

## Technical performance and principles of system design

### Standards, Regulations & Approvals

The following standards, regulations and documents are relevant to the design and specification of internal dry linings and plasters. The list is not exhaustive and it is the responsibility of the designer to ensure that only the most current version of standards, etc, are referenced.

#### American standards

**ASTM C1396-17:** *Standard Specification for Gypsum Board*

- Section 4.3 Gypsum Board, type X (Special Fire-Resistant):
- Section 5. Gypsum Wallboard, Predecorated Gypsum Board, and Laminated Gypsum Board
- Section 6. Gypsum Backing Board, Gypsum Coreboard, and Gypsum Shaftliner Board
- Section 7. Water-Resistant Gypsum Backing Board
- Section 8. Exterior Gypsum Soffit Board
- Section 9. Gypsum Sheathing Board

**ASTM C1629-18a:** *Standard Classification for Abuse-Resistant Non-decorated Interior Gypsum Panel products and Fibre-Reinforced Cement Panels*

**ASTM C1186-08 (2016):** *Standard Specification for Flat Fibre Cement Sheets*

- Type A—Sheets are intended for exterior applications, subjected to the direct action of sun, rain, or snow. They are supplied coated or uncoated.
- Type B—Sheets are intended for exterior applications, not subjected to the direct action of sun, rain, or snow.

**ASTM C473-17:** *Standard Test Methods for Physical Testing of Gypsum Panel Products*

**ASTM C1185-08 (2016):** *Standard Test Methods for Sampling and Testing Non-Asbestos Fiber-Cement Flat Sheet*

**ASTM C1288-17:** *Standard Specification for Discrete Non-Asbestos Fiber-Cement Interior Substrate Sheets*

**ASTM C1658-18:** *Standard Specification for Glass Mat Gypsum Panels*

**ASTM C1177-17:** *Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing*

**ASTM A653-18:** *Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process*

**ASTM C645-18:** *Standard Specification for Non-structural Steel Framing Members*

**ASTM C475-17:** *Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board*

**ASTM C474-15:** *Standard Test Methods for Joint Treatment Materials for Gypsum Board Construction*

**ASTM C587-04:** *Standard Specification for Gypsum Veneer Plaster*

**ASTM C954-18:** *Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs*

**ASTM C1002-18:** *Standard Specification for Steel Self Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs*

**ASTM C1047-14a:** *Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base*

**ASTM E119-18:** *Standard Test Methods for Fire Tests of Building Construction and Materials*

**ASTM E84-19a:** *Standard Test Method for Surface Burning Characteristics of Building Materials*

**ASTM E136-19:** *Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace*

**ASTM E90-09:** *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements*

**ASTM E413-16:** *Classification for Rating Sound Insulation*

**ASTM C423-17:** *Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method*

**ASTM E336 - 19:** *Standard Test Method for Measurement of Airborne Sound Attenuation between Rooms in Buildings*

**ASTM E989 - 18:** *Standard Classification for Determination of Single-Number Metrics for Impact Noise*

**ASTM C754-18:** *Standard Specification for Installation of Steel Framing Members to Receive Screw Attached Gypsum Panel Products*

**ASTM C840-18b:** *Standard Specification for Application and Finishing of Gypsum Board*

**ASTM D3273-16:** *Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber*

**ASTM B117-18:** *Standard Practice for Operating Salt Spray (Fog) Apparatus*

**ASTM D1037-12:** *Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials*

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**NFPA 268:2017** Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source

**NFPA 285:2019:** Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components

### British standards

**BS 476:** Fire tests on building materials and structures

- Part 4:1970 Non-combustibility test for materials
- Part 6:1989+A1:2009 Method of test for fire propagation for products
- Part 7:1997 Method for classification of the surface spread of flame of products
- Part 20:1987 Methods for determination of the fire resistance of elements of construction (general principles)
- Part 21:1987 Method for determination of the fire resistance of loadbearing elements of construction
- Part 22:1987 Methods for determination of the fire resistance of non-loadbearing elements of construction
- Part 23:1987 Methods for the determination of the contribution of components to the fire resistance of a structure

**BS 9999:2017** Code of Practice for fire safety in the design, management and use of buildings

**BS 8233:2014:** Guidance on sound insulation and noise reduction for buildings

**BS 5234:** Specification for performance requirements for strength and robustness

- Part 1:1992 Partitions (including matching linings) - Code of practice for design and installation
- Part 2:1992 Partitions (including matching linings) - Specification for performance requirements for strength and robustness including methods of test

**BS 5250:2011** Code of Practice for the control of condensation in buildings

**BS 12524:2000** Building material and products - Hygrothermal properties - Tabulated design values

**BS 8481:2006** Design, preparation and application of internal gypsum, cement and lime plastering systems - specification

**BS 8212:1995** Code of Practice for Drylining and Partitioning using Gypsum Plasterboard

**BS 8000-0:2014** Workmanship on construction sites. Introduction and general principles

**BS 5385:** - Wall and floor tiling - Code of practice

- Part 1:2018 - Design and installation of ceramic, natural stone and mosaic wall tiling in normal conditions
- Part 4:2015 - Wall and floor tiling. Design and installation of ceramic and mosaic tiling in specific conditions. Code of practice

**BS 7671:2018** Requirements for electrical installations. IET wiring regulations

**BS 6100-0:2010** Building and civil engineering. Vocabulary. Introduction and index

**BS 8414: 2015** Fire performance of external cladding systems.

- Part 1: Test method for non-loadbearing external cladding systems applied to the masonry face of a building
- Part 2: Test method for non-loadbearing external cladding systems fixed to and supported by a structural steel frame

### European standards

**BS EN 520:2004+A1:2009** Gypsum plasterboards - Definitions, Requirements and Test Methods.

- Type A: Gypsum plasterboard: Plasterboard suitable for gypsum plasters or decoration.
- Type D: Gypsum plasterboard with control density: These boards have a controlled density, with a face suitable for gypsum plasters or decoration. Improved performance in certain applications is obtainable.
- Type E: Gypsum sheathing board: Specifically manufactured to be used as sheathing board in external walls. They are not intended to receive decoration or be permanently exposed to external weather conditions. This type of wallboard has reduced water absorption rate with a minimum water vapour permeability.
- Type F: Gypsum plasterboard with improved core adhesion at high temperatures: Plasterboard suitable for gypsum plasters or decoration. These boards have mineral fibres and / or other additives in the gypsum core to improve core cohesion at high temperatures.
- Type H: Plasterboard with reduced water absorption rate: Boards suitable for special applications in which reduced water absorption properties are required to improve the performance of the board. These boards are designated Type H1, H2 and H3, with different water absorption performance.
- Type I: Gypsum plasterboard with enhanced surface hardness: These boards are used for applications where higher surface hardness is required. Suitable for gypsum plasters or decoration.

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- Type P: Gypsum baseboard: Boards which have a face intended to receive gypsum plaster. They may be perforated during manufacture.
- Type R: Gypsum plasterboard with enhanced strength: Boards for special applications where higher strength is required have both increased longitudinal and transverse breaking loads. Suitable for gypsum plasters or decoration.

**BS EN 15283:** Gypsum boards with fibrous reinforcement - Definitions, Requirements and Test Methods

- Part 1:2008+A1:2009 Gypsum board with mat reinforcement
- Part 2:2008+A1:2009 Gypsum fibre boards

**BS EN 10143:2006** Continuously hot-dip coated steel sheet and strip - tolerances on dimensions and shape

**BS EN 14195:2014** Metal framing components for gypsum plasterboard systems. Definitions, requirements and test methods

**BS EN 13658-1:2008** Metal lath and beads - Definitions, Requirements and Test Methods - Internal Plastering

**BS EN 13279-1:2008** Gypsum binders, and gypsum plasters - Definitions and Requirements

**BS EN 13963:2014** Jointing Materials for gypsum plasterboards - Definitions, Requirements and Test Methods

**BS EN 13914-2:2016** Design, preparation and application of external rendering and internal plastering

**BS EN 12004:2017** Adhesives for tiles. Definitions and specifications

**BS EN 1363-1:2012** Fire Resistance Tests. General requirements

**BS EN 1364:** Fire Resistance tests for non-loadbearing elements

- Part 1:2015 Walls
- Part 2:2018 Ceilings

**BS EN 1365:** Fire Resistance tests for loadbearing elements

- Part 1:2012 Walls
- Part 2:2014 Floors and Roofs
- Part 3:2002 Beams
- Part 4:1999 Columns

**BS EN 1366:** Fire Resistance of service installations

- Part 3:2009 Penetration Seals
- Part 4:2006 Linear Joint Seals
- Part 5:2010 Service ducts and shafts

**BS EN 13823:2010** Reaction to fire tests for building products excluding floors. Single burning item test

**BS EN ISO 1182:2010** Reaction to fire tests for building products. Non-combustibility test

**BS EN ISO 1716:2018** Reaction to fire tests for building products. Determination of the heat of combustion

**BS EN ISO 11925-2:2010** Reaction to fire tests. Ignitability of building products subjected to direct impingement of flame. Single-flame source test

**BS EN ISO 10140: 2010** Acoustics. Laboratory measurement of sound insulation of building elements.

- Part 2: Measurement of airborne sound insulation
- Part 3: Measurement of impact sound insulation

**BS EN ISO 10848-1: 2017** Acoustics. Laboratory and field measurement of flanking transmission for airborne, impact and building service equipment sound between adjoining rooms.

- Part 1: Frame document
- Part 2: Application to Type B elements when the junction has a small influence
- Part 3: Application to Type B elements when the junction has a substantial influence

**BS EN ISO 717:** Acoustics. Rating of sound insulation in buildings and of building elements

- Part 1:2013 Airborne sound insulation
- Part 2:2013 Impact sound insulation

**BS EN ISO 354:2003** Acoustics. Measurement of sound absorption in a reverberation room

**BS EN ISO 11654:1997** Acoustics. Sound absorbers for use in buildings. Rating of sound absorption

**BS EN 13964:2014** Suspended Ceilings - Requirements and test methods

**BS EN ISO 6946:2017** Building components and building elements - thermal resistance and thermal transmittance - calculation method

**BS EN 13501-1:2018** Fire classification of construction products and building elements. Classification using data from reaction to fire tests

**BS EN 1993-1:2005** Eurocode 3. Design of steel structures. General rules. Structural fire design

**BS EN 13381-4:2013** Test methods for determining the contribution to the fire resistance of structural members. Applied passive protection

**BS EN 10365:2017** Hot rolled steel channels, I and H sections. Dimensions and masses

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**BS EN 14246:2006** Gypsum elements for suspended ceilings. Definitions, requirements and test methods.

**BS EN 10162:2003** Cold rolled steel sections. Technical delivery conditions. Dimensional and cross-sectional tolerances.

**BS EN 14566:2008+A1:2009** Mechanical fasteners for gypsum plasterboard systems. Definitions, requirements and test methods.

**BS EN 717:2004** Wood-based panels. Determination of formaldehyde release. Formaldehyde emission by the chamber method

**BS EN ISO 11925-2:2010** Reaction to fire tests. Ignitability of products subjected to direct impingement of flame. Single-flame source test

**BS EN ISO 1182:2010** Reaction to fire tests for products. Non-combustibility test

**BS EN ISO 1716:2018** Reaction to fire tests for products. Determination of the gross heat of combustion (calorific value).

**BS OHSAS 18001** Occupational Health and Safety Management

### ISO standards

**ISO 9001:2015** Quality management systems - Requirements

**ISO 14001:2015** Environmental management systems - Requirements

**ISO 45001:2018** Occupational health and safety management system - Requirements

**ISO 16000-23:** Performance test for evaluating the reduction of formaldehyde concentrations by sorptive building materials

### Other reference documents

**Building Regulations Approved Document E (revised 2003)**

**Health Technical Memorandum (HTM) 08-01**

**Building Bulletin 93 (BB93):** Acoustic Design of Schools - A Design Guide

**Gypsum Association GA-216** Application of Finishing of Gypsum Panel Products

**Building Regulations Approved Document B (2019)**

**Estidama** - Sustainability rating system developed by Abu Dhabi Urban Planning Council (UPC)

**Leadership in Energy & Environmental Design (LEED)** is a green building certification program by US Green Building Council

**Uniform Building Code (UBC): 1997**

- Volume 1 - Administrative, Fire and Life-Safety, and Field Inspection Provisions
- Volume 2- Structural Design Requirements

**International Building Code (IBC) published by the International Code Council (ICC)**

**UAE Fire and Life Safety Code of Practice**

**AL SA'FAT Dubai Green Building Evaluation System**

### Government approvals

Safety is one of the biggest concerns by government bodies in the middle east throughout the entire stages of design and construction of buildings - particularly in the selection of sustainable and fire resistant products to ensure a safe environment for occupants.

Gyproc systems are tested and certified to local and international standards by an accredited third party laboratory in compliance with regulatory requirements. In addition, Gyproc holds valid approvals with the following government bodies for its products and systems.

**Civil defence approvals**

- Dubai Civil Defence
- Abu Dhabi Civil Defence
- Sharjah Civil Defence
- Royal Oman Police

**Municipality approvals**

- Dubai Central Laboratory
- Dubai Municipality

### Certifications

**ISO 9001:2015 - Quality Management Systems**

ISO 9001 is an internationally recognised standard currently used by many companies worldwide for establishing quality management systems within the organisation to help improve its overall performance and provide consistent products and services that meets customer expectations.

Our plasterboard manufacturing facility within UAE is certified to ISO 9001:2015

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#### **ISO 14001:2015 - Environmental Management Systems**

Our environmental management system implemented at our plasterboard factory in the middle east is deemed compliant with the environmental statutory requirements in accordance with ISO 14001. Gyproc's ISO 14001 certification emphasises the stringent environmental standards maintained across our facility and enables us to support customers through the delivery of sustainable construction products.

#### **OHSAS 18001:2007 - Occupational Health and Safety Management Systems**

OHSAS 1800:2007 Occupational Health and Safety Management Certification is an international standard which provides a framework to identify, control and decrease the risks associated with health and safety within the workplace.