

इंटरनेट

मानक

Disclosure to Promote the Right To Information

Whereas the Parliament of India has set out to provide a practical regime of right to information for citizens to secure access to information under the control of public authorities, in order to promote transparency and accountability in the working of every public authority, and whereas the attached publication of the Bureau of Indian Standards is of particular interest to the public, particularly disadvantaged communities and those engaged in the pursuit of education and knowledge, the attached public safety standard is made available to promote the timely dissemination of this information in an accurate manner to the public.

“जानने का अधिकार, जीने का अधिकार”

Mazdoor Kisan Shakti Sangathan

“The Right to Information, The Right to Live”

“पुराने को छोड़ नये के तरफ”

Jawaharlal Nehru

“Step Out From the Old to the New”

IS 3403 (1981): Dimensions for knurls [PGD 20: Engineering Standards]



“ज्ञान से एक नये भारत का निर्माण”

Satyanarayan Gangaram Pitroda

“Invent a New India Using Knowledge”



“ज्ञान एक ऐसा खजाना है जो कभी चुराया नहीं जा सकता है”

Bhartrhari—Nitiśatakam

“Knowledge is such a treasure which cannot be stolen”

BLANK PAGE





Indian Standard
DIMENSIONS FOR KNURLS
(First Revision)

1. Scope — Specifies the types and dimensions for knurls.

2. Types — Shall be of the following types:

Type RAA — Knurl with grooves parallel to axis

Type RBL — Left-hand knurl

Type RBR — Right-hand knurl

Type RGE — Left-hand/right-hand knurl, points raised

Type RGV — Left-hand/right-hand knurl, points indented

Type RKE — Cross-knurl, points raised

Type RKV — Cross-knurl, points indented.

2.1 Representation of Types

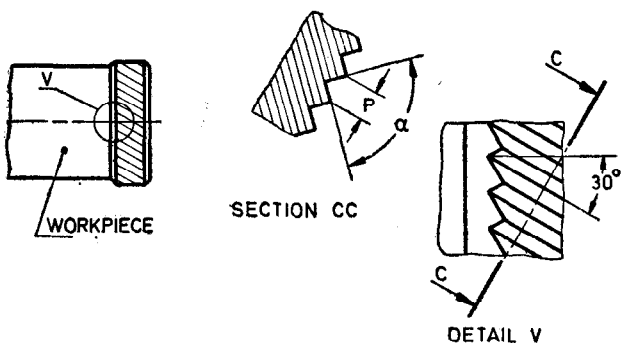
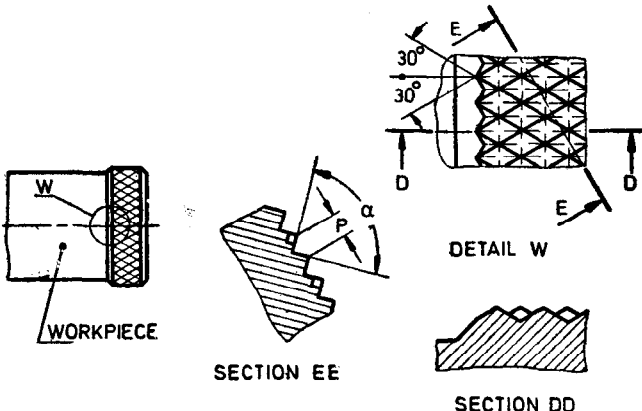
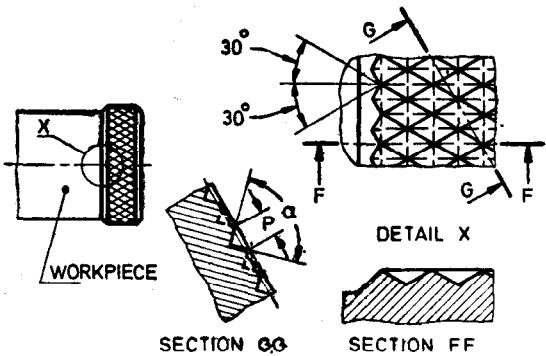
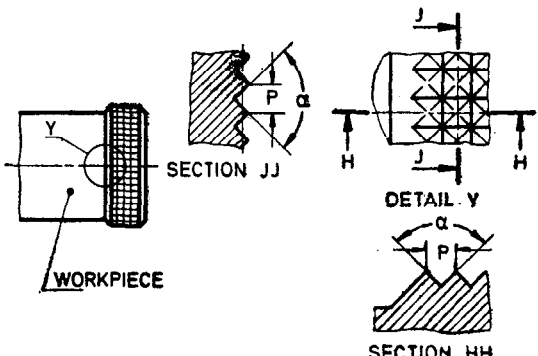
Type	Representation
RAA	<p>Knurling with grooves parallel to axis</p> <p>WORKPIECE SECTION AA DETAIL T</p>
RBL	<p>Left-hand knurling</p> <p>WORKPIECE SECTION BB DETAIL U</p>

Adopted 19 May 1981

© December 1981, ISI

Price Rs 8.00

INDIAN STANDARDS INSTITUTION
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

Type	Representation
RBR	<p>Right-hand knurling</p> 
RGE	<p>Left-hand/Right-hand knurling, points raised</p> 
RGV	<p>Left-hand/Right-hand knurling, points indented</p> 
RKE	<p>Cross-knurling, points raised</p> 

Type	Representation
RKV	<p>Cross-knurling, points indented</p>

3. Dimensions

3.1 *Profile Angle* — Profile angle $\alpha = 90^\circ$.

3.2 *Pitch* — P .

0.5, 0.6, 0.8, 1.0, 1.2, 1.6 mm.

3.3 *Nominal Diameter d_1* — The nominal diameter d_1 stated in the workshop drawing shall be the outside diameter of the finished knurl; this dimension is a function of the design.

3.4 *Initial Diameter d_2* — The initial diameter d_2 of the workpiece prior to knurling shall be smaller than the nominal diameter d_1 , because the initial diameter undergoes enlargement through displacement of the material during the knurling operation.

The initial diameter d_2 for knurls with profile angle $\alpha = 90^\circ$ can be calculated from the formulae in the following table, depending on the type of knurl and the size of pitch:

Type of knurl		Initial diameter d_2
RAA	Knurl with grooves parallel to axis	$d_1 - 0.5 P$
RBL	Left-hand knurl	
RBR	Right-hand knurl	
RGE	Left-hand/right-hand knurl, points raised	$d_1 - 0.67 P$
RGV	Left-hand/right-hand knurl, points indented	$d_1 - 0.33 P$
RKE	Cross-knurl, points raised	$d_1 - 0.67 P$
RKV	Cross-knurl, points indented	$d_1 - 0.33 P$

The factors in the formulae, however, do not take into account the rounding of the grooves resulting from the knurling operation or the specific properties of the materials to be knurled.

4. *Designation* — A cross-knurl, points indented (Type RKV) with pitch $P = 0.8$ mm and conforming to this standard shall be designated as:

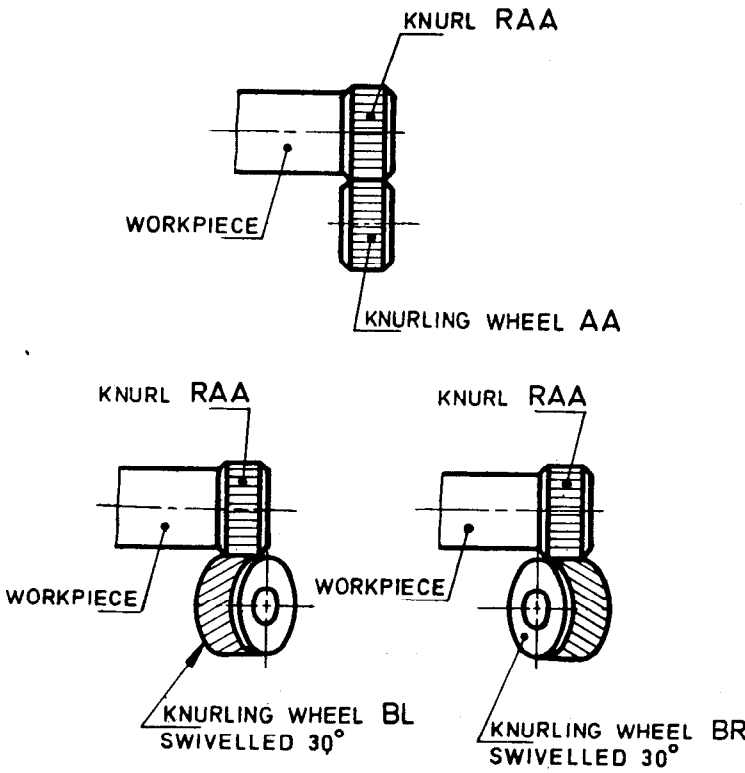
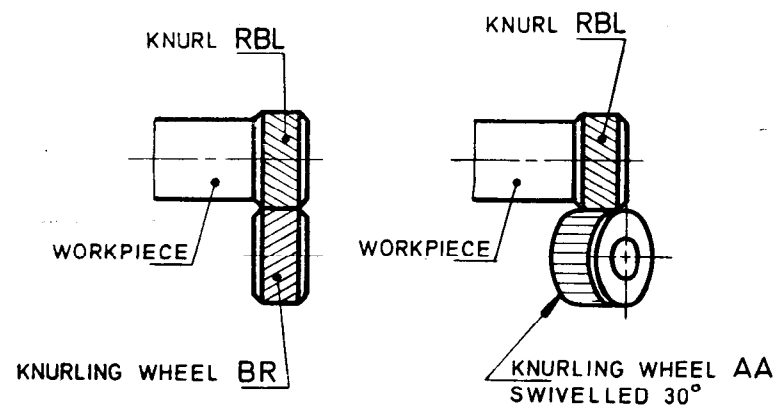
Knurl RKV 08 IS : 3403

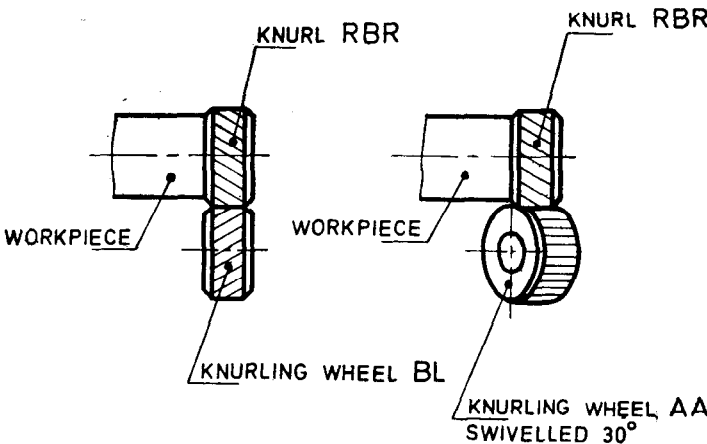
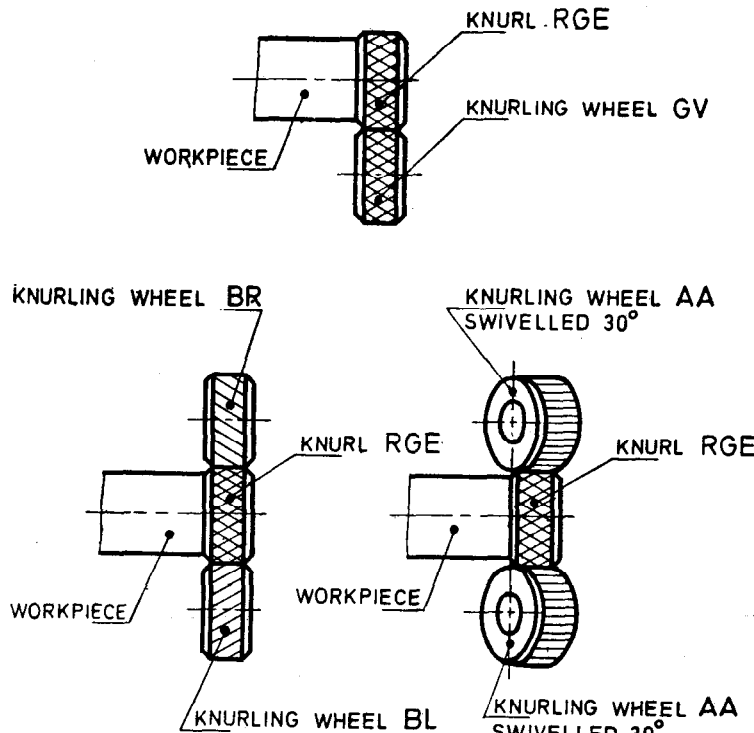
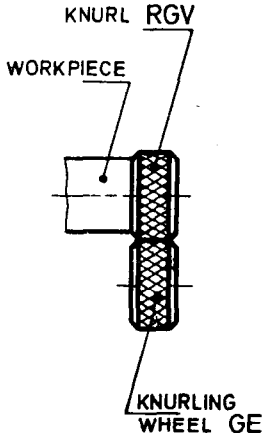
5. *Manufacture* — In order to facilitate the selection of knurling wheels according to IS : 6776-1980 'Specification for knurling wheels (first revision)', the manufacturing methods suitable for each type of knurl are indicated in Appendix A.

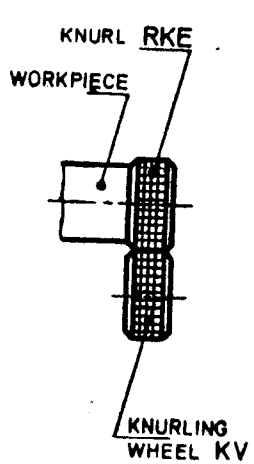
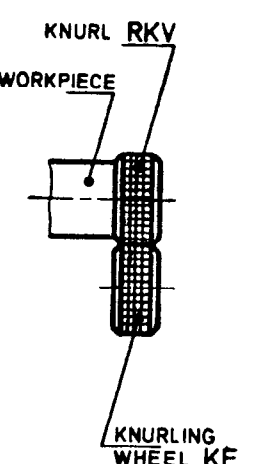
APPENDIX A

(Clause 5)

MANUFACTURING METHODS USING KNURLING WHEEL TO IS : 6776

Type	Manufacturing Method
RAA	<p>Knurl with grooves parallel to axis</p>  <p>KNURL RAA</p> <p>WORKPIECE</p> <p>KNURLING WHEEL AA</p> <p>KNURL RAA</p> <p>WORKPIECE</p> <p>KNURLING WHEEL BL SWIVELLED 30°</p> <p>KNURL RAA</p> <p>WORKPIECE</p> <p>KNURLING WHEEL BR SWIVELLED 30°</p>
RBL	<p>Left-hand knurl</p>  <p>KNURL RBL</p> <p>WORKPIECE</p> <p>KNURLING WHEEL BR</p> <p>KNURL RBL</p> <p>WORKPIECE</p> <p>KNURLING WHEEL AA SWIVELLED 30°</p>

Type	Manufacturing Method
RBR	<p>Right-hand knurl</p> 
RGE	<p>Left-hand/right-hand knurl, points raised</p> 
RGV	<p>Left-hand/right-hand knurl, points indented</p> 

Type	Manufacturing Method
RKE	<p>Cross-knurl, points raised</p>  <p>The diagram illustrates the manufacturing process for a raised cross-knurl (RKE). It shows a cylindrical workpiece being processed by a knurling wheel. The workpiece is labeled 'WORKPIECE' and the knurling wheel is labeled 'KNURLING WHEEL KV'. The resulting knurl pattern is labeled 'KNURL RKE'.</p>
RKV	<p>Cross-knurl, points indented</p>  <p>The diagram illustrates the manufacturing process for an indented cross-knurl (RKV). It shows a cylindrical workpiece being processed by a knurling wheel. The workpiece is labeled 'WORKPIECE' and the knurling wheel is labeled 'KNURLING WHEEL KE'. The resulting knurl pattern is labeled 'KNURL RKV'.</p>

EXPLANATORY NOTE

This standard was first issued in 1966. The present revision has been undertaken to take into consideration the latest changes in the corresponding foreign standards. In this revision, the standard nomenclature "knurl" has been adopted for all types, since the previous names "diamond knurling" and "negative diamond knurling" were not used consistently, and hence difficulties arose in the choice of tools. Some types of knurls have been given shorter names, such as left-hand knurl, right-hand knurl, left-hand/right-hand knurl.

The letter symbols assigned to the various types provide both for better differentiation and also yield a code designation for use in electronic data processing. The letter *R* differentiates the knurls from the knurling wheels (see IS : 6776-1980), the second letter *A*, *B*, *G* and *K* designates the basic type, whilst the third letter (*A* — Parallel to axis, *L* — left-hand, *R* — right-hand, *E* — raised, *V* — indented) marks the direction and form of the grooves.

The helix angle of Types BR, GE and GV is fixed at a standard value of 30° . The profile angle is normally $\alpha = 90^\circ$.

The pitch $P = 2$ mm has been discontinued because it is scarcely used in practice. Similarly, no attempt has been made to correlate pitch with workpiece diameter, since recommendations made earlier have not proved suitable in all fields of application and hence their adoption in actual practice has been limited.

Formulae for calculating the initial diameter of the workpiece as a function of the type of knurl and of the outside diameter of the finished knurl, which counts as the nominal diameter, are given. The results obtained are only reference values, however, since the specific properties of the materials have not been taken into account.

In the preparation of this standard, assistance has been derived from 'DIN 82-1973 Knurls' issued by Deutsches Institut für Normung.