

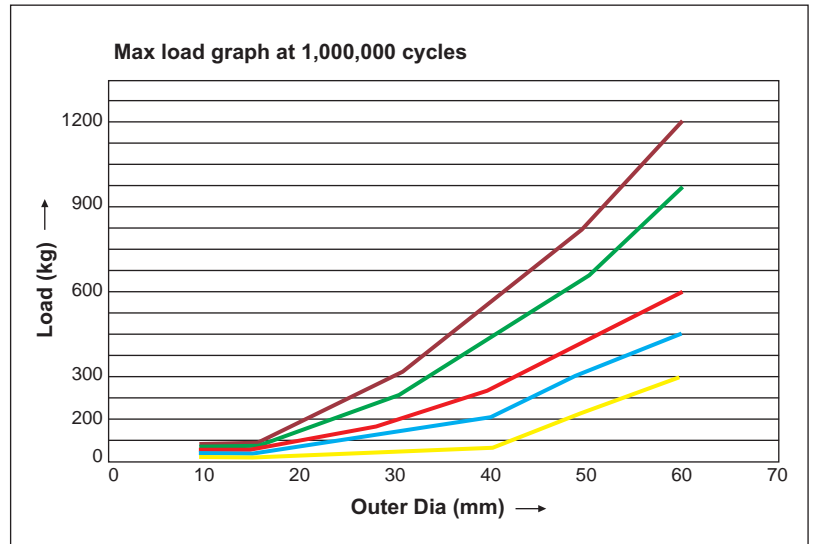
**Section K
DIE SPRINGS**



Die Springs

Compressing Proportion: As Per the drawing.

AF	Highest Load Max	58%
AL	Light Load	48%
AM	Medium Load	38%
AH	Heavy Load	28%
AB	Extra Heavy Load	24%
AR	Light Load (High deflection)	60%



Permitted size tolerance

Outer-Dia	Inner-Dia	Free length		Load	Coil-Direction	Tilt
		55mm	60mm			
+0 mm -0.1mm	+ 0.2mm - 0 mm	0.5 mm	1%	10%	Right	60mm < 2°

The Relationship between usage frequency and compression ratio of Die spring

Types	Usage Frequency	1 million (Free length x %)	0.5 million (Free length x %)	0.3 million (Free length x %)	Max. deflection
AF		40%	45%	50%	58%
AL		32%	36%	40%	48%
AM		25%	28%	32%	38%
AH		19%	21%	24%	28%
AB		16%	21%	20%	24%

JIS Standard Die Spring (Lightest Load)

Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL
AF 8X4	15	AF 16X8	55	AF 22X11	75	AF 30X16	55	AF 50X27.5	175
	20		60		80		60		200
	25		65		90		65		250
	30		70		100		70		300
	35		75		125		75		350
	40		80		150		80		400
	45	25	25	90	450				
	50	30	30	100	500				
	55	35	35	125	70				
	60	40	40	150	80				
AF 10X5	20	AF 18X9	45	AF 25X12.5	45	AF 35X19	175	AF 60X33	90
	25		50		50		40		100
	30		55		55		45		125
	35		60		60		50		150
	40		65		65		55		175
	45		70		70		60		200
	50		75		75		65		250
	55		80		80		70		300
60	90	90	90	350					
AF 12X6	20	AF 20X11	25	AF 27X13.5	100	AF 40X22	80		400
	25		30		125		90	450	
	30		35		150		100	500	
	35		40		25		125		
	40		45		30		150		
	45		50		35		175		
	50		55		40		200		
	55		60		45		50		
	60		65		50		60		
AF 14X7	25	AF 22X11	70	AF 30X16	55	AF 50X27.5	70		
	30		75		60		80		
	35		80		65		90		
	40		90		70		100		
	45		100		75		125		
	50		125		80		150		
	55		25		90		175		
	60		30		100		200		
	65		35		125		250		
70	40	150	60						
AF 16X8	25	AF 22X11	45	AF 30X16	25	AF 50X27.5	70		
	30		50		30		80		
	35		55		35		90		
	40		60		40		100		
	45		65		45		125		
	50		70		50		150		

JIS Standard Die Spring (Light Load)

Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL
AL 8X4	15	AL 16X8	55	AL 22X11	75	AL 30X15	55	AL 50X25	175
	20		60		80		60		200
	25		65		90		65		250
	30		70		100		70		300
	35		75		125		75		350
	40		80		150		80		400
	45	25	25	90	450				
	50	30	30	100	500				
	55	35	35	125	70				
	60	40	40	150	80				
AL 10X5	20	AL 18X9	45	AL 25X12.5	45	AL 35X17.5	175	AL 60X30	90
	25		50		50		40		100
	30		55		55		45		125
	35		60		60		50		150
	40		65		65		55		175
	45		70		70		60		200
	50		75		75		65		250
	55		80		80		70		300
60	90	90	75	350					
AL 12X6	20	AL 20X10	25	AL 27X13.5	100	AL 40X20	80		
	25		30		125		90	450	
	30		35		150		100	500	
	35		40		25		125		
	40		45		30		150		
	45		50		35		175		
	50		55		40		200		
	55		60		45		50		
	60		65		50		60		
	AL 14X7		25		AL 22X11		70	AL 30X15	
30		75	60	80					
35		80	65	90					
40		90	70	100					
45		100	75	125					
50		125	80	150					
55		25	90	175					
60		30	100	200					
AL 16X8	25	AL 22X11	45	AL 30X15	25	AL 50X25	70		
	30		50		30		80		
	35		55		35		90		
	40		60		40		100		
	45		65		45		125		
	50		70		50		150		

JIS Standard Die Spring (Medium Load)

Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL
AM 8X4	15	AM 16X8	55	AM 22X11	70	AM 30X15	50	AM 50X25	150
	20		60		75		55		175
	25		65		80		60		200
	30		70		90		65		250
	35		75		100		70		300
	40		80		125		75		70
	45	25	150	80	80				
	50	30	25	90	90				
	55	35	30	100	100				
	60	40	35	125	125				
AM 10X5	20	AM 18X9	45	AM 25X12.5	40	AM 35X17.5	150	AM 60X30	150
	25		50		45		175		175
	30		55		50		200		200
	35		60		55		250		250
	40		65		60		300		300
	45		70		65		55		
	50		75		70		60		
	55		80		75		65		
60	90	80	70						
AM 12X6	20	AM 20X10	25	AM 27X13.5	90		AM 40X20		75
	25		30		100	80			
	30		35		125	90			
	35		40		150	100			
	40		45		25	125			
	45		50		30	150			
	50		55		35	175			
	55		60		40	200			
	60		65		45	50			
	25		70		50	60			
30	75	55	70						
35	80	60	80						
40	90	65	90						
45	100	70	100						
50	125	75	125						
55	150	80	150						
60	25	90	175						
65	30	100	200						
70	35	125	250						
AM 16X8	25	AM 22X11	40	AM 30X15	150	AM 50X25	60	AM 60X30	
	30		45		25		70		
	35		50		30		80		
	40		55		35		90		
	45		60		40		100		
	50		65		45		125		

JIS Standard Die Spring (Heavy Load)

Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL
AH 8X4	15	AH 16X8	55	AH 22X11	75	AH 30X15	55	AH 50X25	175
	20		60		80		60		200
	25		65		90		65		250
	30		70		100		70		300
	35		75		125		75	70	
	40		80		150		80	80	
	45	AH 18X9	25	AH 25X12.5	25	AH 35X17.5	90	AH 60X30	90
	50		30		30		100		100
	55		35		35		125		125
	60		40		40		150		150
20	45		45		175		175		
25	50		50		200		200		
30	55		55		250		250		
35	60		60		300		300		
40	65		65						
45	70		70						
50	75	75							
55	80	80							
60	90	90							
AH 10X5	20	AH 20X10	25	AH 27X13.5	100	AH 40X20	80	AH 50X25	
	25		30		125		90		
	30		35		150		100		
	35		40		25		125		
	40		45		30		150		
	45		50		35		175		
	50		55		40		200		
	55		60		45		50		50
	60		65		50		60		60
	25		70		55		70		70
30	75	60	80	80					
35	80	65	90	90					
40	90	70	100	100					
45	100	75	125	125					
50	125	80	150	150					
55	AH 22X11	25	AH 30X15	90	AH 50X25	175	AH 60X30	175	
60		30		100		200			
65		35		125		250			
70		40		150		300			
25		45		25		70		70	
30		50		30		80		80	
35	55	35	90	90					
40	60	40	100	100					
45	65	45	125	125					
50	70	50	150	150					

JIS Standard Die Spring (Extra Heavy Load)

Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL
AB 8X4	15	AB 16X8	55	AB 22X11	75	AB 30X15	55	AB 50X25	175
	20		60		80		60		200
	25		65		90		65		250
	30		70		100		70		300
	35		75		125		75	70	
	40		80		150		80	80	
	45	25	25	25	90		90		
	50	30	30	30	100		100		
	55	35	35	35	125		125		
	60	40	40	40	150		150		
AB 10X5	20	AB 18X9	45	AB 25X12.5	45	AB 35X17.5	175	AB 60X30	175
	25		50		50		40		200
	30		55		55		45		250
	35		60		60		50		300
	40		65		65		55		
	45		70		70		60		
	50		75		75		65		
	55		80		80		70		
60	90	90	75						
AB 12X6	20	AB 20X10	25	AB 27X13.5	100		AB 40X20		80
	25		30		125	90			
	30		35		150	100			
	35		40		25	125			
	40		45		30	150			
	45		50		35	175			
	50		55		40	200			
	55		60		45	50		50	
	60		65		50	60		60	
AB 14X7	25	AB 22X11	70	AB 30X15	55	AB 50X25	70		
	30		75		60		80		
	35		80		65		90		
	40		90		70		100		
	45		100		75		125		
	50		125		80		150		
	55		25		90		175		
	60		30		100		200		
	65		35		125		250		
	70		40		150		60		60
AB 16X8	25	AB 22X11	45	AB 30X15	25	AB 50X25	70		
	30		50		30		80		
	35		55		35		90		
	40		60		40		100		
	45		65		45		125		
	50		70		50		150		

JIS Standard Die Spring (High Deflection type)

Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL
AR 14.5X9	20	AR 21X13	30	AR 26X16.5	80	AR 32X21	175	AR 46X32	50
	25		35		90	40	60		
	30		40		100	45	70		
	35		45		125	50	80		
	40		50	150	60	90			
	45		60	AR 39X26	70	70	100		100
	50		70		40	80	125		125
	AR 17X11		25		80	AR 32X21	50		90
30		90	60		100		175	175	
35		100	70	125	200		200		
40		40	80	150	250		250		
45		45	90	175	300	300			
50		50	AR 26X16.5	100	200				
55		60		125	250				
60		70		150	300				

Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL	
AY 14.5X9	20	AY 21X13	35	AY 26X16.5	90	AY 39X26	40	AY 46X32	60	
	25		40		100		45		70	
	30		45		125		50		80	
	35		50		150		60		90	
	40		60	AY 32X21	40		70		100	100
	45		70		45		80		125	125
	50		80		50		90		150	150
	AY 17X11		25		90		AY 26X16.5		60	100
30		100	70	125	200	200				
35		40	80	150	250	250				
40		45	90	175	300	300				
45		50	AY 21X13	100	200					
50		60		125	250					
60		70		150	300					
		80		175						
AY 21X13	30				AY 46X32	50				

JIS Standard Round Wire Die Spring

Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL
ALR 4X2.6	10	ALR 16X10.7	25	ALR 22X14.7	25
	15		30		30
	20		35		35
	25		40		40
	30		45		45
ALR 6X4	15		50		50
	20		55		55
	25		60		60
	30		65		65
	35		70		70
ALR 8X5.4	15	ALR 18X12	75	ALR 25X17	75
	20		80		80
	25		25		90
	30		30		100
	35		35		25
ALR 10X6.5	40		40		30
	25		45		35
	30		50		40
	35		55		45
	40		60		50
ALR 12X8	45	ALR 20X13.5	65	ALR 25X17	55
	50		70		60
	55		75		65
	60		80		70
	25		90		75
	30		25		80
	35		30		90
	40		35		100
ALR 14X9.3	45		40		
	50		45		
	55	50			
	60	55			
	65	60			
	70	65			
		70			

ISO Standard Die Spring (Light Load)

Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL
AJL 10 X 5	25	AJL 20 X 10	139	AJL 40 X 20	127
	32		152		139
	38		178		152
	44		203		178
	51		305		203
	64	AJL 25 X 12.5	25	AJL 50 X 25	229
	76		32		254
	89		38		305
	102		44		64
	305		51		76
AJL 12.5 X 6.3	25		64		89
	32		76		102
	38		89		115
	44		102		127
	51		115		139
	64	127	152		
	76	139	178		
	89	152	203		
	102	178	229		
	115	203	254		
305	229	305			
AJL 16 X 8	25	AJL 32 X 16	305	AJL 63 X 38	76
	32		38		89
	38		44		102
	44		51		115
	51		64		127
	64		76		152
	76		89		178
	89		102		203
	102		115		229
	115		127		254
	127		139		305
	305		152		
AJL 20 X 10	25	AJL 40 X 20	178		
	32		203		
	38		229		
	44		254		
	51		305		
	64		51		
	76		64		
	89		76		
	102		89		
	115		102		
127	115				

ISO Standard Die Spring (Medium Load)

Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL
AJM 10 X 5	25	AJM 20 X 10	139	AJM 40 X 20	127
	32		152		139
	38		178		152
	44		203		178
	51		305		203
	64	AJM 25 X 12.5	25	AJM 50 X 25	229
	76		32		254
	89		38		305
	102		44		64
	305		51		76
AJM 12.5 X 6.3	25		64		89
	32		76		102
	38		89		115
	44		102		127
	51		115		139
	64	127	152		
	76	139	178		
	89	152	203		
	102	178	229		
	115	203	254		
305	229	305			
AJM 16 X 8	25	AJM 32 X 16	305	AJM 63 X 38	76
	32		38		89
	38		44		102
	44		51		115
	51		64		127
	64		76		152
	76		89		178
	89		102		203
	102		115		229
	115		127		254
AJM 20 X 10	127	AJM 40 X 20	139		305
	305		152		
	25		178		
	32		203		
	38		229		
	44	254			
	51	305			
	64	51			
	76	64			
	89	76			
102	89				
115	102				
127	115				

ISO Standard Die Spring (Heavy Load)

Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL
AJH 10 X 5	25	AJH 20 X 10	139	AJH 40 X 20	127
	32		152		139
	38		178		152
	44		203		178
	51		305		203
	64	AJH 25 X 12.5	25	AJH 50 X 25	229
	76		32		254
	89		38		305
	102		44		64
	305		51		76
AJH 12.5 X 6.3	25		64		89
	32		76		102
	38		89		115
	44		102		127
	51		115		139
	64	127	152		
	76	139	178		
	89	152	203		
	102	178	229		
	115	203	254		
305	229	305			
AJH16 X 8	25	AJH 32 X 16	305	AJH 63 X 38	76
	32		38		89
	38		44		102
	44		51		115
	51		64		127
	64		76		152
	76		89		178
	89		102		203
	102		115		229
	115		127		254
	127		139		305
	305		152		
AJH 20 X 10	25	AJH 40 X 20	178		
	32		203		
	38		229		
	44		254		
	51		305		
	64		51		
	76		64		
	89		76		
	102		89		
	115		102		
	127		115		

ISO Standard Die Spring (Extra Heavy Load)

Spring Code OD X ID	FL	Spring Code OD X ID	FL	Spring Code OD X ID	FL
AJB 10 X 5	25	AJB 20 X 10	139	AJB 40 X 20	127
	32		152		139
	38		178		152
	44		203		178
	51		305		203
	64	AJB 25 X 12.5	25	AJB 50 X 25	229
	76		32		254
	89		38		305
	102		44		64
	305		51		76
AJB 12.5 X 6.3	25		64		89
	32		76		102
	38		89		115
	44		102		127
	51		115		139
	64	127	152		
	76	139	178		
	89	152	203		
	102	178	229		
	115	203	254		
305	229	305	305		
AJB 16 X 8	25	AJB 32 X 16	305	AJB 63 X 38	76
	32		38		89
	38		44		102
	44		51		115
	51		64		127
	64		76		152
	76		89		178
	89		102		203
	102		115		229
	115		127		254
	127		139		305
	305		152		
AJB 20 X 10	25	AJB 40 X 20	178		
	32		203		
	38		229		
	44		254		
	51		305		
	64		51		
	76		64		
	89		76		
	102		89		
	115		102		
	127		115		