Cylindrical helical springs made from round wire and bar - Calculation and design - Part 1 : Compression springs

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NATIONAL FOREWORD

See Eesti standard EVS-EN 13906-1:2013 sisaldab Euroopa standardi EN 13906-1:2013 ingliskeelset teksti.	This Estonian standard EVS-EN 13906-1:2013 consists of the English text of the European standard EN 13906-1:2013.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 17.07.2013.	Date of Availability of the European standard is 17.07.2013.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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English Version

Cylindrical helical springs made from round wire and bar - Calculation and design - Part 1 : Compression springs

Ressorts hélicoïdaux cylindriques fabriqués à partir de fils ronds et de barres - Calcul et conception - Partie 1: Ressorts de compression

Zylindrische Schraubenfedern aus runden Drähten und Stäben - Berechnung und Konstruktion - Teil 1: Druckfedern

This European Standard was approved by CEN on 30 May 2013.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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Contents

Foreword

This document (EN 13906-1:2013) has been prepared by Technical Committee CEN/TC 407 “Project Committee - Cylindrical helical springs made from round wire and bar - Calculation and design”, the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by January 2014, and conflicting national standards shall be withdrawn at the latest by January 2014.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 13906-1:2002.

This European Standard has been prepared by the initiative of the Association of the European Spring Federation ESF.

This European Standard constitutes a revision of EN 13906-1:2002 for which it has been technically revised. The main modifications are listed below:

— updating of the normative references,

— technical corrections.

EN 13906 consists of the following parts, under the general title *Cylindrical helical springs made from round wire and bar — Calculation and design*:

— *Part 1: Compression springs;*

— *Part 2: Extension springs;*

— *Part 3: Torsion springs.*

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

Introduction

The revision of EN 13906 series have been initiated by the Association of the European Spring Federation – ESF – in order to correct the technical errors which are in the published standards and to improve them according to the state of the art. However, the revision of the figures is not take part of this work due to the lack of shared (mutual) data to update them. Nevertheless, the customers can have updated data from the manufacturers.

1 Scope

This European Standard specifies the calculation and design of cold and hot coiled cylindrical helical compression springs with a linear characteristic, made from round wire and bar of constant diameter with values according to Table 1, and in respect of which the principal loading is applied in the direction of the spring axis.

Table 1

Characteristic	Cold coiled compression spring	Hot coiled compression spring
Wire or bar diameter	$d \leq 20$ mm	8 mm $\leq d \leq$ 100 mm
Number of active coils	$n \geq 2$	$n \geq 3$
Spring index	$4 \leq w \leq 20$	$3 \leq w \leq 12$

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 10270-1, *Steel wire for mechanical springs — Part 1: Patented cold drawn unalloyed spring steel wire*

EN 10270-2, *Steel wire for mechanical springs — Part 2: Oil hardened and tempered spring steel wire*

EN 10270-3, *Steel wire for mechanical springs — Part 3: Stainless spring steel wire*

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

EN 12166, *Copper and copper alloys — Wire for general purposes*

EN ISO 2162-1:1996, *Technical product documentation — Springs — Part 1: Simplified representation (ISO 2162-1:1993)*

EN ISO 26909:2010, *Springs — Vocabulary (ISO 26909:2009)*

ISO 26910-1, *Springs — Shot peening — Part 1: General procedures*

3 Terms, definitions, symbols, units and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN ISO 26909:2010 and the following apply.

3.1.1
spring
mechanical device designed to store energy when deflected and to return the equivalent amount of energy when released

[SOURCE: EN ISO 26909:2010, 1.1]

3.1.2
compression spring
spring (1.1) that offers resistance to a compressive force applied axially

[SOURCE: EN ISO 26909:2010, 1.2]