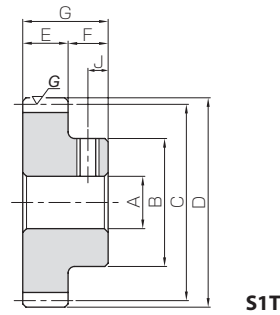




Specifications	
Precision grade	JIS grade N7 (JIS B1702-1: 1998)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C*
Heat Treatment	- *
Tooth hardness	200 to 270HB
Surface treatment	Black oxide coated except for teeth

\* Products with modules of 0.8 or under use S45C thermal refined equivalent materials and are not hardened.



Catalog Number	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total Length	Keyway
				A <sub>H7</sub>	B	C	D	E	F	G	Width × Depth
KSSG0.5-30A KSSG0.5-30B	m0.5	30	S1T	5	13	15	16	5	7	12	—
KSSG0.5-32A		32		5	14	16	17				
KSSG0.5-40B		40		6	18	20	21				
KSSG0.5-50B		50		6	22	25	26				
KSSG0.5-60A KSSG0.5-60B		60		6	28	30	31				
KSSG0.5-70B		70		8	28	35	36				
KSSG0.5-80A		80		6	28	40	41				
KSSG0.8-20A KSSG0.8-20B		m0.8		20	S1T	5	13				
KSSG0.8-25A	25		5	16		20	21.6				
KSSG0.8-30A	30		5	20		24	25.6				
KSSG0.8-34A	34		6	22		27.2	28.8				
KSSG0.8-40B	40		8	28		32	33.6				
KSSG0.8-50A	50		6	28		40	41.6				
KSSG0.8-60A KSSG0.8-60B	60		6	28		48	49.6				
KSSG0.8-70A	70		6	28		56	57.6				
KSSG0.8-80A	80		6	28		64	65.6				

- [Caution on Product Characteristics]
- For products having a tapped hole, a set screw is included.
  - The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see Page 24 for more details.
  - 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.
  - When using S1T set screws for fastening gears to a shaft, only use this method for applications with light load usage. For secure fastening, please use dowel pins in combination.

Socket head screw	Allowable torque (N-m)	Allowable torque (kgf-m)		Backlash (mm)	Weight (kg)	Catalog Number	
		Bending strength	Surface durability				Bending strength
Size	J						
M4	3.5	1.63	0.29	0.17	0.030	0~0.08	0.012 KSSG0.5-30A
		1.78	0.34	0.18	0.035		0.011 KSSG0.5-30B
		2.38	0.55	0.24	0.056		0.014 KSSG0.5-32A
		2.38	0.55	0.24	0.056		0.023 KSSG0.5-40B
		3.14	0.89	0.32	0.091		0.037 KSSG0.5-50B
M4 M5	4	3.91	1.32	0.40	0.13	0~0.08	0.058 KSSG0.5-60A
M5		3.90	1.53	0.40	0.16		0.056 KSSG0.5-60B
M4		4.55	2.04	0.46	0.21		0.066 KSSG0.5-70B
M4	4	3.79	0.53	0.39	0.054	0~0.08	0.080 KSSG0.5-80A
M4		5.22	0.88	0.53	0.090		0.018 KSSG0.8-20A
		6.70	1.30	0.68	0.13		0.017 KSSG0.8-20B
M4		7.90	1.71	0.81	0.17		0.029 KSSG0.8-25A
M5		8.11	2.02	0.83	0.21		0.045 KSSG0.8-30A
M4		10.7	3.26	1.09	0.33		0.056 KSSG0.8-34A
M4 M5		13.3	4.83	1.36	0.49		0.082 KSSG0.8-40B
M4		16.0	6.73	1.63	0.69		0.11 KSSG0.8-50A
M4		18.7	8.97	1.90	0.91		0.15 KSSG0.8-60A
							0.14 KSSG0.8-60B
					0.19 KSSG0.8-70A		
					0.24 KSSG0.8-80A		

- [Caution on Secondary Operations]
- Please read "Cautions on Performing Secondary Operations" (Page 26) when performing modifications and/or secondary operations for safety concerns.

Spur Gears  
Helical Gears  
Internal Gears  
Racks  
CP Racks & Pinions  
Miter Gears  
Bevel Gears  
Screw Gears  
Worm Gear Pairs  
Bevel Gearboxes  
Other Products

Spur Gears  
Helical Gears  
Internal Gears  
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### Application Hints



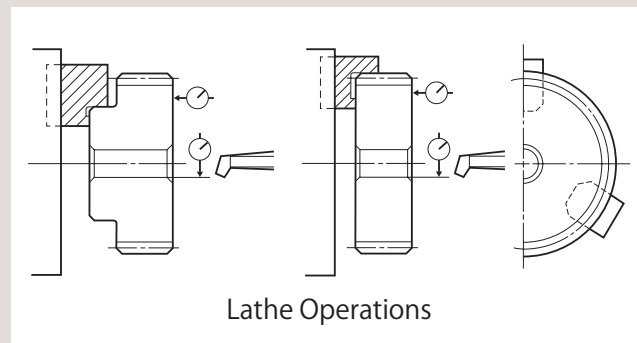
In order to use KHK stock gears safely, carefully read the Application Hints before proceeding. If there are questions or you require clarifications, please contact our technical department or your nearest distributor.  
TEL: (646) 396-GEAR FAX: (516) 437-6700 E-mail: qtcsupport@qtcs.com

#### 1. Cautions on Handling

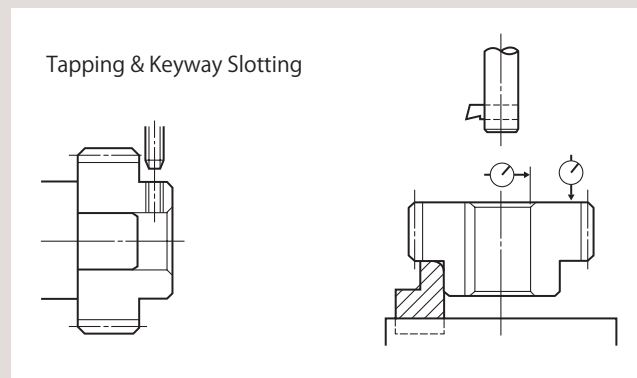
- ① KHK products are packaged one by one to prevent scratches and dents, but if you find issues such as rust, scratches, or dents when the product is removed from the box after purchase, please contact the supplier.
- ② Depending on the handling method, the product may become deformed or damaged. Resin gears and ring gears deform particularly easily, so please handle with care.

#### 2. Cautions on Performing Secondary Operations

- ① If reboring, it is important to pay special attention to locating the center in order to avoid runout.
- ② The reference datum for gear cutting is the bore. Therefore, use the bore for locating the center. If it is too difficult to do for small bores, the alternative is to use one spot on the bore and the runout of the side surface.
- ③ If reworking using scroll chucks, we recommend the use of new or rebored jaws for improved precision. Please exercise caution not to crush the teeth by applying too much pressure. Any scarring will cause noise during operation.



- ④ The maximum bore size is dictated by the requirement that the strength of the hub is to be higher than that of the gear teeth. The maximum bore size should be 60% to 70% of the hub diameter (or tooth root diameter), and 50% to 60% for keyway applied modifications.
- ⑤ In order to avoid stress concentration, round the keyway corners.



- ⑥ To avoid problems of reduced gear precision and other manufacturing difficulties, do not attempt to machine the gears to reduce face widths.
- ⑦ When induction-hardening S45C products, thermal stress cracks may appear. Also, note that the precision grade of the product declines by 1 or 2 grades, as deformation on material may occur. If you require tolerance for bore or other parts, machining is necessary after heat treatment.

### Induction Hardening

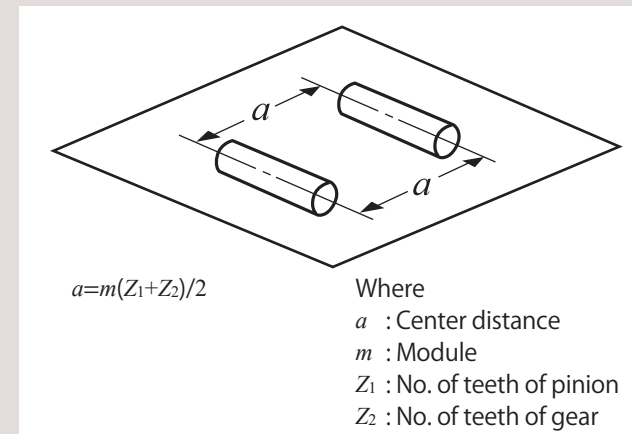
If you apply induction hardening to the gear teeth of S45C products, you need to designate the hardness and where to apply the heat treatment. Below is an example of common specifications and KHK's specifications for hardening:

- Common Specifications for Heat Treatment  
Hardening location: Gear tooth surface or tooth surface and tooth root  
Hardness: Within the range of 45 to 60 HRC and 10 HRC width  
(Example: 48 to 58 HRC)
- KHK's Specifications for Heat Treatment  
Hardened location: Tooth surface, or Tooth surface and Tooth root  
Hardness: 50 to 60 HRC

\* Hardness and Depth of Gear-teeth Induction Hardening  
The hardening method and the state of the hardened teeth area vary depending on the size of gears. Since different hardening treatment is applied in accordance with the module and number of teeth, the hardness level you designate is referred to as the hardness of the reference diameter. For some of our products, the hardness at tooth tip / root may not be equal to the hardness you designated.  
As to the effective case depth for S45C, it is specified by JIS, as "The distance from the surface of the case to the area with hardness HV450." The case depth differs from area to area of a tooth.

#### 3. Points of Caution during Assembly

- ① KHK stock spur gears are designed to give the proper backlash when assembled using the center distance given by the formula below (center distance tolerance of H7 – H8). For the backlash of each product, please refer to the dimension table.  
Backlash may be adjusted by changing the center distance of mating gears. For more information, please consult the technical section on gear backlash (page 56) in our separate technical reference book.



- ② The table below indicates the tolerance on the total length of KHK stock spur gears. Please refer to this data when designing gear boxes or other components.

#### ■ Total Length Tolerance for Spur and Helical Gears

Total Length (mm)	Tolerance
30 or less	0 – 0.10
31 to 100	0 – 0.15
Over 100	0 – 0.20

[Note] The following products are excluded from this table: Spur pinion shafts, Injection molded spur gears, F-loc hub spur gears, and MC nylon products.

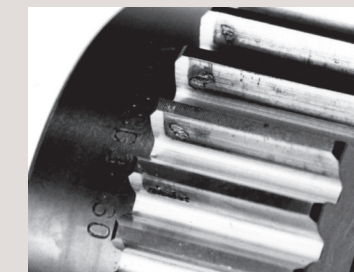
- ③ Spur gears produce no thrust forces; however, be sure to fasten them firmly with stepped shafts, or collars, to prevent shifting toward the shaft.  
Keyways are generally used in fastening gears to a shaft, and they should be secured by applying drilled holes for

set screws, or applying flats to the shaft, in case of fastening only with set screws.

There are also methods of secure settings using a Mecha-Lock, a POSI-LOCK, or a Spanning, which are parts for engaging the hole and the axis.

- ④ Verify that the two shafts are parallel. Incorrect assembly will lead to uneven teeth contact which will cause noise and wear. (Check the assembly by painting a thin layer of red lead primer or the like on the gear teeth, meshing them together and rotating them.)

■ Test example: Abrasion occurred on KSSG3-30 due to poor edge contact (only 30% with proper contact).



Gear oil (equivalent to JIS gear oil category 2 No. 3)  
The design conditions were load torque at 278 rpm, 42.5 kg/m (12 kW), 1.5 times the allowable bending strength, and 3 times the allowable surface durability torque.  
The pitting occurred on the poor tooth contact area after 60 hours of continuous operation.

#### 4. Cautions on Starting

- ① Check the following items before starting.
  - Are the gears installed securely?
  - Is there uneven tooth contact?
  - Is there adequate backlash?  
Be sure to avoid zero-backlash.
  - Has proper lubrication been supplied?
- ② If gears are exposed, be sure to attach a safety cover to ensure safety. Also, be careful not to touch rotating gears.
- ③ Gears can be lubricated with the "grease lubrication method", "splash lubrication method (oil bath method)", or "forced lubrication method (circulation lubrication method)".  
For initial operation, the lubricant may deteriorate markedly, so check the condition of the lubricant after starting. For more technical information, please see the section "Gear Lubrication" (Page 112) of our technical reference book.
- ④ If there is any abnormality such as noise or vibration during startup, check the gears and assembly condition. "High gear accuracy", "smooth gear teeth surface" and "correct tooth contact" are some of the measures against gear noise. For more technical information, please see the section "Gear Noise and Countermeasures" (Page 119) of our technical reference book.

KHK considers safety a priority in the use of our products.

When handling, adding secondary operations, assembling, and operating KHK products, please be aware of the following issues in order to prevent accidents.

#### ⚠ Warning: Precautions for preventing physical and property damage

1. When using KHK products, follow relevant safety regulations (Occupational Safety and Health Regulations, etc.).
2. Pay attention to the following items when installing, removing, or performing maintenance and inspection of the product.
  - ① Turn off the power switch.
  - ② Do not reach or crawl under the product.
  - ③ Wear appropriate clothing and protective equipment for the work.

#### ⚠ Caution Cautions in Preventing Accidents

1. Before using a KHK product, read the precautions in the catalog carefully in order to use it correctly.
2. Avoid use in environments that may adversely affect the product.
3. Our products are manufactured under a superior quality control system based on the ISO9000 quality management system; if you notice any malfunctions upon purchasing a product, please contact the supplier.