

Superior Performance and Unrivalled Versatility **RUBBFLEX COUPLING**



NITTA CHEMICAL INDUSTRIAL PRODUCTS CO., LTD.

INTRODUCTION

Have you experienced difficulties in centering and connecting machinery shafts? You may also have suffered from vibrations, shocks and noises after connection.

Rubbflex Couplings may be the most efficient and economic answer to all these problems. These couplings, with its excellent flexibility and absorption of vibration, incorporate Nitta's years of experience and technical expertise as a major tire manufacturer in Japan.

Rubbflex Couplings are easy to install and fit. They contribute greatly in vibration and noise suppression, to improve working environment and lengthen machine service life. They can also be used for extended periods without lubrication, contributing to maintenance and labor reduction.

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Note : The metal parts (in silver) of the product shown in the photo were painted for aesthetic reasons. The actual products may appear differently from this photo. The flexible element of Rubbflex RF/RFH couplings is formed from tough tire cords and then covered on both sides with rubber specially formulated for increased resistance to bending fatigue.

1. Extreme Flexibility

RF/RFH couplings tolerate a wide range of angular misalignment, parallel misalignment and axial misalignment (end play). Take care when using couplings under such conditions. The resulting stress may cause damage to other equipment.

Angular Misalignment

The maximum permissible angular misalignment $(\Delta \theta)$ is less than 3° for all sizes.

Parallel Misalignment

The maximum permissible parallel misalignment (Δ h) is less than 1% of the coupling's outer diameter.

Hub Separation (End Play)

The maximum permissible deviation in hub separation (Z2) is 0 to -2% of the coupling's outer diameter.





2. Excellent torque shock absorption and torsion damping

Since RF/RFH couplings are highly elastic, they have superior torque shock damping and absorption of torsional vibration. As a result, shaft rotation is quieter and vibration is suppressed. The shaft's torque and the coupling's torsion angle are proportional, and this simplifies design, especially in cases where shaft vibration could pose particular problems.



3. Simple Construction and Easy Fitting

Fitting is simple and all it takes is to bolt down the flexible element with pressure rings to a specified position (to the step of the hub-boss for type RF, or groove for type RFH.) There is a slit in the flexible element to make installation and removal procedures simpler. This allows couplings replacement without a need to move heavy machinery.

4. No Lubrication Required

RF/RFH couplings are virtually maintenance free. They are basically not affected by moisture and dirt. Since there are no parts subjected to metallic friction, noise is minimal. They require no lubrication to prevent excessive wear. With good resistance to bending fatigue and requiring less maintenance, the cost involved in the coupling mechanism of RF/RFH couplings is lower than those of conventional couplings on the market.

RUBBFLEX RF COUPLING SPECIFICATIONS AND DIMENSIONS



	Outer	Во	re	Outer dia. of	Total	Length of single	Outer dia. of	Hub separation			
	uia.	Min.	Max.	boss	width	hub	hub		-		
Sizo No	Da	d min	d max	Dn	L	н	Df	Z1	Z 2	Z3	
5120 NO.	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm	
RF- 60	60	8	12	20	32	10.5	44	11	5	25	
RF-100	100	10	22	36	66	26	80	14	10	40	
RF-135	135	16	30	48	90	35	108	20	14	53	
RF-180	180	23	35	64	120	46	144	28	20	70	
RF-210	210	28	50	76	143	54	168	35	27	83	
RF-265	265	33	60	95	178	67	210	44	32	105	
RF-310	310	36	70	112	208	75	248	58	36	121	
RF-400	400	40	85	145	270	100	320	70	44	153	
RF-450	450	55	100	165	300	110	360	80	50	171	
RF-550	550	90	130	200	365	130	440	105	53	196	
RF-700	700	100	160	255	460	165	560	130	70	256	

Note: (*1) The figures in this table represent standard measurements at the time of temporary assembly.



Note

- Unlike other models, RF-60 uses a spring washer instead of the usual SS400 common washer
- The bore size (d) will be finished using the "d min" figure, unless otherwise specified. (Tolerance: φd=0 to -1)
- 3. Recommended temperature:+20°C, Service temperature range:-10~+60°C.

Prod. No.	Name	Material	Surface treatment
1	Hub	FC200 or Equivalent	Lacquer coating
2	Pressure ring	SS400 or Equivalent	Lacquer coating
3	Flexible element	Rubber and tire cord	
4	Bolt	SWCH10R or Equivalent	Zinc electroplating
5	Common washer	SPCC	Zinc electroplating

Bolt pitch		Bolt size		Max.	Max.	Mass	Weight	
dia.	Number of bolts	Dia. × pitch	Length	rpm	torque	of inertia	Weight	
В	N	dı × p	l	n	Т	I	W	Sizo No
mm		mm	mm	r.p.m.	N∙m	N·cm·sec ²	kg	SIZE NO.
29	12	M4 ×0.7	10	4,000	9.8	0.00008	0.28	RF- 60
54	12	M6 ×1	15	4,000	29	0.00088	1.21	RF-100
70	12	M8 ×1.25	20	4,000	78	0.0038	2.87	RF-135
95	12	M10×1.5	25	3,000	147	0.0151	6.38	RF-180
110	16	M10×1.5	30	3,000	294	0.0319	9.40	RF-210
140	16	M12×1.75	40	2,000	736	0.101	19.0	RF-265
165	16	M12×1.75	45	2,000	1,230	0.224	31.0	RF-310
210	16	M16×2	55	1,600	2,700	0.791	70.0	RF-400
240	16	M20×2.5	60	1,250	4,900	1.39	101	RF-450
280	16	M24×3	75	1,000	9,810	3.78	170	RF-550
364	16	M30×3.5	100	800	19,600	12.6	358	RF-700

RUBBFLEX RFH COUPLING SPECIFICATIONS AND DIMENSIONS



	Outer Bo		re	Outer	Total	Length	Outer	ц.	Hub separation			
	dia.	Min.	Max.	boss	width	hub	hub	110	ib separati	on		
Sizo No	Da	d min	d max	Dn	L	Н	Df	Z1	Z 2	Z3		
SIZE NO.	mm	mm	mm	mm	mm	mm	mm	mm	mm	mm		
RFH-100	100	10	22	38	63	25	80	13	5	38		
RFH-125	125	12.5	30	48	80	31.5	100	17	7	47		
RFH-155	155	16	32	32 60 100 40 12	124	20	9	58				
RFH-180	180	20	35	68	125	50	144	25	10	66		
RFH-210	210	25	50	80	140	56	168	28	12	75		
RFH-265	265	31.5	60	100	160	63	210	34	16	97		
RFH-310	310	40	70	118	200	80	248	40	18	113		
RFH-400	400	50	85	152	250	100	320	50	23	143		
RFH-450	450	63	100	172	315	125	360	65	25	161		
RFH-550	550	80	130	210	355	140	440	75	30	191		
RFH-700	700	100	160	266	450	180	560	90	40	246		

Note: The figures in this table represent standard measurements at the time of temporary assembly.



Notes

- The bore size (d) will be finished using the "d min" figure, unless otherwise specified. (Tolerance:\$\phid=0\$ to -1)
- 2. Recommended temperature:+20°C, Service temperature range:-10~+60°C.

Prod. No.	Name	Material	Surface treatment
1	Hub	FC200 or Equivalent	Lacquer coating
2	Pressure ring	SS400 or Equivalent	Lacquer coating
3	Flexible element	Rubber and tire cord	
4	Bolt	SWCH10R or Equivalent	Zinc electroplating
5	Common washer	SPCC	Zinc electroplating

Bolt pitch		Bolt size		Max.	Max.	Mass	Woight	
dia.	Number of bolts	Dia. × pitch	Length	rpm	torque	of inertia	Weight	
В	Ν	dı × p	l	n	Т	I	W	Sizo No
mm		mm	mm	r.p.m.	N∙m	N·cm·sec ²	kg	SIZE NO.
54	12	M6 ×1	15	5,000	49	0.00095	1.22	RFH-100
68	12	M6 ×1	20	4,500	98	0.00280	2.12	RFH-125
84	12	M8 ×1.25	25	4,200	167	0.0080	4.56	RFH-155
95	12	M10×1.5	25	3,500	294	0.0169	6.88	RFH-180
110	16	M10×1.5	30	3,000	490	0.0355	9.79	RFH-210
140	16	M12×1.75	40	2,500	981	0.112	20.0	RFH-265
165	16	M12×1.75	45	2,000	1,370	0.248	35.0	RFH-310
210	16	M16×2	55	1,600	3,140	0.863	75.0	RFH-400
240	16	M20×2.5	60	1,400	4,900	1.56	115	RFH-450
280	16	M24×3	75	1,100	9,810	4.22	190	RFH-550
364	16	M30×3.5	100	900	19,600	14.2	400	RFH-700

1. To determine the coupling size, derive the operating torque (Md) using the formula below.

 $Md = \frac{P(=KW)}{n} \times 9549 \times K \text{ or } \frac{P(=PS)}{n} \times 7024 \times K$

Md=Operating torque (N·m) P=Motor's power output (KW or PS) n=Min. rpm at the point where coupling is used K=Obtain the impact coefficient from the table below

- 2. Refer to the Size Table on page 4 & 6, or the right Torque/RPM Table, select a coupling with a T (Max. torque) rating equal to or larger than the required operating torque (Md).
- 3. If a particular coupling has a bore size (indicated on the Size Table) smaller than your requirement, select a coupling with the next larger bore size.
- 4. Max. rpm must also be taken into consideration when choosing a coupling.

SI Unit Conv	ersion Table		Figures in () are just numerical examples.			
	SI unit	Conventional unit	Approximation	Conversion coefficient		
Torque	N∙m (981N∙m)	kgf∙m (100kgf∙m)	1kgf∙m10N∙m	9.80665		

SI units (International System of Units)

How to Determine Impact Coefficient (K)

		Impact Coefficient (K)							
		A	В	С	D				
	Electric motor	1.0	1.5	2.0	3.0				
Type of motor	Internal combustion engine (4 cylinders or more)	1.5	2.0	2.5	3.5				
Machine charac- teristics	Internal combustion engine (3 cylinders or less)	2.0	2.5	3.5	5.0				
Machine charac- teristics	Frequency and level of torque variation	Minimal	Small	Medium	Large				
		Small engine		Large lift	Reciprocating pump with flywheel				
		Belt conveyor	Chain conveyor	Winch	Hoist (300 rpm or less)				
		Small machine tool	Sand blaster	Piston	Mill				
		Small hoist (60 rpm or less)	Bucket conveyor	Blower	Crusher				
	Application	Small centrifugal pump	Ventilator	Cutter	Hot-rolled table roller				
		Wood working machine	Crane	Hoist (300 rpm or less)	Compressor				
		Small ventilator	Medium size machine tool	Grinder	Drain pump				
			Centrifugal pump	Large pump	Large press				
			Hydraulic pump	Paper dryer	Drum barker				
				Paper calender	Paper cutter				

INSTALLATION [TYPE RF·RFH]

Step 1



shaft along the key/keyway. Attach the pressure ring 2 and common washers 5 using bolts 4. Tighten bolts a few turns but leave plenty of slack. Verify that shaft alignment is within the permissible limit using the Table A below.

Install hubs ① on each



Adjust hub separation (Z2) to keep it within the specified tolerance listed on p.3-6. This value needs to be uniform around the entire circumference.



Install the flexible element ③ between the hub ① and pressure ring ② as in Fig. 3-1. The flexible element is cut for easy installation. Make sure that element gap created by both ends of the flexible element stays within specified range listed on Table C and Fig.3-2. Use a rope or cloth to hold down the flexible element as in Fig.3-3 to assist installation. Tap the flexible element around the circumference with a plastic hammer for uniform alignment.

Step 4



Tighten pressure ring ⁽²⁾ with the pre-attached bolts ⁽⁴⁾ in crisscross pattern for uniform compression.



Type RF has a step on the outer surface of the hub boss while type RFH has a groove as shown in Fig. 5. Tighten bolts ④ until the side of the pressure ring ② is even with the step or groove. Bolts should be tightened further in case of reassembling to prevent loosening.

Step 6



Bend common washer edges to lock bolts in place. (RF-60 uses spring washers) Watch out for sharp metal edges. Place a protective cover over the coupling for improved safety.

Shaft alignment



Table A Standard Installation Measurement and Tolerance													
Size	60	100	125	135	155	180	210	265	310	400	450	550	700
Parallel misalignment h(mm)		Less than 1% of the coupling's outer diameter											
Angular misalignment θ(deg)		Less than 3° for all couplings											
element gap (mm)	1	2	2	2	2	2	3	3	3	4	4	6	6

Please contact us for any questions on installation procedure.

(For both RF and RFH types)

PRECAUTIONS

- ① Be sure not to exceed tolerances of torque, rpm and bore specified on p.3-6. If a coupling in use surpasses these limits, stop its use immediately. Be sure the value of torque multiplied by an appropriate impact coefficient is below the specified maximum torque.
- 2 Make sure washer edges are bent sufficiently to block bolt movement. See fig. 6.
- ③ The element gap should stay within limits indicated on Table A. If not, reassemble the coupling. (Extra tightening is required after reassembly.)
- ④ Shaft misalignments must stay within specified limits explained on p2.
- ⑤ In places where free rotation due to coupling failure is not acceptable, such as a crane, install a brake, fallout prevention and/or other safety mechanism.
- 6 Install a protective cover.
- ⑦ Rotation creates thrust. Use bearings with adequate rating to withstand this.
- ⑧ Recommended temperature:+20°C, Service temperature range:-10~+60°C.

MAINTENANCE AND STORAGE

- ① Avoid oil, grease, acid, alkaline, paint or organic solvent. If accidentally exposed, wipe off immediately.
- 2 Do not expose the flexible element to direct sunlight.
- ③ Keep away couplings from tight places where it may force the rubber to disfigure, both in use and in storage.
- ④ Do not damage the flexible element with blades or any other sharp objects.
- 5 For storage seal couplings in polyurethane bags and place them in a dry dark compartment at below 40°C.

Table B		Table C	
Depth Limit o	f a Crack	Element Ga	p Limit
Size	Limit	Size	Limit
60~155	1mm	60	3mm
180~265	2mm	100~180	5mm
310	3mm	210~310	6mm
400~550	5mm	400~450	8mm
700	8mm	550~700	10mm

(Common for both RF and RFH types)

PERIODIC MAINTENANCE AND REPLACEMENT

Perform periodic maintenance at least once every 6 months. Completely stop the coupling before working. A coupling should be replaced when it matches the condition described below.

- ① A rip in the flexible element (especially along pressure ring) appears and it reaches the depths indicated on Table B.
- 2 The element gap exceeds the limit specified on Table C.
- ③ If bolts no longer have tightening freedom to adequately fasten the flexible element.
- ④ If the flexible element's fiber is exposed or surface irregularities are formed by abrasion.
- (5) If the flexible element or a portion of it is weakened by exposure to oil, grease or any other chemical agents.
- 6 If the flexible element is hardened from high temperature or extended use.



When selecting a coupling or placing a special order, please inform us the following details.

Transmission torque of the drive shaft	Nominal	Peak							
RPM of the drive shaft	Nominal	Peak	Minimum						
Rotating direction of the drive shaft (i.e. rig	ght, reverse, unidi	rectional)							
Type of the motor (i.e. electric motor, internal combustion engine)									
Type of the driven unit (i.e. pump, fan, conveyor)									
Size limit of the coupling	Diameter	or less	Length	or less					
Shaft diameter of the motor									
Shaft diameter of the driven unit									
Operating environment (i.e. indoor/outdoor, ambient temperature, existence of oil or other chemicals: see above for details)									

Let us know if a special consideration is required besides what is already listed. If bore processing is required, please inform us diameters of both shafts, keyway dimensions and finish tolerance besides the coupling's size number. (Processing fee is charged separately.) Please contact us if you have any questions.

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Products:

Coupling, Mounting, Air spring, Solid polyurethane product, PVC hose, Rubber hose, FRP(fiberglass reinforced polyester) product, FRP air pollution control system, Other industrial rubber products, Automobile tire & tube, Polyurethane foam.