



# **APEX PRECISION MECHATRONIX PVT.LTD.**

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## Features



KHK stock helical gears are quiet, high-strength and easy to use. They are suitable wherever you require high-speed rotation including in machine tools, speed reducers, etc. The following table lists the main features.

Catalog Number	KHG	SH
Module	1~3	2~3
Reference section of gear	Rotating plane	Normal plane
Material	SCM440	S45C
Heat Treatment	Thermal refined, gear teeth induction hardened	—
Tooth Surface Finish	Ground	Cut
Precision JIS B 1702-1:1998	N6	N8
Secondary Operations	Possible except for tooth	Possible
Features	It has excellent accuracy, strength, wear resistance and quietness, and allows secondary operations. Usable in the same center distance of the spur gear.	It has higher strength and quietness than the SS spur gears.

## Selection Hints



It is important to thoroughly understand the contents of the product tables as well as “CAUTION” notes before making the selection. You must specify the right or left hand by including the letter R or L in the catalog number when ordering.

### 1. Caution in Selecting the Mating Gears

The KHK stock helical gears are not interchangeable with KHG series (transverse module) and SH series (normal module). Please keep this in mind when making your selection. Also, right hand and left hand helical mating gears are packaged as a set. See the photos below for reference and for help in making a proper selection.

#### Direction of Helix



### Mating Helical Gear Selection Chart (○ Allowable × Not allowable)

Catalog Number and Direction of Helix	KHG		SH		KRHG KRHGF		SRH	
	RH	LH	RH	LH	RH	LH	RH	LH
KHG	RH	×	○	×	×	×	○	×
	LH	○	×	×	×	○	×	×
SH	RH	×	×	×	○	×	×	×
	LH	×	×	○	×	×	×	○

### 2. Caution in Selecting Gears Based on Gear Strength

The gear strength values shown in the product pages were computed by assuming the application environment in the table below. Therefore, they should be used as reference only. We recommend that each user computes their own values by applying the actual usage conditions.

### Calculation of Bending Strength of Gears

Item	Catalog Number	KHG	SH
Formula <sup>NOTE 1</sup>	Formula of spur and helical gears on bending strength (JGMA401-01)		
No. of teeth of mating gears	Same no. of teeth		
Rotational Speed	600rpm	100rpm	
Design Life (Durability)	Over 10 <sup>7</sup> cycles		
Impact from motor	Uniform load		
Impact from load	Uniform load		
Direction of load	Bidirectional load (calculated with allowable bending stress of 2/3)		
Allowable bending stress at root $\sigma_{Hlim}$ (kgf/mm <sup>2</sup> ) <sup>NOTE 2</sup>	30	19	
Safety factor $S_{Hf}$	1.2		

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

Item	Catalog Number	KHG	SH
Formula <sup>NOTE 1</sup>	Formula of spur and helical gears on surface durability (JGMA402-01)		
Kinematic viscosity of lubricant	100cSt(50°C)		
Gear support	Symmetric support by bearings		
Allowable Hertz stress $\sigma_{Hlim}$ (kgf/mm <sup>2</sup> )	116	49	
Safety factor $S_{Hf}$	1.15		

[NOTE 1] The gear strength formula is based on JGMA (Japanese Gear Manufacturers Association) specifications. The units for the rotational speed (rpm) and the stress (kgf/mm<sup>2</sup>) are adjusted to the units needed in the formula.

# Selecting the Gears

## Step 1

Determine the calculated load torque applied to the gear and the gear type suitable for the purpose.

## Step 2

Select provisionally from the allowable torque table of the Master Catalog or Web Catalog based on the load torque.

### ■ For provisional selection from the Master Catalog

Model Number	Face Width	Module	Pressure Angle	Number of Teeth	Allowable Torque (N·m)	Allowable Torque (kgf·m)	Allowable Torque (hp)	Allowable Torque (kW)
KH01-20R	20	2	20°	22	270	0.028	0.038	0.033
KH01-20R	20	2.5	20°	22	400	0.041	0.055	0.049
KH01-20R	20	3	20°	22	530	0.055	0.074	0.066
KH01-20R	20	4	20°	22	660	0.068	0.091	0.082
KH01-20R	20	5	20°	22	790	0.082	0.109	0.099
KH01-20R	20	6	20°	22	920	0.095	0.127	0.116
KH01-20R	20	8	20°	22	1180	0.123	0.165	0.151
KH01-20R	20	10	20°	22	1440	0.151	0.202	0.186
KH01-20R	20	12	20°	22	1700	0.179	0.239	0.220
KH01-20R	20	15	20°	22	2150	0.225	0.300	0.277
KH01-20R	20	20	20°	22	2880	0.302	0.403	0.373
KH01-20R	20	25	20°	22	3610	0.379	0.505	0.469
KH01-20R	20	30	20°	22	4340	0.456	0.607	0.565
KH01-20R	20	35	20°	22	5070	0.533	0.709	0.661
KH01-20R	20	40	20°	22	5800	0.610	0.811	0.758
KH01-20R	20	45	20°	22	6530	0.687	0.913	0.854
KH01-20R	20	50	20°	22	7260	0.764	1.015	0.950
KH01-20R	20	55	20°	22	7990	0.841	1.117	1.047
KH01-20R	20	60	20°	22	8720	0.918	1.219	1.144
KH01-20R	20	65	20°	22	9450	0.995	1.321	1.241
KH01-20R	20	70	20°	22	10180	1.072	1.423	1.338
KH01-20R	20	75	20°	22	10910	1.149	1.525	1.436
KH01-20R	20	80	20°	22	11640	1.226	1.627	1.532
KH01-20R	20	85	20°	22	12370	1.303	1.729	1.623
KH01-20R	20	90	20°	22	13100	1.380	1.831	1.719
KH01-20R	20	95	20°	22	13830	1.457	1.933	1.815
KH01-20R	20	100	20°	22	14560	1.534	2.035	1.911
KH01-20R	20	110	20°	22	16040	1.682	2.241	2.100
KH01-20R	20	120	20°	22	17520	1.830	2.447	2.292
KH01-20R	20	130	20°	22	19000	1.978	2.653	2.484
KH01-20R	20	140	20°	22	20480	2.126	2.859	2.676
KH01-20R	20	150	20°	22	21960	2.274	3.065	2.868
KH01-20R	20	160	20°	22	23440	2.422	3.271	3.060
KH01-20R	20	170	20°	22	24920	2.570	3.477	3.252
KH01-20R	20	180	20°	22	26400	2.718	3.683	3.444
KH01-20R	20	190	20°	22	27880	2.866	3.889	3.636
KH01-20R	20	200	20°	22	29360	3.014	4.095	3.828
KH01-20R	20	220	20°	22	31280	3.262	4.397	4.116
KH01-20R	20	240	20°	22	33200	3.510	4.699	4.404
KH01-20R	20	260	20°	22	35120	3.758	4.999	4.692
KH01-20R	20	280	20°	22	37040	4.006	5.299	4.980
KH01-20R	20	300	20°	22	38960	4.254	5.599	5.268
KH01-20R	20	320	20°	22	40880	4.502	5.899	5.556
KH01-20R	20	340	20°	22	42800	4.750	6.199	5.844
KH01-20R	20	35	20°	22	5070	0.533	0.709	0.661
KH01-20R	20	40	20°	22	5800	0.610	0.811	0.758
KH01-20R	20	45	20°	22	6530	0.687	0.913	0.854
KH01-20R	20	50	20°	22	7260	0.764	1.015	0.950
KH01-20R	20	55	20°	22	7990	0.841	1.117	1.047
KH01-20R	20	60	20°	22	8720	0.918	1.219	1.144
KH01-20R	20	65	20°	22	9450	0.995	1.321	1.241
KH01-20R	20	70	20°	22	10180	1.072	1.423	1.338
KH01-20R	20	75	20°	22	10910	1.149	1.525	1.436
KH01-20R	20	80	20°	22	11640	1.226	1.627	1.532
KH01-20R	20	85	20°	22	12370	1.303	1.729	1.623
KH01-20R	20	90	20°	22	13100	1.380	1.831	1.719
KH01-20R	20	95	20°	22	13830	1.457	1.933	1.815
KH01-20R	20	100	20°	22	14560	1.534	2.035	1.911
KH01-20R	20	110	20°	22	16040	1.682	2.241	2.100
KH01-20R	20	120	20°	22	17520	1.830	2.447	2.292
KH01-20R	20	130	20°	22	19000	1.978	2.653	2.484
KH01-20R	20	140	20°	22	20480	2.126	2.859	2.676
KH01-20R	20	150	20°	22	21960	2.274	3.065	2.868
KH01-20R	20	160	20°	22	23440	2.422	3.271	3.060
KH01-20R	20	170	20°	22	24920	2.570	3.477	3.252
KH01-20R	20	180	20°	22	26400	2.718	3.683	3.444
KH01-20R	20	190	20°	22	27880	2.866	3.889	3.636
KH01-20R	20	200	20°	22	29360	3.014	4.095	3.828
KH01-20R	20	220	20°	22	31280	3.262	4.397	4.116
KH01-20R	20	240	20°	22	33200	3.510	4.699	4.404
KH01-20R	20	260	20°	22	35120	3.758	4.999	4.692
KH01-20R	20	280	20°	22	37040	4.006	5.299	4.980
KH01-20R	20	300	20°	22	38960	4.254	5.599	5.268
KH01-20R	20	320	20°	22	40880	4.502	5.899	5.556
KH01-20R	20	340	20°	22	42800	4.750	6.199	5.844
KH01-20R	20	360	20°	22	44720	5.000	6.499	6.132
KH01-20R	20	380	20°	22	46640	5.248	6.799	6.420
KH01-20R	20	400	20°	22	48560	5.496	7.099	6.708
KH01-20R	20	420	20°	22	50480	5.744	7.399	6.996
KH01-20R	20	440	20°	22	52400	5.992	7.699	7.284
KH01-20R	20	460	20°	22	54320	6.240	7.999	7.572
KH01-20R	20	480	20°	22	56240	6.488	8.299	7.860
KH01-20R	20	500	20°	22	58160	6.736	8.599	8.148
KH01-20R	20	520	20°	22	60080	6.984	8.899	8.436
KH01-20R	20	540	20°	22	62000	7.232	9.199	8.724
KH01-20R	20	560	20°	22	63920	7.480	9.499	9.012
KH01-20R	20	580	20°	22	65840	7.728	9.799	9.300
KH01-20R	20	600	20°	22	67760	7.976	10.099	9.588
KH01-20R	20	620	20°	22	69680	8.224	10.399	9.876
KH01-20R	20	640	20°	22	71600	8.472	10.699	10.164
KH01-20R	20	660	20°	22	73520	8.720	10.999	10.452
KH01-20R	20	680	20°	22	75440	8.968	11.299	10.740
KH01-20R	20	700	20°	22	77360	9.216	11.599	11.028
KH01-20R	20	720	20°	22	79280	9.464	11.899	11.316
KH01-20R	20	740	20°	22	81200	9.712	12.199	11.604
KH01-20R	20	760	20°	22	83120	9.960	12.499	11.892
KH01-20R	20	780	20°	22	85040	10.208	12.799	12.180
KH01-20R	20	800	20°	22	86960	10.456	13.099	12.468
KH01-20R	20	820	20°	22	88880	10.704	13.399	12.756
KH01-20R	20	840	20°	22	90800	10.952	13.699	13.044
KH01-20R	20	860	20°	22	92720	11.200	13.999	13.332
KH01-20R	20	880	20°	22	94640	11.448	14.299	13.620
KH01-20R	20	900	20°	22	96560	11.696	14.599	13.908
KH01-20R	20	920	20°	22	98480	11.944	14.899	14.196
KH01-20R	20	940	20°	22	100400	12.192	15.199	14.484
KH01-20R	20	960	20°	22	102320	12.440	15.499	14.772
KH01-20R	20	980	20°	22	104240	12.688	15.799	15.060
KH01-20R	20	1000	20°	22	106160	12.936	16.099	15.348
KH01-20R	20	1020	20°	22	108080	13.184	16.399	15.636
KH01-20R	20	1040	20°	22	110000	13.432	16.699	15.924
KH01-20R	20	1060	20°	22	111920	13.680	16.999	16.212
KH01-20R	20	1080	20°	22	113840	13.928	17.299	16.500
KH01-20R	20	1100	20°	22	115760	14.176	17.599	16.788
KH01-20R	20	1120	20°	22	117680	14.424	17.899	17.076
KH01-20R	20	1140	20°	22	119600	14.672	18.199	17.364
KH01-20R	20	1160	20°	22	121520	14.920	18.499	17.652
KH01-20R	20	1180	20°	22	123440	15.168	18.799	17.940
KH01-20R	20	1200	20°	22	125360	15.416	19.099	18.228
KH01-20R	20	1220	20°	22	127280	15.664	19.399	18.516
KH01-20R	20	1240	20°	22	129200	15.912	19.699	18.804
KH01-20R	20	1260	20°	22	131120	16.160	19.999	19.092
KH01-20R	20	1280	20°	22	133040	16.408	20.299	19.380
KH01-20R	20	1300	20°	22	134960	16.656	20.599	19.668
KH01-20R	20	1320	20°	22	136880	16.904	20.899	19.956
KH01-20R	20	1340	20°	22	138800	17.152	21.199	20.244
KH01-20R	20	1360	20°	22	140720	17.400	21.499	20.532
KH01-20R	20	1380	20°	22	142640	17.648	21.799	20.820
KH01-20R	20	1400	20°	22	144560	17.896	22.099	21.108
KH01-20R	20	1420	20°	22	146480	18.144	22.399	21.396
KH01-20R	20	1440	20°	22	148400	18.392	22.699	21.684
KH01-20R	20	1460	20°	22	150320	18.640	22.999	21.972
KH01-20R	20	1480	20°	22	152240	18.888	23.299	22.260
KH01-20R	20	1500	20°	22	154160	19.136	23.599	22.548
KH01-20R	20	1520	20°	22	156080	19.384	23.899	22.836
KH01-20R	20	1540	20°	22	158000	19.632	24.199	23.124
KH01-20R	20	1560	20°	22	159920	19.880	24.499	23.412
KH01-20R	20	1580	20°	22	161840	20.128	24.799	23.700
KH01-20R	20	1600	20°	22	163760	20.376	25.099	23.988
KH01-20R	20	1620	20°	22	165680	20.624	25.399	24.276
KH01-20R	20	1640	20°	22	167600	20.872	25.699	24.564
KH01-20R	20	1660	20°	22	169520	21.120	25.999	24.852
KH01-20R								