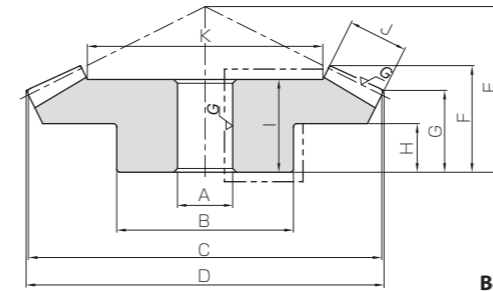
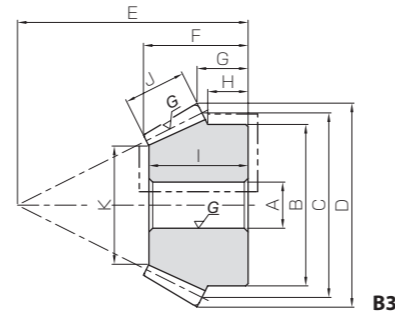




Specifications	
Precision grade	JIS B 1704: 1978 grade 1
Gear teeth	Gleason
Pressure angle	20°
Helix angle	35°
Material	SCM415
Heat treatment	Carburizing
Tooth hardness	55 ~ 60HRC



Catalog No.	Gear ratio	Module	No. of teeth	Direction of spiral	Shape	Bore		Pitch dia.		Outside dia.		Mounting distance		Total length		Crown to back length	
						A <sub>H7</sub>	B	C	D	E	F	G					
KMBMSG2-4020R KMBMSG2-2040L	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					
KMBMSG2.5-4020R KMBMSG2.5-2040L	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					
KMBMSG3-4020R KMBMSG3-2040L	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					
KMBMSG4-4020R KMBMSG4-2040L	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					

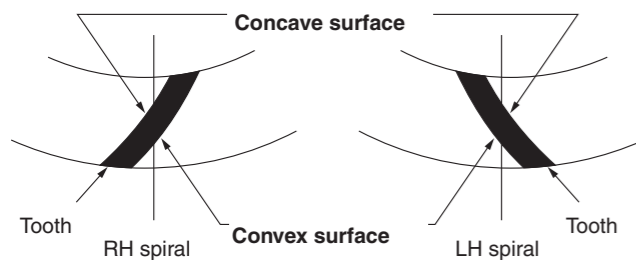
- [Caution on Product Characteristics]
- Allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 303 for more details.
  - Dimensions of the outside diameter, the overall length and crown to back length are all theoretical values, and some differences will occur due to the corner chamfering of the gear tips.
  - These gears produce axial thrust forces. Please see Page 304 for more details.

Hub width	Length of bore	Face width	Holding surface dia.	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	56.5 28.2	94.2 47.1	5.76 2.88	9.61 4.80	0.04~0.10	0.57 0.18	KMBMSG2-4020R KMBMSG2-2040L
16 13.25	30 29	17	66.99 29.97	108 54.1	184 91.8	11.0 5.52	18.7 9.37	0.05~0.11	1.01 0.31	KMBMSG2.5-4020R KMBMSG2.5-2040L
20 18	35 36.5	20	80.28 36.56	185 92.4	318 159	18.8 9.42	32.4 16.2	0.06~0.12	1.64 0.56	KMBMSG3-4020R KMBMSG3-2040L
22 17.5	42 43	27	106.63 51.25	441 221	778 389	45.0 22.5	79.3 39.7	0.09~0.15	3.55 1.20	KMBMSG4-4020R KMBMSG4-2040L

- [Caution on Secondary Operations]
- Please read "Caution on Performing Secondary Operations" (Page 304) when performing modifications and/or secondary operations for safety concerns.
  - 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).

**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.

**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 separate technical reference book, section of "Features of Tooth Surface Contact" (Page 107).

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 -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 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) 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 -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 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