

INTERNATIONAL  
STANDARD

**ISO**  
**6157-2**

First edition  
1995-08-01

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**Fasteners — Surface discontinuities —**

**Part 2:**

Nuts

Sample Document

*Éléments de fixation — Défauts de surface —*

*Partie 2: Écrous*

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Reference number  
ISO 6157-2:1995(E)

## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established 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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 6157-2 was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 1, *Mechanical properties of fasteners*.

ISO 6157 consists of the following parts, under the general title *Fasteners — Surface discontinuities*:

- *Part 1: Bolts, screws and studs for general requirements*
- *Part 2: Nuts*
- *Part 3: Bolts, screws and studs for special requirements*

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International Organization for Standardization  
Case Postale 56 • CH-1211 Genève 20 • Switzerland

Printed in Switzerland

# Fasteners — Surface discontinuities —

## Part 2: Nuts

### 1 Scope

This part of ISO 6157 establishes limits for various types of surface discontinuities on nuts.

It applies to nuts with

- nominal thread diameters from 5 mm up to and including 39 mm;
- product grades A and B;
- all property classes according to ISO 898-2 and ISO 898-6, unless otherwise specified in product standards or agreed between supplier and purchaser.

### 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 6157. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 6157 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

ISO 468:1982, *Surface roughness — Parameters, their values and general rules for specifying requirements.*

ISO 898-2:1992, *Mechanical properties of fasteners — Part 2: Nuts with specified proof load values — Coarse thread.*

ISO 898-6:1994, *Mechanical properties of fasteners — Part 6: Nuts with specified proof load values — Fine pitch thread.*

ISO 2320:1983, *Prevailing torque type steel hexagon nuts — Mechanical and performance properties.*

ISO 3269:1988, *Fasteners — Acceptance inspection.*

ISO 10484:—<sup>1)</sup>, *Widening test on nuts.*

ISO 10485:1991, *Cone proof load test on nuts.*

1) To be published.

### 3 Types, causes, appearance and limits of surface discontinuities

Even if the permissible limits for surface discontinuities indicated in this clause occur, the minimum values for the mechanical and functional properties specified in ISO 898-2, ISO 898-6 and ISO 2320, as appropriate, shall still be met. In addition, the dimensional requirements of the appropriate product standard shall be satisfied.

NOTES

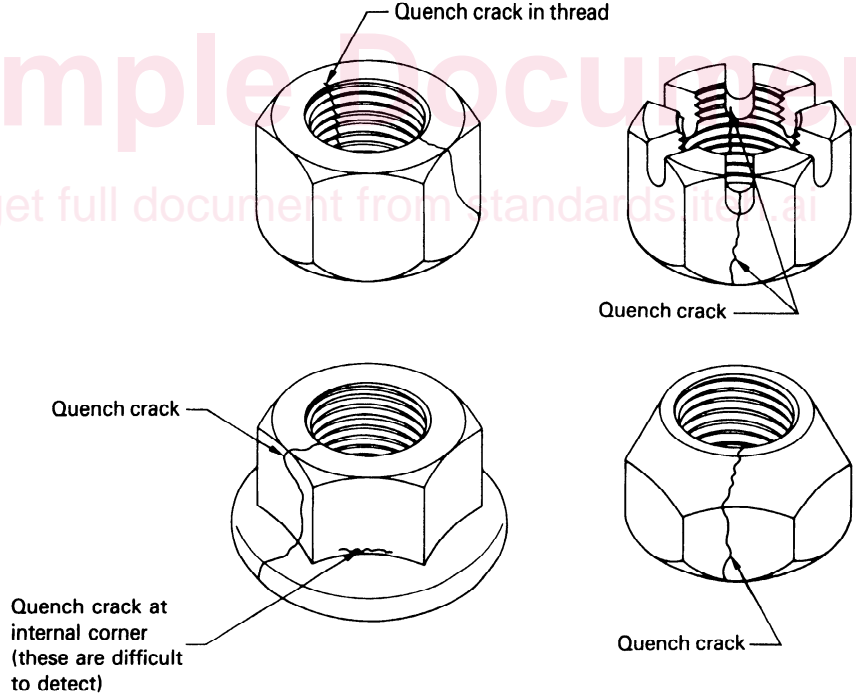
- 1 The figures in this clause are examples only; they also apply correspondingly to other types of nuts.
- 2 The individual figures show the surface discontinuities exaggerated in some cases for clarity.

#### 3.1 Cracks

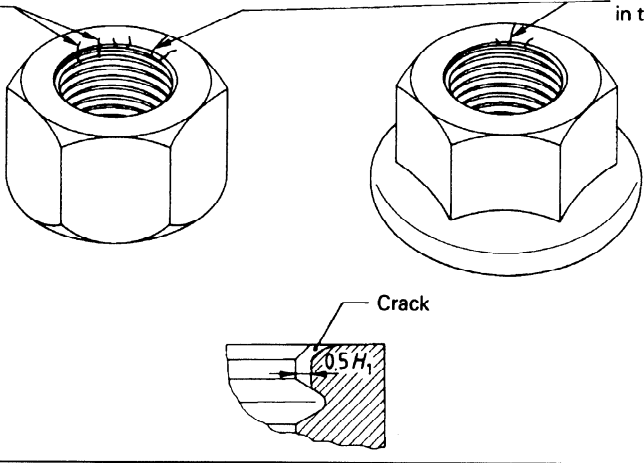
A crack is a clean (crystalline) fracture passing through or across the grain boundaries and may possibly follow inclusions of foreign elements. Cracks are normally caused by overstressing the metal during forging or other forming operations, or during heat treatment, or may have been present in the raw material.

Where parts are subjected to significant reheating, cracks are usually discoloured by scale.

##### 3.1.1 Quench cracks

<b>Cause</b>	Quench cracks may occur during hardening due to excessively high thermal and transformation stresses. Quench cracks usually follow an irregular and erratic course on the surface of the nut.
<b>Appearance</b>	 <p>The diagrams illustrate various quench crack locations on a nut:</p> <ul style="list-style-type: none"> <li><b>Quench crack in thread:</b> A crack running through the threads.</li> <li><b>Quench crack:</b> A crack on the outer surface of the nut.</li> <li><b>Quench crack at internal corner (these are difficult to detect):</b> A crack at the junction between the threads and the hexagonal body.</li> <li><b>Quench crack:</b> A crack on the side surface of the nut.</li> </ul>
<b>Limits</b>	Quench cracks of any depth, any length, or in any location shall not be permitted.

## 3.1.2 Forging cracks and inclusion cracks

<b>Cause</b>	<p>Forging cracks may occur during the cut-off or forging operations and are located only in the top and bottom face of the nuts or in the intersection of the face and flat.</p> <p>Inclusion cracks are caused by non-metallic inclusions inherent in the raw material.</p>
<b>Appearance</b>	<p>Cracks in top or bottom face, or in thread, caused by inclusions</p>  <p>Forging cracks in top or bottom face</p> <p>Crack</p> <p>0,5H<sub>1</sub></p>
<b>Limits</b>	<p>Cracks located in the top and bottom faces shall be permitted, provided that:</p> <ul style="list-style-type: none"> <li>— there are not more than two forging cracks which extend across the full width of the bearing face, neither of which shall exceed a depth of <math>0,05d</math>;</li> <li>— no crack extends into the tapped hole beyond the first full thread;</li> <li>— no crack in the first full thread exceeds a depth of <math>0,5H_1</math>;</li> </ul> <p>where</p> <p><math>d</math> is the nominal thread diameter;</p> <p><math>d_w</math> is the diameter of the bearing face;</p> <p><math>H_1</math> is the effective thread height</p> $H_1 = 0,541P$ <p>where <math>P</math> is the pitch of the thread;</p> <p><math>s</math> is the width across flats.</p> <p>In the case of nuts with a flange, cracks in the area between <math>s</math> and <math>d_w</math> shall not be permitted.</p>