

**Fasteners**

Technical delivery conditions  
Surface discontinuities on bolts and screws

**DIN**  
**267**  
Part 19

Mechanische Verbindungselemente; technische Lieferbedingungen,  
Oberflächenfehler an Schrauben

Supersedes September 1981 edition

*In keeping with current practice in standards published by the International Organization for Standardization (ISO), a comma has been used throughout as the decimal marker.*

See Explanatory notes for connection with the international standards work.

### 1 Field of application

This standard supplements DIN 267 Part 1 and Part 2, DIN ISO 898 Part 1 and DIN ISO 4759 Part 1. It specifies the rejection criteria for a variety of surface discontinuities on bolts and screws assigned to property classes as specified in DIN ISO 898 Part 1, for product grades A (design m) and B (design mg) and with nominal thread diameters from 3 up to and including 39 mm.

Note. Regarding the rejection criteria specified in clause 2 for surface discontinuities, the cumulative effects of discontinuities on one part shall not result in a drop below the minimum values for mechanical and functional properties given in DIN ISO 898 Part 1 or customarily attainable durability levels under vibrational loads.

The illustrations given in clause 2 are merely examples showing discontinuities in a somewhat exaggerated way for reasons of clarity. They shall apply to other kinds of bolts and screws analogously.

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**2 Types, causes, typical forms of surface discontinuities and rejection criteria**

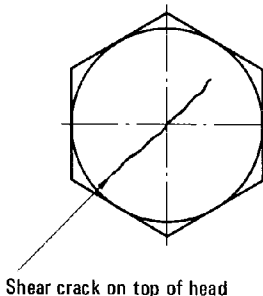
**2.1 Cracks**

A crack is a fracture passing through or across grain or crystalline boundaries and may also follow non-metallic inclusions. Cracks are normally caused by overstressing the material during cold or hot forming or during hardening. Where such parts are exposed to significant heating (e.g. tempering), cracked areas show discolorations or scale.

**2.1.1 Quench cracks**

Cause	<p>Quench cracks may occur during heat treatment due to thermal and transformation stresses. Quench cracks usually traverse an irregular course on the surface of the bolt or screw.</p>
Typical forms of surface discontinuities	<p>Quench crack, circumferential and adjacent to fillet</p> <p>Quench crack at corner of</p> <p>Transverse quench crack</p> <p>Longitudinal quench crack</p> <p>Section A-B</p> <p>Quench crack at root</p> <p>Quench crack, section at thread crest missing</p> <p>Quench crack across top of head, usually extending in shank or side of head</p> <p>Quench crack extending radially into fillet</p> <p>Quench crack across washer face traversing the entire washer face thickness</p> <p>Quench crack</p>
Rejection criteria	<p>Quench cracks, irrespective of depth or length, shall not be permitted at any location.</p>

## 2.1.2 Shear cracks (upset cracks)

Cause	Shear cracks (upset cracks) may occur during shearing or upsetting and are limited to the tops of bolt and screw heads.
Typical forms of surface discontinuities	 <p style="text-align: center;">Shear crack on top of head</p>
Rejection criteria	<p>Crack length: not exceeding <math>1 d</math>.</p> <p>Crack depth and width: not exceeding <math>0,04 d</math>.</p> <p>(<math>d</math> = nominal thread diameter)</p> <p>For calculated limiting values for shear cracks (upset cracks) on bolts and screws from 3 up to and including 39 mm nominal thread diameter, see table 1.</p> <p>The limiting values for shear cracks (upset cracks) shall not apply to hexagon head socket screws (see subclause 2.1.5).</p>