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INTERNATIONAL ORGANIZATION FOR STANDARDIZATION
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МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ

Steel — Hot-rolled ribbed and grooved flats for spring leaves — Tolerances and dimensions

Acier — Plats rainés laminés à chaud pour lames de ressorts — Dimensions et tolérances

Reference number
ISO 9442 : 1988 (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 approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 9442 was prepared by Technical Committee ISO/TC 17, *Steel.*

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Steel — Hot-rolled ribbed and grooved flats for spring leaves — Tolerances and dimensions

1 Scope

This International Standard applies to hot-rolled ribbed and grooved spring steel with the dimensions stated in table 1, of the steel grades listed in clause 4, which are preferably used for rail vehicle construction.

2 Normative reference

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

ISO 683-14 : 1973, *Heat-treated steels, alloy steels and free-cutting steels — Part 14 : Steels for hot-formed and heat-treated springs.*

3 Dimensions and tolerances on dimension and shape

For dimensions see table 1. For tolerances see table 2.

Dimensions in millimetres

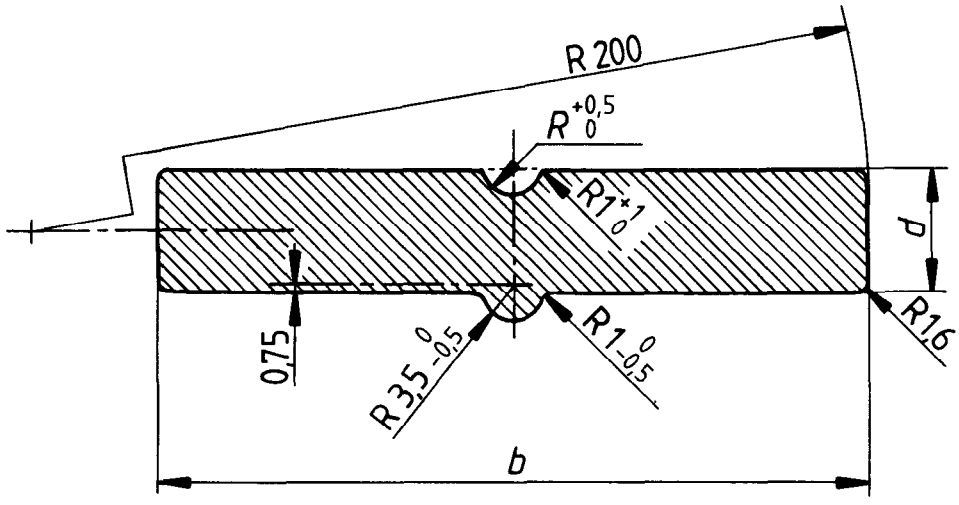


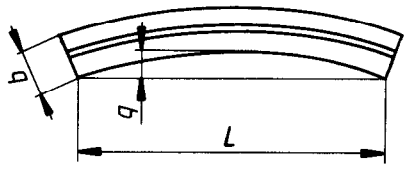
Table 1 — Dimensions

Thickness d	9	10	13	14	15	16	20
R	3,75	4,5					
Width b	Mass[1] in kg/m						
75					8,68		
90	6,32	6,91	**9,03**			**11,2**	
100		7,70	**10,1**		**11,6**	**12,4**	
120			**12,1**	**13,0**	**14,0**	**14,9**	**18,7**

1) Calculated using 7,85 kg/dm^3. Preference should be given to those flats for which the masses are shown in bold print.

Table 2 — Tolerances

Dimensions in millimetres

<table>
<tr><td></td><td colspan="3">Rolling tolerances</td></tr>
<tr><td>1</td><td colspan="3">Width b</td></tr>
<tr><td></td><td colspan="3">± 0,5</td></tr>
<tr><td>2</td><td colspan="3">Thickness d</td></tr>
<tr><td></td><td></td><td>Nominal dimensions</td><td>Tolerances</td></tr>
<tr><td></td><td></td><td>$d \leq 13$
$13 < d$</td><td>± 0,2
± 0,3</td></tr>
<tr><td>3</td><td colspan="3">Convexity</td></tr>
<tr><td></td><td colspan="3">0</td></tr>
<tr><td>4</td><td colspan="3">Concavity</td></tr>
<tr><td></td><td colspan="3">The faces can be slightly concave but the resultant total thickness shall be reduced by no more than the values below :</td></tr>
<tr><td></td><td></td><td>Nominal thickness of leaf</td><td>Reduction of thickness (difference between the thickness at the edge and the centre of the leaf)</td></tr>
<tr><td></td><td></td><td>$d \leq 10$
$10 < d$</td><td>$\leq 0,2$
$\leq 0,3$</td></tr>
<tr><td>5</td><td colspan="3">Lateral offset of the groove and the rib</td></tr>
<tr><td></td><td colspan="3">$\leq 0,3$</td></tr>
<tr><td>6</td><td colspan="3">Straightening defect q</td></tr>
<tr><td></td><td> 
</td><td colspan="2">Normal straightening : The deviation is measured over the total length L of the bar.
Tolerances in the plane of b
$q \leq 0,2$ % of L</td></tr>
</table>

4 Material

Hot-rolled ribbed and grooved spring steel according to this International Standard shall be produced from steel grades according to ISO 683-14, namely :

— preferably from 59 Si 7;

— in exceptional cases from 51 CrV 4.

The desired steel grade and the treatment condition shall be stated in the designation on order.

5 Mode of delivery

5.1 For the supply of hot-rolled ribbed and grooved spring steel, the types of length according to table 3 apply.

5.2 When ordered by weight, the length may vary between the maximum and minimum dimensions specified for the manufacturing length.

6 Testing

6.1 Extent of testing

If an acceptance test is agreed, the number of bars which shall be tested for accuracy to size by measurements at the manufacturer's works shall also be agreed when ordering.

6.2 Testing procedure

6.2.1 The thickness and width shall be measured at least 150 mm from the end of the bars when manufacturing lengths are supplied and at any point when fixed or exact lengths are supplied.

6.2.2 The thickness d shall be measured outside the area of the edge chamfer of the side faces.

Table 3 — Types of length and tolerances on length

Values in millimetres

Type of length	Length		Ordering data for the length
	Range[1]	Tolerance	
Manufacturing length[2]	3 000 to 8 000	See 5.2	None[2]
Fixed length	3 000 to 8 000	± 100[3]	Desired fixed length, mm
Exact length	3 000 to 8 000	± 50 ± 25 or ± 10[3]	Desired exact length and desired tolerance, mm

1) Enquiries should be made to the manufacturer as to whether shorter or greater lengths can be supplied.

2) Ribbed and grooved spring steel can also be supplied in limited manufacturing lengths with a length range to be stated when ordering. The span between the shortest and greatest length of this range shall be at least 2 000 mm (for example, 6 000 to 8 000).

3) When ordering, the total spans for the permissible deviations may, by agreement, be arranged entirely on the plus side, for example :

$+\begin{smallmatrix}200\\0\end{smallmatrix}$ mm (instead of ± 100 mm) in the case of fixed lengths, or

$+\begin{smallmatrix}50\\0\end{smallmatrix}$ mm (instead of ± 25 mm) in the case of exact lengths.

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Descriptors : steels, iron- and steel products, hot rolled products, flat bars, specifications, dimensions, tests, dimensional measurements.

Price based on 3 pages