

SPEZIAL-
SCHRAUBENDRUCKFEDERN
**HIGH PERFORMANCE
COMPRESSION SPRINGS**



DAUER- UND ZEITFESTIGKEITSBEREICHE

Die Lebensdauer der Schraubendruckfeder wird beeinflusst durch die konstruktive Auswahl, die Arbeitsbedingung und den Federwerkstoff.

Eine abgestimmte Zuordnung der Federwege (Vorspannweg zu Arbeitsfederweg), sowie die Einhaltung der zulässigen Schubspannung (nach Tabelle und Schaubild) sind wesentliche Voraussetzungen für eine lange Lebensdauer der Feder.

Der zulässige Wert der Schub- bzw. Hubspannung ist vom verwendeten Federwerkstoff abhängig. FIBRO-Spezialschraubendruckfedern werden aus legiertem Chrom-Spezialstahl hergestellt, vergütet und kugelgestrahlt.

Im Bereich der Dauerfestigkeit und bei dynamischer Belastung beträgt die zulässige Schubspannung τ_{zul} 800 N/mm² und die zul. Hubspannung t_h 400 N/mm².

Höhere Spannungen sind zulässig nur im Bereich der Zeitfestigkeit oder bei statischer/quasi statischer Belastung.

Extreme Arbeitstemperaturen, Querfederung, Stoßbeanspruchung, Resonanzschwingungen führen zur Minderung der Lebensdauer dynamisch beanspruchter Federn und können durch niedrigere Schubspannung berücksichtigt werden.

ARBEITSTEMPERATUR

Der verwendete Federwerkstoff ist für eine Arbeitstemperatur bis 250 °C geeignet. Diese Angaben sind nur Anhaltswerte, die zulässigen Verwendungstemperaturen sind auch abhängig von der Beanspruchung. Dabei ist zu beachten, dass ab 100 °C der Elastizitätsmodus absinkt und durch Spannungsabbau ein Setzen eintritt.

FEDERWEGE IM DAUERFESTIGKEITSBEREICH

Der ausnutzbare Federweg S_6 liegt bei 62% des Gesamt-Federweges S_n (100%), was einer Schubspannung τ_{zul} von 800 N/mm² und einer Hubspannung t_h von 400 N/mm² entspricht.

FEDERKRAFTBERECHNUNG

Die Federkraft errechnet sich aus der Federrate $R \times$ Federweg.

FEDERKRAFT UND FEDERWEG

In der Tabelle sind die zugeordneten Federkenndaten zu den Federwegen 30, 40, 45, 55, 62, 80 und 100% angegeben. Zwischenwerte können nach dem Zeit- und Dauerfestigkeitsschaubild ermittelt werden.

Detaillierte Informationen hierzu finden Sie in unserem Hauptkatalog am Anfang des Kapitels F.

SERVICE DATA FOR LIMITED-/EXTENDED SPRING LIFE

The achievable service life of helical compression springs depends to a large extent on the composition of the spring wire, the operating conditions, and on design parameters.

In all applications with oscillating spring displacement, careful selection of both preload values and compressive displacement are prerequisites for extended spring life, as confirmed by the permissible stress values in the loading data tables and the stress/spring life diagram.

Shear stress maxima and spring oscillation stress differentials are a direct function of the quality of the spring wire. FIBRO High Performance Compression Springs are made exclusively from special alloyed chrome-steel.

For extended spring life under oscillating load changes, the maximal shear stress τ_{zul} is 800 N/mm^2 , of which some $400 \text{ N/mm}^2 = (\tau_h)$. Higher stress levels are permissible only under the proviso of limited life expectancy, or in cases of static and quasi-static load conditions.

Springs subjected to dynamic load conditions also suffer impairment to their life expectancy through influences such as extreme operating temperatures, transversal stress components, shock loads, and resonant vibration frequencies. In all these instances, a lowering of the stress levels assists towards better spring life.

WORKING TEMPERATURE

The spring material used has a working temperature of up to 250°C . This rating is an approximation since the actual approved working temperature will also depend on factors such as load. It is worth noting that above 100°C the modulus of elasticity decreases and with a reduction in tension setting starts to occur.

EXTENDED SPRING LIFE: SPRING DISPLACEMENT VALUES

The largest permissible displacement is indicated by S_6 – offering about 62% of the „total“ displacement of the wire-to-wire compacted spring (= S_n). This displacement will induce a shear stress of τ_{admis} of 800 N/mm^2 . The associated stress differential during oscillations should not exceed $400 \text{ N/mm}^2 (= \tau_h)$.

CALCULATION OF SPRING FORCES

Simple multiplication of the spring coefficient R with the applicable displacement S (mm) yields the spring force value (N).

SPRING FORCE VERSUS SPRING DISPLACEMENT

The relevant tables show the force values for selected displacements of 30, 40, 45, 55, 62, 80 and 100% compression. Intermediate force values can be extra-polated from the Stress/Spring Life Diagram.

For details please refer to our main catalogue at the beginning of chapter F.

VIOLETT/ VIOLET

EXTRA SMALL FORCE



Hülsen-ø ø guide sleeve	Dorn-ø ø guide pin	Länge Length	Bestell-Nr. Order No	Federrate Spring rate
20	10	25	241.13.20.025	32,1
		32	241.13.20.032	24,7
		38	241.13.20.038	20,7
		44	241.13.20.044	17,8
		51	241.13.20.051	15,3
		64	241.13.20.064	12,1
		76	241.13.20.076	10,2
		89	241.13.20.089	8,6
		102	241.13.20.102	7,5
		115	241.13.20.115	6,7
		127	241.13.20.127	6,1
		139	241.13.20.139	5,5
		152	241.13.20.152	5,1
		305	241.13.20.305	2,5
25	12,5	25	241.13.25.025	52,7
		32	241.13.25.032	40,0
		38	241.13.25.038	33,3
		44	241.13.25.044	28,6
		51	241.13.25.051	24,7
		64	241.13.25.064	19,4
		76	241.13.25.076	16,3
		89	241.13.25.089	15,9
		102	241.13.25.102	12,1
		115	241.13.25.115	10,8
		127	241.13.25.127	9,8
		139	241.13.25.139	8,9
		152	241.13.25.152	8,1
		178	241.13.25.178	6,9
		203	241.13.25.203	6,1
		305	241.13.25.305	4,0
32	16	38	241.13.32.038	43,8
		44	241.13.32.044	37,5
		51	241.13.32.051	32,3
		64	241.13.32.064	25,4
		76	241.13.32.076	21,3
		89	241.13.32.089	18,1
		102	241.13.32.102	15,8
		115	241.13.32.115	13,9
		127	241.13.32.127	12,6
		139	241.13.32.139	11,4
		152	241.13.32.152	10,5
		178	241.13.32.178	8,9
		203	241.13.32.203	7,8
		254	241.13.32.254	6,2
		305	241.13.32.305	5,2

VIOLETT/ VIOLET

EXTRA SMALL FORCE



Hülsen-ø ø guide sleeve	Dorn-ø ø guide pin	Länge Length	Bestell-Nr. Order No	Federrate Spring rate
40	20	51	241.13.40.051	50,8
		64	241.13.40.064	39,7
		76	241.13.40.076	33,1
		89	241.13.40.089	28,1
		102	241.13.40.102	24,5
		115	241.13.40.115	21,6
		127	241.13.40.127	19,5
		139	241.13.40.139	17,8
		152	241.13.40.152	16,3
		178	241.13.40.178	13,8
		203	241.13.40.203	12,1
		254	241.13.40.254	9,7
		305	241.13.40.305	8,0
50	25	64	241.13.50.064	80,2
		76	241.13.50.076	66,9
		89	241.13.50.089	56,6
		102	241.13.50.102	40,3
		115	241.13.50.115	43,5
		127	241.13.50.127	39,3
		139	241.13.50.139	35,8
		152	241.13.50.152	32,8
		178	241.13.50.178	27,8
		203	241.13.50.203	24,2
		254	241.13.50.254	19,2
		305	241.13.50.305	16,0

GRÜN/GREEN

SMALL FORCE



Hülsen-ø ø guide sleeve	Dorn-ø ø guide pin	Länge Length	Bestell-Nr. Order No	Federrate Spring rate
10	5	25	241.14.10.025	11,0
		32	241.14.10.032	8,5
		38	241.14.10.038	6,8
		44	241.14.10.044	6,0
		51	241.14.10.051	5,0
		64	241.14.10.064	4,1
		76	241.14.10.076	3,6
		305	241.14.10.305	0,9
12,5	6,3	25	241.14.13.025	21,0
		32	241.14.13.032	16,4
		38	241.14.13.038	13,6
		44	241.14.13.044	12,1
		51	241.14.13.051	10,3
		64	241.14.13.064	7,6
		76	241.14.13.076	6,3
		89	241.14.13.089	5,4
		305	241.14.13.305	1,6
16	8	25	241.14.16.025	29,0
		32	241.14.16.032	22,9
		38	241.14.16.038	19,3
		44	241.14.16.044	17,1
		51	241.14.16.051	14,0
		64	241.14.16.064	10,7
		76	241.14.16.076	9,0
		89	241.14.16.089	7,3
		102	241.14.16.102	6,8
		305	241.14.16.305	2,3
20	10	25	241.14.20.025	55,8
		32	241.14.20.032	45,0
		38	241.14.20.038	36,0
		44	241.14.20.044	30,0
		51	241.14.20.051	24,5
		64	241.14.20.064	19,2
		76	241.14.20.076	16,0
		89	241.14.20.089	14,0
		102	241.14.20.102	12,0
		115	241.14.20.115	10,9
		127	241.14.20.127	9,5
		139	241.14.20.139	8,4
		152	241.14.20.152	7,5
25	12,5	305	241.14.20.305	4,0
		25	241.14.25.025	105,0
		32	241.14.25.032	80,3
		38	241.14.25.038	62,0
		44	241.14.25.044	52,9
		51	241.14.25.051	44,0
		64	241.14.25.064	35,2
		76	241.14.25.076	28,0
		89	241.14.25.089	24,0
		102	241.14.25.102	21,1
		115	241.14.25.115	18,7
		127	241.14.25.127	16,7
		139	241.14.25.139	15,3
		152	241.14.25.152	14,0
		178	241.14.25.178	12,5
		203	241.14.25.203	10,4
		305	241.14.25.305	7,0

GRÜN/GREEN

SMALL FORCE



Hülsen-ø ø guide sleeve	Dorn-ø ø guide pin	Länge Length	Bestell-Nr. Order No	Federrate Spring rate
32	16	38	241.14.32.038	98,0
		44	241.14.32.044	79,5
		51	241.14.32.051	67,0
		64	241.14.32.064	53,0
		76	241.14.32.076	44,0
		89	241.14.32.089	37,2
		102	241.14.32.102	32,0
		115	241.14.32.115	29,0
		127	241.14.32.127	25,0
		139	241.14.32.139	23,0
		152	241.14.32.152	21,5
		178	241.14.32.178	18,2
		203	241.14.32.203	15,8
		254	241.14.32.254	12,5
		305	241.14.32.305	10,3
40	20	51	241.14.40.051	92,0
		64	241.14.40.064	73,0
		76	241.14.40.076	63,0
		89	241.14.40.089	51,0
		102	241.14.40.102	45,0
		115	241.14.40.115	39,6
		127	241.14.40.127	36,0
		139	241.14.40.139	32,0
		152	241.14.40.152	28,0
		178	241.14.40.178	25,2
		203	241.14.40.203	21,8
		254	241.14.40.254	17,0
50	25	305	241.14.40.305	14,8
		64	241.14.50.064	156,0
		76	241.14.50.076	125,0
		89	241.14.50.089	109,0
		102	241.14.50.102	94,0
		115	241.14.50.115	81,0
		127	241.14.50.127	71,0
		139	241.14.50.139	66,5
		152	241.14.50.152	60,0
		178	241.14.50.178	52,0
		203	241.14.50.203	44,0
		254	241.14.50.254	35,0
63	38	305	241.14.50.305	28,5
		76	241.14.63.076	189,0
		89	241.14.63.089	158,0
		102	241.14.63.102	131,0
		115	241.14.63.115	116,0
		127	241.14.63.127	103,0
		152	241.14.63.152	84,3
		178	241.14.63.178	71,5
		203	241.14.63.203	61,7
		254	241.14.63.254	47,0
		305	241.14.63.305	38,2

BLAU/BLUE

MEDIUM FORCE



Hülsen-ø ø guide sleeve	Dorn-ø ø guide pin	Länge Length	Bestell-Nr. Order No	Federrate Spring rate
10	5	25	241.15.10.025	16,0
		32	241.15.10.032	13,0
		38	241.15.10.038	11,9
		44	241.15.10.044	10,3
		51	241.15.10.051	8,9
		64	241.15.10.064	7,5
		76	241.15.10.076	6,2
		305	241.15.10.305	1,6
12,5	6,3	25	241.15.13.025	30,0
		32	241.15.13.032	24,8
		38	241.15.13.038	21,4
		44	241.15.13.044	18,0
		51	241.15.13.051	15,5
		64	241.15.13.064	12,1
		76	241.15.13.076	10,2
		89	241.15.13.089	8,4
16	8	305	241.15.13.305	2,4
		25	241.15.16.025	49,4
		32	241.15.16.032	38,5
		38	241.15.16.038	33,9
		44	241.15.16.044	30,0
		51	241.15.16.051	26,4
		64	241.15.16.064	20,5
		76	241.15.16.076	17,8
20	10	89	241.15.16.089	15,2
		102	241.15.16.102	13,5
		305	241.15.16.305	4,3
		25	241.15.20.025	98,0
		32	241.15.20.032	72,6
		38	241.15.20.038	56,0
		44	241.15.20.044	47,5
		51	241.15.20.051	41,7
		64	241.15.20.064	32,3
		76	241.15.20.076	25,1
		89	241.15.20.089	22,0
		102	241.15.20.102	19,8
25	12,5	115	241.15.20.115	18,1
		127	241.15.20.127	16,6
		139	241.15.20.139	15,1
		152	241.15.20.152	13,2
		305	241.15.20.305	6,1
		25	241.15.25.025	157,0
		32	241.15.25.032	118,0
		38	241.15.25.038	93,0
		44	241.15.25.044	80,8
		51	241.15.25.051	68,6
		64	241.15.25.064	53,0
		76	241.15.25.076	43,2
		89	241.15.25.089	38,2
		102	241.15.25.102	33,0
		115	241.15.25.115	28,0
		127	241.15.25.127	25,9
		139	241.15.25.139	23,2
		152	241.15.25.152	20,8
		178	241.15.25.178	17,8
		203	241.15.25.203	15,8
		305	241.15.25.305	10,2

BLAU/BLUE

MEDIUM FORCE



Hülsen-ø ø guide sleeve	Dorn-ø ø guide pin	Länge Length	Bestell-Nr. Order No	Federrate Spring rate
32	16	38	241.15.32.038	185,0
		44	241.15.32.044	158,0
		51	241.15.32.051	134,0
		64	241.15.32.064	99,0
		76	241.15.32.076	80,5
		89	241.15.32.089	69,1
		102	241.15.32.102	58,8
		115	241.15.32.115	51,5
		127	241.15.32.127	44,8
		139	241.15.32.139	42,3
		152	241.15.32.152	37,8
		178	241.15.32.178	32,5
		203	241.15.32.203	28,9
		254	241.15.32.254	22,2
		305	241.15.32.305	18,3
40	20	51	241.15.40.051	182,0
		64	241.15.40.064	140,0
		76	241.15.40.076	108,0
		89	241.15.40.089	90,7
		102	241.15.40.102	81,0
		115	241.15.40.115	71,8
		127	241.15.40.127	62,7
		139	241.15.40.139	57,5
		152	241.15.40.152	51,6
		178	241.15.40.178	44,1
		203	241.15.40.203	36,7
		254	241.15.40.254	30,1
		305	241.15.40.305	24,6
50	25	64	241.15.50.064	209,0
		76	241.15.50.076	168,0
		89	241.15.50.089	140,0
		102	241.15.50.102	119,0
		115	241.15.50.115	106,0
		127	241.15.50.127	97,0
		139	241.15.50.139	87,0
		152	241.15.50.152	80,0
		178	241.15.50.178	69,5
		203	241.15.50.203	59,8
		229	241.15.50.229	50,9
		254	241.15.50.254	46,0
		305	241.15.50.305	38,6
63	38	76	241.15.63.076	320,0
		89	241.15.63.089	260,0
		102	241.15.63.102	221,0
		115	241.15.63.115	187,0
		127	241.15.63.127	168,0
		152	241.15.63.152	136,0
		178	241.15.63.178	114,0
		203	241.15.63.203	100,0
		229	241.15.63.229	89,2
		254	241.15.63.254	78,4
		305	241.15.63.305	64,7

ROT/RED

LARGE FORCE



Hülsen-ø ø guide sleeve	Dorn-ø ø guide pin	Länge Length	Bestell-Nr. Order No	Federrate Spring rate
10	5	25	241.16.10.025	23,0
		32	241.16.10.032	17,5
		38	241.16.10.038	14,8
		44	241.16.10.044	13,0
		51	241.16.10.051	11,2
		64	241.16.10.064	9,2
		76	241.16.10.076	7,5
		305	241.16.10.305	1,9
12,5	6,3	25	241.16.13.025	42,1
		32	241.16.13.032	33,2
		38	241.16.13.038	29,3
		44	241.16.13.044	24,6
		51	241.16.13.051	19,6
		64	241.16.13.064	15,0
		76	241.16.13.076	13,2
		89	241.16.13.089	11,4
16	8	305	241.16.13.305	3,2
		25	241.16.16.025	75,7
		32	241.16.16.032	60,2
		38	241.16.16.038	50,8
		44	241.16.16.044	42,8
		51	241.16.16.051	37,1
		64	241.16.16.064	30,3
		76	241.16.16.076	25,7
20	10	89	241.16.16.089	21,7
		102	241.16.16.102	18,9
		305	241.16.16.305	6,3
		25	241.16.20.025	216,0
		32	241.16.20.032	168,0
		38	241.16.20.038	129,0
		44	241.16.20.044	112,0
		51	241.16.20.051	94,0
		64	241.16.20.064	72,1
		76	241.16.20.076	59,7
		89	241.16.20.089	50,5
		102	241.16.20.102	44,2
25	12,5	115	241.16.20.115	38,4
		127	241.16.20.127	34,1
		139	241.16.20.139	31,0
		152	241.16.20.152	28,2
		305	241.16.20.305	14,0
		25	241.16.25.025	375,0
		32	241.16.25.032	297,0
		38	241.16.25.038	219,0
		44	241.16.25.044	187,0
		51	241.16.25.051	156,0
		64	241.16.25.064	123,0
		76	241.16.25.076	99,0
		89	241.16.25.089	84,0
		102	241.16.25.102	73,0
		115	241.16.25.115	65,0
		127	241.16.25.127	57,7
		139	241.16.25.139	52,7
		152	241.16.25.152	47,8
		178	241.16.25.178	41,0
		203	241.16.25.203	35,8
		305	241.16.25.305	22,9

ROT/RED

LARGE FORCE



Hülsen-ø ø guide sleeve	Dorn-ø ø guide pin	Länge Length	Bestell-Nr. Order No	Federrate Spring rate
32	16	38	241.16.32.038	388,0
		44	241.16.32.044	324,0
		51	241.16.32.051	272,0
		64	241.16.32.064	212,0
		76	241.16.32.076	172,0
		89	241.16.32.089	141,0
		102	241.16.32.102	122,0
		115	241.16.32.115	107,0
		127	241.16.32.127	93,0
		139	241.16.32.139	86,0
		152	241.16.32.152	78,0
		178	241.16.32.178	67,2
		203	241.16.32.203	59,1
		254	241.16.32.254	46,4
		305	241.16.32.305	38,0
40	20	51	241.16.40.051	350,0
		64	241.16.40.064	269,0
		76	241.16.40.076	219,0
		89	241.16.40.089	190,0
		102	241.16.40.102	163,0
		115	241.16.40.115	142,0
		127	241.16.40.127	128,0
		139	241.16.40.139	115,0
		152	241.16.40.152	105,0
		178	241.16.40.178	89,0
		203	241.16.40.203	77,0
		254	241.16.40.254	61,0
		305	241.16.40.305	51,0
50	25	64	241.16.50.064	413,0
		76	241.16.50.076	339,0
		89	241.16.50.089	288,0
		102	241.16.50.102	245,0
		115	241.16.50.115	215,0
		127	241.16.50.127	192,0
		139	241.16.50.139	168,0
		152	241.16.50.152	154,0
		178	241.16.50.178	134,0
		203	241.16.50.203	117,0
		254	241.16.50.254	89,0
		305	241.16.50.305	73,0
63	38	76	241.16.63.076	618,0
		89	241.16.63.089	515,0
		102	241.16.63.102	438,0
		115	241.16.63.115	370,0
		127	241.16.63.127	333,0
		152	241.16.63.152	269,0
		178	241.16.63.178	226,0
		203	241.16.63.203	198,0
		254	241.16.63.254	155,0
		305	241.16.63.305	128,0

GELB/ YELLOW

EXTRA LARGE FORCE



Hülsen-ø ø guide sleeve	Dorn-ø ø guide pin	Länge Length	Bestell-Nr. Order No	Federrate Spring rate
10	5	25	241.17.10.025	36,8
		32	241.17.10.032	27,9
		38	241.17.10.038	23,7
		44	241.17.10.044	19,2
		51	241.17.10.051	16,5
		64	241.17.10.064	13,2
		76	241.17.10.076	10,9
		305	241.17.10.305	2,6
12,5	6,3	25	241.17.13.025	58,5
		32	241.17.13.032	43,9
		38	241.17.13.038	36,0
		44	241.17.13.044	30,3
		51	241.17.13.051	26,2
		64	241.17.13.064	21,2
		76	241.17.13.076	17,1
		89	241.17.13.089	14,5
		305	241.17.13.305	4,3
16	8	25	241.17.16.025	118,0
		32	241.17.16.032	89,0
		38	241.17.16.038	72,1
		44	241.17.16.044	60,9
		51	241.17.16.051	52,3
		64	241.17.16.064	41,2
		76	241.17.16.076	34,1
		89	241.17.16.089	29,5
		102	241.17.16.102	25,6
		305	241.17.16.305	8,4
20	10	25	241.17.20.025	293,0
		32	241.17.20.032	224,0
		38	241.17.20.038	177,0
		44	241.17.20.044	149,0
		51	241.17.20.051	128,0
		64	241.17.20.064	99,0
		76	241.17.20.076	81,7
		89	241.17.20.089	69,5
		102	241.17.20.102	60,6
		115	241.17.20.115	53,0
		127	241.17.20.127	47,5
		139	241.17.20.139	43,0
		152	241.17.20.152	39,0
25	12,5	305	241.17.20.305	20,0
		25	241.17.25.025	459,0
		32	241.17.25.032	374,0
		38	241.17.25.038	300,0
		44	241.17.25.044	244,0
		51	241.17.25.051	208,0
		64	241.17.25.064	161,0
		76	241.17.25.076	131,0
		89	241.17.25.089	111,0
		102	241.17.25.102	96,3
		115	241.17.25.115	85,7
		127	241.17.25.127	76,3
		139	241.17.25.139	66,0
		152	241.17.25.152	63,5
		178	241.17.25.178	53,9
		203	241.17.25.203	47,0
		305	241.17.25.305	30,9

GELB/ YELLOW

EXTRA LARGE FORCE



Hülsen-ø ø guide sleeve	Dorn-ø ø guide pin	Länge Length	Bestell-Nr. Order No	Federrate Spring rate
32	16	38	241.17.32.038	480,0
		44	241.17.32.044	390,0
		51	241.17.32.051	336,0
		64	241.17.32.064	269,0
		76	241.17.32.076	219,0
		89	241.17.32.089	180,0
		102	241.17.32.102	155,0
		115	241.17.32.115	140,0
		127	241.17.32.127	124,0
		139	241.17.32.139	112,0
		152	241.17.32.152	102,0
		178	241.17.32.178	88,2
		203	241.17.32.203	76,0
		254	241.17.32.254	60,8
		305	241.17.32.305	49,0
40	20	51	241.17.40.051	628,0
		64	241.17.40.064	487,0
		76	241.17.40.076	379,0
		89	241.17.40.089	321,0
		102	241.17.40.102	281,0
		115	241.17.40.115	245,0
		127	241.17.40.127	221,0
		139	241.17.40.139	185,0
		152	241.17.40.152	168,0
		178	241.17.40.178	150,0
		203	241.17.40.203	132,0
		254	241.17.40.254	107,0
		305	241.17.40.305	87,8
50	25	64	241.17.50.064	709,0
		76	241.17.50.076	572,0
		89	241.17.50.089	475,0
		102	241.17.50.102	405,0
		115	241.17.50.115	352,0
		127	241.17.50.127	316,0
		139	241.17.50.139	289,0
		152	241.17.50.152	255,0
		178	241.17.50.178	215,0
		203	241.17.50.203	187,0
		254	241.17.50.254	153,0
		305	241.17.50.305	127,0
63	38	76	241.17.63.076	952,0
		89	241.17.63.089	819,0
		102	241.17.63.102	700,0
		115	241.17.63.115	620,0
		127	241.17.63.127	565,0
		152	241.17.63.152	458,0
		178	241.17.63.178	384,0
		203	241.17.63.203	337,0
		254	241.17.63.254	263,0
		305	241.17.63.305	218,0

WEISS/ WHITE

3 EXTRA LARGE FORCE



Hülsen-ø ø guide sleeve	Dorn-ø ø guide pin	Länge Length	Bestell-Nr. Order No	Federrate Spring rate
16	6,3	20	241.19.16.020	1818
		35	241.19.16.035	1000
		50	241.19.16.050	615
		75	241.19.16.075	400
		100	241.19.16.100	286
19	8	25	241.19.19.025	2400
		40	241.19.19.040	1333
		50	241.19.19.050	1000
		75	241.19.19.075	600
		100	241.19.19.100	429
25	10	30	241.19.25.030	4800
		50	241.19.25.050	2400
		75	241.19.25.075	1500
		100	241.19.25.100	1000
		125	241.19.25.125	857
32	12,5	35	241.19.32.035	6667
		50	241.19.32.050	3636
		75	241.19.32.075	2222
		100	241.19.32.100	1538
		125	241.19.32.125	1250
		150	241.19.32.150	1053
38	16	40	241.19.38.040	7143
		50	241.19.38.050	5000
		75	241.19.38.075	2778
		100	241.19.38.100	1923
		150	241.19.38.150	1316
		200	241.19.38.200	926



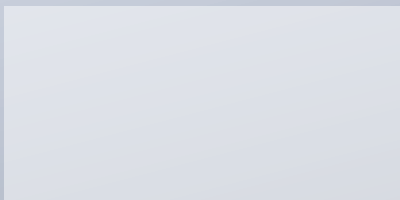
NOTIZEN/NOTES

[illegible]



WE LOVE TECHNOLOGY

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09/2020 Art.-Nr. / Order N° 2.2508.02.1119.1100000