

Specification for

Rack type gear cutters, metric module

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Gauge and Toolmakers' Association	Navy and Vickers Gearing Research Association
Milling Cutter and Reamers' Association	North East Coast Institution of Engineers and Shipbuilders
National Federation of Engineers' Tool Manufacturers	

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Foreword

This British Standard has been prepared under the authority of the Mechanical Engineering Standards Committee and is one of a number dealing with gear cutting tools.

This edition is a revision of BS 2697:1956 but in accordance with the UK policy of metrication, diametral pitch cutters have been replaced with metric module cutters.

It was not considered practicable to include dimensions of backplates in this standard. But if these are ordered it is essential to state the thickness of backplate required and also the cutter type as the latter determines the depth of the backplate.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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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, an inside back cover 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.

1 Scope

This British Standard specifies certain dimensions and accuracy requirements for non-topping finishing rack type gear cutters in the range 1–40 metric module inclusive, which are used in gear planing machines intended for the generation of spur and single helical gears having an involute form.

It does not relate to cutters for double helical gears. One accuracy test also relates to backplates.

These cutters are intended for use in the production of metric module gears with a 20° pressure angle and which comply with the requirements of ISO 53 and ISO/R54 and BS 436-2. This British Standard 2697 includes two additional modules, 3.25 and 3.75.

This standard specifies two grades of tolerance for cutters, grade A and grade B.

The following types of cutter are covered by this standard:

Rectangular mounted cutters.

Inclined mounted cutters.

Inclined mounted parallelogram cutters.

Details of information to be marked on cutters and information which is recommended to be given when ordering cutters are included.

2 References

The titles of the publications referred to in this standard are listed on the inside back cover.

3 Terminology

For the purposes of this British Standard the following terms apply.

3.1

rectangular mounted cutter

this is a cutter which is mounted in the cutter box at right angles to the direction of cut (see Figure 2)

3.2

inclined mounted cutter (often called Maag type)

this is a cutter which is mounted in the cutter box inclined at an angle of 6½° to a plane at right angles to the direction of cut (see Figure 3)

3.3

inclined mounted parallelogram cutter

this is a cutter which is mounted in a tool holder at an angle of 3°. It has the additional feature that the bottom datum face is ground parallel to the top face, i.e. at an angle equal to the cutter top clearance angle

the advantage of this type of tool is that it may be re-sharpened and then replaced in the tool-holder without the need for making subsequent adjustments to the machine set-up. These cutters are sharpened on the full face i.e. front datum face [see Figure 1(d) and Figure 4]

3.4

general

the general terms and notations used, common to gears and gear making tools, are taken from BS 2519¹⁾

Figure 1 illustrates the terminology applied to typical cutters

4 Tooth form

Rack type cutters shall have teeth of such a form that they will be capable of generating gear teeth corresponding to the British Standard basic rack tooth profile given in BS 436-2.

The basic rack may be modified to the extent of the modifications shown in Figure 5. This aspect is subject to agreement between the customer and the manufacturer.

5 Dimensions

5.1 General. Dimensions of cutters shall comply with those given in Table 1 and Table 2 as appropriate.

Cutters are also manufactured and used outside the ranges of pitches and dimensions indicated for each type but these are not covered by this standard. However, by agreement between the purchaser and the manufacturer, essential features of this standard e.g. tolerances, may be applied to such other designs.

5.2 Position of first tooth. This shall comply with the dimensions given in Table 3.

6 Accuracy requirements

Cutters shall comply with the values given in Table 4.

Backing plates shall comply with Table 4 test 1, otherwise backing plates have not been toleranced specifically and they can therefore be regarded generally as having open dimensions but they shall not cause interference with the function of the cutter when in use.

¹⁾ Under revision.