



**Fitted Furniture for Post Primary Schools**

**Specifications and Standards**

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# Fitted Furniture – Specification and Standards

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## 1.0 Introduction

This document is intended to layout down the minimum standards and requirements for fitted furniture in secondary schools. Design Teams are permitted to use alternative materials and finishes of equal or higher specification and performance.

## 2.0 Fitted Furniture General Requirements

### Drawings

#### 2.1 Detail drawings

These guidelines are to be read in conjunction with DES Fitted Furniture detail drawings.

### Standards

All furniture shall comply with the following standards:

#### 2.2 Furniture General

I.S. EN 1729 Part 1 and 2 Education Furniture

BS 6396 1990 – Specifications for electrical systems on office furniture and office screens.

I.S. EN 1032 – 1:12003.

Building Bulletin 88 Fume Cupboards in Schools: Department for Education and Employment, London

#### 2.3 Ergonomics

I.S. EN ISO 9421 Ergonomics of design of visual display terminals (VDT's).

BS 3044 1990 Ergonomic principles in the design and selection of office furniture

#### 2.4 Office Furniture

I.S. EN 527 Office Furniture

BS 5459-2 Specification for performance requirements and tests for office furniture.

I.S. EN 1335 Part 1, 2 and 3

#### 2.5 Materials

I.S. EN 622 Dry Process Fibreboard (MDF) (including furniture) for use in dry conditions

I.S. EN 438 Decorative High Pressure Laminates Sheets based on thermosetting resins

FIRA standard 6250 – Lacquer application.

I.S. 12720, 12721 and 12722 – Methods of test for finishes of wooden furniture.

BS 1186 Part 2 Timber for and workmanship in joinery

I.S. EN 942 Timber in joinery – General classification of timber quality

It is essential that Furniture for School Use shall:

- i) Comply fully with the specifications and be durable and safe for School Use.
- ii) Comply fully with the standards as detailed and shall comply fully with current European (EN) Standards and future revisions, both established, developing and new standards replacing existing Standards.
- iii) Be accompanied by documentation of sufficient detail for full evaluation.
- iv) Include the completed and signed certificate of compliance.

## **Quality**

- 2.4 All materials and workmanship throughout must be of the highest quality. Any inferior materials or practice will not be accepted.
- 2.5 All items and components shall be soundly constructed in accordance with the best manufacturing process and practice.
- 2.6 All the dimensions, details, fixings etc shown on drawings must be strictly observed.
- 2.7 All proprietary materials must be used strictly in accordance with the manufacturers instructions or recommendations.

## **Alternative materials**

- 2.8 Materials, dimensions and finishes described in this document and on fitted furniture details are deemed to fulfil the requirements for stability and other performance requirements. Equivalent materials/design may be considered by designers. Designers/architects are to ensure alternative materials match the performance criteria of typical furniture components and materials listed below.

## **3.0 Performance criteria**

- 3.1 Alternative materials of equal or higher specification and performance to the typical furniture components and materials listed in Section 4 may be used. A non-exhaustive list of performance criteria is set out below.
- 3.2 Worktops/carcasses  
Stability to comply with I.S En 1729 and other relevant standards  
Finish to be robust and resistant to impact, scratching, staining and water penetration, with edge finish to prevent chipping of worktop surface.
- 3.3 Science room surfaces finish to be robust and resistant to impact, scratching, staining, water penetration, heat and of chemicals.
- 3.4 Home Economics room surfaces finish to be robust and resistant to impact, scratching, staining, water penetration and heat.
- 3.5 Metal worktop support frames and height adjustable frames to comply with IS En 1729.
- 3.6 Painted finishes are generally not accepted, except where noted on drawings.

## **4.0 Typical furniture components, core materials and surfacing**

### **4.1 Core Materials for laminated worktops and components**

High density chipboard to IS EN 312-3 type P3, class E1 formaldehyde content. Moisture resistant board to EN 312-5 type P5, class E1 formaldehyde content.

Dry Fibre Board (MDF) to IS EN 622-5 Class E1 formaldehyde content.

Moisture resistant board to IS EN 622-5 MDF.H, class E1 formaldehyde content

Plywood to conform with I.S. EN 1072, I.S. EN 314 and I.S. EN 636.

All the above fibre board products to be tested to EN120 to have less than 8mg/100g free formaldehyde content (Class E1)

Surface preparation: Prepare surfaces in accordance with decorative coating manufacturer's recommendations.

#### **4.2 Plastic Laminates**

Plastic laminates should comply with BS 4965 and I.S./EN 438, grade HGS/HGP (including vertical panels). Balancing laminate to be used in all cases. Grade VGS allowed only for balancing laminate to underside of worktops or tables.

Condition materials before fixing and bond in accordance with the manufacturer's recommendations. Chamfer edges at all external angles.

All laminated panels to have either solid colour laminate or PVC edges to seal all lippings, with the lipping fitted after laminating. All edges to be finished flush and smooth with the black core of the laminate concealed behind the lipping. Two edges of doors and drawer fronts to be postformed.

Worktops used in kitchens to be heat-resistant to 180°C.

Assembly: Quality of Work:

Carefully machine particle board to accurate lengths and profiles free from twist and bowing. After machining, surfaces to be smooth and free from tearing, chip bruising and other machining defects. Assemble panels, rails and stiles carefully by multiple dowelling and gluing to form a rigid carcass.

#### **4.3 Worktops**

Where worktops are not continuous between adjacent units, worktops shall be jointed using mason mitre or equivalent jointing method.

Provision shall be made for cut-outs for columns and services pipes/conduits as required. Provision shall be made for a neat junction between worktops and fair faced block walls. The exposed edge of the worktop shall be sealed to prevent water ingress and junction with wall/columns shall be sealed with a neoprene strip or other approved method.

*Design Teams to ensure Main Contract includes the following: in Home Economics Room, Staff and GP kitchens all pipes and pipe drops penetrating the worktop to be boxed-in and finished to match adjacent surfaces.*

Clearances between units for appliances are critical and also apply to worktops.

#### **4.4 Solid Core Laminates**

Alternative materials, e.g. cast epoxy or solid core laminates may be used in lieu of timber for science bench worktops. Certification is required that the proposed material is chemical resistant, heat resistant to 180° Celsius and scratch resistant.

#### **4.5 Timber worktops**

##### **4.5.1 Hardwood timber worktops (e.g. science benches):**

To IS EN 942, Class J2. Timber shall be sound, well conditioned, properly seasoned to suit internal joinery use, and free from defects, or a combination of defects rendering it unsuitable for purpose intended. All timber to be from forests managed under principles of sustainability in accordance with international guidelines. Manufacturer to demonstrate that timber derived from well managed sources.

The preferred species of timber to be timber of high density – min. 600 kg/m<sup>3</sup>, but with little dimensional movement, such as Iroko (*Milicia exelsa /Milicia regia*) or Teak (*Tectona grandis*). Less commonly available timbers that are similar in properties may be used if agreed with architect, and test results submitted in advance of manufacture. Use of timber species with CITES listings is not allowed. FSC/PEFC chain of custody to be demonstrated.

Average density to be more than 600 kg/m<sup>3</sup> and to be suitable for internal joinery. Average moisture content of timber on delivery: 9 % to 13 %. Adhesive: to I.S. EN 204

##### **4.5.2 Softwood timber worktops (e.g. metalwork benches):**

Softwood for worktops shall be Scots Pine *Pinus sylvestris* (or Red Deal), to Class J10 of I.S. EN 942. Average density to be more than 500 kg/m<sup>3</sup> and to be suitable for internal joinery – see I.S EN 942. Average moisture content of timber on delivery: 9 % to 13 %. Adhesive: to I.S EN 204

#### **4.5.3 Fabrication**

Standard: BS 1186-2 and I.S. EN 1313-1 and I.S. EN 1313-2

Sections: Accurate in profile and length, and free from twist and bowing. Form out of solid unless shown otherwise.

Machined surfaces: Smooth and free from tearing, wooliness, chip bruising and other machining defects.

Joints: Tight and close fitting.

Assembled components: Rigid. Free from distortion.

Screws: Provide pilot holes.

- Screws of 8 gauge or more and screws into hardwood: Provide clearance holes.

- Countersink screws: Sink heads at least 2 mm below timber surfaces visible in completed work.

Worktops shall be fitted so as to allow for shrinkage movement etc. and also to facilitate easy replacement.

Dowels shall be hardwood. Fix carefully all fittings, check and adjust all fittings as necessary to ensure correct functioning.

All metal and timber shall be neatly bored and countersunk to take the required screws. Tops are to be securely fixed and screws to be inserted in correct alignment to ensure that no screws heads are projected above finished layer.

#### **4.5.4 Moisture Content**

Timber and wood based products: Maintain moisture content within range specified for the component during manufacture, storage and delivery.

#### **4.5.5 Finishing**

##### **COATING MATERIALS**

Selected manufacturer: Submit name for approval before commencement of any coating work.

Lacquer to FIRA Standard severe rating: to all work surfaces. Lacquer to be factory applied by ultra violet cured method or other method guaranteed to meet the specification.

Lacquer to FIRA standard 6250 general rating: to all other surfaces, factory applied.

##### **PREPARATION GENERALLY**

To BS 6150, Section 4.

Preparation materials: Types recommended by their manufacturers and the coating manufacturer for the situation and surfaces being prepared

##### **IRONMONGERY**

Before commencing work: Remove ironmongery from surfaces to be coated and re-fix on completion of coating work.

##### **UNCOATED TIMBER**

General: Abrade to a smooth, even finish with arrises and moulding edges lightly rounded or eased. Heads of fasteners: Countersink sufficient to hold stoppers/fillers.

Resinous areas and knots: Apply two coats of knotting.

##### **COATING GENERALLY**

Application: To BS 6150, Section 5.

##### **SITE COATING OF CONCEALED JOINERY SURFACES**

General: After priming, apply additional coatings to surfaces that will be concealed when fixed in place.

#### **4.6 Metal Frames**

##### **4.6.1 General**

Use proprietary products to manufacturer's instructions.

Grades of metals, section dimensions and properties to be to the appropriate Irish Standard. When not specified, select grades and sections appropriate for the purpose.

Prefinished metal may be used if methods of fabrication do not damage or alter appearance of finish, and finish is adequately protected.

Fasteners to be to the appropriate Irish Standard and, unless specified otherwise, to be of the same metal as the component, with matching coating or finish.

#### FABRICATION GENERALLY

Fabricate components carefully and accurately to ensure compliance with design and performance requirements .

Finished components to be rigid and free from distortion, cracks, burrs and sharp arrises which would be visible after fixing or a hazard to the user. Moving parts must move freely and without binding.

Unless specified otherwise, mitre corner junctions of identical sections.

Cold formed work: Use brake presses or cold rolling to produce accurate profiles with straight arrises.

#### WELDING/BRAZING GENERALLY

Thoroughly clean surfaces to be joined.

Ensure accurate fit using clamps and jigs where practicable. Use tack welds only for temporary attachment.

Make joints with parent and filler metal fully bonded throughout with no inclusions, holes, porosity or cracks.

Prevent weld spatter falling on surfaces of materials which will be self-finished and visible in completed work.

Remove all traces of flux residue, slag and weld spatter.

Welding of steel: Metal arc welding to I.S. EN 1011-1 and I.S EN 1011-2, or other methods subject to approval.

#### FINISHING WELDED/BRAZED JOINTS

Butt joints which will be visible in completed work to be smooth, flush with adjacent surfaces.

Fillet joints which will be visible in completed work to be executed neatly.

All welds to be concealed where possible or to be ground smooth where visible. Remove rust, loose scale, welding slag and spatter. Remove oil, grease and dirt. Surfaces to be smooth to touch prior to application of finishing coats.

#### PREPARATION FOR APPLICATION OF COATINGS

Before applying coating ensure that fabrication is complete and all fixing holes have been drilled, unless otherwise specified.

Remove all paint, grease, flux, rust, burrs and sharp arrises.

#### 4.6.2 Height adjustable frames

Height adjustable frames for Home Economics, Art & Craft room and Science rooms are to be provided for one workstation. The frame should comply with I.S. 140 and I.S. 170 in terms of stability. The height adjusting mechanism should operate safely and evenly. Details of proposed system to be supplied prior to manufacture. Fabrication to be in accordance with Item 4.5.1 and powder coated as Item 4.5.3

#### 4.6.3 Powder Coating

Metal Coating shall be epoxy powder coated to selected RAL colour, as specified on drawings.

##### WORKING PROCEDURES

Requirement: Comply with: BS 6497 for galvanized steel backgrounds.

British Coatings Federation: Code of safe practice - Application of thermosetting powder coatings by electrostatic spraying.

#### POWDER COATINGS APPLICATORS

Applicator requirements:

- Approved by powder coating manufacturer.
- Currently certified to I.S. EN ISO 9001.
- Comply with quality procedures, guarantee conditions, standards and tests required by powder coating manufacturer.
- Each applicator to use only one plant.

#### GUARANTEES

Powder coating manufacturer and applicator guarantees:

- Submit signed project specific copies on completion of work.

#### EXTENT OF POWDER COATINGS

Application: To visible component surfaces, and concealed surfaces requiring protection. Coated surfaces will be deemed 'significant surfaces' for relevant BS 6496/ BS 6497 performance requirements.

#### PERFORMANCE AND APPEARANCE OF POWDER COATINGS

Standard: To BS 6496/ BS 6497.

#### STEEL FABRICATIONS

Unit assembly: Wherever practical, before powder coating.

Exposure of uncoated background metal: Not acceptable.

Assembly sealants: Compatible with powder coatings.

#### FIXINGS

Exposed metal fixings: Powder coat together with components, or coat with matching repair paint system applied in accordance with the powder coating manufacturer's recommendations.

#### PROTECTION

Powder coated surfaces of components: Protect from damage during handling and installation, or by subsequent site operations.

Protective tapes in contact with powder coatings: Must be:

- Low tack, self adhesive and light in colour.
  - Applied and removed in accordance with tape and powder coating manufacturers' recommendations.
- Do not use solvents to remove residues.

#### SITE DAMAGE REPAIR/ REPLACEMENT

Damage to powder coatings: Rectify immediately damage caused during handling and installation, or by subsequent site operations. Submit proposals for extensive repair or replacement.

### 4.7 Ironmongery

Assemble and fix carefully and accurately using fastenings with matching finish supplied by ironmongery manufacturer. Prevent damage to ironmongery and adjacent surfaces. At completion check, adjust and lubricate as necessary to ensure correct functioning.

#### Locks and Master keying

Locks to be provided to all storage units – high level and base units.

Locks to all units in teachers desks to be keyed alike.

Locks to all other student units to be master keyed.

Locks to all office storage units to be mastered. In admin office main filing units to be keyed alike.

Principal's office all units to be keyed alike.

Handles should either be D-shape stainless steel with reverse fixing through back of door or recessed stainless steel – as specified on drawings.

Hinges should be high quality 180 degree type self-closing hinges.

### 4.8 Miscellaneous

#### 4.8.1 Fume Cupboards

Fume cupboard to be fixed and conform with Building Bulletin 88 (Fume Cupboards in Schools, Department for Education and Employment, London).

Dimensions to be approximately 900 wide x 500 deep x 900 mm high internal dimensions with adjustable sash height, glazed with 5 mm thick toughened glass, bypass, melamine lining, maximum working sash height 400 mm, stoppered (adjustable for cleaning), lowest

gap position not less than 50 mm, face velocity with sash set for full working aperture shall not be below  $0.3 \text{ ms}^{-1}$ , digital face velocity indicator. Fume cupboards shall be provided as part of the fixed furniture contract.

Fume cupboard extraction systems shall be provided as part of the mechanical contract in accordance with prevailing standards and be integrated with the building design at Stage 2. Fume cupboard extract fans are not to be located in teaching spaces.

Supply and fix complete with sink, waste and dilution pot – materials to be at least equal to laboratory sink (polypropylene sink is unsuitable). Water, gas, drainage and power supply (twin socket) should be provided. Fume Cupboard installer to coordinate testing and commissioning of complete assembly – including fume cupboard, fan, and flue.

#### **4.8.1 Blackout Blinds**

#### **TO BE CONFIRMED**

*Blackout blinds are included in the fitted furniture package, but are to be specified by the architect to ensure the blinds match the window system used.*

## **5.0 EXECUTION**

### **5.1 Shop drawings:**

Contractor to prepared for all furniture. Contractor to allow sufficient programme time for mark up and approval of these drawings by the architect prior to manufacture. The programme to allow for amendment and resubmission of drawings for approval.

### **5.2 Control Samples:**

After finalisation of all details prepare one of each of the following, as part of the quantity required for the project, incorporated into the finished work where possible, and obtain approval of appearance before proceeding with manufacture of the remaining quantity:

- Worktop (standard type)
- Sink Unit (standard type)
- High level open shelf unit (standard type)
- Single Science Bench 600 mm x 700 mm
- Movable Science Project Table 1200 mm x 700 mm
- Movable Craft Table 2000 mm x 1000 mm
- Adjustable Shelving
- Office worktop with two support legs
- Office pedestal unit
- Home Economics sink unit
- Home Economics drawer unit

### **5.3 Moisture Content**

Temperature and humidity: During delivery, storage, fixing and to handover maintain conditions to suit specified moisture contents of timber components.

Testing: When instructed, test components with approved moisture meter to manufacturer's recommendations.

### **5.4 Installation Generally**

#### **FIXINGS GENERALLY**

Integrity of supported components: Types, sizes and quantities of fasteners/ packing and spacing of fixings selected to retain supported components without distortion or loss of support.

Components/ substrates/ fasteners of dissimilar metals: Fixed with isolating washers/ sleeves to avoid bimetallic corrosion.

General usage: To recommendations of fastener manufacturers and/ or manufacturers of components, products or materials fixed and fixed to.

Appearance: As approved samples.

Position joinery accurately, plumb, level and aligned as necessary. Fix securely to prevent pulling away, deflection, or other movement during use.



#### DISTORTION

Do not distort joinery when driving wedges or other packing or when tightening fixings.  
Ensure adequate clearances for opening parts. If necessary adjust packing and fixings to eliminate binding.

#### FIXINGS THROUGH FINISHES

Penetration of fasteners/ plugs into substrate: To achieve a secure fixing.

#### PACKINGS

Function: To take up tolerances and prevent distortion of materials/ components.  
Materials: Non-compressible, non-corrodible, rot proof.  
Locations: Not within zones to be filled with sealant.

#### CRAMP FIXINGS

Cramp positions: Maximum 150 mm from each end of frame sections and at 600 mm maximum centres.  
Fasteners: Cramps fixed to frames with screws of same material as cramps.  
Cramp fixings in masonry work: Fully bedded in mortar.

#### PELLETED COUNTERSUNK FIXINGS

Finished level of countersunk screw heads: Minimum 6 mm below timber surface.  
Pellets: Cut from matching timber, grain matched and glued in to full depth of hole.  
Finished level of pellets: Flush with surface.

#### POWDER ACTUATED FIXING SYSTEMS

Powder actuated fixing tools: To BS 4078-2 and Kitemark certified. Operatives trained and certified as competent by tool manufacturer.  
Types of fastener, accessories and consumables: As recommended by tool manufacturer.  
Protective coating to exposed fasteners used externally or in other locations subject to dampness: Zinc rich primer to fastener heads.

#### ADHESIVES

Storage/ Usage: In accordance with manufacturer's and statutory requirements.  
Surfaces: Clean. Regularity and texture adjusted to suit bonding and gap filling characteristics of adhesive.  
Finished adhesive joints: Fully bonded. Free of surplus adhesive.

#### PROTECTION

Prevent distortion of components during transit, handling, storage and fixing.  
Keep components clean and dry before fixing. Retain coverings in position for as long as practicable.  
Prevent damage to components and marking of surfaces which will be visible in completed work.  
Provide additional protection as necessary until practical completion and remove all temporary coverings on completion.

#### STORAGE

Do not deliver to site any components which cannot be immediately unloaded into suitable conditions of storage.

#### SERVICED UNITS

Before fixing serviced units ensure that all provision has been made for connection of gas, water, drainage, electrical and other services.

#### 5.5 Sealant Pointing

Material: Silicone based to BS 5889, Type B with fungicide.  
Colour: to match work surface.

#### SUITABILITY OF JOINTS

Pre-sealing checks:

- Joint dimensions: Within limits specified for the sealant.
- Substrate quality: Surfaces regular, undamaged and stable.

Joints not fit to receive sealant: Submit proposals for rectification.

## PREPARING JOINTS

Surfaces to which sealant must adhere:

- Remove temporary coatings, tapes, loosely adhering material, dust, oil, grease, surface water and contaminants that may affect bond.
- Clean using materials and methods recommended by sealant manufacturer.

Vulnerable surfaces adjacent to joints: Mask to prevent staining or smearing with primer or sealant.

Primer, backing strip, bond breaker: Types recommended by sealant manufacturer.

- Backing strip and/or bond breaker installation: Insert into joint to correct depth, without stretching or twisting, leaving no gaps.

Protection: Keep joints clean and protect from damage until sealant is applied.

## APPLYING SEALANTS

Substrate: Dry (unless recommended otherwise).

Environmental conditions: Mix and apply primers and sealants within temperature and humidity ranges recommended by manufacturers. Do not dry or raise temperature of joints by heating.

Sealant application: Unless shown otherwise on drawings, fill joints completely and neatly, ensuring firm adhesion to substrates.

Sealant profiles:

Butt and lap joints: Slightly concave.

Fillet joints: Flat or slightly convex.

Protection: Protect finished joints from contamination or damage until sealant has cured.

### 5.6 Trims

Lengths: Wherever possible, un-jointed between angles or ends of runs.

Running joints: Where unavoidable, obtain approval of location and method of jointing.

Angle joints: Mitred.

### 5.7 Completion

Doors and drawers: Accurately aligned, not binding. Adjusted to ensure smooth operation.

Ironmongery: Checked, adjusted and lubricated to ensure correct functioning.

### 5.8 Cleaning

Cleaning all items of fitted furniture is the responsibility of the fitted furniture contractor. All units to be thoroughly cleaned inside and out for Practical Completion.

## 6.0 CERTIFICATES OF COMPLIANCE

Certificate of Compliance must certify that materials and finished fully comply with the minimum Standards described in this document and on the drawings. It is the responsibility of the Designer/Contractor to ensure that the materials/items used meet these Standards. Part of this quality assurance may involve obtaining copy of certificate of testing or other supporting documentations. Where further evidence is required then the supplier may be required to submit sample(s) to the NSAI, or another competent body for independent testing.

The following certificates are to be obtained from the contractor and handed to the client on completion of the project:

- 6.1 Certificate of compliance with standards – drafted and issued by the contractor/manufacturer
- 6.2 FSC/PEFC: chain of custody certification in relation to all timber products used
- 6.3 Evidence of formaldehyde content of all fibre board materials used
- 6.4 Certification to demonstrate compliance with performance criteria for solid core laminate products.
- 6.5 Guarantees for powder coating of metal frames.

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