

Centre for Basic, Thermal and Length Metrology  
National Physical Laboratory

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**MOY/SCMI/60**

**SPECIFICATION OF ACCURACY FOR VEE  
PIECES FOR EXTERNAL SCREW THREAD  
MEASUREMENT**

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*Hardened steel vee pieces, for use in the measurement of the minor diameter of external screw threads, made to NPL Sketch No. 617.*

**Note:**

*Issue 5 2001 was previously issued with the incorrect heading Issue 4 2001 due to a typographical error. This mistake has now been corrected. This issue is in all other respects the same that marked Issue 4 2001.*

## FOREWORD

In the 1940s and 1950s, NPL was involved in drafting a special series of Specifications of Accuracy that covered a wide range of precision measuring apparatus. This series has been built on first hand experience gained in the design and construction of prototype measuring equipment at NPL and in the design and calibration of measuring equipment of British and foreign manufacture. Each specification in the series originally conformed to a general pattern and was allocated a permanent serial number which, in addition to its title, serves as its identity.

The MOY/SCMI (Metrology/Specification Certification Measuring Instruments) standards are complementary to the Standards issued by the British Standards Institute (BSI). The majority relate to measurement equipment of a proprietary kind designed either at NPL or by British manufacturers which, in the ordinary way, would not fall within BSI's terms of reference. In some cases, in which the equipment is of a more general nature, the Specification has provided a useful basis for formulating a British Standard. The specifications are to enable manufacturers to base their inspection on mutually agreed specifications of accuracy both in workmanship and performance.

MOY/SCMI/60 has been updated as part of a project financed by the DTI (MPU 8/61.3) concerned with Good Practice Guides and Equipment Specifications.

## SCOPE

Hardened steel vee pieces, for use in the measurement of the minor diameter of screw threads, made to NPL Sketch No. 617.

CONTENTS

	Page
1 GENERAL .....	3
2 SIZE AND ACCURACY.....	3
3 SKETCH .....	4
4 UNCERTAINTIES .....	5
5 REPORTING OF COMPLIANCE .....	5

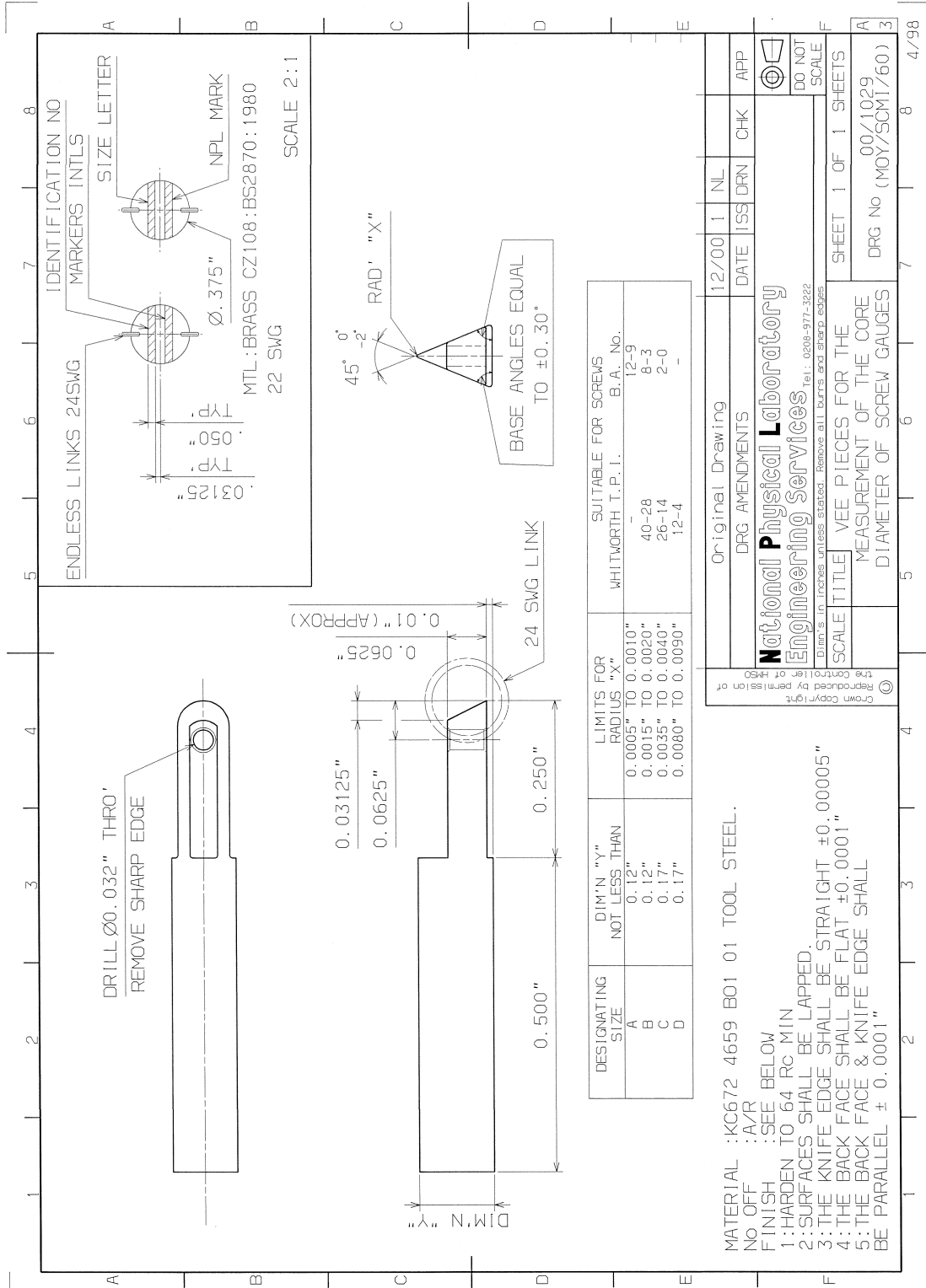
## **1 GENERAL**

- 1.1 The general dimensions shall be as shown in sketch 617 at Section 3.
- 1.2 The vee pieces shall be hardened and, when finished, shall have a hardness of not less than **800 HV**, when tested in accordance with BS EN ISO 6507-1:1998.
- 1.3 The surfaces shall have a lapped finish and shall be free from any blemishes such as scratches, pits, burrs and rust stains. All sharp corners shall be removed.
- 1.4 Each vee piece shall be identified as indicated in sketch 617 at Section 3.

## **2 SIZE AND ACCURACY**

- 2.1 The knife-edge shall be straight to within **0.001 2 mm**
- 2.2 The back face shall be flat to within **0.002 5 mm**
- 2.3 The back face and the knife-edge shall be parallel to within **0.002 5 mm**
- 2.4 The radius of the knife-edge shall lie within the limits stated in Column 3 of Table I.
- 2.5 The thickness of the vee pieces shall be as stated in Column 2 of Table I.
- 2.6 Where the vees are used in pairs, equality of thickness is not essential but when used in sets of three the thickness shall be equal to within **0.002 5 mm**.

3 SKETCH



## **4 UNCERTAINTIES**

- 4.1 It will normally be necessary to consider the uncertainty of measurement when ascertaining compliance (or non-compliance) with this specification. UKAS document M3003 '*Uncertainty and confidence in measurement*' gives guidance in Appendix J.

## **5 REPORTING OF COMPLIANCE**

- 5.1 Certain clauses in any specifications are necessary to support manufacture and assembly but may be difficult or unnecessary to check in subsequent checks for compliance with this specification. In certain cases checking a feature may require disassembly of the item, which may be undesirable. Although it is not essential that all clauses be checked on subsequent verification, it is important that those clauses omitted do not detract from the metrological value of the test. Where applicable, a performance check should always be carried out as this may allow indirect verification of those parameters that are not easily measured individually without disassembly.
- 5.2 When making statements of compliance or non-compliance, it is recommended that this specification and the relevant clauses within it be unambiguously identified in the calibration certificate or test report.

Example wording for a set of angle gauges follows.

This set of angle gauges has been examined for compliance with the accuracy requirements of clauses 2 and 3 of NPL Specification of Accuracy MOY/SCMI/18 (Issue 5), a copy of which is attached to this certificate.

For free measurement advice and information on other specifications in this series call the NPL Help line on 020 8943 6880

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The vee-pieces to which this specification relates are further described in Notes on Applied Science No. 1 '*Gauging and Measuring Screw Threads*' (Third Edition 1958) on pages 12 and 97. Table 25 on page 97 also gives suitability for B.S.C. and B.A. screws.

The standard reference temperature for industrial length measurements is defined in ISO 1:1975 *Standard reference temperature for industrial length measurements*.

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