

Rubber Spring SRX [Overview]

Pressure Source Components

Great improvement of durability

SRX is the product with a special blending method of various rubbers. It is resistant to large deflection (35%) and high load. Permanent set is limited. It is very cost effective compared to coil springs or urethane springs.



■ Features

- **Durability:** With 35% deflection, durability of 1,000,000 strokes is achieved. It is excellent in oil resistance, chemical resistance, heat resistance, dust resistance and corrosion resistance.
- **Permanent set:** With 35% deflection, 2% or less permanent set is achieved at 300,000 strokes. Permanent distortion appears extreme by 10,000 strokes, progresses gradually to 50,000 strokes, and then stabilizes.
- **Maximum deflection:** 35%
- **Double stack** can be allowed when the allowable maximum deflection is 30% or less and L/D is 1.6 or less.

■ Bulge of Outer Diameter

When the SRX is compressed, the outer diameter is bulged. The bulge rate is not relevant to the spring size. It is proportional to the deflection rate and the rate is almost constant of $\Delta D = 0.81\delta$

Bulge rate of

$$\text{outer diameter: } \Delta D = \frac{\phi D\delta - \phi D_0}{\phi D_0} \times 100\%$$

$$\text{Deflection rate: } \delta = \frac{S}{L} \times 100\%$$

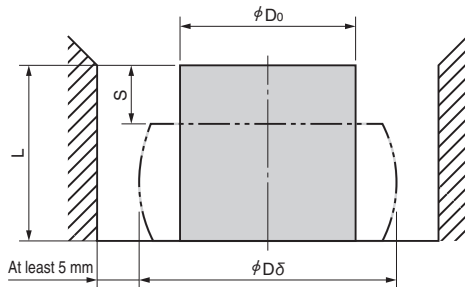
Where

ϕD_0 : Initial outer diameter mm, L: Initial length mm

$\phi D\delta$: Maximum outer diameter, S: Deflection mm

$$\text{Therefore } \phi D\delta = (1 + 0.81 \frac{S}{L}) \times \phi D_0$$

The required clearance between the maximum bulge diameter and the wall is at least 5 mm.



■ Storage

- In order to protect against ultraviolet rays, store away from direct sunlight.
- Deterioration is faster under conditions of high temperature or humidity. We recommend putting a desiccant in the container and storing in as cool a location as possible.

■ Load - Stroke Design

Refer to the SRX "load - deflection diagram" for load design.

Use the compression line (black line) for the load - deflection diagram.

Select the appropriate keeper size that can withstand the end pressure.

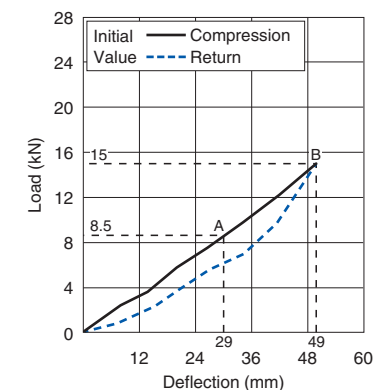
● Example : SRX $\phi 80 \times L140$

Stroke : 49 mm (deflection: 35%)

A : Start pressure (20 mm before bottom dead center) = 8.5 kN

B : End pressure (bottom dead center) = 15 kN

SRX80-140



■ Range of Application

1. Heat resistance

When the SRX is repeatedly compressed, it generates heat with hysteresis effect. Temperature rise reaches a balanced value and becomes constant around 1,000 strokes. The larger the volume, deflection rate and strokes per minute (spm) are, the larger temperature. Continuous heat resistance of the SRX is 80°C.

2. Dust resistance

The SRX is resistant to atmospheric debris. If debris gets imbedded in the SRX surface and crack develops, it will not affect performance. Use RSX as is.

3. Scratch resistance

If the SRX has scratches in the compression direction, it may not be broken immediately. It is better to replace it at an early stage.

4. Durability

At the deflection of 35%, the durability is one million strokes.

5. Oil and Chemical Resistance

Water	1	Acetone	3
Ethyl Alcohol	2	Ammonia	2
Paint Thinner	2	Rust Proofing Oil	×
Hydrochloric Acid	×	Trichlene	×
Sulfuric Acid	×	Oxalic Acid	2
Nitric Acid	×	Tar	×
Grinding Oil	2	Toluene	×
Machine Oil	3	Phenol	3
Grease	3	Benzene	×
Gasoline	×	Acetic Acid	×
Brine	1	Glycerin	2
Methyl alcohol	2		

1 = excellent resistance
2 = good resistance
3 = mediocre resistance
× = not resistant

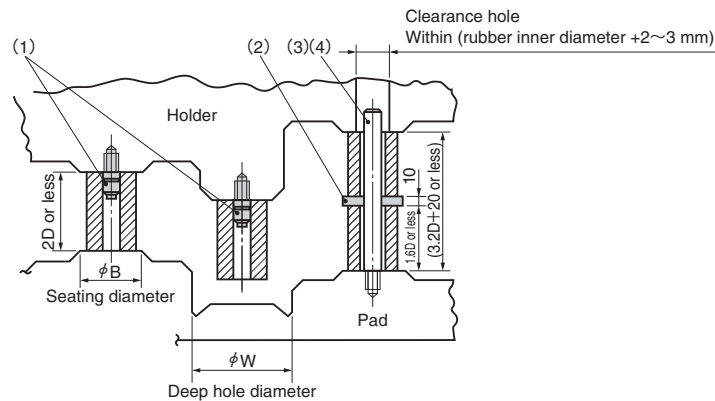
Rubber Spring SRX [Overview]

Pressure Source Components

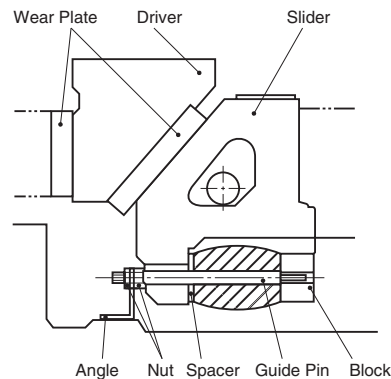
Application Example

Pad Cushion (Free Compression Type)

- ① If holding force is required to prevent the Rubber Spring from coming off, use a Rubber Spring with SORTB of the Retainer with enhanced holding force.
- ② It is recommended that resin spacer SOIS be used to prevent heating between rubber springs when the SRX is used in stages.
- ③ Use guide pin (manufactured by customer) with the diameter smaller by 1 to 2 mm than the rubber inner diameter and with precision finish ($\sqrt{1.6}$).
- ④ When the SRX is used in stages, use the length per SRX which is 1.6 times the diameter.



Cam Return Cushion (Forced Initial Compression Type)



Conditions for Use

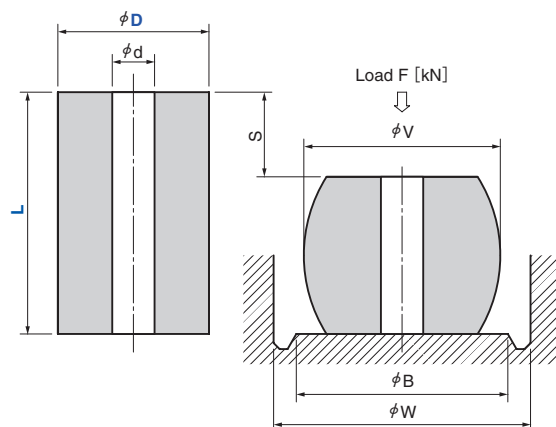
- Use at or below the stated deflection ratio.
- The urethane spring seating surface requires an external diameter of > 20 mm.
- The clearance around each spring must be sufficient to prevent any contact with the neighboring components.
- Exposure to ultraviolet and sunlight must be avoided.
- Guide pins should be S25C equivalent or better and finished within Ra1.6.
- Since rubber springs have adsorptive properties, be careful not to drop parts when disassembling press dies.
- Note that the rubber spring may come loose from the retainer due to its adsorptive properties and may not hit the seat parallel to the seat surface.
- If holding force is required to prevent the Rubber Spring from coming off, use a Rubber Spring with SORTB of the Retainer with enhanced holding force.

Rubber Spring

Pressure Source Components

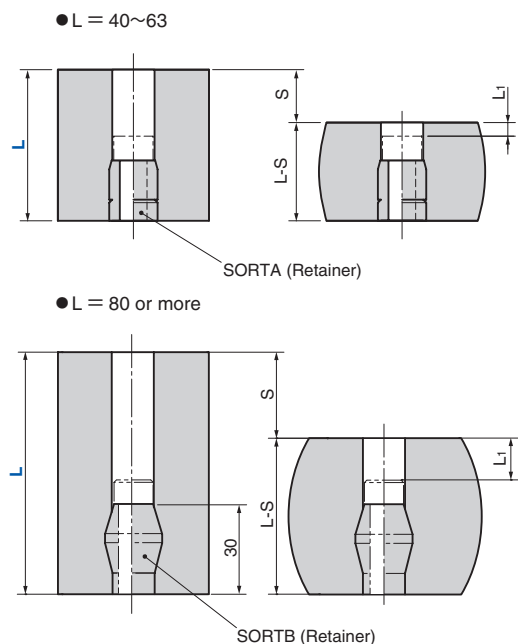
SRX

CAD
FILE



SRXT (with Retainer)

CAD
FILE



〈Material〉 Special blend rubber

Catalog No.	D	L	S = Lx35%			L ₁	B	W	d	Retainer used for SRXT
			S	F [kN]	V					
		30*1	10.5			—				—
		40	14.0			8.0				SORTA14-10
	40	50	17.5	3.2	52	4.5	60	≥ 62		SORTA14-20
		63	22.1			13.0				SORTB14
		80	28.0			14.0				SORTA14-20
	50	50	17.5			4.5				SORTA14-20
		63	22.1	5.5	65	12.9	70	≥ 75	14	SORTB14
		80	28.0			14.0				SORTA14-20
		100	35.0			27.0				SORTB14
SRX		63	22.1			12.9				SORTA14-20
SRXT		80	28.0	10.0	81	14.0	85	≥ 91		SORTB14
		100	35.0			27.0				
		125	43.8			43.2				
		80	28.0			10.0				
		100	35.0			23.0				
	80	125	43.8	15.0	103	39.2	110	≥ 114		
		140	49.0			49.0				
		160	56.0			62.0			22	SORTB22
		100	35.0			23.0				
		125	43.8			39.2				
		140	49.0	24.5	129	49.0	130	≥ 139		
		160	56.0			62.0				

F value in above chart shows average force. Load-deflection diagram shown next page is from actual test data.
*1 40-30 is SRX only.



Catalog No.	D	—	L
SRX	50	—	80
SRXT	50	—	80



Refer to page 1192 for the spacer for stack use of springs.



- Retainers are SORTA for overall rubber spring lengths of 50 and 63 mm, and SORTB for overall rubber spring lengths of 80 mm and longer.
- Since rubber springs have adsorptive properties, be careful not to drop parts when disassembling molds.



Refer to page 1191 for attached retainer size.

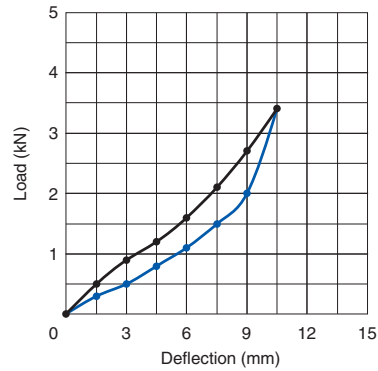
Rubber Spring

SRX Load-Deflection Diagrams

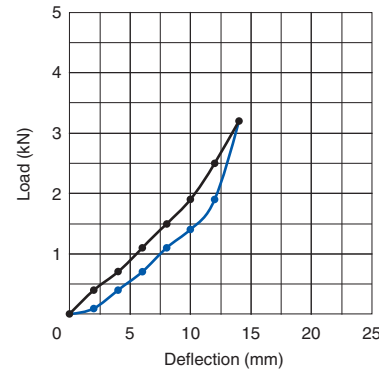
Pressure Source Components

—●— Compression —●— Return

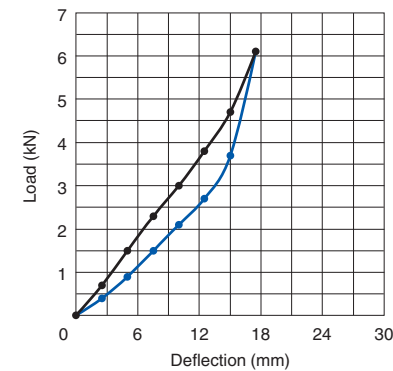
SRX40-30



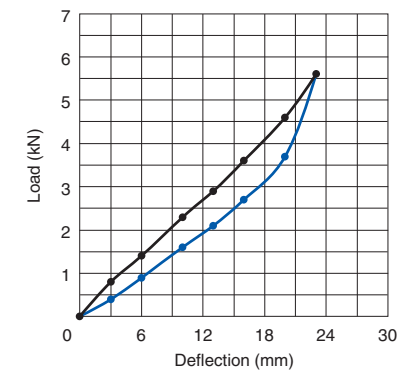
SRX40-40



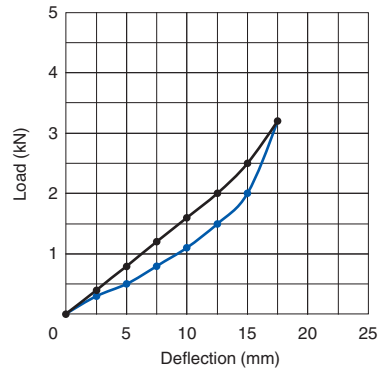
SRX50-50



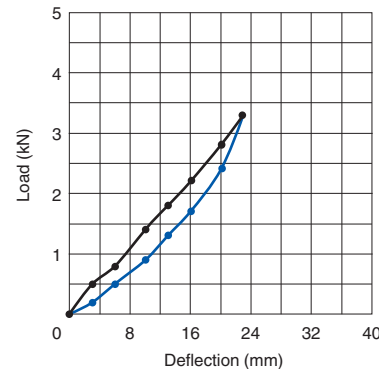
SRX50-63



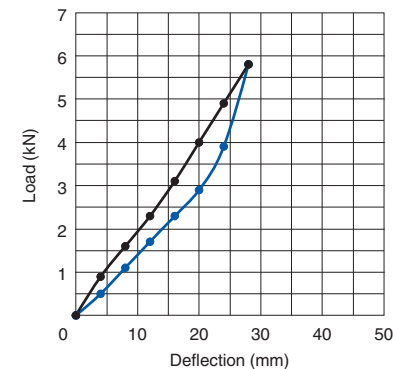
SRX40-50



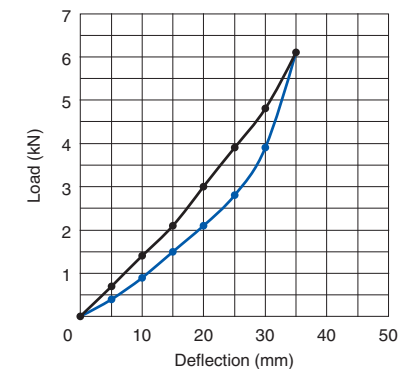
SRX40-63



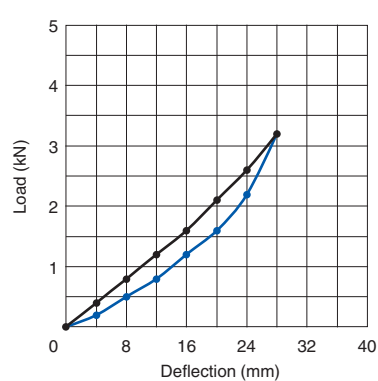
SRX50-80



SRX50-100



SRX40-80



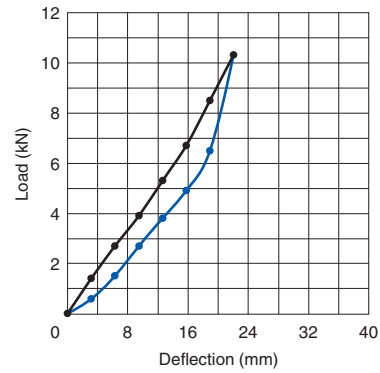
Rubber Spring

SRX Load-Deflection Diagrams

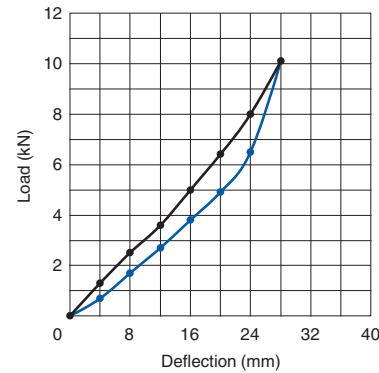
Pressure Source Components

—●— Compression —●— Return

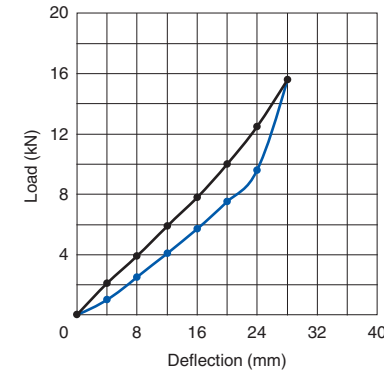
SRX63-63



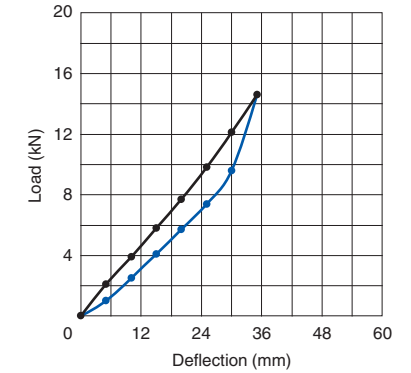
SRX63-80



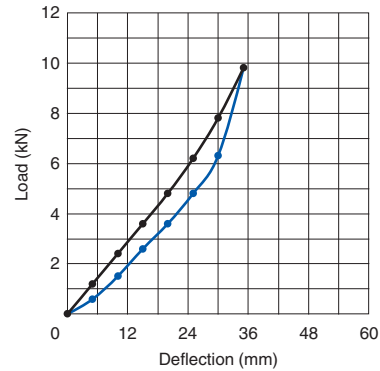
SRX80-80



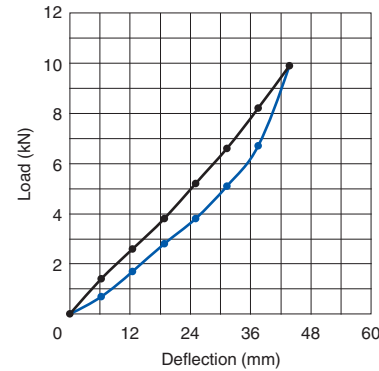
SRX80-100



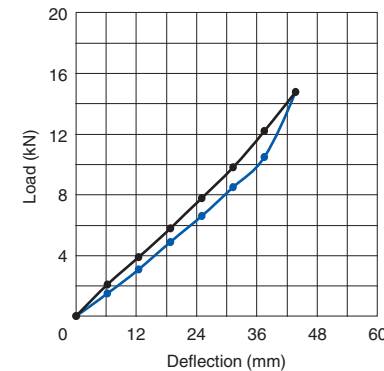
SRX63-100



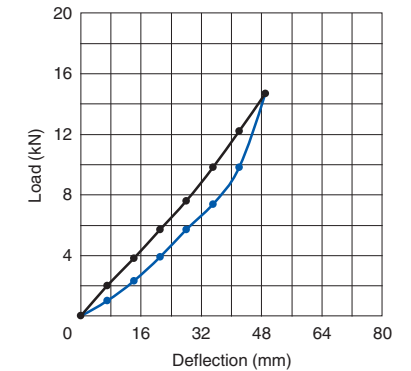
SRX63-125



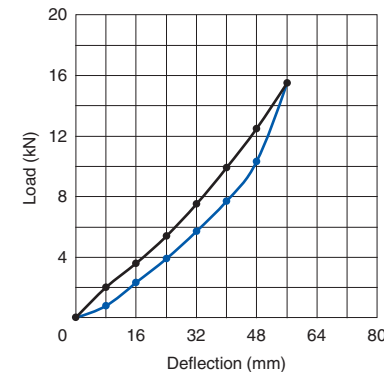
SRX80-125



SRX80-140



SRX80-160



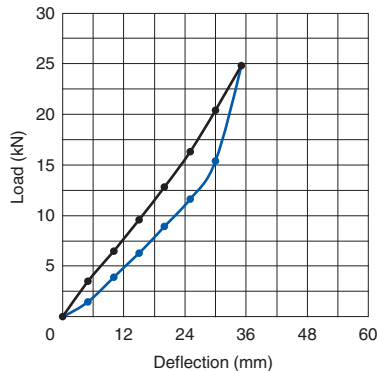
Rubber Spring

SRX Load-Deflection Diagrams

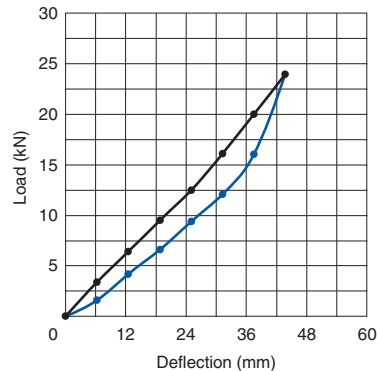
Pressure Source Components

● Compression ● Return

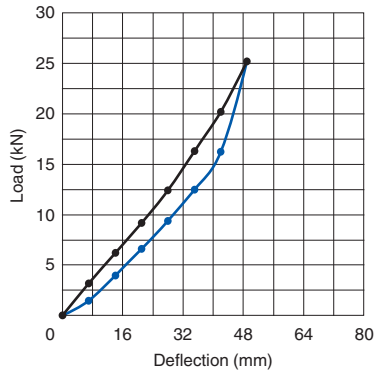
SRX100-100



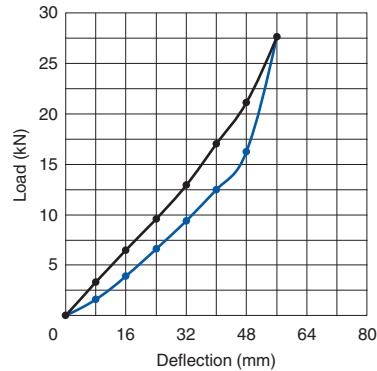
SRX100-125



SRX100-140



SRX100-160

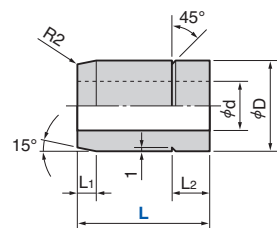


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Retainer, Spacer

Pressure Source Components

SORTA



〈Material〉 SS400 or S25C

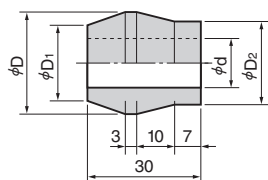
Catalog No.	Nominal	L	D	d	L ₁	L ₂	Applicable Rubber Spring, Urethane Spring	
							Outer Diameter	Length
SORTA	10	10			2	3	30, 40	~40
	14	20	16	9	3	7	30~63	50~63
	20	30	22		5	10	60~	60~120
	22	35	24	13			70~100	60~200



Order

Catalog No.	Nominal	L
SORTA	20	30

SORTB



〈Material〉 SS400 or S25C

Catalog No.	Nominal	D	D ₁	D ₂	d	Outer Diameter
SORTB	14	19	13	14	9	50 63
	22	27	20	22	13	80 100



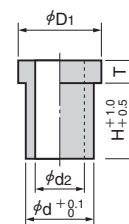
When installing SORTB, set the straight part to the fixed surface side.



Order

Catalog No.	Nominal
SORTB	14

K



〈Material〉 SS400

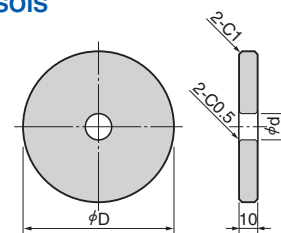
Catalog No.	Nominal	D1	d	d2	H	T
K	10	19.5	15	11	12	5
	12	22	18	13	20	6



Order

Catalog No.	Nominal
K	10

SOIS



〈Material〉 Neodel
(#25-61N)

Catalog No.	Nominal	D	d	Applicable Rubber Spring, Urethane Spring		
				Outer Diameter	Inner Diameter	Guide Pin Diameter
SOIS	50	65		30 40 50		
	63	80	13	60 63	14	12
	80	100		70 80	20	
	100	125	21	90 100 110	22	20



Guide pins should be S25C equivalent or better and finished within Ra1.6.



Order

Catalog No.	Nominal
SOIS	63