
**Tools for pressing — Compression
springs with rectangular section —
Housing dimensions and colour coding**

*Outillage de presse — Ressorts de compression à section
rectangulaire — Dimensions d'encombrement et code couleur*

STANDARDSISO.COM : Click to view the full PDF of ISO 10243:2019



STANDARDSISO.COM : Click to view the full PDF of ISO 10243:2019



COPYRIGHT PROTECTED DOCUMENT

© ISO 2019

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	1
4 Technical specifications	1
4.1 General	1
4.2 Tolerances for free length, L_0	2
4.3 Light spring rate (green)	2
4.4 Medium spring rate (blue)	6
4.5 Strong spring rate (red)	10
4.6 Extra strong spring rate (yellow)	14
5 Designation	18
Bibliography	19

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 of 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 www.iso.org/iso/foreword.html. This document was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 8, *Tools for pressing and moulding*.

This third edition cancels and replaces the second edition (ISO 10243:2010), which has been technically revised. It also incorporates the Amendment ISO 10243:2010/Amd 1:2011.

The main changes compared to the previous edition are as follows:

- some values of spring rate have been modified in [Table 2](#) to [Table 5](#);
- a column giving the force at maximum operating deflection has been added in [Table 2](#) to [Table 5](#).

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.

Tools for pressing — Compression springs with rectangular section — Housing dimensions and colour coding

1 Scope

This document establishes the technical specifications for compression springs made from rectangular wires.

The parameters set in this document are applicable to springs which are set. This document does not attempt to specify the quality of the springs themselves, nor all of their dimensions (e.g. cross-section), their material or their length of life.

The springs are classified into spring rates: light, medium, strong and extra strong. For each spring rate, this document gives a colour code.

2 Normative references

There are no normative references in this document.

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

3.1

spring rate

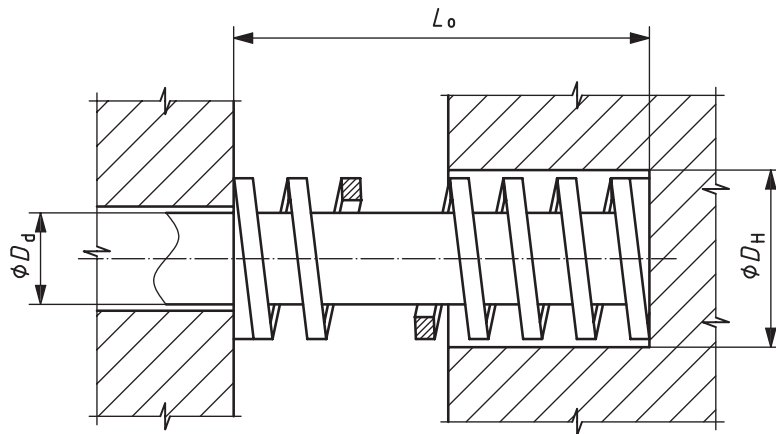
force required to deflect a compression spring by one unit of length

[SOURCE: : ISO 26909:2009, 5.21, modified — Limited the definition to compression spring.]

4 Technical specifications

4.1 General

Compression springs in accordance with this document shall comply with [Figure 1](#) and the provisions of [4.2](#) to [4.6](#).

**Key** L_o free length D_d rod diameter D_H hole diameter**Figure 1 — Compression springs****4.2 Tolerances for free length, L_o**

The tolerances for free length, L_o , shall comply with [Figure 1](#) and [Table 1](#).

Table 1 — Tolerances of free length

L_o mm	Tolerance
25	± 1 mm
32	
38	
44	
51	
64	
76	
89	
102	$\pm 1 \% L_o$
115	
127	
139	
152	
178	
203	
254	
305	

4.3 Light spring rate (green)

Compression springs of light spring rate in accordance with this document shall comply with [Figure 1](#) and [Table 2](#).

Compression springs of light spring rate shall be green according to the colour code of this document.

Table 2 — Technical specifications of compression springs of light spring rate

Hole diameter D_H H15 mm	Rod diameter D_d h15 mm	Free length L_0 mm	Spring rate $\pm 10\%$ N/mm	Maximum operating deflection $40\% L_0$ mm	Force at maximum operating deflection N
10	5	25	11	10,0	110,0
		32	8,5	12,8	108,8
		38	6,8	15,2	103,4
		44	6	17,6	105,6
		51	5	20,4	102,0
		64	4,1	25,6	105,0
		76	3,6	30,4	109,4
		305	0,9	122	109,8
12,5	6,3	25	21	10,0	210,0
		32	16,4	12,8	209,9
		38	13,6	15,2	206,7
		44	12,1	17,6	213,0
		51	10,3	20,4	210,1
		64	7,6	25,6	194,6
		76	6,3	30,4	191,5
		89	5,4	35,6	192,2
16	8	305	1,6	122	195,2
		25	29	10,0	290,0
		32	22,9	12,8	293,1
		38	19,3	15,2	293,4
		44	17,1	17,6	301,0
		51	14	20,4	285,6
		64	10,7	25,6	273,9
		76	9	30,4	273,6
		89	7,3	35,6	259,9
		102	6,8	40,8	277,4
		305	2,3	122	280,6

Table 2 (continued)

Hole diameter D_H H15 mm	Rod diameter D_d h15 mm	Free length L_0 mm	Spring rate $\pm 10\%$ N/mm	Maximum operating deflection $40\% L_0$ mm	Force at maximum operating deflection N
20	10	25	55,8	10,0	558,0
		32	45	12,8	576,0
		38	36	15,2	547,2
		44	30	17,6	528,0
		51	24,5	20,4	499,8
		64	19,2	25,6	491,5
		76	16	30,4	486,4
		89	14	35,6	498,4
		102	12	40,8	489,6
		115	10,9	46,0	501,4
		127	9,5	50,8	482,6
		139	8,4	55,6	467,0
		152	7,5	60,8	456,0
		305	4	122	488,0
25	12,5	25	105	10,0	1 050,0
		32	80,3	12,8	1 027,8
		38	62	15,2	942,4
		44	52,9	17,6	931,0
		51	44	20,4	897,6
		64	35,2	25,6	901,1
		76	28	30,4	851,2
		89	24	35,6	854,4
		102	21,1	40,8	860,9
		115	18,7	46,0	860,2
		127	16,7	50,8	848,4
		139	15,3	55,6	850,7
		152	14	60,8	851,2
		178	12,5	71,2	890,0
		203	10,4	81,2	844,5
		305	7	122	854,0

Table 2 (continued)

Hole diameter D_H H15 mm	Rod diameter D_d h15 mm	Free length L_0 mm	Spring rate $\pm 10\%$ N/mm	Maximum operating deflection 40 % L_0 mm	Force at maximum operating deflection N
32	16	38	98	15,2	1 490
		44	79,5	17,6	1 399
		51	67	20,4	1 367
		64	53	25,6	1 357
		76	44	30,4	1 338
		89	37,2	35,6	1 324
		102	32	40,8	1 306
		115	29	46,0	1 334
		127	25	50,8	1 270
		139	23	55,6	1 279
		152	21,5	60,8	1 307
		178	18,2	71,2	1 296
		203	15,8	81,2	1 283
		254	12,5	102	1 275
		305	10,3	122	1 257
40	20	51	92	20,4	1 877
		64	73	25,6	1 869
		76	63	30,4	1 915
		89	51	35,6	1 816
		102	45	40,8	1 816
		115	39,6	46,0	1 822
		127	36	50,8	1 829
		139	32	55,6	1 779
		152	28	60,8	1 702
		178	25,2	71,2	1 794
		203	21,8	81,2	1 770
		254	17	102	1 734
		305	14,8	122	1 806

Table 2 (continued)

Hole diameter D_H H15 mm	Rod diameter D_d h15 mm	Free length L_0 mm	Spring rate $\pm 10\%$ N/mm	Maximum operating deflection $40\% L_0$ mm	Force at maximum operating deflection N
50	25	64	156	25,6	3 994
		76	125	30,4	3 800
		89	109	35,6	3 880
		102	94	40,8	3 835
		115	81	46,0	3 726
		127	71	50,8	3 607
		139	66,5	55,6	3 697
		152	60	60,8	3 648
		178	52	71,2	3 702
		203	44	81,2	3 573
		254	35	102	3 570
		305	28,5	122	3 477
63	38	76	189	30,4	5 746
		89	158	35,6	5 625
		102	131	40,8	5 345
		115	116	46,0	5 336
		127	103	50,8	5 232
		152	84,3	60,8	5 125
		178	71,5	71,2	5 091
		203	61,7	81,2	5 010
		254	47	102	4 794
		305	38,2	122	4 660

4.4 Medium spring rate (blue)

Compression springs of medium spring rate in accordance with this document shall comply with [Figure 1](#) and [Table 3](#).

Compression springs of medium spring rate shall be blue according to the colour code of this document.

Table 3 — Technical specifications of compression springs of medium spring rate

Hole diameter D_H H15 mm	Rod diameter D_d h15 mm	Free length L_o mm	Spring rate $\pm 10\%$ N/mm	Maximum operating deflection $37,5\% L_o$ mm	Force at maximum operating deflection N
10	5	25	16	9,4	150,4
		32	13	12,0	156,0
		38	11,9	14,2	169,0
		44	10,3	16,5	170,0
		51	8,9	19,1	170,0
		64	7,5	24,0	180,0
		76	6,2	28,5	176,7
		305	1,6	114	182,4
12,5	6,3	25	30	9,4	282,0
		32	24,8	12,0	297,6
		38	21,4	14,2	303,9
		44	18	16,5	297,0
		51	15,5	19,1	296,1
		64	12,1	24,0	290,4
		76	10,2	28,5	290,7
		89	8,4	33,3	279,7
		305	2,4	114	273,6
16	8	25	49,4	9,4	464,4
		32	38,5	12,0	462,0
		38	33,9	14,2	481,4
		44	30	16,5	495,0
		51	26,4	19,1	504,2
		64	20,5	24,0	492,0
		76	17,8	28,5	507,3
		89	15,2	33,3	506,2
		102	13,5	38,2	515,7
		305	4,3	114	490,2

Table 3 (continued)

Hole diameter D_H H15 mm	Rod diameter D_d h15 mm	Free length L_0 mm	Spring rate $\pm 10\%$ N/mm	Maximum operating deflection $37,5\% L_0$ mm	Force at maximum operating deflection N
20	10	25	98	9,4	921,2
		32	72,6	12,0	871,2
		38	56	14,2	795,2
		44	47,5	16,5	783,8
		51	41,7	19,1	796,5
		64	32,3	24,0	775,2
		76	25,1	28,5	715,4
		89	22	33,3	732,6
		102	19,8	38,2	756,4
		115	18,1	43,1	780,1
		127	16,6	47,6	790,2
		139	15,1	52,1	786,7
		152	13,2	57,0	752,4
		305	6,1	114	695,4
25	12,5	25	157	9,4	1 476
		32	118	12,0	1 416
		38	93	14,2	1 321
		44	80,8	16,5	1 333
		51	68,6	19,1	1 310
		64	53	24,0	1 272
		76	43,2	28,5	1 231
		89	38,2	33,3	1 272
		102	33	38,2	1 261
		115	28	43,1	1 207
		127	25,9	47,6	1 233
		139	23,2	52,1	1 209
		152	20,8	57,0	1 186
		178	17,8	66,7	1 187
		203	15,8	76,1	1 202
		305	10,2	114	1 163

Table 3 (continued)

Hole diameter D_H H15 mm	Rod diameter D_d h15 mm	Free length L_0 mm	Spring rate $\pm 10\%$ N/mm	Maximum operating deflection $37,5\% L_0$ mm	Force at maximum operating deflection N
32	16	38	185	14,2	2 627
		44	158	16,5	2 607
		51	134	19,1	2 559
		64	99	24,0	2 376
		76	80,5	28,5	2 294
		89	69,1	33,3	2 301
		102	58,8	38,2	2 246
		115	51,5	43,1	2 220
		127	44,8	47,6	2 132
		139	42,3	52,1	2 204
		152	37,8	57,0	2 155
		178	32,5	66,7	2 168
		203	28,9	76,1	2 199
		254	22,2	95,2	2 113
		305	18,3	114	2 086
40	20	51	182	19,1	3 476
		64	140	24,0	3 360
		76	108	28,5	3 078
		89	90,7	33,3	3 020
		102	81	38,2	3 094
		115	71,8	43,1	3 095
		127	62,7	47,6	2 985
		139	57,5	52,1	2 996
		152	51,6	57,0	2 941
		178	44,1	66,7	2 941
		203	36,7	76,1	2 793
		254	30,1	95,2	2 866
		305	24,6	114	2 804

Table 3 (continued)

Hole diameter D_H H15 mm	Rod diameter D_d h15 mm	Free length L_0 mm	Spring rate $\pm 10\%$ N/mm	Maximum operating deflection $37,5\% L_0$ mm	Force at maximum operating deflection N
50	25	64	209	24,0	5 016
		76	168	28,5	4 788
		89	140	33,3	4 662
		102	119	38,2	4 546
		115	106	43,1	4 569
		127	97	47,6	4 617
		139	87	52,1	4 533
		152	80	57,0	4 560
		178	69,5	66,7	4 636
		203	59,8	76,1	4 551
		229	50,9	85,8	4 367
		254	46	95,2	4 379
		305	38,6	114	4 400
63	38	76	320	28,5	9 120
		89	260	33,3	8 658
		102	221	38,2	8 442
		115	187	43,1	8 060
		127	168	47,6	7 997
		152	136	57,0	7 752
		178	114	66,7	7 604
		203	100	76,1	7 610
		229	89,2	85,8	7 653
		254	78,4	95,2	7 464
		305	64,7	114	7 376

4.5 Strong spring rate (red)

Compression springs of strong spring rate in accordance with this document shall comply with [Figure 1](#) and [Table 4](#).

Compression springs of strong spring rate shall be red according to the colour code of this document.

Table 4 — Technical specifications of compression springs of strong spring rate

Hole diameter	Rod diameter	Free length	Spring rate	Maximum operating deflection	Force at maximum operating deflection
D_H H15 mm	D_d h15 mm	L_0 mm	$\pm 10\%$ N/mm	30 % L_0 mm	N
10	5	25	23	7,5	172,5
		32	17,5	9,6	168,0
		38	14,8	11,4	168,7
		44	13	13,2	171,6
		51	11,2	15,3	171,4
		64	9,2	19,2	176,6
		76	7,5	22,8	171,0
		305	1,9	91,5	173,9
12,5	6,3	25	42,1	7,5	315,8
		32	33,2	9,6	318,7
		38	29,3	11,4	334,0
		44	24,6	13,2	324,7
		51	19,6	15,3	299,9
		64	15	19,2	288,0
		76	13,2	22,8	301,0
		89	11,4	26,7	304,4
		305	3,2	91,5	292,8
16	8	25	75,7	7,5	567,8
		32	60,2	9,6	577,9
		38	50,8	11,4	579,1
		44	42,8	13,2	565,0
		51	37,1	15,3	567,6
		64	30,3	19,2	581,8
		76	25,7	22,8	586,0
		89	21,7	26,7	579,4
		102	18,9	30,6	578,3
		305	6,3	91,5	576,5

Table 4 (continued)

Hole diameter D_H H15 mm	Rod diameter D_d h15 mm	Free length L_0 mm	Spring rate $\pm 10\%$ N/mm	Maximum operating deflection $30\% L_0$ mm	Force at maximum operating deflection N
20	10	25	216	7,5	1 620
		32	168	9,6	1 613
		38	129	11,4	1 471
		44	112	13,2	1 478
		51	94	15,3	1 438
		64	72,1	19,2	1 384
		76	59,7	22,8	1 361
		89	50,5	26,7	1 348
		102	44,2	30,6	1 353
		115	38,4	34,5	1 325
		127	34,1	38,1	1 299
		139	31	41,7	1 293
		152	28,2	45,6	1 286
		305	14	91,5	1 281
25	12,5	25	375	7,5	2 813
		32	297	9,6	2 851
		38	219	11,4	2 497
		44	187	13,2	2 468
		51	156	15,3	2 387
		64	123	19,2	2 362
		76	99	22,8	2 257
		89	84	26,7	2 243
		102	73	30,6	2 234
		115	65	34,5	2 243
		127	57,7	38,1	2 198
		139	52,7	41,7	2 198
		152	47,8	45,6	2 180
		178	41	53,4	2 189
		203	35,8	60,9	2 180
		305	22,9	91,5	2 095

Table 4 (continued)

Hole diameter D_H H15 mm	Rod diameter D_d h15 mm	Free length L_0 mm	Spring rate $\pm 10\%$ N/mm	Maximum operating deflection 30 % L_0 mm	Force at maximum operating deflection N
32	16	38	388	11,4	4 423
		44	324	13,2	4 277
		51	272	15,3	4 162
		64	212	19,2	4 070
		76	172	22,8	3 922
		89	141	26,7	3 765
		102	122	30,6	3 733
		115	107	34,5	3 692
		127	93	38,1	3 543
		139	86	41,7	3 586
		152	78	45,6	3 557
		178	67,2	53,4	3 588
		203	59,1	60,9	3 599
		254	46,4	76,2	3 536
		305	38	91,5	3 477
40	20	51	350	15,3	5 355
		64	269	19,2	5 165
		76	219	22,8	4 993
		89	190	26,7	5 073
		102	163	30,6	4 988
		115	142	34,5	4 899
		127	128	38,1	4 877
		139	115	41,7	4 796
		152	105	45,6	4 788
		178	89	53,4	4 753
		203	77	60,9	4 689
		254	61	76,2	4 648
		305	51	91,5	4 667

Table 4 (continued)

Hole diameter	Rod diameter	Free length	Spring rate	Maximum operating deflection	Force at maximum operating deflection
D_H H15 mm	D_d h15 mm	L_0 mm	$\pm 10\%$ N/mm	$30\% L_0$ mm	N
50	25	64	413	19,2	7 930
		76	339	22,8	7 729
		89	288	26,7	7 690
		102	245	30,6	7 497
		115	215	34,5	7 418
		127	192	38,1	7 315
		139	168	41,7	7 006
		152	154	45,6	7 022
		178	134	53,4	7 156
		203	117	60,9	7 125
		254	89	76,2	6 782
		305	73	91,5	6 680

4.6 Extra strong spring rate (yellow)

Compression springs of extra strong spring rate in accordance with this document shall comply with [Figure 1](#) and [Table 5](#).

Compression springs of extra strong spring rate shall be yellow according to the colour code of this document.

Table 5 — Technical specifications of compression springs of extra strong spring rate

Hole diameter	Rod diameter	Free length	Spring rate	Maximum operating deflection	Force at maximum operating deflection
D_H H15 mm	D_d h15 mm	L_0 mm	$\pm 10\%$ N/mm	$25\% L_0$ mm	N
10	5	25	36,8	6,2	228,2
		32	27,9	8,0	223,2
		38	23,7	9,5	225,2
		44	19,2	11,0	211,2
		51	16,5	12,7	209,6
		64	13,2	16,0	211,2
		76	10,9	19,0	207,1
		305	2,6	76,3	198,4

Table 5 (continued)

Hole diameter D_H H15 mm	Rod diameter D_d h15 mm	Free length L_0 mm	Spring rate $\pm 10\%$ N/mm	Maximum operating deflection 25 % L_0 mm	Force at maximum operating deflection N
12,5	6,3	25	58,5	6,2	362,7
		32	43,9	8,0	351,2
		38	36	9,5	342,0
		44	30,3	11,0	333,3
		51	26,2	12,7	332,7
		64	21,2	16,0	339,2
		76	17,1	19,0	324,9
		89	14,5	22,2	321,9
		305	4,3	76,3	328,1
16	8	25	118	6,2	731,6
		32	89	8,0	712,0
		38	72,1	9,5	685,0
		44	60,9	11,0	669,9
		51	52,3	12,7	664,2
		64	41,2	16,0	659,2
		76	34,1	19,0	647,9
		89	29,5	22,2	654,9
		102	25,6	25,5	652,8
20	10	305	8,4	76,3	640,9
		25	293	6,2	1 817
		32	224	8,0	1 792
		38	177	9,5	1 682
		44	149	11,0	1 639
		51	128	12,7	1 626
		64	99	16,0	1 584
		76	81,7	19,0	1 552
		89	69,5	22,2	1 543
		102	60,6	25,5	1 545
		115	53	28,7	1 521
		127	47,5	31,7	1 506
		139	43	34,7	1 492
		152	39	38,0	1 482
		305	20	76,3	1 526