
Disc springs —
Part 2:
Technical specifications

Ressorts à disques —

Partie 2: Spécifications techniques





COPYRIGHT PROTECTED DOCUMENT

© ISO 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

	Page
Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Symbols and units	2
5 Dimensions and designation	3
5.1 General	3
5.2 Disc spring groups	5
5.3 Dimensional series	5
6 Grade A — Basic performance requirements for static applications	5
6.1 Material	5
6.2 Manufacturing process	5
6.3 Permissible stresses	6
6.4 Presetting	6
6.5 Surface condition and corrosion protection	6
6.6 Tolerances	7
6.6.1 Thickness	7
6.6.2 External- internal diameter and coaxiality	7
6.6.3 Free height	8
6.6.4 Spring load	8
6.7 Clearance between disc spring and guiding element	8
6.8 Hardness	9
6.9 Appearance	9
7 Grade B — Requirements on disc springs for dynamic applications and high-performance static applications	9
7.1 Material	9
7.2 Manufacturing process	9
7.3 Permissible stresses	11
7.3.1 Static load	11
7.3.2 Dynamic loading	11
7.4 Shot peening	14
7.5 Presetting	14
7.6 Creep and relaxation	14
7.7 Surface condition and corrosion protection	16
7.8 Tolerances	17
7.8.1 Thickness	17
7.8.2 External-internal diameter and coaxiality	17
7.8.3 Free height	18
7.8.4 Spring load	18
7.9 Clearance between disc spring and guiding element	19
7.10 Hardness	19
7.11 Appearance	19
Annex A (informative) Spring dimensions	20
Annex B (informative) Testing	25
Annex C (normative) Representative material grades	28
Bibliography	29

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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 227, *Springs*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

A list of all parts in the ISO 19690 series can be found on the ISO website.

Disc springs —

Part 2: Technical specifications

1 Scope

This document specifies two different grades of disc springs.

Grade A defines basic requirements of disc springs for static applications with low and moderate performance. Springs manufactured according to Grade A are not used for dynamic applications.

Grade B defines requirements on disc springs especially used for dynamic applications and high performance static applications. Disc springs according to Grade B ensure a better quality by higher demands on manufacturing processes and tolerance requirements. Grade B includes graphs showing the guaranteed fatigue life such as a function of stress.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 683-1, *Heat-treatable steels, alloy steels and free-cutting steels — Part 1: Non-alloy steels for quenching and tempering*

ISO 683-2, *Heat-treatable steels, alloy steels and free-cutting steels — Part 2: Alloy steels for quenching and tempering*

ISO 6507 (all parts), *Metallic materials — Vickers hardness test*

ISO 6508 (all parts), *Metallic materials — Rockwell hardness test*

ISO 16249, *Springs — Symbols*

ISO 26909, *Springs — Vocabulary*

EN 1654, *Copper and copper alloys — Strip for springs and connectors*

EN 10083-1, *Quenched and tempered steels — Technical delivery conditions for special steels*

EN 10083-2, *Quenched and tempered steels — Technical delivery conditions for unalloyed quality steels*

EN 10083-3, *Quenched and tempered steels — Technical delivery conditions for boron steels*

EN 10089, *Hot-rolled steels for quenched and tempered springs — Technical delivery conditions*

EN 10132-4, *Cold-rolled narrow steel strip for heat treatment — Technical delivery conditions — Part 4: Spring steels and other applications*

EN 10151, *Stainless steel strip for springs — Technical delivery conditions*

JIS G 3311, *Cold-rolled special steel strip*

JIS G 4801, *Spring steels*