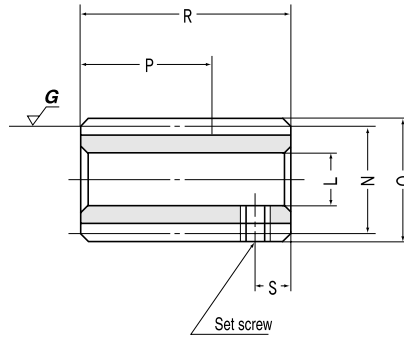
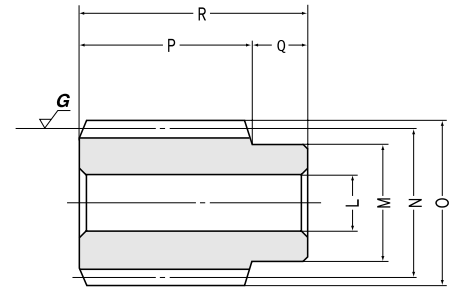




# SWG Ground Worms, AG Worm Wheels Axial Modules 1 ~ 1.5



W2 Shape



W1 Shape

## Module 1 Ground Worms

Catalog No.	Axial module <i>m</i>	Number of starts	Lead angle	Hand of thread	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
					LH7	M	N	O	P	Q	Q'	R
<b>SWG1-R1</b>	1	1	3°35'	R	8	—	16	18	20	—	—	32
<b>SWG1-R2</b>	1	2	7°08'	R	8	—	16	18	20	—	—	32

## Module 1 Worm Wheels

Catalog No.	Transverse module <i>m</i>	Reduction ratio	No. of teeth	Coefficient of profile shift	Number of starts	Hand of thread	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
							A <sub>H7</sub>	B	C	D	D'	E	F	F'	G
<b>AG1-20R1</b>	1	1/20	20	0	1	R	6	16	20	22	23	10	10	—	20
<b>AG1-20R2</b>	1	1/10	20	0	2	R	6	16	20	22	23	10	10	—	20
<b>AG1-30R1</b>	1	1/30	30	0	1	R	6	20	30	32	33	10	10	—	20
<b>AG1-30R2</b>	1	1/15	30	0	2	R	6	20	30	32	33	10	10	—	20
<b>AG1-40R1</b>	1	1/40	40	0	1	R	8	26	40	42	43	10	10	—	20
<b>AG1-50R1</b>	1	1/50	50	0	1	R	8	30	50	52	53	10	10	—	20
<b>AG1-60R1</b>	1	1/60	60	0	1	R	10	35	60	62	63	10	10	—	20

## Module 1.5 Ground Worms

Catalog No.	Axial module <i>m</i>	Number of starts	Lead angle	Hand of thread	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
					LH7	M	N	O	P	Q	Q'	R
<b>SWG1.5-R1</b>	1.5	1	3°26'	R	10	20	25	28	30	10	—	40
<b>SWG1.5-R2</b>	1.5	2	6°51'	R	10	20	25	28	30	10	—	40

## Module 1.5 Worm Wheels

Catalog No.	Transverse module <i>m</i>	Reduction ratio	No. of teeth	Coefficient of profile shift	Number of starts	Hand of thread	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
							A <sub>H7</sub>	B	C	D	D'	E	F	F'	G
<b>AG1.5-20R1</b>	1.5	1/20	20	0	1	R	8	22	30	33	34.5	14	10	—	24
<b>AG1.5-20R2</b>	1.5	1/10	20	0	2	R	8	22	30	33	34.5	14	10	—	24
<b>AG1.5-30R1</b>	1.5	1/30	30	0	1	R	10	30	45	48	49.5	14	10	—	24
<b>AG1.5-30R2</b>	1.5	1/15	30	0	2	R	10	30	45	48	49.5	14	10	—	24
<b>AG1.5-40R1</b>	1.5	1/40	40	0	1	R	12	35	60	63	64.5	14	10	—	24
<b>AG1.5-50R1</b>	1.5	1/50	50	0	1	R	12	45	75	78	79.5	14	10	—	24
<b>AG1.5-60R1</b>	1.5	1/60	60	0	1	R	12	50	90	93	94.5	14	10	—	24

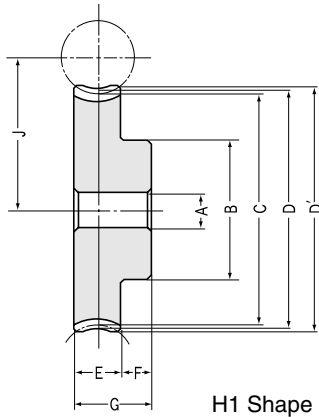
**CAUTION:** The root area of teeth on worms is very hard due to heat treatment. Extra caution is urged for any secondary operations. This caution applied especially to remachining the bore of W2 shape worms.

### AG1 Allowable Worm Wheel Torques (N·m)

Catalog No.	Worms min <sup>-1</sup>						
	30	100	300	600	900	1200	1800
<b>AG1-20R1</b>	3.35	2.79	2.23	1.83	1.63	1.5	1.3
<b>AG1-20R2</b>	3.31	2.69	2.06	1.68	1.48	1.35	1.15
<b>AG1-30R1</b>	7.08	5.98	4.84	4.05	3.63	3.31	2.92
<b>AG1-30R2</b>	7.03	5.84	4.56	3.72	3.33	3.03	2.63
<b>AG1-40R1</b>	12.11	10.24	8.43	7.12	6.38	5.86	5.13
<b>AG1-50R1</b>	18.3	15.49	12.85	10.93	9.87	9.09	7.95
<b>AG1-60R1</b>	25.6	21.8	18.09	15.44	14.09	12.94	11.39

Worm Gear Pair

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## Specifications

Catalog No.	SWG	AG
Precision grade	KHK W 001 grade 2	KHK W 002 grade 2
Reference section of gear	Axial	Rotating plane
Gear teeth	JIS 3 type Standard full depth	Standard full depth
Normal pressure angle	20°	20°
Material	S45C	CAC702 (Formerly JIS A/BC2)
Heat treatment	Teeth induction hardened	—
Tooth hardness	48~53HRC	—
Surface treatment	Black oxide except ground surfaces	—
Tooth surface finish	Ground	Cut
<small>Datum reference surface for gear cutting and grinding</small>	Bore	Bore
Secondary operations	Possible except tooth area	Possible

**CAUTION:** A/BC2 is aluminum bronze.

Screw <small>NOTE 1</small>		Shape	Weight (kgf)	Catalog No.
Size	S			
M4	5	W2	0.05	<b>SWG1-R1</b> <b>SWG1-R2</b>
M4	5	W2	0.05	

**NOTE 1:** The W2 shape worms are supplied with set screws.

Web thickness	Web O.D.	Mounting distance	Shape	Allowable torque (N·m)	Allowable torque (Kgf·m)	Backlash (mm)	Weight (kgf)	Catalog No.
				<small>NOTE 2</small>				
H	I	J		Surface durability	Surface durability			
—	—	18	H1	1.83	(0.19)	0.1 ~ 0.17	0.05	<b>AG1-20R1</b> <b>AG1-20R2</b> <b>AG1-30R1</b> <b>AG1-30R2</b> <b>AG1-40R1</b>
—	—	18	H1	1.63	(0.17)	0.1 ~ 0.17	0.05	
—	—	23	H1	4.05	(0.41)	0.1 ~ 0.17	0.08	
—	—	23	H1	3.72	(0.38)	0.1 ~ 0.17	0.08	
—	—	28	H1	7.12	(0.73)	0.1 ~ 0.17	0.15	
—	—	33	H1	10.93	(1.11)	0.1 ~ 0.17	0.23	<b>AG1-50R1</b> <b>AG1-60R1</b>
—	—	38	H1	15.44	(1.57)	0.1 ~ 0.17	0.32	

**NOTE 2:** The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 294 for more details. The tables below show the allowable worm wheel torques (N·m) at selected worm speeds.

Screw <small>NOTE 1</small>		Shape	Weight (kgf)	Catalog No.
Size	S			
—	—	W1	0.09	<b>SWG1.5-R1</b> <b>SWG1.5-R2</b>
—	—	W1	0.09	

Web thickness	Web O.D.	Mounting distance	Shape	Allowable torque (N·m)	Allowable torque (Kgf·m)	Backlash (mm)	Weight (kgf)	Catalog No.
				<small>NOTE 2</small>				
H	I	J		Surface durability	Surface durability			
—	—	27.5	H1	5.3	(0.54)	0.12 ~ 0.19	0.09	<b>AG1.5-20R1</b> <b>AG1.5-20R2</b> <b>AG1.5-30R1</b> <b>AG1.5-30R2</b> <b>AG1.5-40R1</b> <b>AG1.5-50R1</b> <b>AG1.5-60R1</b>
—	—	27.5	H1	4.87	(0.5)	0.12 ~ 0.19	0.09	
—	—	35	H1	11.71	(1.19)	0.12 ~ 0.19	0.27	
—	—	35	H1	10.76	(1.1)	0.12 ~ 0.19	0.27	
—	—	42.5	H1	20.59	(2.1)	0.12 ~ 0.19	0.43	
—	—	50	H1	31.6	(3.22)	0.12 ~ 0.19	0.68	
—	—	57.5	H1	44.65	(4.55)	0.12 ~ 0.19	0.95	

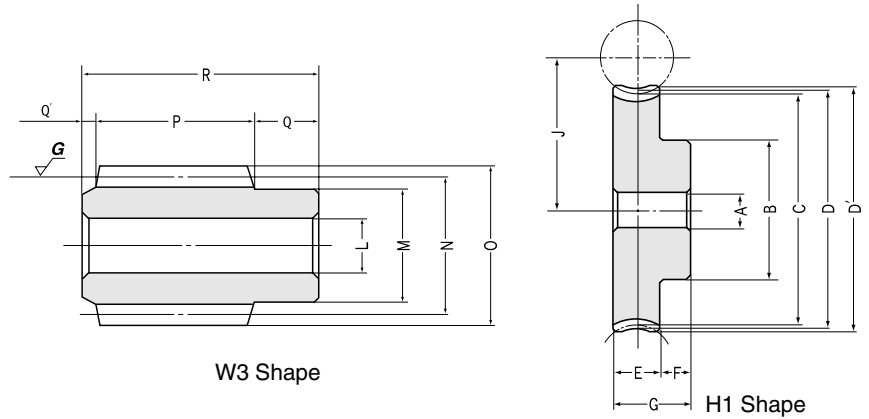
■ AG1.5 Allowable Worm Wheel Torques (N·m)

Catalog No.	Worms min <sup>-1</sup>						
	30	100	300	600	900	1200	1800
AG1.5-20R1	9.84	8.18	6.4	5.3	4.68	4.25	3.68
AG1.5-20R2	9.72	7.87	5.92	4.87	4.25	3.83	3.27
AG1.5-30R1	20.8	17.5	13.89	11.71	10.4	9.4	8.28
AG1.5-30R2	20.7	17.12	13.08	10.76	9.56	8.58	7.46
AG1.5-40R1	35.6	30	24.2	20.6	18.3	16.62	14.58
AG1.5-50R1	53.8	45.4	36.9	31.6	28.3	25.8	22.6
AG1.5-60R1	75.3	63.8	51.9	44.7	40.4	36.7	32.4



# SWG Ground Worms, AG Worm Wheels

Axial Modules **2~2.5**



## Module 2 Ground Worms

Catalog No.	Axial module <i>m</i>	Number of starts	Lead angle	Hand of thread	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
					LH7	M	N	O	P	Q	Q'	R
<b>SWG2-R1</b>	2	1	3°41'	R	12	25	31	35	32	15	3	50
<b>SWG2-R2</b>	2	2	7°21'	R	12	25	31	35	32	15	3	50

## Module 2 Worm Wheels

Catalog No.	Transverse module <i>m</i>	Reduction ratio	No. of teeth	Coefficient of profile shift	Number of starts	Hand of thread	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
							AH7	B	C	D	D'	E	F	F'	G
<b>AG2-20R1</b>	2	1/20	20	0	1	R	12	33	40	44	46	18	15	—	33
<b>AG2-20R2</b>	2	1/10	20	0	2	R	12	33	40	44	46	18	15	—	33
<b>AG2-30R1</b>	2	1/30	30	0	1	R	12	40	60	64	66	18	15	—	33
<b>AG2-30R2</b>	2	1/15	30	0	2	R	12	40	60	64	66	18	15	—	33
<b>AG2-40R1</b>	2	1/40	40	0	1	R	12	45	80	84	86	18	15	—	33
<b>AG2-50R1</b>	2	1/50	50	0	1	R	12	50	100	104	106	18	15	—	33
<b>AG2-60R1</b>	2	1/60	60	0	1	R	12	55	120	124	126	18	15	—	33

## Module 2.5 Ground Worms

Catalog No.	Axial module <i>m</i>	Number of starts	Lead angle	Hand of thread	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
					LH7	M	N	O	P	Q	Q'	R
<b>SWG2.5-R1</b>	2.5	1	3°52'	R	15	30	37	42	45	17	3	65
<b>SWG2.5-R2</b>	2.5	2	7°42'	R	15	30	37	42	45	17	3	65

## Module 2.5 Worm Wheels

Catalog No.	Transverse module <i>m</i>	Reduction ratio	No. of teeth	Coefficient of profile shift	Number of starts	Hand of thread	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
							AH7	B	C	D	D'	E	F	F'	G
<b>AG2.5-20R1</b>	2.5	1/20	20	0	1	R	12	35	50	55	57.5	20	14	—	34
<b>AG2.5-20R2</b>	2.5	1/10	20	0	2	R	12	35	50	55	57.5	20	14	—	34
<b>AG2.5-30R1</b>	2.5	1/30	30	0	1	R	12	40	75	80	82.5	20	14	—	34
<b>AG2.5-30R2</b>	2.5	1/15	30	0	2	R	12	40	75	80	82.5	20	14	—	34
<b>AG2.5-40R1</b>	2.5	1/40	40	0	1	R	15	45	100	105	107.5	20	14	—	34
<b>AG2.5-50R1</b>	2.5	1/50	50	0	1	R	15	55	125	130	132.5	20	14	—	34
<b>AG2.5-60R1</b>	2.5	1/60	60	0	1	R	15	60	150	155	157.5	20	14	—	34

**CAUTION:** Before assembling or performing any secondary operations, please carefully read the "Application Hints" on page 296.

## AG2 Allowable Worm Wheel Torques (N·m)

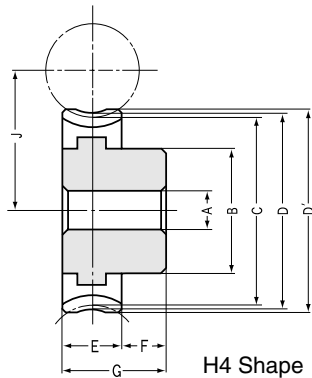
Catalog No.	Worms min <sup>-1</sup>						
	30	100	300	600	900	1200	1800
<b>AG2-20R1</b>	21	17.45	13.63	11.22	9.84	8.94	7.75
<b>AG2-20R2</b>	20.7	16.78	12.59	10.31	8.93	8.05	6.89
<b>AG2-30R1</b>	44.3	37.3	29.6	24.8	21.9	19.75	17.43
<b>AG2-30R2</b>	44	36.5	27.8	22.8	20.1	18.03	15.69
<b>AG2-40R1</b>	75.8	64	51.4	43.6	38.5	34.9	30.7
<b>AG2-50R1</b>	114.5	96.8	78.4	66.9	59.5	54.2	47.6
<b>AG2-60R1</b>	160.2	136.1	110.4	94.6	84.9	77.2	68.1

Worm Gear Pair

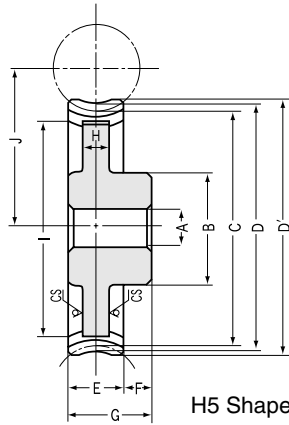
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# Ground Worms, Worm Wheels



H4 Shape



H5 Shape

\*CS has a sand mold casting finish. The dimensional tolerance of CS parts are the very coarse grade of JIS B 0405.

## Specifications

Catalog No.	SWG	AG
Precision grade	KHK W 001 grade 2	KHK W 002 grade 2
Reference section of gear	Axial	Rotating plane
Gear teeth	JIS 3 type Standard full depth	Standard full depth
Normal pressure angle	20°	20°
Material	S45C	CAC702(Formerly A & BC2) (Hub of H4, H5 shape is FC200)
Heat treatment	Teeth induction hardened	—
Tooth hardness	48~53HRC	—
Surface treatment	Black oxide except ground surfaces	—
Tooth surface finish	Ground	Cut
Datum reference surface for gear cutting and grinding	Bore	Bore
Secondary operations	Possible except tooth area	Possible

CAUTION: A & BC2 is aluminum bronze.

Screw		Shape	Weight (kgf)	Catalog No.
Size	S			
—	—	W3	0.2	<b>SWG2-R1</b> <b>SWG2-R2</b>
—	—	W3	0.2	

Web thickness	Web O.D.	Mounting distance	Shape	Allowable torque (N·m)		Backlash (mm)	Weight (kgf)	Catalog No.
				NOTE 1	NOTE 2			
H	I	J	NOTE 2	Surface durability	Surface durability			
—	—	35.5	H1	11.22	(1.14)	0.14 ~ 0.21	0.29	<b>AG2-20R1</b> <b>AG2-20R2</b> <b>AG2-30R1</b> <b>AG2-30R2</b> <b>AG2-40R1</b>
—	—	35.5	H1	10.31	(1.05)	0.14 ~ 0.21	0.29	
—	—	45.5	H4	24.8	(2.53)	0.14 ~ 0.21	0.55	
—	—	45.5	H4	22.79	(2.32)	0.14 ~ 0.21	0.55	
—	—	55.5	H4	43.61	(4.45)	0.14 ~ 0.21	0.85	
8	83	65.5	H5	66.94	(6.83)	0.14 ~ 0.21	0.95	<b>AG2-50R1</b> <b>AG2-60R1</b>
11	100	75.5	H5	94.58	(9.64)	0.14 ~ 0.21	1.5	

NOTE 1: The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 294 for more details. The tables below show the allowable worm wheel torques (N·m) at selected worm speeds.

NOTE 2: Please avoid secondary operations that affect the strength of the joint between CAC702 and FC200. Also, there may be space in the casting between the two materials, but it will not affect the joint strength.

Screw		Shape	Weight (kgf)	Catalog No.
Size	S			
—	—	W3	0.4	<b>SWG2.5-R1</b> <b>SWG2.5-R2</b>
—	—	W3	0.4	

Web thickness	Web O.D.	Mounting distance	Shape	Allowable torque (N·m)		Backlash (mm)	Weight (kgf)	Catalog No.
				NOTE 1	NOTE 2			
H	I	J	NOTE 2	Surface durability	Surface durability			
—	—	43.5	H1	18.31	( 1.87)	0.17 ~ 0.24	0.4	<b>AG2.5-20R1</b> <b>AG2.5-20R2</b> <b>AG2.5-30R1</b> <b>AG2.5-30R2</b> <b>AG2.5-40R1</b> <b>AG2.5-50R1</b> <b>AG2.5-60R1</b>
—	—	43.5	H1	16.82	( 1.72)	0.17 ~ 0.24	0.4	
—	—	56	H4	40.46	( 4.13)	0.17 ~ 0.24	0.8	
—	—	56	H4	37.17	( 3.79)	0.17 ~ 0.24	0.8	
11	81	68.5	H5	71.15	( 7.26)	0.17 ~ 0.24	1.4	
12	106	81	H5	109.22	(11.14)	0.17 ~ 0.24	2.1	
12	130	93.5	H5	154.32	(15.74)	0.17 ~ 0.24	2.3	

### AG2.5 Allowable Worm Wheel Torques (N·m)

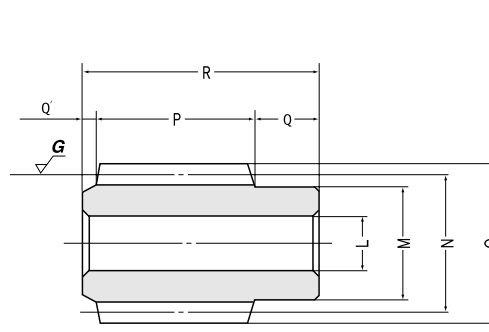
Catalog No.	Worms min <sup>-1</sup>						
	30	100	300	600	900	1200	1800
<b>AG2.5-20R1</b>	34.6	28.5	22.3	18.31	16	14.58	12.5
<b>AG2.5-20R2</b>	34.2	27.4	20.6	16.82	14.51	13.13	11.09
<b>AG2.5-30R1</b>	73.2	61	48.3	40.5	35.5	32.2	28.1
<b>AG2.5-30R2</b>	72.7	59.6	45.5	37.2	32.6	29.4	25.3
<b>AG2.5-40R1</b>	125.2	104.6	84	71.2	62.5	57	49.5
<b>AG2.5-50R1</b>	189.3	158.2	128.1	109.2	96.7	88.5	76.7
<b>AG2.5-60R1</b>	265	222	180.4	154.3	138	125.9	109.8

Worm Gear Pair

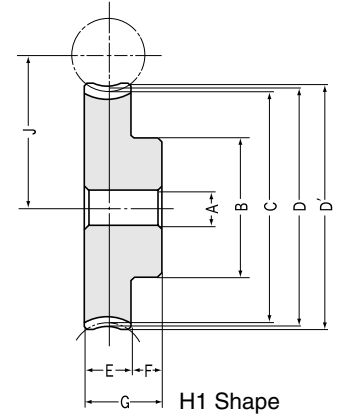
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# SWG Ground Worms, AG Worm Wheels Axial Modules 3~4



W3 Shape



H1 Shape

## Module 3 Ground Worms

Catalog No.	Axial module <i>m</i>	Number of starts	Lead angle	Hand of thread	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
					LH7	M	N	O	P	Q	Q'	R
SWG3-R1	3	1	3° 54'	R	16	35	44	50	50	20	4	74
SWG3-R2	3	2	7° 46'	R	16	35	44	50	50	20	4	74
SWG3-R3	3	3	11° 34'	R	16	35	44	50	50	20	4	74

## Module 3 Worm Wheels

Catalog No.	Transverse module <i>m</i>	Reduction ratio	No. of teeth	Coefficient of profile shift	Number of starts	Hand of thread	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
							A <sub>H7</sub>	B	C	D	D'	E	F	F'	G
AG3-20R1	3	1/20	20	0	1	R	20	50	60	66	69	25	18	—	43
AG3-20R2	3	1/10	20	0	2	R	20	50	60	66	69	25	18	—	43
AG3-30R1	3	1/30	30	0	1	R	20	55	90	96	99	25	18	—	43
AG3-30R2	3	1/15	30	0	2	R	20	55	90	96	99	25	18	—	43
AG3-30R3	3	1/10	30	0	3	R	20	55	90	96	99	25	18	—	43
AG3-40R1	3	1/40	40	0	1	R	20	65	120	126	129	25	18	—	43
AG3-45R3	3	1/15	45	0	3	R	20	70	135	141	144	25	18	—	43
AG3-50R1	3	1/50	50	0	1	R	20	75	150	156	159	25	18	—	43
AG3-60R1	3	1/60	60	0	1	R	20	85	180	186	189	25	18	—	43

## Module 4 Ground Worms

Catalog No.	Axial module <i>m</i>	Number of starts	Lead angle	Hand of thread	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
					LH7	M	N	O	P	Q	Q'	R
SWG4-R1	4	1	3° 41'	R	22	50	62	70	70	25	5	100
SWG4-R2	4	2	7° 21'	R	22	50	62	70	70	25	5	100
SWG4-R3	4	3	10° 57'	R	22	50	62	70	70	25	5	100

## Module 4 Worm Wheels

Catalog No.	Transverse module <i>m</i>	Reduction ratio	No. of teeth	Coefficient of profile shift	Number of starts	Hand of thread	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
							A <sub>H7</sub>	B	C	D	D'	E	F	F'	G
AG4-20R1	4	1/20	20	0	1	R	20	60	80	88	92	30	20	—	50
AG4-20R2	4	1/10	20	0	2	R	20	60	80	88	92	30	20	—	50
AG4-30R1	4	1/30	30	0	1	R	20	65	120	128	132	30	20	—	50
AG4-30R2	4	1/15	30	0	2	R	20	65	120	128	132	30	20	—	50
AG4-30R3	4	1/10	30	0	3	R	20	65	120	128	132	30	20	—	50
AG4-40R1	4	1/40	40	0	1	R	20	80	160	168	172	30	20	—	50
AG4-45R3	4	1/15	45	0	3	R	20	90	180	188	192	30	20	—	50
AG4-50R1	4	1/50	50	0	1	R	20	90	200	208	212	30	20	—	50
AG4-60R1	4	1/60	60	0	1	R	20	100	240	248	252	30	20	—	50

### AG3 Allowable Worm Wheel Torques (N·m)

Catalog No.	Worms min <sup>-1</sup>						
	30	100	300	600	900	1200	1800
AG3-20R1	59.5	48.8	38	30.9	27	24.7	20.9
AG3-20R2	58.7	46.9	35.1	28.4	24.5	22.2	18.51
AG3-30R1	125.7	104.3	82.4	68.4	59.9	54.5	46.9
AG3-30R2	124.9	102	77.6	62.8	55.1	49.7	42.2
AG3-30R3	129.1	103	77.1	62.4	53.8	48.7	40.6
AG3-40R1	215	178.7	143.4	120.2	105.5	96.4	82.5
AG3-45R3	274	224	170.5	137.8	120.9	109.2	92.6
AG3-50R1	325	270	219	184.5	163.1	149.6	127.9
AG3-60R1	455	380	308	261	233	213	183.1

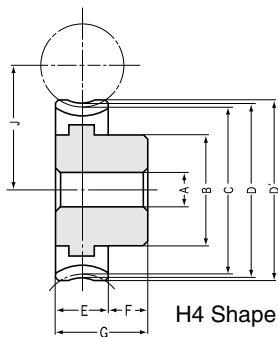
**CAUTION:** Before assembling or performing any secondary operations, please carefully read the "Application Hints" on page 296.

Worm Gear Pair

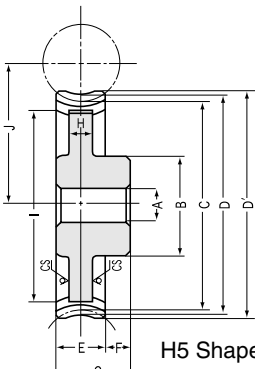
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# Ground Worms, Worm Wheels



H4 Shape



H5 Shape

\*CS has a sand mold casting finish. The dimensional tolerance of CS parts are the very coarse grade of JIS B 0405.

## Specifications

Catalog No.	SWG	AG
Precision grade	KHK W 001 grade 2	KHK W 002 grade 2
Reference section of gear	Axial	Rotating plane
Gear teeth	JIS 3 type Standard full depth	Standard full depth
Normal pressure angle	20°	20°
Material	S45C	CAC702(Formerly A & BC2) (Hub of H4,H5 shape is FC200)
Heat treatment	Teeth induction hardened	—
Tooth hardness	48~53HRC	—
Surface treatment	Black oxide except ground surfaces	—
Tooth surface finish	Ground	Cut
<small>Datum reference surface for gear cutting and grinding</small>	Bore	Bore
Secondary operations	Possible except tooth area	Possible

CAUTION: A & BC2 is aluminum bronze.

Screw		Shape	Weight (kgf)	Catalog No.
Size	S			
—	—	W3	0.6	<b>SWG3-R1</b> <b>SWG3-R2</b> <b>SWG3-R3</b>
—	—	W3	0.6	
—	—	W3	0.6	

Web thickness	Web O.D.	Mounting distance	Shape	Allowable torque (N-m)	Allowable torque (Kgf-m)	Backlash (mm)	Weight (kgf)	Catalog No.
				<small>NOTE 1</small>	<small>NOTE 1</small>			
H	I	J	<small>NOTE 2</small>	Surface durability	Surface durability			
—	—	52	H1	30.93	( 3.15 )	0.19 ~ 0.26	0.75	<b>AG3-20R1</b> <b>AG3-20R2</b> <b>AG3-30R1</b> <b>AG3-30R2</b> <b>AG3-30R3</b>
—	—	52	H1	28.41	( 2.9 )	0.19 ~ 0.26	0.75	
—	—	67	H4	68.35	( 6.97 )	0.19 ~ 0.26	1.4	
—	—	67	H4	62.78	( 6.4 )	0.19 ~ 0.26	1.4	
—	—	67	H4	62.35	( 6.36 )	0.19 ~ 0.26	1.4	
10	103	82	H5	120.2	(12.26)	0.19 ~ 0.26	2.3	<b>AG3-40R1</b> <b>AG3-45R3</b> <b>AG3-50R1</b> <b>AG3-60R1</b>
11	120	89.5	H5	137.8	(14.05)	0.19 ~ 0.26	2.5	
15	130	97	H5	184.5	(18.81)	0.19 ~ 0.26	3.2	
15	155	112	H5	260.7	(26.58)	0.19 ~ 0.26	4.3	

NOTE 1: The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 294 for more details. The tables below show the allowable worm wheel torques (N-m) at selected worm speeds.

Screw		Shape	Weight (kgf)	Catalog No.
Size	S			
—	—	W3	1.7	<b>SWG4-R1</b> <b>SWG4-R2</b> <b>SWG4-R3</b>
—	—	W3	1.7	
—	—	W3	1.7	

NOTE 2: Please avoid secondary operations that affect the strength of the joint between CAC702 and FC200. Also, there may be space in the casting between the two materials, but it will not affect the joint strength.

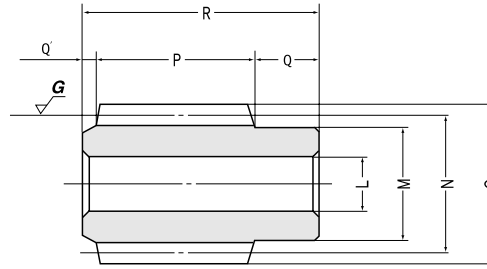
Web thickness	Web O.D.	Mounting distance	Shape	Allowable torque (N-m)	Allowable torque (Kgf-m)	Backlash (mm)	Weight (kgf)	Catalog No.
				<small>NOTE 1</small>	<small>NOTE 1</small>			
H	I	J	<small>NOTE 2</small>	Surface durability	Surface durability			
—	—	71	H1	58.21	( 5.94 )	0.22 ~ 0.29	1.5	<b>AG4-20R1</b> <b>AG4-20R2</b> <b>AG4-30R1</b> <b>AG4-30R2</b> <b>AG4-30R3</b>
—	—	71	H1	53.48	( 5.45 )	0.22 ~ 0.29	1.5	
—	—	91	H4	128.7	(13.12)	0.22 ~ 0.29	2.5	
—	—	91	H4	118.2	(12.05)	0.22 ~ 0.29	2.5	
—	—	91	H4	117.3	(11.96)	0.22 ~ 0.29	2.5	
15	133	111	H5	226.2	(23.07)	0.22 ~ 0.29	4.4	<b>AG4-40R1</b> <b>AG4-45R3</b> <b>AG4-50R1</b> <b>AG4-60R1</b>
16	153	121	H5	259.2	(26.43)	0.22 ~ 0.29	5.5	
16	173	131	H5	347.2	(35.41)	0.22 ~ 0.29	6.5	
17	210	151	H5	490.6	(50.03)	0.22 ~ 0.29	8.5	

■ AG4 Allowable Worm Wheel Torques (N-m)

Catalog No.	Worms min <sup>-1</sup>						
	30	100	300	600	900	1200	1800
<b>AG4-20R1</b>	115.2	93.6	72.7	58.2	51.1	45.7	38.4
<b>AG4-20R2</b>	113.8	90	67.2	53.5	46.4	41.2	34.1
<b>AG4-30R1</b>	244	200	157.6	128.7	113.5	101.1	86.3
<b>AG4-30R2</b>	242	195.7	148.4	118.2	104.3	92.2	77.6
<b>AG4-30R3</b>	250	197.5	147.4	117.3	101.8	90.2	74.7
<b>AG4-40R1</b>	417	343	274	226	200	178.7	152
<b>AG4-45R3</b>	531	430	326	259	229	202	170.2
<b>AG4-50R1</b>	630	519	418	347	309	277	236
<b>AG4-60R1</b>	881	730	589	491	441	395	337

Worm Gear Pair

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W3 Shape

### Module 5 Ground Worms

Catalog No.	Axial module <i>m</i>	Number of starts	Lead angle	Hand of thread	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
					LH7	M	N	O	P	Q	Q'	R
<b>SWG5-R1</b>	5	1	4°05'	R	25	56	70	80	85	30	5	120
<b>SWG5-R2</b>	5	2	8°08'	R	25	56	70	80	85	30	5	120

### Module 5 Worm Wheels

Catalog No.	Transverse module <i>m</i>	Reduction ratio	No. of teeth	Coefficient of profile shift	Number of starts	Hand of thread	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
							AH7	B	C	D	D'	E	F	F'	G
<b>AG5-20R1</b>	5	1/20	20	0	1	R	22	75	100	110	115	35	25	—	60
<b>AG5-20R2</b>	5	1/10	20	0	2	R	22	75	100	110	115	35	25	—	60
<b>AG5-30R1</b>	5	1/30	30	0	1	R	22	75	150	160	165	35	25	—	60
<b>AG5-30R2</b>	5	1/15	30	0	2	R	22	75	150	160	165	35	25	—	60
<b>AG5-40R1</b>	5	1/40	40	0	1	R	22	110	200	210	215	35	25	—	60
<b>AG5-50R1</b>	5	1/50	50	0	1	R	22	120	250	260	265	35	25	—	60
<b>AG5-60R1</b>	5	1/60	60	0	1	R	22	130	300	310	315	35	25	—	60

### Module 6 Ground Worms

Catalog No.	Axial module <i>m</i>	Number of starts	Lead angle	Hand of thread	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
					LH7	M	N	O	P	Q	Q'	R
<b>SWG6-R1</b>	6	1	4°17'	R	30	63	80	92	100	35	5	140
<b>SWG6-R2</b>	6	2	8°32'	R	30	63	80	92	100	35	5	140

### Module 6 Worm Wheels

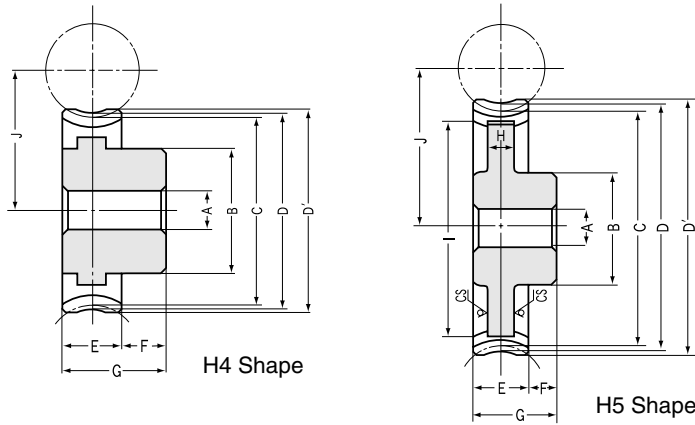
Catalog No.	Transverse module <i>m</i>	Reduction ratio	No. of teeth	Coefficient of profile shift	Number of starts	Hand of thread	Bore	Hub dia.	Pitch dia.	Throat dia.	Outside dia.	Face width	Hub length (R)	Hub length (L)	Total length
							AH7	B	C	D	D'	E	F	F'	G
<b>AG6-20R1</b>	6	1/20	20	0	1	R	25	85	120	132	138	40	30	—	70
<b>AG6-20R2</b>	6	1/10	20	0	2	R	25	85	120	132	138	40	30	—	70
<b>AG6-30R1</b>	6	1/30	30	0	1	R	25	100	180	192	198	40	30	—	70
<b>AG6-30R2</b>	6	1/15	30	0	2	R	25	100	180	192	198	40	30	—	70
<b>AG6-40R1</b>	6	1/40	40	0	1	R	25	120	240	252	258	40	30	—	70
<b>AG6-50R1</b>	6	1/50	50	0	1	R	25	130	300	312	318	40	30	—	70
<b>AG6-60R1</b>	6	1/60	60	0	1	R	25	150	360	372	378	40	30	—	70

**CAUTION:** Before assembling or performing any secondary operations, please carefully read the "Application Hints" on page 296.

### AG5 Allowable Worm Wheel Torques (N·m)

Catalog No.	Worms min <sup>-1</sup>						
	30	100	300	600	900	1200	1800
<b>AG5-20R1</b>	202	162.9	126.7	101.4	88.4	79	65.5
<b>AG5-20R2</b>	199.6	156.5	117	93.2	80.2	71.1	58.1
<b>AG5-30R1</b>	427	348	275	224	196.3	174.6	147.2
<b>AG5-30R2</b>	425	340	259	206	180.2	159.3	132.3
<b>AG5-40R1</b>	731	597	478	394	346	309	259
<b>AG5-50R1</b>	1105	903	729	605	534	479	402
<b>AG5-60R1</b>	1547	1270	1026	855	763	682	575

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Worm Gear Pair



\*CS has a sand mold casting finish. The dimensional tolerance of CS parts are the very coarse grade of JIS B 0405.

## Specifications

Catalog No.	SWG	AG
Precision grade	KHK W 001 grade 2	KHK W 002 grade 2
Reference section of gear	Axial	Rotating plane
Gear teeth	JIS 3 type Standard full depth	Standard full depth
Normal pressure angle	20°	20°
Material	S45C	CAC702(Formerly A & BC2) (Hub of H4, H5 shape is FC200)
Heat treatment	Teeth induction hardened	—
Tooth hardness	48~53HRC	—
Surface treatment	Black oxide except ground surface	—
Tooth surface finish	Ground	Cut
Datum reference surface for gear cutting and grinding	Bore	Bore
Secondary operations	Possible except tooth area	Possible

**CAUTION:** A, B, BC2 is aluminum bronze.

Screw		Shape	Weight (kgf)	Catalog No.
Size	S			
—	—	W3	2.8	<b>SWG5-R1</b> <b>SWG5-R2</b>
—	—	W3	2.8	

Web thickness	Web O.D.	Mounting distance	Shape	Allowable torque (N·m)	Allowable torque (Kgf·m)	Backlash (mm)	Weight (kgf)	Catalog No.
				NOTE 1	NOTE 1			
H	I	J	NOTE 2	Surface durability	Surface durability			
—	—	85	H4	101.4	(10.34)	0.25 ~ 0.32	2.7	<b>AG5-20R1</b> <b>AG5-20R2</b>
—	—	85	H4	93.2	( 9.5 )	0.25 ~ 0.32	2.7	
21	120	110	H5	224.1	(22.85)	0.25 ~ 0.32	5	<b>AG5-30R1</b> <b>AG5-30R2</b>
21	120	110	H5	205.8	(20.99)	0.25 ~ 0.32	5	
23	168	135	H5	394	(40.18)	0.25 ~ 0.32	8	<b>AG5-40R1</b>
23	215	160	H5	604.8	(61.67)	0.25 ~ 0.32	13	
24	260	185	H5	854.6	(87.14)	0.25 ~ 0.32	17	<b>AG5-60R1</b>

**NOTE 1:** The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 294 for more details. The tables below show the allowable worm wheel torques (N·m) at selected worm speeds.

**NOTE 2:** Please avoid secondary operations that affect the strength of the joint between CAC702 and FC200. Also, there may be space in the casting between the two materials, but it will not affect the joint strength.

Screw		Shape	Weight (kgf)	Catalog No.
Size	S			
—	—	W3	4.3	<b>SWG6-R1</b> <b>SWG6-R2</b>
—	—	W3	4.3	

Web thickness	Web O.D.	Mounting distance	Shape	Allowable torque (N·m)	Allowable torque (Kgf·m)	Backlash (mm)	Weight (kgf)	Catalog No.
				NOTE 1	NOTE 1			
H	I	J	NOTE 2	Surface durability	Surface durability			
—	—	100	H4	156.7	( 15.98)	0.27 ~ 0.34	5.5	<b>AG6-20R1</b> <b>AG6-20R2</b>
—	—	100	H4	145.4	( 14.82)	0.27 ~ 0.34	5.5	
26	142	130	H5	346.3	( 35.31)	0.27 ~ 0.34	8.8	<b>AG6-30R1</b> <b>AG6-30R2</b>
26	142	130	H5	321.2	( 32.75)	0.27 ~ 0.34	8.8	
28	200	160	H5	608.9	( 62.09)	0.27 ~ 0.34	14	<b>AG6-40R1</b>
30	258	190	H5	934.7	( 95.31)	0.27 ~ 0.34	23	
30	312	220	H5	1321	(134.7 )	0.27 ~ 0.34	29	<b>AG6-60R1</b>

### AG6 Allowable Worm Wheel Torques (N·m)

Catalog No.	Worms min <sup>-1</sup>							
	30	100	300	600	900	1200	1800	
<b>AG6-20R1</b>	315	252	195.6	156.7	135	120.9	99.6	
<b>AG6-20R2</b>	314	244	182.4	145.4	123.6	109.8	89.3	
<b>AG6-30R1</b>	666	538	424	346	300	267	224	
<b>AG6-30R2</b>	668	532	403	321	278	246	203	
<b>AG6-40R1</b>	1140	923	738	609	528	472	394	
<b>AG6-50R1</b>	1723	1396	1126	935	816	733	611	
<b>AG6-60R1</b>	2410	1963	1584	1321	1165	1044	875	