to withstand heat, overstress and insulation resistance

The standards establish the importance of testing SPDs to determine their electrical, mechanical and safety performance.

BS EN 50085-1:2005+A1:2013 Cable trunking systems and cable ducting systems for electrical installations. General requirements

The EN 50085 series of standards contains various parts. This first part describes general items, applicable for all installation systems. System-specific requirements are dealt with in the appropriate parts of the series. Central to EN 50085 is the requirement for the manufacturer to classify their systems. The basic requirement is that the designer understands the basics of the classification. The classification takes important product properties into account, such as protection ratings, load capacities and areas of application.

BS EN 61558-2-1:2007 Safety of power transformers, power supplies, reactors and similar products. Particular requirements and tests for separating transformers and power supplies incorporating separating transformers for general applications

This international standard deals with the safety aspects of power transformers, power supplies, reactors and similar products such as electrical, thermal and mechanical safety. The windings of such products may be encapsulated or non-encapsulated.

BS EN 60529:1992+A2:2013 Degrees of protection provided by enclosures (IP code)

This standard applies to the classification of degrees of protection provided by enclosures for electrical equipment with a rated voltage not exceeding 72.5 kV. Whilst probably not applicable to most furniture due to its use indoors, it would apply to products that could be exposed to liquid, or dust and ingress.

See also section 5.3.3 and 5.3.4 explaining the relationship between the LVD and RED along with LVD harmonised standards used to satisfy products under the scope of RED.

5.1.3 LVD and CE marking requirements

Manufacturers have certain CE marking obligations to meet the requirements of the Low Voltage Directive.

- Meet the applicable safety objectives (typically satisfied by complying with the appropriate harmonised standard(s)
- Complete the required conformity assessment procedure:
- Produce Technical Documentation including an adequate analysis and assessment of the risks. Where a harmonised standard only addresses limited essential requirement of the directive, a risk assessment should be performed
- Create and sign an EU Declaration of Conformity
- Affix a CE mark
- Manufacture products with Factory Production Control procedures to ensure products remain in conformity with the Directive, in particular keeping a register of complaints of non-conforming equipment
- Ensure that product placed on the market bears a type, batch or serial number or other element allowing its identification
- Indicate on the product the name, registered tradename or registered trademark and the postal address of the manufacturer / authorised representative
- Ensure the product is accompanied by instructions and safety information in the language of the country in which the product is sold. Such instructions and safety information, as well as any labelling, shall be clear, understandable and intelligible

In addition, if the manufacturer / authorised representative has reason to believe that equipment which they have placed on the market is not in conformity with the LVD it shall immediately take the corrective measures necessary to bring that equipment into conformity, including withdrawing it from sale or initiating a product recall if appropriate.

5.2 Electromagnetic Compatibility (EMC) Directive (2014/30/EU)

5.2.1 Introduction

Electromagnetic compatibility (EMC) is the ability of a product to operate within normal conditions in its electromagnetic energy (emissions) and offer protection (immunity) against electromagnetic energy that occurs in the environment of its intended use. This Directive controls the emissions and immunity characteristics of electrically powered furniture. All electronic devices have the potential to emit electromagnetic fields, there is therefore a potential risk of interference between such devices.

The purpose of electromagnetic compatibility (EMC) is to keep these side effects under reasonable control. The EMC Directive ensures that electrical and electronic equipment does not generate, or is not affected by, electromagnetic disturbance. The Directive limits electromagnetic emissions from equipment in order to ensure that, when used as intended, such equipment does not disturb radio and telecommunication, as well as other equipment. The Directive also governs the immunity of such equipment to interference and seeks to ensure that this equipment is not disturbed by radio emissions when used as intended. The EMC Directive has been transposed into UK domestic legislation as part of the Electromagnetic Compatibility Regulations 2016.

Where not EMC benign, furniture incorporating electrical/electronic components needs to comply with EMC requirements when placed on the market (and supplied to an end user). The objective of the Directive is to harmonise EMC protection requirements (including emissions and immunity) in order to guarantee the operation of the product in its intended EMC environment. The following two statements, relating to emissions of disturbance and immunity to disturbances, cover the essential requirements of the Directive.

The product shall have:

- emission limitation to permit other products to operate as intended
- immunity requirements to permit the product concerned to operate as intended

Products, therefore, shall be constructed so that the electromagnetic disturbance generated does not exceed a level allowing radio and telecommunications equipment to operate as intended, and so that the product has an adequate level of immunity to electromagnetic disturbance to enable it to operate without unacceptable degradation of its intended use.

5.2.2 Related Harmonised standards – EMC

As with the LVD - the application of a harmonised standard is optional at the manufacturer's choice, but if the product fully meets the requirements of a standard harmonised for that Directive (see section 5.3) then the manufacturer may simplify the conformity assessment process and reduce the burden of the technical file. If a relevant standard exists but the manufacturer chooses not to meet it in full, it the onus is on the manufacturer to show, potentially in much more detail, how the relevant essential requirements have been met. It should be remembered that enforcing authorities may use the harmonised standard(s) as a guide in assessing compliance with the essential requirements.

With regards to electrical components incorporated in furniture the associated standards would be:-

BS EN 55014-1:2017 Electromagnetic compatibility. Requirements for household appliances, electric tools and similar apparatus. Emission

and

BS EN 55014-2:2015 Electromagnetic compatibility. Requirements for household appliances, electric tools and similar apparatus. Immunity

EN 55014 is the EMC testing standard for household appliances, electric tools, and similar apparatus which may cause interference to radio reception, or may be effected by electromagnetic interference. This includes products such as: office machines, movie projectors, electric toys, blenders, and toasters, restaurant equipment, and similar devices.

BS EN 55032:2015 Electromagnetic compatibility of multimedia equipment. Emission requirements

and

BS EN 55035:2017 Electromagnetic compatibility of multimedia equipment. Immunity requirements

These are the EMC testing standards for radio services operating in the intended frequency range 9 kHz to 400 GHz. They specify procedures to ensure the reproducibility of measurement and the repeatability of results.

BS EN 61000-6-3:2007+A1:2011 Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments

and

BS EN 61000-6-1:2007 Electromagnetic compatibility (EMC). Generic standards. Immunity for residential, commercial and light-industrial environments

These standards relate to those furniture products intended to be directly connected to a low-voltage public mains network or connected to a dedicated DC source which is intended to interface between the apparatus and the low-voltage public mains network (240V). This standard would also apply also to furniture powered by a non-public, but non-industrial, low voltage power distribution system if the furniture is intended to be used in the locations described below. The environments encompassed by these two standards are residential, commercial and light industrial.

- Residential properties e.g. houses, apartments
- Retail outlets e.g. shops, supermarkets
- Business premises e.g. offices, banks
- Areas of public entertainment e.g. cinemas, public bars, dance halls
- Outdoor locations e.g. petrol stations, car parks, amusement and sports centres.

It is also worth noting two other Harmonised standards used to demonstrate compliance with the EMC Directive.

BS EN 61000-3-2:2014 Electromagnetic compatibility (EMC). Limits for harmonic current emissions (equipment input current ≤16A per phase).

BS EN 61000-3-3:2013 Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low voltage supply systems, for equipment with rated current ≤ 16A per phase and not subject to conditional connection.

These two EMC standards deal with the limitation of harmonic currents and voltage fluctuations injected into public low voltage mains electricity supply systems by electrical and electronic equipment (EEE). It is applicable for electrical equipment supplied from mains network with voltage not less than 220V and current up to 16A intended for use by both the general public and professionals

Manufacturers shall look to test electrical elements of their product to these standards in order to determine whether or not they meet the essential requirements of the EMC Directive.

BS EN 62041:2010 Safety of transformers, reactors, power supply units and combinations thereof. EMC requirements

This international standard deals with the EMC aspects of power transformers, power supplies, reactors and similar products which may cause interference to radio reception, or may be effected by electromagnetic interference.

See also section 5.3.5 and 5.3.6 explaining relationship between the EMC Directive and RED along with EMC harmonised standards used to satisfy products under the scope of RED.

5.2.3 EMC Directive and CE marking requirements

Meet the applicable safety objectives (typically satisfied by complying with the appropriate harmonised standard(s)

- Follow either of the two conformity assessment procedures
- Produce Technical Documentation including an adequate analysis and assessment of the risks. Where a harmonised standard only addresses limited essential requirement of the directive, a risk assessment should be performed.
- Create and sign an EU Declaration of Conformity
- Affix a CE mark
- Manufacture products with Factory Production Control procedures to ensure products remain in conformity with the Directive, in particular keeping a register of complaints of non-conforming equipment
- Ensure that product placed on the market bears a type, batch or serial number or other element allowing its identification
- Indicate on the product the name, registered tradename or registered trademark and the postal address of the manufacturer / authorised representative
- Ensure the product is accompanied by instructions and safety information in the language of the country in which the product is sold. Such instructions and safety information, as well as any labelling, shall be clear, understandable and intelligible

In addition, if the manufacturer / authorised representative has reason to believe that equipment which they have placed on the market is not in conformity with the Directive it shall immediately take the corrective measures necessary to bring that equipment into conformity, including withdrawing it from sale or initiating a product recall if appropriate.

5.3 Radio Equipment Directive (RED) (2014/53/EU)

5.3.1 Introduction

In June 2016 the Radio Equipment Directive (RED) became the new compliance requirement in Europe for wireless transmitters, establishing the regulatory framework for placing radio equipment on the market and replacing the Radio & Telecommunications Terminal Equipment (R&TTE) Directive. During the period between June 2016 and June 2017 manufacturers were allowed apply either the R&TTE or the RED Directives. From June 2017 manufacturers have been required to comply with only the RED.

Radio equipment is defined in Article 2.1(1) of the RED

'as *an electrical or electronic product, which intentionally emits and/or receives radio waves for the purpose of radio communication and/or radio determination, or an electrical or electronic product which must be completed with an accessory, such as antenna, so as to intentionally emit and/or receive radio waves for the purpose of radio communication and/or radio determination;*

The RED includes essential requirements for safety and health, electromagnetic compatibility, and the efficient use of the radio spectrum. It is a product-specific Directive that establishes the requirements for all wireless transmitters and receivers, with the exception of devices used exclusively for military, state security, radio amateurs, and civil aviation. The scope includes radio devices that range from cell phone handsets and cell base stations to licensed 2-way land mobile radios and their base stations.

One of the common characteristics for these aforementioned devices is their transmit power levels are typically at or above 1W *(low power device)* and many are licensed service applications, meaning that in addition to the device conformity assessment the end user may need to receive a license to transmit at the particular frequency band. VHF and UHF business and professional radios are examples of licensed device applications. Licensed devices receive exclusive rights to transmit on a particular frequency, at a specified power, and for a defined geographic location. However, unlicensed transmitters are permitted to transmit on certain licensed bands but at power levels that will not interfere with licensed users.

License exempt transmitters would usually include the types of accessories used in furniture e.g. Wi-Fi and Bluetooth. These devices typically transmit at less than 200mW and operate in designated frequency bands with specified powers, bandwidths, and duty cycles. They are primarily sold without the user having to obtain a license. The applications for low power wireless transmitters are growing rapidly and feeding the pace of expansion for the Internet of Things. Manufacturers of products incorporating these low power wireless transmitters that are sold into Europe must comply with all the regulations associated with the CE Mark. There are some categories of radio equipment excluded from the scope of RED and these are detailed in Annex I of the Directive which should be referred to if in any doubt.

The following statements cover the essential requirements of the Directive. Radio equipment shall be constructed so as to ensure:

- the protection of health and safety of persons and of domestic animals and the protection of property, including the objectives with respect to safety requirements set out in Directive 2014/35/EU (LVD), but with no voltage limit applying;
- an adequate level of electromagnetic compatibility as set out in Directive 2014/30/EU;

- that it both effectively uses and supports the efficient use of the radio spectrum in order to avoid harmful interference.

5.3.2 Related Harmonised standards – RED

As with LVD and EMC - the application of any standard for any product safety Directive like the RED is optional at the manufacturer's choice, but if the product fully meets the requirements of a standard harmonised for that Directive (see section 5.3) then the manufacturer may simplify the conformity assessment process and reduce the burden of the technical file. If a relevant standard exists but the manufacturer chooses not to follow it, the onus is on the manufacturer to show, potentially in much more detail, how the relevant essential requirements have been met, bearing in mind enforcement authorities may use the harmonised standard(s) as a guide in assessing compliance with the essential requirements. In regards to harmonised standards that address the efficient use of the radio spectrum (Article 3.2), where a harmonised standard is not employed, or not met in full, the services of a Notified Body must be employed.

Manufacturers are advised to contact test labs that specialise in RED testing for guidance on identifying specific harmonised standards that apply to their products according to frequency band usage and other requirements. This guide will cover generic standards related to the more common devices/technologies used in furniture. For the RED, the harmonized standards are organized into product specific standards and more generic application standards. Product specific standards nearly always take priority over more generic standards. An example of a common specific standard is EN 300 328 for wide band transmitters operating in the 2.4GHz band.

ETSI EN 300 328 V2.1.1 (Harmonised standard) Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised standard covering the essential requirements of article 3.2 of The Radio Equipment Directive 2014/53/EU. This standard applies to Wide Band Data Transmission equipment and also describes spectrum access requirements to facilitate spectrum sharing with other equipment. Applicable to radio equipment capable of operating in the band provided in table below.

	Service frequency bands
Transmit	2 400 MHz to 2 483,5 MHz
Receive	2 400 MHz to 2 483,5 MHz

These ranges would include Wi-Fi 802.11b/g/n and Bluetooth devices. The standard contains requirements to demonstrate that radio equipment both effectively uses and supports the efficient use of the radio spectrum in order to avoid harmful interference.

ETSI EN 300 330 V2.1.1 - Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Harmonised standard covering the essential requirements of article 3.2 of The Radio Equipment Directive 2014/53/EU

This standard specifies technical characteristics and methods of measurements for the following Short Range Device equipment types:

- Generic Short range Devices including transmitters and receivers operating in the range from 9 kHz to 25 MHz; and
- inductive loop transmitters and receivers operating from 9 kHz to 30 MHz including Radio Frequency Identification (RFID), Near Field Communication (NFC) and Electronic Article Surveillance (EAS) operating in LF and HF ranges.

The standard covers fixed, mobile and portable stations.

ETSI EN 300 440 V2.1.1 - Short Range Devices (SRD); Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

This standard specifies technical characteristics and methods of measurements for the following Short Range Device equipment types:

- Non-specific Short Range Devices, including alarms, telecommand, telemetry, data transmission in general, etc.
- Radio Frequency Identification (RFID) devices.
- Radio determination devices including detection, movement and alert applications.

These radio equipment types are capable of operating in the permitted frequency bands within the 1 GHz to 40 GHz range with either a Radio Frequency (RF) output connection and dedicated antenna or an integral antenna.

The standard covers fixed, mobile and portable stations.

Final Draft ETSI EN 303 417 V1.1.1 - Wireless power transmission systems, using technologies other than radio frequency beam, in the 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6 765 - 6 795 kHz ranges; Harmonised standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.

NOTE - this standard is not yet a published standard (and therefore may be subject to change) and it does not provide a presumption of conformity (not yet published in the OJEU). Notified Body involvement would be required if deciding to use this standard.

This standard specifies technical characteristics and methods of measurements for wireless power transmission (WPT) systems, using technologies other than radio frequency beam, in the 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz,100 - 300 kHz, 6 765 - 6 795 kHz ranges.

The present standard covers wireless power transmission systems which are regarded as radio equipment since they include inherent radio communication functionality or radio determination via the WPT interface or port at the specific WPT frequency ranges.

Such systems usually consist of:

- A power transmitter, with additional communication capability to control the charge function, in conjunction with the receiving part. The power transmitter could also be named as base station.

- A power receiver, which supplies the received energy to a mobile device and performs a control/supervision function for the mobile device status and charge operation. Both parts in combination are able to transmit and receive data in addition to the power transmission mode e.g. to control the mobile device status and to optimize the power transmission mode.

The scope of the standard covers fixed systems, mobile and portable systems.

5.3.3 RED Relationship with the LVD and EMC Directive

The RED is mutually exclusive to the LVD and EMC, insofar as where the RED applies to a product, and when considering its primary function, this will effectively take precedence as the requirements for LVD and EMC pertaining to radio equipment are written into the RED.

Article 3.1(a) of the RED contains requirements that manufacturers must ensure electrical safety with respect to requirements set out in Directive 2014/35/EU, but with no voltage limit applying. This means that even battery equipment or 12VDC powered electronics that might have fallen outside the scope of the Low Voltage Directive because the operational voltage is less than 50 VAC or 75 VDC will have to comply with the requirements of the LVD to be compliant with the RED.

Article 3.1(b) of the RED states that all radio equipment must have an adequate level of electromagnetic compatibility as set out in Directive 2014/30/EU.

As such, it should be noted that a Declaration of Conformity shall refer to the RED only, and not to the LVD or EMC Directive.

5.3.4 RED associated LVD standards

To satisfy LVD requirements of RED article 3.3(a) the following standards can be used to demonstrate conformity.

BS EN 60950-1:2006+A2:2013 Information technology equipment. Safety General Requirements This standard specifies requirements intended to reduce risks of fire, electric shock or injury for an operator or layman who may come into contact with the equipment. It is intended to reduce such risks with respect to installed equipment, whether it consists of a system of interconnected units or independent units, subject to installing, operating and maintaining the equipment in the manner prescribed by the manufacturer. The standard is applicable to both mains-powered or battery-powered information technology equipment, including electrical business equipment and associated equipment, with a rating not exceeding 600 V.

- The standard is also applicable to the following information technology equipment
- Designed for use as telecommunication terminal equipment and telecommunication network infrastructure equipment, regardless of the source of power
- Designed and intended to be connected directly to, or used as infrastructure equipment in a cable distribution system, regardless of the source of power

Whilst still providing a presumption of conformity to the safety objectives of the LVD, the above standard has since been superseded by the following;

BS EN 62368-1:2014 Audio/video information and communication technology equipment. Safety requirements. This standard covers the principle safety objectives for electrical equipment designed

for use within certain voltage limits as per the LVD. The standard applies to manufacturers of audio, video and similar electronic apparatus.

Transmitters that are hand held, body worn, or operate within 20cm of a person may require an evaluation for hazards from RF exposure and Specific Absorption Rate (SAR). A SAR test report is required to be submitted as part of an electrical safety technical evaluation. Maximum Permissible Exposure (MPE) requirements may apply for transmitters that operate at distances greater than 20cm with power levels above limits based on transmit frequency. It is worth noting that each wireless application has unique considerations when evaluating hazards from RF exposure, i.e. distance from the body, transmit power, duty cycle and type of application.

Typical standards for evaluation of RF hazards include:

BS EN 62479:2010 Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz) This standard relates to Low Power Devices RF Exposure and includes evaluation of RF Hazards in TCF and evaluates exclusion vs. distance.

BS EN 62311:2008 Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)
This standard is a generic standard for RF exposure which determines the scope of the hazard and the relaxation of exclusions. The impact of RF hazard is considered due to co-located transmitters

Or

BS EN 62233:2008 Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure

This standard deals with electromagnetic fields up to 300 GHz and defines methods for evaluating the electric field strength and magnetic flux density around household and similar electrical appliances, including the conditions during testing as well as measuring distances and positions.

5.3.5 RED associated EMC Directive standards

To Satisfy the EMC requirements of RED article 3.3(a) the following standards can be used to demonstrate conformity. Many of the EMC harmonized standards for low power transmitters have a corresponding product specific European standard (EN and ETSI EN) to adapt the general EMC standard EN 301 489-1 for the particular application. Note that ETSI standards can be harmonised European standards.

ETSI EN 301 489-1 V2.1.1 (Harmonised standard) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU. These standards cover requirements to ensure that EMC phenomena are taken into account accordingly. The scope of the test can roughly be divided into two parts:

- Interference Emission – Which disturbances come from the device and how can they affect other devices. Testing involved includes RF Conducted Emissions, RF Radiated Emissions, Low Frequency Harmonics
- Interference Immunity – How immune is the device against disturbances, which emanate from other devices. Testing involved includes Electrostatic Discharge, RF Radiated

Immunity, Conducted RF Immunity, Fast Transients/Burst Surge, Voltage Dips & Interruptions, Magnetic Field Immunity

Product specific standards are applied if the component incorporated into the furniture falls into a specific category i.e. Short Range Device, Broadband Wireless, Ultra-Wide Band, Mobile Phones. Product specific standards nearly always take priority over the generic standard

ETSI EN 301 489-3 V2.1.0 (Harmonised standard) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU.
The product family of Short Range Devices covers a wide range of equipment types, which may have different sets of performance criteria set out in the relevant radio standards and/or product standards. The standard is intended for all SRD types and applies a standard set of performance criteria. This includes the requirement that the equipment continues to operate as intended under certain standardised conditions of EMC stress.

ETSI EN 301 489-33 V2.1.1 (Harmonised standard) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 33: Specific conditions for Ultra-Wideband (UWB) devices; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU.
The product family for radio devices based on UWB technology w.r.t EMC applies to fixed, mobile or portable UWB devices e.g.

- stand alone radio equipment with or without its own control provision
- plug-in radio devices intended for use with, or within, a variety of host systems, e.g. personal computers, hand-held terminals, etc.
- plug-in radio devices intended for use within combined equipment, e.g. cable modems, set-top boxes, access points, etc.
- combined equipment or a combination of a plug-in radio device and a specific type of host equipment
- equipment for use in road and rail vehicles

ETSI EN 301 489-17 V2.1.1 (Harmonised standard) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU.

This standard specifies technical characteristics and methods of measurements for Broadband Data Transmission System equipment operating in the 2.4 GHz ISM band and using wide band modulation

ETSI EN 301 489-52 V1.1.0 (Harmonised standard) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for Cellular Communication Mobile and portable (UE) radio and ancillary equipment; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU

This standard specifies technical characteristics and methods of measurements for products incorporating cellular / GSM devices e.g.

- digital cellular User Equipment (UE)
- associated ancillary equipment

Including combinations of

- UTRA, WCDMA (IMT-2000 Direct Spread, W-CDMA, UMTS)
- E-UTRA, LTE (IMT-2000 and IMT advanced) (see annex D)
- GSM (IMT-2000 SC, Technology GSM/EDGE) (see annex D)

This standard does cover mobile and portable equipment that is intended to be operated in a fixed location while connected to the AC mains.

5.3.6 RED Directive and CE marking requirements

Meet the applicable safety objectives (typically satisfied by complying with the appropriate harmonised standard(s) Follow the appropriate conformity assessment procedure;

- Produce Technical Documentation including an adequate analysis and assessment of the risks. Where a harmonised standard only addresses limited essential requirement of the directive, a risk assessment should be performed
- Create and sign an EU Declaration of Conformity
- Affix a CE mark
- Manufacture products with Factory Production Control procedures to ensure products remain in conformity with the Directive, in particular keeping a register of complaints of non-conforming equipment
- Ensure that product placed on the market bears a type, batch or serial number or other element allowing its identification
- Indicate on the product the name, registered tradename or registered trademark and the postal address of the manufacturer / authorised representative
- Geographical information in case of restrictions existing in Member States requires manufacturers to add information on the package identifying those restrictions (frequencies are not harmonised throughout EU)
- Ensure the product is accompanied by instructions and safety information in the language of the country in which the product is sold. Such instructions and safety information, as well as any labelling, shall be clear, understandable and intelligible

In addition, if the manufacturer / authorised representative has reason to believe that equipment which they have placed on the market is not in conformity with the Directive it shall immediately take the corrective measures necessary to bring that equipment into conformity, including withdrawing it from sale or initiating a product recall if appropriate.

5.4 RoHS Directive 2011/65/EU

5.4.1 Introduction

The Restriction of the Use of Certain Hazardous Substances in Electronic and Electrical Equipment Directive 2011/65/EU, or RoHS, restricts the amount of hazardous substances that can be used in the manufacture of electrical and electronic equipment (EEE). Such hazardous substances can be difficult to manage at the end of the product life cycle, when electrical and electronic products are being disposed of or recycled. Therefore, the Regulations focus on restricting them at the design and production stage in order to keep them out of the waste stream.

The new Regulations came into effect on 2nd January 2013 and were transposed into UK domestic law under the Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic

Equipment Regulations 2012. The definition of a piece of EEE equipment falling under the scope of the Regulations is as follows:

- with a voltage rating not exceeding 1,000V for AC and 1,500V for DC that requires electric currents or electromagnetic fields to work, or equipment used for the generation, transfer and measurement of electric currents and fields. EEE can be a component or assembly used in a finished product. Cables and spare parts for repairing, reusing, updating or upgrading a product are all EEE
- All equipment that has at least one intended function which is dependent on electric current or electromagnetic fields is EEE. Even if the electric function is only a minor element of the equipment, the definition still applies
- In EEE furniture products the electric function is an intended and integral part of the product's functionality, and the full functionality of the equipment is at least impaired (i.e. it does not work properly) if that electrical function fails. In order for products to be EEE, their electricity dependent functions must in principle be integrated. With a rise recliner chair, for example, the motion package unit is an integrated part of the product and cannot be separated so the chair and motion package cannot be used as fully functioning separate products.

There are 11 RoHs categories of product specified in the regulations;

- Large Household Appliance (LHA)
- Small Household Appliance (SHA)
- IT and Telecommunications equipment
- Consumer equipment
- Lighting Equipment
- Electrical and electronic tools
- Toys, leisure and sports equipment
- Medical devices
- Monitoring and control instruments
- Automatic dispensers
- Other EEE not covered in any of the categories above

The Directive bans anyone from placing on the EU market an EEE product in which any homogeneous material contains more than the tolerated maximum concentration values (MCVs) of six substances:

- lead (Pb)
- mercury (Hg)
- hexavalent chromium (Cr(VI))
- cadmium (Cd)
- polybrominated biphenyls (PBB)
- polybrominated diphenyl ether (PBDE)

NOTE – RoHS will be updated with a further 4 substances which will be banned with certain concentration levels from 22nd July 2019.

- Bis(2-Ethylhexyl) phthalate (DEHP)
- Benzyl butyl phthalate (BBP)
- Dibutyl phthalate (DBP)
- Diisobutyl phthalate (DIBP)

The Directive is unusual in that responsibility for compliance is shared by the manufacturer and distributor placing the EEE on the UK market and are obligated to ensure that the design and manufacture of the product complies with RoHS, this includes each homogeneous material within the EEE.

5.4.2 Related Harmonised standards – RoHS

Furniture incorporating electrical accessories conforms to the safety objectives of RoHS where the equipment has been manufactured in accordance with applicable Harmonised standards.

EN 50581:2012 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

This standard describes three kinds of documents that may be used to demonstrate conformity with the RoHS requirements:

- Supplier declarations and/or signed contractual agreements
- Materials declarations
- Analytical test results (Requires the use of EN 62321)

EN 62321: 2009 Electro-technical products Determination of levels of six regulated substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers).

5.4.3 RoHS Directive and CE marking requirements

In line with standard CE marking practice there are obligations the manufacturer needs to do to satisfy the Directive broadly similar to previous Directives:

- Meet the applicable safety objectives (typically satisfied by complying with the appropriate harmonised standard(s)
- Follow the necessary conformity assessment procedure
- Produce Technical Documentation including an adequate analysis and assessment of the risks
- Create and sign an EU Declaration of Conformity
- Affix a CE mark
- Manufacture products with Factory Production Control procedures to ensure products remain in conformity with the Directive, in particular keeping a register of complaints of non-conforming equipment

- Ensure that equipment placed on the market bears a type, batch or serial number or other element allowing its identification
- Indicate on the equipment their name, registered tradename or registered trademark and the postal address of the manufacturer / authorised representative

In addition, if the manufacturer/ authorised representative has reason to believe that equipment which they have placed on the market is not in conformity with this Directive they shall immediately take the corrective measures necessary to bring that equipment into conformity, including to withdraw from sale or initiating a product recall it if appropriate.

5.5 National and International Standards

5.5.1 Introduction

As well as those standards directly related to European Directives, thereby offering presumption of conformity, consideration must also be given to current national legislation. The best example of this is the UK Statutory Instrument covering domestic mains plugs and sockets.

The Plugs and Sockets (Safety) Regulations SI 1994 no. 1768 were introduced to provide a regulatory regime to address issues regarding consumer safety. There were concerns that consumer safety was compromised by the substantial quantity of counterfeit and unsafe electrical plugs and sockets being placed on the UK market. The main body of the regulations are split into Parts I, II and III.

- Part I relates to safety requirements for electrical devices such as plugs, socket outlets, adaptors, fuse links and cartridge fuse links for plugs and adaptors. Relates to any plug, socket or adaptor ordinarily intended for domestic use at a voltage of not less than 200 volts, to any fuse link suitable for a standard plug (A standard plug is one intended to connect with a socket outlet with dimensions as specified in BS1363)
- Part II relates to requirements for electrical appliances intended for domestic use to be fitted with an approved plug or conversion plug. Applies to electrical appliances ordinarily intended for domestic use, designed to operate at a voltage no less than 200 volts with a maximum rated input of no more than 13 amperes, and intended to be connected to a socket outlet made to the dimensions of BS1363
- Part III details the information requirements for products covered by Part I and Part II

The regulations require plugs and sockets to meet the requirements of the BS 1363 series of standards and undergo approval by a notified body (NB), self-certification is not permitted.

It is important to note that CE marking is not appropriate for these products as they fall outside of the scope of the so called CE marking Directives such as the LVD.

It should also be noted that plugs and sockets also fall outside the scope of the Electrical Equipment (Safety) Regulations SI 2016 No. 1101 as they are covered by specific legislation in the Plugs and Sockets (Safety) Regulations.

Related International (IEC) and UK National standards

BS 1363-1:2016+A1:2018 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for rewirable and non-rewirable 13 A fused plugs

BS 1363-2:2016+A1:2018 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for 13 A switched and unswitched socket-outlets

These two standards are part of a series of British standards covering the UK's national electrical power plug and socket outlet system. By law, all UK electrical appliances must be supplied with a BS 1363 plug and all installations must include BS 1363 outlets. Manufacturers of electrical products, accessories, cord sets and plug in items should make sure that the parts that they use conform to these standards. The standard itself includes essential requirements for the safety, construction, electrical and mechanical testing, dimensional accuracy and markings of the UK national electrical power plug and socket outlet system.

The Plugs and Sockets. (Safety) Regulations references the above standards and specifies the requirements for all domestic plugs and sockets; including socket outlet units (power strips). The regulation requires all socket outlet units to comply with the requirements of BS 1363-2 Specification for 13A switched and unswitched socket-outlets and with the requirements of BS 5733 Specification for General requirements for electrical accessories. Sockets and socket outlets do not require independent approval under the regulations. Any plug fitted to the socket outlet unit must comply with the requirements of BS 1363-1 Specification for rewirable and non-rewirable 13A fused plugs. Plugs must also be independently approved and marked in accordance with the requirements of the regulation.

BS 5733:2010+A1:2014 - General requirements for electrical accessories. Specification

This British standard specifies requirements and tests to check the safety in normal use of electrical accessories which are not covered by other specific British standards. Such accessories are intended for use in household, commercial and light industrial premises where:-

- Supply voltage does not exceed 250V a.c single phase 50Hz to 60Hz or 250V d.c.
- The rated current of the accessory does not exceed 63A

Accessories conforming to this standard are intended for connection by cables or flexible cords conforming to BS EN 50525-1, BS EN 50525-2-11, BS EN 50525-2-12, BS EN 50525-2-21, BS EN 50525-2-71. Items falling into the scope of this category may include electrical sockets and junction boxes. Maintenance-free enclosures also have to meet BS 5733, which applies to electrical accessories not already covered by BS 7671

6. Components incorporated as Accessories into Furniture

6.1.1 Introduction

Components that are sold for incorporation into the completed furniture product may fall into the scope of an EU Directive. Therefore, the finished products that use these components must meet all applicable Directives as previously identified. Compliance of the finished product is highly dependent on compliance of critical components used in the completed assembly. Many Directives / standards such as safety standards under the LVD and RED require all safety critical components to comply with the appropriate component safety standard. Other Directives like the EMC Directive involves testing on the finished product that may conclude with 'failing results' if EMC critical components do not comply.

Some components do not require to be CE marked, as they do not fall under the scope of a CE marking Directive, but have a requirement against UK national regulation– see section 6.2.1 for examples.

6.1.2 Component suppliers of CE components

It is recommended that manufacturers of critical components comply with all applicable Directives and standards or they may be 'selling their customers a problem'. Leaving it to the finished product manufacturer to verify that the component meets the applicable component standards would require important design and materials details to be supplied to the final manufacturer and increase testing / prototyping costs.

The process described on page 20 is the same for components as it is for products – identify the applicable Directive(s) then verify the component meets the appropriate standards listed within the OJEU aligned with the applicable Directive(s). Component suppliers should review component construction and perform appropriate tests in accordance with standards for typical critical components in electrical accessories incorporated into furniture e.g. Bluetooth devices and power outlets with a USB port.

6.1.3 Manufacturers using CE components in final product

Manufacturers sourcing critical components should ensure that they comply with applicable Directives and standards. Requesting a copy of the D.O.C (Declaration of Conformity) from suppliers for all critical components would an indication of the Directives to which the components comply. Manufacturers should check that Directives applied to the finished product are present on the component D.O.C. For safety / performance Directives (RED, LVD, EMC), manufacturers should check if the applicable component safety standard is on the component D.O.C and it is advisable that evidence of certification should also be sought from the component supplier (test reports) as the DOC as mentioned previously is only an indication.

If the product is required to meet the RoHS Directive – make sure that ALL components and materials meet the RoHS Directive. If a component or material is not declared compliant with RoHS on its D.O.C you will likely have to test the component to verify compliance.

The best solution for manufacturers of the final product is to utilize the fewest number of critical components that are not CE compliant. Selecting a non CE marked component based on cost saving may be counter-productive as the cost savings will be significantly less than the added cost and time necessary to have the component evaluated for CE compliance – or worse, the non CE marked part could cause failure to RED, LVD, EMC or RoHS testing for the completed product.

6.2 Related Standards for Components

6.2.1 Related Standards – Non CE components

With all CE marked components as previously defined, it is up to the manufacturer to determine the appropriate standards selected to provide conformity to the Directives. The standards listed below for each of the common components is only a guide – actual standards required may relate more closely to the design specifications of the component. Manufacturers should seek specialist advice if unsure.

13A Switched UK Socket.

LVD 2014/35/EU	N/A– National Regulations Apply – Plug and Socket Safety Regulations.
EMC 2014/30/EU	N/A – UK Socket is mechanical by nature and does not emit intolerable electromagnetic interference since significant electromagnetic disturbances are only generated during insertion and withdrawal which are not continuous.
RoHS 2011/65/EU	N/A – Socket would not fall into one of the 11 categories of EEE. Components don't need to be CE marked but would need to meet RoHs restrictions if used as part of EEE.
National UK Regulations	BS 1363-2 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for 13 A switched and unswitched socket-outlets BS 5733 - General requirements for electrical accessories. Specification

13A UK Plug

LVD 2014/35/EU	N/A– National Regulations Apply – Plug and Socket Safety Regulations.
EMC 2014/30/EU	N/A – UK Plug is mechanical by nature and does not emit intolerable electromagnetic interference since significant electromagnetic disturbances are only generated during insertion and withdrawal which are not continuous.
RoHS 2011/65/EU	N/A – Plug would not fall into one of the 11 categories of EEE. Components don't need to be CE marked but would need to meet RoHs restrictions if used as part of EEE.
National UK Regulations	BS 1363-1 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for rewirable and non-rewirable 13 A fused plugs NOTE - Plugs must also be independently approved and marked in accordance with the requirements of the regulation.

6.2.2 Related Standards – CE Components

13A Switched UK Socket with surge protection and USB charging port within Enclosure intended for domestic use

USB ports are increasingly becoming the most convenient means of charging electronic devices at work or in the home. These components are power modules (plug sockets) featuring USB ports, either on their own or in combination with standard three-pin power ports. These ports can be used to charge a range of devices, from work-based electronics and mobile phones to personal items and could be incorporated into furniture. An isolating transformer is normally used in the electronic controls.

LVD 2014/35/EU	BS EN 61558-2-1 - Safety of power transformers, power supplies, reactors and similar products. Particular requirements and tests for separating transformers and power supplies incorporating separating transformers for general applications BS EN 61643-21 - Low voltage surge protective devices. Surge protective devices connected to telecommunications and signalling networks. Performance requirements and testing methods
EMC 2014/30/EU	BS EN 62041:2010 Safety of transformers, reactors, power supply units and combinations thereof. EMC requirements. BS EN 61000-3-2 Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current < 16A per phase) **NOTE** – Exclusion for products < 75W BS EN 61000-3-3 Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low voltage supply systems, for equipment with rated current < 16A per phase and not subject to conditional connection
RoHS 2011/65/EU	BS EN 50581 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.
National UK Regulations	BS 1363-2 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for 13 A switched and unswitched socket-outlets BS 5733 - General requirements for electrical accessories. Specification

Flexible Cable with PVC insulation and Ducting intended for use in Domestic Furniture

Cables that may be used within the furniture to route and connect electrical accessories falls under the scope of the LVD.

LVD 2014/35/EU	BS EN 50085-1 Cable trunking systems and cable ducting systems for electrical installations. General requirements BS EN 50525-2-11 - Electric cables. Low voltage energy cables of rated voltages up to and including 450/750V (U0/U). Cables for general applications. Flexible cables with thermoplastic PVC insulation
EMC 2014/30/EU	N/A
RoHS 2011/65/EU	BS EN 50581 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.
International standards	IEC 60364-7-713:2013. Low-voltage electrical installations. Requirements for special installations or locations. Furniture

Wireless Induction Charger

Inductive charging (also known as wireless charging or cordless charging) uses an electromagnetic field to transfer energy between two objects through electromagnetic induction. This is usually done with a charging station. Energy is sent through an inductive coupling to an electrical device, which can then use that energy to charge batteries or run the device. Induction chargers use an induction coil to create an alternating electromagnetic field from within a charging base, and a second induction coil in the portable device takes power from the electromagnetic field and converts it back into electric current to charge the battery. The Radio Equipment Directive defines these products as radio devices with wireless charging function and clear standards are defined for regulatory approval.

LVD 2014/35/EU via Article 3 1a of the RED	BS EN 60950-1 Information technology equipment. Safety General Requirements.
Radio Equipment Directive (RED) (2014/53/EU)	Final Draft ETSI EN 303 417 V1.1.1 - Wireless power transmission systems, using technologies other than radio frequency beam, in the 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6 765 - 6 795 kHz ranges; Harmonised standard covering the essential requirements of article 3.2 of Directive 2014/53/EU **NOTE** – Alternative standards may apply depending on the specific technology used in design of the product. ETSI EN 301 489-1 V2.1.1 - Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU.

	ETSI EN 301 489-3 V2.1.0 (Harmonised standard) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU. BS EN 62311 - Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz) OR (Depends on power output and gap between device and user) BS EN 62479 - Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)
EMC 2014/30/EU via Article 3 1b of the RED	BS EN 55032:2015 Electromagnetic compatibility of multimedia equipment. Emission requirements BS EN 55035:2017 Electromagnetic compatibility of multimedia equipment. Immunity requirements BS EN 61000-3-2 Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current < 16A per phase) BS EN 61000-3-3 Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low voltage supply systems, for equipment with rated current < 16A per phase and not subject to conditional connection
RoHS 2011/65/EU	BS EN 50581 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

Bluetooth Speaker

Furniture may be designed incorporating Bluetooth speakers. Bluetooth is simply a wireless technology that lets two devices talk to each other. In the case of Bluetooth speakers a smartphone, tablet, or other device transmits to the Bluetooth speaker which uses its built-in amplifier and speakers for playback.

Bluetooth wireless connectivity that is paired (pre-associated) with one or more smartphone(s), tablet(s), MP3 or music player or computer(s) decompresses, decodes and amplifies the audio through the built-in speakers.

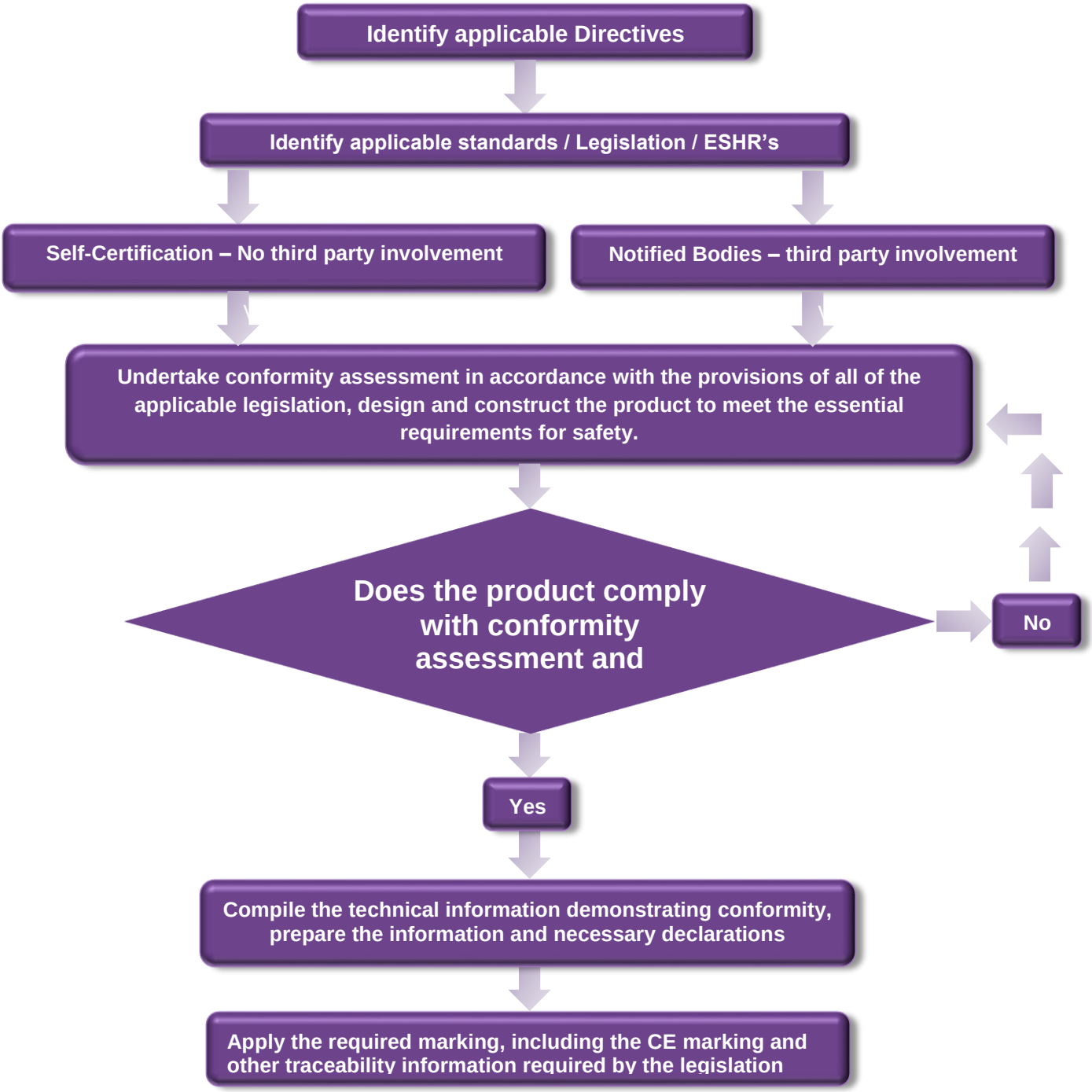
LVD 2014/35/EU via Article 3 1a of the RED.	BS EN 62368-1:2014+A11:2017 - Audio, video, information technology equipment. Safety requirements
Radio Equipment Directive (RED) (2014/53/EU)	ETSI EN 300 328 V2.1.1 (Harmonised standard) Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised standard covering the essential requirements of article 3.2 of Directive 2014/53/EU. ETSI EN 301 489-1 V2.1.1 - Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU. ETSI EN 301 489-17 V3.1.1 - Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU BS EN 62311 - Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz) OR (Depends on power output and gap between device and user) BS EN 62479 - Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)
EMC 2014/30/EU via Article 3 1b of the RED	BS EN 55032:2015 Electromagnetic compatibility of multimedia equipment. Emission requirements BS EN 55035:2017 Electromagnetic compatibility of multimedia equipment. Immunity requirements BS EN 61000-3-2 Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current < 16A per phase) BS EN 61000-3-3 Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low voltage supply systems, for equipment with rated current < 16A per phase and not subject to conditional connection
RoHS 2011/65/EU	BS EN 50581 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

7. Proof of conformity for CE marking

7.1 Introduction

Once the appropriate Directives, legislation and EHSR's relating to a product have been identified then it is time to establish proof of conformity and apply the CE mark. The various elements to this route are detailed in the following process, including explanations of Technical File requirements, risk management, Factory Production Control, marking and user information requirements; all of which lead to the final Declaration of Conformity.

Typical Process diagram for CE marking – Self Declaration



7.2 Identify applicable Directives

The applicable Directives can be derived from the technical description of the product. Manufacturers may need to refer to the exact definition within the Directives to determine if their product falls within the scope of the Directive. Descriptions of each Directive are provided in the previous sections of this document.

7.3 Identify applicable Standards

An EU Directive is in effect an instruction from the EU to a member state to implement a national law and bring the provisions of the Directive into effect. Directives do not tend to state how their requirements are to be specifically and quantifiably achieved. This is the role of standards which help to define more closely what is required in order to address a particular hazard. Various multinational committees meet to produce and update standards relating to the safety, marking, design etc. of products within their fields. These standards are implemented at National, European or International level and some are ultimately adopted by the Member State governments to specify the requirements of the Directives.

When a standard has been referenced by the European Commission (by publication in the Official Journal of the European Union - OJEU), it can be adopted by a Member State to use for product compliance and manufacturers can use the referenced harmonised standard to demonstrate that a product complies with the relevant EU legislation. Whilst harmonised standards are still deemed to be voluntary there isn't often any other method available to prove an item is 'safe' or meets a particular Directive. Compliance with a harmonised standard also has the benefit of offering "presumption of conformity" with the essential requirements of the Directive under which it is harmonised. Conversely, it is possible that, where a product is found to be non-compliant with the requirements of a harmonised standard it may also be considered to be non-compliant with the requirements of the Directive. A manufacturer not taking this approach would have to prove how their method of compliance meets all of the relevant requirements of the Directive. In effect the burden of proof would be reversed.

Harmonised standards can be checked on the Europa Website with a list of harmonised standards for each Directive, at:

https://ec.europa.eu/growth/single-market/european-standards/harmonised-standards_en

7.4 Self-certification

Most of the Directives incorporate a self-certification option, leaving the responsibility for applying the test standards and certifying that the products comply with the Directives to the manufacturer. Generally, most furniture manufacturers will be able to self-certify their products. Whilst this means there are no mandatory requirements for third party involvement, many manufacturers subcontract aspects of the assessment procedure to an independent testing facility. A declaration (accompanied by the relevant technical examinations and documentation) by the manufacturer is enough to ensure the conformity of the product(s) in question against the relevant legislative requirements. In this case the manufacturer himself carries out all required controls and checks, establishes the technical documentation and ensures the conformity of the production process.

7.5 Notified Bodies

A notified body is an independent organisation that performs one or several elements of the conformity assessment, including the following activities: calibration, testing, certification and inspection. Notified bodies are conformity assessment organisations who have been officially designated by their national authority to carry out the procedures for conformity assessment within the meaning of applicable EU harmonisation legislation when third party verification is required. Notified bodies take responsibilities in areas of public interest and therefore, must remain accountable to the competent national authorities. To be eligible an organisation must be a legal entity established in the territory of a Member State and, thus, come under its jurisdiction. Member States remain free to decide whether or not to notify a body which complies with the requirements laid down in the relevant Union harmonisation legislation.

7.6 Technical documentation – The Technical File

7.6.1 Introduction

All CE marking Directives require the manufacturer of the product to create a Technical File.

The Technical File is a mandatory document (no requirement to be single document) containing the relevant technical information to support the claim of conformity with the requirements of applicable Directives.

The manufacturer has to determine what information is needed to complete the Technical File and must implement internal measures to ensure the product remains in conformity and that the file is kept up to date.

As a general guide, the following items should be included in the Technical File:

- Description of the furniture and intended use
- Wiring and circuit diagrams
- General arrangement drawings
- Details of any changes or modifications to materials or the product
- Full detailed drawings accompanied by calculations, if applicable
- List of standards or technical specifications applied
- Records of risk assessments and assessments to standards
- Description of control philosophy/logic
- Datasheets for critical sub-assemblies
- Safety critical component conformity evidence
- Parts list
- Copies of any markings and labels
- Copy of instructions (user, maintenance, installation)
- Test reports
- Quality control and commissioning procedures – e.g. Factory Production Control (FPC)
- Declaration of Conformity

There is nothing to stop the file containing a great deal more information than listed. For instance copies of the engineering drawings for any bespoke parts could also be included. These should not, however, be used to fill out the file at the expense of the more relevant information on how the equipment operates and how it meets the essential requirements of the Directives.

If the product has been the subject of third party testing then the test reports confirming compliance to an appropriate standard shall also be included in the Technical File.

The importance of including a basic general description of the appliance along with its intended use cannot be overstated.

7.6.2 Access to, and Delivery of, the Technical File

It is important to understand that only the authorities given power to enforce the Directives have a right to see the Technical File. It does not need to be published or given to customers.

The purpose of the Technical File is to provide evidence to an enforcement authority that the product has correctly undergone and completed an assessment in order to comply with the relevant Directives. Enforcement authorities have the right to demand a copy of the file for up to 10 years after the last date on which the products described in the file were produced. This is a significant, often overlooked, requirement.

Changes in personnel, company administrative and managerial facilities and resources present challenges in ensuring the availability of the required information and this needs to be considered carefully.

The technical file must also be made available to the market surveillance authorities of the Member States on request. The relevant elements of the technical file must be made available in response to a reasoned request from the competent authorities, whether of the Member State where the manufacturer is established or of any other Member State.

The technical file does not have to be located within the territory of the EU, nor does it have to be permanently available in material form. The term 'technical file' thus refers to a body of information which can be stored on paper or in electronic form in one or several places. There is no need to duplicate documents that are common to different products, however the information must be organised, classified and stored so that the manufacturer or their authorised representative can, without delay, communicate the relevant elements of the technical file in response to a duly reasoned request from the market surveillance authorities of any of the Member States. Such requests will be addressed to the person designated in the EC Declaration of Conformity for that purpose.

7.7 Internal checks on the manufacturing process to Assess Conformity

7.7.1 Introduction

For furniture incorporating electrical accessories produced in volume, the manufacturer must ensure that each piece of furniture remains in conformity with the provisions of the Directives. The manufacturer must carry out necessary research and tests on components, fittings and / or the completed product to determine whether, by its design or construction, it is capable of being assembled and put into service safely.

If changes are made to the design, for example where materials or components from different suppliers are incorporated, or where improvements are made to the design, the conformity of the aspects of the design that have been modified must be reassessed and the Technical File updated accordingly.

The internal checks on the manufacture of the product referred to in the Directives refer to the manufacturing process being robust enough to ensure consistency of production so that all product complies with the Technical File and with the applicable essential health and safety requirements (EHSRs). Quality Control is very important to ensure the 'nth' product is in conformity and safe as well as the first product manufactured.

The Directives also state that there shall be a customer complaints procedure, a means of keeping a register of complaints and also a non-conformance management procedure to apply corrective measures to bring the product back into conformity with the Directives.

Employing a Factory Production Control system within the manufacturing environment is one such way to satisfy these requirements.

7.7.2 Factory Production Control (FPC)

The Directives require the Technical File to contain information relating to the internal production control or Factory Production Control (FPC) system which would include any in-process or final quality control and commissioning procedures.

A formal quality management system (QMS) such as ISO 9001 would satisfy such a requirement and the Technical File may reference such a system. Those manufacturers that do not have formal ISO 9001 systems in place will need to implement auditable FPC procedures.

The following elements demonstrate the requirements of a typical FPC:

Scope and policy - Covers the scope of the products covered by the FPC system and includes statements related to the inspection of incoming materials, products and components. A policy statement related to the company's commitment to maintain a proactive FPC system is aimed at ensuring the understanding and ongoing implementation of procedures and ensures compliance with technical and performance characteristics of the product to meet the essential requirements of the Directives.

FPC system review - There shall be a formal procedure for annual review meetings to evaluate the functioning and performance of the FPC system and its associated procedures. The outputs of the meeting, including the minutes, shall be clearly communicated and reference all decisions taken and actions agreed.

Documentation and records - Document issue and control must be in place and must contain appropriate references, including an index, approval and dates of issue. In addition, any revisions or amendments shall be recorded.

Training/awareness - The organisation must be proactive in identifying ongoing training and awareness needs for individuals employed in the management of the system as well as wider quality management aspects.

Purchasing process - The company must have a recorded supplier evaluation and approval process whereby vendors of materials, products, services and components are scrutinised for suitability and performance.

Customer order process - There shall be a documented order entry process following the initial receipt of a customer enquiry. Following receipt of customer order details, these shall be recorded, collated and verified before acceptance to ensure that the specification is within the capabilities of the manufacturer.

Manufacture/assembly, inspection, testing - A procedure shall exist detailing the manufacturing process together with the quality control points and employees responsible for inspection. Any non-conformities shall also be recorded along with details of corrective actions.

Measurement and testing - The FPC shall define which measurement, test equipment and machines used for manufacture, inspection and verification purposes are subject to internal calibration control and ensure records are maintained.

Non-conformity management - The manufacturer must have a process for the identification, and recording, of non-conformities. Details of the non-conformity must be recorded and discussed with concerned parties in order to determine the root causes (which may be internal or external), and for agreed corrective action to be taken in order to resolve the non-conformity or complaint at the earliest opportunity.

7.8 Declaration of Conformity

Like the CE mark, the (EU) Declaration of Conformity is one of the common aspects throughout all the CE marking Directives. Essentially, the Declaration is a signed document completed by a responsible individual declaring compliance with the relevant requirements of the Directive. It also allows an enforcement authority to identify who is responsible for a product and what that person claims to have done to ensure compliance.

A properly issued Declaration of Conformity is always issued by the product's manufacturer (or by the person responsible for placing the product on the market in the EEA. It is never issued by a test house).

The Declaration must be signed by someone who has the power to make binding commitments on behalf of the manufacturer, but for the Declaration to be truly meaningful the signatory shall also be someone who has the authority to commit the resources required to ensure that the CE marking process is properly completed. The effect of the Declaration is to identify an individual in the company who can be held responsible if the CE marking on a product turns out to be invalid.

Each Directive has slightly different requirements for the content of its Declaration but some features are common to all:

- name/address of manufacturer (and of responsible person where applicable)
- model and/or serial number of equipment
- list of relevant Directives
- list of standards used – NOTE: if listing a standard on the declaration you are declaring that you **fully** meet all the requirements of that standard, if only compliant with specific clauses of a standard then this must be identified.
- declaration statement
- where applicable, the notified body (name and number)
- where applicable, description of accessories and components, including software allowing the product to operate as intended
- name and position of person signing
- signature
- date

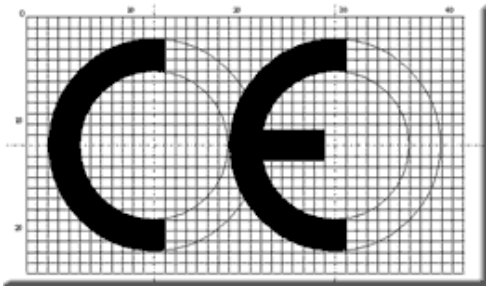
The Declaration shall be translated into the languages of the countries in which the product is placed on the market.

7.9 CE marking the product

There are a number of criteria that must be conformed to when reproducing the CE markon a product. Some will depend on the specifics of the Directive that covers the product. These criteria are:

- CE marking must consist of the initials ‘CE’ in the standard recognisable form
- If the size of the marking is reduced or enlarged, the letters CE must be in proportion to the standard version
- CE marking must be at least 5 millimetres – unless a larger minimum dimension is specified in the relevant Directive. The minimum dimension may be waived for small scale equipment
- CE marking shall be followed by the identification number of the notified body if applicable. The identification number of the notified body should be same height as the CE marking.
- The CE mark must be affixed to the product, or to its data plate, in the immediate vicinity of the name of the manufacturer. If this is not possible, or not warranted because of the nature of the product, it must be affixed to the packaging and accompanying documents
- CE marking must be easily visible, readable and permanent

The standard version of the CE mark is shown below. CE marking consists only of the letters "CE" with the graphic form shown in the diagram. The grid and dotted lines are only included in the diagram to help to define the shape of the letters and must not be reproduced in the CE marking.



7.10 Traceability marking

As well as the CE mark being placed on the product the applicable Directives also describe traceability requirements allowing identification of the product and the manufacturer including contact details. Furniture incorporating electrical accessories must be marked visibly, legibly and indelibly with the following minimum particulars:

- **Business name and full address of the manufacturer**
- The purpose of the requirement is to enable the user or the market surveillance authorities to contact the manufacturer. The term 'business name' refers to the name under which the company concerned is registered. The term 'full address' means a postal address that is sufficient to enable a letter to reach the manufacturer.

- **Designation**

- The term refers to the usual name of the category of equipment to which the specific product belongs.
- **CE Marking**
- See previous section for rules of CE marking.
- **Designation of series or type**
- The designation of the series or type is the name, code or number given by the manufacturer to the model of equipment concerned that has been subject to the relevant conformity assessment procedure.
- **Serial number, if any**
- There is no requirement for products to bear a serial number, but where a serial number has been attributed by the manufacturer, it must be indicated after the designation of the series or type.
- **The year of construction**
- The year in which the manufacturing process was completed.

NOTE – *standards used in the conformity assessment may also require additional markings e.g. 60335-1 requires markings related to rated voltage, frequency, power etc.*

7.11 User Instructions and safety information

7.11.1 Introduction

A manufacturer's instructions must accompany the furniture until it reaches the end user. As a general rule, all health and safety related instructions must be supplied in the official EU language or languages of the Member State(s) in which it is placed on the market.

Instructions should include all the necessary information for the safe use of the product, to enable the consumer to assemble, install, operate, store, maintain, and dispose of the product. Instructions for assembly or installation should include the inventory parts and special skills or tools.

Instructions on operation should include information for restriction of use, whether in relation to user weight, ability or age; the need for any personal protective equipment and how the product may be maintained, cleaned or repaired. It is for the manufacturer to determine the relevant information which should be included in the instructions and safety information for a particular product. Manufacturers have to look beyond what they consider the intended use of a product and place themselves in the position of the average user of a particular product and envisage in what way they would reasonably or foreseeably use the product. If the product is intended for general public, non-professional operators, the layout and content of the instructions must be adapted to the layperson and avoid specialist terminology.

7.11.2 Contents of the user instructions - Generic

Many of the Directives listed in this guide have generic requirements for information as summarised in 7.12.1 and in general should include:-

- Business name and full address of the manufacturer
- Designation of the product as marked on the product itself
- EC Declaration of Conformity, or a document setting out the contents of the EC Declaration of Conformity, showing the particulars of the product. A shortened version of the DOC may be used. Where a simplified EU DOC is provided, it shall contain the exact internet address where the full text of the EU DOC can be obtained.
- General description of the product
- Drawings, diagrams, descriptions and explanations necessary for the use, maintenance and repair of the product and for checking its correct functioning
- Description of the intended use of the product
- Warnings concerning ways in which the product must not be used
- Assembly, installation and connection instructions including software description
- Instructions for the putting into service and use of the product
- Information about the residual risks that remain despite the inherent safe design measures, safeguarding and complementary protective measures adopted
- Instructions on the protective measures to be taken by the user
- Operating method to be followed in the event of accident or breakdown
- Description of the adjustment and maintenance operations that should be carried out by the user and the preventive maintenance measures that should be observed
- Specifications of the spare parts to be used

7.11.3 Contents of the user instructions – Specific Directive Requirements

Some Directives contain specific requirements to be included in the Instructions.

RED

The following information shall also be included in the case of radio equipment intentionally emitting radio waves:

- frequency band(s) in which the radio equipment operates;
- maximum radio-frequency power transmitted in the frequency band(s) in which the radio equipment operates.

EMC Directive

The following information shall also be included for those product falling under EMC Directives:

- Information on any specific precautions that must be taken when the apparatus is assembled, installed, maintained or used, in order to ensure that, when put into service, the apparatus is in conformity with the essential requirements of the EMCD,
- A clear indication on restriction of use in residential areas, where appropriate also on the packaging, if the compliance with the essential requirements of the EMCD is not ensured in residential areas

If no information is given with the apparatus it is presumed that users can install and use the apparatus without any special considerations regarding the EMC aspects, and that the apparatus will still comply with the essential requirements of the EMCD.

Examples of cases where it is relevant to provide more detailed information:

- If there are any particular earthing aspects related to the apparatus for EMC purposes, recognising of course that earthing for safety purposes cannot be compromised;
- Where the product is connected to other apparatus there may be a need to have specific types of cables and connectors (e.g. screened, double screened, etc.). If so, this must be specified to allow for proper installation and use.

Information on any precautions that need to be observed for the apparatus to maintain its compliance with the essential requirements regarding use and maintenance needs to be included.

7.11.4 Contents of the user instructions – standard requirements

Standards used in the conformity assessment may also require additional specific information to be placed in the instructions for use e.g. 60335-1 refers to including the substance of the following in the instructions for use

‘This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision’

8. Appendix A

Applicable Directives and standards for common examples of electrical accessories incorporated into furniture

Finding applicable standards can be challenging. If in doubt expert advice should be sought from an organisation such as FIRA International Ltd (FIRA) or one of the other testing laboratories in the Element group.

Once applicable standards have been identified, an independent third party test facility can provide the necessary testing services.

In this section there are some examples and detailed information relating to applicable Directives, standards and National Legislation for common electrical components incorporated into furniture products. To assist with determining which Directives apply to a product, it is helpful to understand the product's intended use as well as its construction and technical aspects. Manufacturer's intent is crucial where a product is classed as a medical device and falls under MDR instead of LVD. It is advisable for a manufacturer to write a brief summary, including:

- Technical description
- Intended use
- Environment in which it is to be used

It is important to note that that the examples within this document may not match an organisation's specific product and, as such, care is needed when working towards compliance with the Directives and national legislation.

Common product range examples

- Domestic table incorporating UK socket
- Bedframe incorporating Bluetooth Speakers in the Headboard
- Wireless charger incorporated into work-surface.
- Domestic sofa incorporating USB charger socket
- Office desk incorporating Wireless Charger with USB socket

A1 Domestic Table Incorporating UK Socket.

A1.1 Technical description – Coffee table constructed from timber incorporating a socket faceplate on the top side of the table with wiring enclosed within a plastic enclosure. The product is powered by domestic mains voltage 230V – 240V 50Hz with a UK plug via PVC flexible cord.

A1.2 Intended use - The product is designed for sale in the UK for indoor home, domestic use where tables with electrics are considered suitable for "adults of 12 years and above".

A1.3 Application environment - This product is purely designed for use within a domestic environment (excluding nursing homes, geriatric facilities, hospitals, contract environment). The product is designed to be moved only within the intended room of use, for cleaning and for access.

The related Directives are:

- LVD Directive

- RoHS Directive

The related UK national regulations are:

- Plugs and Sockets (Safety) Regulations

A1.4 Standards – The standards listed below are not absolutely the required standards as each specific product design should be considered on its own merits. The testing regime employed may just require the purchase of a compliant component, or maybe an assessment as opposed to testing

e.g. compliance with BS EN 50581 for RoHS – there is no actual testing and the manufacturer should source appropriate part / materials.

Some Standards may not ensure compliance where a standard does not address all aspects of the product or when it only addresses limited essential requirements of the directive, a risk assessment should be considered in this case e.g. BS EN 60335-1 is only a generic standard for household or similar equipment, and without use of an applicable part 2 it may not address all the relevant requirements.

LVD 2014/35/EU	BS EN 60335-1 Household and similar electrical appliances. Safety. General requirements BS EN 50525-2-11:2011 Electric cables. Low voltage energy cables of rated voltages up to and including 450/750V (U0/U). Cables for general applications. Flexible cables with thermoplastic PVC insulation. BS EN 60670-1:2005+A1:2013 Boxes and enclosures for electrical accessories for household and similar fixed electrical installations. General requirements
RoHS 2011/65/EU	BS EN 50581 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.
National UK Regulations and International standards	IEC 60364-7-713:2013. Low-voltage electrical installations. Requirements for special installations or locations. Furniture BS 1363-2 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for 13 A switched and unswitched socket-outlets BS 5733 - General requirements for electrical accessories. Specification BS 1363-1 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for rewirable and non-rewirable 13 A fused plugs NOTE - Plugs must also be independently approved and marked in accordance with the requirements of the regulation.
Associated standards to be noted (GPSD) 2001/95/EC	The collection of standards listed in ‘associated standards’ can also be used to demonstrate conformance to General Product Safety Directive (GPSD). BS EN 12521 - Furniture. Strength, durability and safety. Requirements for domestic tables

A2 Bedframe incorporating Bluetooth Speakers in the Headboard.

A 2.1 Technical description – A wooden bed frame sold with applicable mattress consisting of slatted platform constructed from timber and plywood incorporating Bluetooth speakers with internal power supply in the headboard. Wiring is via conduit fixed onto the frame using flexible PVC cable. The product is powered by domestic mains voltage 230V – 240V 50Hz with a UK plug and trailing PVC cable.

A2.2 Intended use - The product is designed for indoor home, domestic use for sleeping or resting with no medical claims.

A 2.3 Application environment - This product is purely designed for sale in the UK to use within a domestic environment (excluding nursing homes, geriatric facilities, hospitals, contract environment). The product is designed to be moved only within the intended room of use, for cleaning and for access.

The related Directives are:

- RED Directive
- RoHS Directive

A2.4 Standards – The standards listed below are not absolutely the required standards as each specific product design should be considered on its own merits. The testing regime employed may just require the purchase of a compliant component, or maybe an assessment as opposed to testing.

Some Standards may not ensure compliance where a standard does not address all aspects of the product or when it only addresses limited essential requirements of the directive, a risk assessment should be considered in this case.

LVD 2014/35/EU via Article 3 1a of the RED.	BS EN 62368-1:2014+A11:2017 - Audio, video, information technology equipment. Safety requirements BS EN 50525-2-11:2011 Electric cables. Low voltage energy cables of rated voltages up to and including 450/750V (U0/U). Cables for general applications. Flexible cables with thermoplastic PVC insulation. BS EN 50085-1 Cable trunking systems and cable ducting systems for electrical installations. General requirements BS EN 61558-2-1 - Safety of power transformers, power supplies, reactors and similar products. Particular requirements and tests for separating transformers and power supplies incorporating separating transformers for general applications
Radio Equipment Directive (RED) (2014/53/EU)	ETSI EN 300 328 V2.1.1 (Harmonised standard) Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised standard covering the essential requirements of article 3.2 of Directive 2014/53/EU. ETSI EN 301 489-1 V2.1.1 - Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU. ETSI EN 301 489-17 V3.1.1 - Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU BS EN 62311 - Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz) **OR** (Depends on power output and gap between device and user) BS EN 62479 - Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)
EMC 2014/30/EU via Article 3 1b of the RED	BS EN 55032:2015 Electromagnetic compatibility of multimedia equipment. Emission requirements BS EN 55035 Electromagnetic compatibility of multimedia equipment. Immunity requirements BS EN 61000-3-2 Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current < 16A per phase) BS EN 61000-3-3 Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low voltage

	supply systems, for equipment with rated current < 16A per phase and not subject to conditional connection BS EN 62041:2010 Safety of transformers, reactors, power supply units and combinations thereof. EMC requirements
RoHS 2011/65/EU	BS EN 50581 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.
National UK Regulations and International standards	IEC 60364-7-713:2013. Low-voltage electrical installations. Requirements for special installations or locations. Furniture BS 5733 - General requirements for electrical accessories. Specification The Furniture and Furnishings (Fire) (Safety) Regulations 1988 SI 1988/1324 as amended BS 1363-1 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for rewirable and non-rewirable 13 A fused plugs NOTE - Plugs must also be independently approved and marked in accordance with the requirements of the regulation.
Associated standards to be noted (GPSD) 2001/95/EC	BS EN 1725 Domestic furniture. Beds and mattresses. Safety requirements and test methods

A3 Wireless Charger incorporated into Work Surface

A3.1 Technical description - A work-surface OR kitchen plastic laminate worktop with a wireless charger and integrated power supply fitted flush into the surface with an enclosure underneath. Wiring is via conduit fixed onto the frame using flexible PVC cable. The product is powered by domestic mains voltage 230V – 240V 50Hz with a UK plug.

A3.2 Intended use - The product is designed for indoor home, domestic and kitchen use where work-surfaces are considered suitable for ‘adults of 12 years and above’. The intended use is as platform for performing kitchen or household related tasks with no medical claims.

A3.3 Application environment - This product is designed for sale in the UK for use within a domestic / kitchen environment (excluding nursing homes, geriatric facilities, hospitals, contract environment). The product is designed to be moved only within the intended place of use, for cleaning and for access.

The related Directives are:

- RED Directive
- RoHS Directive

A3.4 Standards – The standards listed below are not absolutely the required standards as each specific product design should be considered on its own merits. The testing regime employed may just require the purchase of a compliant component, or maybe an assessment as opposed to testing

Some Standards may not ensure compliance where a standard does not address all aspects of the product or when it only addresses limited essential requirements of the directive, a risk assessment should be considered in this case.

LVD 2014/35/EU via Article 3 1a of the RED.	BS EN 60950-1 Information technology equipment. Safety General Requirements. BS EN 50525-2-11:2011 Electric cables. Low voltage energy cables of rated voltages up to and including 450/750V (U0/U). Cables for general applications. Flexible cables with thermoplastic PVC insulation. BS EN 60670-1:2005+A1:2013 Boxes and enclosures for electrical accessories for household and similar fixed electrical installations. General requirements BS EN 50085-1 Cable trunking systems and cable ducting systems for electrical installations. General requirements BS EN 61558-2-1 - Safety of power transformers, power supplies, reactors and similar products. Particular requirements and tests for separating transformers and power supplies incorporating separating transformers for general applications
Radio Equipment Directive (RED) (2014/53/EU)	Final Draft ETSI EN 303 417 V1.1.1 - Wireless power transmission systems, using technologies other than radio frequency beam, in the 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6 765 - 6 795 kHz ranges; Harmonised standard covering the essential requirements of article 3.2 of Directive 2014/53/EU ETSI EN 301 489-1 V2.1.1 - Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU. ETSI EN 301 489-3 V2.1.0 (Harmonised standard) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU. BS EN 62311 - Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz) OR (Depends on power output and gap between device and user) BS EN 62479 - Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)

EMC 2014/30/EU via Article 3 1b of the RED	BS EN 55032:2015 Electromagnetic compatibility of multimedia equipment. Emission requirements BS EN 55035 Electromagnetic compatibility of multimedia equipment. Immunity requirements BS EN 61000-3-2 Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current < 16A per phase) BS EN 61000-3-3 Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low voltage supply systems, for equipment with rated current < 16A per phase and not subject to conditional connection BS EN 62041:2010 Safety of transformers, reactors, power supply units and combinations thereof. EMC requirements
RoHS 2011/65/EU	BS EN 50581 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.
National UK Regulations and International standards	IEC 60364-7-713:2013. Low-voltage electrical installations. Requirements for special installations or locations. Furniture BS 5733 - General requirements for electrical accessories. Specification BS 1363-1 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for rewirable and non-rewirable 13 A fused plugs NOTE - Plugs must also be independently approved and marked in accordance with the requirements of the regulation.
Associated standards to be noted (GPSD) 2001/95/EC	The collection of standards listed in ‘associated standards’ can also be used to demonstrate conformance to General Product Safety Directive (GPSD). BS EN 12521 - Furniture. Strength, durability and safety. Requirements for domestic tables. BS 6222-2 - Domestic kitchen equipment. Fitted kitchen units, peninsular units, island units and breakfast bars. Performance requirements and test methods.

A4 Domestic sofa incorporating USB socket.

A4.1 Technical description - A sofa constructed from timber, plywood, foam, fibre and textiles combined with a wooden frame with a USB socket with enclosure containing power supply fitted into the arm. Wiring is via conduit fixed onto the frame using flexible PVC cable. The product is powered by domestic mains voltage 230V – 240V 50Hz with a UK plug.

A4.2 Intended use - The product is designed for sale in the UK for indoor home, domestic use where sofas with electrical accessories are considered suitable for "adults of 12 years and above". The intended use is for resting with no medical claims.

A4.3 Application environment - This product is purely designed for use within a domestic environment (excluding nursing homes, geriatric facilities, hospitals, contract environment). The product is designed to be moved only within the intended room of use, for cleaning and for access.

The related Directives are:

- LVD Directive
- EMC Directive
- RoHS Directive

A4.4 Standards – The standards listed below are not absolutely the required standards as each specific product design should be considered on its own merits. The testing regime employed may just require the purchase of a compliant component, or maybe an assessment as opposed to testing.

Some Standards may not ensure compliance where a standard does not address all aspects of the product or when it only addresses limited essential requirements of the directive, a risk assessment should be considered in this case.

LVD 2014/35/EU	BS EN 60950-1 Information technology equipment. Safety General Requirements. BS EN 50525-2-11:2011 Electric cables. Low voltage energy cables of rated voltages up to and including 450/750V (U0/U). Cables for general applications. Flexible cables with thermoplastic PVC insulation. BS EN 60670-1:2005+A1:2013 Boxes and enclosures for electrical accessories for household and similar fixed electrical installations. General requirements BS EN 50085-1 Cable trunking systems and cable ducting systems for electrical installations. General requirements BS EN 61558-2-1 - Safety of power transformers, power supplies, reactors and similar products. Particular requirements and tests for separating transformers and power supplies incorporating separating transformers for general applications
EMC 2014/30/EU	BS EN 55032:2015 Electromagnetic compatibility of multimedia equipment. Emission requirements BS EN 55035:2017 Electromagnetic compatibility of multimedia equipment. Immunity requirements BS EN 61000-3-2 Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current < 16A per phase) BS EN 61000-3-3 Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low voltage

	supply systems, for equipment with rated current < 16A per phase and not subject to conditional connection BS EN 62041:2010 Safety of transformers, reactors, power supply units and combinations thereof. EMC requirements
RoHS 2011/65/EU	BS EN 50581 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.
National UK Regulations and International standards	IEC 60364-7-713:2013. Low-voltage electrical installations. Requirements for special installations or locations. Furniture BS 5733 - General requirements for electrical accessories. Specification The Furniture and Furnishings (Fire) (Safety) Regulations 1988 SI 1988/1324 as amended BS 1363-1 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for rewirable and non-rewirable 13 A fused plugs NOTE - Plugs must also be independently approved and marked in accordance with the requirements of the regulation.
Associated standards to be noted (GPSD) 2001/95/EC	The collection of standards listed in 'associated standards' can also be used to demonstrate conformance to General Product Safety Directive (GPSD). BS EN 12520 - Furniture. Strength, durability and safety. Requirements for domestic seating

A5 Office Desking Incorporating Wireless Charging and USB pod

A5.1 Technical description - An office desk incorporating a pod with USB and wireless charging capabilities. The system consists of desktop and legs with cable tray with flexible cord connecting the pod to domestic mains voltage 230V – 240V 50Hz with a UK plug.

A5.2 Intended use - The product is designed for use in an office where desking is considered suitable for 'adults of 12 years and above'. The desks intended use is as a platform for performing office related tasks with no medical claims.

A5.3 Application environment - This product is purely designed for use within an office environment. The product is designed to be moved only within the intended room of use, for cleaning and for access.

The related Directives are:

- RED Directive
- RoHS Directive

A5.4 Standards – The standards listed below are not absolutely the required standards as each specific product design should be considered on its own merits. The testing regime employed may

just require the purchase of a compliant component, or maybe an assessment as opposed to testing e.g. compliance with BS EN 50581 for RoHS – there is no actual testing and the manufacturer should source appropriate part / materials.

Some Standards may not ensure compliance where a standard does not address all aspects of the product or when it only addresses limited essential requirements of the directive, a risk assessment should be considered in this case e.g. BS EN 60335-1 is only a generic standard for household or similar equipment, and without use of an applicable part 2 it may not address all the relevant requirements

LVD 2014/35/EU via Article 3 1a of the RED.	BS EN 60950-1 Information technology equipment. Safety General Requirements. BS EN 50525-2-11:2011 Electric cables. Low voltage energy cables of rated voltages up to and including 450/750V (U0/U). Cables for general applications. Flexible cables with thermoplastic PVC insulation. BS EN 60670-1:2005+A1:2013 Boxes and enclosures for electrical accessories for household and similar fixed electrical installations. General requirements BS EN 61558-2-1 - Safety of power transformers, power supplies, reactors and similar products. Particular requirements and tests for separating transformers and power supplies incorporating separating transformers for general applications
Radio Equipment Directive (RED) (2014/53/EU)	Final Draft ETSI EN 303 417 V1.1.1 - Wireless power transmission systems, using technologies other than radio frequency beam, in the 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6 765 - 6 795 kHz ranges; Harmonised standard covering the essential requirements of article 3.2 of Directive 2014/53/EU **NOTE** – Alternative standards may apply depending on the specific technology used in design of the product ETSI EN 301 489-1 V2.1.1 - Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU. ETSI EN 301 489-3 V2.1.0 (Harmonised standard) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU. BS EN 62311 - Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz) OR (Depends on power output and gap between device and user)

	BS EN 62479 - Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)
EMC 2014/30/EU via Article 3 1b of the RED	BS EN 61000-6-1:2007 Electromagnetic compatibility (EMC). Generic standards. Immunity for residential, commercial and light-industrial environment BS EN 61000-6-3 Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments. BS EN 61000-3-2 Electromagnetic compatibility (EMC). Limits. Limits for harmonic current emissions (equipment input current < 16A per phase) BS EN 61000-3-3 Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low voltage supply systems, for equipment with rated current < 16A per phase and not subject to conditional connection
RoHS 2011/65/EU	BS EN 50581 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.
National UK Regulations and International standards	BS 6396:2008+A1:2015 - Electrical systems in office furniture and educational furniture. Specification BS 5733 - General requirements for electrical accessories. Specification BS 1363-1 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for rewirable and non-rewirable 13 A fused plugs NOTE - Plugs must also be independently approved and marked in accordance with the requirements of the regulation.
Associated standards to be noted (GPSD) 2001/95/EC	The collection of standards listed in ‘associated standards’ can also be used to demonstrate conformance to General Product Safety Directive (GPSD). BS EN 527-1 Office furniture. Work tables and desks. Dimensions BS EN 527-2 Office furniture. Work tables. Safety, strength and durability requirements BS EN ISO 9241-5 Ergonomic requirements for office work with visual Displays terminals (VDTs). Workstation layout and postural requirements

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9. References

Always ensure you are referring to the latest version of any document in this list, as they are subject to revision. Also check whether documents have been withdrawn and whether additional, or replacement documentation has come into force.

Directives

Electromagnetic Compatibility (EMC) Directive 2014/30/EU

General Product Safety Directive 2001/95/EC

Low Voltage Directive (LVD) 2014/35/EU

Machinery Directive 2006/42/EC

Medical Device Directive (MDD) 93/42/EEC

Reduction of certain Hazardous Substances (RoHS) Directive 2011/65/EU

Radio Equipment Directive (RED) 2014/53/EU

National Legislation

The Furniture and Furnishings (Fire) (Safety) Regulations 1988 SI 1988/1324 as amended

Electricity at Work Regulations 1989

Building Regulations UK - Part P

The Plugs and Sockets, etc. (Safety) Regulations 1994

Standards

BS 7671:2018 Requirements for Electrical Installations. IET Wiring Regulation

BS 6396:2008+A1:2015 - Electrical systems in office furniture and educational furniture. Specification

IEC 60364-7-713:2013. Low-voltage electrical installations. Requirements for special installations or locations. Furniture

BS EN 60335-1:2012+A13:2017 Household and similar electrical appliances. Safety. General requirements

BS EN 60065:2014+A11:2017 Audio, video and similar electronic apparatus. Safety requirements

BS EN 60529:1992+A2:2013 Degrees of protection provided by enclosures (IP code)

BS EN 50525-1:2011 Electric cables. Low voltage energy cables of rated voltages up to and including 450/750 V (U0/U). General requirements

BS EN 60670-1:2005+A1:2013 Boxes and enclosures for electrical accessories for household and similar fixed electrical installations. General requirements

BS EN 61643-11:2012+A11:2018 Low-voltage surge protective devices. Surge protective devices connected to low-voltage power systems. Requirements and test methods

BS EN 61643-21:2001+A2:2013 Low voltage surge protective devices. Surge protective devices connected to telecommunications and signalling networks. Performance requirements and testing methods

BS EN 50085-1:2005+A1:2013 Cable trunking systems and cable ducting systems for electrical installations. General requirements

BS EN 55014-1:2017 Electromagnetic compatibility. Requirements for household appliances, electric tools and similar apparatus. Emission
BS EN 55014-2:2015 Electromagnetic compatibility. Requirements for household appliances, electric tools and similar apparatus. Immunity

BS EN 55032:2015 Electromagnetic compatibility of multimedia equipment. Emission requirements

BS EN 55035:2017 Electromagnetic compatibility of multimedia equipment. Immunity requirements

BS EN 61000-3-2:2014 Electromagnetic compatibility (EMC). Limits for harmonic current emissions (equipment input current ≤16A per phase).

BS EN 61000-3-3:2013 Electromagnetic compatibility (EMC). Limits. Limitation of voltage changes, voltage fluctuations and flicker in public low voltage supply systems, for equipment with rated current ≤ 16A per phase and not subject to conditional connection.

BS EN 61000-6-3:2007+A1:2011 Electromagnetic compatibility (EMC). Generic standards. Emission standard for residential, commercial and light-industrial environments

BS EN 61000-6-1:2007 Electromagnetic compatibility (EMC). Generic standards. Immunity for residential, commercial and light-industrial environments

ETSI EN 300 328 V2.1.1 (Harmonised standard) Wideband transmission systems; Data transmission equipment operating in the 2,4 GHz ISM band and using wide band modulation techniques; Harmonised standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.

ETSI EN 300 330 V2.1.1 - Short Range Devices (SRD); Radio equipment in the frequency range 9 kHz to 25 MHz and inductive loop systems in the frequency range 9 kHz to 30 MHz; Harmonised standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

ETSI EN 300 440 V2.1.1 - Short Range Devices (SRD); Radio equipment to be used in the 1 GHz to 40 GHz frequency range; Harmonised Standard covering the essential requirements of article 3.2 of Directive 2014/53/EU

Final Draft ETSI EN 303 417 V1.1.1 - Wireless power transmission systems, using technologies other than radio frequency beam, in the 19 - 21 kHz, 59 - 61 kHz, 79 - 90 kHz, 100 - 300 kHz, 6 765 - 6 795 kHz ranges; Harmonised standard covering the essential requirements of article 3.2 of Directive 2014/53/EU.

ETSI EN 301 489-52 V1.1.0 (Harmonised standard) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 52: Specific conditions for Cellular Communication Mobile and portable (UE) radio and ancillary equipment; Harmonised Standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU

BS EN 60950-1:2006+A2:2013 Information technology equipment. Safety General Requirements

BS EN 62368-1:2014 Audio/video information and communication technology equipment. Safety requirements

BS EN 62479:2010 Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)

BS EN 62311:2008 Assessment of electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (0 Hz - 300 GHz)

BS EN 62233:2008 Measurement methods for electromagnetic fields of household appliances and similar apparatus with regard to human exposure

ETSI EN 301 489-1 V2.1.1 (Harmonised standard) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 1: Common technical requirements; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU and the essential requirements of article 6 of Directive 2014/30/EU.

ETSI EN 301 489-3 V2.1.0 (Harmonised standard) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 3: Specific conditions for Short-Range Devices (SRD) operating on frequencies between 9 kHz and 246 GHz; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU

ETSI EN 301 489-33 V2.1.1 (Harmonised standard) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 33: Specific conditions for Ultra-Wideband (UWB) devices; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU.

ETSI EN 301 489-17 V2.1.1 (Harmonised standard) Electromagnetic Compatibility (EMC) standard for radio equipment and services; Part 17: Specific conditions for Broadband Data Transmission Systems; Harmonised standard covering the essential requirements of article 3.1(b) of Directive 2014/53/EU.

BS EN 60670-1:2005+A1:2013 Boxes and enclosures for electrical accessories for household and similar fixed electrical installations. General requirements

BS EN 61535:2009+A1:2013 Installation couplers intended for permanent connection in fixed installations

BS EN 50581:2012 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances.

EN 62321: 2009 Electro-technical products Determination of levels of six regulated substances (lead, mercury, cadmium, hexavalent chromium, polybrominated biphenyls, polybrominated diphenyl ethers).

BS 1363-1:2016+A1:2018 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for rewirable and non-rewirable 13 A fused plugs

BS 1363-2:2016+A1:2018 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for 13 A switched and unswitched socket-outlets

BS 5733:2010+A1:2014 - General requirements for electrical accessories. Specification

BS EN 50525-2-11:2011 Electric cables. Low voltage energy cables of rated voltages up to and including 450/750V (U0/U). Cables for general applications. Flexible cables with thermoplastic PVC insulation.

BS 1363-1:2016+A1:2018 13 A plugs, socket-outlets, adaptors and connection units. Specification for rewirable and non-rewirable 13 A fused plugs

BS 1363-2 - 13 A plugs, socket-outlets, adaptors and connection units. Specification for 13 A switched and unswitched socket-outlets

BS EN 61558-2-1 - Safety of power transformers, power supplies, reactors and similar products. Particular requirements and tests for separating transformers and power supplies incorporating separating transformers for general applications

BS EN 62368-1:2014+A11:2017 - Audio, video, information technology equipment. Safety requirements

BS EN 12521:2015 Furniture. Strength, durability and safety. Requirements for domestic tables

BS EN ISO 9001:2015 Quality Management systems. Requirements

BS EN 1725:1998 Domestic furniture. Beds and mattresses. Safety requirements and test methods

BS 6222-2:2009+A1:2017 Domestic kitchen equipment. Fitted kitchen units, peninsular units, island units and breakfast bars. Performance requirements and test methods

BS EN 527-1 Office furniture. Work tables and desks. Dimensions

BS EN 527-2 Office furniture. Work tables. Safety, strength and durability requirements

BS EN ISO 9241-5 Ergonomic requirements for office work with visual Displays terminals (VDTs). Workstation layout and postural requirements

BS EN 12520:2015 Furniture. Strength durability and safety – Requirements for domestic seating

BS EN 61204-3:2001 Low voltage power supplies, d.c. output. Electromagnetic compatibility (EMC)

BS EN 61204-7:2006 Low-voltage power supplies, d.c. output. Safety requirements

BS EN 62479:2010 Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)

BS EN 62041:2010 Safety of transformers, reactors, power supply units and combinations thereof. EMC requirements

How we can help…

This guidance document represents a summary of key issues appertaining to furniture incorporating electronic components

Companies can access more detailed information and advice by attending one of FIRA's regular training courses in Stevenage **- www.fira.co.uk/training**

Alternatively organisations may prefer the added benefits of retaining a FIRA expert to provide support throughout the CE marking process.

To find out more, please contact Bruce Lovell - blovell@fira.co.uk

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Furniture Industry Research Association
Maxwell Road
Stevenage
Hertfordshire
SG1 2EW
UK

Tel +44(0)1438 777 700

Email: info@fira.co.uk

Website: www.fira.co.uk

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