

Specification for

Single point cutting tools —

Part 3: Butt-welded cutting tools and
blanks

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	Water-tube Boilermakers' Association

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

High Speed Steel Tool Bit Association	Welding Manufacturers' Association
Welded Tool Manufacturers' Association	

This British Standard, having been prepared under the direction of the Mechanical Engineering Standards Committee, was published under the authority of the Executive Board on 30 December 1977

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Foreword

First published in 1946 as BS 1296, this standard was first revised in 1961. A further revision was carried out in 1972, when it was issued as BS 1296-3, to cover the changeover to the metric system of measurement. This latest edition has been prepared under the direction of the Mechanical Engineering Standards Committee to take account of recent trends in the manufacture and usage of this type of cutting tool.

This revision provides for a further rationalization of the general purpose range of tools and also of those for special applications that were depicted in schedule E of the previous edition. It means the elimination of a further 12 shapes of tool from the former general purpose range where it is felt that alternative shapes are readily available or can, with suitable modification in the workshop, be made available for the application required. A further five shapes of tool have been eliminated from the former range of tools for special applications (former schedule E) and modifications have been made to the one remaining shape in this category, which is now embodied in the general range of shapes available.

The opportunity has been taken to reorganize the layout of the standard so that users can select from shank dimensions that are readily available for each tool shape. This has been accomplished by the provision of tables for each tool shape. The tables indicate those tools that are considered “preferred” or “non-preferred” for that particular shape. Those shank sections that are shown in parentheses in the respective tables of dimensions (i.e. 20×16 , 25×20 and 50×40) are deemed “non-preferred” in BS 1296-1 but, owing to their extensive requirement in industry for use on existing machinery, they are included in many cases as “preferred” for certain shapes of tool.

Tolerances on shank dimensions are included in this standard. Part 1 of this standard deals with shank sections in metric units; Part 2 covers tool nomenclature based on the normal rake system which has been used in the illustrations in this standard. However, for the purpose of specifying the shapes of butt-welded tools manufactured in accordance with this standard, all of which are hand ground, the rake angles illustrated in some cases are only approximately equal to the normal rake. Nevertheless, these angles are adequately specified within the standard.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, 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 Part of BS 1296 specifies requirements for the shape of the cutting ends and the shank dimensions of lathe, shaper and planer tools and blanks comprising a high speed steel cutting part butt-welded to a medium carbon steel shank.

2 References

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

3 Terms and definitions

For the purposes of this Part of BS 1296 the terms and definitions given in Part 2 apply.

4 Tool shapes

The shapes of the tools shall be as shown diagrammatically in this standard.

NOTE The diagrams illustrate the general shape of the cutting part of the tool, and details such as the amount of offset of bent and cranked tools and the cutting lengths and widths of parting and recessing tools should be regarded as approximate.

5 Tool sizes and size/shape combinations

5.1 Shank dimensions and overall lengths.

Shank dimensions and overall lengths shall be as given in the respective tables, shown below the relevant tool shape.

5.2 Size/shape combinations. The relative tables indicate those size/shape combinations that shall be deemed “preferred” or “non-preferred”.

6 Rake angle

Rake angles shall be as indicated on the diagrams, unless otherwise agreed between the purchaser and the supplier.

7 Reference numbers

For convenience, each tool shape illustrated has been given a reference number. These numbers, whilst not being consecutive, are those by which the tool has been readily recognized in the past. The appropriate reference number shall be used in designating the tool shape.

8 Tolerances on dimensions of height and width of shank section

The tolerances relating to the dimensions of shank sections (for butt-welded tools) shall be as specified in Part 1 of this standard for unmachined shanks (namely the normal rolling or forging tolerance before finishing the bottom face), but for guidance purposes the following tolerances are recommended.

Shank section	Tolerance
mm	mm
Up to 20	+ 0.5, – 1.0
Over 20 to 40	+ 0.5, – 1.5
Over 40	+ 0.5, – 2.0

When shank sections to finer limits are required, the permissible tolerances shall be as agreed between the purchaser and the manufacturer.

9 Supplied condition

The base of each tool shall be flat and the cutting part shall be supplied ground.

10 Shank section

The designations *H* and *W* have been used throughout this standard to denote tool height and tool width, respectively, but these are shown as *h* and *b* in BS 1296-1:1970.

The shank sections shown in parentheses in the tables are non-preferred according to BS 1296-1 (see also foreword, paragraph 3).

IMPORTANT NOTE. High speed steel butt-welded tools should be dry ground, using a free-cutting grinding wheel and care should be taken not to cause excessive heat. It is also strongly emphasized that, during initial grinding and reservicing, tools should not be periodically quenched in water, as rapid temperature changes may produce small cracks along the cutting edge or adjacent to the weld, which could lead to early failure of the tool.

Eye protection should be used whenever high speed steel butt-welded tools are ground.

Grinding has also to be performed under conditions that ensure that the operator is not exposed to dust to an extent that would be deleterious to health.

Adequate dust extraction is required and conventional precautions relating to the operation of safe grinding should be strictly observed.

Attention is also drawn to the Health and Safety at Work, etc., Act, 1974.