INTERNATIONAL STANDARD

ISO 10243

Second edition
2010-02-01

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 de couleur

Reference number
ISO 10243:2010(E)

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Published in Switzerland

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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 10243 was prepared by Technical Committee ISO/TC 29, *Small tools*, Subcommittee SC 8, *Tools for pressing and moulding*.

This second edition cancels and replaces the first edition (ISO 10243:1991), which has been technically revised.

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

1 Scope

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

The parameters set in this International Standard are applicable to springs which are set. This International Standard 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 International Standard gives a colour code.

2 Technical specifications

2.1 General

Compression springs in accordance with this International Standard shall comply with the technical specifications given in Figure 1 and in 2.2 to 2.6.

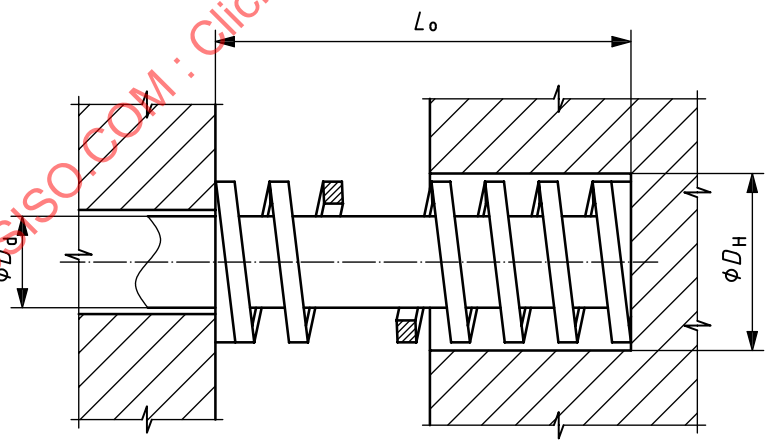

Figure 1 — Compression springs

2.2 Tolerances for free length, L_o

The tolerances for free length, L_o, shall comply with the indications of Figure 1 and Table 1.

Table 1 — Tolerances of free length

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

2.3 Light spring rate

Compression springs of light spring rate in accordance with this International Standard shall comply with the technical specifications given in Figure 1 and Table 2.

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

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_o mm	**Required force to deflect** 1 mm ±10 % N	**Maximum operating deflection** 40 % L_o mm
10	5	25	10	10,0
		32	8,5	12,8
		38	6,8	15,2
		44	6	17,6
		51	5	20,4
		64	4,3	25,6
		76	3,2	30,4
		305	1,1	122
12,5	6,3	25	17,9	10,0
		32	16,4	12,8
		38	13,6	15,2
		44	12,1	17,6
		51	11,4	20,4
		64	9,3	25,6
		76	7,1	30,4
		89	5,4	35,6
		305	1,4	122
16	8	25	23,4	10,0
		32	22,9	12,8
		38	19,3	15,2
		44	17,1	17,6
		51	15,7	20,4
		64	10,7	25,6
		76	10	30,4
		89	8,6	35,6
		102	7,8	40,8
		305	2,5	122

Table 2 (*continued*)

Hole diameter D_H H15 mm	**Rod diameter** D_d h15 mm	**Free length** L_o mm	**Required force to deflect** 1 mm ±10 % N	**Maximum operating deflection** 40 % L_o mm
20	10	25	55,8	10,0
		32	45	12,8
		38	33,3	15,2
		44	30	17,6
		51	24,5	20,4
		64	20	25,6
		76	16	30,4
		89	14	35,6
		102	12	40,8
		115	10,9	46,0
		127	9,5	50,8
		139	8,4	55,6
		152	7,5	60,8
		305	4	122
25	12,5	25	100	10,0
		32	80,3	12,8
		38	62	15,2
		44	52,9	17,6
		51	44	20,4
		64	35,2	25,6
		76	28	30,4
		89	24	35,6
		102	21,1	40,8
		115	18,7	46,0
		127	16,7	50,8
		139	15,3	55,6
		152	14	60,8
		178	12,5	71,2
		203	10,4	81,2
		305	7	122

Table 2 (*continued*)

Hole diameter D_H H15 mm	**Rod diameter** D_d h15 mm	**Free length** L_o mm	**Required force to deflect** 1 mm ±10 % N	**Maximum operating deflection** 40 % L_o mm
32	16	38	94	15,2
		44	79,5	17,6
		51	67	20,4
		64	53	25,6
		76	44	30,4
		89	37,2	35,6
		102	32	40,8
		115	29	46,0
		127	25	50,8
		139	23	55,6
		152	21,5	60,8
		178	18,2	71,2
		203	15,8	81,2
		254	12,5	102
		305	10,3	122
40	20	51	92	20,4
		64	73	25,6
		76	63	30,4
		89	51	35,6
		102	43	40,8
		115	39,6	46,0
		127	37	50,8
		139	32	55,6
		152	28	60,8
		178	25,2	71,2
		203	22,7	81,2
		254	17	102
		305	14,8	122

Table 2 (*continued*)

Hole diameter D_H H15 mm	**Rod diameter** D_d h15 mm	**Free length** L_o mm	**Required force to deflect** 1 mm ±10 % N	**Maximum operating deflection** 40 % L_o mm
50	25	64	156	25,6
		76	125	30,4
		89	109	35,6
		102	94	40,8
		115	81	46,0
		127	71	50,8
		139	66,5	55,6
		152	60	60,8
		178	52	71,2
		203	44	81,2
		254	35	102
		305	28,5	122
63	38	76	189	30,4
		89	158	35,6
		102	131	40,8
		115	116	46,0
		127	103	50,8
		152	84,3	60,8
		178	71,5	71,2
		203	61,7	81,2
		254	47	102
		305	38,2	122

2.4 Medium spring rate

Compression springs of medium spring rate in accordance with this International Standard shall comply with the technical specifications given in Figure 1 and Table 3.

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

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	**Required force to deflect** 1 mm ±10 % N	**Maximum operating deflection** 37,5 % L_o mm
10	5	25	16	9,4
		32	13	12,0
		38	11,9	14,2
		44	10,3	16,5
		51	8,9	19,1
		64	7,5	24,0
		76	5,3	28,5
		305	1,6	114
12,5	6,3	25	30	9,4
		32	24,8	12,0
		38	21,4	14,2
		44	18,5	16,5
		51	15,5	19,1
		64	12,1	24,0
		76	10,2	28,5
		89	8,4	33,3
		305	2,1	114
16	8	25	49,4	9,4
		32	37,1	12,0
		38	33,9	14,2
		44	30	16,5
		51	26,4	19,1
		64	20,5	24,0
		76	17,8	28,5
		89	15,2	33,3
		102	13,5	38,2
		305	4,8	114

Table 3 (*continued*)

Hole diameter D_H H15 mm	**Rod diameter** D_d h15 mm	**Free length** L_o mm	**Required force to deflect** 1 mm ±10 % N	**Maximum operating deflection** 37,5 % L_o mm
20	10	25	98	9,4
		32	72,6	12,0
		38	56	14,2
		44	47,5	16,5
		51	41,7	19,1
		64	32,3	24,0
		76	25,1	28,5
		89	22	33,3
		102	19,8	38,2
		115	18,1	43,1
		127	16,6	47,6
		139	15,1	52,1
		152	13,2	57,0
		305	6,1	114
25	12,5	25	147	9,4
		32	118	12,0
		38	93	14,2
		44	80,8	16,5
		51	68,6	19,1
		64	53	24,0
		76	43,2	28,5
		89	38,2	33,3
		102	33	38,2
		115	28	43,1
		127	25,9	47,6
		139	23,2	52,1
		152	20,8	57,0
		178	17,8	66,7
		203	15,8	76,1
		305	10,2	114

Table 3 (*continued*)

Hole diameter D_H H15 mm	**Rod diameter** D_d h15 mm	**Free length** L_o mm	**Required force to deflect** 1 mm ±10 % N	**Maximum operating deflection** 37,5 % L_o mm
32	16	38	185	14,2
		44	158	16,5
		51	134	19,1
		64	99	24,0
		76	80,5	28,5
		89	69,1	33,3
		102	58,8	38,2
		115	51,5	43,1
		127	44,8	47,6
		139	42,3	52,1
		152	37,8	57,0
		178	32,5	66,7
		203	28,9	76,1
		254	21,4	95,2
		305	18,3	114
40	20	51	182	19,1
		64	140	24,0
		76	108	28,5
		89	90,7	33,3
		102	81	38,2
		115	71,8	43,1
		127	62,7	47,6
		139	57,5	52,1
		152	51,6	57,0
		178	44,1	66,7
		203	36,7	76,1
		254	30,1	95,2
		305	24,6	114

Table 3 (*continued*)

Hole diameter D_H H15 mm	**Rod diameter** D_d h15 mm	**Free length** L_o mm	**Required force to deflect** 1 mm ±10 % N	**Maximum operating deflection** 37,5 % L_o mm
50	25	64	209	24,0
		76	168	28,5
		89	140	33,3
		102	119	38,2
		115	106	43,1
		127	97	47,6
		139	87	52,1
		152	80	57,0
		178	69,5	66,7
		203	59,8	76,1
		229	50,9	85,8
		254	43,9	95,2
		305	38,6	114
63	38	76	312	28,5
		89	260	33,3
		102	221	38,2
		115	187	43,1
		127	168	47,6
		152	136	57,0
		178	114	66,7
		203	100	76,1
		229	89,2	85,8
		254	78,4	95,2
		305	64,7	114

2.5 Strong spring rate

Compression springs of strong spring rate in accordance with this International Standard shall comply with the technical specifications given in Figure 1 and Table 4.

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

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

Hole diameter D_H H15 mm	**Rod diameter** D_d h15 mm	**Free length** L_o mm	**Required force to deflect** 1 mm ±10 % N	**Maximum operating deflection** 30 % L_o mm
10	5	25	22,1	7,5
		32	17,5	9,6
		38	17,1	11,4
		44	15	13,2
		51	12,8	15,3
		64	10,7	19,2
		76	7,5	22,8
		305	2,1	91,5
12,5	6,3	25	42,1	7,5
		32	33,2	9,6
		38	29,3	11,4
		44	24,6	13,2
		51	19,6	15,3
		64	15	19,2
		76	13,2	22,8
		89	11,4	26,7
		305	2,8	91,5
16	8	25	75,7	7,5
		32	52,8	9,6
		38	48,5	11,4
		44	42,8	13,2
		51	37,1	15,3
		64	30,3	19,2
		76	25,7	22,8
		89	21,7	26,7
		102	19,3	30,6
		305	7,1	91,5

Table 4 (*continued*)

Hole diameter D_H H15 mm	**Rod diameter** D_d h15 mm	**Free length** L_o mm	**Required force to deflect** 1 mm ±10 % N	**Maximum operating deflection** 30 % L_o mm
20	10	25	216	7,5
		32	168	9,6
		38	129	11,4
		44	112	13,2
		51	94	15,3
		64	72,1	19,2
		76	59,7	22,8
		89	50,5	26,7
		102	44,2	30,6
		115	38,4	34,5
		127	34,1	38,1
		139	31	41,7
		152	28,2	45,6
		305	15	91,5
25	12,5	25	375	7,5
		32	297	9,6
		38	219	11,4
		44	187	13,2
		51	156	15,3
		64	123	19,2
		76	99	22,8
		89	84	26,7
		102	73	30,6
		115	65	34,5
		127	57,7	38,1
		139	52,7	41,7
		152	47,8	45,6
		178	41	53,4
		203	35,8	60,9
		305	22,9	91,5

Table 4 (*continued*)

Hole diameter D_H H15 mm	**Rod diameter** D_d h15 mm	**Free length** L_o mm	**Required force to deflect** 1 mm ±10 % N	**Maximum operating deflection** 30 % L_o mm
32	16	38	388	11,4
		44	324	13,2
		51	272	15,3
		64	212	19,2
		76	172	22,8
		89	141	26,7
		102	122	30,6
		115	107	34,5
		127	93	38,1
		139	86	41,7
		152	78	45,6
		178	67,2	53,4
		203	59,1	60,9
		254	46,4	76,2
		305	38	91,5
40	20	51	350	15,3
		64	269	19,2
		76	219	22,8
		89	190	26,7
		102	163	30,6
		115	142	34,5
		127	128	38,1
		139	115	41,7
		152	105	45,6
		178	89	53,4
		203	77	60,9
		254	61	76,2
		305	51	91,5

Table 4 (*continued*)

Hole diameter D_H H15 mm	**Rod diameter** D_d h15 mm	**Free length** L_o mm	**Required force to deflect** 1 mm ±10 % N	**Maximum operating deflection** 30 % L_o mm
50	25	64	413	19,2
		76	339	22,8
		89	288	26,7
		102	245	30,6
		115	215	34,5
		127	192	38,1
		139	168	41,7
		152	154	45,6
		178	134	53,4
		203	117	60,9
		254	89	76,2
		305	73	91,5

2.6 Extra strong spring rate

Compression springs of extra strong spring rate in accordance with this International Standard shall comply with the technical specifications given in Figure 1 and Table 5.

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

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

Hole diameter D_H H15 mm	**Rod diameter** D_d h15 mm	**Free length** L_o mm	**Required force to deflect** 1 mm ±10 % N	**Maximum operating deflection** 25 % L_o mm
10	5	25	36,8	6,2
		32	27,9	8,0
		38	23,7	9,5
		44	19,2	11,0
		51	16,5	12,7
		64	13,2	16,0
		76	10,9	19,0
		305	2,6	76,3
12,5	6,3	25	58,5	6,2
		32	43,9	8,0
		38	36	9,5
		44	30,3	11,0
		51	26,2	12,7
		64	21,2	16,0
		76	17,1	19,0
		89	14,5	22,2
		305	4,3	76,3
16	8	25	118	6,2
		32	89	8,0
		38	72,1	9,5
		44	60,9	11,0
		51	52,3	12,7
		64	41,2	16,0
		76	34,1	19,0
		89	29,5	22,2
		102	25,6	25,5
		305	8,4	76,3