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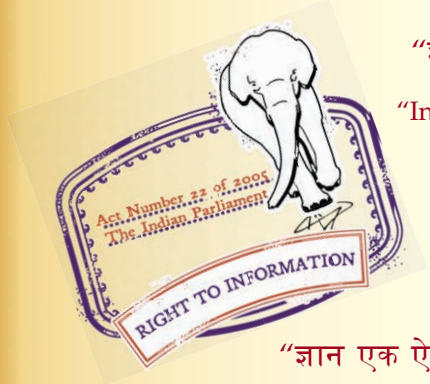
IS 5037-1 (2004): Straight bevel gears for general engineering and heavy engineering, Part 1: Basic rack [PGD 31: Bolts, Nuts and Fasteners Accessories]



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Bhartṛhari—Nītiśatakam
"Knowledge is such a treasure which cannot be stolen"

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IS 5037 (Part 1) : 2004
ISO 677 : 1976

भारतीय मानक

सामान्य तथा भारी इंजीनियरिंग के लिए सीधे बेवल गियर्स

भाग 1 आधार रेक

(पहला पुनरीक्षण)

Indian Standard

STRAIGHT BEVEL GEARS FOR GENERAL ENGINEERING AND HEAVY ENGINEERING

PART 1 BASIC RACK

(First Revision)

ICS 21.200

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

December 2004

Price Group 1

NATIONAL FOREWORD

This Indian Standard (Part 1) (First Revision) which is identical with ISO 677 : 1976 'Straight bevel gears for general engineering and heavy engineering — Basic rack' issued by the International Organization for Standardization (ISO) was adopted by the Bureau of Indian Standards on the recommendations of the Transmission Devices Sectional Committee and approval of the Medical Instruments, General and Production Engineering Division Council.

This standard was first published in 1969 and was based on ISO/R 677 : 1968 'Basic rack of straight bevel gears for general engineering and heavy engineering' and ISO/R 678 : 1968 'Modules and diametral pitch of straight bevel gears for general engineering and heavy engineering'. In order to harmonize the standard with latest version of ISO 677 and ISO 678 the committee decided to revise the standard and split it into two parts adopting latest version of ISO Standards. This standard has now been published in the following two parts:

IS 5037 (Part 1) : 2004 Straight bevel gears for general engineering and heavy engineering: Part 1 Basic rack

IS 5037 (Part 2) : 2004 Straight bevel gears for general engineering and heavy engineering: Part 2 Module and diametral pitches

The text of the ISO Standard has been approved as suitable for publication as an Indian Standard without deviations. Certain conventions are, however, not identical to those used in Indian Standards Attention is particularly drawn to the following:

a) Wherever the words 'International Standard' appear, referring to this standard, they should be read as 'Indian Standard', and

b) Comma (,) has been used as a decimal marker while in Indian Standards, the current practice is to use a point (.) as the decimal marker.

CROSS REFERENCE

In the adopted standard reference appears to the following International Standard for which Indian Standard also exists. The corresponding Indian Standard which is to be substituted in its place is listed below along with its degree of equivalence for the edition indicated:

International Standard	*Corresponding Indian Standard*	*Degree of Equivalence*
ISO 678 : 1976 Straight bevel gears for general engineering and heavy engineering — Part 2 : Module and diametral pitches	IS 5037 (Part 2) : 2004 Straight bevel gears for general engineering and heavy engineering: Part 2 Module and diametral pitches	Identical

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

STRAIGHT BEVEL GEARS FOR GENERAL ENGINEERING AND HEAVY ENGINEERING

PART 1 BASIC RACK

(First Revision)

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the dimensional characteristics of the basic rack of straight bevel gears, for general engineering and heavy engineering, having a constant bottom clearance. In these gear pairs the tip angle of one gear is equal to the difference between the designed shaft angle and the root angle of the mating gear.

2 DEFINITIONS

2.1 basic rack : Rack, the profile of which corresponds to a section of the tooth surface of a crown gear of infinitely large diameter on a plane at right angles to the tooth surfaces.

This profile is used as the basis of a system of bevel gears having straight teeth.

2.2 reference line : Straight line on the profile of the basic rack, with reference to which the tooth dimensions are specified.

3 PROFILE

Figure 1 represents the profile of the basic rack for gears of module $m = 1$ and of diametral pitch $P = 1$.

For a module or a diametral pitch differing from 1, the linear dimensions which are indicated have to be multiplied by this module or by the inverse of this diametral pitch.

The dimensional characteristics apply within the following limits[1] :

$$1 \leqslant m \leqslant 50$$
$$20 \geqslant P \geqslant 0{,}5$$

4 NOTES

4.1 The profile of the standard basic rack refers to bevel gears with involute teeth. This profile has substantially straight sides and the following characteristics :

- pressure angle 20°;
- height of tooth 2,20 m (dimensions in millimetres),

  or $\frac{2.20}{P}$ (dimensions in inches).

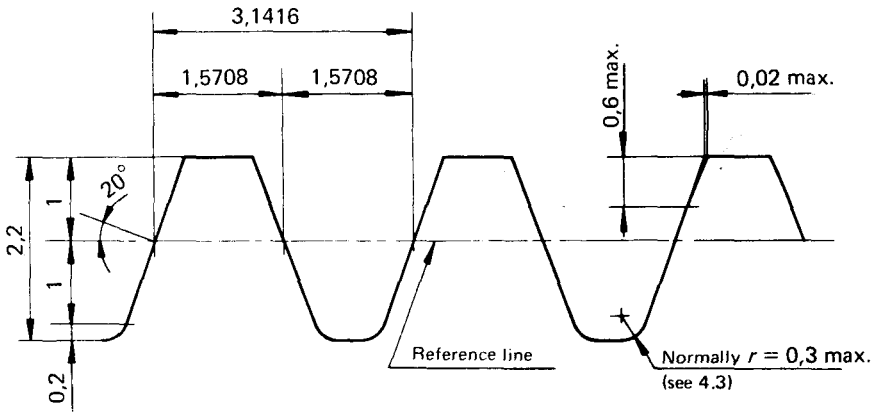

FIGURE 1 – **Profile of basic rack**

1) See ISO 678, *Straight bevel gears for general engineering and heavy engineering – Modules and diametral pitches.*

4.2 The tips of the teeth are at a distance from the reference line equal to the module, and the thickness of the tooth measured on this line equals the width of the space.

4.3 The value of the radius at the root of the tooth is normally fixed at 0,3 *m* maximum, keeping in mind that this radius should be as large as possible. In certain cases and as far as permitted by the conditions of meshing, this value may be exceeded up to a maximum of 0,35 *m*.

4.4 When it is desired to effect relief to the profile, this relief is applied, in principle, to the tips of the teeth.

4.5 In practice, the bevel tooth corresponding to the standard basic rack is that which is conjugate to a tooth of a crown gear with straight flanks. The tooth is constituted by the planes described by the cutting edge of the tool or of the two cutting tools. The radius of the crown wheel considered is equal to the length of the cone distance of the teeth which are to be cut. The profile of the cut tooth is a portion of an octoid.

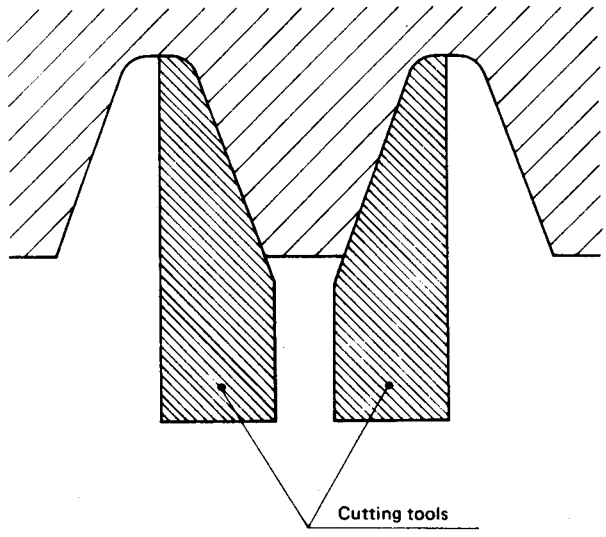

FIGURE 2 – **Relation between the basic rack and the cutting tools**

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This Indian Standard has been developed from Doc: No. MGP 30 (0346).

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

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