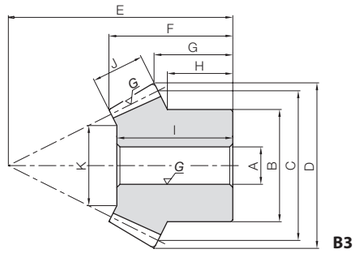
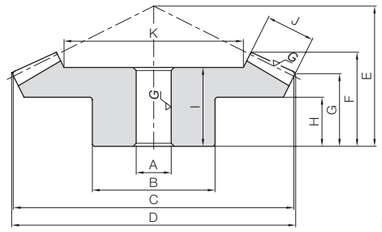
Ground Spiral Bevel Gears

Specifications	
Precision grade	JIS B 1704: 1978 grade 2
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	S45C
Heat treatment	Gear teeth induction hardened
Tooth hardness	50 to 60HRC
Surface treatment	Black oxide coated except for ground part



B3



B4

Catalog Number	Gear Ratio	Module	No. of teeth	Direction of spiral	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back
						A_{H7}	B	C	D	E	F	G
SBSG2-3020R	1.5	***m*2**	30	R	B4	12	35	60	61.6	40	26.6	21.2
SBSG2-2030L			20	L	B3	10	30	40	43.55	45	24.91	16.18
SBSG2.5-3020R		***m*2.5**	30	R	B4	15	45	75	77.09	50	33.86	26.56
SBSG2.5-2030L			20	L	B3	12	40	50	54.43	55	30.88	18.98
SBSG3-3020R		***m*3**	30	R	B4	16	50	90	92.21	55	35.34	26.66
SBSG3-2030L			20	L	B3	16	45	60	65.58	70	40.17	26.86
SBSG4-3020R		***m*4**	30	R	B4	20	70	120	122.85	75	47.49	37.14
SBSG4-2030L			20	L	B3	20	60	80	87.34	90	48.17	32.45
SBSG2-4020R	2	***m*2**	40	R	B4	12	40	80	80.99	45	32.26	25.99
SBSG2-2040L			20	L	B3	12	32	40	44.1	60	34.04	21.02
SBSG2.5-4020R		***m*2.5**	40	R	B4	15	50	100	101.27	55	39.65	31.27
SBSG2.5-2040L			20	L	B3	12	40	50	55.21	75	43.61	26.3
SBSG3-4020R		***m*3**	40	R	B4	20	60	120	121.48	65	45.76	36.48
SBSG3-2040L			20	L	B3	16	50	60	66.06	90	50.63	31.52
SBSG4-4020R		***m*4**	40	R	B4	20	70	160	162.07	80	53.69	42.07
SBSG4-2040L			20	L	B3	20	60	80	88.5	120	66.24	42.12
SBSG2-4515R	3	***m*2**	45	R	B4	12	40	90	90.67	40	30.29	26.01
SBSG2-1545L			15	L	B3	10	24	30	34.78	60	29.66	15.8
SBSG2.5-4515R		***m*2.5**	45	R	B4	15	50	112.5	113.32	50	38.25	32.47
SBSG2.5-1545L			15	L	B3	12	30	37.5	43.36	75	38.27	19.73
SBSG3-4515R		***m*3**	45	R	B4	20	60	135	135.99	55	40.59	33.98
SBSG3-1545L			15	L	B3	15	38	45	52.08	90	44.98	23.68

Hub width	Hole length	Face width	Holding surface dia.	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash	Weight	Catalog Number
H	I	J	K	Bending strength	Surface durability	Bending strength	Surface durability	(mm)	(kg)	
15	23	11	37.56	14.1	14.2	1.44	1.44	0.05~0.11	0.26	**SBSG2-3020R**
11.67	22		21.34	9.61	9.44	0.98	0.96		0.13	**SBSG2-2030L**
18	30	15	45.61	29.0	29.7	2.96	3.03	0.06~0.12	0.55	**SBSG2.5-3020R**
14.17	28		27.42	19.8	19.8	2.02	2.02		0.28	**SBSG2.5-2030L**
17	31	17	57.14	48.4	50.4	4.94	5.14	0.07~0.13	0.82	**SBSG3-3020R**
20	37		34.71	33.1	33.6	3.37	3.42		0.49	**SBSG3-2030L**
25	40	20	78.59	106	113	10.8	11.5	0.10~0.16	1.90	**SBSG4-3020R**
23.33	43		46.89	72.2	75.3	7.36	7.68		1.05	**SBSG4-2030L**
18	27	15	48.46	25.5	26.7	2.60	2.73	0.05~0.11	0.51	**SBSG2-4020R**
18	32		20.92	12.8	13.4	1.30	1.36		0.19	**SBSG2-2040L**
20	34	20	59.28	51.7	55.1	5.27	5.62	0.06~0.12	1.06	**SBSG2.5-4020R**
22.5	40		20.56	25.9	27.6	2.64	2.81		0.42	**SBSG2.5-2040L**
24	38	22	73.81	84.8	91.9	8.65	9.38	0.07~0.13	1.67	**SBSG3-4020R**
27.5	47		29.61	42.5	46.0	4.33	4.69		0.69	**SBSG3-2040L**
28	45	28	102.39	195	217	19.9	22.2	0.10~0.16	3.33	**SBSG4-4020R**
35	62		42.78	97.9	109	9.98	11.1		1.53	**SBSG4-2040L**
17	26	15	59.04	34.8	28.1	3.55	2.87	0.05~0.11	0.60	**SBSG2-4515R**
14	29		19.13	11.2	9.38	1.14	0.96		0.095	**SBSG2-1545L**
22	35	20	72.84	59.0	48.3	6.01	4.93	0.06~0.12	1.21	**SBSG2.5-4515R**
17.5	37		20.51	18.9	16.1	1.93	1.64		0.19	**SBSG2.5-1545L**
20	35	23	88.18	99.3	82.5	10.1	8.41	0.07~0.13	1.99	**SBSG3-4515R**
21.33	44		28.54	31.8	27.5	3.24	2.80		0.34	**SBSG3-1545L**

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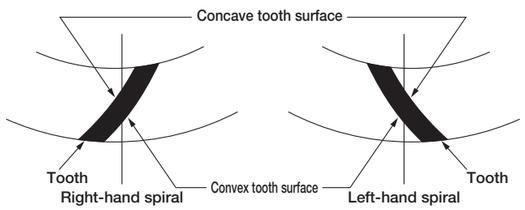
■ Mating surface of spiral bevel gears

Spiral bevel gears have convex and concave tooth surfaces. If the direction of rotation of the drive gear differs, the meshing tooth surface will also change. The table on the right shows how to view the convex and concave tooth surfaces and the meshing tooth surface with respect to the direction of rotation of the drive gear.



For right-hand drive gear

Direction of rotation of drive gear NOTE 1	Meshing tooth surface	
	Right-hand drive gear	Left-hand driven gear
Clockwise	Convex tooth surface	Concave tooth surface
Counterclockwise	Concave tooth surface	Convex tooth surface

For left-hand drive gear

Direction of rotation of drive gear NOTE 1	Meshing tooth surface	
	Left-hand drive gear	Right-hand driven gear
Clockwise	Concave tooth surface	Convex tooth surface
Counterclockwise	Convex tooth surface	Concave tooth surface

[NOTE 1] The direction of rotation in the table is as seen from the hub of the gear.

■ The force applied to the teeth of the spiral bevel gear

The table below shows, for spiral bevel gears with an axis angle of $\Sigma = 90°$, pressure angle of $\alpha n = 20°$ and spiral angle of $\beta m = 35°$, the magnitudes of the axial force Fx and radial force Fr where the tangential force Ft at the center of the tooth width is 100.

$$\frac{\text{Thrust force } Fx}{\text{Radial force } Fr} \text{ value}$$

(1) Force applied to pinion

Meshing tooth surface	Gear Ratio z_2/z_1						
	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Concave tooth surface	80.9 / −18.1	82.9 / −1.9	82.5 / 8.4	81.5 / 15.2	80.5 / 20.0	78.7 / 26.1	77.4 / 29.8
Convex tooth surface	−18.1 / 80.9	−33.6 / 75.8	−42.8 / 71.1	−48.5 / 67.3	−52.4 / 64.3	−57.2 / 60.1	−59.9 / 57.3

(2) Force applied to gear

Meshing tooth surface	Gear Ratio z_2/z_1						
	1.0	1.5	2.0	2.5	3.0	4.0	5.0
Concave tooth surface	80.9 / −18.1	75.8 / −33.6	71.1 / −42.8	67.3 / −48.5	64.3 / −52.4	60.1 / −57.2	57.3 / −59.9
Convex tooth surface	−18.1 / 80.9	−1.9 / 82.9	8.4 / 82.5	15.2 / 81.5	20.0 / 80.5	26.1 / 78.7	29.8 / 77.4