



## Straight bevel gears for general engineering and heavy engineering — Basic rack

*Engrenages coniques à denture droite de mécanique générale et de grosse mécanique — Crémaillère de référence*

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ISO 677:1976

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## FOREWORD

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO Member Bodies). The work of developing International Standards is carried out through ISO Technical Committees. Every Member Body interested in a subject for which a Technical Committee has been set up has the right to be represented on that Committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the Technical Committees are circulated to the Member Bodies for approval before their acceptance as International Standards by the ISO Council.

Prior to 1972, the results of the work of the Technical Committees were published as ISO Recommendations; these documents are now in the process of being transformed into International Standards. As part of this process, Technical Committee ISO/TC 60 has reviewed ISO Recommendation R 677 and found it technically suitable for transformation. International Standard ISO 677 therefore replaces ISO Recommendation R 677-1968 to which it is technically identical.

ISO Recommendation R 677 was approved by the Member Bodies of the following countries :

Australia	Germany	South Africa, Rep. of
Austria	Hungary	Spain
Belgium	India	Switzerland
Brazil	Israel	Turkey
Chile	Italy	United Kingdom
Czechoslovakia	Netherlands	U.S.S.R.
France	Poland	Yugoslavia

No Member Body expressed disapproval of the Recommendation.

The Member Body of the following country disapproved the transformation of ISO/R 677 into an International Standard :

Czechoslovakia

# Straight bevel gears for general engineering and heavy engineering — Basic rack

## 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<sup>1)</sup> :

$$1 \leq m \leq 50$$

$$20 \geq P \geq 0,5$$

## 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  $20^\circ$ ;
- height of tooth  $2,20 m$  (dimensions in millimetres),

$$\text{or } \frac{2,20}{P} \quad (\text{dimensions in inches}).$$

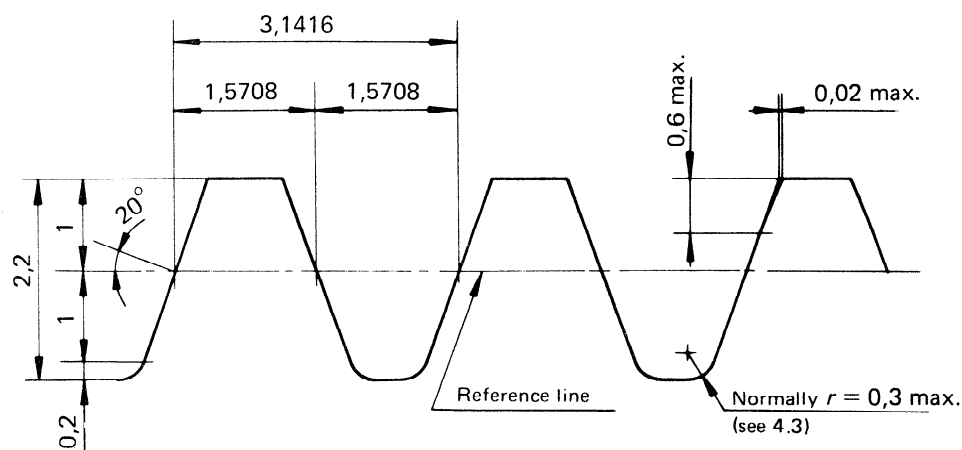


FIGURE 1 — Profile of basic rack

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  $0,3m$  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  $0,35m$ .

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.

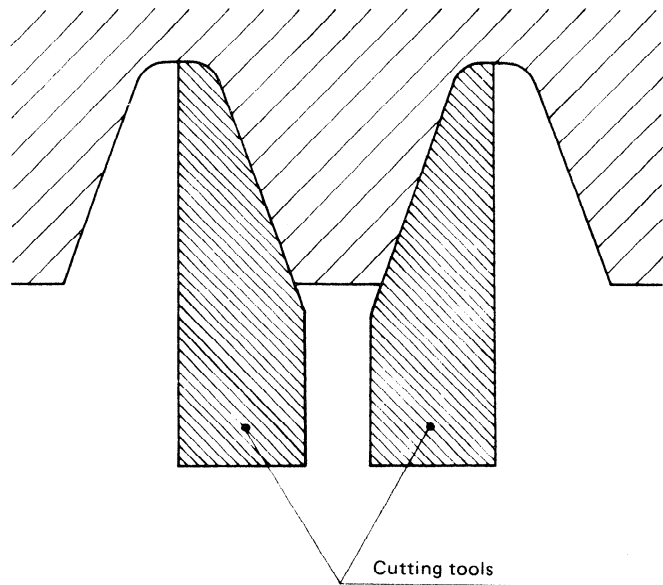


FIGURE 2 – Relation between the basic rack and the cutting tools

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