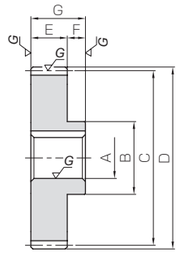
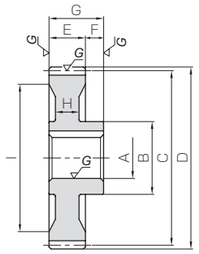
KMSGA / KMSGB
Ground Spur Gears

Specifications	
Precision grade	JIS grade N5 (JIS B1702-1: 1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	SCM415
Heat Treatment	Carburized
Tooth hardness	55 to 60HRC



S1



S2

Catalog Number	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total Length	Web thickness	Web O.D.
				A_{H7}	B	C	D	E	F	G	H	I
KMSGA2.5-15 **KMSGB2.5-15****	***m*2.5**	15	S1	15 18	30	37.5	42.5	25	12	37	—	—
KMSGA2.5-18 **KMSGB2.5-18**		18		18 20	38	45	50					
KMSGA2.5-20 **KMSGB2.5-20**		20		18 22	40	50	55					
KMSGA2.5-24 **KMSGB2.5-24**		24		18 22	40	60	65					
KMSGA2.5-25 **KMSGB2.5-25**		25		20 25	45	62.5	67.5					
KMSGA2.5-30 **KMSGB2.5-30**		30		22 28	50	75	80					
KMSGA2.5-35 **KMSGB2.5-35**		35		25 30	55	87.5	92.5					
KMSGA2.5-36 **KMSGB2.5-36**		36		25 30	55	90	95					
KMSGA2.5-40 **KMSGB2.5-40**		40		25 32	55	100	105					
KMSGA2.5-45 **KMSGB2.5-45**		45		30 35	60	112.5	117.5					
KMSGA2.5-48 **KMSGB2.5-48**		48		30 35	60	120	125					
KMSGA2.5-50 **KMSGB2.5-50**		50		30 35	60	125	130					
KMSGA2.5-55 **KMSGB2.5-55**		55		30 40	70	137.5	142.5					
KMSGA2.5-60 **KMSGB2.5-60**		60		30 40	70	150	155					
KMSGA2.5-70 **KMSGB2.5-70**		70	S2	40 50	85	175	180				17	150

[Caution on Product Characteristics]

① Although the dimensions of the keyway are made to the JIS B1301 (Js9) tolerance, there may be some deviations due to the effects of the heat treatment.
② The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 for more details.
③ The backlash values shown in the table are the theoretical values for the backlash in the normal direction of a pair of identical gears in mesh.
④ Products marked with "**" have a small amount of material between the corner of the keyway and the tooth root. This mode of failure must be considered when selecting these gears.
For details, please see our web site.

Keyway	Allowable torque (N·m)		Allowable torque (kgf·m)		Backlash	Weight	Catalog Number
Width × Depth	Bending strength	Surface durability	Bending strength	Surface durability	(mm)	(kg)	
5 x 2.3 6 x 2.8	143	71.0	14.6	7.24	0.10~0.20	0.23 0.20	**KMSGA2.5-15** **KMSGB2.5-15****
6 x 2.8 6 x 2.8	190	107	19.4	10.9		0.34 0.32	**KMSGA2.5-18** **KMSGB2.5-18**
6 x 2.8 6 x 2.8	222	134	22.7	13.7		0.42 0.39	**KMSGA2.5-20** **KMSGB2.5-20**
6 x 2.8 6 x 2.8	289	201	29.4	20.5	0.12~0.22	0.59 0.56	**KMSGA2.5-24** **KMSGB2.5-24**
6 x 2.8 8 x 3.3	306	220	31.2	22.4		0.66 0.60	**KMSGA2.5-25** **KMSGB2.5-25**
6 x 2.8 8 x 3.3	392	322	40.0	32.8		0.94 0.87	**KMSGA2.5-30** **KMSGB2.5-30**
8 x 3.3 8 x 3.3	480	444	49.0	45.3		1.25 1.19	**KMSGA2.5-35** **KMSGB2.5-35**
8 x 3.3 8 x 3.3	498	471	50.8	48.0		1.32 1.26	**KMSGA2.5-36** **KMSGB2.5-36**
8 x 3.3 10 x 3.3	543	560	55.3	57.1		1.61 1.52	**KMSGA2.5-40** **KMSGB2.5-40**
8 x 3.3 10 x 3.3	629	718	64.1	73.2	0.14~0.24	2.00 1.93	**KMSGA2.5-45** **KMSGB2.5-45**
8 x 3.3 10 x 3.3	681	823	69.5	83.9		2.27 2.20	**KMSGA2.5-48** **KMSGB2.5-48**
8 x 3.3 10 x 3.3	716	897	73.0	91.5		2.46 2.39	**KMSGA2.5-50** **KMSGB2.5-50**
8 x 3.3 12 x 3.3	804	1090	82.0	112		3.06 2.90	**KMSGA2.5-55** **KMSGB2.5-55**
8 x 3.3 12 x 3.3	892	1310	90.9	134		3.62 3.45	**KMSGA2.5-60** **KMSGB2.5-60**
12 x 3.3 14 x 3.8	1020	1730	104	176		4.24 4.03	**KMSGA2.5-70** **KMSGB2.5-70**

[Caution on Secondary Operations]

① No secondary operations can be performed on these precision finished gears due to the applied carburizing process. For products which are different in specifications, such as bore size, we accept custom-made gear orders and provide a price quote.

Selection Hints

1 ...
650 ...

1. Caution in Selecting the Mating Gears

2. Caution in Selecting Gears Based on Gear Strength

5IF HFBST SFOHU WBMVFT TIPXO JO UIF QSPEVDU HFBST BSF DPNQVUFE CBTFE PO DFSUBJO BTTVNQUJPOT 5IFSFGPSF UIFZ TIPVME CF VTFE BT SFGFSFODF WBMVFT 5IF N FDIBOJDBM FODIVSF DPNQBSJTPO BMMPXBCMF UPSRVF WBMVFT BMMZ OHUF BDDPVOU UIF DPOEJUJPOT ,464 MPHIC TQ HFBST,% MPHIC TQ HFBST BOE WBSJPVT TFSJFT UBU VF UF GBDUPST PG MJOH NFUPE GBDUPS HFBST I BGUFE EJUPOBM DPOTJEFSBUPOT GPS SFTUSJDUJOH RVF 5I F BCMF FMP X POBJOU BTTVNQUPOT FTUBCMJTIFE GPS WBSJPVT QSPEVDUT JO PSEFS UP DPNQBSF HFBST TUSFOHUI

Calculation of Bending Strength of Gears

Item \ Catalog Number	.MSGA .MSGB	.SSGS	.SSG .SSAG	.SSS,.SS .SSA,.SSY .SSA Y,.SSR	.SUS .SUSA .SUSF	.BSS	.KSG	.KS	.NSU	.PU .PS .PSA	.DSF .DS
Formula /05&	PSNVMBPGTQVSBOEIFMJDBMHFBSTPOCFOEJOHTUSFOHU(.")								5IF-FXJTGPSNVMB		
No. of teeth of mating gears	4BNFOVNCFSPGUFFUIGPS,44(4,444,				443		3BDLT		•		
Rotational speed	SQN		SQN						SQN		
Design life (durability)	0WFS DZDMFT								•		
Impact from motor	6OJGPSNMPBE								MMPXBCMFCFOEJOHTUSFTTLHGNN		
Impact from load	6OJGPSNMPBE								XUP -VCSJDBUJPO	XUP -VCSJDBUJPO	N N N XU (SFBTF -VCSJDBUJPO
Direction of load	JEJSFDUJPOBM										
Allowable bending stress at root 1_{Flim} (LHGNN) /05&			/PUF	/PUF							
Safety factor S_F											

Calculation of Surface Durability (Except where it is common with bending strength)

Item								
Formula /05&	PSNVMBPGTQVSBOEIFMJDBMHFBSTPOTVSGBDFEVSBCJMJUZ(.")							
Kinematic viscosity of lubricant	D4U							
Gear support	4ZNNFUSJDTVQQPSUCZCFBSJOHT/PUF						4VQQPSUFEPOPOFFOE	
Allowable Hertz stress 1_{Hlim} (LHGNN)			/PUF	/PUF		•		
Safety factor S_H								

[NOTE 1] 5IFHFBSTUSFOHUIGPSNVMBJTCBTFEPO+(.+BQBOFTF(FBS.BOVGBDUVSFSTTPDJBUJPOTDJpDBUJPOT./POPO5FDIOJDBMBCZBOP1PMZ(PODP-JNJUFE BOE(FBSBDPO(FBSBCZPMZBTUJDP5IFVOJUTGPSUFSPUBUJPOBMTQFFEBOEUFTUSFTTLHGNN BSFBEKVTUFEUPUIFVOJUTOFFEFEJOUIFGPSNVMB
[NOTE 2] 5IFBMMPXBCMFCFOEJOHTUSFTTBUUFSPPU Flim...
[NOTE 3] PS,44((SPVOE4QVS(FBSTXUINPEVMFPSMFTTUIFSNBMSFpOJOHJTBQQMJFEMMPXBCMFCFOEJOHTUSFTTBOEBMMPXBCMFIFSU[TUSFTTWBMVFTBSFTIPXOJO QBSFOUIFTFT [NOTE 4] PS ,4444Q1JOJPO4IBGUTXJUINPEVMFPWFSUPUIJOEVDUJPOIBSEFOJOHJTOPUBQQMJFEMMPXBCMFCFOEJOHTUSFTTBOEBMMPXBCMFIFSU[TUSFTTWBMVFTBSFTIPXOJOQBSFOUIFTFT
[NOTE 5] ,4444Q1JOJPO4IBGUTXJUINPEVMFPSMFTT ,4DPOpHVSBUJPOBSFFUDBOUMFWFSTQSBUUFSBSFTJOHMFTIBGUT

When selecting KHK standard gears, glance over the Cautions on Product Characteristics and Cautions on Performing Secondary Operations in the respective dimension tables.

1SPEVDUTOPMJTUFEJOUIJTDBUBMPHPSNBESBJMTNPVMFTOVNCFSPGUFFUIBOEUFMJLFOPUMJTUFEJOUIFEJNFOTJPOBCMFTDBOCFNBOVGBDUVSFEBTDVTUPNJUFNT1MFBTFTFF1BHFGPSNPSFEFUBJMTBCPVUDVTUPNNBEFPSEFST 5IFDPMPSBOETIBQFPGUIFQSPEVDUNBHFTMJTUFEPOUIFEJNFOTJPOUBCMFQBHFPGFBDIQSPEVDUNBZEJGGFSGSPNUIFBDUVBMQSPEVDU FTVSFUPDPOpSNUIFTIBQFJOUIFEJNFOTJPOUBCMFCFGPSFTFMFDUJPO 5IFEFUBJMTQFDJGJDBUJPOTQSJOUFEJOUIFDBUBMPHNBZCFDIBOHFEXJUIPVUQSJPSOPUJDF IBOHFTBSFBOOPVODFEPOUIF,),XFCTJUF

The most important factor in selecting gears is the gear strength.

Step 1 Determine the actual load torque applied to the gear and the gear type suitable for the purpose.

Definition of Bending Strength of Gears

5IFBMMPXBCMFCFOEJOHTUSFOHUI PGBHFBSEFGJOFEBTUIFBM MPXBCMFUBOHFOUJBMGPSDFBUUIF QJUDIDJSDMFCBTFEPOUIFNV BMMBMMPXBCMFSPPUTUSFTTPGB NFTIJOHHFBSTUPEFSMPBE

BNQMFPGGBJMVSFEVF JOTVGGJDJFOUCFOEJOHTUSFOHUI

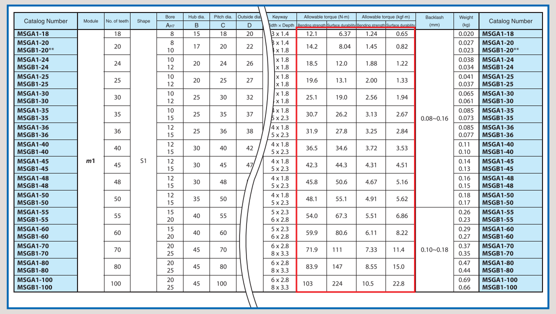
Definition of Surface Durability

5IFTVSGBDFEVSBCJMJUZPGBHFBS JTEFpOFEBTUIFBMMPXBCMFUBO HFOUJBMGPSDFBUUIFQJUDIDJSDMF XIJDIQFSNJUTUIFGPSDFUP CFUSBOTNJUUFETBGFMZXJUIPVU JODSFBTJOHTVSGBDFGBJMVSF BMMPXBCMFIFSU[TUSFTTPGB HFBSJTEFpOFEBTUIFBMMPXBCMF UBOHFOUJBMGPSDFBUUIFQJUDI DJSDMFCBTFEPOUIFNVUVBMHFBS BDUJOHTFOTJUJPOPGNFTIJOH HFBSTVEFSMPBE

BNQMFPGGBJMVSFEVF JOTVGGJDJFOUTVSGBDFEVSBCJMJUZ

Step 2 Select provisionally from the allowable torque table of the Master Catalog based on the load torque.

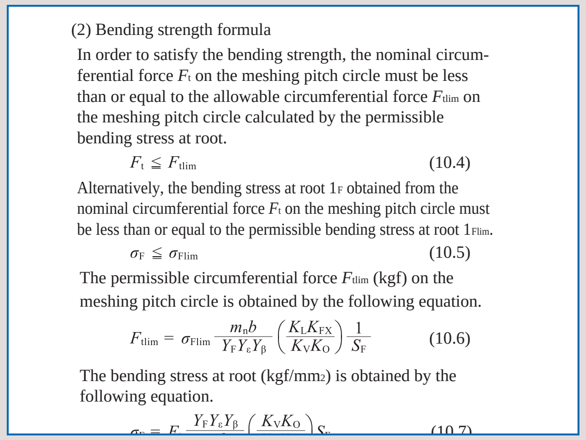
For provisional selection from the Master Catalog



Step 3 We recommend that each user computes their own values by applying the actual usage conditions to determine the suitability of the gear strength.

Calculate the strength formally using the various gear strength formulas.
Please see Page 71 of our technical reference book for more details.

Strength confirmation is simple when using the website.


(2) Bending strength formula

In order to satisfy the bending strength, the nominal circumferential force F_t on the meshing pitch circle must be less than or equal to the allowable circumferential force F_{tlim} on the meshing pitch circle calculated by the permissible bending stress at root.

$$F_t \leq F_{tlim} \quad (10.4)$$

Alternatively, the bending stress at root σ_F obtained from the nominal circumferential force F_t on the meshing pitch circle must be less than or equal to the permissible bending stress at root σ_{Flim}.

$$\sigma_F \leq \sigma_{Flim} \quad (10.5)$$

The permissible circumferential force F_{tlim} (kgf) on the meshing pitch circle is obtained by the following equation.

$$F_{tlim} = \sigma_{Flim} \frac{m_n b}{Y_F Y_\varepsilon Y_\beta} \left(\frac{K_L K_{FX}}{K_V K_O} \right) \frac{1}{S_F} \quad (10.6)$$

The bending stress at root (kgf/mm2) is obtained by the following equation.