INTERNATIONAL STANDARD 522

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Special tolerances for reamers

Tolérances spéciales d'alésoirs

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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 29 has reviewed ISO Recommendation R 522 and found it technically suitable for transformation. International Standard ISO 522 therefore replaces ISO Recommendation R 522-1966 to which it is technically identical.

ISO Recommendation R 522 was approved by the Member Bodies of the following countries :

Australia	France	Poland
Austria	Germany	Portugal
Belgium	Hungary	Spain
Brazil	India	Sweden
Canada	Italy	Switzerland
Chile	Japan	United Kingdom
Colombia	Korea, Rep. of	U.S.S.R.
Czechoslovakia	Netherlands	Yugoslavia
Denmark	New Zealand	

The Member Body of the following country expressed disapproval of the Recommendation on technical grounds :

U.S.A.

The Member Body of the following country disapproved the transformation of ISO/R 522 into an International Standard :

Sweden

Printed in Switzerland

Special tolerances for reamers

1 SCOPE AND FIELD OF APPLICATION

This International Standard specifies the special tolerances to be applied to the diameter of the cutting portion of the hand and machine reamers covered by ISO/R 236, *Hand reamers and long fluted machine reamers, Morse taper shank*, and ISO/R 521, *Machine chucking reamers with parallel shanks or Morse taper shanks*, when a grade of accuracy other than the standard stock grade (with m6 tolerance) provided for in these ISO Recommendations is required.

2 DETERMINATION OF TOLERANCES

Unless otherwise specified in the order, reamers are made to the tolerance m6 (standard stock grade) and it is impossible to infer in advance what tolerances can be guaranteed on the holes produced with these tools.

The actual diameter of a hole produced by a given reamer depends in practice on very many factors. These factors include :

a) the type of material to be cut and the amount of material to be removed;

b) the cutting angle of the reamer;

c) the condition of the reamer at the time of use;

d) the method of mounting and operation;

e) the lubrication.

These different factors should be taken into account when determining the special tolerances to be called for on a reamer for the production of a hole *with a given tolerance*. It is thus impossible to establish, for this type of application, standard "special" tolerances likely to give guaranteed results under all conditions.

In order to obtain uniformity, however, it is recommended that the method shown below for determining the limits of tolerance on the reamer in relation to those of the hole to be produced should be adopted for special reamers wherever possible.

2.1 Rule for determining the limits of tolerances on reamers

For a given hole with IT tolerance :

– the high limit of the diameter of the reamer is equal to the maximum diameter of the hole, minus 0,15 IT.

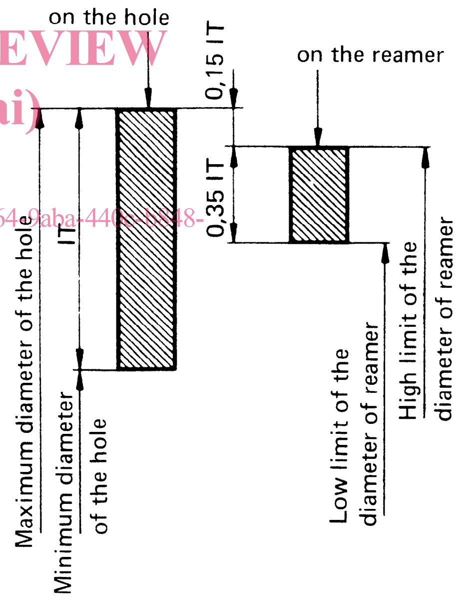
The value 0,15 IT should be rounded upwards to a whole multiple of 0,001 mm (or 0.000 1 in).

– the low limit of the diameter of the reamer is equal to its maximum diameter, minus 0,35 IT.

The value 0,35 IT should be rounded upwards to a whole multiple of 0,001 mm (or 0.000 1 in).

NOTE – For inch size reamers, the IT values are obtained by direct conversion from the metric IT values.

Tolerances



2.2 General remark

It is always possible to make reamers with greater precision than that provided for by this International Standard, while remaining within the limits specified above.

2.3 Examples

2.3.1 *For a 12* H7 *hole in millimetres*

IT7 = 0,018 mm

Hole sizes : max. 12,018 mm, min. 12,000 mm

The high limit of the diameter of the reamer is 0,15 IT below the maximum diameter of the hole :

$$0{,}15 \times 0{,}018 \text{ mm} = 0{,}002\ 7 \text{ mm}$$
which is rounded to 0,003 mm

High limit of the diameter of the reamer
= 12,018 mm − 0,003 mm = **12,015 mm**

The low limit of the diameter of the reamer is 0,35 IT below the high limit of the diameter of the reamer :

0,35 × 0,018 mm = 0,006 3 mm
which is rounded to 0,007 mm

Low limit of the diameter of the reamer
= 12,015 mm − 0,007 mm = **12,008 mm**

2.3.2 *For a 0,5* H7 *hole in inches*

IT7 = 0.000 7 in (direct conversion of 0,018 min)

Hole sizes : max. 0.500 7 in, min. 0.500 0 in

The high limit of the diameter of the reamer is 0,15 IT below the maximum diameter of the hole :

0.15 × 0.000 7 in = 0.000 10 in
which is rounded to 0.000 1 in

High limit of the diameter of the reamer
= 0.500 7 in − 0.000 1 in = **0.500 6 in**

The low limit of the diameter of the reamer is 0,35 IT below the high limit of the diameter of the reamer :

0.35 × 0.000 7 in = 0.000 24 in
which is rounded to 0.000 3 in

Low limit of the diameter of the reamer
= 0.500 6 in − 0.000 3 in = **0.500 3 in**