

Fasteners

Technical delivery conditions
Surface discontinuities on bolts and screws

DIN
267
Part 19

Mechanische Verbindungselemente; technische Lieferbedingungen,
Oberflächenfehler an Schrauben

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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.

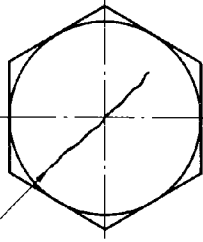
Note. Regarding the rejection criteria specified in clause 2 for surface discontinuities, the cumulative effects of discontinuities on one part shall not result in a drop below the minimum values for mechanical and functional properties given in DIN ISO 898 Part 1 or customarily attainable durability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

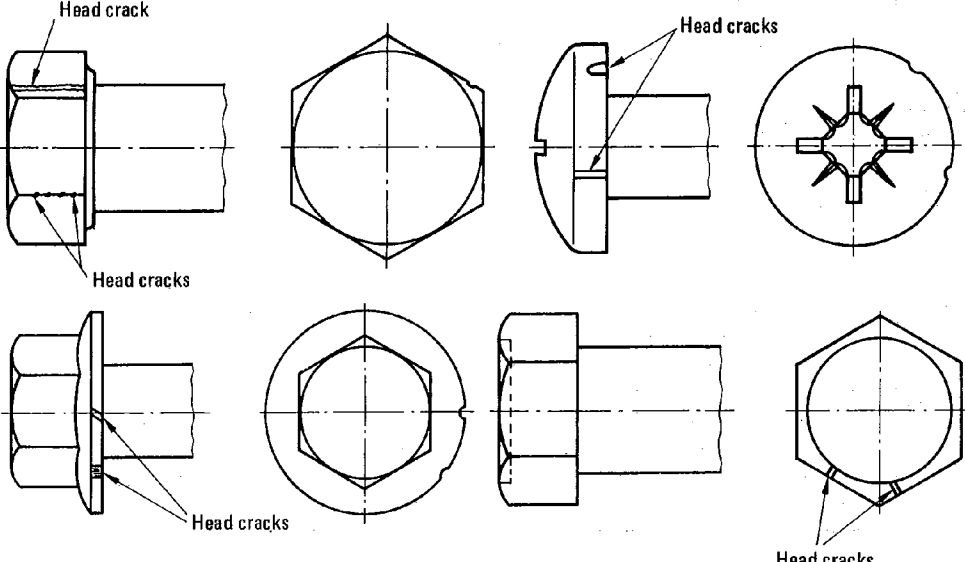
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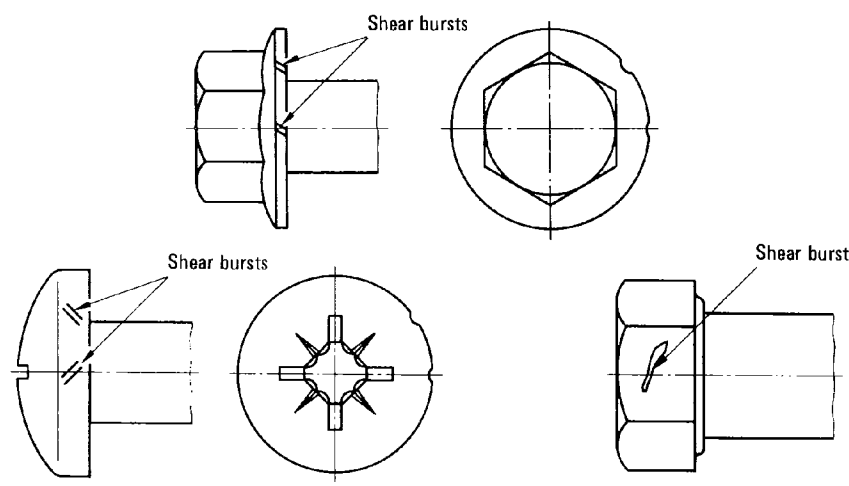
2.1.2 Shear cracks (upset cracks)

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	 Shear crack on top of head
Rejection criteria	Crack length: not exceeding $1 d$. Crack depth and width: not exceeding $0,04 d$. (d = nominal thread diameter) 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. The limiting values for shear cracks (upset cracks) shall not apply to hexagon head socket screws (see subclause 2.1.5).

2.1.3 Head cracks (forging cracks)

Cause	Head cracks (bursts) may occur for example during metal working on flats or corners of bolt heads, at the periphery of pan heads or round heads and at the edges of indented finish formed hexagon heads.
Typical forms of surface discontinuities	
Rejection criteria	Hexagon bolts and screws: No head cracks on the wrenching flats of hexagon bolts and screws shall extend into the chamfer circle on the top of the head or into the bearing surface. At hexagonal corners, head cracks shall not reduce the width across corners. Round head bolts: At the outer periphery of round head bolts, including flanged bolts, head cracks are permitted. Crack widths on hexagon and round head bolts: not exceeding $0,25 \text{ mm} + 0,02 s$ for wrenching flats; not exceeding $0,08 d_c$ or d_k for flanged bolts and round head bolts with one crack only; not exceeding $0,04 d_c$ or d_k where there are several cracks, one of which may reach $0,08 d_c$ or d_k in the case of flanged bolts and round head bolts. Crack depths for hexagon and round head bolts: not exceeding $0,04 d$; not exceeding $0,06 d$ for bolts with indented head, but not deeper than the indentation. In the above specifications d is the nominal thread diameter; d_c is the flange diameter; d_k is the head diameter; s is the width across flats. Hexagon socket head screws: For hexagon socket head screws, subclause 2.1.5 shall apply.

2.1.4 Shear bursts

Cause	Shear bursts may occur, for example, during metal working, frequently at the periphery of round heads and pan heads and are located at approximately 45° to the bolt and screw axes. Shear bursts may also occur at the sides of hexagon heads.
Typical forms of surface discontinuities	
Rejection criteria	Hexagon bolts and screws: No shear bursts on the wrenching flats of hexagon bolts and screws shall extend into the chamfer circle on the top of the head or into the underhead bearing surface. At hexagonal corners, shear bursts shall not reduce the width across corners. Round head bolts: Shear bursts are permitted at the periphery of round head bolts, including flanged bolts. Crack widths on hexagon and round head bolts: not exceeding 0,25 mm + 0,02 s for wrenching flats; not exceeding 0,08 d_c or d_k for flanged bolts and round head bolts with one crack only; not exceeding 0,04 d_c or d_k where there are several cracks, one of which may reach 0,08 d_c or d_k in the case of flanged bolts and round head bolts. Crack depths for hexagon and round head bolts: not exceeding 0,04 d; not exceeding 0,06 d for bolts with indented head, but not deeper than the indentation. In the above specifications d is the nominal thread diameter; d_c is the flange diameter; d_k is the head diameter; s is the width across flats. Hexagon socket head screws: For hexagon socket head screws, subclause 2.1.5 shall apply.