

Recommendations for

The co-ordination of dimensions in shipbuilding: co-ordinating spaces for furniture

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Foreword

This British Standard has been prepared under the authority of the Shipbuilding and Marine Industry Standards Committee and is based on a proposal of the British Ship Research Association.

The changeover to the metric system within the shipbuilding industry has been taken as an opportunity to introduce a rationalized method of design for ships' accommodation that is applied to the components and to the structures within which they are used. Dimensional co-ordination, the method chosen, uses a range of related dimensions within a co-ordinated framework to achieve standardized components.

The aim in publishing the series of standards under the general title "*Recommendations for the co-ordination of dimensions in shipbuilding*" is thus to establish for designers and manufacturers limited ranges of standard components that can be utilized to maximum effect within dimensionally co-ordinated accommodation space, giving the advantages of less need to manufacture non-standard units, avoidance of wastage of materials and labour in cutting components on site, and flexibility and interchangeability of components in use.

This standard is one of the series mentioned. It presents data on the principal items of ships' furniture and makes recommendations for a range of co-ordinating sizes for these components.

Other standards in the series are:

BS MA 13, *Recommendations for the co-ordination of dimensions in shipbuilding: glossary of terms*. (Definitions of terms used in modular and dimensional co-ordination, including terms peculiar to shipbuilding.)

BS MA 14, *Recommendations for the co-ordination of dimensions in shipbuilding: co-ordinating sizes for components and assemblies*. (Recommendations on the first selection of sizes based on the use of standard modules or increments of size.)

BS MA 44, *Recommendations for the co-ordination of dimensions in shipbuilding: principles of dimensional co-ordination*. (An introduction to the subject giving guidance on the use of the standards in the series.)

BS MA 45, *Recommendations for the co-ordination of dimensions in shipbuilding: controlling dimensions*. (A framework of controlling dimensions for use in the design of ships' deckhouses and accommodation and to assist in the derivation of co-ordinating sizes of components.)

BS MA 71, *Recommendations for the co-ordination of dimensions in shipbuilding: co-ordinating spaces for internal subdivision*. (Information on the dimensional requirements for components used in the subdivision of accommodation areas expressed in terms of co-ordinating spaces.)

BS MA 73, *Recommendations for the co-ordination of dimensions in shipbuilding: co-ordinating sizes for fixtures, fittings and equipment*. (Recommendations for co-ordinating sizes of these items in order to integrate them within dimensionally co-ordinated spaces.)

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 14 and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

NOTE Users of this British Standard: Marine Series should note that, while observing the requirements of this standard, they should at the same time ensure compliance with such statutory requirements, rules and regulations as may be applicable to the individual ships concerned.

1 Scope

1.1 This British Standard gives information on the dimensional requirements for furniture components in order to assist in the derivation of limited ranges of co-ordinating sizes for these items.

1.2 This standard includes information (Figure 4 to Figure 10) on the anthropometric and ergonomic dimensions which relate to the furniture items under consideration.

2 References

This standard makes reference to the following British Standard publications:

BS MA 13, *Recommendations for the co-ordination of dimensions in shipbuilding: glossary of terms.*

BS MA 14, *Recommendations for the co-ordination of dimensions in shipbuilding: co-ordinating sizes for components and assemblies.*

BS MA 44, *Recommendations for the co-ordination of dimensions in shipbuilding: principles of dimensional co-ordination.*

BS MA 45, *Recommendations for the co-ordination of dimensions in shipbuilding: controlling dimensions.*

BS MA 71, *Recommendations for the co-ordination of dimensions in shipbuilding: co-ordinating spaces for internal subdivision.*

BS 1877, *Domestic bedding — Part 1: Spring interior mattresses for adult use (performance and construction).*

BS 2900, *Recommendations for the co-ordination of dimensions in building. Glossary of terms.*

BS 3173, *Non-pocketed or open type spring centre units for domestic mattresses.*

DD 22, *Recommendations for the co-ordination of dimensions in building. Tolerances and fits for building. The calculation of work sizes and joint clearances for building components.*

PD 6446, *Recommendations for the co-ordination of dimensions in building. Combinations of sizes.*

3 Definitions

For the purposes of these recommendations the definitions in BS MA 13 apply. These definitions are based on BS 2900, any variations being necessitated by the different terminology used in the shipbuilding industry.

4 Guidance for selection of co-ordinating sizes

4.1 In order to achieve the co-ordination of dimensions it is necessary first to reduce the number of possible sizes that are to be used, i.e. a selection of sizes must be made. The method given in BS MA 14 is to recommend the use of particular units of size, or modules, and multiples of these modules for the co-ordinating dimensions of components or assemblies.

4.2 Further variety reduction is obtained by standardizing the principal vertical and horizontal dimensions within the accommodation, such as deck-to-ceiling height or length and width of cabins. These dimensions are termed controlling dimensions and are the subject of the recommendations contained in BS MA 45.

4.3 Within the restrictions imposed by the use of the standard modules and controlling dimensions it is necessary to select a range of the sizes for modular components which most conveniently meet the requirements found from the survey for the particular item. In making this selection use can be made of the mathematical technique “combinations of numbers”, which is the subject of PD 6446, to establish groups of “relatively prime numbers” to give maximum flexibility in assembly.

5 Co-ordinating spaces for furniture

5.1 The space allocated to an individual component (including an allowance for joints and tolerances for manufacture and siting) is termed a co-ordinating space and the dimensions of this space are termed co-ordinating dimensions. The co-ordinating dimensions defining the spaces are for length, width, depth, and height and the ranges of sizes allocated to these dimensions are determined within the restrictions outlined in clause 4. Further reference to joints and tolerances is made in 7.1.

5.2 Co-ordinating sizes for individual components are given in Table 1. The ranges of co-ordinating sizes are derived from the data given by statutory requirements and recommendations and have been chosen to provide mean coverage of the ranges of sizes most frequently encountered in the survey of existing furniture standards and ship outfits. All possible combinations of length, width, depth and height given in the table may be used.

5.3 The co-ordinating dimensions defining the spaces, particularly the height of a working top, must have regard to ergonomic and anthropometric considerations; the heights may require variation to accord with the particular function of the component or type of person to whom this is related. Figure 4 gives anthropometric data for guidance in design, Figure 5, Figure 6 and Figure 7 give examples of dimensions based on such data, and Figure 8, Figure 9 and Figure 10 illustrate some other factors to be considered.

5.4 Within certain component co-ordinating spaces, allowance must be made for toe space, and it is recommended that for those components requiring provision of toe space (e.g. beds with drawers under) this should be 100 mm in height and 50 mm in depth.

6 Component ranges

6.1 Within the ranges of co-ordinating sizes given in Table 1, particular sizes can be identified as being of greater significance in terms of dimensional co-ordination because of frequency of use, economic production or flexibility of assembly.

6.2 Table 1 also indicates the co-ordinating sizes which are intended as the restricted series for each component to cover the majority of the existing range of furniture dimensions and should form the nucleus of any range proposed for manufacture. All combinations of length, width, depth and height may be used.

6.3 Reference has been made in 4.3 to mathematical techniques that can assist in achieving flexibility for components, but it is also often possible to increase the flexibility of a limited range of components by the use of “infill” pieces or by “makeup” jointing techniques, and it is recommended that attention be paid to these methods when component sizes are considered (Figure 1).

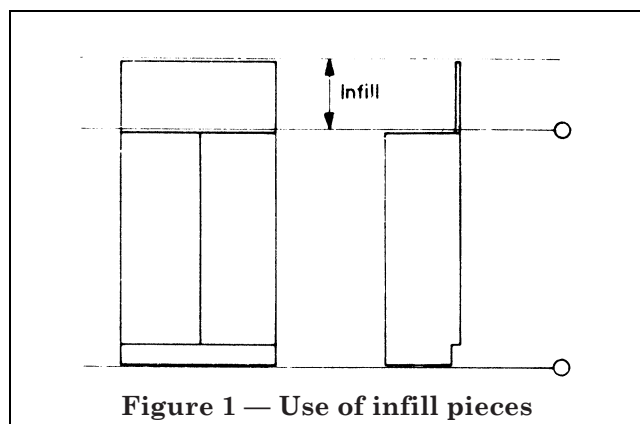


Figure 1 — Use of infill pieces

6.4 In selecting a range of sizes for a component it should be noted that the sizes given in Table 1 are the co-ordinating sizes. In some instances a situation may arise in which a built-in unit is placed on, or attached to, unfinished elements of the structure, and hence extends past the key reference plane which defines the finished surface of the floor, bulkhead, ceiling etc. The size of the component must therefore include this extra size in addition to the co-ordinating size (Figure 2).

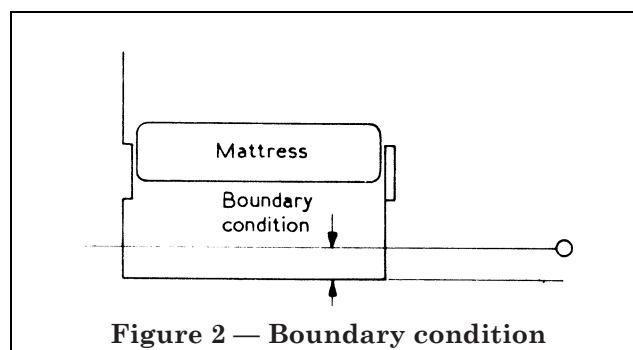


Figure 2 — Boundary condition

6.5 This situation, which may involve either an addition to or a subtraction from the co-ordinating size, is termed a boundary condition and where possible is identified in the tables of co-ordinating spaces and component ranges.

NOTE An example of a boundary condition is where built-in units are fitted to the deck before the flooring is laid.

7 Manufacturing sizes

7.1 Co-ordinating sizes include allowances for the joints between components and for the deviations involved in component manufacture, setting out and assembly. In order to ensure that all manufacturers produce compatible sizes capable of being assembled with standardized joint designs it is necessary to use an agreed procedure for determining work sizes and joint clearances. A recommended procedure has been established for the building industry in DD 22 and in view of the commonality of certain components it is proposed to adopt similar procedures for the shipbuilding industry and to recommend simplified methods for determining work sizes (see Figure 3).