Keyless Hub Spur Gear

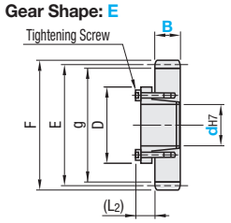
Pressure Angle 20°, Module 1.0, 1.5, 2.0, 2.5, 3.0

Features: Additional machining to shafts (such as keyway) is not required, and the strength of shafts is not compromised. Positioning is easy.

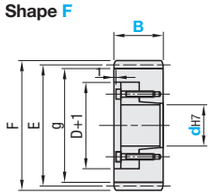
RoHS10

Type	M Material: Gears	M Material: Bushing	S Surface Treatment: Gears	S Surface Treatment: Bushing	A Accessory
GEAL	S45C Equivalent	S45C Equivalent	-	-	Hex Socket Head Cap Screw SCM435, Black Oxide
GEALB			Black Oxide		
GEALG			Electroless Nickel Plating		

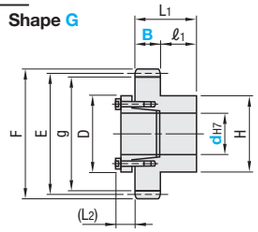
Gear Shape: E



Shape F



Shape G



* Standard Type Bushings (ST) and Short Type Bushings (SH) are available. Refer to the next page.

Accuracy Previous JIS B 1702 Class 4 (New JIS B 1702-1 Class 8 Equivalent)

Part Number Type	Module	Number of Teeth	B	Gear Shape	Shaft Bore Dia. dH7 (select from Table 1 on next page) Shape E, G: ST Bushing	Shape F: ST Bushing	Shape F: SH Bushing	E Reference Dia.	F Tip Dia.	G Root Dia.	ℓ1	L1	H	*1. Allowable Transmission Force (N, m) Bending Strength	Unit Price GEAL Shape E	GEAL Shape F	GEAL Shape G	GEALB Shape E	GEALB Shape F	GEALB Shape G	GEALG Shape E	GEALG Shape F	GEALG Shape G
GEAL GEALB GEALG	1.0	35	10	G	8~10	-	-	35	37	32.5	10	20	30	12.13	-	-		-	-		-	-	
		36						36	38	33.5				12.52									
		38						38	40	35.5				13.46									
		40			8~12			40	42	37.5				14.31									
		42						42	44	39.5				15.24									
		45						45	47	42.5				16.66									
		48			8~18			48	50	45.5			44	18.04									
		50						50	52	47.5			46	18.95									
		52						52	54	49.5				19.87									
		60			10~18			60	62	57.5			50	23.64									
		70			12~32			70	72	67.5			56	28.31									
		80			15~32			80	82	77.5			60	32.98									
		100			17~32			100	102	97.5				42.59									
		120						120	122	117.5			70	51.87									
	1.5	20	15	E G	8	-	-	30	33	26.25	12	27	25	18.81	-			-			-		
		24						36	39	32.25			30	24.45									
		25						37.5	40.5	33.75				25.92									
		26						39	42	35.25			32	27.42									
		28			8~12			42	45	38.25			34	30.43									
		30						45	48	41.25			35	33.30									
		32			8~17			48	51	44.25			40	36.11									
		35			8~18			52.5	55.5	48.75				40.93									
		36						54	57	50.25				42.24									
		40			8~30			60	63	56.25			45	48.31									
		48			8~32			72	75	68.25			50	60.90									
		50						75	78	71.25				63.97									
		52						78	81	74.25				67.07									
		60			12~32			90	93	86.25			55	79.80									
		70						105	108	101.25			65	95.56									
		80						120	123	116.25				111.30									
	2.0	15	20	E F G	8	-	-	30	34	25	14	34	24	28.65		-			-			-	
		18						36	40	31			30	38.07		-			-			-	
		20					8	40	44	35			33	44.59									
		24			8~17		8~12	48	52	43			40	57.96									
		25						50	54	45				61.43									
		26			8~18			52	56	47			42	64.99									
		30						60	64	55			48	78.93									
		32						64	68	59			50	85.59									
		36			10~32			72	76	67			55	100.13									
		40						80	84	75			60	114.52									
		48						96	100	91			62	144.35									
		50						100	104	95				151.64									
		52			12~32			104	108	99			65	158.99									
		60						120	124	115				189.16									
	2.5	14	25	E F G	8	-	-	35	40	28.75	16	41	25	49.96		-			-			-	
		15						37.5	42.5	31.25			30	55.96		-			-			-	
		16					8	40	45	33.75			32	61.98									
		18			8~14			45	50	38.75			38	74.36									
		20				8~12	-	50	55	43.75			40	87.09									
		24			8~22		14~19	60	65	53.75			48	113.19									
		25			8~25			62.5	67.5	56.25			50	119.98									
		28						70	75	63.75			60	140.86									
		30						75	80	68.75			65	154.16									
		32			10~28			80	85	73.75			70	167.17									
		36			10~35			90	95	83.75			75	195.56									
		40			10~42			100	105	93.75			80	223.66									
		48			12~50			120	125	113.75			85	281.94									
		50						125	130	118.75				296.17									
	3.0	12	30	E F G	8	-	-	36	42	28.5	18	48	27	66.66		-			-			-	
		14			8, 10			42	48	34.5			32	86.33		-			-			-	
		15			8~12	8	-	45	51	37.5			35	96.70									
		16			8~17	8~10	11	48	54	40.5			40	107.10									
		18				8~15	-	54	60	46.5			44	128.50									
		20				8~17	18, 19	60	66	52.5			50	150.49									
		24			8~25	8~25	28	72	78	64.5			58	195.60									
		25					28, 30	75	81	67.5			60	207.33									
		28			10~35		28~35	84	90	76.5			70	243.41									
		30						90	96	82.5			75	266.40									
		32						96	102	88.5				288.88									
		36			12~42			108	114	100.5			80	337.93									
		40			12~45			120	126	112.5			85	386.49									

*1 Allowable Transmission Forces in the table are reference values calculated with prescribed conditions. For conditions, see P. 1498.

Ordering Example

Part Number	-	Number of Teeth	-	B	-	Gear Shape	-	Shaft Bore Dia. d
GEAL1.0	-	40	-	10	-	G	-	10

Bushings

Notes on Installation

- When installing, be sure to apply oil or grease. When oil or grease is not applied, shaft may slip because of inadequate tightening.
- Tighten the bushing screws only after the shaft has been inserted. (The bushing will be deformed if tightened without a shaft inserted.)
- Use a torque wrench to tighten the screws.
- Do not use screws other than those included.

Installation

①Wipe dusts off shaft surface and apply oil or grease. (Do not use any oil or grease containing molybdenum type wear reduction agents.)

②Wipe off and apply oil or grease on contact surfaces of spur gear and bushing. Apply oil or grease to threads and seat of screws as well.

③Temporarily assemble spur gear and bushing and insert the shaft. (Do not tighten the bushing before inserting the shaft.)

④After locating the gear on the shaft, tighten the clamping screws using a torque wrench in the diagonal pattern order, beginning lightly (approx. 1/4 of the specified tightening torque).

⑤Tighten the screws further to an increased torque (approximately 1/2 of specified torque).

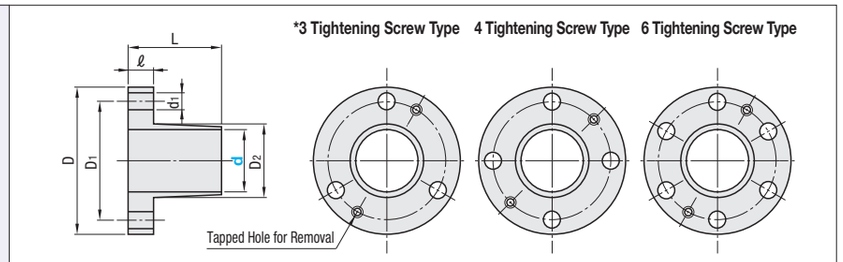
⑥Tighten to the specified full tightening torque.

⑦Finally, tighten the screws to the listed torque values in a circular order.

Removal

- Be sure to work after the system is completely shut down and stopped.
- Loosen the tightening screws in circular order.
- Insert screws into removal holes and tighten evenly.
- Repeat "Installation" process for re-installation.

RoHS10



Operating Temperature: -20 ~ +80°C

* SH bushings have tapped holes for removal in 3 places.

M Material: Main Body S45C; Screws SCM435 (Black Oxide)

Table 1: Bushing Dimension Table

· Standard Type (ST)

Shaft Bore Dia. d	Screw Qty.	Screw Size	Tapped Hole for Removal	Max. Allowable Torque N·m	Allowable Thrust Load kN	Screw Tightening Torque N·m	(L2)	D	D1	D2	d1	L	ℓ
8	4	M3x12	M3x2	16	4.0	2.0	8.5	25.5	19	10	3.3	15.5	4
10	3	M4x16	M4x2	39	5.34	4.0	10.5	30	22	12	4.5	16.5	5
11				43				31	23	13			
12				48				32	24	14			
14	4	M4x18	M4x2	73	5.34	4.0	12	35	27	16.6	4.5	22	6
15				78				36	28	17.6			
16				83			13	37	29	18.6		23	7
17				88				38	30	19.6			
18	4	M5x20	M5x2	154	8.74	8.3	14	43	33	20.6	5.5	23	7
19				163				45	35	22.4			
20				171				46	36	23.4			
22				186				48	38	24.6			
24				206				50	40	26.6			
25				216				52	42	28.4			
28	6	M5x25	M5x2	353	8.74	8.3	15.5	54	44	30.6	5.5	24	8
30				382				57	47	33.4			
32				412			16.5	59	49	34.7		25	9
35				451				63	53	38.4		26.5	
38	6	M6x28	M6x2	686	12.3	13.7	19	70	58	42	6.6	28	10
40				725				71	59	43.5		30.5	
42				757			20	74	62	46		31.5	11
45	6	M8x35	M8x2	1490	22.7	34.3	24.5	84	69	49.5	8.8	38.5	13
48				1600				87	72	52.5			
50				1660				89	74	54.5			

- Shaft tolerance g6, shaft surface roughness Ra6.3 are standard.

kgf=Nx0.101972

- When there is a keyway machining or a D cut on the shaft, transmitting torque is reduced by approximately 15% or more.

Electroless nickel plating reduces maximum allowable torque and thrust load capacities by 20% ~ 30% .

· Short Type (SH)

Shaft Bore Dia. d	Screw Qty.	Screw Size	Tapped Hole for Removal	Max. Allowable Torque N·m	Allowable Thrust Load kN	Screw Tightening Torque N·m	D	D1	D2	d1	L	ℓ
6	3	M3x10	M3x3	5.6	1.87	1.9	22.5	16	8.5	3.3	10.5	3
8				8.5	2.12		24.5	18	10.5			
10	3	M4x12	M4x3	18	3.59	3.9	29	21	12.75	4.4	13	4
11				20	3.63		30	22	13.75			
12				23	3.76		31	23	14.75			
14	4	M4x18	M4x2	37	5.21	3.9	36	26	17.65	4.4	17	5
15				39	5.10		37	27	18.65			
16				42	5.17		38	28	19.65			
17				45	5.23		39	29	20.65			
18				48	5.28		40	30	21.85			
19				49	5.12		42	32	22.85			
20	4	M5x18	M5x2	97	9.68	7.8	46	36	24.1	5.5	19	6
22				110	9.98		47	37	25.75			
24				121	10.00		49	39	27.75			
25				124	9.90		51	41	28.75			
28				141	10.00		53	43	31.75			
30				149	9.89		56	46	33.75			
32				163	10.12		58	47	35.75			
35				173	9.88		61	50	39.1		20	

kgf=Nx0.101972