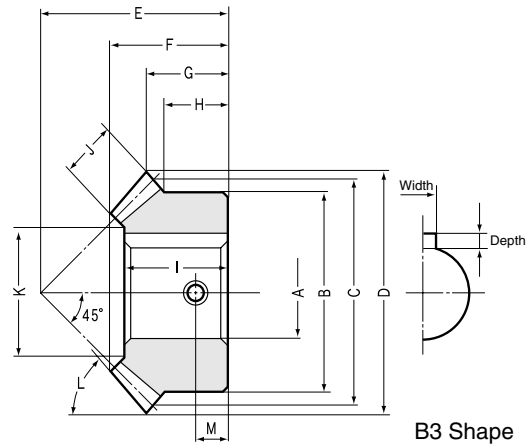




# SMA(B)(C) Finished Bore Miter Gears Modules 1~8



B3 Shape

## 20 Tooth Miter Gears Modules 1~8

Catalog No.	Module	No. of teeth	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width	Length of bore	Face width	Holding surface dia.	Tip angle
	<i>m</i>	<i>z</i>	AH7	B	C	D	E	F	G	H	I	J	K	L
<b>SMA1 -20</b> <b>SMB1 -20</b>	1	20	8 10	16	20	21.41	20	13.95	10.71	8	12 12.07	5	9.86 10	49°48'
<b>SMA1.5-20</b> <b>SMB1.5-20</b>	1.5	20	10 12	26	30	32.12	30	21.24	16.06	13	19	8	15.37	49°48'
<b>SMA2 -20</b> <b>SMB2 -20</b>	2	20	14 15	34	40	42.83	37	24.89	18.41	14	22	10	21.72	49°48'
<b>SMA2.5-20</b> <b>SMB2.5-20</b>	2.5	20	18 20	42	50	53.54	48	32.54	24.77	19	29	12	28.06	49°48'
<b>SMA3 -20</b> <b>SMB3 -20</b> <b>SMC3 -20</b>	3	20	22 25 20	50	60	64.24	58	39.84	30.12	23	35	15	31.57	49°48'
<b>SMA3.5-20</b> <b>SMB3.5-20</b>	3.5	20	28 30	60	70	74.95	65	44.13	32.47	25	40	18	39.09	49°48'
<b>SMA4 -20</b> <b>SMB4 -20</b> <b>SMC4 -20</b>	4	20	30 32 25	64	80	85.65	75	50.78	37.83	27	45	20	43.43	49°48'
<b>SMA5 -20</b> <b>SMB5 -20</b> <b>SMC5 -20</b>	5	20	40 30 35	80	100	107.07	90	60.38	43.54	30	54	26	54.46	49°48'
<b>SMA6 -20</b> <b>SMB6 -20</b> <b>SMC6 -20</b>	6	20	45 50 40	100	120	128.48	104	67.67	48.24	34	60	30	67.15	49°48'
<b>SMA8 -20</b>	8	20	60	130	160	171.31	125	73.33	50.66	30	62	35	95	49°48'

CAUTION: SMA, SMB and SMC gears are identical in all features except for bore and keyway dimensions.

CAUTION: 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.

Miter Gears  
SMA · SMB · SMC



## Finished Bore Miter Gears

### Specifications

Precision grade	JIS B 1704 grade 4	Tooth hardness	48~53HRC
Gear teeth	Gleason	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Helix angle	—	Datum reference surface for gear cutting	Bore
Material	S45C	Secondary Operations	Possible except tooth areas and bore
Heat treatment	Teeth induction hardened		

Keyway NOTE 1 Width×Depth	Threaded hole NOTE 2		Shape	Allowable torque (N·m) NOTE 3		Allowable torque (kgf·m)		Backlash (mm)	Weight (kgf)	Catalog No.
	M	Thread Size		Bending strength	Surface durability	Bending strength	Surface durability			
—	4	M4	B3	0.8953	0.3687	( 0.0913 )	( 0.0376 )	0.03 ~ 0.13	0.015 0.015	<b>SMA1 -20</b> <b>SMB1 -20</b>
— 4 x 1.8	6.5	M4 M5	B3	3.132	1.312	( 0.3194 )	( 0.1338 )	0.05 ~ 0.15	0.07 0.07	<b>SMA1.5-20</b> <b>SMB1.5-20</b>
5 x 2.3 5 x 2.3	7	M5	B3	7.165	3.045	( 0.7306 )	( 0.3105 )	0.06 ~ 0.16	0.14 0.14	<b>SMA2 -20</b> <b>SMB2 -20</b>
* 5 x 2.3 6 x 2.8	9.5	M6	B3	13.66	5.896	( 1.393 )	( 0.6012 )	0.07 ~ 0.17	0.28 0.25	<b>SMA2.5-20</b> <b>SMB2.5-20</b>
* 7 x 3 * 7 x 3 6 x 2.8	11.5	M6 M8 M6	B3	24.18	10.54	( 2.466 )	( 1.075 )	0.08 ~ 0.18	0.41 0.39 0.5	<b>SMA3 -20</b> <b>SMB3 -20</b> <b>SMC3 -20</b>
* 7 x 3 8 x 3.3	12.5	M8	B3	39.01	17.15	( 3.978 )	( 1.749 )	0.1 ~ 0.25	0.7 0.65	<b>SMA3.5-20</b> <b>SMB3.5-20</b>
* 7 x 3 10 x 3.3 8 x 3.3	13.5	M8	B3	57.32	25.4	( 5.845 )	( 2.59 )	0.12 ~ 0.27	1 1 1.1	<b>SMA4 -20</b> <b>SMB4 -20</b> <b>SMC4 -20</b>
* 10 x 3.3 8 x 3.3 10 x 3.3	15	M8	B3	114.4	51.27	(11.67 )	( 5.228 )	0.14 ~ 0.34	2 2.1 2	<b>SMA5 -20</b> <b>SMB5 -20</b> <b>SMC5 -20</b>
* 12 x 3.3 14 x 3.8 12 x 3.3	17	M8	B3	189.6	87.46	(19.33 )	( 8.919 )	0.16 ~ 0.36	3.4 3.3 3.5	<b>SMA6 -20</b> <b>SMB6 -20</b> <b>SMC6 -20</b>
18 x 4.4	15	M10	B3	406.1	193.9	(41.41 )	(19.77 )	0.2 ~ 0.45	6	<b>SMA8 -20</b>

NOTE 1: The keyway dimensions of items with "\*" marks do not conform to JIS Standards.

Pitch Angle 45°

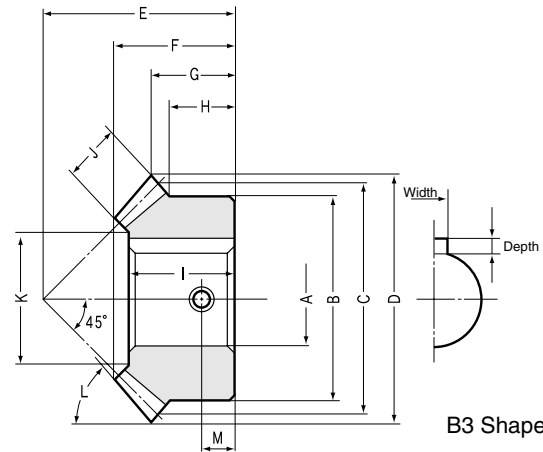
NOTE 2: A set screw comes with these products.

NOTE 3: The allowable torques shown in the table are the calculated values according to the assumed usage conditions.

Please see page 196 for more details.



# SMA(B) Finished Bore Miter Gears Module 1~6



## 25 Tooth Miter Gears Modules 1~6

Catalog No.	Module	No. of teeth	Bore	Hub dia.	Pitch dia.	Outside dia.	Mounting distance	Total length	Crown to back length	Hub width	Length of bore	Face width	Holding surface dia.	Tip angle
	<i>m</i>	<i>z</i>	AH7	B	C	D	E	F	G	H	I	J	K	L
<b>SMA1 -25</b>	1	25	10	20	25	26.41	23	15.16	11.21	8	14	6	15.03	48°51'
<b>SMA1.5-25</b>	1.5	25	12	30	37.5	39.62	34	22.25	16.31	11.5	19	9	19.54	48°51'
<b>SMA2 -25</b> <b>SMB2 -25</b>	2	25	18 15	40	50	52.83	40	24.33	16.41	10	20	12	26.06	48°51'
<b>SMA2.5-25</b> <b>SMB2.5-25</b>	2.5	25	20 18	50	62.5	66.04	50	30.41	20.52	12.5	26	15	34.57	48°51'
<b>SMA3 -25</b> <b>SMB3 -25</b>	3	25	30 25	60	75	79.24	60	37.81	24.62	15	32	20	37.43	48°51'
<b>SMA3.5-25</b> <b>SMB3.5-25</b>	3.5	25	32 28	70	87.5	92.45	70	43.23	28.72	17.5	37	22	46.77	48°51'
<b>SMA4 -25</b> <b>SMB4 -25</b>	4	25	35 30	80	100	105.66	80	49.32	32.83	20	43	25	55.29	48°51'
<b>SMA5 -25</b>	5	25	50	100	125	132.07	100	60.82	41.04	25	50	30	65.15	48°51'
<b>SMA6 -25</b>	6	25	55	120	150	158.48	120	72.32	49.24	30	61	35	83	48°51'

## 30 Tooth Miter Gears Modules 1~5

<b>SMA1 -30</b>	1	30	12	24	30	31.41	28	17.71	13.71	10	16	6	19.03	48°12'
<b>SMA1.5-30</b>	1.5	30	15	36	45	47.12	43	28.24	21.56	16	25	10	25.71	48°12'
<b>SMA2 -30</b> <b>SMB2 -30</b>	2	30	20 15	45	60	62.83	50	29.42	21.41	12.5	25	12	36.06	48°12'
<b>SMA2.5-30</b> <b>SMB2.5-30</b>	2.5	30	25 20	60	75	78.54	62	36.28	26.27	17	32	15	47.57	48°12'
<b>SMA3 -30</b> <b>SMB3 -30</b>	3	30	32 25	70	90	94.24	75	45.47	32.12	20	40	20	53.43	48°12'
<b>SMA3.5-30</b> <b>SMB3.5-30</b>	3.5	30	35 30	90	105	109.95	85	49.66	34.97	25	45	22	67.77	48°12'
<b>SMA4 -30</b> <b>SMB4 -30</b>	4	30	40 30	100	120	125.66	95	54.52	37.83	25	50	25	79.29	48°12'
<b>SMA5 -30</b>	5	30	55	130	150	157.07	120	68.56	48.54	35	62	30	99.15	48°12'

**CAUTION:** SMA and SMB gears are identical in all features except for bore and keyway dimensions.

**CAUTION:** 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.

Miter Gears  
SMA · SMB



## Specifications

Precision grade	JIS B 1704 grade 4	Tooth hardness	48~53HRC
Gear teeth	Gleason	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Helix angle	—	Datum reference surface for gear cutting	Bore
Material	S45C	Secondary Operations	Possible except tooth areas and bore
Heat treatment	Teeth induction hardened		

Keyway NOTE 1	Threaded hole NOTE 2		Shape	Allowable torque (N·m) NOTE 3		Allowable torque (kgf·m)		Backlash (mm)	Weight (kgf)	Catalog No.
	Width×Depth	M		Thread Size	Bending strength	Surface durability	Bending strength			
—	4	M4	B3	1.477	0.71	( 0.1506 )	( 0.0724 )	0.03 ~ 0.13	0.04	<b>SMA1 -25</b>
4 x 1.8	5.75	M5	B3	4.983	2.444	( 0.5081 )	( 0.2492 )	0.05 ~ 0.15	0.06	<b>SMA1.5-25</b>
6 x 2.8 5 x 2.3	5	M6 M5	B3	11.81	5.896	( 1.204 )	( 0.6012 )	0.06 ~ 0.16	0.17	<b>SMA2 -25</b> <b>SMB2 -25</b>
* 5 x 2.3 6 x 2.8	6	M6	B3	23.07	11.67	( 2.352 )	( 1.19 )	0.07 ~ 0.17	0.4	<b>SMA2.5-25</b> <b>SMB2.5-25</b>
* 7 x 3 8 x 3.3	7.5	M8	B3	42.31	21.59	( 4.314 )	( 2.202 )	0.08 ~ 0.18	0.6	<b>SMA3 -25</b> <b>SMB3 -25</b>
10 x 3.3 8 x 3.3	8.5	M8	B3	65.03	33.5	( 6.631 )	( 3.416 )	0.1 ~ 0.25	1	<b>SMA3.5-25</b> <b>SMB3.5-25</b>
10 x 3.3 8 x 3.3	10	M8	B3	96.76	50.18	( 9.867 )	( 5.117 )	0.12 ~ 0.27	1.6	<b>SMA4 -25</b> <b>SMB4 -25</b>
* 12 x 3.3	12.5	M8	B3	184.6	96.76	(18.82 )	( 9.867 )	0.14 ~ 0.34	3	<b>SMA5 -25</b>
16 x 4.3	15	M10	B3	307.3	165.7	(31.34 )	(16.9 )	0.16 ~ 0.36	4.5	<b>SMA6 -25</b>

Pitch Angle 45°

4 x 1.8	5	M5	B3	1.999	1.105	( 0.2038 )	( 0.1127 )	0.03 ~ 0.13	0.05	<b>SMA1 -30</b>
5 x 2.3	8	M5	B3	7.224	4.078	( 0.7366 )	( 0.4158 )	0.05 ~ 0.15	0.19	<b>SMA1.5-30</b>
6 x 2.8 5 x 2.3	6.25	M6 M5	B3	15.98	9.198	( 1.63 )	( 0.9379 )	0.06 ~ 0.16	0.32	<b>SMA2 -30</b> <b>SMB2 -30</b>
8 x 3.3 6 x 2.8	8.5	M8 M6	B3	31.23	18.19	( 3.185 )	( 1.855 )	0.07 ~ 0.17	0.7	<b>SMA2.5-30</b> <b>SMB2.5-30</b>
10 x 3.3 8 x 3.3	10	M8	B3	57.79	33.95	( 5.893 )	( 3.462 )	0.08 ~ 0.18	1.1	<b>SMA3 -30</b> <b>SMB3 -30</b>
10 x 3.3 8 x 3.3	12.5	M8	B3	88.38	52.34	( 9.012 )	( 5.337 )	0.1 ~ 0.25	2.1	<b>SMA3.5-30</b> <b>SMB3.5-30</b>
12 x 3.3 8 x 3.3	12.5	M8	B3	131.4	78.32	(13.4 )	( 7.987 )	0.12 ~ 0.27	2.9	<b>SMA4 -30</b> <b>SMB4 -30</b>
16 x 4.3	17.5	M10	B3	249.9	150.4	(25.48 )	(15.34 )	0.14 ~ 0.34	5.2	<b>SMA5 -30</b>

**NOTE 1:** The keyway dimensions of items with "\*" marks do not conform to JIS Standards.

**NOTE 2:** A set screw comes with these products.

**NOTE 3:** The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 196 for more details.

Pitch Angle 45°