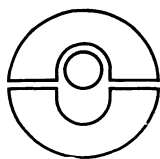


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**Permissible tolerances on dimensions
where no tolerances are shown
for stamped parts made of steel**



International Union of Railways



Documents

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OR

Leaflet to be classified in Volumes :

- V - Transport stock
- VI - Traction
- VIII - Technical specifications

Amendments

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This leaflet is :

- obligatory for all technical drawings, drawings in leaflets and other technical documents prepared in connection with the UIC and the ORE,
- recommendatory for the technical drawings of the Member-Railways of the Union

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OR**1 - Subject**

This leaflet sets out the permissible tolerances on dimensions where no tolerances are indicated for stamped parts made of steel.

2 - Sphere of application

This leaflet applies to stamped parts in the as-supplied state, which are hot dropped or press-forged from plain carbon steel or alloyed steel.

The tolerances apply to stamped parts up to a mass of 250 kg and a maximum length of 2 500 mm.

Tolerances for heavier or larger stamped parts as well as tolerances for stamped parts with very complicated forms must be mutually agreed by manufacturer and purchaser.

3 - Nominal dimensions, ranges of nominal dimensions

For the purpose of this leaflet the dimensions specified for a rough-finished stamped part are nominal dimensions or ranges of nominal dimensions.

4 - Dimensional tolerances

1-7-87 } Dimensional tolerances for stamped parts depend on the nominal dimensions, the mass of the part, the steel grade used and the shape coefficient of the parts. Therefore, the following data must be considered, before specifying tolerances for a drawing :

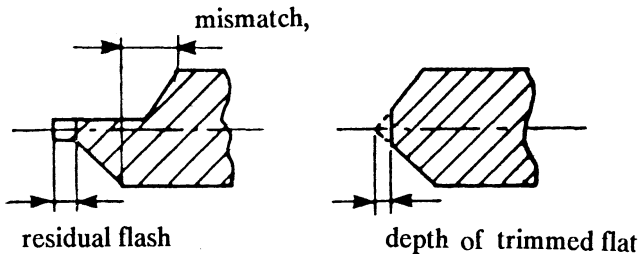
- the nominal dimensions, for which tolerances are to be specified,
- the mass,
- the orientation of the burring line,
- the material composition group M1 or M2 corresponding to the steel grade,
- 1-7-87 } - the shape coefficient, which expresses the influence of the form of the part.

Separate tolerances shall be set for the different types of dimension, for example :

- length, width, height and hole dimensions.

- thickness dimensions, i.e. dimensions crossing the burring line,
- mismatch,
- residual flash and trimmed flat,
- ejector marks,
- deviation from straightness and planeness,
- distance between centres

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5 - Quality of forging

This leaflet specifies tolerances for a quality of forging, which can be achieved with the usual forging tools and production methods.

Closer tolerances shall be set only for those dimensions, which require greater accuracy.

6 - Geometrical tolerances

The tolerances for the length, width, height and thickness dimensions set out in this leaflet relate not only to dimensional deviations, but also to the following geometrical deviations (form deviations) :

- circularity,
- cylindricity,
- parallelism,
- various deviations from a prescribed geometrical form,

but not to the deviations from straightness and planeness as referred to in point 10.3, or to the surface faults defined below, or to the surface roughness.

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The extent of the above-mentioned geometrical deviations must not exceed the limits set by the dimensional tolerances. In extreme cases the deviations may extend over the whole tolerance range, unless especially agreed by producer and customer.

Residual surface deviations with a maximum depth not exceeding half the value of the nominal machining tolerance are permitted for surfaces requiring further machining. Checking of dimensions relating to the depth of surface deviations or any other disputed point must be carried out with reference to the datum points for machining. Residual surface deviations for surfaces not requiring subsequent machining are permitted, provided their depth below or protrusion above the datum level does not exceed one-third of the value of the total thickness tolerance.

7 - INFORMATION REGARDING THE DETERMINATION OF THE TOLERANCES

So as to be able to determine the dimensional tolerances to be applied to a stamped part from the tables the following information is required in addition to the dimensions of the parts :

7.1 - Mass of the stamped part

It is calculated.

7.2 - Burring line

A distinction is made between plane, symmetrically bent and asymmetrically bent lines.

7.3 - Material composition, steel grade

The material composition group makes allowance for the fact that greater dimensional variations of the part and greater tool wear occurs, when forging steels with a high carbon or alloy content than with steels with a lower carbon or alloy content.

The characteristic values of the material composition are the carbon content and the sum of the alloy elements : manganese, chromium, nickel, molybdenum, vanadium and tungsten (1).

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- 1) In some countries this sum is replaced by an indication of the maximum proportions of the various alloys.