

# APEX PRECISION MECHATRONIX PVT.LTD.

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# **Selection Hints**

Racks

Please select the most suitable products by carefully considering the characteristics of items and contents of the product tables. It is also important to read all applicable "CAUTION" notes shown below before the final selection.

## 1. Caution in Selecting the Mating Gears

- (1) With the exception of helical racks. KHK stock racks can mate with any spur gears of the same module. Products with different tooth width can also be mated as a pinion.
- 2 See the table on the right for the mating gears of the helical racks.

Be sure to check the combination of helix direction (right or left) when selecting.

### 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

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

Catalog Number and Direction of		KR	HG HGF	ZST ZSTD	SRHEF	SRH/SRHF SRHFD		
Helix		RH	LH RH		RH	RH	LH	
кнд	LH	0	×	×	×	×	×	
	RH	×	0	×	×	×	×	
ZSTP	LH	×	×	0	0	×	х	
SHE	LH	×	×	0	0	×	×	
SH	LH	×	×	×	×	0	×	
	RH	×	×	×	×	×	0	



Pinion (B) & Back (L)

	Racks							Pinion		Racks	6			
Catalog Number Item	MRGF MRGFD	KRGF-H KRGFD-H KRF-H KRFD-H	KRG/KRGF KRGFD KRHG/KRHGF KRHGFD/KRF KRFD	SRG/SRGF SRGFD/SRGFK SRF-H/SRFD-H ZST/ZSTD	SRF-HL SRFD-HL	SRAF/SRAFD SRAFK/SR/SRF SRFD/SRFK/SRO SROS/SRH/SRHF SRHFD/SRHEF	SUR SURF SURFD SURO	BSRS	HEZS	DRF DRFC DRFF	PR PRF	DR		
Formula NOTE 1		Formula of spur and helical gears on bending strength (JGMA401-01)									The Lewis formula			
No. of teeth of mating gears		30 Note 2 Racks								6	(30)			
Rotational Speed of Pinion		100rpm									(100rpm)			
Design Life (Durability)	Over 10 <sup>7</sup> cycles								Allowab	Allowable bending stress (kgf/mm²)				
Impact from motor	Uniform load									m 0.8 1.15 (40°C m 1.5 1 m 2.0	m 0.8 4.0			
Impact from load	Uniform load								1.0		m 1.0 3.5 m 1.5 1.8 NOTE 4 m 2.0 1.2			
Direction of load	Bidirectional load (calculated with allowable bending stress of 2/3)							(40°C with No						
Allowable bending stress at root $\sigma_{\rm Him}$ (kgf/mm²)	47		32		20 NOTE	3	10.5	4	30	Lubricatio	Lubrication	Grease		
Safety factor SF				1	.2							Lubrication)		

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

Formula NOTE 1	Formula of spur and helical gears on surface durability (JGMA402-01)										
Kinematic viscosity of lubricant		100cSt(50°C)									
Gear support		Supported on one end.									
Allowable Hertz stress $\sigma_{\rm Him}$ (kgf/mm²)	166	112	79	90 NOTE 3	80	52.5	41.3	-	49	112	
Safety factor SH	1.15										

INOTE 11 The gear strength formula is based on JGMA (Japanese Gear Manufacturers Association) specifications. "MC Nvion Technical Data" by Mitsubishi Chemical Advanced Materials and "Duracon (R) Gear" by Polyplastics Co. The units for the rotational speed (rpm) and the stress (kgf/mm<sup>2</sup>) are adjusted to the units needed in the formula. [NOTE 2] No. of mating teeth in the ZST and ZSTD racks is the "minimum number of teeth" of the ZSTP pinion. The No. of mating teeth in the SRHEF racks is also calculated by the "minimum number of teeth" of the SHE pinion.

[NOTE 3] For SRG, or SRGF Ground Racks, with a module less than m0.8, the allowable bending stress and allowable hertz stress are respectively 24.5 (kgf/mm<sup>2</sup>). and 62.5 (kgf/mm<sup>2</sup>). [NOTE 4] The values for DR m 1.5 racks were assumed by KHK. Usage conditions for SSDR (DR Rack Pinion) are the same for the SSCP Pinion, shown on Page 269.

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

① Products not listed in this catalog or materials, modules, number of teeth and the like not listed in the dimensional tables can be manufactured as custom items. Please see Page 24 for more details about custom-made orders.

(2) The color and shape of the product images listed on the dimension table page of each product may differ from the actual product. Be sure to confirm the shape in the dimension table before selection.

③ The details (specifications, dimensions, etc.) listed in the catalog may be changed without prior notice. Changes are announced on the KHK website. Website URL: https://khkgears.net/new/

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