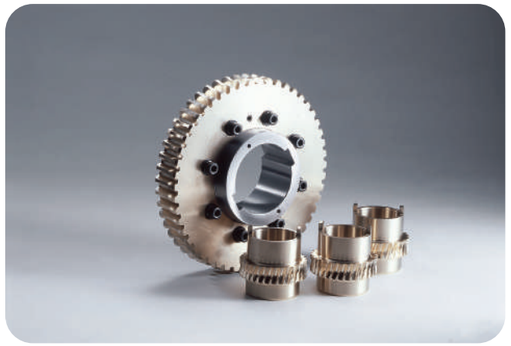
Custom-made worm gears are available.

KHK offers high-precision products.

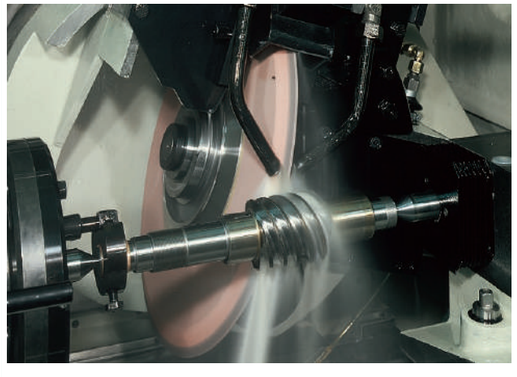


◆ Production Range
Module : 0.5~10
Worm outer diameter : ϕ100 mm or less
Wheel outer diameter : ϕ600 mm or less
Assembly distance : 350 mm or less

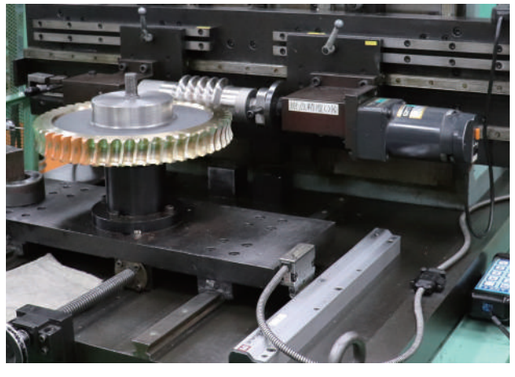
Please see Page 26 for more details about custom-made orders.

High-precision ground gear technology achieves high speed and quiet movement.

Excellent tooth contact and appropriate backlash are essential for worm gears. Give KHK's reliable stock worm gears a try.



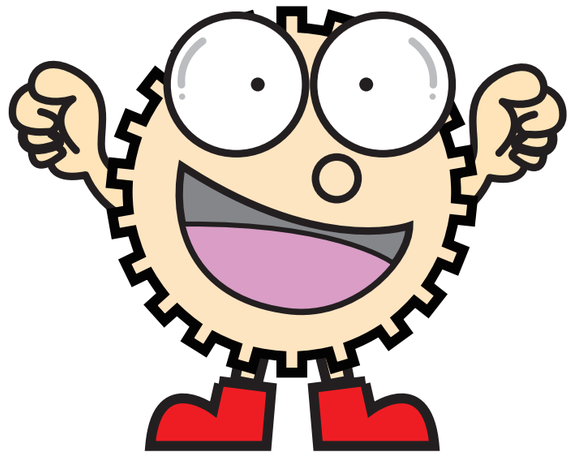
Klingelnberg Worm Grinding Machine



Worm Gear Tooth Contact Machine

Gearboxes

KBX Bevel Gearboxes	CBX Bevel Gearboxes
	
Material: -	Material: -
Model L/T Page 452	Model L/T Page 456



Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying the Catalog Numbers.

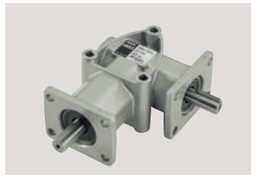
(Example) Gearboxes

K BX - 10 1 L

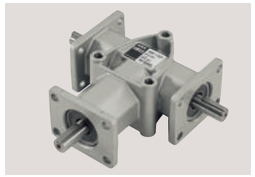
- L: Type (L)
- 1: Gear Ratio (1)
- 10: Shaft Diameter (4 mm)
- BX: Type (Bevel Gearboxes)
- K: Case Material (Light Alloy)

Case Material		Type	
K	Light Alloy	BX	Bevel Gearboxes
C	FC250		

■ Selection Guide



KBX-L



KBX-T

Items required for selection

Load torque, prime mover type, input rotation speed, speed ratio, operating time, connection method, frequency of start/stop

Selection Procedure

The performance table in the catalog is where the load is uniform, the prime mover is a motor and the operating time is 10 hours/day.

A) When using under other conditions, correct the load torque according to the Service Factors in <Table 1>.

Corrected load torque = Load torque applied to the gear box × Service factor <See Table 1>

Service Factor (Sf) <Table 1>

Load State	Service Factor (Sf)		
	Operation of 3H or less / day	Operation of 3~10H / day	Operation of 10H or more / day
Uniform load	1 (1)	1 (1.25)	1.25 (1.50)
Light impact load	1 (1.25)	1.25 (1.50)	1.50 (1.75)
Severe impact load	1.25 (1.50)	1.50 (1.75)	1.75 (2.00)

(Note) 1. If the frequency of start/stop is 10 times or more per hour, the coefficient in parentheses will be used.
2. For a prime mover other than electric motor is used (engine, etc.), the coefficient in parentheses will also be used.

Make sure that the corrected load torque is smaller than the X/Y-axis allowable torque or the Y-axis allowable torque in the performance table at the operating rotation speed.

B) For the shaft arrangement, select from the Shaft Arrangement Diagram of respective model.

C) Confirming the overhang load (O.H.L.)
Overhang load (O.H.L.) is a suspended load acting on the shaft. The O.H.L. must be considered if a chain, belt, gear or the like is used to connect the gear box shaft and mating machine.

$$\text{O.H.L.} = \frac{T_{LE} \times K_1 \times K_2}{R} \text{ (N) \{kgf\}}$$

T_{LE} : Corrected load torque (N·m) {kgf·m} applied to the gear box shaft
R : Pitch circle radius (m) of a sprocket, pulley, gear or the like attached to the gear box shaft
K_1 : Coefficient by connection method <See Table 2>
K_2 : Coefficient by load position <See Table 3>
* Make sure that the O.H.L. calculated using the above formula is smaller than the allowable O.H.L. for the X-axis and Y-axis shown in the performance table.

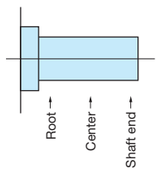
Coefficient K_1 <Table 2>

Connection method	K_1
Chain, timing belt	1.00
Gear	1.25
V-belt	1.50

Coefficient K_2 <Table 3>

Load position	K_2
Shaft root	0.75
Shaft center	1.00
Shaft end	1.50

● Load position



D) Select a model that satisfies all of A), B) and C) obtained using the above formula.

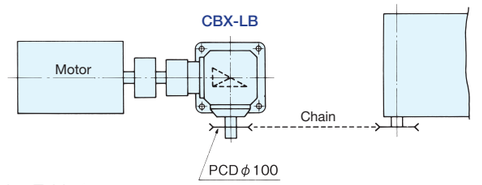
■ Selection Example

CBX-L

CBX-T

Selection example 1

Application / Conveyor (uniform load)
Load torque / 78.4N·m {8kgf·m}
X-axis rotation speed / 300rpm
Speed ratio / 1:2
Shaft arrangement / As shown in the diagram on the right
Operating time / 12 hours/day
Connection method / X-axis - Coupling
Y-axis - Chain (located in the center of the shaft)
Installation method / Horizontal mounting
Installation location / Indoors



① Considering the torque

The service factor based on the load status is Sf = 1.25 as shown in <Table 1>.
Therefore, the corrected load torque applied to the Y-axis is:
T_{LE} = 78.4×1.25 = 98N·m {T_{LE} = 8×1.25 = 10kgf·m}.

② Considering the O.H.L.

The load O.H.L. of Y-axis is:

$$\text{O.H.L.} = \frac{T_{LE} \times K_1 \times K_2}{R} = \frac{98 \times 1 \times 1}{\frac{100}{2 \times 1000}} = 1960\text{N} \quad \{\text{O.H.L.} = \frac{T_{LE} \times K_1 \times K_2}{R} = \frac{10 \times 1 \times 1}{\frac{100}{2 \times 1000}} = 200\text{kgf}\}$$

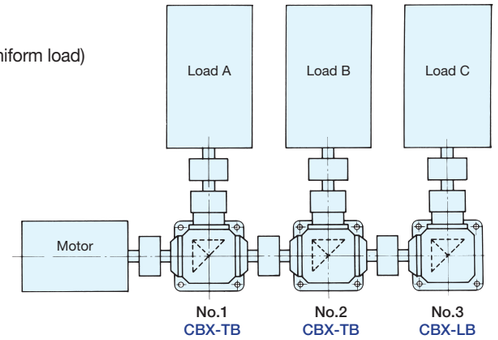
③ Determining the model

A model that satisfies all the conditions, torque and O.H.L. is **CBX-322LB**.

Selection example 2

Application / Line shaft drive
Load torque / Load A, B, and C are 58.8N·m {6kgf·m} respectively (uniform load)
Rotation speed / 600rpm
Speed ratio / 1:1
Shaft arrangement / As shown in the diagram on the right
Operating time / 8 hours/day
Connection method / All coupling
Installation method / Horizontal mounting
Installation location / Indoors

For line shaft drive, the load applied to the Y-axis differs depending on the position of the gear box, so it is necessary to select each separately. The Service Factors <Table 1> based on the conditions are all Sf = 1.0.



① Gearboxes No.1

The corrected load torque applied to the X-axis drives only load A.
Therefore, 58.8 × 1.0 = 58.8 N·m {6 × 1.0 = 6 kgf·m}
The corrected load torque applied to the Y-axis drives loads A, B and C.
Therefore, (58.8 + 58.8 + 58.8) × 1.0 = 176.4 N·m
{(6 + 6 + 6) × 1.0 = 18kgf·m}
Based on the performance table, **CBX-401TB** is selected.

② Gearboxes No.2

The corrected load torque applied to the X-axis drives only load B.
Therefore, 58.8 × 1.0 = 58.8 N·m {6 × 1.0 = 6 kgf·m}
The corrected load torque applied to the Y-axis drives loads B and C.
Therefore, (58.8 + 58.8) × 1.0 = 117.6N·m
{(6 + 6) × 1.0 = 12kgf·m}
Based on the performance table, **CBX-321TB** is selected.

③ Gearboxes No.3

The corrected load torque applied to the X-axis drives only load C.
Therefore, 58.8 × 1.0 = 58.8 N·m {6 × 1.0 = 6 kgf·m}
The corrected load torque applied to the Y-axis drives only load C.
Therefore, 58.8 × 1.0 = 58.8 N·m {6 × 1.0 = 6 kgf·m}
Based on the performance table, **CBX-251LB** is selected.

④ Determining the model

No.1 Gear Box **CBX-401TB**
No.2 Gear Box **CBX-321TB**
No.3 Gear Box **CBX-251LB**

Moment of Inertia of KBX Bevel Box

Unit: kg·m²

Model	Item	Pinion Axis (X)	Gear Axis (Y)
L	KBX-101L	4.45×10^{-6}	4.45×10^{-6}
	KBX-102L	2.16×10^{-6}	8.65×10^{-6}
	KBX-151L	5.30×10^{-5}	5.30×10^{-5}
	KBX-152L	3.65×10^{-5}	1.47×10^{-4}
	KBX-201L	1.79×10^{-4}	1.79×10^{-4}
	KBX-202L	7.85×10^{-5}	3.15×10^{-4}
T	KBX-101T	4.75×10^{-6}	4.75×10^{-6}
	KBX-102T	2.23×10^{-6}	8.93×10^{-6}
	KBX-151T	5.60×10^{-5}	5.60×10^{-5}
	KBX-152T	3.37×10^{-5}	1.50×10^{-4}
	KBX-201T	1.94×10^{-4}	1.94×10^{-4}
	KBX-202T	8.20×10^{-5}	3.28×10^{-4}

[NOTES] Consider the indicated moment of inertia as reference values.

Moment of Inertia of CBX Bevel Box

Unit: kg·m²

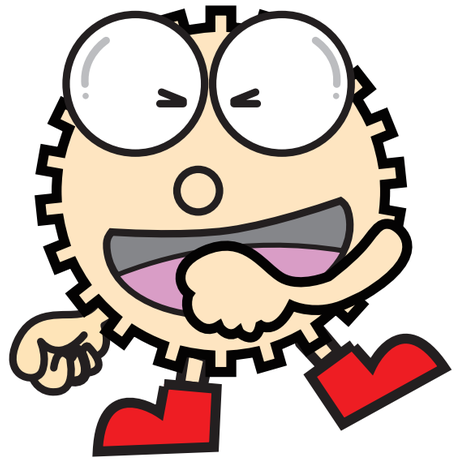
Model	Item	Pinion Axis (X)	Gear Axis (Y)
L	CBX-191L	4.00×10^{-4}	4.00×10^{-4}
	CBX-192L	1.86×10^{-4}	7.43×10^{-4}
	CBX-251L	2.48×10^{-3}	2.48×10^{-3}
	CBX-252L	1.03×10^{-3}	4.13×10^{-3}
	CBX-321L	4.00×10^{-3}	4.00×10^{-3}
	CBX-322L	1.29×10^{-3}	5.18×10^{-3}
	CBX-401L	8.95×10^{-3}	8.95×10^{-3}
	CBX-402L	3.83×10^{-3}	1.53×10^{-2}
T	CBX-191T	4.05×10^{-4}	4.05×10^{-4}
	CBX-192T	1.87×10^{-4}	7.48×10^{-4}
	CBX-251T	2.50×10^{-3}	2.50×10^{-3}
	CBX-252T	1.04×10^{-3}	4.15×10^{-3}
	CBX-321T	4.08×10^{-3}	4.08×10^{-3}
	CBX-322T	1.31×10^{-3}	5.25×10^{-3}
	CBX-401T	9.20×10^{-3}	9.20×10^{-3}
	CBX-402T	3.88×10^{-3}	1.55×10^{-2}

[NOTES] Consider the indicated moment of inertia as reference values.

Other Products

SRT/SRT-C Ratchets & Pawls — J — Material: S45C — P2.09~12.57 — Page 464
SRTB/SRT-C Ratchets & Pawls — M — Material: S45C — P2.09~12.57 — Page 466
GC/GC-I Gear Couplings — J — Material: S45C — m2, 2.5 — Page 468
SV/SVI Involute Spline Shafts, Spline Bushings — Material: S45C — m1.667 — Page 470
GCU Gear Assembly Kit — Material: - — Page 472
DLS Rack & Pinion Lubrication System — M — Material: - — Page 474
Racks & Pinions Aluminum Frame Transport Device — Material: - — Page 30

M Includes Made to Order



Catalog Number of KHK Stock Gears

The Catalog Number for KHK stock gears is based on the simple formula listed below. Please order KHK gears by specifying the Catalog Numbers.

(Example) Other Products

S V 20 - 200

- 200: Total Length (200mm)
- 20: Outer diameter (20mm)
- V: Type (Involute Spline Shafts)
- S: Material (S45C)

Material	
S	S45C

Type	
RT	Ratchets
GC	Gear Couplings
V	Involute Spline