***भारतीय मानक* IS 7906 (Part 3) : 2024**

***Indian Standard***

**कुंडलाकार संपीड़न कमानियां**

**भाग 3 वृताकार सेक्शन तार तथा छड़ों से बनी कमानियों के विनिर्देशन हेतु डेटा शीट**

*( पहला पुनरीक्षण )*

**Helical Compression Springs**

**Part 3 Data Sheet for Specifications for Springs Made from Circular Section
Wire and Bar**

*( First Revision )*

ICS 21.160

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###### **भारतीय मानक ब्यूरो**

BUREAU OF INDIAN STANDARDS

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Springs and Suspension Systems Sectional Committee**,** TED 34

Foreword

This Indian Standard was adopted by the Bureau of Indian Standards, after the draft finalized by the Springs and Suspension Systems Sectional Committee had been approved by the Transport Engineering Division Council.

This standard was first published in 1975 to specify data sheet for processing of orders and queries for the specification for compression springs covered by IS 7906 (Part 2) and IS 7906 (Part 5). This revision has been brought out in view of technological advancements which have taken place after publication of the standard. In this revision editorial corrections have been rectified and references have been made up to date.

This standard (Part 3) is one of a series dealing with helical compression springs:

|  |
| --- |
| Part 1 Design and calculation for springs made from circular section wire and bar |
| Part 2 Specification for cold coiled springs made from circular section wire and bar |
| Part 4 Selection of standard cold coiled springs made from circular section wire and bar |
| Part 5 Hot coiled springs made from circular section bars — Specification |
| Part 6 Design and calculations for springs made from rectangular section bar — Steel |
| Part 7 Quality requirements for cylindrical coil compression springs used mainly as vehicle suspension springs |
| Part 8 Method of inspection of hot coiled compression springs made from circular section bars |

The duplication of this data sheet is allowed. This Data Sheet is so designed that it can also be used as a factory drawing.

In the preparation of this standard considerable assistance has been derived from DIN 2099 Sheet 1 Helical springs made from circular section wire and bar, Specification for tension springs, issued by Deutschen lnstitut fur Normung (DIN).

The composition of the Committee responsible for the formulation of this standard is given at Annex A.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with
IS 2 : 2022 ‘Rules for rounding off numerical values (*second revision*)’. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

*Indian Standard*

HELICAL COMPRESSION SPRINGS

**PART 3 DATA SHEET FOR SPECIFICATIONS FOR SPRINGS MADE**

**FROM CIRCULAR SECTION WIRE AND BAR**

*( First Revision )*

**1** **SCOPE**

The standard covers the data sheet for processing of orders and queries for the specification for compression springs covered by IS 7906 (Part 2) and IS 7906 (Part 5).

**2 REFERENCES**

The following standards contain provisions which through reference in this text, constitute provision of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below:

|  |  |
| --- | --- |
| *IS No.* | *Title* |
| IS 7906  | Helical compression springs:  |
| (Part 1) : 1997 | Design and calculation for springs made from circular section wire and bar (*first revision*) |
| (Part 2) : 1975 | Specification for cold coiled springs made from circular section wire and bar |
| (Part 5) : 2004 | Part 5 hot coiled springs made from circular section bars — Specification (*second* *revision*) |

**3 PROCEDURE FOR USE OF DATA SHEET**

**3.1** It may not always be necessary to give all the data provided in the Data Sheet. Initially only those Parameters that are required for the use of spring may be given. The parameters that are not necessary for the working of spring can be bracketed. The bracketed parameters are not toleranced, for example, the spring rate SC.

**3.2** The data sheet can generally be used for all types of compression springs. If a separate drawing is attached to the data sheet, mention of the drawing shall be made in the item 13 of the data sheet. If different or additional dimensions are to be specified in special cases, this can be done in the diagram in the data sheet itself.

**3.3** The data on material and permissible shear-stress and on tolerances depend on type of production which is determined by the size of the spring.

**3.4** Compression springs made of wires of diameter up to 17 mm are generally cold-formed but with modern machines cold formed springs can be made above 17mm

**3.5** Compression springs made with bars of diameter more than 17 mm are generally hot-formed but springs made from wire and bar between 10 mm and 17 mm can also be hot-formed. For this manufacturer should be consulted for process, tolerances, etc. The process generally depends on the ‘load, function of the spring and the material.

**3.6** To allow economical manufacture of springs, the maximum possible tolerance according to IS 7906 (Part 2) shall be, specified for the coil diameter *DO*, *D1* or *Dm*, the unloaded length *LO* and axial loads *F1* to *Fm* and deviations el and e2. The complimentary adjustment for manufacturing as described in IS 7906 (Part 2) shall be applied.

**3.7** Indication shall be made whether the spring has to work with guides. For this purpose, the outer or inner diameter of guide shall be mentioned in the drawing. This is particularly important for compression springs which work in a guide, since even in block position of the spring there should still be a play the spring and the guide.



|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Fig. 1 Ends Closed O and Ground | Fig. 2 Ends Open O and Unground | Fig. 3 End Open O and Ground | Fig. 4 Ends Closed O and Unground | Fig. 5 Ends Tapered O Before Coiling Closed and Ground |

Give Only those particulars which are functionally important and cross the appropriate circles. Avoid redundant dimensioning. In the case of shear stress R, and the appropriate subscript s ­or k as per IS 7906 (Part 1) for reasons of economy the tolerances should be made as large as possible.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | Number of working coiltotal number of coil | if = ………ig = ……… |  | (10) |  | Tolerances according to  |
| IS 7906 (Part 2) | IS 7906 (Part 6) |
|  | Hand of coiling (Optional) | Right-Hand  |  | Do1),D11)(Dm1)) | ………………… | ………………… |
| Left-Hand |  | Lo | ………………… | ………………… |
|  | Chamfering of spring ends  |  Omitted Internally Width……… Angle……… ExternallyWidth………, Angle……… |  | F1 To Fm | ………………… | ………………… |
| e1 | ………………… | ………………… |
| e2 | ………………… | ………………… |
| Wire Or Bar Diameter d | ………………… | ………………… |
|  | Stroke | Max height ………. mm and Min height ………mm |  | (11) | Adaptation of the Spring |
| Given Requirements | Permissible Deviation |
|  | Load cycle frequency | n = ………Hz |  | 1. One load *F*1, corresponding length $L\_{1}$ and spring rate $R\_{s}$
 | $$L\_{o},d, n\_{t}$$ |  |
|  | Maximum working temperature | =………ºC |  | 1. Two load *F*1/*F*2 and Corresponding length *L*1/*L*2
 | $$L\_{o},d, n\_{t}$$ |
|  | Wire or bar surface |  | Drawn RolledCentreless GroundSpring Shot-Peened |  |  | 1. Length of the un preset spring and spring rate $R\_{s}$
 | $$d, n\_{t}$$ |  |
|  |  | 1. One load *F*1 and the load of the preset spring
 | $$L\_{o}$$ |
|  |  |
|  |  |  | e) One load *F*1, the length of the preset spring and the length of the unpreset spring *L*o | $n\_{t}$, $d$or $n\_{t}$,$ D\_{e}$,$ D\_{i}$ |
|  | Surface protection |  |
|  | Material…………according to IS………Permissible shear stress Rsp=………………………$\frac{N}{mm^{2}}$ |  | (12) | Type of end ………….. |
| (13) | Total number of cycles up to rupture …………… |
| (14) | Permissible relaxation at defined initial stress, temperature and duration…………… |
| (15) | Any other special details: |
| 1) Any one the coil diameters Di, Do OR Dm may appear2) The listed parameters may be altered in order to meet the given requirements.  |
|  |  |  |  |  |  |
|  |  |  |  |  | Name | Date |
|  |  |  |  | Designed |  |  |
|  |  |  |  | Drawn |  |  |
|  |  |  |  | Checked |  |  |
|  |  |  |  | Standard |  |  |
| Issue | Modifications | Date | Name | Approved |  |  |
| Scale | Data Sheet for helical compression springIS 7906 (Part 3) | Drawing number |
|  |
| Sheet |
|  |  |  |  |  |  |  |  |

**ANNEX A**

(*Foreword*)

**COMMITTEE COMPOSITION**

Springs and Suspension Systems Sectional Committee, TED 34

|  |  |
| --- | --- |
| *Organization* | *Representative*(*s*) |
| Automotive Research Association of India, Pune | Shri V. V. Shinde **(*Chairperson*)** |
| Advik Hi-Tech Private Limited, Pune | Shri Kamalkishor Kakade |
| Anna University, Chennai | Shri G. Venkatesan |
| Automotive Component Manufactures Association of India, New Delhi | Shri Sanjay Tank Shreemati Seema Babal (*Alternative*) |
| Automotive Research Association of India, Pune | Shri Nitin Sinnarkar |
| Central Institute of Road Transport, Pune | Shri Rajkumar MalajureShri Birendra Rawat (*Alternative*) |
| International Centre for Automotive Technology, Manesar | Shri Samir Shikalgar |
| Jamna Auto Industries Limited, New Delhi | Shri Anuj Sharma |
| Mubea Automotive Components India Private Limited, Pune | Shri Amol Hari Joshi |
| Stumpp Scheule And Somappa Springs Private Limited, Bengaluru | Shri Punith Reddy |
| BIS Directorate General | Shri A. P. D. Dwivedi, Scientist ‘F’/Senior Director and Head (Transport Engineering) [Representing Director General (*Ex-officio*)]  |

*Member* *Secretary*

Shri Gali Ajit Kumar

Scientist ‘C’ /Deputy Director

(Transport Engineering), Bis