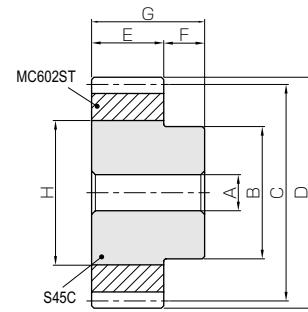




Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC602ST with S45C core
Heat treatment	—
Tooth hardness	115 ~ 120HRR



S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Metal core dia.
				A _{H7}	B	C	D	E	F	G	H
NSU1-30	m1	30	S1	8	20	30	32	10	10	20	20
NSU1-32		32	S1	8	22	32	34	10	10	20	22
NSU1-34		34	S1	8	25	34	36	10	10	20	25
NSU1-35		35	S1	8	25	35	37	10	10	20	25
NSU1-36		36	S1	8	25	36	38	10	10	20	25
NSU1-40		40	S1	10	25	40	42	10	10	20	28
NSU1-45		45	S1	10	30	45	47	10	10	20	34
NSU1-48		48	S1	10	30	48	50	10	10	20	34
NSU1-50		50	S1	10	30	50	52	10	10	20	34
NSU1-60		60	S1	10	40	60	62	10	10	20	45
NSU1-70	m1.5	70	S1	10	40	70	72	10	10	20	45
NSU1-80		80	S1	10	40	80	82	10	10	20	45
NSU1-90		90	S1	10	40	90	92	10	10	20	55
NSU1-100		100	S1	10	40	100	102	10	10	20	65
NSU1.5-28		28	S1	10	30	42	45	15	12	27	30
NSU1.5-30		30	S1	10	30	45	48	15	12	27	30
NSU1.5-32		32	S1	10	33	48	51	15	12	27	33
NSU1.5-34		34	S1	10	33	51	54	15	12	27	33
NSU1.5-35		35	S1	10	33	52.5	55.5	15	12	27	36
NSU1.5-36		36	S1	10	33	54	57	15	12	27	36
NSU1.5-40	40	S1	10	40	60	63	15	12	27	45	
NSU1.5-45	45	S1	10	40	67.5	70.5	15	12	27	45	
NSU1.5-48	48	S1	10	40	72	75	15	12	27	45	
NSU1.5-50	50	S1	12	40	75	78	15	12	27	45	
NSU1.5-56	56	S1	12	50	84	87	15	12	27	55	
NSU1.5-60	60	S1	12	50	90	93	15	12	27	55	
NSU1.5-68	68	S1	12	50	102	105	15	12	27	67	
NSU1.5-70	70	S1	12	50	105	108	15	12	27	70	
NSU1.5-80	80	S1	12	60	120	123	15	12	27	85	
NSU1.5-90	90	S1	12	60	135	138	15	12	27	100	

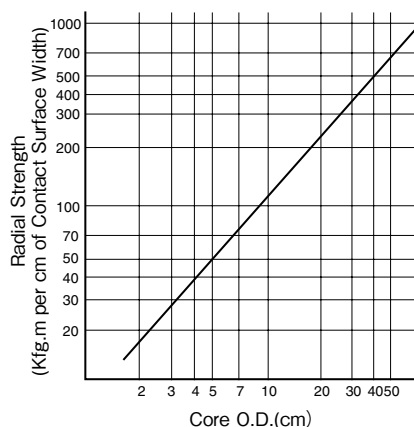
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② When the core O.D. is the same as the hub diameter, you may see some serration on the hub. There is no effect on the strength of the gear.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ 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.

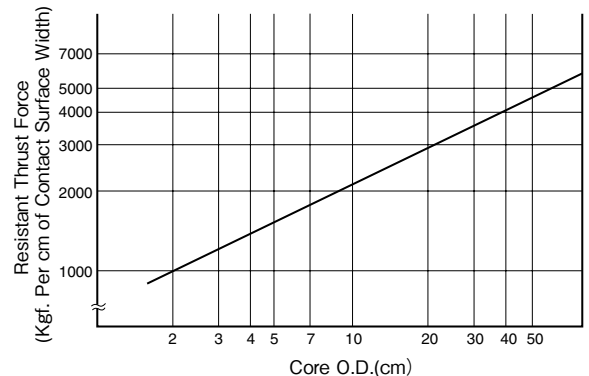
Definition of Holding Strength and Safety Factor

① The holding strength between the metal core and the molded material is a function of the contact area. The relationship between the core outside diameter and the radial strength (torque) is shown on the left, while the relationship between the core diameter and the resistant thrust force is shown on the right.

Relationship between radial strength and core diameter



Relationship between resistant thrust force and core diameter

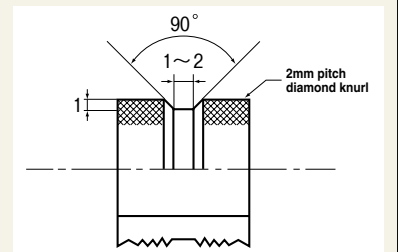


Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Bending strength			
1.23	0.13	0~0.34	0.046	NSU1-30
1.34	0.14	0~0.34	0.057	NSU1-32
1.44	0.15	0~0.34	0.074	NSU1-34
1.50	0.15	0~0.34	0.075	NSU1-35
1.56	0.16	0~0.34	0.076	NSU1-36
1.78	0.18	0~0.34	0.082	NSU1-40
2.06	0.21	0~0.34	0.12	NSU1-45
2.23	0.23	0~0.34	0.13	NSU1-48
2.35	0.24	0~0.34	0.13	NSU1-50
2.93	0.30	0~0.36	0.23	NSU1-60
3.46	0.35	0~0.36	0.24	NSU1-70
4.00	0.41	0~0.36	0.25	NSU1-80
4.56	0.46	0~0.36	0.32	NSU1-90
5.12	0.52	0~0.36	0.40	NSU1-100
3.82	0.39	0~0.38	0.15	NSU1.5-28
4.15	0.42	0~0.38	0.15	NSU1.5-30
4.51	0.46	0~0.38	0.18	NSU1.5-32
4.88	0.50	0~0.40	0.19	NSU1.5-34
5.07	0.52	0~0.40	0.20	NSU1.5-35
5.26	0.54	0~0.40	0.21	NSU1.5-36
6.00	0.61	0~0.40	0.31	NSU1.5-40
6.94	0.71	0~0.40	0.33	NSU1.5-45
7.53	0.77	0~0.40	0.33	NSU1.5-48
7.92	0.81	0~0.40	0.33	NSU1.5-50
9.09	0.93	0~0.40	0.50	NSU1.5-56
9.89	1.01	0~0.40	0.51	NSU1.5-60
11.3	1.15	0~0.40	0.66	NSU1.5-68
11.7	1.19	0~0.42	0.70	NSU1.5-70
13.5	1.38	0~0.42	1.01	NSU1.5-80
15.4	1.57	0~0.42	1.29	NSU1.5-90

How is MC nylon fused to the metal core

This method is superior to other conventional methods such as bolting, shrink fitting and bonding.

① Outline of the procedure
The surface of the core material is rolled with a 2mm pitch diamond knurl. Then one or more grooves (1 to 2mm wide and 1mm deep) are cut as shown below. The metal surface is treated prior to casting nylon in a mold.



② Advantage of MC nylon with metal core

1. Wide temperature range.
There are examples of wheel use in furnaces at 130 to 140° C.
2. Good dimensional stability
Since nylon is fused to the whole outer surface of the metal hub, dimensional change is very small even under temperature variations.
3. Good appearance
Elimination of bolts and nuts provides a cleaner physical appearance.

- [Caution on Secondary Operations]
- ① Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
 - ② Even though the holding strength at the material interface is designed to be stronger than the teeth, a secondary operation may weaken the holding strength.
 - ③ Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

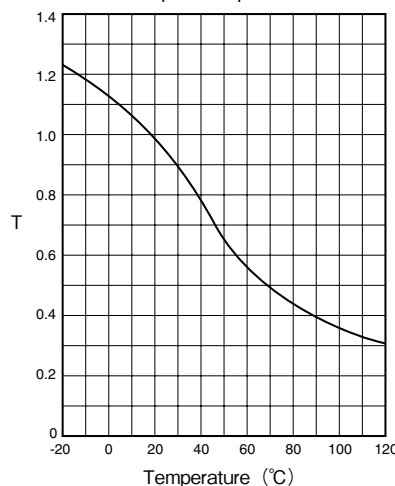
Ambient temperature compensation factor T

② When the ambient temperature rises, obtain the temperature compensation factor, T, from the chart on the right. Also, use a safety factor of 4 to 5 in the calculation.

$$T_{al} = T_{max} \times \frac{1}{\text{Safety Factor}} \times T$$

Where

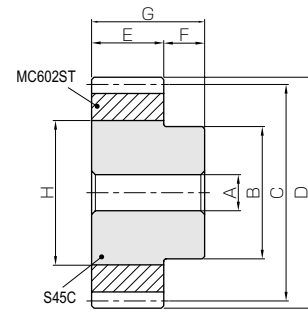
- T_{al} : Allowable Holding Strength at the contact surface
- T_{max} : Maximum Holding Strength - Find from the charts on the left.
- T : Temperature Compensation Factor



* Data supplied by Japan Polypenco Limited.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC602ST with S45C core
Heat treatment	—
Tooth hardness	115 ~ 120HRR



S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Metal core dia.
				A _{H7}	B	C	D	E	F	G	H
NSU2-20	m2	20	S1	10	22	40	44	20	14	34	22
NSU2-22		22	S1	10	30	44	48	20	14	34	30
NSU2-24		24	S1	10	30	48	52	20	14	34	30
NSU2-25		25	S1	10	30	50	54	20	14	34	30
NSU2-28		28	S1	10	35	56	60	20	14	34	35
NSU2-30		30	S1	10	35	60	64	20	14	34	35
NSU2-32		32	S1	12	40	64	68	20	14	34	40
NSU2-34		34	S1	12	40	68	72	20	14	34	45
NSU2-35		35	S1	12	40	70	74	20	14	34	45
NSU2-36		36	S1	12	40	72	76	20	14	34	45
NSU2-40	m2.5	40	S1	15	55	80	84	20	14	34	60
NSU2-44		44	S1	15	55	88	92	20	14	34	60
NSU2-45		45	S1	15	55	90	94	20	14	34	60
NSU2-48		48	S1	15	60	96	100	20	14	34	65
NSU2-50		50	S1	15	60	100	104	20	14	34	65
NSU2-56	m2.5	56	S1	15	60	112	116	20	14	34	65
NSU2-60		60	S1	15	60	120	124	20	14	34	85
NSU2-68		68	S1	15	60	136	140	20	14	34	100
NSU2-70		70	S1	15	60	140	144	20	14	34	105
NSU2-80		80	S1	15	60	160	164	20	14	34	125
NSU2.5-18	m2.5	18	S1	12	25	45	50	25	15	40	25
NSU2.5-20		20	S1	12	28	50	55	25	15	40	28
NSU2.5-22		22	S1	12	35	55	60	25	15	40	35
NSU2.5-24		24	S1	12	35	60	65	25	15	40	35
NSU2.5-25		25	S1	12	35	62.5	67.5	25	15	40	35
NSU2.5-28	m2.5	28	S1	12	40	70	75	25	15	40	40
NSU2.5-30		30	S1	12	45	75	80	25	15	40	50
NSU2.5-32		32	S1	12	45	80	85	25	15	40	50
NSU2.5-34		34	S1	12	50	85	90	25	15	40	55
NSU2.5-35		35	S1	12	55	87.5	92.5	25	15	40	60

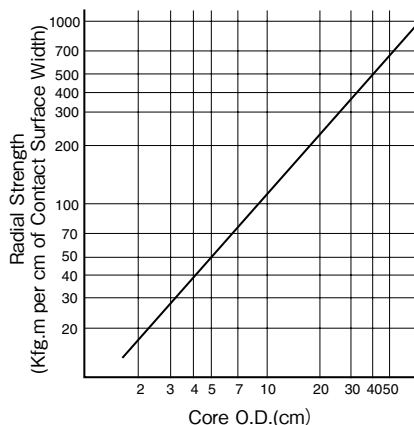
[Caution on Product Characteristics]

- ① The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 35 for more details.
- ② When the core O.D. is the same as the hub diameter, you may see some serration on the hub. There is no effect on the strength of the gear.
- ③ Without lubrication, using plastic gears in pairs may generate heat and dilation. It is recommended to mate with steel gears.
- ④ 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.

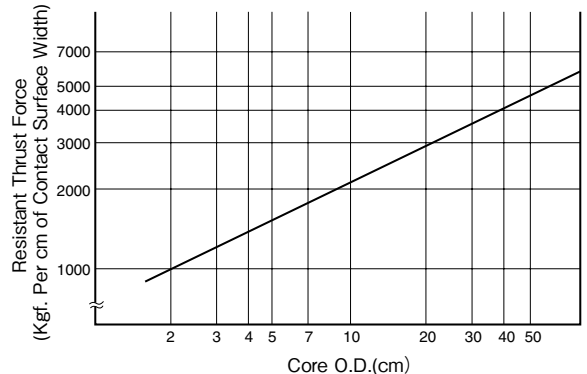
Definition of Holding Strength and Safety Factor

① The holding strength between the metal core and the molded material is a function of the contact area. The relationship between the core outside diameter and the radial strength (torque) is shown on the left, while the relationship between the core diameter and the resistant thrust force is shown on the right.

Relationship between radial strength and core diameter



Relationship between resistant thrust force and core diameter

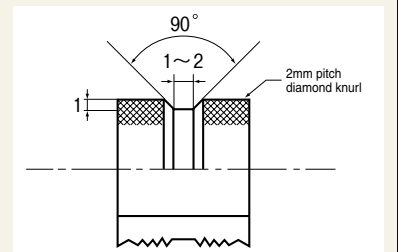


Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Bending strength			
5.89	0.60	0~0.42	0.10	NSU2-20
6.66	0.68	0~0.42	0.19	NSU2-22
7.43	0.76	0~0.42	0.19	NSU2-24
7.85	0.80	0~0.42	0.20	NSU2-25
9.05	0.92	0~0.44	0.27	NSU2-28
9.84	1.00	0~0.44	0.28	NSU2-30
10.7	1.09	0~0.44	0.35	NSU2-32
11.6	1.18	0~0.44	0.41	NSU2-34
12.0	1.22	0~0.44	0.41	NSU2-35
12.5	1.27	0~0.44	0.42	NSU2-36
14.2	1.45	0~0.44	0.71	NSU2-40
16.0	1.63	0~0.44	0.74	NSU2-44
16.5	1.68	0~0.44	0.74	NSU2-45
17.8	1.82	0~0.44	0.88	NSU2-48
18.8	1.92	0~0.44	0.90	NSU2-50
21.5	2.20	0~0.46	0.95	NSU2-56
23.5	2.39	0~0.46	1.29	NSU2-60
26.8	2.74	0~0.46	1.66	NSU2-68
27.7	2.82	0~0.46	1.79	NSU2-70
32.0	3.27	0~0.46	2.38	NSU2-80
9.93	1.01	0~0.44	0.15	NSU2.5-18
11.5	1.17	0~0.44	0.20	NSU2.5-20
13.0	1.33	0~0.46	0.31	NSU2.5-22
14.5	1.48	0~0.46	0.32	NSU2.5-24
15.3	1.56	0~0.46	0.33	NSU2.5-25
17.7	1.80	0~0.46	0.44	NSU2.5-28
19.2	1.96	0~0.46	0.61	NSU2.5-30
20.9	2.13	0~0.46	0.63	NSU2.5-32
22.6	2.30	0~0.46	0.76	NSU2.5-34
23.5	2.39	0~0.46	0.90	NSU2.5-35

How is MC nylon fused to the metal core

This method is superior to other conventional methods such as bolting, shrink fitting and bonding.

① Outline of the procedure
The surface of the core material is rolled with a 2mm pitch diamond knurl. Then one or more grooves (1 to 2mm wide and 1mm deep) are cut as shown below. The metal surface is treated prior to casting nylon in a mold.

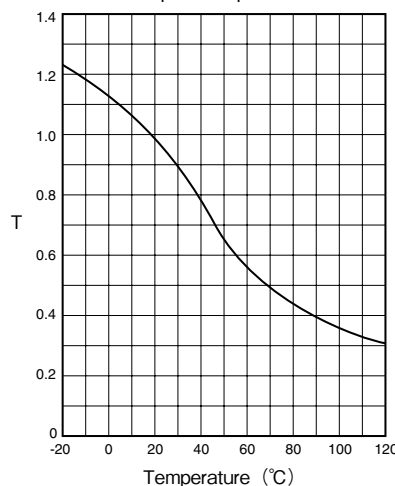


② Advantage of MC nylon with metal core

- Wide temperature range.
There are examples of wheel use in furnaces at 130 to 140° C.
- Good dimensional stability
Since nylon is fused to the whole outer surface of the metal hub, dimensional change is very small even under temperature variations.
- Good appearance
Elimination of bolts and nuts provides a cleaner physical appearance.

- [Caution on Secondary Operations]
- Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
 - Even though the holding strength at the material interface is designed to be stronger than the teeth, a secondary operation may weaken the holding strength.
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Ambient temperature compensation factor T



② When the ambient temperature rises, obtain the temperature compensation factor, T, from the chart on the right. Also, use a safety factor of 4 to 5 in the calculation.

$$T_{al} = T_{max} \times \frac{1}{\text{Safety Factor}} \times T$$

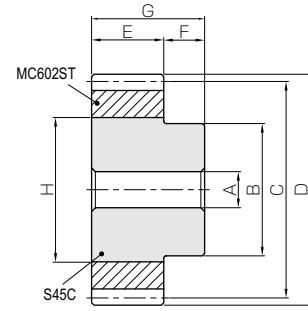
Where

- T_{al} : Allowable Holding Strength at the contact surface
- T_{max} : Maximum Holding Strength - Find from the charts on the left.
- T : Temperature Compensation Factor

* Data supplied by Japan Polypenco Limited.



Specifications	
Precision grade	JIS grade N9 (JIS B1702-1: 1998) JIS grade 5 (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	MC602ST with S45C core
Heat treatment	—
Tooth hardness	115 ~ 120HRR



S1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Metal core dia.
				A _{H7}	B	C	D	E	F	G	H
NSU2.5-36	m2.5	36	S1	12	55	90	95	25	15	40	60
NSU2.5-40		40	S1	15	65	100	105	25	15	40	70
NSU2.5-44		44	S1	15	65	110	115	25	15	40	75
NSU2.5-45		45	S1	15	65	112.5	117.5	25	15	40	75
NSU2.5-48		48	S1	15	65	120	125	25	15	40	85
NSU2.5-50		50	S1	15	65	125	130	25	15	40	95
NSU2.5-56	56	S1	15	65	140	145	25	15	40	105	
NSU2.5-60	60	S1	20	70	150	155	25	15	40	115	
NSU2.5-68	68	S1	20	70	170	175	25	15	40	135	
NSU2.5-70	70	S1	20	70	175	180	25	15	40	140	
NSU3-16	m3	16	S1	12	24	48	54	30	17	47	24
NSU3-18		18	S1	12	30	54	60	30	17	47	30
NSU3-20		20	S1	12	33	60	66	30	17	47	33
NSU3-22		22	S1	12	38	66	72	30	17	47	38
NSU3-24		24	S1	12	43	72	78	30	17	47	43
NSU3-25		25	S1	12	45	75	81	30	17	47	45
NSU3-28	28	S1	15	50	84	90	30	17	47	50	
NSU3-30	30	S1	15	55	90	96	30	17	47	60	
NSU3-32	32	S1	15	60	96	102	30	17	47	65	
NSU3-34	34	S1	15	60	102	108	30	17	47	65	
NSU3-35	35	S1	15	60	105	111	30	17	47	75	
NSU3-36	36	S1	15	60	108	114	30	17	47	80	
NSU3-40	40	S1	20	70	120	126	30	17	47	85	
NSU3-44	44	S1	20	70	132	138	30	17	47	95	
NSU3-45	45	S1	20	70	135	141	30	17	47	105	
NSU3-48	48	S1	20	70	144	150	30	17	47	105	
NSU3-50	50	S1	20	70	150	156	30	17	47	105	
NSU3-56	56	S1	20	70	168	174	30	17	47	130	
NSU3-60	60	S1	20	70	180	186	30	17	47	145	
NSU3-68	68	S1	20	70	204	210	30	17	47	165	
NSU3-70	70	S1	20	70	210	216	30	17	47	175	

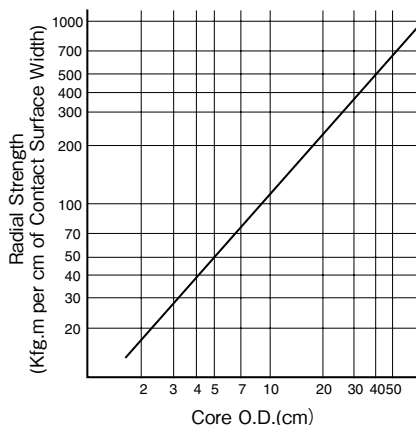
[Caution on Product Characteristics]

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- ② When the core O.D. is the same as the hub diameter, you may see some serration on the hub. There is no effect on the strength of the gear.
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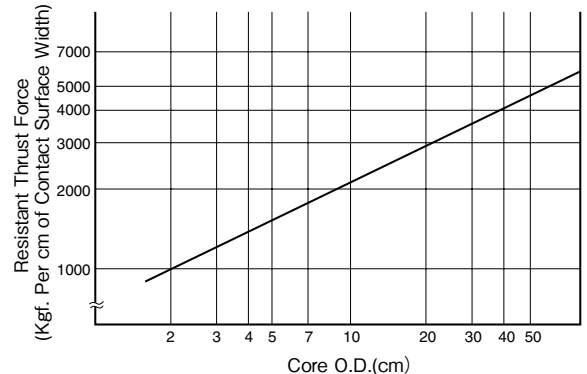
Definition of Holding Strength and Safety Factor

① The holding strength between the metal core and the molded material is a function of the contact area. The relationship between the core outside diameter and the radial strength (torque) is shown on the left, while the relationship between the core diameter and the resistant thrust force is shown on the right.

Relationship between radial strength and core diameter



Relationship between resistant thrust force and core diameter

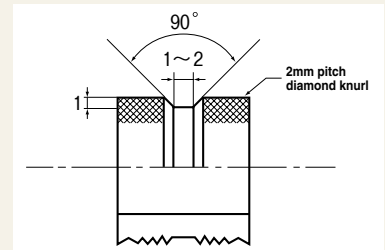


Allowable torque (N·m)	Allowable torque (kgf·m)	Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Bending strength			
24.3	2.48	0~0.46	0.91	NSU2.5-36
27.8	2.83	0~0.46	1.21	NSU2.5-40
31.3	3.19	0~0.48	1.36	NSU2.5-44
32.1	3.28	0~0.48	1.37	NSU2.5-45
34.8	3.55	0~0.48	1.62	NSU2.5-48
36.7	3.74	0~0.48	1.89	NSU2.5-50
42.1	4.29	0~0.48	2.24	NSU2.5-56
45.8	4.67	0~0.48	2.62	NSU2.5-60
52.4	5.34	0~0.48	3.42	NSU2.5-68
54.1	5.51	0~0.48	3.64	NSU2.5-70
14.7	1.50	0~0.52	0.18	NSU3-16
17.2	1.75	0~0.54	0.28	NSU3-18
19.9	2.03	0~0.54	0.35	NSU3-20
22.5	2.29	0~0.54	0.46	NSU3-22
25.1	2.56	0~0.54	0.59	NSU3-24
26.5	2.70	0~0.54	0.65	NSU3-25
30.5	3.11	0~0.54	0.79	NSU3-28
33.2	3.39	0~0.54	1.05	NSU3-30
36.1	3.68	0~0.54	1.24	NSU3-32
39.0	3.98	0~0.56	1.27	NSU3-34
40.5	4.13	0~0.56	1.51	NSU3-35
42.1	4.29	0~0.56	1.65	NSU3-36
48.0	4.90	0~0.56	1.94	NSU3-40
54.0	5.51	0~0.56	2.31	NSU3-44
55.5	5.66	0~0.56	2.65	NSU3-45
60.2	6.14	0~0.56	2.72	NSU3-48
63.4	6.46	0~0.56	2.77	NSU3-50
72.7	7.42	0~0.56	3.85	NSU3-56
79.1	8.07	0~0.56	4.62	NSU3-60
90.6	9.23	0~0.56	5.85	NSU3-68
93.4	9.53	0~0.56	6.45	NSU3-70

How is MC nylon fused to the metal core

This method is superior to other conventional methods such as bolting, shrink fitting and bonding.

① Outline of the procedure
The surface of the core material is rolled with a 2mm pitch diamond knurl. Then one or more grooves (1 to 2mm wide and 1mm deep) are cut as shown below. The metal surface is treated prior to casting nylon in a mold.

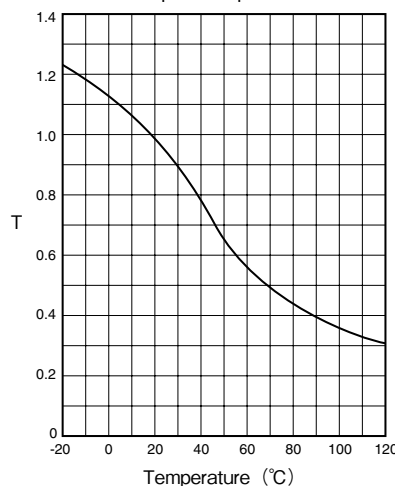


② Advantage of MC nylon with metal core

- Wide temperature range.
There are examples of wheel use in furnaces at 130 to 140° C.
- Good dimensional stability
Since nylon is fused to the whole outer surface of the metal hub, dimensional change is very small even under temperature variations.
- Good appearance
Elimination of bolts and nuts provides a cleaner physical appearance.

- [Caution on Secondary Operations]
- Please read "Caution on Performing Secondary Operations" (Page 36) when performing modifications and/or secondary operations for safety concerns. Haguruma Kobo, the KHK's system for quick modification of KHK stock gears is also available.
 - Even though the holding strength at the material interface is designed to be stronger than the teeth, a secondary operation may weaken the holding strength.
 - Plastic gears are susceptible to the effects of temperature and moisture. Dimensional changes may occur while performing secondary operations and during post-machining operations.

Ambient temperature compensation factor T



- ② When the ambient temperature rises, obtain the temperature compensation factor, T, from the chart on the right. Also, use a safety factor of 4 to 5 in the calculation.

$$T_{al} = T_{max} \times \frac{1}{\text{Safety Factor}} \times T$$

Where

- T_{al} : Allowable Holding Strength at the contact surface
- T_{max} : Maximum Holding Strength - Find from the charts on the left.
- T : Temperature Compensation Factor

* Data supplied by Japan Polypenco Limited.