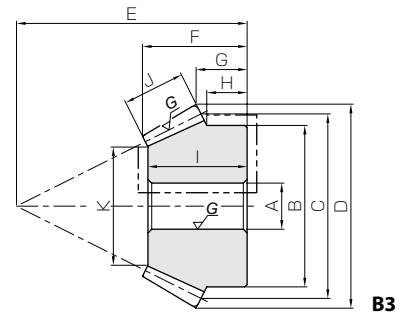


Specifications	
Precision grade	JIS B 1704 grade 2
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415
Heat treatment	Carburizing
Tooth hardness	55 ~ 60HRC



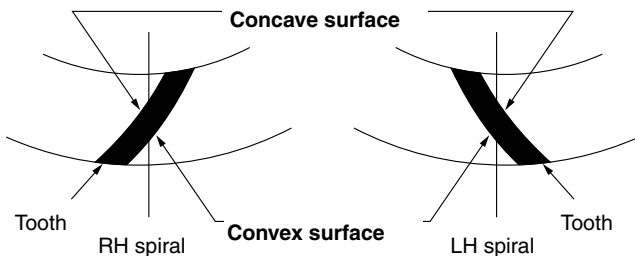
- Spur Gears
- Helical Gears
- Internal Gears
- Racks
- CP Racks & Pinions
- Miter Gears
- Bevel Gears
- Screw Gears
- Worm Gear Pair
- Bevel Gearboxes
- Other Products

Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length
						A <sub>H7</sub>	B	C	D	E	F	G
MBSG2-4020R MBSG2-2040L	2	m2	40	R	B4	15	45	80	81.1	45	31.78	26.1
			20	L	B3	12	35	40	44.1	55	28.16	16.02
MBSG2.5-4020R MBSG2.5-2040L	2	m2.5	40	R	B4	16	55	100	101.29	50	33.35	26.29
			20	L	B3	12	43	50	55.12	65	31.01	16.28
MBSG3-4020R MBSG3-2040L	2	m3	40	R	B4	20	65	120	121.57	60	39.81	31.57
			20	L	B3	16	52	60	66.03	80	38.9	21.51
MBSG4-4020R MBSG4-2040L	2	m4	40	R	B4	25	80	160	162.06	75	48.27	37.06
			20	L	B3	20	70	80	88.46	100	45.38	22.12

- [Caution on Product Characteristics]
- ① Allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 451 for more details.
  - ② Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
  - ③ These gears produce axial thrust forces. Please see page 452 for more details.

### ■ Contact Surface of Spiral Bevel Gears

Tooth surfaces of spiral gears have concave and convex sides. Changes in the rotational direction of the driving gear alter the contact surface accordingly. The illustrations show the top view of RH and LH Spiral Gears, and the tables on the right explain the different contact surface depending on the situation.



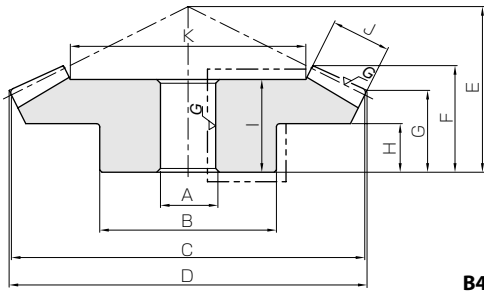
#### RH Spiral as a driving gear

Rotating Direction of Driving Gear <small>Note 1</small>	Contact Surface	
	Driving Gear (RH Spiral)	Driving Gear (LH Spiral)
RH Rotation (Clockwise)	Convex Surface	Concave Surface
LH rotation (counterclockwise)	Concave Surface	Convex Surface

#### LH Spiral as a driving gear

Rotating Direction of Driving Gear <small>Note 1</small>	Contact Surface	
	Driving Gear (LH Spiral)	Driving Gear (RH Spiral)
RH Rotation (Clockwise)	Concave Surface	Convex Surface
LH Rotation (Counterclockwise)	Convex Surface	Concave Surface

[Note 1] Rotation directions given in the tables are for viewing the gears from the hub side.



B4

Hub width H	Length of bore I	Face width J	Holding surface dia. K	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash (mm)	Weight (kg)	Catalog No.
				Bending strength	Surface durability	Bending strength	Surface durability			
18 13.75	29 27	14	52.7 25.39	51.8 25.9	87.2 43.6	5.28 2.65	8.89 4.45	0.05~0.11	0.57 0.18	<b>MBSG2-4020R</b> <b>MBSG2-2040L</b>
16 13.25	30 29	17	66.99 29.97	99.3 49.7	170 85.1	10.1 5.07	17.4 8.68	0.06~0.12	1.01 0.31	<b>MBSG2.5-4020R</b> <b>MBSG2.5-2040L</b>
20 18	35 36.5	20	80.28 36.56	169 84.9	295 147	17.3 8.65	30.1 15.0	0.07~0.13	1.64 0.56	<b>MBSG3-4020R</b> <b>MBSG3-2040L</b>
22 17.5	42 43	27	106.63 51.25	405 203	722 361	41.3 20.7	73.7 36.8	0.10~0.16	3.55 1.20	<b>MBSG4-4020R</b> <b>MBSG4-2040L</b>

[Caution on Secondary Operations]

- ① Please read "Caution on Performing Secondary Operations" (Page 452) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
- ② In the illustration, the area surrounded with ---- line is masked during the carburization process and can be modified. However, care should be exercised since the hardness is high (approx. HRC40, maximum).

### ■ Forces Acting on Spiral Bevel Gear Teeth

For a spiral bevel gear with shaft angle  $\Sigma=90^\circ$ , pressure angle  $\alpha_n=20^\circ$ , and spiral angle  $\beta_m=35^\circ$ , the tables below show the axial thrust force  $F_x$  and the radial force  $F_r$  when a tangential force  $F_t$  of 100 units is applied at the center of face width. For details, please refer to the section "Features of Tooth Surface Contact" in the technical reference.

The tables show the values of  $\frac{\text{Axial Thrust Force } F_x}{\text{Radial Force } F_r}$

#### (1) Forces acting upon pinion

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

#### (2) Forces acting upon gear

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