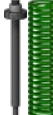


							
Name	Ultra High Deflection	Super High Deflection	High Deflection	Medium Deflection	Lightest Load	Light Load	Medium Load
Model	19SSY	19SSU	19SSR	19SSS	19SF	19SL	19SM
Page	273-274	275-276	277-278	279	280-284	285-290	291-296

							
Name	Heavy Load	Extra Heavy Load	Super Heavy Load	Spring Guide Unit	Spring Guide Flange	Spring Guide Pins	Spring Guide Retainers
Model	19SH	19SB	19SG	25SUK	25WUNT	25SGA	25SGR
Page	297-302	303-307	308-311	312-313	314	314	315-316

! ข้อควรระวังในการใช้สปริง | Spring Usage Precautions



- ควรใช้ร่วมกับสปริงไกด์ เพื่อยืดอายุการใช้งานสปริง และลดอุบัติเหตุจากการทำงาน
Use with Spring Guide to increase spring life time and reduce accident
- ขนาดของแกนไกด์ควรเล็กกว่าค่ารูในของสปริง 1 มม ($d - 1$)
Guide diameter should be 1mm smaller than spring inside diameter ($d - 1$)
- ขนาดของช่องสวมสปริงควรโตกว่าค่าไดนอกของสปริง 1.5 มม ($D + 1$)
Spring housing should be 1.5mm larger than the spring outer diameter ($D + 1$)
- ความยาวไกด์ขั้นต่ำอยู่ที่ 150% ของความสูงเริ่มต้น และแกนไกด์ควรทำแชมเฟอร์ที่ระดับ C3
Guide length minimum at 150% of initial set height, and should be C3 chamfer
- กำหนดค่ายุบตัวเริ่มต้น เพื่อรักษาสภาพส่วนหัวและท้ายของสปริง
Setting an initial deflection to stabilize the top and bottom ends of the spring
- สปริงแต่ละตัวควรวางในตำแหน่งของด้ายที่ขนาดกัน
The mounting surface of springs should be sufficient parallel
- ไม่ควรใช้สปริงเกินค่าขีดจำกัด
Do not use spring over their allow limits
- ไม่ควรใช้งานเมื่อมีสิ่งแปลกปลอมเข้าไปติดค้างในสปริง
Do not use when foreign objects are caught in the spring
- ไม่ควรรนำสปริงมาต่อกันด้านหัวท้าย ควรเลือกความยาวที่ถูกต้องหรือสอบถามเพื่อสั่งทำขนาดพิเศษ
Do not stack springs to increase length, choose the right length or ask for customize length
- ไม่ควรรนำสปริงมาซ้อนกันสองชั้น (ตัวเล็กในตัวใหญ่)
Do not use spring inside another spring
- ไม่ควรรนำสปริงในแนวนอน
Do not use spring horizontally

ตารางการเลือกสปริง
Spring Selection Chart



Type		Model	Color	Outer Diameter		Free Length		1,000,000 Free Length %	Load N (kgf)	
				Min	Max	Min	Max		Min	Max
Ultra High Deflection		19SSY	Light Green	ø11	ø42	20	300	65.0%	29.4 (3.0)	392.3 (40.0)
Super High Deflection		19SSU	Light Blue	ø10.5	ø43	15	300	60.0%	68.6 (7.0)	588.4 (60.0)
High Deflection		19SSR	Ivory White	ø10.5	ø46	15	300	50.0%	127.5 (13)	3579.4 (110)
Medium Deflection		19SSS	Orange	ø10.5	ø46	30	300	40.0%	976.15 (30)	4230.2 (130)
Lightest Load		19SF	Yellow	ø6	ø70	10	500	40.0%	58.8 (6)	2255.5 (230)
Light Load		19SL	Dark Blue	ø6	ø70	10	500	32.0%	78.5 (8)	3814.4 (389)
Medium Load		19SM	Red	ø6	ø70	10	350	25.6%	107.9 (11)	5638.8 (525)
Heavy Load		19SH	Dark Green	ø6	ø70	10	350	19.2%	166.7 (17)	8472.9 (864)
Extra Heavy Load		19SB	Brown	ø6	ø70	10	350	16.0%	255.0 (26)	11297.3 (152)
Super Heavy Load		19SG	Grey	ø10	ø50	15	300	16.0%	392.3 (40)	10101.2 (1040)

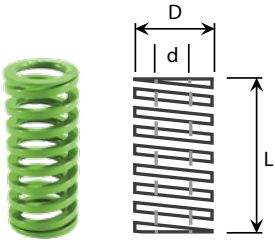
Spring Tolerance

Outer Dia	Inner Dia	Free Length		Load (kgf)	Coil Direction
		< 50mm	> 55mm		
+ 0mm - 0mm	+ 0.7mm - 0.1mm	±0.5mm	±1%	±10%	Right



วิธีคำนวณค่ารับแรงกดของสปริง
Spring force calculation

$Force = Spring\ Constant \times Deflection$
 $N = N/mm \times Deflection$
 $kgf = kgf/mm \times Deflection$



สปริงสีเขียวอ่อน
Light Green Spring
Model: 19SSY



แรงกด Load ±10%

ความได้ฉาก Perpendicularity 3° or less

ระยะเพื่อความยาว Free Length ≤ 50 ±0.5mm
≥ 55 ±1.5%

ORDER
EXAMPLE

Model D - L
19SSY12.5-050

SAE9245
JIS Standard

D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					65% Deflection	Load N (kgf)
11	20	7	5.0	2.26 (0.23)	13.0	29.4 (3.0)
	25		6.3	1.81 (0.18)	16.3	
	30		7.5	1.51 (0.15)	19.5	
	35		8.8	1.29 (0.13)	22.8	
	40		10.0	1.13 (0.12)	26.0	
	45		11.3	1.01 (0.10)	29.3	
	50		12.5	0.91 (0.092)	32.5	
	55		13.8	0.82 (0.084)	35.8	
	60		15.0	0.75 (0.077)	39.0	
	65		16.3	0.70 (0.071)	42.3	
	70		17.5	0.65 (0.066)	45.5	
	75		18.8	0.60 (0.061)	48.8	
12.5	80	6.5	20.0	0.57 (0.058)	52.0	40.2 (4.1)
	85		21.3	0.52 (0.052)	55.3	
	90		22.5	0.50 (0.051)	58.8	
	95		23.8	0.47 (0.047)	62.3	
	100		25.0	0.45 (0.046)	65.0	
	105		26.3	0.42 (0.042)	68.3	
	110		27.5	0.40 (0.040)	71.5	
	115		28.8	0.38 (0.038)	74.8	
	120		30.0	0.36 (0.036)	78.0	
	125		31.3	0.34 (0.034)	81.3	
	130		32.5	0.32 (0.032)	84.5	
	135		33.8	0.30 (0.030)	87.8	
	140		35.0	0.28 (0.028)	91.0	
	145		36.3	0.26 (0.026)	94.3	
	150		37.5	0.25 (0.025)	97.5	
	155		38.8	0.23 (0.023)	100.8	
	160		40.0	0.22 (0.022)	104.0	
	165		41.3	0.20 (0.020)	107.3	
	170		42.5	0.19 (0.019)	110.5	
	175		43.8	0.18 (0.018)	113.8	
	180		45.0	0.17 (0.017)	117.0	
	185		46.3	0.16 (0.016)	120.3	
	190		47.5	0.15 (0.015)	123.5	
	195		48.8	0.14 (0.014)	126.8	
	200		50.0	0.13 (0.013)	130.0	

D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					65% Deflection	Load N (kgf)
16.5	20	10.5	5.0	7.02 (0.72)	13.0	91.2 (9.3)
	25		6.3	5.61 (0.57)	16.3	
	30		7.5	4.68 (0.48)	19.5	
	35		8.8	4.01 (0.41)	22.8	
	40		10.0	3.51 (0.36)	26.0	
	45		11.3	3.12 (0.32)	29.3	
	50		12.5	2.81 (0.29)	32.5	
	55		13.8	2.55 (0.26)	35.8	
	60		15.0	2.34 (0.24)	39.0	
	65		16.3	2.16 (0.22)	42.3	
	70		17.5	2.00 (0.20)	45.5	
	75		18.8	1.87 (0.19)	48.8	
20.5	80	13.5	20.0	1.75 (0.18)	52.0	108.9 (11.1)
	85		21.3	1.62 (0.16)	55.3	
	90		22.5	1.56 (0.16)	58.5	
	95		23.8	1.44 (0.14)	61.8	
	100		25.0	1.40 (0.14)	65.0	
	105		26.3	1.28 (0.13)	68.3	
	110		27.5	1.28 (0.13)	71.5	
	115		28.8	1.17 (0.12)	74.8	
	120		30.0	1.17 (0.12)	78.0	
	125		31.3	1.12 (0.11)	81.3	
	130		32.5	0.94 (0.10)	84.5	
	135		33.8	0.94 (0.10)	87.8	
	140		35.0	0.88 (0.09)	91.0	
	145		36.3	0.88 (0.09)	94.3	
	150		37.5	0.82 (0.084)	97.5	
	155		38.8	0.82 (0.084)	100.8	
	160		40.0	0.77 (0.079)	104.0	
	165		41.3	0.77 (0.079)	107.3	
	170		42.5	0.72 (0.072)	110.5	
	175		43.8	0.69 (0.070)	113.8	
	180		45.0	0.69 (0.070)	117.0	
	185		46.3	0.62 (0.063)	120.3	
	190		47.5	0.62 (0.063)	123.5	
	195		48.8	0.56 (0.057)	126.8	
	200		50.0	0.56 (0.057)	130.0	

Ultra-High Deflection Spring - สปริงยวบตัวได้สูงมากพิเศษ

ORDER
EXAMPLE

Model D - L
19SSY12.5-050

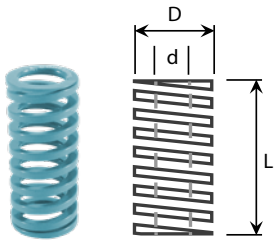
สปริงสีเขียวอ่อน
Light Green Spring
Model: 19SSY



D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					65% Deflection	Load N (kgf)
24.5	30	16.5	7.5	6.99 (0.71)	19.5	136.3 (13.9)
	35		8.8	5.99 (0.61)	22.8	
	40		10.0	5.24 (0.53)	26.0	
	45		11.3	4.66 (0.48)	29.3	
	50		12.5	4.19 (0.43)	32.5	
	55		13.8	3.81 (0.39)	35.8	
	60		15.0	3.50 (0.36)	39.0	
	65		16.3	3.23 (0.33)	42.3	
	70		17.5	3.00 (0.31)	45.5	
	75		18.8	2.80 (0.29)	48.8	
	80		20.0	2.62 (0.27)	52.0	
	90		22.5	2.33 (0.24)	58.5	
	100		25.0	2.10 (0.21)	65.0	
	110		27.5	1.91 (0.19)	71.5	
	120		30.0	1.75 (0.18)	78.0	
	125		31.3	1.68 (0.17)	81.3	
	130		32.5	1.61 (0.16)	84.5	
	140		35.0	1.50 (0.15)	91.0	
30	150		37.5	1.40 (0.14)	97.5	200.1 (20.4)
	175		43.8	1.20 (0.12)	113.8	
	200		50.0	1.05 (0.11)	130.0	
	35	21	8.8	8.79 (0.90)	22.8	
	40		10.0	7.69 (0.78)	26.0	
	45		11.3	6.84 (0.70)	29.3	
	50		12.5	6.16 (0.63)	32.5	
	55		13.8	5.60 (0.57)	35.8	
	60		15.0	5.13 (0.52)	39.0	
	65		16.3	4.74 (0.48)	42.3	
	70		17.5	4.40 (0.45)	45.5	
	75		18.8	4.10 (0.42)	48.8	
	80		20.0	3.85 (0.39)	52.0	
	90		22.5	3.42 (0.35)	58.5	
	100		25.0	3.08 (0.31)	65.0	
	110		27.5	2.80 (0.29)	71.5	
	120		30.0	2.56 (0.26)	78.0	
	125		31.3	2.46 (0.25)	81.3	
	130		32.5	2.37 (0.24)	84.5	
	140		35.0	2.20 (0.22)	91.0	
	150		37.5	2.05 (0.21)	97.5	
	160		40.0	1.92 (0.20)	104.0	
	170		42.5	1.81 (0.18)	110.5	
	175		43.8	1.76 (0.18)	113.8	
	180		45.0	1.71 (0.17)	117.0	
	190		47.5	1.62 (0.17)	123.5	
	200		50.0	1.54 (0.16)	130.0	
	250		62.5	1.23 (0.13)	162.5	
	300		75.0	1.03 (0.10)	195.0	

D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					65% Deflection	Load N (kgf)
37	40	26	10.0	11.32 (1.15)	26.0	294.2 (30.0)
	45		11.3	10.06 (1.03)	29.3	
	50		12.5	9.05 (0.92)	32.5	
	55		13.8	8.23 (0.84)	35.8	
	60		15.0	7.54 (0.77)	39.0	
	65		16.3	6.96 (0.71)	42.3	
	70		17.5	6.47 (0.66)	45.5	
	75		18.8	6.03 (0.62)	48.8	
	80		20.0	5.66 (0.58)	52.0	
	90		22.5	5.03 (0.51)	58.5	
	100		25.0	4.53 (0.46)	65.0	
	110		27.5	4.11 (0.42)	71.5	
	120		30.0	3.77 (0.38)	78.0	
	130		32.5	3.48 (0.36)	84.5	
	140		35.0	3.23 (0.33)	91.0	
	150		37.5	3.02 (0.31)	97.5	
	160		40.0	2.83 (0.29)	104.0	
	170		42.5	2.66 (0.27)	110.5	
42	180		45.0	2.51 (0.26)	117.0	392.3 (40.0)
	190		47.5	2.38 (0.24)	123.5	
	200		50.0	2.26 (0.23)	130.0	
	225		56.3	2.01 (0.21)	146.3	
	250		62.5	1.81 (0.18)	162.5	
	275		68.8	1.65 (0.17)	178.8	
	300		75.0	1.51 (0.15)	195.0	
	50	31	12.5	12.07 (1.23)	32.5	
	60		15.0	10.06 (1.03)	39.0	
	70		17.5	8.62 (0.88)	45.5	
	80		20.0	7.54 (0.77)	52.0	
	90		22.5	6.71 (0.68)	58.5	
	100		25.0	6.03 (0.62)	65.0	
	110		27.5	5.49 (0.56)	71.5	
	120		30.0	5.03 (0.51)	78.0	
	130		32.5	4.64 (0.47)	84.5	
	140		35.0	4.31 (0.44)	91.0	
	150		37.5	4.02 (0.41)	97.5	
	160		40.0	3.77 (0.38)	104.0	
	170		42.5	3.55 (0.36)	110.5	
	180		45.0	3.35 (0.34)	117.0	
	190		47.5	3.18 (0.32)	123.5	
	200		50.0	3.02 (0.31)	130.0	
	225		56.3	2.68 (0.27)	146.3	
	250		62.5	2.41 (0.25)	162.5	
	275		68.8	2.19 (0.22)	178.8	
	300		75.0	2.01 (0.21)	195.0	

Die Springs



สปริงสีฟ้าอ่อน
Light Blue Spring
Model: 19SSU

Spring Load Chart



แรงกด Load ±10%

ความได้ฉาก Perpendicularity 3° or less

ระยะเพื่อความยาว Free Length ≤ 50 ±0.5mm
≥ 55 ±1.5%

ORDER
EXAMPLE

Model D - L
19SSU12.5-050



SAE9245



JIS Standard

D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					60% Deflection	Load N (kgf)
10.5	6	6	4.5	7.63 (0.78)	9	68.6 (7.0)
			6.0	5.72 (0.58)	12	
			7.5	4.58 (0.47)	15	
			9.0	3.81 (0.39)	18	
			10.5	3.27 (0.33)	21	
			12.0	2.86 (0.29)	24	
			13.5	2.54 (0.26)	27	
			15.0	2.29 (0.23)	30	
			16.5	2.08 (0.21)	33	
			18.0	1.91 (0.19)	36	
			19.5	1.76 (0.18)	39	
			21.0	1.63 (0.17)	42	
12.5	7	7	4.5	8.72 (0.89)	9	78.5 (8.0)
			6.0	6.54 (0.67)	12	
			7.5	5.23 (0.53)	15	
			9.0	4.36 (0.44)	18	
			10.5	3.74 (0.38)	21	
			12.0	3.27 (0.33)	24	
			13.5	2.91 (0.30)	27	
			15.0	2.62 (0.27)	30	
			16.5	2.38 (0.24)	33	
			18.0	2.18 (0.22)	36	
			19.5	2.01 (0.21)	39	
			21.0	1.87 (0.19)	42	
14.5	8.5	8.5	4.5	10.90 (1.11)	9	98.1 (10.0)
			6.0	8.17 (0.83)	12	
			7.5	6.54 (0.67)	15	
			9.0	5.45 (0.56)	18	
			10.5	4.67 (0.48)	21	
			12.0	4.09 (0.42)	24	
			13.5	3.63 (0.37)	27	
			15.0	3.27 (0.33)	30	
			16.5	2.97 (0.30)	33	
			18.0	2.72 (0.28)	36	
			19.5	2.51 (0.26)	39	
			21.0	2.33 (0.24)	42	

D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					60% Deflection	Load N (kgf)
17	10.5	10.5	6.0	12.26 (1.25)	12	147.1 (15.0)
			7.5	9.81 (1.00)	15	
			9.0	8.17 (0.83)	18	
			10.5	7.00 (0.71)	21	
			12.0	6.13 (0.63)	24	
			13.5	5.45 (0.56)	27	
			15.0	4.90 (0.50)	30	
			16.5	4.46 (0.45)	33	
			18.0	4.09 (0.42)	36	
			19.5	3.77 (0.38)	39	
			21.0	3.50 (0.36)	42	
			22.5	3.27 (0.33)	45	
21	13.5	13.5	24.0	3.06 (0.31)	48	225.6 (23.0)
			27.0	2.72 (0.28)	54	
			30.0	2.45 (0.25)	60	
			33.0	2.23 (0.23)	66	
			36.0	2.04 (0.21)	72	
			37.5	1.96 (0.20)	75	
			45.0	1.63 (0.17)	90	
			52.5	1.40 (0.14)	105	
			7.5	15.04 (1.53)	15	
			9.0	12.53 (1.28)	18	
			10.5	10.74 (1.10)	21	
			12.0	9.40 (0.96)	24	

Super-High Deflection Spring - สปริงยวบตัวได้สูงมาก

ORDER
EXAMPLE

Model D - L
19SSU12.5-050

สปริงสีฟ้าอ่อน
Light Blue Spring
Model: 19SSU



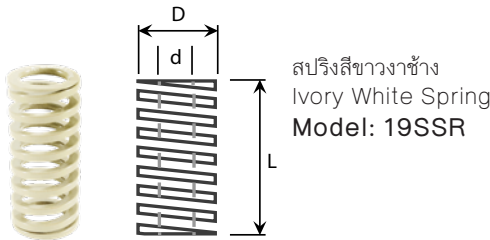
D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					60% Deflection	Load N (kgf)
26	30	16.5	9.0	16.34 (1.67)	18	294.2 (30.0)
	35		10.5	14.01 (1.43)	21	
	40		12.0	12.26 (1.25)	24	
	45		13.5	10.90 (1.11)	27	
	50		15.0	9.81 (1.00)	30	
	55		16.5	8.92 (0.91)	33	
	60		18.0	8.17 (0.83)	36	
	65		19.5	7.54 (0.77)	39	
	70		21.0	7.00 (0.71)	42	
	75		22.5	6.54 (0.67)	45	
	80		24.0	6.13 (0.63)	48	
	90		27.0	5.45 (0.56)	54	
	100		30.0	4.90 (0.50)	60	
	110		33.0	4.46 (0.45)	66	
	120		36.0	4.09 (0.42)	72	
	125		37.5	3.92 (0.40)	75	
	130		39.0	3.77 (0.38)	78	
31	140		42.0	3.50 (0.36)	84	372.7 (38.0)
	150		45.0	3.27 (0.33)	90	
	175		52.5	2.80 (0.29)	105	
	200		60.0	2.45 (0.25)	120	
	225		67.5	2.18 (0.22)	135	
	250		75.0	1.96 (0.20)	150	
	35	21	10.5	17.75 (1.81)	21	
	40		12.0	15.53 (1.58)	24	
	45		13.5	13.80 (1.41)	27	
	50		15.0	12.42 (1.27)	30	
	55		16.5	11.29 (1.15)	33	
	60		18.0	10.35 (1.06)	36	
	65		19.5	9.56 (0.97)	39	
	70		21.0	8.87 (0.90)	42	
	75		22.5	8.28 (0.84)	45	
	80		24.0	7.76 (0.79)	48	
	90		27.0	6.90 (0.70)	54	
	100		30.0	6.21 (0.63)	60	
	110		33.0	5.65 (0.58)	66	
	120		36.0	5.18 (0.53)	72	
	125		37.5	4.97 (0.51)	75	
	130		39.0	4.78 (0.49)	78	
	140		42.0	4.44 (0.45)	84	
	150		45.0	4.14 (0.42)	90	
	160		48.0	3.88 (0.40)	96	
	170		51.0	3.65 (0.37)	102	
	175		52.5	3.55 (0.36)	105	
	180		54.0	3.45 (0.35)	108	
	190		57.0	3.27 (0.33)	114	
	200		60.0	3.11 (0.32)	120	
	250		75.0	2.48 (0.25)	150	
	300		90.0	2.07 (0.21)	180	

D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					60% Deflection	Load N (kgf)
37	40	26	12.0	19.20 (1.96)	24	460.9 (47.0)
	45		13.5	17.07 (1.74)	27	
	50		15.0	15.36 (1.57)	30	
	55		16.5	13.97 (1.42)	33	
	60		18.0	12.80 (1.31)	36	
	65		19.5	11.82 (1.21)	39	
	70		21.0	10.97 (1.12)	42	
	75		22.5	10.24 (1.04)	45	
	80		24.0	9.60 (0.98)	48	
	90		27.0	8.54 (0.87)	54	
	100		30.0	7.68 (0.78)	60	
	110		33.0	6.98 (0.71)	66	
	120		36.0	6.40 (0.65)	72	
	130		39.0	5.91 (0.60)	78	
	140		42.0	5.49 (0.56)	84	
	150		45.0	5.12 (0.52)	90	
	160		48.0	4.80 (0.49)	96	
43	170		51.0	4.52 (0.46)	102	588.4 (60.0)
	180		54.0	4.27 (0.44)	108	
	190		57.0	4.04 (0.41)	114	
	200		60.0	3.84 (0.39)	120	
	225		67.5	3.41 (0.35)	135	
	250		75.0	3.07 (0.31)	150	
	275		82.5	2.79 (0.28)	165	
	300		90.0	2.56 (0.26)	180	
	50	31	15.0	19.61 (2.00)	30	
	60		18.0	16.34 (1.67)	36	
	70		21.0	14.01 (1.43)	42	
	80		24.0	12.26 (1.25)	48	
	90		27.0	10.90 (1.11)	54	
	100		30.0	9.81 (1.00)	60	
	110		33.0	8.92 (0.91)	66	
	120		36.0	8.17 (0.83)	72	
	130		39.0	7.54 (0.77)	78	
	140		42.0	7.00 (0.71)	84	
	150		45.0	6.54 (0.67)	90	
	160		48.0	6.13 (0.63)	96	
	170		51.0	5.77 (0.59)	102	
	180		54.0	5.45 (0.56)	108	
	190		57.0	5.16 (0.53)	114	
	200		60.0	4.90 (0.50)	120	
	225		67.5	4.36 (0.44)	135	
	250		75.0	3.92 (0.40)	150	
	275		82.5	3.57 (0.36)	165	
	300		90.0	3.27 (0.33)	180	

Die Springs

สปริงแม่พิมพ์

High Deflection Spring - สปริงยวบตัวได้สูง



สปริงสีขาววงข้าง
Ivory White Spring
Model: 19SSR



แรงกด Load ±10%

ความได้ฉาก Perpendicularity 3° or less

ระยะเพื่อความยาว Free Length ≤ 50 ±0.5mm
≥ 55 ±1.5%

ORDER
EXAMPLE

Model D - L
19SSR12.5-050

SAE9245
JIS Standard

D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					50% Deflection	Load N (kgf)
10.5	15	6	6	10.46 (1.07)	7.5	78.5 (8.0)
	20		8	7.85 (0.80)	10.0	
	25		10	6.28 (0.64)	12.5	
	30		12	5.23 (0.53)	15.0	
	35		14	4.48 (0.46)	17.5	
	40		16	3.92 (0.40)	20.0	
	45		18	3.49 (0.36)	22.5	
	50		20	3.14 (0.32)	25.0	
	55		22	2.85 (0.29)	27.5	
	60		24	2.62 (0.27)	30.0	
	65		26	2.41 (0.25)	32.5	
	70		28	2.24 (0.23)	35.0	
12.5	75	7	30	2.09 (0.21)	37.5	88.3 (9.0)
	80		32	1.96 (0.20)	40.0	
	15		6	11.77 (1.20)	7.5	
	20		8	8.83 (0.90)	10.0	
	25		10	7.06 (0.72)	12.5	
	30		12	5.88 (0.60)	15.0	
	35		14	5.04 (0.51)	17.5	
	40		16	4.41 (0.45)	20.0	
	45		18	3.92 (0.40)	22.5	
	50		20	3.53 (0.36)	25.0	
	55		22	3.21 (0.33)	27.5	
	60		24	2.94 (0.30)	30.0	
	65		26	2.72 (0.28)	32.5	
	70		28	2.52 (0.26)	35.0	
	75		30	2.35 (0.24)	37.5	
	80		32	2.21 (0.23)	40.0	
	90		36	1.96 (0.20)	45.0	
	100		40	1.77 (0.18)	50.0	

D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					50% Deflection	Load N (kgf)
14.5	15	8.5	6	17.00 (1.73)	7.5	127.5 (13.0)
	20		8	12.75 (1.30)	10.0	
	25		10	10.20 (1.04)	12.5	
	30		12	8.50 (0.87)	15.0	
	35		14	7.28 (0.74)	17.5	
	40		16	6.37 (0.65)	20.0	
	45		18	5.67 (0.58)	22.5	
	50		20	5.10 (0.52)	25.0	
	55		22	4.64 (0.47)	27.5	
	60		24	4.25 (0.43)	30.0	
	65		26	3.92 (0.40)	32.5	
	70		28	3.64 (0.37)	35.0	
17	75	10.5	30	3.40 (0.35)	37.5	196.1 (20.0)
	80		32	3.19 (0.33)	40.0	
	90		36	2.83 (0.29)	45.0	
	100		40	2.55 (0.26)	50.0	
	125		50	2.04 (0.21)	62.5	
	150		60	1.70 (0.17)	75.0	
	25		10	15.69 (1.60)	12.5	
	30		12	13.08 (1.33)	15.0	
	35		14	11.21 (1.14)	17.5	
	40		16	9.81 (1.00)	20.0	
	45		18	8.72 (0.89)	22.5	
	50		20	7.85 (0.80)	25.0	
	55		22	7.13 (0.73)	27.5	
	60		24	6.54 (0.67)	30.0	
	65		26	6.03 (0.62)	32.5	
	70		28	5.60 (0.57)	35.0	
	75		30	5.23 (0.53)	37.5	
	80		32	4.90 (0.50)	40.0	
	90		36	4.36 (0.44)	45.0	
	100		40	3.92 (0.40)	50.0	
	125		50	3.14 (0.32)	62.5	
	150		60	2.62 (0.27)	75.0	
	175		70	2.24 (0.23)	87.5	

High Deflection Spring - สปริงยุบตัวได้สูง

ORDER
EXAMPLE

Model D - L
19SSR12.5-050

สปริงสีขาวข้าง
Ivory White Spring
Model: 19SSR



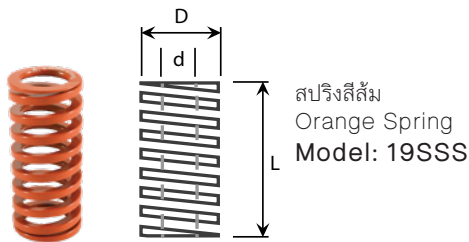
D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					50% Deflection	Load N (kgf)
21	25	13.5	10	23.54 (2.40)	12.5	294.2 (30.0)
	30		12	19.61 (2.00)	15.0	
	35		14	16.81 (1.71)	17.5	
	40		16	14.71 (1.50)	20.0	
	45		18	13.08 (1.33)	22.5	
	50		20	11.77 (1.20)	25.0	
	55		22	10.70 (1.09)	27.5	
	60		24	9.81 (1.00)	30.0	
	65		26	9.05 (0.92)	32.5	
	70		28	8.41 (0.86)	35.0	
	75		30	7.85 (0.80)	37.5	
	80		32	7.35 (0.75)	40.0	
	90		36	6.54 (0.67)	45.0	
	100		40	5.88 (0.60)	50.0	
	110		44	5.35 (0.55)	55.0	
	120		48	4.90 (0.50)	60.0	
	125		50	4.71 (0.48)	62.5	
	130		52	4.53 (0.46)	65.0	
	140		56	4.20 (0.43)	70.0	
	150		60	3.92 (0.40)	75.0	
26	175	16.5	70	3.36 (0.34)	87.5	392.3 (40.0)
	200		80	2.94 (0.30)	100.0	
	25		10	31.38 (3.20)	12.5	
	30		12	26.15 (2.67)	15.0	
	35		14	22.42 (2.29)	17.5	
	40		16	19.61 (2.00)	20.0	
	45		18	17.43 (1.78)	22.5	
	50		20	15.69 (1.60)	25.0	
	55		22	14.26 (1.45)	27.5	
	60		24	13.08 (1.33)	30.0	
	65		26	12.07 (1.23)	32.5	
	70		28	11.21 (1.14)	35.0	
	75		30	10.46 (1.07)	37.5	
	80		32	9.81 (1.00)	40.0	
	90		36	8.72 (0.89)	45.0	
	100		40	7.85 (0.80)	50.0	
	110		44	7.13 (0.73)	55.0	
	120		48	6.54 (0.67)	60.0	
	125		50	6.28 (0.64)	62.5	
	130		52	6.03 (0.62)	65.0	
31	140	21	56	5.60 (0.57)	70.0	490.3 (50.0)
	150		60	5.23 (0.53)	75.0	
	175		70	4.48 (0.46)	87.5	
	200		80	3.92 (0.40)	100.0	
	225		90	3.49 (0.36)	112.5	
	250		100	3.14 (0.32)	125.0	
	35		14	28.02 (2.86)	17.5	
	40		16	24.52 (2.50)	20.0	
	45		18	21.79 (2.22)	22.5	
	50		20	19.61 (2.00)	25.0	
	55		22	17.83 (1.82)	27.5	
	60		24	16.34 (1.67)	30.0	
	65		26	15.09 (1.54)	32.5	
	70		28	14.01 (1.43)	35.0	
	75		30	13.08 (1.33)	37.5	
	80		32	12.26 (1.25)	40.0	
	90		36	10.90 (1.11)	45.0	
	100		40	9.81 (1.00)	50.0	
	110		44	8.92 (0.91)	55.0	
	120		48	8.17 (0.83)	60.0	
	125		50	7.85 (0.80)	62.5	
31	130		52	7.54 (0.77)	65.0	
	140		56	7.00 (0.71)	70.0	
	150		60	6.54 (0.67)	75.0	

D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					50% Deflection	Load N (kgf)
31	160	21	67	6.13 (0.63)	80.0	490.3 (50.0)
	170		68	5.77 (0.59)	85.0	
	175		70	5.60 (0.57)	87.5	
	180		72	5.45 (0.56)	90.0	
	190		76	5.16 (0.53)	95.0	
	200		80	4.90 (0.50)	100.0	
	250		100	3.92 (0.40)	125.0	
	300		120	3.27 (0.33)	150.0	
	35		14	33.62 (3.43)	17.5	
	40		16	29.42 (3.00)	20.0	
39	45	26	18	26.15 (2.67)	22.5	588.4 (60.0)
	50		20	23.54 (2.40)	25.0	
	55		22	21.40 (2.18)	27.5	
	60		24	19.61 (2.00)	30.0	
	65		26	18.10 (1.85)	32.5	
	70		28	16.81 (1.71)	35.0	
	75		30	15.69 (1.60)	37.5	
	80		32	14.71 (1.50)	40.0	
	90		36	13.08 (1.33)	45.0	
	100		40	11.77 (1.20)	50.0	
46	110	33	44	10.70 (1.09)	55.0	1079 (110)
	120		48	9.81 (1.00)	60.0	
	125		50	9.41 (0.96)	62.5	
	130		52	9.05 (0.92)	65.0	
	140		56	8.41 (0.86)	70.0	
	150		60	7.85 (0.80)	75.0	
	160		64	7.35 (0.75)	80.0	
	170		68	6.92 (0.71)	85.0	
	175		70	6.72 (0.69)	87.5	
	180		72	6.54 (0.67)	90.0	
46	190	33	76	6.19 (0.63)	95.0	1079 (110)
	200		80	5.88 (0.60)	100.0	
	250		100	4.71 (0.48)	125.0	
	300		120	3.92 (0.40)	150.0	
	50		20	43.15 (4.40)	25.0	
	60		24	35.96 (3.67)	30.0	
	70		28	30.82 (3.14)	35.0	
	80		32	26.97 (2.75)	40.0	
	90		36	23.97 (2.44)	45.0	
	100		40	21.57 (2.20)	50.0	
46	110	33	44	19.61 (2.00)	55.0	1079 (110)
	120		48	17.98 (1.83)	60.0	
	125		50	17.26 (1.76)	62.5	
	130		52	16.60 (1.69)	65.0	
	140		56	15.41 (1.57)	70.0	
	150		60	14.38 (1.47)	75.0	
	175		70	12.33 (1.26)	87.5	
	200		80	10.79 (1.10)	100.0	
	225		90	9.59 (0.98)	112.5	
	250		100	8.63 (0.88)	125.0	
46	275	33	110	7.85 (0.80)	137.5	1079 (110)
	300		120	7.19 (0.73)	150.0	

Die Springs

สปริงแม่พิมพ์

Medium Deflection Spring - สปริงยวบตัวได้ปานกลาง



แรงกด Load +20% -10%

ความได้ฉาก Perpendicularity 3° or less

ระยะเพื่อความยาว Free Length ±2%

ORDER
EXAMPLE

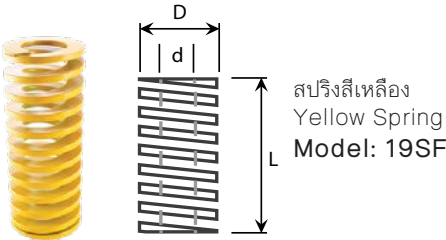
Model D - L
19SSS21-050

SAE9245
JIS Standard

D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					40% Deflection	Load N (kgf)
17	30	10.5	15.0	24.52 (2.50)	12	294.2 (30.0)
	40		20.0	18.39 (1.88)	16	
	50		25.0	14.71 (1.50)	20	
	60		30.0	12.26 (1.25)	24	
	70		35.0	10.51 (1.07)	28	
	80		40.0	9.19 (0.94)	32	
	90		45.0	8.17 (0.83)	36	
	100		50.0	7.35 (0.75)	40	
21	30	13.5	15.0	35.17 (3.59)	12	422.0 (43.0)
	40		20.0	26.38 (2.69)	16	
	50		25.0	21.10 (2.15)	20	
	60		30.0	17.58 (1.79)	24	
	70		35.0	15.07 (1.54)	28	
	80		40.0	13.19 (1.34)	32	
	90		45.0	11.72 (1.20)	36	
	100		50.0	10.55 (1.08)	40	
26	30	16.5	15.0	47.42 (4.84)	12	569.0 (58.0)
	40		20.0	35.56 (3.63)	16	
	50		25.0	28.45 (2.90)	20	
	60		30.0	23.71 (2.42)	24	
	70		35.0	20.32 (2.07)	28	
	80		40.0	17.78 (1.81)	32	
	90		45.0	15.81 (1.61)	36	
	100		50.0	14.23 (1.45)	40	
31	110	21	55.0	9.59 (0.98)	44	784.0 (79.9)
	125		62.5	8.44 (0.86)	50	
	150		75.0	7.35 (0.75)	60	
	175		87.5	6.46 (0.66)	70	
	200		100.0	5.79 (0.59)	80	
	225		112.5	5.21 (0.53)	90	
	250		125.0	4.72 (0.48)	100	
	275		137.5	4.31 (0.44)	110	
37	30	26	15.0	62.50 (6.40)	12	834.0 (85.0)
	40		20.0	46.88 (4.78)	16	
	50		25.0	37.50 (3.85)	20	
	60		30.0	31.25 (3.18)	24	
	70		35.0	26.67 (2.73)	28	
	80		40.0	23.13 (2.36)	32	
	90		45.0	20.00 (2.04)	36	
	100		50.0	17.50 (1.78)	40	
46	110	33	55.0	15.45 (1.57)	44	1275 (130)
	125		62.5	13.64 (1.39)	50	
	150		75.0	11.43 (1.17)	60	
	175		87.5	10.00 (1.02)	70	
	200		100.0	8.93 (0.91)	80	
	225		112.5	8.00 (0.82)	90	
	250		125.0	7.27 (0.74)	100	
	275		137.5	6.67 (0.68)	110	

D	L	d	Solid Length	Spring Constant N/mm (kgf/mm)	1,000,000 times	
					40% Deflection	Load N (kgf)
31	40	21	20.0	49.00 (5.00)	16	784.0 (79.9)
	50		25.0	39.20 (4.00)	20	
	60		30.0	32.67 (3.33)	24	
	70		35.0	28.00 (2.86)	28	
	80		40.0	24.50 (2.50)	32	
	90		45.0	21.78 (2.22)	36	
	100		50.0	19.60 (2.00)	40	
	110		55.0	17.82 (1.82)	44	
37	125	26	62.5	15.68 (1.60)	50	834.0 (85.0)
	150		75.0	13.07 (1.33)	60	
	175		87.5	11.20 (1.14)	70	
	200		100.0	9.80 (1.00)	80	
	225		112.5	8.73 (0.89)	90	
	250		125.0	7.86 (0.80)	100	
	275		137.5	7.14 (0.73)	110	
	300		150.0	6.53 (0.67)	120	
46	40	33	20.0	52.13 (5.32)	16	1275 (130)
	50		25.0	41.70 (4.25)	20	
	60		30.0	34.75 (3.54)	24	
	70		35.0	29.79 (3.04)	28	
	80		40.0	26.06 (2.66)	32	
	90		45.0	23.17 (2.36)	36	
	100		50.0	20.85 (2.13)	40	
	110		55.0	18.95 (1.93)	44	
56	125	40	62.5	16.68 (1.70)	50	1680 (170)
	150		75.0	13.90 (1.42)	60	
	175		87.5	11.91 (1.21)	70	
	200		100.0	10.43 (1.06)	80	
	225		112.5	9.38 (0.96)	90	
	250		125.0	8.46 (0.87)	100	
	275		137.5	7.66 (0.78)	110	
	300		150.0	6.96 (0.71)	120	

Lightest Load Spring - สปริงรับแรงกดที่มีค่าน้อยมาก



- แรงกด Load ±10%
- ความได้ฉาก Perpendicularity 2° or less
- ระยะเพื่อความยาว Free Length ≤ 50 ±0.5mm ≥ 55 ±1

ORDER
EXAMPLE

Model D - L
19SF25-050

- SAE9245
- JIS Standard

D	L	d	Spring Constant (kg/mm)	300,000 times		500,000 times		1,000,000 times	
				50% Deflection	Load N (kgf)	45% Deflection	Load N (kgf)	40% Deflection	Load N (kgf)
6	15	3	0.80	7.5	59 (6)	6.8	53 (5.4)	6.0	47 (4.8)
	20		0.60	10.0		9.0		8.0	
	25		0.48	12.5		11.3		10.0	
	30		0.40	15.0		13.5		12.0	
	35		0.34	17.5		15.8		14.0	
	40		0.30	20.0		18.0		16.0	
	45		0.27	22.5		20.3		18.0	
	50		0.24	25.0		22.5		20.0	
	55		0.22	27.5		24.8		22.0	
	60		0.20	30.0		27.0		24.0	
8	10	4	1.56	5.0	79 (8)	4.5	71 (7.2)	4.0	63 (6.4)
	15		1.04	7.5		6.8		6.0	
	20		0.78	10.0		9.0		8.0	
	25		0.62	12.5		11.2		10.0	
	30		0.52	15.0		13.5		12.0	
	35		0.44	17.5		15.7		14.0	
	40		0.39	20.0		18.0		16.0	
	45		0.35	22.5		20.2		18.0	
	50		0.31	25.0		22.5		20.0	
	55		0.28	27.5		24.7		22.0	
	60		0.26	30.0		27.0		24.0	
	65		0.24	32.5		29.2		26.0	
	70		0.22	35.0		31.5		28.0	
	75		0.21	37.5		33.7		30.0	
10	80	5	0.20	40.0	98 (10)	36.0	88 (9)	32.0	78 (8)
	90		0.17	45.0		40.5		36.0	
	100		0.16	50.0		45.0		40.0	
	10		2.00	5.0		4.5		4.0	
	15		1.32	7.5		6.8		6.0	
	20		1.00	10.0		9.0		8.0	
	25		0.80	12.5		11.2		10.0	
	30		0.67	15.0		13.5		12.0	
	35		0.57	17.5		15.7		14.0	
	40		0.50	20.0		18.0		16.0	
	45		0.44	22.5		20.2		18.0	
	50		0.40	25.0		22.5		20.0	
	55		0.36	27.5		24.7		22.0	
	60		0.33	30.0		27.0		24.0	
	65		0.31	32.5		29.2		26.0	
	70		0.29	35.0		31.5		28.0	
	75		0.27	37.5		33.7		30.0	
	80		0.25	40.0		36.0		32.0	
	90		0.22	45.0		40.5		36.0	
	100		0.20	50.0		45.0		40.0	
	125		0.16	62.5		56.2		50.0	

Die Springs

Lightest Load Spring - สปริงรับแรงกดที่มีค่าน้อยมาก

ORDER
EXAMPLE

Model D - L
19SF25-050

สปริงสีเหลือง
Yellow Spring
Model: 19SF



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				50% Deflection	Load N (kgf)	45% Deflection	Load N (kgf)	40% Deflection	Load N (kgf)
12	20	6	1.40	10.0	137 (14)	9.0	124 (13)	8.0	110 (11)
	25		1.12	12.5		11.2		10.0	
	30		0.93	15.0		13.5		12.0	
	35		0.80	17.5		15.7		14.0	
	40		0.70	20.0		18.0		16.0	
	45		0.62	22.5		20.2		18.0	
	50		0.56	25.0		22.5		20.0	
	55		0.51	27.5		24.7		22.0	
	60		0.47	30.0		27.0		24.0	
	65		0.43	32.5		29.2		26.0	
	70		0.40	35.0		31.5		28.0	
	75		0.37	37.5		33.7		30.0	
	80		0.35	40.0		36.0		32.0	
	90		0.31	45.0		40.5		36.0	
	100		0.28	50.0		45.0		40.0	
14	20	7	1.78	10.0	177 (18)	9.0	159 (16)	8.0	141 (14)
	25		1.44	12.5		11.2		10.0	
	30		1.20	15.0		13.5		12.0	
	35		1.03	17.5		15.7		14.0	
	40		0.90	20.0		18.0		16.0	
	45		0.80	22.5		20.2		18.0	
	50		0.72	25.0		22.5		20.0	
	55		0.65	27.5		24.7		22.0	
	60		0.60	30.0		27.0		24.0	
	65		0.55	32.5		29.2		26.0	
	70		0.51	35.0		31.5		28.0	
	75		0.48	37.5		33.7		30.0	
	80		0.45	40.0		36.0		32.0	
	90		0.40	45.0		40.5		36.0	
	100		0.36	50.0		45.0		40.0	
16	20	8	2.11	10.0	206 (21)	9.0	185 (19)	8.0	165 (17)
	25		1.68	12.5		11.2		10.0	
	30		1.40	15.0		13.5		12.0	
	35		1.20	17.5		15.7		14.0	
	40		1.05	20.0		18.0		16.0	
	45		0.94	22.5		20.2		18.0	
	50		0.84	25.0		22.5		20.0	
	55		0.77	27.5		24.7		22.0	
	60		0.70	30.0		27.0		24.0	
	65		0.65	32.5		29.2		26.0	
	70		0.60	35.0		31.5		28.0	
	75		0.56	37.5		33.7		30.0	
	80		0.53	40.0		36.0		32.0	
	90		0.47	45.0		40.5		36.0	
	100		0.42	50.0		45.0		40.0	
18	20	9	2.56	10.0	255 (26)	9.0	229 (23)	8.0	204 (21)
	25		2.08	12.5		11.2		10.0	
	30		1.74	15.0		13.5		12.0	
	35		1.49	17.5		15.7		14.0	
	40		1.30	20.0		18.0		16.0	
	45		1.16	22.5		20.2		18.0	
	50		1.04	25.0		22.5		20.0	
	55		0.95	27.5		24.7		22.0	
	60		0.87	30.0		27.0		24.0	
	65		0.80	32.5		29.2		26.0	
	70		0.74	35.0		31.5		28.0	
	75		0.70	37.5		33.7		30.0	
	80		0.65	40.0		36.0		32.0	
	90		0.58	45.0		40.5		36.0	
	100		0.52	50.0		45.0		40.0	
18	125		0.42	62.5		56.2		50.0	
	150		0.34	75.0		67.5		60.0	

Die Springs

Lightest Load Spring - สปริงรับแรงกดที่มีค่าน้อยมาก

ORDER
EXAMPLE

Model D - L
19SF25-050

สปริงสีเหลือง
Yellow Spring
Model: 19SF



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				50% Deflection	Load N (kgf)	45% Deflection	Load N (kgf)	40% Deflection	Load N (kgf)
20	20	11	3.22	10.0	314 (32)	9.0	282 (29)	8.0	251 (26)
	25		2.56	12.5		11.2		10.0	
	30		2.13	15.0		13.5		12.0	
	35		1.83	17.5		15.7		14.0	
	40		1.60	20.0		18.0		16.0	
	45		1.42	22.5		20.2		18.0	
	50		1.28	25.0		22.5		20.0	
	55		1.16	27.5		24.7		22.0	
	60		1.07	30.0		27.0		24.0	
	65		0.98	32.5		29.2		26.0	
	70		0.91	35.0		31.5		28.0	
	75		0.85	37.5		33.7		30.0	
	80		0.80	40.0		36.0		32.0	
	90		0.71	45.0		40.5		36.0	
	100		0.64	50.0		45.0		40.0	
	125		0.51	62.5		56.2		50.0	
	150		0.43	75.0		67.5		60.0	
	175		0.37	87.5		78.7		70.0	
22	25	11	3.20	12.5	392 (40)	11.2	353 (36)	10.0	314 (32)
	30		2.67	15.0		13.5		12.0	
	35		2.29	17.5		15.7		14.0	
	40		2.00	20.0		18.0		16.0	
	45		1.78	22.5		20.2		18.0	
	50		1.60	25.0		22.5		20.0	
	55		1.46	27.5		24.7		22.0	
	60		1.33	30.0		27.0		24.0	
	65		1.23	32.5		29.2		26.0	
	70		1.14	35.0		31.5		28.0	
	75		1.07	37.5		33.7		30.0	
	80		1.00	40.0		36.0		32.0	
	90		0.89	45.0		40.5		36.0	
	100		0.80	50.0		45.0		40.0	
	125		0.64	62.5		56.2		50.0	
	150		0.53	75.0		67.5		60.0	
	175		0.46	87.5		78.7		70.0	
25	25	13.5	4.00	12.5	490 (50)	11.2	441 (45)	10.0	392 (40)
	30		3.33	15.0		13.5		12.0	
	35		2.85	17.5		15.7		14.0	
	40		2.50	20.0		18.0		16.0	
	45		2.22	22.5		20.2		18.0	
	50		2.00	25.0		22.5		20.0	
	55		1.82	27.5		24.7		22.0	
	60		1.67	30.0		27.0		24.0	
	65		1.54	32.5		29.2		26.0	
	70		1.43	35.0		31.5		28.0	
	75		1.33	37.5		33.7		30.0	
	80		1.25	40.0		36.0		32.0	
	90		1.11	45.0		40.5		36.0	
	100		1.00	50.0		45.0		40.0	
	125		0.80	62.5		56.2		50.0	
	150		0.67	75.0		67.5		60.0	
	175		0.57	87.5		78.7		70.0	
	200		0.50	100.0		90.0		80.0	
27	25	13.5	4.80	12.5	588 (60)	11.2	530 (54)	10.0	471 (48)
	30		4.00	15.0		13.5		12.0	
	35		3.43	17.5		15.7		14.0	
	40		3.00	20.0		18.0		16.0	
	45		2.67	22.5		20.2		18.0	
	50		2.40	25.0		22.5		20.0	
	55		2.18	27.5		24.7		22.0	
	60		2.00	30.0		27.0		24.0	
	65		1.85	32.5		29.2		26.0	
	70		1.71	35.0		31.5		28.0	
	75		1.60	37.5		33.7		30.0	
	80		1.50	40.0		36.0		32.0	
	90		1.33	45.0		40.5		36.0	
	100		1.20	50.0		45.0		40.0	
	125		0.96	62.5		56.2		50.0	
	150		0.80	75.0		67.5		60.0	
	175		0.96	87.5		78.7		70.0	
	200		0.60	100.0		90.0		80.0	

Die Springs

Lightest Load Spring - สปริงรับแรงกดที่มีค่าน้อยมาก

ORDER Model D - L สปริงสีเหลือง
EXAMPLE 19SF25-050 Yellow Spring
Model: 19SF



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				50% Deflection	Load N (kgf)	45% Deflection	Load N (kgf)	40% Deflection	Load N (kgf)
30	25	16	5.80	12.5	760 (72)	11.2	635 (65)	10.0	565 (58)
	30		4.83	15.0		13.5		12.0	
	35		4.13	17.5		15.7		14.0	
	40		3.60	20.0		18.0		16.0	
	45		3.21	22.5		20.2		18.0	
	50		2.88	25.0		22.5		20.0	
	55		2.63	27.5		24.7		22.0	
	60		2.40	30.0		27.0		24.0	
	65		2.22	32.5		29.2		26.0	
	70		2.05	35.0		31.5		28.0	
	75		1.93	37.5		33.7		30.0	
	80		1.80	40.0		36.0		32.0	
	90		1.60	45.0		40.5		36.0	
	100		1.44	50.0		45.0		40.0	
	125		1.15	62.5		56.2		50.0	
	150		0.96	75.0		67.5		60.0	
35	175	19	0.82	87.5	768 (78)	78.7	864 (88)	70.0	768 (78)
	200		0.72	100.0		90.0		80.0	
	35		5.60	17.5		15.7		14.0	
	40		4.90	20.0		18.0		16.0	
	45		4.36	22.5		20.2		18.0	
	50		3.92	25.0		22.5		20.0	
	55		3.56	27.5		24.7		22.0	
	60		3.26	30.0		27.0		24.0	
	65		3.02	32.5		29.2		26.0	
	70		2.80	35.0		31.5		28.0	
	75		2.61	37.5		33.7		30.0	
	80		2.45	40.0		36.0		32.0	
40	90	22	2.17	45.0	1254 (128)	40.5	1129 (115)	36.0	1003 (102)
	100		1.96	50.0		45.0		40.0	
	125		1.57	62.5		56.2		50.0	
	150		1.30	75.0		67.5		60.0	
	175		1.12	87.5		78.7		70.0	
	200		0.98	100.0		90.0		80.0	
	40		6.38	20.0		18.0		16.0	
	45		5.67	22.5		20.2		18.0	
	50		5.12	22.5		22.5		20.0	
	55		4.64	27.5		24.7		22.0	
	60		4.26	30.0		27.0		24.0	
	65		3.93	32.5		29.2		26.0	
	70		3.65	35.0		31.5		28.0	
	75		3.40	37.5		33.7		30.0	
	80		3.20	40.0		36.0		32.0	
	90		2.84	45.0		40.5		36.0	
	100		2.56	50.0		45.0		40.0	
	125		2.04	62.5		56.2		50.0	
	150		1.70	75.0		67.5		60.0	
	175		1.46	87.5		78.7		70.0	
	200		1.28	100.0		90.0		80.0	
	225		1.13	112.5		101.2		90.0	
	250		1.02	125.0		112.5		100.0	
	275		0.93	137.5		123.7		110.0	
	300		0.85	150.0		135.0		120.0	

Die Springs

Lightest Load Spring - สปริงรับแรงกดที่มีค่าน้อยมาก

ORDER
EXAMPLE

Model D - L
19SF25-050

สปริงสีเหลือง
Yellow Spring
Model: 19SF

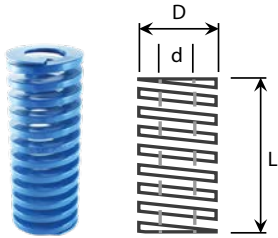


D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				50% Deflection	Load N (kgf)	45% Deflection	Load N (kgf)	40% Deflection	Load N (kgf)
50	50	27.5	8.00	25.0	1960 (200)	22.5	1764 (180)	20.0	1568 (160)
	55		7.27	27.5		24.7		22.0	
	60		6.66	30.0		27.0		24.0	
	65		6.15	32.5		29.2		26.0	
	70		5.71	35.0		31.5		28.0	
	75		5.33	37.5		33.7		30.0	
	80		5.00	40.0		36.0		32.0	
	90		4.44	45.0		40.5		36.0	
	100		4.00	50.0		45.0		40.0	
	125		3.20	62.5		56.2		50.0	
	150		2.66	75.0		67.5		60.0	
	175		2.28	87.5		78.7		70.0	
	200		2.00	100.0		90.0		80.0	
	225		1.78	112.5		101.2		90.0	
	250		1.60	125.0		112.5		100.0	
	275		1.45	137.5		123.7		110.0	
	300		1.33	150.0		135.0		120.0	
	350		1.14	175.0		157.5		140.0	
	400		1.00	200.0		180.0		160.0	
	450		0.89	225.0		202.5		180.0	
	500		0.80	250.0		225.0		200.0	
60	60	33	9.59	30.0	2820 (288)	27.0	2538 (259)	24.0	2256 (230)
	70		8.22	35.0		31.5		28.0	
	80		7.19	40.0		36.0		32.0	
	90		6.40	45.0		40.5		36.0	
	100		5.76	50.0		45.0		40.0	
	125		4.60	62.5		56.2		50.0	
	150		3.84	75.0		67.5		60.0	
	175		3.29	87.5		78.7		70.0	
	200		2.88	100.0		90.0		80.0	
	225		2.56	112.5		101.3		90.0	
	250		2.30	125.0		112.5		100.0	
	275		2.09	137.5		123.8		110.0	
	300		1.92	150.0		135.0		120.0	
	350		1.65	175.0		157.5		140.0	
	400		1.44	200.0		180.0		160.0	
	450		1.28	225.0		202.5		180.0	
	500		1.15	250.0		225.0		200.0	
70	70	38.5	11.43	35.0	3920 (400)	31.5	3528 (360)	28.0	3136 (320)
	80		10.00	40.0		36.0		32.0	
	90		8.89	45.0		40.5		36.0	
	100		8.00	50.0		45.0		40.0	
	125		6.40	62.5		56.2		50.0	
	150		5.33	75.0		67.5		60.0	
	175		4.57	87.5		78.7		70.0	
	200		4.00	100.0		90.0		80.0	
	225		3.56	112.5		101.3		90.0	
	250		3.20	125.0		112.5		100.0	
	275		2.91	137.5		123.8		110.0	
	300		2.67	150.0		135.0		120.0	
	350		2.29	175.0		157.5		140.0	

Die Springs

สปริงแม่พิมพ์

Light Load Spring - สปริงรับแรงกดที่มีค่าน้อย



สปริงสีน้ำเงิน
Blue Spring
Model: 19SL



แรงกด Load ±10%

ความได้ฉาก Perpendicularity 2° or less

ระยะเผื่อความยาว Free Length ≤ 50 ±0.5mm
≥ 55 ±1

ORDER EXAMPLE Model D - L 19SL25-050

SAE9245

JIS Standard

D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				40% Deflection	Load N (kgf)	36% Deflection	Load N (kgf)	32% Deflection	Load N (kgf)
6	15	3	1.33	6.0	78 (8)	5.4	71 (7.2)	4.8	63 (64)
	20		1.00	8.0		7.2		6.4	
	25		0.80	10.0		9.0		8.0	
	30		0.67	12.0		10.8		9.6	
	35		0.57	14.0		12.6		11.2	
	40		0.50	16.0		14.4		12.8	
	45		0.44	18.0		16.2		14.4	
	50		0.40	20.0		18.0		16.0	
	55		0.36	22.0		19.8		17.6	
	60		0.33	24.0		21.6		19.2	
8	10	4	2.50	40.0	98 (10)	3.6	88 (9)	3.2	78 (8)
	15		1.67	6.0		5.4		4.8	
	20		1.25	8.0		7.2		6.4	
	25		1.00	10.0		9.0		8.0	
	30		0.83	12.0		10.8		9.6	
	35		0.71	14.0		12.6		11.2	
	40		0.63	16.0		14.4		12.8	
	45		0.56	18.0		16.2		14.4	
	50		0.50	20.0		18.0		16.0	
	55		0.46	22.0		19.8		17.6	
	60		0.42	24.0		21.6		19.2	
	65		0.38	26.0		23.4		20.8	
	70		0.36	28.0		25.2		22.4	
	75		0.33	30.0		27.0		24.0	
	80		0.31	32.0		28.8		25.6	
	90		0.28	36.0		32.4		28.8	
	100		0.25	40.0		36.0		32.0	
10	10	5	3.61	4.0	137 (14)	3.6	124 (13)	3.2	110 (11)
	15		2.41	6.0		5.4		4.8	
	20		1.81	8.0		7.2		6.4	
	25		1.45	10.0		9.0		8.0	
	30		1.21	12.0		10.8		9.6	
	35		1.03	14.0		12.6		11.2	
	40		0.90	16.0		14.4		12.8	
	45		0.80	18.0		16.2		14.4	
	50		0.73	20.0		18.0		16.0	
	55		0.66	22.0		19.8		17.6	
	60		0.60	24.0		21.6		19.2	
	65		0.55	26.0		23.4		20.8	
	70		0.51	28.0		25.2		22.4	
	75		0.48	30.0		27.0		24.0	
	80		0.45	32.0		28.8		25.6	
	90		0.40	36.0		32.4		28.8	
	100		0.36	40.0		36.0		32.0	
	125		0.28	50.0		45.0		40.0	

Die Springs

Light Load Spring - สปริงรับแรงกดที่มีค่าน้อย

ORDER
EXAMPLE

Model D - L
19SL25-050

สปริงสีน้ำเงิน
Blue Spring
Model: 19SL



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				40% Deflection	Load N (kgf)	36% Deflection	Load N (kgf)	32% Deflection	Load N (kgf)
12	20	6	2.63	8.0	206 (21)	7.2	185 (19)	6.4	165 (17)
	25		2.10	10.0		9.0		8.0	
	30		1.75	12.0		10.8		9.6	
	35		1.50	14.0		12.6		11.2	
	40		1.32	16.0		14.4		12.8	
	45		1.17	18.0		16.2		14.4	
	50		1.05	20.0		18.0		16.0	
	55		0.96	22.0		19.8		17.6	
	60		0.88	24.0		21.6		19.2	
	65		0.81	26.0		23.4		20.8	
	70		0.75	28.0		25.2		22.4	
	75		0.70	30.0		27.0		24.0	
	80		0.66	32.0		28.8		25.6	
	90		0.58	36.0		32.4		28.8	
	100		0.53	40.0		36.0		32.0	
14	125		0.42	50.0		45.0		40.0	
	20	7	3.47	8.0	275 (28)	7.2	247 (25)	6.4	220 (22)
	25		2.80	10.0		9.0		8.0	
	30		3.34	12.0		10.8		9.6	
	35		2.00	14.0		12.6		11.2	
	40		1.75	16.0		14.4		12.8	
	45		1.56	18.0		16.2		14.4	
	50		1.40	20.0		18.0		16.0	
	55		1.27	22.0		19.8		17.6	
	60		1.17	24.0		21.6		19.2	
	65		1.08	26.0		23.4		20.8	
	70		1.00	28.0		25.2		22.4	
	75		0.93	30.0		27.0		24.0	
	80		0.87	32.0		28.8		25.6	
	90		0.77	36.0		32.4		28.8	
	100		0.70	40.0		36.0		32.0	
16	125		0.56	50.0		45.0		40.0	
	20	8	4.44	8.0	343 (35)	7.2	309 (32)	6.4	275 (28)
	25		3.50	10.0		9.0		8.0	
	30		2.92	12.0		10.8		9.6	
	35		2.50	14.0		12.6		11.2	
	40		2.19	16.0		14.4		12.8	
	45		1.95	18.0		16.2		14.4	
	50		1.75	20.0		18.0		16.0	
	55		1.60	22.0		19.8		17.6	
	60		1.46	24.0		21.6		19.2	
	65		1.35	26.0		23.4		20.8	
	70		1.25	28.0		25.2		22.4	
	75		1.17	30.0		27.0		24.0	
	80		1.10	32.0		28.8		25.6	
	90		0.98	36.0		32.4		28.8	
	100		0.88	40.0		36.0		32.0	
	125		0.70	50.0		45.0		40.0	

Die Springs

สปริงแม่พิมพ์

Light Load Spring - สปริงรับแรงกดที่มีค่าน้อย

ORDER
EXAMPLE

Model D - L
19SL25-050

สปริงสีน้ำเงิน
Blue Spring
Model: 19SL

Spring Load Chart
Light < > Heavy



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				40% Deflection	Load N (kgf)	36% Deflection	Load N (kgf)	32% Deflection	Load N (kgf)
18	20	9	5.42	8.0	422 (43)	7.2	380 (39)	6.4	337 (34)
	25		4.30	10.0		9.0		8.0	
	30		3.58	12.0		10.8		9.6	
	35		3.07	14.0		12.6		11.2	
	40		2.69	16.0		14.4		12.8	
	45		2.39	18.0		16.2		14.4	
	50		2.15	20.0		18.0		16.0	
	55		1.96	22.0		19.8		17.6	
	60		1.79	24.0		21.6		19.2	
	65		1.66	26.0		23.4		20.8	
	70		1.54	28.0		25.2		22.4	
	75		1.44	30.0		27.0		24.0	
	80		1.35	32.0		28.8		25.6	
	90		1.20	36.0		32.4		28.8	
	100		1.07	40.0		36.0		32.0	
20	125		0.86	50.0		45.0		40.0	
	20	10	6.81	8.0	530 (54)	7.2	477 (48)	6.4	424 (43)
	25		5.40	10.0		9.0		8.0	
	30		4.50	12.0		10.8		9.6	
	35		3.86	14.0		12.6		11.2	
	40		3.38	16.0		14.4		12.8	
	45		3.00	18.0		16.2		14.4	
	50		2.70	20.0		18.0		16.0	
	55		2.45	22.0		19.8		17.6	
	60		2.25	24.0		21.6		19.2	
	65		2.08	26.0		23.4		20.8	
	70		1.93	28.0		25.2		22.4	
	75		1.80	30.0		27.0		24.0	
	80		1.69	32.0		28.8		25.6	
	90		1.50	36.0		32.4		28.8	
	100		1.35	40.0		36.0		32.0	
22	125		1.08	50.0		45.0		40.0	
	150		0.90	60.0		54.0		48.0	
	175		0.77	70.0		63.0		56.0	
	25	11	6.70	10.0	657 (67)	9.0	591 (60)	8.0	526 (54)
	30		5.60	12.0		10.8		9.6	
	35		4.80	14.0		12.6		11.2	
	40		4.20	16.0		14.4		12.8	
	45		3.72	18.0		16.2		14.4	
	50		3.35	20.0		18.0		16.0	
	55		3.05	22.0		19.8		17.6	
	60		2.80	24.0		21.6		19.2	
	65		2.58	26.0		23.4		20.8	
	70		2.40	28.0		25.2		22.4	
	75		2.23	30.0		27.0		24.0	
	80		2.10	32.0		28.8		25.6	
	90		1.86	36.0		32.4		28.8	
	100		1.68	40.0		36.0		32.0	
	125		1.34	50.0		45.0		40.0	
	150		1.12	60.0		54.0		48.0	
	175		0.96	70.0		63.0		56.0	

Die Springs

Light Load Spring - สปริงรับแรงกดที่มีค่าน้อย

ORDER
EXAMPLE

Model D - L
19SL25-050

สปริงสีน้ำเงิน
Blue Spring
Model: 19SL



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				40% Deflection	Load N (kgf)	36% Deflection	Load N (kgf)	32% Deflection	Load N (kgf)
25	25	12.5	8.40	10.0	824 (84)	9.0	741 (76)	8.0	659 (67)
	30		7.00	12.0		10.8		9.6	
	35		6.00	14.0		12.6		11.2	
	40		5.25	16.0		14.4		12.8	
	45		4.67	18.0		16.2		14.4	
	50		4.20	20.0		18.0		16.0	
	55		3.82	22.0		19.8		17.6	
	60		3.50	24.0		21.6		19.2	
	65		3.23	26.0		23.4		20.8	
	70		3.00	28.0		25.2		22.4	
	75		2.80	30.0		27.0		24.0	
	80		2.63	32.0		28.8		25.6	
	90		2.33	36.0		32.4		28.8	
	100		2.10	40.0		36.0		32.0	
	125		1.68	50.0		45.0		40.0	
	150		1.40	60.0		54.0		48.0	
27	25	13.5	10.00	10.0	981 (100)	9.0	883 (90)	8.0	785 (80)
	30		8.33	12.0		10.8		9.6	
	35		7.14	14.0		12.6		11.2	
	40		6.25	16.0		14.4		12.8	
	45		5.56	18.0		16.2		14.4	
	50		5.00	20.0		18.0		16.0	
	55		4.55	22.0		19.8		17.6	
	60		4.17	24.0		21.6		19.2	
	65		3.85	26.0		23.4		20.8	
	70		3.57	28.0		25.2		22.4	
	75		3.33	30.0		27.0		24.0	
	80		3.13	32.0		28.8		25.6	
	90		2.78	36.0		32.4		28.8	
	100		2.50	40.0		36.0		32.0	
	125		2.00	50.0		45.0		40.0	
	150		1.67	60.0		54.0		48.0	
30	25	15	12.11	10.0	1186 (121)	9.0	1067 (109)	8.0	949 (97)
	30		10.08	12.0		10.8		9.6	
	35		8.65	14.0		12.6		11.2	
	40		7.56	16.0		14.4		12.8	
	45		6.73	18.0		16.2		14.4	
	50		6.05	20.0		18.0		16.0	
	55		5.50	22.0		19.8		17.6	
	60		5.04	24.0		21.6		19.2	
	65		4.65	26.0		23.4		20.8	
	70		4.32	28.0		25.2		22.4	
	75		4.03	30.0		27.0		24.0	
	80		3.78	32.0		28.8		25.6	
	90		3.36	36.0		32.4		28.8	
	100		3.02	40.0		36.0		32.0	
	125		2.42	50.0		45.0		40.0	
	150		2.01	60.0		54.0		48.0	
	175		1.72	70.0		63.0		56.0	
	200		1.51	80.0		72.0		64.0	

Die Springs

สปริงแม่พิมพ์

Light Load Spring - สปริงรับแรงกดที่มีค่าน้อย

ORDER
EXAMPLE

Model D - L
19SL25-050

สปริงสีน้ำเงิน
Blue Spring
Model: 19SL

Spring Load Chart
Light <  > Heavy



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				40% Deflection	Load N (kgf)	36% Deflection	Load N (kgf)	32% Deflection	Load N (kgf)
35	35	17.5	11.78	14.0	1617 (165)	12.6	1455 (148)	11.2	1294 (132)
	40		10.31	16.0		14.4		12.8	
	45		9.17	18.0		16.2		14.4	
	50		8.25	20.0		18.0		16.0	
	55		7.50	22.0		19.8		17.6	
	60		6.87	24.0		21.6		19.2	
	65		6.35	26.0		23.4		20.8	
	70		5.89	28.01		25.2		22.4	
	75		5.50	30.0		27.0		24.0	
	80		5.15	32.0		28.8		25.6	
	90		4.58	36.0		32.4		28.8	
	100		4.12	40.0		36.0		32.0	
	125		3.30	50.0		45.0		40.0	
	150		2.75	60.0		54.0		48.0	
	175		2.35	70.0		63.0		56.0	
	200		2.06	80.0		72.0		64.0	
40	40	20	13.50	16.0	2117 (216)	14.4	1905 (194)	12.8	1694 (173)
	45		12.00	18.0		16.2		14.4	
	50		10.80	20.0		18.0		16.0	
	55		9.82	22.0		19.8		17.6	
	60		9.00	24.0		21.6		19.2	
	65		8.31	26.0		23.4		20.8	
	70		7.71	28.0		25.2		22.4	
	75		7.20	30.0		27.0		24.0	
	80		6.70	32.0		28.8		25.6	
	90		6.00	36.0		32.4		28.8	
	100		5.40	40.0		36.0		32.0	
	125		4.32	50.0		45.0		40.0	
	150		3.60	60.0		54.0		48.0	
	175		3.08	70.0		63.0		56.0	
	200		2.70	80.0		72.0		64.0	
	225		2.40	90.0		81.0		72.0	
	250		2.16	100.0		90.0		80.0	
	275		1.96	110.0		99.0		88.0	
	300		1.80	120.0		108.0		96.0	
50	50	25	16.89	20.0	3312 (338)	18.0	2981 (304)	16.0	2650 (270)
	55		15.35	22.0		19.8		17.6	
	60		14.08	24.0		21.6		19.2	
	65		12.99	26.0		23.4		20.8	
	70		12.07	28.0		25.2		22.4	
	75		11.26	30.0		27.0		24.0	
	80		10.56	32.0		28.8		25.6	
	90		9.38	36.0		32.4		28.8	
	100		8.45	40.0		36.0		32.0	
	125		6.76	50.0		45.0		40.0	
	150		5.63	60.0		54.0		48.0	
	175		4.82	70.0		63.0		56.0	
	200		4.22	80.0		72.0		64.0	
	225		3.75	90.0		81.0		72.0	
	250		3.38	100.0		90.0		80.0	
	275		3.07	110.0		99.0		88.0	
	300		2.81	120.0		108.0		96.0	
	350		2.41	140.0		126.0		112.0	
	400		2.11	160.0		144.0		128.0	
	450		1.88	180.0		162.0		144.0	
	500		1.69	200.0		180.0		160.0	

Die Springs

Light Load Spring - สปริงรับแรงกดที่มีค่าน้อย

ORDER
EXAMPLE

Model D - L
19SL25-050

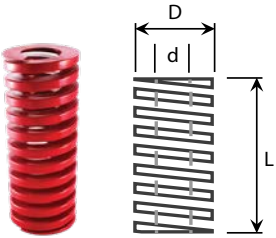
สปริงสีน้ำเงิน
Blue Spring
Model: 19SL



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				40% Deflection	Load N (kgf)	36% Deflection	Load N (kgf)	32% Deflection	Load N (kgf)
60	60	30	20.25	24.0	4770 (486)	21.6	4293 (438)	19.2	3816 (389)*
	70		17.35	28.0		25.2		22.4	
	80		15.18	32.0		28.8		25.6	
	90		13.50	36.0		32.4		28.8	
	100		12.15	40.0		36.0		32.0	
	125		9.72	50.0		45.0		40.0	
	150		8.10	60.0		54.0		48.0	
	175		6.94	70.0		63.0		56.0	
	200		6.07	80.0		72.0		64.0	
	225		5.40	90.0		81.0		72.0	
	250		4.86	100.0		90.0		80.0	
	275		4.42	110.0		99.0		88.0	
	300		4.05	120.0		108.0		96.0	
	350		3.47	140.0		126.0		112.0	
	400		3.04	160.0		144.0		128.0	
	450		2.70	180.0		162.0		144.0	
	500		2.43	200.0		180.0		160.0	
70	70	38.5	21.79	28.0	5978 (610)	25.2	5380 (549)	22.4	4782 (488)
	80		19.06	32.0		28.8		25.6	
	90		16.94	36.0		32.4		28.8	
	100		15.25	40.0		36.0		32.0	
	125		12.20	50.0		45.0		40.0	
	150		10.17	60.0		54.0		48.0	
	175		8.71	70.0		63.0		56.0	
	200		7.62	80.0		72.0		64.0	
	225		6.78	90.0		81.0		72.0	
	250		6.10	100.0		90.0		80.0	
	275		5.55	110.0		99.0		88.0	
	300		5.08	120.0		108.0		96.0	
	350		4.36	140.0		126.0		112.0	

สปริงแม่พิมพ์

Medium Load Spring - สปริงรับแรงกดที่มีค่าปานกลาง



สปริงสีแดง
Red Spring
Model: 19SM



แรงกด Load ±10%

ความได้ฉาก Perpendicularity 2° or less

ระยะเพื่อความยาว Free Length ≤ 50 ±0.5mm
≥ 55 ±1

ORDER EXAMPLE Model D - L 19SM25-050

SAE9245

JIS Standard

D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				32% Deflection	Load N (kgf)	28.8% Deflection	Load N (kgf)	25.6% Deflection	Load N (kgf)
6	15	3	2.08	4.8	98 (10)	4.3	88 (9)	3.8	79 (8)
	20		1.56	6.4		5.8		5.1	
	25		1.25	8.0		7.2		6.4	
	30		1.04	9.6		8.6		7.7	
	35		0.89	11.2		10.1		9.0	
	40		0.78	12.8		11.5		10.2	
	45		0.69	14.4		13.0		11.5	
	50		0.63	16.0		14.4		12.8	
	55		0.57	17.6		15.8		14.1	
	60		0.52	19.2		17.3		15.4	
8	10	4	4.34	3.2	137 (14)	2.9	123 (13)	2.6	110 (11)
	15		2.89	4.8		4.3		3.8	
	20		2.17	6.4		5.8		5.1	
	25		1.74	8.0		7.2		6.4	
	30		1.45	9.6		8.6		7.7	
	35		1.24	11.2		10.1		9.0	
	40		1.09	12.8		11.5		10.2	
	45		0.97	14.4		13.0		11.5	
	50		0.87	16.0		14.4		12.8	
	55		0.79	17.6		15.8		14.1	
	60		0.72	19.2		17.3		15.4	
	65		0.67	20.8		18.7		16.6	
	70		0.62	22.4		20.2		17.9	
	75		0.58	24.0		21.6		19.2	
	80		0.54	25.6		23.0		20.5	
	90		0.48	28.8		25.9		23.0	
	100		0.44	32.0		28.8		25.6	
10	10	5	6.21	3.2	196 (20)	2.9	176 (18)	2.6	157 (16)
	15		4.09	4.8		4.4		3.8	
	20		3.13	6.4		5.8		5.1	
	25		2.50	8.0		7.2		6.4	
	30		2.08	9.6		8.6		7.7	
	35		1.78	11.2		10.1		9.0	
	40		1.56	12.8		11.5		10.2	
	45		1.38	14.4		13.0		11.5	
	50		1.25	16.0		14.4		12.8	
	55		1.13	17.6		15.8		14.1	
	60		1.04	19.2		17.3		15.4	
	65		0.96	20.8		18.7		16.6	
	70		0.89	22.4		20.2		17.9	
	75		0.83	24.0		21.6		19.2	
	80		0.78	25.6		23.0		20.5	
	90		0.70	28.8		25.9		23.0	
	100		0.63	32.0		28.8		25.6	
	125		0.50	40.0		36.0		32.0	

Medium Load Spring - สปริงรับแรงกดที่มีค่าปานกลาง

ORDER
EXAMPLE

Model D - L
19SM25-050

สปริงสีแดง
Red Spring
Model: 19SM



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				32% Deflection	Load N (kgf)	28.8% Deflection	Load N (kgf)	25.6% Deflection	Load N (kgf)
12	20	6	4.53	6.4	284 (29)	5.8	256 (26)	5.1	227 (23)
	25		3.62	8.0		7.2		6.4	
	30		3.02	9.6		8.6		7.7	
	35		2.58	11.2		10.1		9.0	
	40		2.27	12.8		11.5		10.2	
	45		2.01	14.4		13.0		11.5	
	50		1.81	16.0		14.4		12.8	
	55		1.64	17.6		15.8		14.1	
	60		1.51	19.2		17.3		15.4	
	65		1.39	20.8		18.7		16.6	
	70		1.29	22.4		20.2		17.9	
	75		1.20	24.0		21.6		19.2	
	80		1.13	25.6		23.0		20.5	
	90		1.01	28.8		25.9		23.0	
	100		0.91	32.0		28.8		25.6	
	125		0.72	40.4		36.0		32.0	
14	20	7	6.03	6.4	383 (39)	5.8	345 (35)	5.1	306 (31)
	25		4.87	8.0		7.2		6.4	
	30		4.06	9.6		8.6		7.7	
	35		3.48	11.2		10.1		9.0	
	40		3.04	12.8		11.5		10.2	
	45		2.70	14.4		13.0		11.5	
	50		2.43	16.0		14.4		12.8	
	55		2.21	17.6		15.8		14.1	
	60		2.03	19.2		17.3		15.4	
	65		1.87	20.8		18.7		16.6	
	70		1.74	22.4		20.2		17.9	
	75		1.62	24.0		21.6		19.2	
	80		1.52	25.6		23.0		20.5	
	90		1.35	28.8		25.9		23.0	
	100		1.22	32.0		28.8		25.6	
	125		0.97	40.0		36.0		32.0	
16	20	8	7.93	6.4	500 (51)	5.8	450 (46)	5.1	400 (41)
	25		6.39	8.0		7.2		6.4	
	30		5.32	9.6		8.6		7.7	
	35		4.55	11.2		10.1		9.0	
	40		3.98	12.8		11.5		10.2	
	45		3.54	14.4		13.0		11.5	
	50		3.18	16.0		14.4		12.8	
	55		2.89	17.6		15.8		14.1	
	60		2.65	19.2		17.3		15.4	
	65		2.45	20.8		18.7		16.6	
	70		2.27	22.4		20.2		17.9	
	75		2.11	24.0		21.6		19.2	
	80		1.99	25.6		23.0		20.5	
	90		1.77	28.8		25.9		23.0	
	100		1.59	32.0		28.8		25.6	
	125		1.28	40.0		36.0		32.0	

Die Springs

สปริงแม่พิมพ์

Medium Load Spring - สปริงรับแรงกดที่มีค่าปานกลาง

ORDER
EXAMPLE

Model D - L
19SM25-050

สปริงสีแดง
Red Spring
Model: 19SM



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				32% Deflection	Load N (kgf)	28.8% Deflection	Load N (kgf)	25.6% Deflection	Load N (kgf)
18	20	9	10.00	6.4	637 (65)	5.8	574 (59)	5.1	510 (52)
	25		8.12	8.0		7.2		6.4	
	30		6.77	9.6		8.6		7.7	
	35		5.80	11.2		10.1		9.0	
	40		5.07	12.8		11.5		10.2	
	45		4.51	14.4		13.0		11.5	
	50		4.06	16.0		14.4		12.8	
	55		3.69	17.6		15.8		14.1	
	60		3.38	19.2		17.3		15.4	
	65		3.12	20.8		18.7		16.6	
	70		2.90	22.4		20.2		17.9	
	75		2.70	24.0		21.6		19.2	
	80		2.53	25.6		23.0		20.5	
	90		2.25	28.8		25.9		23.0	
	100		2.02	32.0		28.8		25.6	
	125		1.62	40.0		36.0		32.0	
20	20	10	12.41	6.4	784 (80)	5.8	706 (72)	5.1	628 (64)
	25		10.00	8.0		7.2		6.4	
	30		8.33	9.6		8.6		7.7	
	35		7.14	11.2		10.1		9.0	
	40		6.25	12.8		11.5		10.2	
	45		5.55	14.4		13.0		11.5	
	50		5.00	16.0		14.4		12.8	
	55		4.54	17.6		15.8		14.1	
	60		4.16	19.2		17.3		15.4	
	65		3.84	20.8		18.7		16.6	
	70		3.57	22.4		20.2		17.9	
	75		3.33	24.0		21.6		19.2	
	80		3.12	25.6		23.0		20.5	
	90		2.77	28.8		25.9		23.0	
	100		2.50	32.0		28.8		25.6	
	125		2.00	40.0		36.0		32.0	
22	150	11	1.67	48.0	951 (97)	43.2	856 (87)	38.4	761 (78)
	175		1.43	56.0		50.4		44.8	
	25		12.13	8.0		7.2		6.4	
	30		10.10	9.6		8.6		7.7	
	35		8.65	11.2		10.1		9.0	
	40		7.57	12.8		11.5		10.2	
	45		6.74	14.4		13.0		11.5	
	50		6.06	16.0		14.4		12.8	
	55		5.50	17.6		15.8		14.1	
	60		5.05	19.2		17.3		15.4	
	65		4.66	20.8		18.7		16.6	
	70		4.33	22.4		20.2		17.9	
	75		4.04	24.0		21.6		19.2	
	80		3.78	25.6		23.0		20.5	
	90		3.36	28.8		25.9		23.0	
	100		3.03	32.0		28.8		25.6	
	125		2.42	40.0		36.0		32.0	
	150		2.01	48.0		43.2		38.4	
	175		1.73	56.0		50.4		44.8	

Die Springs

Medium Load Spring - สปริงรับแรงกดที่มีค่าปานกลาง

ORDER
EXAMPLE

Model D - L
19SM25-050

สปริงสีแดง
Red Spring
Model: 19SM



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				32% Deflection	Load N (kgf)	28.8% Deflection	Load N (kgf)	25.6% Deflection	Load N (kgf)
25	25	12.5	15.63	8.0	1225 (125)	7.2	1103 (113)	6.4	981 (100)
	30		13.02	9.6		8.6		7.7	
	35		11.20	11.2		10.1		9.0	
	40		9.76	12.8		11.5		10.2	
	45		8.68	14.4		13.0		11.5	
	50		7.81	16.0		14.4		12.8	
	55		7.10	17.6		15.8		14.1	
	60		6.51	19.2		17.3		15.4	
	65		6.00	20.8		18.7		16.6	
	70		5.58	22.4		20.2		17.9	
	75		5.21	24.0		21.6		19.2	
	80		4.88	25.6		23.0		20.5	
	90		4.34	28.8		25.9		23.0	
	100		3.90	32.0		28.8		25.6	
	125		3.12	40.0		36.0		32.0	
	150		2.60	48.0		43.2		38.4	
	175		2.23	56.0		50.4		44.8	
	200		1.95	64.0		57.6		51.2	
27	25	13.5	18.25	8.0	1431 (146)	7.2	1288 (131)	6.4	1145 (117)
	30		15.20	9.6		8.6		7.7	
	35		13.04	11.2		10.1		9.0	
	40		11.40	12.8		11.5		10.2	
	45		10.14	14.4		13.0		11.5	
	50		9.12	16.0		14.4		12.8	
	55		8.30	17.6		15.8		14.1	
	60		7.60	19.2		17.3		15.4	
	65		7.00	20.8		18.7		16.6	
	70		6.51	22.4		20.2		17.9	
	75		6.08	24.0		21.6		19.2	
	80		5.70	25.6		23.0		20.5	
	90		5.06	28.8		25.9		23.0	
	100		4.56	32.0		28.8		25.6	
	125		3.65	40.0		36.0		32.0	
	150		3.04	48.0		43.2		38.4	
	175		2.61	56.0		50.4		44.8	
	200		2.28	64.0		57.6		51.2	
30	25	15	22.50	8.0	1765 (180)	7.2	1589 (162)	6.4	1412 (144)
	30		18.75	9.6		8.6		7.7	
	35		16.10	11.2		10.1		9.0	
	40		14.06	12.8		11.5		10.2	
	45		12.50	14.4		13.0		11.5	
	50		11.25	16.0		14.4		12.8	
	55		10.23	17.6		15.8		14.1	
	60		9.37	19.2		17.3		15.4	
	65		8.65	20.8		18.7		16.6	
	70		8.03	22.4		20.2		17.9	
	75		7.50	24.0		21.6		19.2	
	80		7.03	25.6		23.0		20.5	
	90		6.25	28.8		25.9		23.0	
	100		5.62	32.0		28.8		25.6	
	125		4.50	40.0		36.0		32.0	
	150		3.75	48.0		43.2		38.4	
	175		3.21	56.0		50.4		44.8	
	200		2.81	64.0		57.6		51.2	

Die Springs

สปริงแม่พิมพ์

Medium Load Spring - สปริงรับแรงกดที่มีค่าปานกลาง

ORDER
EXAMPLE

Model D - L
19SM25-050

สปริงสีแดง
Red Spring
Model: 19SM

Spring Load Chart

Light <  > Heavy

OIL FREE™
CORE

D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				32% Deflection	Load N (kgf)	28.8% Deflection	Load N (kgf)	25.6% Deflection	Load N (kgf)
35	35	17.5	21.87	11.2	2401 (245)	10.1	2161 (220)	9.0	1921 (196)
	40		19.14	12.8		11.5		10.2	
	45		17.01	14.4		13.0		11.5	
	50		15.31	16.0		14.4		12.8	
	55		13.92	17.6		15.8		14.1	
	60		12.76	19.2		17.3		15.4	
	65		11.77	20.8		18.7		16.6	
	70		10.93	22.4		20.2		17.9	
	75		10.20	24.0		21.6		19.2	
	80		9.57	25.6		23.0		20.5	
	90		8.50	28.8		25.9		23.0	
	100		7.65	32.0		28.8		25.6	
	125		6.12	40.0		36.0		32.0	
	150		5.10	48.0		43.2		38.4	
	175		4.37	56.0		50.4		44.8	
	200		3.82	64.0		57.6		51.2	
40	40	20	25.02	12.8	3138 (320)	11.5	2824 (288)	10.2	2510 (256)
	45		22.26	14.4		13.0		11.5	
	50		20.00	16.0		14.4		12.8	
	55		18.15	17.6		15.8		14.1	
	60		16.60	19.2		17.3		15.4	
	65		15.40	20.8		18.7		16.6	
	70		14.28	22.4		20.2		17.9	
	75		13.34	24.0		21.6		19.2	
	80		12.50	25.6		23.0		20.5	
	90		11.11	28.8		25.9		23.0	
	100		10.00	32.0		28.8		25.6	
	125		8.00	40.0		36.0		32.0	
	150		6.66	48.0		43.2		38.4	
	175		5.71	56.0		50.4		44.8	
	200		5.00	64.0		57.6		51.2	
	225		4.44	72.0		64.8		57.6	
50	250	25	4.00	80.0	4900 (500)	72.0	4410 (450)	64.0	3920 (400)
	275		3.64	88.0		79.2		70.4	
	300		3.33	96.0		86.4		76.8	
	50		31.25	16.0		14.4		12.8	
	55		28.41	17.6		15.8		14.1	
	60		26.04	19.2		17.3		15.4	
	65		24.04	20.8		18.7		16.6	
	70		22.32	22.4		20.2		17.9	
	75		20.83	24.0		21.6		19.2	
	80		19.53	25.6		23.0		20.5	
	90		17.36	28.8		25.9		23.0	
	100		15.62	32.0		28.8		25.6	
	125		12.50	40.0		36.0		32.0	
	150		10.41	48.0		43.2		38.4	
	175		8.92	56.0		50.4		44.8	
	200		7.81	64.0		57.6		51.2	
	225		6.94	72.0		64.8		57.6	
	250		6.25	80.0		72.0		64.0	
	275		5.68	88.0		79.2		70.4	
	300		5.20	96.0		86.4		76.8	
	350		4.46	112.0		100.8		89.6	

Medium Load Spring - สปริงรับแรงกดที่มีค่าปานกลาง

ORDER
EXAMPLE

Model D - L
19SM25-050

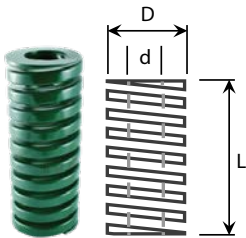
สปริงสีแดง
Red Spring
Model: 19SM



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				32% Deflection	Load N (kgf)	28.8% Deflection	Load N (kgf)	25.6% Deflection	Load N (kgf)
60	60	30	37.40	19.2	7056 (720)	17.3	6350 (648)	15.4	5645 (576)
	70		32.10	22.4		20.2		17.9	
	80		28.12	25.6		23.0		20.5	
	90		25.00	28.8		25.9		23.0	
	100		22.50	32.0		28.8		25.6	
	125		18.00	40.0		36.0		32.0	
	150		15.00	48.0		43.2		38.4	
	175		12.85	56.0		50.4		44.8	
	200		11.25	64.0		57.6		51.2	
	225		10.00	72.0		64.8		57.6	
	250		9.00	80.0		72.0		64.0	
	275		8.18	88.0		79.2		70.4	
	300		7.50	96.0		86.4		76.8	
	350		6.43	112.0		100.8		89.6	
70	70	38.5	37.9	22.4	8330 (850)	20.2	7497 (764)	17.9	6664 (680)
	80		33.2	25.6		23.0		20.5	
	90		29.5	28.8		25.9		23.0	
	100		26.6	32.0		28.8		25.6	
	125		21.3	40.0		36.0		32.0	
	150		17.7	48.0		43.2		38.4	
	175		15.2	56.0		50.4		44.8	
	200		13.3	64.0		57.6		51.2	
	225		11.8	72.0		64.8		57.6	
	250		10.6	80.0		72.0		64.0	
	275		9.7	88.0		79.2		70.4	
	300		8.9	96.0		86.4		76.8	
	350		7.6	112.0		100.8		89.6	

สปริงแม่พิมพ์

Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูง



สปริงสีเขียวเข้ม
Dark Green Spring
Model: 19SH



แรงกด Load ±10%

ความได้ฉาก Perpendicularity 2° or less

ระยะเพื่อความยาว Free Length ≤ 50 ±0.5mm
≥ 55 ±1

ORDER EXAMPLE Model D - L 19SH25-050

SAE9245

JIS Standard

D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				24% Deflection	Load N (kgf)	21.6% Deflection	Load N (kgf)	19.5% Deflection	Load N (kgf)
6	15	3	3.90	3.6	137 (14)	3.2	123 (13)	2.9	110 (11)
	20		2.90	4.8		4.3		3.8	
	25		2.30	6.0		5.4		4.8	
	30		1.90	7.2		6.5		5.8	
	35		1.70	8.4		7.6		6.7	
	40		1.50	9.6		8.6		7.7	
	45		1.30	10.8		9.7		8.6	
	50		1.20	12.0		10.8		9.6	
	55		1.10	13.2		11.9		10.6	
	60		1.00	14.4		13.0		11.5	
8	10	4	8.80	2.4	206 (21)	2.2	185 (19)	1.9	165 (17)
	15		5.86	3.6		3.2		2.9	
	20		4.40	4.8		4.3		3.8	
	25		3.52	6.0		5.4		4.8	
	30		2.93	7.2		6.5		5.8	
	35		2.51	8.4		7.6		6.7	
	40		2.20	9.6		8.6		7.7	
	45		1.95	10.8		9.7		8.6	
	50		1.76	12.0		10.8		9.6	
	55		1.60	13.2		11.9		10.6	
	60		1.47	14.4		13.0		11.5	
	65		1.35	15.6		14.0		12.5	
	70		1.26	16.8		15.1		13.4	
	75		1.17	18.0		16.2		14.4	
	80		1.10	19.2		17.3		15.4	
	90		0.98	21.6		19.4		17.3	
	100		0.87	24.0		21.6		19.2	
10	10	5	12.27	2.4	294 (30)	2.2	265 (27)	1.9	235 (24)
	15		8.18	3.6		3.3		2.9	
	20		6.25	4.8		4.3		3.8	
	25		5.00	6.0		5.4		4.8	
	30		4.16	7.2		6.5		5.8	
	35		3.57	8.4		7.6		6.7	
	40		3.15	9.6		8.6		7.7	
	45		2.77	10.8		9.7		8.6	
	50		2.50	12.0		10.8		9.6	
	55		2.27	13.2		11.9		10.6	
	60		2.08	14.4		13.0		11.5	
	65		1.92	15.6		14.0		12.5	
	70		1.79	16.8		15.1		13.4	
	75		1.67	18.0		16.2		14.4	
	80		1.56	19.2		17.3		15.4	
	90		1.39	21.6		19.4		17.3	
	100		1.25	24.0		21.6		19.2	
	125		1.00	30.0		27.0		24.0	

Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูง

ORDER
EXAMPLE

Model D - L
19SH25-050

สปริงสีเขียวเข้ม
Dark Green Spring
Model: 19SH



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				24% Deflection	Load N (kgf)	21.6% Deflection	Load N (kgf)	19.5% Deflection	Load N (kgf)
12	20	6	8.90	4.8	421 (43)	4.3	379 (38)	3.8	337 (34)
	25		7.10	6.0		5.4		4.8	
	30		5.97	7.2		6.5		5.8	
	35		5.11	8.4		7.6		6.7	
	40		4.47	9.6		8.6		7.7	
	45		3.98	10.8		9.7		8.6	
	50		3.58	12.0		10.8		9.6	
	55		3.25	13.2		11.9		10.6	
	60		2.98	14.4		13.0		11.5	
	65		2.74	15.6		14.0		12.5	
	70		2.54	16.8		15.1		13.4	
	75		2.37	18.0		16.2		14.4	
	80		2.21	19.2		17.3		15.4	
	90		1.98	21.6		19.4		17.3	
	100		1.78	24.0		21.6		19.2	
	125		1.42	30.0		27.0		24.0	
14	20	7	12.05	4.8	578 (59)	4.4	520 (53)	3.8	462 (47)
	25		9.83	6.0		5.4		4.8	
	30		8.19	7.2		6.5		5.8	
	35		7.02	8.4		7.6		6.7	
	40		6.14	9.6		8.6		7.7	
	45		5.46	10.8		9.7		8.6	
	50		4.91	12.0		10.8		9.6	
	55		4.46	13.2		11.9		10.6	
	60		4.09	14.4		13.0		11.5	
	65		3.78	15.6		14.0		12.5	
	70		3.51	16.8		15.1		13.4	
	75		3.27	18.0		16.2		14.4	
	80		3.07	19.2		17.3		15.4	
	90		2.72	21.6		19.4		17.3	
	100		2.46	24.0		21.6		19.2	
	125		1.97	30.0		27.0		24.0	
16	20	8	15.68	4.8	755 (77)	4.4	680 (690)	3.8	604 (62)
	25		12.83	6.0		5.4		4.8	
	30		10.69	7.2		6.5		5.8	
	35		9.16	8.4		7.6		6.7	
	40		8.02	9.6		8.6		7.7	
	45		7.12	10.8		9.7		8.6	
	50		6.41	12.0		10.8		9.6	
	55		5.83	13.2		11.9		10.6	
	60		5.34	14.4		13.0		11.5	
	65		4.93	15.6		14.0		12.5	
	70		4.58	16.8		15.1		13.4	
	75		4.28	18.0		16.2		14.4	
	80		4.01	19.2		17.3		15.4	
	90		3.57	21.6		19.4		17.3	
	100		3.21	24.0		21.6		19.2	
	125		2.57	30.0		27.0		24.0	

Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูง

ORDER
EXAMPLE

Model D - L
19SH25-050

สปริงสีเขียวเข้ม
Dark Green Spring
Model: 19SH



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				24% Deflection	Load N (kgf)	21.6% Deflection	Load N (kgf)	19.5% Deflection	Load N (kgf)
18	20	9	19.77	4.8	951 (97)	4.4	856 (87)	3.8	761 (78)
	25		16.16	6.0		5.4		4.8	
	30		13.47	7.2		6.5		5.8	
	35		11.54	8.4		7.6		6.7	
	40		10.10	9.6		8.6		7.7	
	45		8.98	10.8		9.7		8.6	
	50		8.08	12.0		10.8		9.6	
	55		7.34	13.2		11.9		10.6	
	60		6.73	14.4		13.0		11.5	
	65		6.21	15.6		14.0		12.5	
	70		5.77	16.8		15.1		13.4	
	75		5.39	18.0		16.2		14.4	
	80		5.05	19.2		17.3		15.4	
	90		4.50	21.6		19.4		17.3	
	100		4.04	24.0		21.6		19.2	
20	125		3.23	30.0		27.0		24.0	
	20	10	24.55	4.8	1176 (120)	4.4	1058 (108)	3.7	941 (96)
	25		20.00	6.0		5.4		4.8	
	30		16.66	7.2		6.5		5.8	
	35		14.28	8.4		7.6		6.7	
	40		12.50	9.6		8.6		7.7	
	45		11.11	10.8		9.7		8.6	
	50		10.00	12.0		10.8		9.6	
	55		9.09	13.2		11.9		10.6	
	60		8.33	14.4		13.0		11.5	
	65		7.69	15.6		14.0		12.5	
	70		7.14	16.8		15.1		13.4	
	75		6.67	18.0		16.2		14.4	
	80		6.25	19.2		17.3		15.4	
	90		5.55	21.6		19.4		17.3	
	100		5.00	24.0		21.6		19.2	
22	125		4.00	30.0		27.0		24.0	
	150		3.33	36.0		32.4		28.8	
	175		2.86	42.0		37.8		33.6	
	25	11	24.16	6.0	1421 (145)	5.4	1279 (130)	4.8	1137 (116)
	30		20.13	7.2		6.5		5.8	
	35		17.30	8.4		7.6		6.7	
	40		15.10	9.6		8.6		7.7	
	45		13.40	10.8		9.7		8.6	
	50		12.08	12.0		10.8		9.6	
	55		10.94	13.2		11.9		10.6	
	60		10.06	14.4		13.0		11.5	
	65		9.28	15.6		14.0		12.5	
	70		8.63	16.8		15.1		13.4	
	75		8.04	18.0		16.2		14.4	
	80		7.55	19.2		17.3		15.4	
	90		6.71	21.6		19.4		17.3	
	100		6.04	24.0		21.6		19.2	
	125		4.83	30.0		27.0		24.0	
	150		4.02	36.0		32.4		28.8	
	175		3.45	42.0		37.8		33.6	

Die Springs

Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูง

ORDER
EXAMPLE

Model D - L
19SH25-050

สปริงสีเขียวเข้ม
Dark Green Spring
Model: 19SH



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				24% Deflection	Load N (kgf)	21.6% Deflection	Load N (kgf)	19.5% Deflection	Load N (kgf)
25	25	12.5	31.20	6.0	1833 (187)	5.4	1650 (168)	4.8	1466 (150)
	30		25.97	7.2		6.5		5.8	
	35		22.38	8.4		7.6		6.7	
	40		19.47	9.6		8.6		7.7	
	45		17.40	10.8		9.7		8.6	
	50		15.58	12.0		10.8		9.6	
	55		14.20	13.2		11.9		10.6	
	60		12.98	14.4		13.0		11.5	
	65		12.00	15.6		14.0		12.5	
	70		11.13	16.8		15.1		13.4	
	75		10.40	18.0		16.2		14.4	
	80		9.73	19.2		17.3		15.4	
	90		8.65	21.6		19.4		17.3	
	100		7.79	24.0		21.6		19.2	
	125		6.23	30.0		27.0		24.0	
	150		5.20	36.0		32.4		28.8	
	175		4.46	42.0		37.8		33.6	
	200		3.90	48.0		43.2		38.4	
27	25	13.5	36.40	6.0	2146 (219)	5.4	1931 (197)	4.8	1717 (175)
	30		30.41	7.2		6.5		5.8	
	35		26.20	8.4		7.6		6.7	
	40		22.81	9.6		8.6		7.7	
	45		20.30	10.8		9.7		8.6	
	50		18.25	12.0		10.8		9.6	
	55		16.50	13.2		11.9		10.6	
	60		15.20	14.4		13.0		11.5	
	65		14.00	15.6		14.0		12.5	
	70		13.03	16.8		15.1		13.4	
	75		12.10	18.0		16.2		14.4	
	80		11.40	19.2		17.3		15.4	
	90		10.13	21.6		19.4		17.3	
	100		9.12	24.0		21.6		19.2	
	125		7.30	30.0		27.0		24.0	
	150		6.08	36.0		32.4		28.8	
	175		5.21	42.0		37.8		33.6	
	200		4.56	48.0		43.2		38.4	
30	25	15	45.00	6.0	2646 (270)	5.4	2381 (243)	4.8	2117 (216)
	30		37.50	7.2		6.5		5.8	
	35		32.26	8.4		7.6		6.7	
	40		28.12	9.6		8.6		7.7	
	45		25.00	10.8		9.7		8.6	
	50		22.50	12.0		10.8		9.6	
	55		20.40	13.2		11.9		10.6	
	60		18.75	14.4		13.0		11.5	
	65		17.30	15.6		14.0		12.5	
	70		16.07	16.8		15.1		13.4	
	75		15.00	18.0		16.2		14.4	
	80		14.06	19.2		17.3		15.4	
	90		12.50	21.6		19.4		17.3	
	100		11.25	24.0		21.6		19.2	
	125		9.00	30.0		27.0		24.0	
	150		7.50	36.0		32.4		28.8	
	175		6.42	42.0		37.8		33.6	
	200		5.62	48.0		43.2		38.4	

Die Springs

สปริงแม่พิมพ์

Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูง

ORDER
EXAMPLE

Model D - L
19SH25-050

สปริงสีเขียวเข้ม
Dark Green Spring
Model: 19SH



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				24% Deflection	Load N (kgf)	21.6% Deflection	Load N (kgf)	19.5% Deflection	Load N (kgf)
35	35	17.5	43.68	8.4	3597 (367)	7.6	3237 (330)	6.7	2878 (293)
	40		38.22	9.6		8.6		7.7	
	45		33.98	10.8		9.7		8.6	
	50		30.58	12.0		10.8		9.6	
	55		27.80	13.2		11.9		10.6	
	60		25.48	14.4		13.0		11.5	
	65		23.53	15.6		14.0		12.5	
	70		21.84	16.8		15.1		13.4	
	75		20.39	18.0		16.2		14.4	
	80		19.11	19.2		17.3		15.4	
	90		16.99	21.6		19.4		17.3	
	100		15.29	24.0		21.6		19.2	
	125		12.23	30.0		27.0		24.0	
	150		10.19	36.0		32.4		28.8	
	175		8.73	42.0		37.8		33.6	
	200		7.64	48.0		43.2		38.4	
40	40	20	50.00	9.6	4704 (480)	8.6	4234 (432)	7.7	3763 (384)
	45		44.44	10.8		9.7		8.6	
	50		40.00	12.0		10.8		9.6	
	55		36.36	13.2		11.9		10.6	
	60		33.33	14.4		13.0		11.5	
	65		30.77	15.6		14.0		12.5	
	70		28.57	16.8		15.1		13.4	
	75		26.67	18.0		16.2		14.4	
	80		25.00	19.2		17.3		15.4	
	90		22.22	21.6		19.4		17.3	
	100		20.00	24.0		21.6		19.2	
	125		16.00	30.0		27.0		24.0	
	150		13.33	36.0		32.4		28.8	
	175		11.42	42.0		37.8		33.6	
	200		10.00	48.0		43.2		38.4	
	225		8.89	54.0		48.6		43.2	
50	250	25	8.00	60.0	7350 (750)	54.0	6615 (675)	48.0	5880 (600)
	275		7.27	66.0		59.4		52.8	
	300		6.67	72.0		64.8		57.6	
	50		62.50	12.0		10.8		9.6	
	55		56.82	13.2		11.9		10.6	
	60		52.08	14.4		13.0		11.5	
	65		48.08	15.6		14.0		12.5	
	70		44.64	16.8		15.1		13.4	
	75		41.67	18.0		16.2		14.4	
	80		39.06	19.2		17.3		15.4	
	90		34.72	21.6		19.4		17.3	
	100		31.25	24.0		21.6		19.2	
	125		25.00	30.0		27.0		24.0	
	150		20.83	36.0		32.4		28.8	
	175		17.85	42.0		37.8		33.6	
	200		15.62	48.0		43.2		38.4	
	225		13.89	54.0		48.6		43.2	
	250		12.50	60.0		54.0		48.0	
	275		11.36	66.0		59.4		52.8	
	300		10.41	72.0		64.8		57.6	
	350		8.93	84.0		75.6		67.2	

Die Springs

Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูง

ORDER
EXAMPLE

Model D - L
19SH25-050

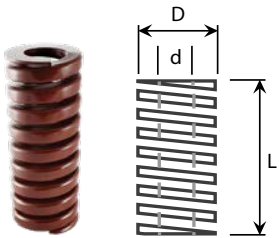
สปริงสีเขียวเข้ม
Dark Green Spring
Model: 19SH



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				24% Deflection	Load N (kgf)	21.6% Deflection	Load N (kgf)	19.5% Deflection	Load N (kgf)
60	60	30	75.00	14.4	10584 (1079)	13.0	9526 (971)	11.5	8467 (863)
	70		64.28	16.8		15.1		13.4	
	80		56.25	19.2		17.3		15.4	
	90		50.00	21.6		19.4		17.3	
	100		45.00	24.0		21.6		19.2	
	125		36.00	30.0		27.0		24.0	
	150		30.00	36.0		32.4		28.8	
	175		25.71	42.0		37.8		33.6	
	200		22.50	48.0		43.2		38.4	
	225		20.00	54.0		48.6		43.2	
	250		18.00	60.0		54.0		48.0	
	275		16.36	66.0		59.4		52.8	
	300		15.00	72.0		64.8		57.6	
	350		12.86	84.0		75.6		67.2	
70	70	38.5	76.2	16.8	12557 (1280)	15.1	11301 (1152)	13.4	10046 (1024)
	80		66.7	19.2		17.3		15.4	
	90		59.3	21.6		19.4		17.3	
	100		53.3	24.0		21.6		19.2	
	125		42.7	30.0		27.0		24.0	
	150		35.6	36.0		32.4		28.8	
	175		30.5	42.0		37.8		33.6	
	200		26.7	48.0		43.2		38.4	
	225		23.7	54.0		48.6		43.2	
	250		21.3	60.0		54.0		48.0	
	275		19.4	66.0		59.4		52.8	
	300		17.8	72.0		64.8		57.6	
	350		15.2	84.0		75.6		67.2	

สปริงแม่พิมพ์

Extra Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูงพิเศษ



สปริงสีน้ำตาล
Brown Spring
Model: 19SB



แรงกด Load ±10%

ความได้ฉาก Perpendicularity 2° or less

ระยะเผื่อความยาว Free Length ≤ 50 ±0.5mm
≥ 55 ±1

ORDER EXAMPLE Model D - L 19SB25-050

SAE9245

JIS Standard

D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				20% Deflection	Load N (kgf)	18% Deflection	Load N (kgf)	16% Deflection	Load N (kgf)
6	15	3	6.00	3.0	177 (18)	2.7	159 (16.2)	2.4	141 (14.4)
	20		4.50	4.0		3.6		3.2	
	25		3.60	5.0		4.5		4.0	
	30		3.00	6.0		5.4		4.8	
	35		2.60	7.0		6.3		5.6	
	40		2.30	8.0		7.2		6.4	
	45		2.00	9.0		8.1		7.2	
	50		1.80	10.0		9.0		8.0	
	55		1.60	11.0		9.9		8.8	
	60		1.50	12.0		10.8		9.6	
8	10	4	16.94	2.0	324 (33)	1.8	294 (30)	1.6	255 (26)
	15		11.30	3.0		2.7		2.4	
	20		8.47	4.0		3.6		3.2	
	25		6.78	5.0		4.5		4.0	
	30		5.65	6.0		5.4		4.8	
	35		4.84	7.0		6.3		5.6	
	40		4.24	8.0		7.2		6.4	
	45		3.77	9.0		8.1		7.2	
	50		3.39	10.0		9.0		8.0	
	55		3.08	11.0		9.9		8.8	
	60		2.82	12.0		10.8		9.6	
	65		2.61	13.0		11.7		10.4	
	70		2.42	14.0		12.6		11.2	
	75		2.26	15.0		13.5		12.0	
	80		2.12	16.0		14.4		12.8	
	90		1.88	18.0		16.2		14.4	
	100		1.65	20.0		18.0		16.0	
10	10	5	22.78	2.0	441 (45)	1.8	402 (41)	1.6	353 (36)
	15		15.19	3.0		2.7		2.4	
	20		11.25	4.0		3.6		3.2	
	25		9.00	5.0		4.5		4.0	
	30		7.50	6.0		5.4		4.8	
	35		6.43	7.0		6.3		5.6	
	40		5.63	8.0		7.2		6.4	
	45		5.00	9.0		8.1		7.2	
	50		4.50	10.0		9.0		8.0	
	55		4.09	11.0		9.9		8.8	
	60		3.75	12.0		10.8		9.6	
	65		3.47	13.0		11.7		10.4	
	70		3.21	14.0		12.6		11.2	
	75		3.00	15.0		13.5		12.0	
	80		2.82	16.0		14.4		12.8	
	90		2.50	18.0		16.2		14.4	
	100		2.25	20.0		18.0		16.0	
	125		1.80	25.0		22.5		20.0	

Die Springs

Extra Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูงพิเศษ

ORDER
EXAMPLE

Model D - L
19SB25-050

สปริงสีน้ำตาล
Brown Spring
Model: 19SB



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				20% Deflection	Load N (kgf)	18% Deflection	Load N (kgf)	16% Deflection	Load N (kgf)
12	20	6	14.50	4.0	569 (58)	3.6	510 (52)	3.2	451 (46)
	25		11.60	5.0		4.5		4.0	
	30		9.67	6.0		5.4		4.8	
	35		8.29	7.0		6.3		5.6	
	40		7.25	8.0		7.2		6.4	
	45		6.44	9.0		8.1		7.2	
	50		5.80	10.0		9.0		8.0	
	55		5.27	11.0		9.9		8.8	
	60		4.83	12.0		10.8		9.6	
	65		4.44	13.0		11.7		10.4	
	70		4.13	14.0		12.6		11.2	
	75		3.85	15.0		13.5		12.0	
	80		3.61	16.0		14.4		12.8	
	90		3.22	18.0		16.2		14.4	
	100		2.90	20.0		18.0		16.0	
14	125		2.30	25.0		22.5		20.0	
	20	7	18.89	4.0	736 (75)	3.6	667 (68)	3.2	589 (60)
	25		15.00	5.0		4.5		4.0	
	30		12.50	6.0		5.4		4.8	
	35		10.72	7.0		6.3		5.6	
	40		9.38	8.0		7.2		6.4	
	45		8.34	9.0		8.1		7.2	
	50		7.50	10.0		9.0		8.0	
	55		6.82	11.0		9.9		8.8	
	60		6.25	12.0		10.8		9.6	
	65		5.77	13.0		11.7		10.4	
	70		5.36	14.0		12.6		11.2	
	75		5.00	15.0		13.5		12.0	
	80		4.69	16.0		14.4		12.8	
	90		4.17	18.0		16.2		14.4	
	100		3.75	20.0		18.0		16.0	
16	125		3.00	25.0		22.5		20.0	
	20	8	25.00	4.0	981 (100)	3.6	883 (90)	3.2	785 (80)
	25		20.00	5.0		4.5		4.0	
	30		16.67	6.0		5.4		4.8	
	35		14.29	7.0		6.3		5.6	
	40		12.50	8.0		7.2		6.4	
	45		11.11	9.0		8.1		7.2	
	50		10.00	10.0		9.0		8.0	
	55		9.09	11.0		9.9		8.8	
	60		8.34	12.0		10.8		9.6	
	65		7.69	13.0		11.7		10.4	
	70		7.14	14.0		12.6		11.2	
	75		6.67	15.0		13.5		12.0	
	80		6.25	16.0		14.4		12.8	
	90		5.56	18.0		16.2		14.4	
	100		5.00	20.0		18.0		16.0	
18	125		4.00	25.0		22.5		20.0	
	20	9	31.39	4.0	1226 (125)	3.6	1108 (113)	3.2	981 (100)
	25		25.00	5.0		4.5		4.0	
	30		20.84	6.0		5.4		4.8	
	35		17.86	7.0		6.3		5.6	
	40		15.63	8.0		7.2		6.4	
	45		13.89	9.0		8.1		7.2	
	50		12.50	10.0		9.0		8.0	
	55		11.37	11.0		9.9		8.8	
	60		10.42	12.0		10.8		9.6	
	65		9.62	13.0		11.7		10.4	
	70		8.93	14.0		12.6		11.2	
	75		8.34	15.0		13.5		12.0	
	80		7.82	16.0		14.4		12.8	
	90		6.95	18.0		16.2		14.4	
	100		6.26	20.0		18.0		16.0	
	125		5.00	25.0		22.5		20.0	

Die Springs

สปริงแม่พิมพ์

Extra Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูงพิเศษ

ORDER
EXAMPLE Model D - L
19SB25-050

สปริงสีน้ำตาล
Brown Spring
Model: 19SB



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				20% Deflection	Load N (kgf)	18% Deflection	Load N (kgf)	16% Deflection	Load N (kgf)
20	20	10	40.00	4.0	1569 (160)	3.6	1412 (144)	3.2	1255 (128)
	25		32.00	5.0		4.5		4.0	
	30		26.67	6.0		5.4		4.8	
	35		22.86	7.0		6.3		5.6	
	40		20.00	8.0		7.2		6.4	
	45		17.78	9.0		8.1		7.2	
	50		16.00	10.0		9.0		8.0	
	55		14.55	11.0		9.9		8.8	
	60		13.33	12.0		10.8		9.6	
	65		12.31	13.0		11.7		10.4	
	70		11.43	14.0		12.6		11.2	
	75		10.67	15.0		13.5		12.0	
	80		10.00	16.0		14.4		12.8	
	90		8.89	18.0		16.2		14.4	
	100		8.00	20.0		18.0		16.0	
	125		6.40	25.0		22.5		20.0	
	150		5.33	30.0		27.0		24.0	
	175		4.57	35.0		31.5		28.0	
22	25	11	39.00	5.0	1912 (195)	4.5	1726 (176)	4.0	1530 (156)
	30		32.50	6.0		5.4		4.8	
	35		27.86	7.0		6.3		5.6	
	40		24.38	8.0		7.2		6.4	
	45		21.67	9.0		8.1		7.2	
	50		19.50	10.0		9.0		8.0	
	55		17.73	11.0		9.9		8.8	
	60		16.25	12.0		10.8		9.6	
	65		15.00	13.0		11.7		10.4	
	70		13.93	14.0		12.6		11.2	
	75		13.00	15.0		13.5		12.0	
	80		12.19	16.0		14.4		12.8	
	90		10.83	18.0		16.2		14.4	
	100		9.75	20.0		18.0		16.0	
	125		7.80	25.0		22.5		20.0	
	150		6.50	30.0		27.0		24.0	
	175		5.57	35.0		31.5		28.0	
25	25	12.5	49.00	5.0	2403 (245)	4.5	2167 (221)	4.0	1922 (196)
	30		40.80	6.0		5.4		4.8	
	35		35.00	7.0		6.3		5.6	
	40		30.60	8.0		7.2		6.4	
	45		27.20	9.0		8.1		7.2	
	50		24.50	10.0		9.0		8.0	
	55		22.30	11.0		9.9		8.8	
	60		20.40	12.0		10.8		9.6	
	65		18.80	13.0		11.7		10.4	
	70		17.50	14.0		12.6		11.2	
	75		16.30	15.0		13.5		12.0	
	80		15.30	16.0		14.4		12.8	
	90		13.60	18.0		16.2		14.4	
	100		12.30	20.0		18.0		16.0	
	125		9.80	25.0		22.5		20.0	
	150		8.17	30.0		27.0		24.0	
	175		7.00	35.0		31.5		28.0	
	200		6.13	40.0		36.0		32.0	

Die Springs

Extra Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูงพิเศษ

ORDER
EXAMPLE

Model D - L
19SB25-050

สปริงสีน้ำตาล
Brown Spring
Model: 19SB



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				20% Deflection	Load N (kgf)	18% Deflection	Load N (kgf)	16% Deflection	Load N (kgf)
27	25	13.5	58.00	5.0	2844 (290)	4.5	2560 (261)	4.0	2275 (232)
	30		48.33	6.0		5.4		4.8	
	35		41.43	7.0		6.3		5.6	
	40		36.25	8.0		7.2		6.4	
	45		32.22	9.0		8.1		7.2	
	50		29.00	10.0		9.0		8.0	
	55		26.36	11.0		9.9		8.8	
	60		24.17	12.0		10.8		9.6	
	65		22.31	13.0		11.7		10.4	
	70		20.71	14.0		12.6		11.2	
	75		19.33	15.0		13.5		12.0	
	80		18.13	16.0		14.4		12.8	
	90		16.11	18.0		16.2		14.4	
	100		14.50	20.0		18.0		16.0	
	125		11.60	25.0		22.5		120.0	
	150		9.67	30.0		27.0		24.0	
	175		8.28	35.0		31.5		28.0	
	200		7.25	40.0		36.0		32.0	
30	25	15	72.00	5.0	3530 (360)	4.5	3177 (324)	4.0	2824 (288)
	30		60.00	6.0		5.4		4.8	
	35		51.43	7.0		6.3		5.6	
	40		45.00	8.0		7.2		6.4	
	45		40.00	9.0		8.1		7.2	
	50		36.00	10.0		9.0		8.0	
	55		32.72	11.0		9.9		8.8	
	60		30.00	12.0		10.8		9.6	
	65		27.69	13.0		11.7		10.4	
	70		25.71	14.0		12.6		11.2	
	75		24.00	15.0		13.5		12.0	
	80		22.50	16.0		14.4		12.8	
	90		20.00	18.0		16.2		14.4	
	100		18.00	20.0		18.0		16.0	
	125		14.40	25.0		22.5		20.0	
	150		12.00	30.0		27.0		24.0	
	175		10.28	35.0		31.5		28.0	
	200		9.00	40.0		36.0		32.0	
35	35	17.5	569.94	7.0	4805 (490)	6.3	4325 (441)	5.6	3844 (392)
	40		61.25	8.0		7.2		6.4	
	45		54.44	9.0		8.1		7.2	
	50		49.00	10.0		9.0		8.0	
	55		44.54	11.0		9.9		8.8	
	60		40.83	12.0		10.8		9.6	
	65		37.69	13.0		11.7		10.4	
	70		35.00	14.0		12.6		11.2	
	75		32.67	15.0		13.5		12.0	
	80		30.62	16.0		14.4		12.8	
	90		27.22	18.0		16.2		14.4	
	100		24.50	20.0		18.0		16.0	
	125		19.60	25.0		22.5		20.0	
	150		16.33	30.0		27.0		24.0	
	175		14.00	35.0		31.5		28.0	
	200		12.25	40.0		36.0		32.0	

Die Springs

Extra Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูงพิเศษ

ORDER
EXAMPLE

Model D - L
19SB25-050

สปริงสีน้ำตาล
Brown Spring
Model: 19SB

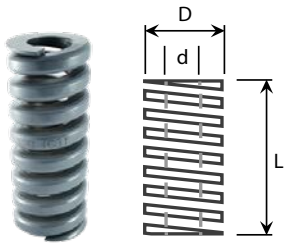
Spring Load Chart
Light <  > Heavy



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				20% Deflection	Load N (kgf)	18% Deflection	Load N (kgf)	16% Deflection	Load N (kgf)
40	40	20	80.00	8.0	6276 (640)	7.2	5649 (576)	6.4	5021 (512)
	45		71.11	9.0		8.1		7.2	
	50		64.00	10.0		9.0		8.0	
	55		58.18	11.0		9.9		9.8	
	60		53.33	12.0		10.8		9.6	
	65		49.23	13.0		11.7		10.4	
	70		45.71	14.0		12.6		11.2	
	75		12.67	15.0		13.5		12.0	
	80		40.00	16.0		14.4		12.8	
	90		35.55	18.0		16.2		14.4	
	100		32.00	20.0		18.0		16.0	
	125		25.60	25.0		22.5		20.0	
	150		21.33	30.0		27.0		24.0	
	175		18.28	35.0		31.5		28.0	
	200		16.00	40.0		36.0		32.0	
	225		14.22	45.0		40.5		36.0	
50	250	25	12.80	50.0	9807 (1000)	45.0	8826 (900)	40.0	7845 (800)
	275		11.64	55.0		49.5		44.0	
	300		10.67	60.0		54.0		48.0	
	50		100.00	10.0		9.0		8.0	
	55		90.91	11.0		9.9		8.8	
	60		83.33	12.0		10.8		9.6	
	65		76.92	13.0		11.7		10.4	
	70		71.42	14.0		12.6		11.2	
	75		66.67	15.0		13.5		12.0	
	80		62.50	16.0		14.4		12.8	
	90		55.55	18.0		16.2		14.4	
	100		50.00	20.0		18.0		16.0	
	125		40.00	25.0		22.5		20.0	
	150		33.33	30.0		27.0		24.0	
	175		28.57	35.0		31.5		28.0	
	200		25.00	40.0		36.0		32.0	
60	225	30	22.22	45.0	14122 (1440)	40.5	12709 (1296)	36.0	11297 (1152)
	250		20.00	50.0		45.0		40.0	
	275		18.18	55.0		49.5		44.0	
	300		16.66	60.0		54.0		48.0	
	350		14.29	70.0		63.0		56.0	
	60		120.00	12.0		10.8		9.6	
	70		102.86	14.0		12.6		11.2	
	80		90.00	16.0		14.4		12.8	
	90		80.00	18.0		16.2		14.4	
	100		72.00	20.0		18.0		16.0	
	125		57.60	25.0		22.5		20.0	
	150		48.00	30.0		27.0		24.0	
	175		41.14	35.0		31.5		28.0	
	200		36.00	40.0		36.0		32.0	
	225		32.00	45.0		40.5		36.0	
70	250	38.5	28.80	50.0	17652 (1800)	45.0	15887 (1620)	40.0	14122 (1440)
	275		26.18	55.0		49.5		44.0	
	300		24.00	60.0		54.0		48.0	
	350		20.57	70.0		63.0		56.0	
	70		124.3	14.0		12.6		11.2	
	80		108.8	16.0		14.4		12.8	
	90		96.7	18.0		16.2		14.4	
	100		87.0	20.0		18.0		16.0	
	125		69.6	25.0		22.5		20.0	
	150		58.0	30.0		27.0		24.0	
	175		49.7	35.0		31.5		28.0	
	200		43.5	40.0		36.0		32.0	
	225		38.7	45.0		40.5		36.0	
	250		34.8	50.0		45.0		40.0	
	275		31.6	55.0		49.5		44.0	
	300		29.0	60.0		54.0		48.0	
	350		24.9	70.0		63.0		56.0	

Die Springs

Super Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูงมาก



สปริงสีเทา
Grey Spring
Model: 19SG



แรงกด Load $\pm 10\%$
ความได้ฉาก Perpendicularity 2° or less
ระยะเพื่อความยาว Free Length $\leq 50 \pm 0.5\text{mm}$
 $\geq 55 \pm 1$

ORDER
EXAMPLE

Model D - L
19SG25-050

SAE9245
 JIS Standard

D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				20% Deflection	Load N (kgf)	18% Deflection	Load N (kgf)	16% Deflection	Load N (kgf)
10	15	5	16.67	3.0	490 (50)	2.7	441 (45)	2.4	392 (40)
	20		12.50	4.0		3.6		3.2	
	25		10.00	5.0		4.5		4.0	
	30		8.33	6.0		5.4		4.8	
	35		7.14	7.0		6.3		5.6	
	40		6.25	8.0		7.2		6.4	
	45		5.56	9.0		8.1		7.2	
	50		5.00	10.0		9.0		8.0	
	55		4.55	11.0		9.9		8.8	
	60		4.17	12.0		10.8		9.6	
	65		3.85	13.0		11.7		10.4	
	70		3.57	14.0		12.6		11.2	
	75		3.33	15.0		13.5		12.0	
12	80	6	3.13	16.0	736 (75)	14.4	662 (67.5)	12.8	588 (60)
	90		2.78	18.0		16.2		14.4	
	100		2.50	20.0		18.0		16.0	
	20		18.75	4.0		3.6		3.2	
	25		15.00	5.0		4.5		4.0	
	30		12.50	6.0		5.4		4.8	
	35		10.71	7.0		6.3		5.6	
	40		9.38	8.0		7.2		6.4	
	45		8.33	9.0		8.1		7.2	
	50		7.50	10.0		9.0		8.0	
	55		6.82	11.0		9.9		8.8	
	60		6.25	12.0		10.8		9.6	
	65		5.77	13.0		11.7		10.4	
14	70	7	5.36	14.0	951 (97)	12.6	853 (87)	11.2	761 (77.6)
	75		5.00	15.0		13.5		12.0	
	80		4.69	16.0		14.4		12.8	
	90		4.17	18.0		16.2		14.4	
	100		3.75	20.0		18.0		16.0	
	20		24.25	4.0		3.6		3.2	
	25		19.40	5.0		4.5		4.0	
	30		16.17	6.0		5.4		4.8	
	35		13.86	7.0		6.3		5.6	
	40		12.13	8.0		7.2		6.4	
	45		10.78	9.0		8.1		7.2	
	50		9.70	10.0		9.0		8.0	
	55		8.82	11.0		9.9		8.8	
	60		8.08	12.0		10.8		9.6	
	65		7.46	13.0		11.7		10.4	
	70		6.93	14.0		12.6		11.2	
	75		6.47	15.0		13.5		12.0	
	80		6.06	16.0		14.4		12.8	
	90		5.39	18.0		16.2		14.4	
	100		4.85	20.0		18.0		16.0	

Die Springs

Super Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูงมาก

ORDER
EXAMPLE

Model D - L
19SG25-050

สปริงสีเทา
Grey Spring
Model: 19SG

Spring Load Chart
Light <  > Heavy



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				20% Deflection	Load N (kgf)	18% Deflection	Load N (kgf)	16% Deflection	Load N (kgf)
16	20	8	32.25	4.0	1275 (130)	3.6	1147 (117)	3.2	1020 (104)
	25		25.80	5.0		4.5		4.0	
	30		21.50	6.0		5.4		4.8	
	35		18.43	7.0		6.3		5.6	
	40		16.13	8.0		7.2		6.4	
	45		14.33	9.0		8.1		7.2	
	50		12.90	10.0		9.0		8.0	
	55		11.73	11.0		9.9		8.8	
	60		10.75	12.0		10.8		9.6	
	65		9.92	13.0		11.7		10.4	
	70		9.21	14.0		12.6		11.2	
	75		8.60	15.0		13.5		12.0	
	80		8.06	16.0		14.4		12.8	
	90		7.17	18.0		16.2		14.4	
18	20	9	40.25	4.0	1569 (160)	3.6	1412 (144)	3.2	1255 (128)
	25		32.20	5.0		4.5		4.0	
	30		26.83	6.0		5.4		4.8	
	35		23.00	7.0		6.3		5.6	
	40		20.13	8.0		7.2		6.4	
	45		17.89	9.0		8.1		7.2	
	50		16.10	10.0		9.0		8.0	
	55		14.64	11.0		9.9		8.8	
	60		13.42	12.0		10.8		9.6	
	65		12.38	13.0		11.7		10.4	
	70		11.50	14.0		12.6		11.2	
	75		10.73	15.0		13.5		12.0	
	80		10.06	16.0		14.4		12.8	
	90		8.94	18.0		16.2		14.4	
20	20	10	51.50	4.0	2059 (210)	3.6	1853 (189)	3.2	1648 (168)
	25		41.20	5.0		4.5		4.0	
	30		34.33	6.0		5.4		4.8	
	35		29.43	7.0		6.3		5.6	
	40		25.75	8.0		7.2		6.4	
	45		22.89	9.0		8.1		7.2	
	50		20.60	10.0		9.0		8.0	
	55		18.73	11.0		9.9		8.8	
	60		17.17	12.0		10.8		9.6	
	65		15.85	13.0		11.7		10.4	
	70		14.71	14.0		12.6		11.2	
	75		13.73	15.0		13.5		12.0	
	80		12.88	16.0		14.4		12.8	
	90		11.44	18.0		16.2		14.4	
22	25	11	50.20	5.0	2354 (240)	4.5	2118 (216)	4.0	1883 (192)
	30		41.83	6.0		5.4		4.8	
	35		35.86	7.0		6.3		5.6	
	40		31.38	8.0		7.2		6.4	
	45		27.89	9.0		8.1		7.2	
	50		25.10	10.0		9.0		8.0	
	55		22.82	11.0		9.9		8.8	
	60		20.92	12.0		10.8		9.6	
	65		19.31	13.0		11.7		10.4	
	70		17.93	14.0		12.6		11.2	
	75		16.73	15.0		13.5		12.0	
	80		15.69	16.0		14.4		12.8	
	90		13.94	18.0		16.2		14.4	
	100		12.55	20.0		18.0		16.0	
	125		10.04	25.0		22.5		20.0	

Die Springs

Super Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูงมาก

ORDER
EXAMPLE

Model D - L
19SG25-050

สปริงสีเทา
Grey Spring
Model: 19SG



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				20% Deflection	Load N (kgf)	18% Deflection	Load N (kgf)	16% Deflection	Load N (kgf)
25	25	12.5	63.00	5.0	3040 (310)	4.5	2736 (279)	4.0	2432 (248)
	30		52.50	6.0		5.4		4.8	
	35		45.00	7.0		6.3		5.6	
	40		39.38	8.0		7.2		6.4	
	45		35.00	9.0		8.1		7.2	
	50		31.50	10.0		9.0		8.0	
	55		28.64	11.0		9.9		8.8	
	60		26.25	12.0		10.8		9.6	
	65		24.23	13.0		11.7		10.4	
	70		22.50	14.0		12.6		11.2	
	75		21.00	15.0		13.5		12.0	
	80		19.69	16.0		14.4		12.8	
	90		17.50	18.0		16.2		14.4	
	100		15.75	20.0		18.0		16.0	
	125		12.60	25.0		22.5		20.0	
	150		10.50	30.0		27.0		24.0	
27	25	13.5	74.60	5.0	3628 (370)	4.5	3265 (333)	4.0	2903 (296)
	30		62.17	6.0		5.4		4.8	
	35		53.29	7.0		6.3		5.6	
	40		46.63	8.0		7.2		6.4	
	45		41.44	9.0		8.1		7.2	
	50		37.30	10.0		9.0		8.0	
	55		33.91	11.0		9.9		8.8	
	60		31.08	12.0		10.8		9.6	
	65		28.69	13.0		11.7		10.4	
	70		26.64	14.0		12.6		11.2	
	75		24.87	15.0		13.5		12.0	
	80		23.31	16.0		14.4		12.8	
	90		20.72	18.0		16.2		14.4	
	100		18.65	20.0		18.0		16.0	
	125		14.92	25.0		22.5		20.0	
	150		12.43	30.0		27.0		24.0	
30	25	15	92.80	5.0	4707 (480)	4.5	4236 (432)	4.0	3765 (384)
	30		77.33	6.0		5.4		4.8	
	35		66.29	7.0		6.3		5.6	
	40		58.00	8.0		7.2		6.4	
	45		51.56	9.0		8.1		7.2	
	50		46.40	10.0		9.0		8.0	
	55		42.18	11.0		9.9		8.8	
	60		38.67	12.0		10.8		9.6	
	65		35.69	13.0		11.7		10.4	
	70		33.14	14.0		12.6		11.2	
	75		30.93	15.0		13.5		12.0	
	80		29.00	16.0		14.4		12.8	
	90		25.78	18.0		16.2		14.4	
	100		23.20	20.0		18.0		16.0	
	125		28.56	25.0		22.5		20.0	
	150		15.47	30.0		27.0		24.0	
	175		13.26	35.0		31.5		28.0	
	200		11.60	40.0		36.0		32.0	
35	35	17.5	90.14	7.0	6178 (630)	6.3	5560 (567)	5.6	4942 (504)
	40		78.88	8.0		7.2		6.4	
	45		70.11	9.0		8.1		7.2	
	50		63.10	10.0		9.0		8.0	
	55		57.36	11.0		9.9		8.8	
	60		52.58	12.0		10.8		9.6	
	65		48.54	13.0		11.7		10.4	
	70		45.07	14.0		12.6		11.2	
	75		42.07	15.0		13.5		12.0	
	80		39.44	16.0		14.4		12.8	
	90		35.06	18.0		16.2		14.4	
	100		31.55	20.0		18.0		16.0	
	125		25.24	25.0		22.5		20.0	
	150		21.03	30.0		27.0		24.0	
	175		18.03	35.0		31.5		28.0	
	200		15.78	40.0		36.0		32.0	

Die Springs

Super Heavy Load Spring - สปริงรับแรงกดที่มีค่าสูงมาก

ORDER
EXAMPLE

Model D - L

19SG25-050

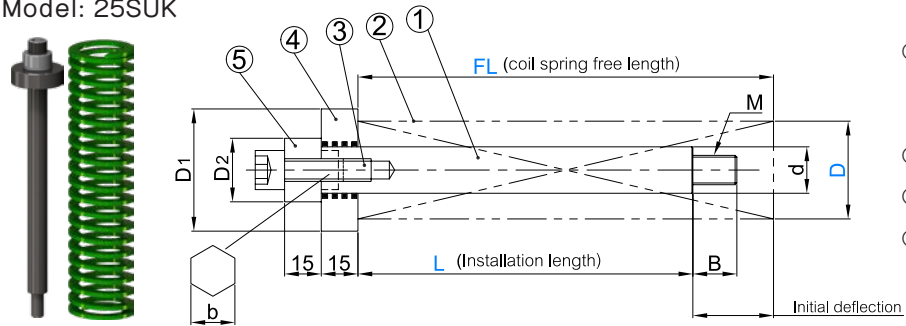
สปริงสีเทา
Grey Spring
Model: 19SG



D	L	d	Spring Constant (kgf/mm)	300,000 times		500,000 times		1,000,000 times	
				20% Deflection	Load N (kgf)	18% Deflection	Load N (kgf)	16% Deflection	Load N (kgf)
40	40	20	103.00	8.0	8041 (820)	7.2	7237 (738)	6.4	6433 (656)
	45		91.56	9.0		8.1		7.2	
	50		82.40	10.0		9.0		8.0	
	55		74.91	11.0		9.9		8.8	
	60		68.67	12.0		10.8		9.6	
	65		63.38	13.0		11.7		10.4	
	70		58.86	14.0		12.6		11.2	
	75		54.93	15.0		13.5		12.0	
	80		51.50	16.0		14.4		12.8	
	90		45.78	18.0		16.2		14.4	
	100		41.20	20.0		18.0		16.0	
	125		32.96	25.0		22.5		20.0	
	150		27.47	30.0		27.0		24.0	
	175		23.54	35.0		31.5		28.0	
	200		20.60	40.0		36.0		32.0	
50	50	25	128.80	10.0	12258 (1250)	9.0	11033 (1125)	8.0	9807 (1000)
	55		117.09	11.0		9.9		8.8	
	60		107.33	12.0		10.8		9.6	
	65		99.08	13.0		11.7		10.4	
	70		92.00	14.0		12.6		11.2	
	75		85.87	15.0		13.5		12.0	
	80		80.50	16.0		14.4		12.8	
	90		71.56	18.0		16.2		14.4	
	100		64.40	20.0		18.0		16.0	
	125		51.52	25.0		22.5		20.0	
	150		42.93	30.0		27.0		24.0	
	175		36.80	35.0		31.5		28.0	
	200			40.0		36.0		32.0	

Spring Guide Unit - สปริงไกด์ยูนิต

Model: 25SUK



- ① **M** Guide Pin
S45C
50HRC-
(Induction Harden)
- ② Coil Spring
- ③ Hex Socket Head Bolt
- ④ **M** Separate Disk
FC250
Oil Free™ Solid
Lubricant
- ⑤ **M** Pressure Disk
SS400

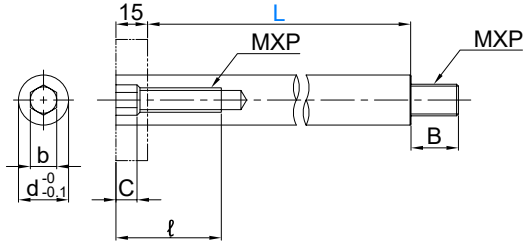
ORDER	Model	Spring Type	- D - FL - L
EXAMPLE	25SUKF50-200-150		

! *ขนาด 400 หรือมากกว่า สำหรับสปริงสีเหลือง (F) เท่านั้น
*Size 400 and over for yellow springs (F) only

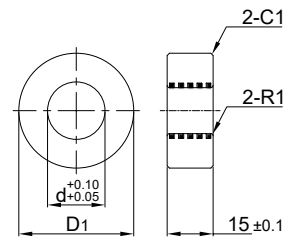
Model	Spring Type	D	FL	L 1mm increments											d	D1	D2	MxP	B	b		
				FL																		
				90	100	125	150	175	200	250	300	350	*400	*450	*500							
25SUK	F (Yellow) L (Blue) M (Red) H (Green)	40	90 100 125 150	68 ~ 90	80 ~ 100	90 ~ 125	105 ~ 150	130 ~ 175	145 ~ 200	195 ~ 250	240 ~ 300	-	-	-	-	19	50	28	12x1.75	24	12	
		50	175 200 250											325 ~ 400	375 ~ 450	425 ~ 500	24	60	36	16x2.0	28	17
		60	300 350 400 450 500					95 ~ 125	110 ~ 150	120 ~ 175	135 ~ 200	185 ~ 250	225 ~ 300	275 ~ 350				29	70			
		70														-	-	-	35	80	48	20x2.5

ORDER	Model	Spring OD	- FL - L
EXAMPLE	25SUKGP60-250-200		

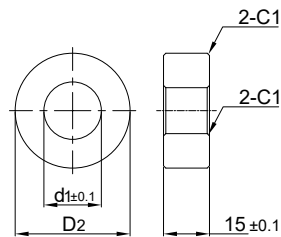
Coil Spring OD	l											
	Coil Spring Free Length (FL)											
	90	100	125	150	175	200	250	300	350	*400	*450	*500
40	55	65	75	85	85	95	95	110				
50	60	70	80	90	90	100	100	110	110	110	110	110
60	60	70	80	90	90	100	100	110	110	110	110	110
70	60	70	80	90	90	100	100	110	110			



Model	Coil Spring OD	FL	L 1mm increments												d	b	C	MxP	B
			FL																
			90	100	125	150	175	200	250	300	350	*400	*450	*500					
25SUKGP	40	90 100 125 150	68 - 90	80 - 100	90 - 125	105 - 150	130 - 175	145 - 200	195 - 250	240 - 300	-	-	-	-	19	12	7	12x1.75	24
	50	175 200 250			95 - 125	110 - 150	120 - 175	135 - 200	185 - 250	225 - 300	275 - 350	325 - 400	375 - 450	425 - 500	24	17	10	16x2.0	28
	60	300 350 400 450 500			29	17	10												
	70															35	22	10	20x2.5

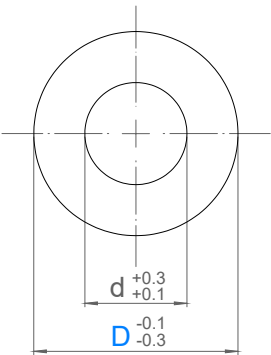


Model	Coil Spring OD	D1	d
25SUKSD	40	50	19
	50	60	24
	60	70	29
	70	80	35



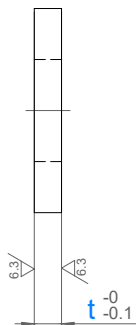
Model	Coil Spring OD	D2	d1
25SUKPD	40	28	13
	50	36	17
	60	43	
	70	48	21

Model: 25SSWA



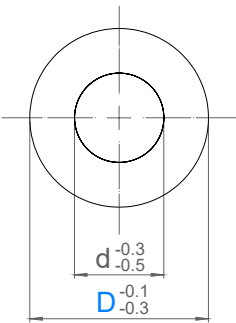
ORDER	Model	D - t
EXAMPLE	25SSWA13-2.0	

SS400



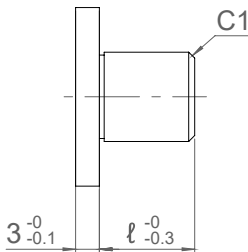
Model	D	t	d	Spring OD
25SSWA	5	1.0 2.0 3.0 4.0 5.0	3.0	6
	7		5.0	8
	9		6.0	10
	11.5		7.0	12
	13		8.0	14
	15		9.0	16
	17		10.0	18
	19		12.0	20
	21		12.0	22
	24		14.5	25
	26		15.0	27
	29		17.0	30
	34		20.0	35
	39		23.0	40

Model: 25SSWB



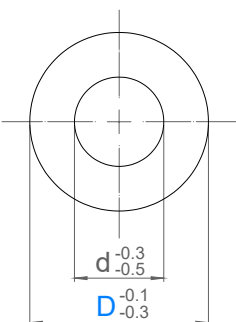
ORDER	Model	D
EXAMPLE	25SSWB13	

SS400



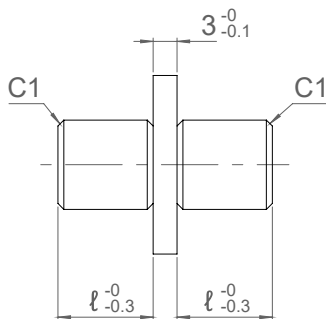
Model	D	d	l	Spring OD
25SSWB	7	3.5	4.0	8
	9	4.5	5.0	10
	11	5.5	6.0	12
	13	6.5	7.0	14
	15	7.5	8.0	16
	17	8.5	9.0	18
	19	9.5	10.0	20
	21	10.5	11.0	22
	24	12.0	12.0	25
	26	13.0	13.0	27
	29	14.5	15.0	30
	34	17.0	17.0	35
	39	19.5	20.0	40

Model: 25SSWC



ORDER	Model	D
EXAMPLE	25SSWC13	

SS400



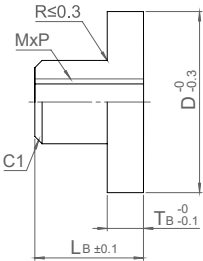
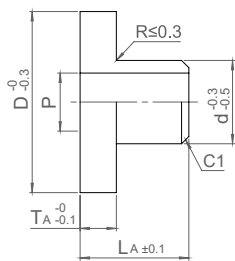
Model	D	d	l	Spring OD
25SSWC	7	3.5	4.0	8
	9	4.5	5.0	10
	11	5.5	6.0	12
	13	6.5	7.0	14
	15	7.5	8.0	16
	17	8.5	9.0	18
	19	9.5	10.0	20
	21	10.5	11.0	22
	24	12.0	12.0	25
	26	13.0	13.0	27
	29	14.5	15.0	30
	34	17.0	17.0	35
	39	19.5	20.0	40

Spring Unit Flanges - แฟล่งสำหรับชุดประคองสปริง

FOIL FREE™



Model: 25WUNT



ORDER
EXAMPLE

Model Spring OD - L1
25WUNT30-13



S45C
Fe304 (Blackening)

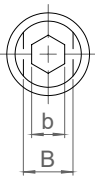
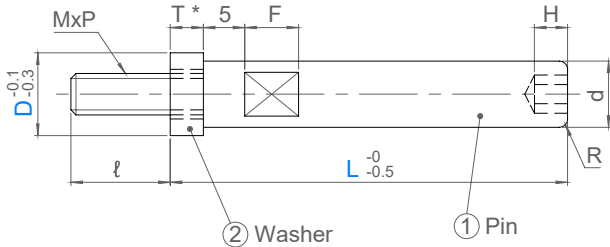
Model	Spring OD	LA	LB	P	MxP	TA	TB	D	d
25WUNT	25	10	10	8	6x1.0	5	5	26	12
	27	11	11					28	13
	30	11	11	10	8x1.25			31	14
		13	13					36	17
	35	13	13	12				41	19
	40	13	13						

Spring Guide Pins - สปริงไกด์พิน

FOIL FREE™



Model: 25SGA



ORDER
EXAMPLE

Model D - L
25SGA15-100



S45C
20-25HRC
Fe304 (Blackening)



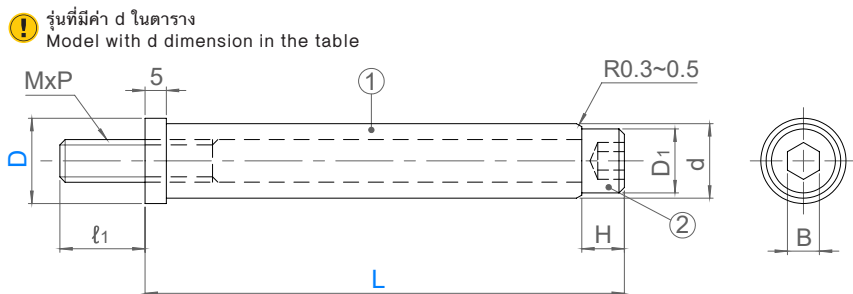
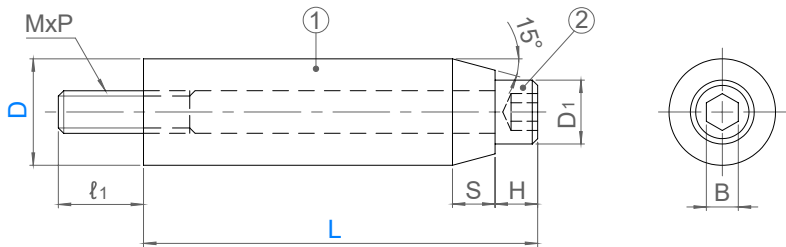
*ขนาด T เปลี่ยนตามขนาด L
T change with L

Model	D	L	MxP	ℓ	b	H	B	F	R	T	d	Spring OD	
		5mm increments										Yellow	Load > Yellow
25SGA	7	20 - 50	4x0.7	7	3	3	4	8	1	3	6	14	14
	8											16	16
	9	20 - 75	5x0.8	8	4	3	6	8	2	4	8	18	18
	10											-	20
	11	20 - 85	6x1.0	10	5	4	8	8	2	5	10	20 22	22
	12.5											-	25
	13.5	20 - 125	8x1.25	17 (12)	6	4	11	10	3	5 (10)	13	25 - 27	27
	15											-	30
	16											30	-
	17.5											-	35
	19	30 - 185	10x1.5	20 (15)	8	5	14	12	3	5 (10)	16	35	-
	20											-	40
	22	30 - 215	12x1.75	23 (18)	10	6	17	14	3	5 (10)	20	40	-
	25											-	50
	27.5											50	-
	30											-	60
	33	50 - 215	16x2.0	27 (22)	14	8	22	16	3	5 (10)	25	60	-

สปริงแม่พิมพ์

Spring Guide Retainers - สปริงไกด์รีเทนเนอร์

Model: 25SGR



⚠ รุ่นที่มีค่า d ในตาราง
Model with d dimension in the table

ORDER Model D - L ① ② SS400
EXAMPLE 25SGR8-30 ② (M) SCM435

D	L	d	D1	B	MxP	H	S	l1	Spring OD	
									Yellow	Load > Yellow
6	18	-	4.5	2	2.5x0.45	2.5	2	9.5	14 16	14 16
	23									
	28									
8	20	-	5.5	2.5	3x0.5	3	3	8	18	18 20
	30									
	40									
10	50	-	7	3	4x0.7	4	4	9	20 22	22 25
	20									
	30									
	40									
12	60	-	8.5	4	5x0.8	5	4	10	25 27	27
	20									
	30									
	40									
14	50	-	10	5	6x1.0	5	4	11	30	30
	20									
	30									
	40									
	60									

Spring Guide Retainers - สปริงไกด์รีเทนเนอร์



ORDER
EXAMPLE

Model D - L
25SGR20-40

① SS400
② SCM435

D	L	d	D1	B	MxP	H	S	t1	Spring OD	
									Yellow	Load > Yellow
16	18	-	13	6	8x1.25	8	5	15	35	35
	30									
	60									
	80									
19	28	-	16	8	10x1.5	10	5	17	-	40
	40									
	60									
	80									
	100	17								
20	23	-	16	8	10x1.5	10	5	17	40	-
	40									
	60									
	80									
	100	17								
23	30	-	18	10	12x1.75	12	8	22	-	50
	40									
	60									
	80									
	100									
	120	20								
26	28	-	18	10	12x1.75	12	8	24	50	-
	60									
	80									
	100									
	120	21								
28	30	-					18	10	12x1.75	12
	40									
	60									
	80									
	100									
	120	23								
31	28	-	18	10	12x1.75	12	12	22	60	-
	40									
	60									
	80									
	100	25								
	120									
36	40	-	18	10	12x1.75	12	15	22	70	70
	60									
	80									
	100									
	120	30								

Die Springs