

Tapers and other outboard details of propeller shafts —

**Part 2: Specification for shafts of
diameter greater than 160 mm up
to 1000 mm**

UDC 629.12.037.4:621.824

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Foreword

This Part of this British Standard has been prepared under the direction of the Shipbuilding and Marine Standards Committee.

BS MA 74-1:1976, formerly BS MA 74:1976, specifies details of the taper, key and keyway, and external thread of propeller shafts for shaft diameters from 16 mm to 160 mm. This Part of BS MA 74 extends the range of shafts up to 1 000 mm diameter.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 10 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.

Amendments issued since publication

Amd. No.	Date of issue	Comments

This British Standard, having been prepared under the direction of the Shipbuilding and Marine Standards Committee, was published under the authority of the Executive Board and comes into effect on 31 December 1980

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The following BSI references relate to the work on this standard:
Committee reference SME/10
Draft for comment 79/73204

ISBN 0 580 11731 6

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

1 Scope

This Part of this British Standard specifies requirements for the tapered end of ships' propeller shafts, the key and keyway, and the external thread for the propeller securing nut for propeller shafts of diameter greater than 160 mm up to 1 000 mm.

It is applicable to propeller shafts for keyed and keyless propellers with tapers of 1 : 12 and 1 : 20 respectively. Parallel shafts or shafts for flange mounted propellers are excluded.

NOTE Propeller shafts from 16 mm to 160 mm diameter are the subject of BS MA 74-1.

2 References

This Part of the standard makes reference to the following standards publications.

BS 29, *Specification for carbon steel forgings above 150 mm ruling section*.

BS 970, *Wrought steels in the form of blooms, billets, bars and forgings — Part 1: Carbon and carbon manganese steels including free cutting steels*.

BS 1134, *Method for the assessment of surface texture — Part 1: Method and instrumentation — Part 2: General information and guidance*.

BS 3643, *ISO metric screw threads — Part 2: Limits and tolerances for coarse pitch series threads — Part 3: Limits and tolerances for fine pitch threads (constant pitch series)*.

BS 3692, *ISO metric precision hexagon bolts, screws and nuts*.

BS 4360, *Specification for weldable structural steels*.

BS 4500, *ISO limits and fits*.

BS 4670, *Alloy steel forgings*.

BS MA 74, *Tapers and other outboard details of propeller shafts — Part 1: Specification for shafts of diameter from 16 mm to 160 mm*.

ISO 68, *ISO general purpose screw threads — Basic profile*.

ISO 2901-4, *ISO metric trapezoidal screw threads — Basic profile and maximum material profiles*.

3 Propeller shaft diameters and taper

3.1 Shaft diameter. The design diameter of the propeller shaft shall be the uniform diameter measured at the top of the taper (see Figure 1). The diameter shall be determined in accordance with the rules of the appropriate Regulatory Body.

3.2 Taper. The tapered length of the propeller shaft that mates with the propeller bore shall have a taper, as follows:

- a) for keyed propellers, taper 1 : 12 on the diameter;
- b) for keyless propellers, taper 1 : 20 on the diameter.

4 Keys and keyways

4.1 A sled runner key shall be fitted. The length of the key shall be such that the effective sectional area of the key, in shear, shall comply with the rules of the appropriate Regulatory Body. Sectional dimensions of keys are given in Figure 2, for incremental increases of 50 mm in the range of shaft diameters.

NOTE For keyed propellers, the ratio of the shaft diameter (at the top of the taper) to the key width is nominally 4 : 1. The ratio of the key width to the key thickness is nominally 2 : 1.

4.2 The keyway in the shaft shall be machined to a constant depth from the surface of the taper measured along the centreline of the keyway. The depth of the keyway at the side, measured at the mid-length of the keyway, shall be half the thickness of the key (see Figure 3 for keyway details).

The length of the keyway depends upon that of the key.

NOTE The depth of the keyway at the sides will not be constant over the length of the keyway because of the change of section of the shaft along the cone.

4.3 The key and keyway shall be machined as a matched fit to provide an interference fit of h7/P9 in accordance with the limits of tolerance given in the table in Figure 2 which are taken from BS 4500.

5 Materials

The material for propeller shaft forgings shall be in accordance with the rules of the appropriate Regulatory Body.

Table 1 — Material specification

Component	Material	Specification		Tensile strength N/mm ²
		BS No.	Designation	
Propeller key	Carbon steel	BS 970-1	070M20	400 minimum
Propeller nut				
Securing screws for key	Steel	—	—	392 minimum
Locking plate for nut		BS 4360	grade 43A (see note)	430
Bolts for locking plate		BS 3692	grade 8.8	785 minimum

NOTE Shipbuilding quality steel plate may be used provided it has equivalent mechanical properties.