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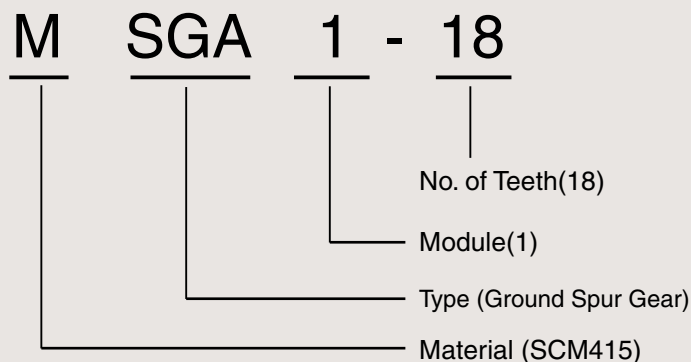
Catalog Number of KHK Stock Gears

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)

Spur Gears



Material	Type
S S45C	S Spur Gears
M SCM415	SA Hubless Spur Gears
SU SUS303	SY Thin Face Spur Gears
P MC901	SAY Hubless Thin Face Spur Gears
N MC601-ST	SGA(B) Ground Spur Gears
D DURACON	SG Ground Spur Gears
BS Free-Cutting Brass C3604BD	SL Fairloc Hub Gears
L SMF5040	SR Ring Gears
	U Plastic Spur Gears with Steel Core

1 Spur Gears





With Our Large Selection, You Can Find Suitable Gears for Almost Any Application!



Characteristics

To meet your requirements, KHK stock gears are made in a variety of types, materials, configurations, modules and numbers of teeth. We also offer products that allow secondary operations to be performed on the bores, shafts, outside diameters, keyways and set screws.

Main Features of Types of Spur Gears Offered

The following table lists the main features

Catalog No.	Module	Material	Heat Treatment	Tooth Surface Finish	Precision JIS B1702-1 () denotes JIS B1702-2	Secondary Operations	Main Characteristics
MSG(A)	1~4	SCM415	Carburized	Ground	N5	×	High strength, abrasion-resistant and compact.
SSG	1~4	S45C	Gear teeth induction hardened	Ground	N7	△	Allows users to perform secondary operations.
SSGS	1.5~3	S45C	Gear teeth induction hardened	Ground	N7	△	Ground shaft pinions that allow modification of shafts to fit your bearings.
SS	1~10	S45C	—	Cut	N8	○	Low cost with large selections of modules and numbers of teeth.
SSA	1~5	S45C	—	Cut	N8	○	Hubless gears for lighter and more compact applications.
SSY	0.8~1.25	S45C	—	Cut	N8	○	Narrower face gears for light-duty applications.
SSAY	1~1.25	S45C	—	Cut	N8	○	Hubless and narrow faces for even lighter and more compact gears.
LS	0.5~0.8	SMF5040 (Equiv. to S45C)	—	Sintered	(N8)	○	Low cost due to elimination of machining and reduction in wasted material.
SUS·SUSA	1~4	SUS303	—	Cut	N8	○	Stainless steel gears for more rust-resistant gears.
SUSL	0.5~1	SUS303	—	Cut	(N8)	△	Smaller module gears which clamp to the shafts without any keys or set screws.
DSL	0.5~1	Acetal (SUS303)	—	Cut	(N10)	△	These rust-resistant gears can be clamped to the shafts without any keys or set screws.
NSU	1~3	MC601ST (S45C)	—	Cut	N9	○	Nylon teeth with steel hubs that can have keyways and set screws added.
PU	1~3	MC901 (SUS303)	—	Cut	N9	○	Nylon teeth with stainless steel hubs for rust-resistance.
PS·PSA	1~3	MC901	—	Cut	N9	○	Possible to operate without lubrication. Suitable for food processing machines.
DS	0.5~1	M90-44	—	Injection Molded	(N12)	△	Low cost, mass-produced products suitable for light duty office machines.
BSS	0.5~0.8	C3604BD-F	—	Cut	N8	○	Small module brass spur gears suitable for mating with DS gears.
SSR	2~3	S45C	—	Cut	N9	○	Allows large gear ratios. Can also be used as segment gears and corner racks.

○ Possible △ Partly possible X Not possible

- By chamfering the corners of the top land, gear noise is reduced, and the chances of damage due to handling and transportation are decreased. All KHK gears larger than m1.5 have their teeth chamfered.
- Black oxide coating is a film of triferotetraoxide (Fe₃O₄), a kind of rust, which is applied to the gear surface to help resist rusting.



Selection Hints

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 before the final selection.

Use of catalog numbers when ordering will simplify and expedite the processing of your order.

1. Caution in selecting the mating Gears

- ① Basically, all spur gears, internal gears and racks can be paired as long as the module matches. The product with different materials, tooth widths, or methods of cutting the teeth can be mated.
- ② When using a pinion with an internal gear with a small difference in the numbers of teeth, there are possibilities for involute interference, trochoid interference and trimming interference. See the internal gear interference portion of the technical section to avoid problems in assembling these items.

2. Caution in Selecting Gears Based on Gear Strength

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

NSU spur gears with steel core and PU plastic gears with stainless steel core require additional considerations of holding strength between plastic and metal. Also, SUSL Fairloc hub spur gears, DSL Fairloc hub spur gears and SSAY/K spur gears with built-in clamps need additional considerations of the starting torque. The table below contains the assumptions established for various products in order to compute gear strengths.

Calculation of Bending Strength of Gears

Catalog No. Item	MSG(A)(B)	SSG (SSGS)	SS, SSA SSY, SSAY SSAY/K SSR	SUS SUSA SUSL LS	BSS	NSU	PU PS	DSL DS
Formula <small>NOTE 1</small>	Formula of spur and helical gears on bending strength (JGMA401-01)					The Lewis formula		
No. of teeth of mating gears	Same number of teeth (30 for SSR)					—		
Rotation	600min ⁻¹		100min ⁻¹			100min ⁻¹		
Durability	Over 10 ⁷ cycles					Allowable bending stress		
Impact from motor	Uniform load					1.59kgf/mm ² (40°C with no lubricant)	1.59kgf/mm ² (40°C with no lubricant)	<small>NOTE 3</small> m0.5 4.5 m0.8 4.0 m1.0 3.5 kgf/mm ²
Impact from load	Uniform load							
Direction of load	Bidirectional							
Allowable bending stress at root σ_{Flim} <small>NOTE 2</small>	31.33kgf/mm ²	14(16.67)kgf/mm ²	12.67kgf/mm ²	7kgf/mm ²	2.67kgf/mm ²			
Safety factor S_F	1.2							

Calculation of Surface Durability (Except where it is common with Bending Strength)

Formula <small>NOTE 1</small>	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 σ_{Hlim}	166kgf/mm ²	90(99)kgf/mm ²	49kgf/mm ²	41.3kgf/mm ²	—
Safety factor S_H	1.15				

NOTE 1: JGMA (Japanese Manufacturers' Association), “MC Nylon Technical Data” of Nippon Polypenco Limited and “Duracon Gear” of Polyplastic Co. The units for rotational speed (rpm) and the load (kgf/mm²) were matched to the units needed in the equation.

NOTE 2: Since the load is bidirectional, the allowable bending stress at root σ_{Flim} , calculated from JGMA 401-01, is set to 2/3 of the value.

NOTE 3: The values for DS m 0.5 gears were assumed by KHK.

Definition of bending strength

The allowable bending strength of a gear is defined as the allowable tangential force at the pitch circle based on the mutually allowable root stress of two meshing gears under load.



Example of the failure due to insufficient bending strength.

Definition of surface durability

The surface durability of a gear is defined as the allowable tangential force at the pitch circle, which permits the force to be transmitted safely without incurring surface failure.



Example of the defacement due to insufficient surface durability.



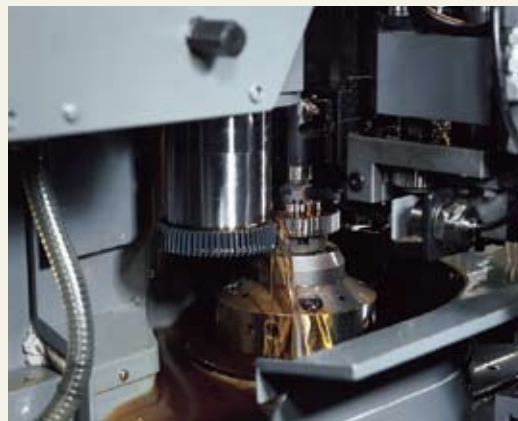
3. Caution with Regard to the Special Characteristics of Various Products

- ① MSGA (B) series of ground gears are carburized and therefore no secondary operations can be performed. Also, even though the keyways are made according to JIS B1301 standard, Js 9 tolerance, the heat treating process may produce some deformations.
- ② SSGS ground pinion shafts with 10 and 11 teeth are profile shifted gears ($x=+0.5$) and therefore cannot be assembled to the center distance of gears that are not profile shifted gears ($x=0$).
- ③ The black oxide finish is somewhat effective in preventing rust but is not rustproof.
- ④ SUS stainless steel gears have high degrees of antirust property, but are not totally rustproof.
- ⑤ When selecting SUSL Fairloc hub spur gears, it is possible in some cases for the gears to slip on the shaft before the gear teeth fail due to loads.
- ⑥ When selecting NSU plastic spur gears with steel core, it is possible in some cases for the holding strength between the metal core and the molded plastic to be less than the gear strength. As for details of the holding strength please refer to pages 108~109.
- ⑦ Due to their material, the quality of PS plastic spur gears may be affected by significant variations in temperature or humidity. As for details please refer to pages 32~33.
- ⑧ Due to a large coefficient of heat expansion of nylon, if these gears are to be used without lubrication, we recommend that the mating gears be metal gears, which can transmit heat, preventing temperature build-up.
- ⑨ SSR ring gears are easily deformable and may develop changes in dimensions.
- ⑩ SSAY, SSY spur gears and DS injection molded spur gears have narrow face widths. However, it is possible to mesh them with other gears (SS, SSA...) with wide face widths.



4. Other Points to Consider in Selection Process

- ① There are various footnotes to the product pages under the headings of “CAUTION”. Please consider them carefully when selecting these products.
- ② There may be slight differences in color or shape of products shown in the photograph from the actual products.
- ③ KHK reserves the right to make changes in specifications and dimensions without notice.
- ④ KHK is ready to produce and supply custom order products. When you require specific gears different from KHK Stock Gears please contact our distributor for quotation. Also, please refer to page 16 “KHK Custom Order Products”.





Application Hints

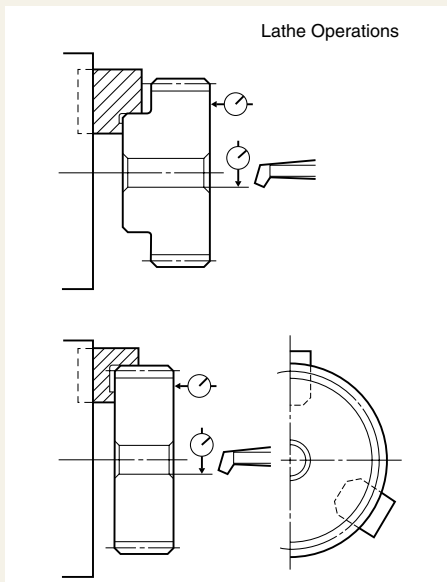
In order to use KHK stock gears safely, carefully read the Application Hints before proceeding. If there are questions or if you require clarifications, please contact our technical department or your nearest distributor.

KHK CO., LTD. TECHNICAL DEPARTMENT
PHONE: 81-48-254-1744 FAX: 81-48-254-1765
E-mail export@khkgears.co.jp

1. Caution on Performing Secondary Operations

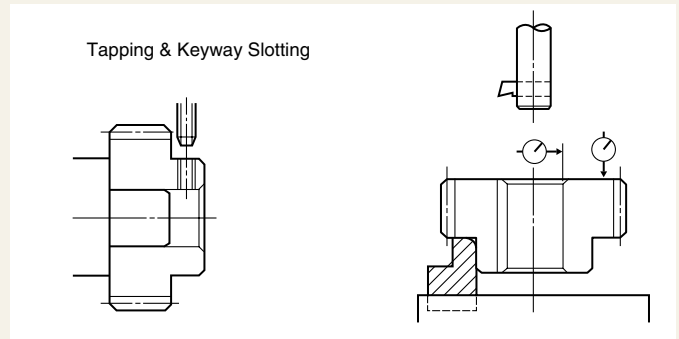
Most KHK gears can be modified by the user. Please note the following points.

- ① If you are re boring, 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 the rework requires using scroll chucks, we recommend the use of new or rebored jaws for improved precision. If chucking by the teeth, please apply the pressure carefully to avoid crushing the teeth which will lead to noisy gears.



- 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.
- ⑤ MSGA (B) ground spur gears (material SCM415) are wholly carburized so that no secondary operations can be performed.
- ⑥ SSG ground spur gear teeth are induction hardened past the tooth root (approximately 1mm deep). Therefore, care must be exercised when performing secondary operations on the bores or adding keyways.

- ⑦ Nylon is susceptible to change due to temperature and humidity. Dimensions may change during remachining operations and afterwards.
- ⑧ In order to avoid stress concentration, leave radii on the keyway corners.



- ⑨ To avoid problems of reduced gear precision and other manufacturing difficulties, do not attempt to machine the gears to reduce face widths.
- ⑩ The bore tolerance of DS injection molded spur gears is generally -0.10 to -0.05, but may be +values at the central portion of the hole. Remachining the bore is not recommended since reworking may expose voids in the plastic.
- ⑪ SUSL Fairloc gears cannot be rebored. They may be pinned provided caution is exercised not to deform the slots in the hubs.
- ⑫ When heat-treating S45C products, it is possible to get thermal stress cracks. It is best to subject them to penetrant inspection afterwards. If tooth strength is not sufficient, it can be increased approximately four times by heat-treating. On the other hand, the precision of the gear will drop about one grade.

Heat Treatment

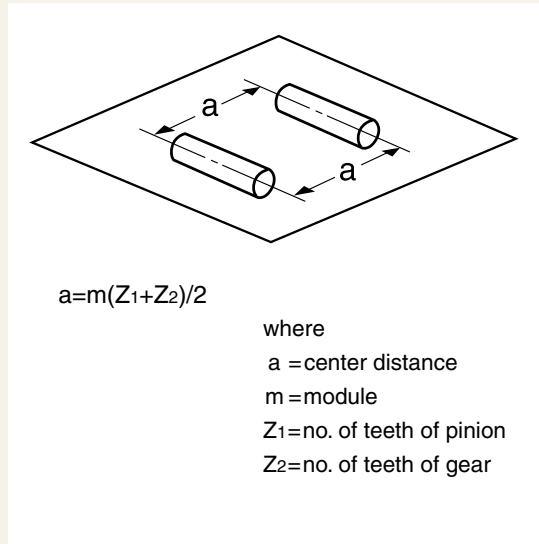
- 1) Induction heat treatment of S45C products should conform with the reference data below;
 - Heat treatment temperature - 800~900°C
 - Tempering temperature - 200~250°C
 - Hardness - 48~53HRC
- 2) In general, gears made from S45C have not been heat-treated. The user can heat-treat as required, but some deformation will be introduced. Ordinarily, a grinding process is needed after heat-treatment. Otherwise, the precision grade will drop about one grade.
- 3) SUS303 and 304 belong to austenite family and cannot be hardened. To harden stainless, there are martensitic series, such as SUS420J2.
- 4) The induction hardened depth is approximately 1mm. However, the hardening process does not completely reach the root of the gear tooth at the center portion of the face width.



Spur Gears

2. Points of Caution in Assembling

① KHK stock spur gears are designed to give the proper backlash when assembled using the center distance given by the formula below. The amount of backlash is given in the product table for each gear. For SSGS ground gears with 10 or 11 teeth, however, the profile is shifted ($x = +0.5$) so that the center distances are given in tables below the product table.



Center Distance Tolerance

Old standard JGMA113-01, Center Distance Tolerance, specified plus side tolerance of H7 - H8. In the new standard, JGMA1101-01:2000, it was decided that it is more desirable to specify +/- tolerance especially in gear train applications.

Method for Adjusting Backlash

Backlash may be adjusted by changing the center distance of mating gears. For more information, please consult the technical section on gear backlash.

Overall Length Tolerance for Spur and Helical Gears

Overall Length (mm)		Tolerance
Over	Under	
	30	0 - 0.10
30	100	0 - 0.15
100		0 - 0.20

Following products are excluded from this table:
 DS Injection Molded Spur Gears, LS Sintered Metal Spur Gears, DSL Fairloc Hub Spur Gears, SUSL Fairloc Hub Spur Gears

② Verify that the two shafts are parallel. Incorrect assembly will lead to uneven teeth contact which will cause noise and wear. (After assembly, the gear mesh can be checked by applying a contact pattern compound and rotating the gears.)



Poor tooth contact and pitting

This picture is an example of poor tooth contact of an SSG3-30 gear which had only 30% of the gear tooth in proper contact. In this example the gear oil used is equivalent to JIS gear oil category 2, No.3, and the design conditions were 417N.m load torque at 278 min⁻¹ (12 kW) which was 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.

- ③ A gear may slip on the shaft or move axially while in motion if it is not firmly fastened to the shaft. Step shafts, collars and set screws are some of the ways to secure the gears.
- ④ Keyways are generally used as the method of engaging the gears with the axis. There is also a method of the setting with a MACHALOCK, Posi-Lock, and Shupanring, etc. which are parts for engaging the hole and the axis.
- ⑤ Assembly should be performed cautiously to avoid damage to the gears or injuries to the worker.

3. Notes on Starting Operations

- ① Before operating, check the following:
 - Are the gears firmly mounted on the shafts?
 - Have you eliminated uneven tooth contact?
 - Does the gear mesh have a proper amount of backlash?
(Please avoid the condition of no backlash.)
 - Is there sufficient lubrication?
- ② If the gears are exposed, install a safety cover for protection. Never touch gears while they are in motion.



③ If there is unusual noise or vibration at the start up or insufficient lubrication after the start up, please recheck the gears and correctness of the assembly. Some of the methods for achieving noise reduction are:

- (a) High Precision
- (b) Fine Tooth Surface Finish
- (c) Accurate Tooth Contact

④ The followings are the gear lubrication methods in general use:

- (a) Grease Lubrication
- (b) Splash Lubrication (Oil Bath Method)
- (c) Forced Oil Circulation Lubrication

Check lubrication after start up. Sometimes, when the unit is initially being operated, lubricating oil deteriorates rapidly.

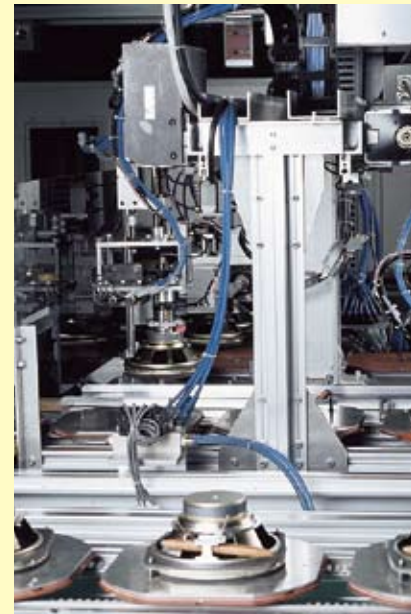
4. Other Points to Consider in Applications

- ① KHK products are individually packaged to avoid damage. Depending on how they are handled, it is still possible to deform or break them. It is important to exercise care in handling these parts.
- ② Check the products as they are being taken out of the boxes. If any of them are rusted, scratched or dented, please return to the dealer where they were bought, for exchange.
- ③ KHK cannot guarantee the precision of gears once the customer performs a secondary operation on them.

Examples of KHK Gear Applications

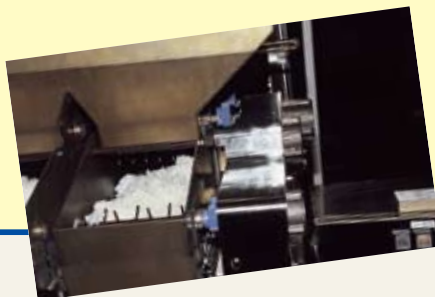


Automatic packing machine (Spur Gears)



Electric Component Assembly Line
(SS Spur Gears)

Food handling machine
(Plastic Spur gear)





Spur Gears

Characteristics of Plastic Gears

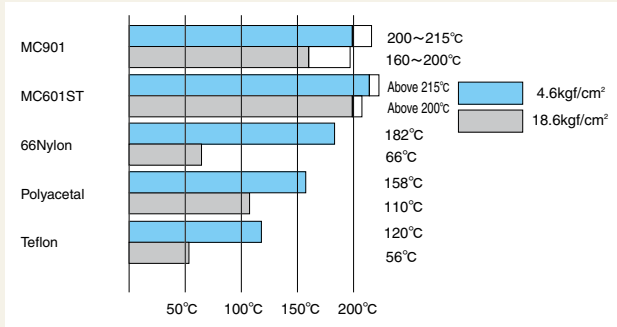
The quality of plastic gears (MC) may change due to variations of ambient temperature and humidity. The following useful data is provided to help the user with correct selection.

Thermal Properties

Dimensions of MC nylon gears change with temperature. KHK MC nylon gears are cut in the ambient temperature of 20° to 30°C (68°~86°F). Some dimensional changes could be expected in summer and winter.

We present the thermal deflection property of several plastics under load.

Thermal deflection temperature under load of certain plastic materials (ASTM-D648)



For plastic materials, it is difficult to determine the operating temperature below which there is no harmful effect from long term, continuous operation. In general, it is set by actual usage experience, though it is said to be 20°C to 30°C below the thermal deflection temperature.

There is not much data on low temperature limits. Users should rely on their own experience taking the brittleness properties into consideration.

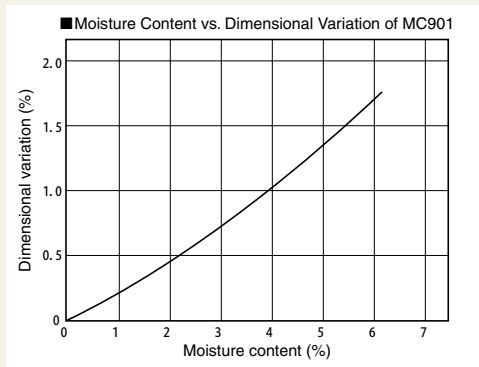
If you were to use NSU, PU or PS Plastic gears without lubricants, the meshing two nylon gears generates heat and they expand. We recommend metal gears for mating gears.

Water Absorption Properties

Dimensions of MC nylon gears change with moisture content. This may cause the sizes to vary from the time of purchase to the time of usage. The following table and the chart show the moisture content and its effect on the dimensions of MC901 nylon.

Moisture Absorption Rate of MC901 (ASTM D-570, etc.)

Moisture Absorption Rate (24 hrs., in water at room temperature)	0.5~1.0%
Water Saturation Value (in water)	5.5~7.0%
Water Saturation Value (room temperature in air)	2.5~3.5%



Thermal Properties of Plastic Materials

Properties	Test method ASTM	Unit	MC		66 Nylon	Polyacetal	Teflon
			901, 900NC	601ST			
Heat conductivity	C-177	10 ⁻¹ kcal/mhr·°C	2		2.11		2.16
Coefficient of linear thermal expansion	D-696	10 ⁻⁶ /°C	9	6.5	10 15	9	10
Specific heat	—	cal/°C·g	0.4		0.4		0.25
Temperature of thermal deflection under certain load (18.6kgf/cm²)	D-648	°C	160 200	Above 200	66	110	56
(4.6kgf/cm²)	D-648	°C	200 215	Above 215	182	158	120
Continuous working temperature	—	°C	120	150	120	95	260
Deflection rate under certain load (140kgf/cm², 50°C)	D-621	%	0.65				
Melting point		°C	220 223	220 223		165	

Chemical Resistance Properties

MC nylon products are mainly used in food and chemical machinery. However, there are limitations depending on the environment. Generally, MC nylon is resistant against organic agents but weak against acids. We list the chemical resistance properties of MC nylon against various substances. Since the reaction may vary depending on the applications, it is important to test it before processing. The MC Nylon that is approved for food contact by the US FDA is MC907. Gears can be custom made from this material.

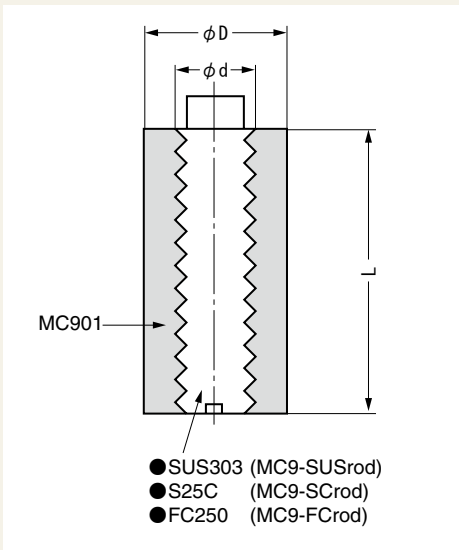
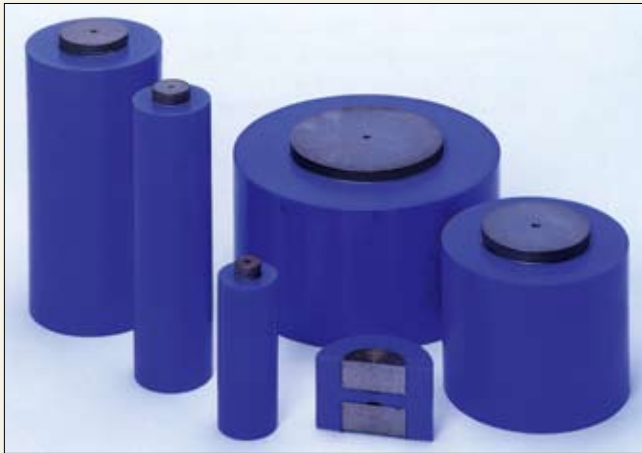
Chemical Resistance Properties of MC Nylon

(○) Hardly affected (△) Possible to use under certain conditions (×) Not suitable for use

Diluted hydrochloric acid	△	Methyl acetate	○	Nitrobenzene	○
Concentrated hydrochloric acid	×	Ethyl acetate	○	Salicylic acid	○
Diluted sulfuric acid	△	Sodium acetate	○	Diduthylphthalate	○
Concentrated sulfuric acid	×	Aceton	○	Synchrohexane	○
Diluted nitric acid	△	Methyl acetate	○	Synchrohexanol	○
Concentrated nitric acid	×	Formaldehyde	○	Tetrahydrofuran	○
Diluted phosphoric acid	△	Acetaldehyde	○	(Epsilon)-caprolactam	○
Sodium hydroxide(50%)	○	Ether family	○	Petroleum ether	○
Ammonia water(10%)	○	Acetamide	○	Gasoline	○
Ammonia gas	○	Ethylenediamine	○	Diesel oil	○
Saline solution(10%)	○	Acrylnitrile	○	Lubricant oil	○
Potassium chloride	○	Carbon tetrachloride	○	Mineral oil	○
Calcium chloride	○	Ethylene chloride	○	Castor oil	○
Ammonium chloride	○	Ethylene chlorohydrin	○	Linseed oil	○
Sodium hypochlorite	×	Trichlorethylene(Tri-clene)	○	Silicon oil	○
Sodium sulfate	○	Benzene	○	Edible fat	○
Sodium thiosulfate	○	Toluene	○	Tallow	○
Sodium bisulfate	○	Phenol	△	Butter	○
Cupric sulfate	○	Aniline	△	Milk	○
Potassium dichromate (5%)	○	Benzaldehyde	△	Grape wine	○
Potassium permanganate	△	Benzoic acid	△	Fruit juice	○
Sodium carbonate	○	Chlorobenzene	○	Carbonate drink	○



Round bar-MC cast nylon with metal core



If you require other sized gears than those listed in our NSU or PU series, we can design and quote custom gears made from the following round bars. Since we stock them, we can deliver fast and reduce your cost.

■ Dimensions of MC nylon round bars (Unit: mm)

Outside dia.	Metal core dia.	Total length	MC thickness	Weight (kgf/pcs.)
D	d	L		
40	20	105	10	0.4
50	25	105	12.5	0.7
55	30	105	12.5	0.9
65	40	105	12.5	1.4
80	45	105	17.5	1.9
90	50	105	20	2.3
100	55	105	22.5	2.8
110	60	105	25	3.4
120	70	105	25	4.4
130	80	105	25	5.5
150	90	105	30	7.0
180	110	105	35	10.4
200	120	105	40	12.5

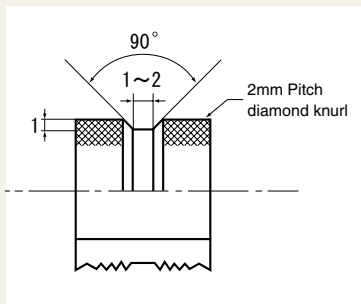
*Dimensions are based on technical data of NIPPON POLYPENCO LIMITED.

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

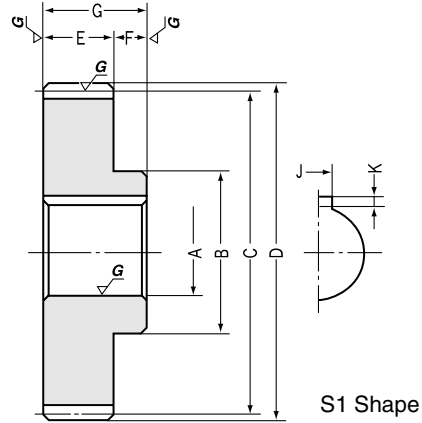
The surface of the core material is rolled with a 2mm pitch diamond knurl. Then one or more grooves (1~2mm wide and 1mm deep) are cut as shown on the right. The metal surface is treated prior to casting nylon in a mold.



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) Metal-hub rim may be thin
Even if there is not sufficient material to pass a bolt into the rim, the hub can be fixed by means of a bonding method.
- (4) Good appearance
Elimination of bolts and nuts provides a cleaner physical appearance .
- (5) Cost savings
In general, it is more economical than attaching with bolts, especially in large quantities.

Data related to the properties of MC nylon are extracted from the MC nylon technical data issued by NIPPON POLYPENCO LIMITED.



Module 1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A _{H7}	B	C	D	E	F	G	H	I
MSG(A)1-18 MSG(B)1-18	m1	18	S1	8	15	18	20	10	5	15	—	—
MSG(A)1-20 MSG(B)1-20		20	S1	8 10	17	20	22	10	5	15	—	—
MSG(A)1-24 MSG(B)1-24		24	S1	10 12	20	24	26	10	5	15	—	—
MSG(A)1-25 MSG(B)1-25		25	S1	10 12	20	25	27	10	5	15	—	—
MSG(A)1-30 MSG(B)1-30		30	S1	10 12	25	30	32	10	5	15	—	—
MSG(A)1-35 MSG(B)1-35		35	S1	10 15	25	35	37	10	5	15	—	—
MSG(A)1-36 MSG(B)1-36		36	S1	12 15	25	36	38	10	5	15	—	—
MSG(A)1-40 MSG(B)1-40		40	S1	12 15	30	40	42	10	5	15	—	—
MSG(A)1-45 MSG(B)1-45		45	S1	12 15	30	45	47	10	5	15	—	—
MSG(A)1-48 MSG(B)1-48		48	S1	12 15	30	48	50	10	5	15	—	—
MSG(A)1-50 MSG(B)1-50		50	S1	12 15	35	50	52	10	5	15	—	—
MSG(A)1-55 MSG(B)1-55		55	S1	15 20	40	55	57	10	10	20	—	—
MSG(A)1-60 MSG(B)1-60		60	S1	15 20	40	60	62	10	10	20	—	—
MSG(A)1-70 MSG(B)1-70		70	S1	20 25	45	70	72	10	10	20	—	—
MSG(A)1-80 MSG(B)1-80		80	S1	20 25	45	80	82	10	10	20	—	—
MSG(A)1-100 MSG(B)1-100		100	S1	20 25	45	100	102	10	10	20	—	—

CAUTION: No secondary operation can be performed due to the carburizing process.

NOTE 1: Although the dimensions of the keyway are made to the JIS(Js9) tolerance, there may be some deviations due to the effects of the heat treatment.



Specifications

Precision grade	JIS NS grade (JIS B1702-1: 1998) OLD JIS 1 grade (JIS B1702: 1976)	Tooth hardness	55~60HRC
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Ground
Material	SCM415	Datum reference surface for gear grinding	Bore
Heat treatment	Overall carburizing	Secondary Operations	Not possible (We can supply different configuration as custom made gears)

Keyway <small>NOTE 1</small>	Allowable torque (N · m)		Allowable torque (kgf · m)		Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
	Width × Depth	Bending strength	Surface durability	Bending strength			
3 x 1.4	12.1	6.37	1.24	0.65	0.08~0.16	0.020	MSGA1-18
3 x 1.4 4 x 1.8	14.2	8.04	1.45	0.82	0.08~0.16	0.027 0.023	MSGA1-20 MSGB1-20
4 x 1.8 4 x 1.8	18.5	12.0	1.88	1.22	0.08~0.16	0.038 0.034	MSGA1-24 MSGB1-24
4 x 1.8 4 x 1.8	19.6	13.1	2.00	1.33	0.08~0.16	0.041 0.037	MSGA1-25 MSGB1-25
4 x 1.8 4 x 1.8	25.1	19.0	2.56	1.94	0.08~0.16	0.065 0.061	MSGA1-30 MSGB1-30
4 x 1.8 5 x 2.3	30.7	26.2	3.13	2.67	0.08~0.16	0.085 0.073	MSGA1-35 MSGB1-35
4 x 1.8 5 x 2.3	31.9	27.8	3.25	2.84	0.08~0.16	0.085 0.077	MSGA1-36 MSGB1-36
4 x 1.8 5 x 2.3	36.5	34.6	3.72	3.53	0.08~0.16	0.11 0.10	MSGA1-40 MSGB1-40
4 x 1.8 5 x 2.3	42.3	44.3	4.31	4.51	0.08~0.16	0.14 0.13	MSGA1-45 MSGB1-45
4 x 1.8 5 x 2.3	45.8	50.6	4.67	5.16	0.08~0.16	0.16 0.15	MSGA1-48 MSGB1-48
4 x 1.8 5 x 2.3	48.1	55.1	4.91	5.62	0.08~0.16	0.18 0.17	MSGA1-50 MSGB1-50
5 x 2.3 6 x 2.8	54.0	67.3	5.51	6.86	0.10~0.18	0.26 0.23	MSGA1-55 MSGB1-55
5 x 2.3 6 x 2.8	59.9	80.6	6.11	8.22	0.10~0.18	0.29 0.27	MSGA1-60 MSGB1-60
6 x 2.8 8 x 3.3	71.9	111	7.33	11.4	0.10~0.18	0.37 0.35	MSGA1-70 MSGB1-70
6 x 2.8 8 x 3.3	83.9	147	8.55	15.0	0.10~0.18	0.47 0.44	MSGA1-80 MSGB1-80
6 x 2.8 8 x 3.3	103	224	10.5	22.8	0.10~0.18	0.69 0.66	MSGA1-100 MSGB1-100

NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

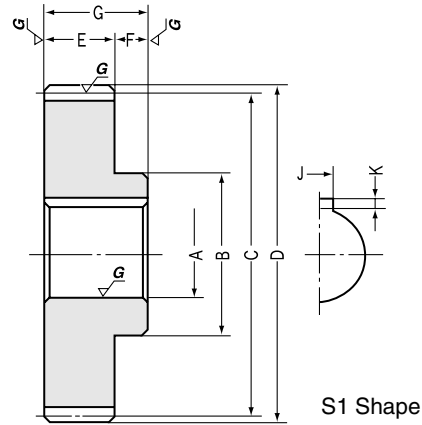
NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



MSG(A)B Ground Spur Gears Module 1.5

Spur Gears

BGS M · A G S M



Module 1.5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A _{H7}	B	C	D	E	F	G	H	I
MSG1.5-15	m1.5	15	S1	10	18	22.5	22.5	15	10	25	—	—
MSG1.5-18 MSG1.5-18		18	S1	10 12	22	27	30	15	10	25	—	—
MSG1.5-20 MSG1.5-20		20	S1	12 15	25	30	33	15	10	25	—	—
MSG1.5-24 MSG1.5-24		24	S1	12 15	28	36	39	15	10	25	—	—
MSG1.5-25 MSG1.5-25		25	S1	14 16	30	37.5	40.5	15	10	25	—	—
MSG1.5-30 MSG1.5-30		30	S1	15 18	30	45	48	15	10	25	—	—
MSG1.5-35 MSG1.5-35		35	S1	15 18	32	52.5	55.5	15	10	25	—	—
MSG1.5-36 MSG1.5-36		36	S1	15 18	32	54	57	15	10	25	—	—
MSG1.5-40 MSG1.5-40		40	S1	16 20	35	60	63	15	10	25	—	—
MSG1.5-45 MSG1.5-45		45	S1	16 20	40	67.5	70.5	15	10	25	—	—
MSG1.5-48 MSG1.5-48		48	S1	16 20	40	72	75	15	10	25	—	—
MSG1.5-50 MSG1.5-50		50	S1	18 22	40	75	78	15	10	25	—	—
MSG1.5-55 MSG1.5-55		55	S1	20 25	45	82.5	85.5	15	10	25	—	—
MSG1.5-60 MSG1.5-60		60	S1	20 25	45	90	93	15	10	25	—	—
MSG1.5-70 MSG1.5-70		70	S1	20 25	45	105	108	15	10	25	—	—
MSG1.5-80 MSG1.5-80		80	S1	20 25	45	120	123	15	10	25	—	—
MSG1.5-100 MSG1.5-100	100	S1	25 30	50	150	153	15	10	25	—	—	

CAUTION: No secondary operation can be performed due to the carburizing process.

NOTE 1: Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of the heat treatment.



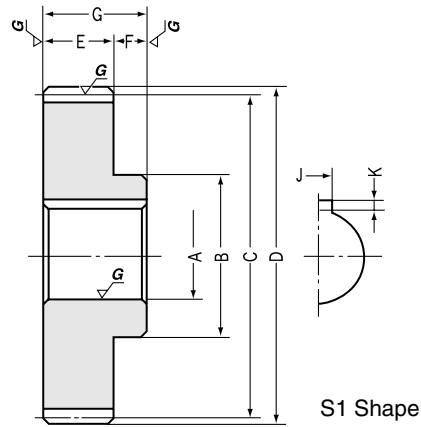
Specifications

Precision grade	JIS NS grade (JIS B1702-1: 1996) OLD JIS 1 grade (JIS B1702: 1976)	Tooth hardness	55~60HRC
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Ground
Material	SCM415	Datum reference surface for gear grinding	Bore
Heat treatment	Overall carburizing	Secondary Operations	Not possible (We can supply different configuration as custom made gears)

Keyway <i>NOTE 1</i>	Allowable torque (N · m) <i>NOTE 2</i>		Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 3</i>	Weight (kg)	Catalog No.
	Width × Depth	Bending strength	Surface durability	Bending strength			
4 x 1.8	30.8	14.8	3.15	1.51	0.08~0.16	0.050	MSGA1.5-15
4 x 1.8 4 x 1.8	41.0	22.1	4.18	2.26	0.08~0.16	0.080 0.074	MSGA1.5-18 MSGB1.5-18
4 x 1.8 5 x 2.3	48.0	27.9	4.89	2.84	0.08~0.16	0.098 0.085	MSGA1.5-20 MSGB1.5-20
4 x 1.8 5 x 2.3	62.4	41.5	6.36	4.24	0.08~0.16	0.14 0.13	MSGA1.5-24 MSGB1.5-24
5 x 2.3 5 x 2.3	66.0	45.4	6.73	4.63	0.08~0.16	0.15 0.14	MSGA1.5-25 MSGB1.5-25
5 x 2.3 6 x 2.8	84.7	66.4	8.63	6.77	0.08~0.16	0.21 0.19	MSGA1.5-30 MSGB1.5-30
5 x 2.3 6 x 2.8	104	91.5	10.6	9.34	0.10~0.18	0.28 0.26	MSGA1.5-35 MSGB1.5-35
5 x 2.3 6 x 2.8	108	97.1	11.0	9.90	0.10~0.18	0.30 0.28	MSGA1.5-36 MSGB1.5-36
5 x 2.3 6 x 2.8	123	121	12.6	12.3	0.10~0.18	0.37 0.34	MSGA1.5-40 MSGB1.5-40
5 x 2.3 6 x 2.8	143	155	14.5	15.8	0.10~0.18	0.48 0.46	MSGA1.5-45 MSGB1.5-45
5 x 2.3 6 x 2.8	155	177	15.8	18.1	0.10~0.18	0.54 0.51	MSGA1.5-48 MSGB1.5-48
6 x 2.8 6 x 2.8	162	193	16.6	19.7	0.10~0.18	0.57 0.54	MSGA1.5-50 MSGB1.5-50
6 x 2.8 8 x 3.3	182	236	18.6	24.0	0.10~0.18	0.69 0.65	MSGA1.5-55 MSGB1.5-55
6 x 2.8 8 x 3.3	202	283	20.6	28.8	0.10~0.18	0.81 0.77	MSGA1.5-60 MSGB1.5-60
6 x 2.8 8 x 3.3	231	372	23.6	38.0	0.12~0.20	1.08 1.04	MSGA1.5-70 MSGB1.5-70
6 x 2.8 8 x 3.3	270	494	27.5	50.3	0.12~0.20	1.39 1.36	MSGA1.5-80 MSGB1.5-80
8 x 3.3 8 x 3.3	347	787	35.4	80.2	0.12~0.20	2.13 2.09	MSGA1.5-100 MSGB1.5-100

NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

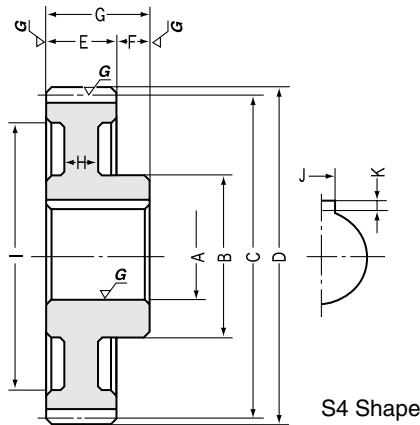


Module 2

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A _{H7}	B	C	D	E	F	G	H	I
MSG2-15 MSG2-15	m2	15	S1	12 15	24	30	34	20	10	30	—	—
MSG2-18 MSG2-18		18	S1	12 15	30	36	40	20	10	30	—	—
MSG2-20 MSG2-20		20	S1	15 18	32	40	44	20	10	30	—	—
MSG2-24 MSG2-24		24	S1	15 18	35	48	52	20	10	30	—	—
MSG2-25 MSG2-25		25	S1	16 20	35	50	54	20	10	30	—	—
MSG2-30 MSG2-30		30	S1	18 22	40	60	64	20	10	30	—	—
MSG2-35 MSG2-35		35	S1	18 22	40	70	74	20	10	30	—	—
MSG2-36 MSG2-36		36	S1	18 22	40	72	76	20	10	30	—	—
MSG2-40 MSG2-40		40	S1	20 25	45	80	84	20	10	30	—	—
MSG2-45 MSG2-45		45	S1	20 25	45	90	94	20	10	30	—	—
MSG2-48 MSG2-48		48	S1	22 28	50	96	100	20	10	30	—	—
MSG2-50 MSG2-50		50	S1	22 28	50	100	104	20	10	30	—	—
MSG2-55 MSG2-55		55	S1	25 30	55	110	114	20	10	30	—	—
MSG2-60 MSG2-60		60	S1	25 30	55	120	124	20	10	30	—	—
MSG2-70 MSG2-70		70	S1	25 30	55	140	144	20	10	30	—	—
MSG2-80 MSG2-80		80	S2	30 35	60	160	164	20	10	30	—	—
MSG2-100 MSG2-100		100	S2	35 40	80	200	204	20	10	30	—	—

CAUTION: No secondary operation can be performed due to the carburizing process.

NOTE 1: Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of the heat treatment.



Specifications

Precision grade	JIS NS grade (JIS B1702-1: 1998) OLD JIS 1 grade (JIS B1702: 1976)	Tooth hardness	55~60HRC
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Ground
Material	SCM415	Datum reference surface for gear grinding	Bore
Heat treatment	Overall carburizing	Secondary Operations	Not possible (We can supply different configuration as custom made gears)

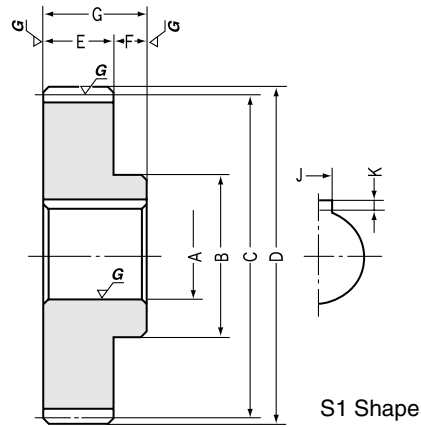
Keyway <i>NOTE 1</i>	Allowable torque (N · m) <i>NOTE 2</i>		Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 3</i>	Weight (kg)	Catalog No.
	Width × Depth	Bending strength	Surface durability	Bending strength			
4 x 1.8 5 x 2.3	73.1	35.7	7.46	3.64	0.10~0.20	0.12 0.10	MSGA2-15 MSGB2-15
4 x 1.8 5 x 2.3	97.2	53.5	9.91	5.46	0.10~0.20	0.19 0.17	MSGA2-18 MSGB2-18
5 x 2.3 6 x 2.8	114	67.6	11.6	6.89	0.10~0.20	0.22 0.20	MSGA2-20 MSGB2-20
5 x 2.3 6 x 2.8	148	101	15.1	10.3	0.10~0.20	0.32 0.30	MSGA2-24 MSGB2-24
5 x 2.3 6 x 2.8	157	110	16.0	11.2	0.10~0.20	0.33 0.31	MSGA2-25 MSGB2-25
6 x 2.8 6 x 2.8	201	161	20.5	16.5	0.12~0.22	0.48 0.45	MSGA2-30 MSGB2-30
6 x 2.8 6 x 2.8	246	223	25.1	22.7	0.12~0.22	0.64 0.61	MSGA2-35 MSGB2-35
6 x 2.8 6 x 2.8	255	236	26.0	24.1	0.12~0.22	0.67 0.64	MSGA2-36 MSGB2-36
6 x 2.8 8 x 3.3	292	294	29.7	30.0	0.12~0.22	0.84 0.79	MSGA2-40 MSGB2-40
6 x 2.8 8 x 3.3	338	377	34.5	38.4	0.12~0.22	1.05 1.00	MSGA2-45 MSGB2-45
6 x 2.8 8 x 3.3	349	411	35.6	41.9	0.12~0.22	1.20 1.14	MSGA2-48 MSGB2-48
6 x 2.8 8 x 3.3	367	448	37.4	45.7	0.12~0.22	1.29 1.24	MSGA2-50 MSGB2-50
8 x 3.3 8 x 3.3	412	548	42.0	55.8	0.14~0.24	1.56 1.51	MSGA2-55 MSGB2-55
8 x 3.3 8 x 3.3	457	658	46.6	67.1	0.14~0.24	1.84 1.79	MSGA2-60 MSGB2-60
8 x 3.3 8 x 3.3	547	909	55.8	92.7	0.14~0.24	2.48 2.43	MSGA2-70 MSGB2-70
8 x 3.3 10 x 3.3	610	1150	62.2	117	0.14~0.24	2.55 2.49	MSGA2-80 MSGB2-80
10 x 3.3 12 x 3.3	785	1820	80.1	186	0.14~0.24	4.16 4.09	MSGA2-100 MSGB2-100

NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



MSG A (B) Ground Spur Gears Module 2.5

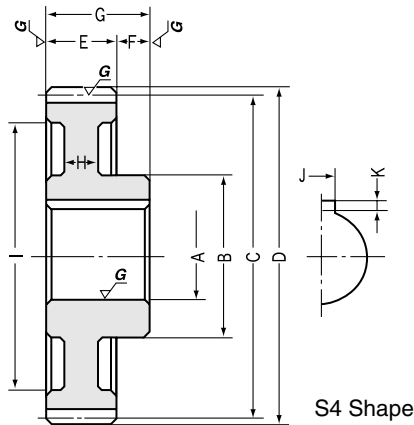


Module 2.5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A _{H7}	B	C	D	E	F	G	H	I
MSG A 2.5-15 MSG B 2.5-15**	m2.5	15	S1	15 18	30	37.5	42.5	25	12	37	—	—
MSG A 2.5-18 MSG B 2.5-18		18	S1	18 20	38	45	50	25	12	37	—	—
MSG A 2.5-20 MSG B 2.5-20		20	S1	18 22	40	50	55	25	12	37	—	—
MSG A 2.5-24 MSG B 2.5-24		24	S1	18 22	40	60	65	25	12	37	—	—
MSG A 2.5-25 MSG B 2.5-25		25	S1	20 25	45	62.5	67.5	25	12	37	—	—
MSG A 2.5-30 MSG B 2.5-30		30	S1	22 28	50	75	80	25	12	37	—	—
MSG A 2.5-35 MSG B 2.5-35		35	S1	25 30	55	87.5	92.5	25	12	37	—	—
MSG A 2.5-36 MSG B 2.5-36		36	S1	25 30	55	90	95	25	12	37	—	—
MSG A 2.5-40 MSG B 2.5-40		40	S1	25 32	55	100	105	25	12	37	—	—
MSG A 2.5-45 MSG B 2.5-45		45	S1	30 35	60	112.5	117.5	25	12	37	—	—
MSG A 2.5-48 MSG B 2.5-48		48	S1	30 35	60	120	125	25	12	37	—	—
MSG A 2.5-50 MSG B 2.5-50		50	S1	30 35	60	125	130	25	12	37	—	—
MSG A 2.5-55 MSG B 2.5-55		55	S1	30 40	70	137.5	142.5	25	12	37	—	—
MSG A 2.5-60 MSG B 2.5-60		60	S1	30 40	70	150	155	25	12	37	—	—
MSG A 2.5-70 MSG B 2.5-70		70	S2	40 50	85	175	180	25	12	37	17	150

CAUTION: No secondary operation can be performed due to the carburizing process.

NOTE 1: Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of the heat treatment.



S4 Shape

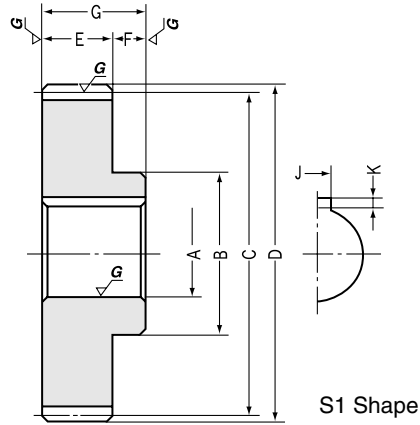
Specifications

Precision grade	JIS N5 grade (JIS B1702-1: 1998) OLD JIS 1 grade (JIS B1702: 1976)	Tooth hardness	55~60HRC
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Ground
Material	SCM415	Datum reference surface for gear grinding	Bore
Heat treatment	Overall carburizing	Secondary Operations	Not possible (We can supply different configuration as custom made gears)

Keyway NOTE 1 Width × Depth	Allowable torque (N · m) NOTE 2		Allowable torque (kgf · m)		Backlash (mm) NOTE 3	Weight (kg)	Catalog No.
	Bending strength	Surface durability	Bending strength	Surface durability			
5 x 2.3 6 x 2.8	143	71.0	14.6	7.24	0.10~0.20	0.23 0.20	MSGA2.5-15 MSGB2.5-15**
6 x 2.8 6 x 2.8	190	107	19.4	10.9	0.10~0.20	0.34 0.32	MSGA2.5-18 MSGB2.5-18
6 x 2.8 6 x 2.8	222	134	22.7	13.7	0.10~0.20	0.42 0.39	MSGA2.5-20 MSGB2.5-20
6 x 2.8 6 x 2.8	289	201	29.4	20.5	0.12~0.22	0.59 0.56	MSGA2.5-24 MSGB2.5-24
6 x 2.8 8 x 3.3	306	220	31.2	22.4	0.12~0.22	0.66 0.60	MSGA2.5-25 MSGB2.5-25
6 x 2.8 8 x 3.3	392	322	40.0	32.8	0.12~0.22	0.94 0.87	MSGA2.5-30 MSGB2.5-30
8 x 3.3 8 x 3.3	480	444	49.0	45.3	0.12~0.22	1.25 1.19	MSGA2.5-35 MSGB2.5-35
8 x 3.3 8 x 3.3	498	471	50.8	48.0	0.12~0.22	1.32 1.26	MSGA2.5-36 MSGB2.5-36
8 x 3.3 10 x 3.3	543	560	55.3	57.1	0.12~0.22	1.61 1.52	MSGA2.5-40 MSGB2.5-40
8 x 3.3 10 x 3.3	629	718	64.1	73.2	0.14~0.24	2.00 1.93	MSGA2.5-45 MSGB2.5-45
8 x 3.3 10 x 3.3	681	823	69.5	83.9	0.14~0.24	2.27 2.20	MSGA2.5-48 MSGB2.5-48
8 x 3.3 10 x 3.3	716	897	73.0	91.5	0.14~0.24	2.46 2.39	MSGA2.5-50 MSGB2.5-50
8 x 3.3 12 x 3.3	804	1090	82.0	112	0.14~0.24	3.06 2.90	MSGA2.5-55 MSGB2.5-55
8 x 3.3 12 x 3.3	892	1310	90.9	134	0.14~0.24	3.62 3.45	MSGA2.5-60 MSGB2.5-60
12 x 3.3 14 x 3.8	1020	1730	104	176	0.14~0.24	4.24 4.03	MSGA2.5-70 MSGB2.5-70

NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

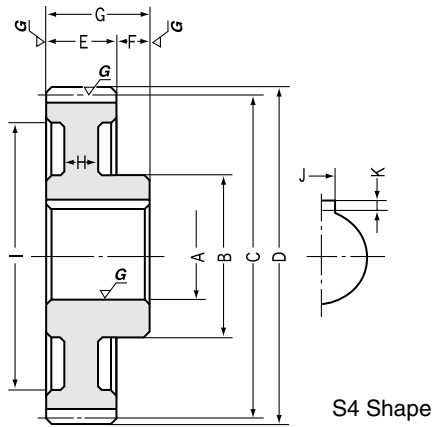


Module 3

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A _{H7}	B	C	D	E	F	G	H	I
MSG3-15 MSGB3-15	m3	15	S1	18 22	36	45	51	30	15	45	—	—
MSG3-18 MSGB3-18		18	S1	20 25	45	54	60	30	15	45	—	—
MSG3-20 MSGB3-20		20	S1	20 25	45	60	66	30	15	45	—	—
MSG3-24 MSGB3-24		24	S1	20 25	45	72	78	30	15	45	—	—
MSG3-25 MSGB3-25		25	S1	25 30	55	75	81	30	15	45	—	—
MSG3-30 MSGB3-30		30	S1	28 35	60	90	96	30	15	45	—	—
MSG3-35 MSGB3-35		35	S1	30 35	60	105	111	30	15	45	—	—
MSG3-36 MSGB3-36		36	S1	30 35	60	108	114	30	15	45	—	—
MSG3-40 MSGB3-40		40	S1	30 40	70	120	126	30	15	45	—	—
MSG3-45 MSGB3-45		45	S1	30 40	70	135	141	30	15	45	—	—
MSG3-48 MSGB3-48		48	S1	35 40	70	144	150	30	15	45	—	—
MSG3-50 MSGB3-50		50	S2	32 40	70	150	156	30	15	45	20	126
MSG3-55 MSGB3-55		55	S2	35 40	70	165	171	30	15	45	20	140
MSG3-60 MSGB3-60		60	S2	35 45	80	180	186	30	15	45	20	156

CAUTION: No secondary operation can be performed due to the carburizing process.

NOTE 1: Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of the heat treatment.



Specifications

Precision grade	JIS N5 grade (JIS B1702-1: 1998) OLD JIS 1 grade (JIS B1702: 1976)	Tooth hardness	55~60HRC
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Ground
Material	SCM415	Datum reference surface for gear grinding	Bore
Heat treatment	Overall carburizing	Secondary Operations	Not possible (We can supply different configuration as custom made gears)

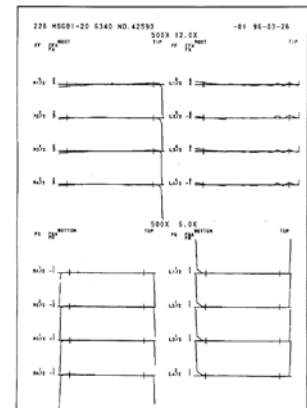
Keyway <i>NOTE 1</i>	Allowable torque (N · m) <i>NOTE 2</i>		Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 3</i>	Weight (kg)	Catalog No.
	Width × Depth	Bending strength	Surface durability	Bending strength			
6 x 2.8 6 x 2.8	247	124	25.2	12.7	0.10~0.20	0.40 0.35	MSGA3-15 MSGB3-15
6 x 2.8 8 x 3.3	328	187	33.4	19.1	0.12~0.22	0.61 0.54	MSGA3-18 MSGB3-18
6 x 2.8 8 x 3.3	384	236	39.1	24.1	0.12~0.22	0.74 0.67	MSGA3-20 MSGB3-20
6 x 2.8 8 x 3.3	499	353	50.9	36.0	0.12~0.22	1.03 0.96	MSGA3-24 MSGB3-24
8 x 3.3 10 x 3.3	528	386	53.9	39.3	0.12~0.22	1.14 1.06	MSGA3-25 MSGB3-25
8 x 3.3 10 x 3.3	677	565	69.1	57.7	0.12~0.22	1.60 1.48	MSGA3-30 MSGB3-30
8 x 3.3 10 x 3.3	790	745	80.6	75.9	0.14~0.24	2.11 2.02	MSGA3-35 MSGB3-35
8 x 3.3 10 x 3.3	820	790	83.6	80.6	0.14~0.24	2.23 2.14	MSGA3-36 MSGB3-36
8 x 3.3 12 x 3.3	938	988	95.6	101	0.14~0.24	2.86 2.66	MSGA3-40 MSGB3-40
8 x 3.3 12 x 3.3	1090	1260	111	129	0.14~0.24	3.57 3.37	MSGA3-45 MSGB3-45
10 x 3.3 12 x 3.3	1180	1450	120	147	0.14~0.24	3.94 3.83	MSGA3-48 MSGB3-48
10 x 3.3 12 x 3.3	1240	1570	126	161	0.14~0.24	3.79 3.62	MSGA3-50 MSGB3-50
10 x 3.3 12 x 3.3	1330	1830	135	187	0.14~0.24	4.39 4.29	MSGA3-55 MSGB3-55
10 x 3.3 14 x 3.8	1470	2200	150	224	0.14~0.24	5.31 5.08	MSGA3-60 MSGB3-60

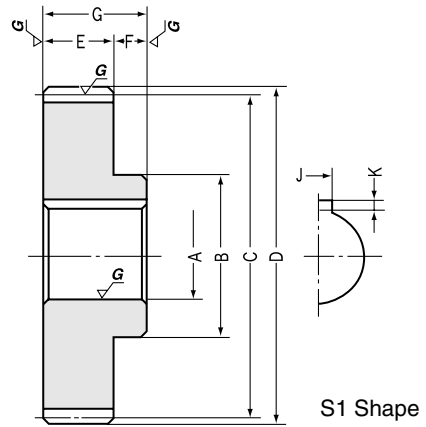
NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

An example of KHK's inspection report on tooth profile and lead errors.

The precision of a spur gear (JIS B 1702-1) is determined by factors such as single pitch error, pitch variation error, accumulated pitch error, tooth profile error, run out error, lead error etc.



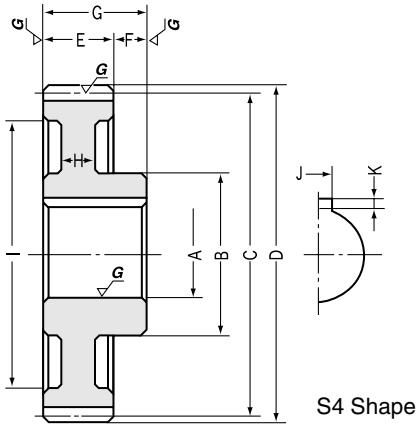


Module 4

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A _{H7}	B	C	D	E	F	G	H	I
MSG4-15 MSGB4-15	m4	15	S1	25 30	48	60	68	40	20	60	—	—
MSG4-18 MSGB4-18		18	S1	25 30	50	72	80	40	20	60	—	—
MSG4-20 MSGB4-20		20	S1	28 32	60	80	88	40	20	60	—	—
MSG4-24 MSGB4-24		24	S1	28 32	60	96	104	40	20	60	—	—
MSG4-25 MSGB4-25		25	S1	30 35	60	100	108	40	20	60	—	—
MSG4-30 MSGB4-30		30	S1	35 40	70	120	128	40	20	60	—	—
MSG4-35 MSGB4-35		35	S1	35 40	70	140	148	40	20	60	—	—
MSG4-36 MSGB4-36		36	S1	35 40	70	144	152	40	20	60	—	—
MSG4-40 MSGB4-40		40	S1	40 45	80	160	168	40	20	60	—	—
MSG4-45 MSGB4-45		45	S1	40 45	80	180	188	40	20	60	—	—
MSG4-48 MSGB4-48		48	S2	40 45	80	192	200	40	20	60	26	160
MSG4-50 MSGB4-50		50	S2	40 50	85	200	208	40	20	60	26	168

CAUTION: No secondary operation can be performed due to the carburizing process.

NOTE 1: Although the dimensions of the keyway are made to the JIS (Js9) tolerance, there may be some deviations due to the effects of the heat treatment.



Specifications

Precision grade	JIS N5 grade (JIS B1702-1: 1998) OLD JIS 1 grade (JIS B1702: 1976)	Tooth hardness	55~60HRC
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Ground
Material	SCM415	Datum reference surface for gear grinding	Bore
Heat treatment	Overall carburizing	Secondary Operations	Not possible (We can supply different configuration as custom made gears)

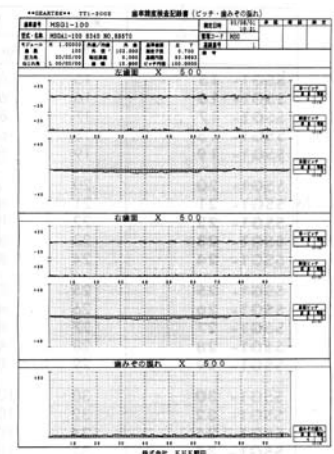
Keyway NOTE 1 Width × Depth	Allowable torque (N · m) NOTE 2		Allowable torque (kgf · m)		Backlash (mm) NOTE 3	Weight (kg)	Catalog No.
	Bending strength	Surface durability	Bending strength	Surface durability			
8 x 3.3 8 x 3.3	585	302	59.7	30.8	0.14~0.24	0.93 0.83	MSGA4-15 MSGB4-15
8 x 3.3 8 x 3.3	777	455	79.3	46.4	0.14~0.24	1.34 1.24	MSGA4-18 MSGB4-18
8 x 3.3 10 x 3.3	910	574	92.8	58.6	0.14~0.24	1.72 1.63	MSGA4-20 MSGB4-20
8 x 3.3 10 x 3.3	1130	819	115	83.5	0.14~0.24	2.41 2.32	MSGA4-24 MSGB4-24
8 x 3.3 10 x 3.3	1190	896	122	91.4	0.14~0.24	2.56 2.44	MSGA4-25 MSGB4-25
10 x 3.3 12 x 3.3	1530	1320	156	134	0.16~0.26	3.69 3.54	MSGA4-30 MSGB4-30
10 x 3.3 12 x 3.3	1870	1820	191	185	0.16~0.26	4.97 4.83	MSGA4-35 MSGB4-35
10 x 3.3 12 x 3.3	1940	1930	198	197	0.16~0.26	5.25 5.11	MSGA4-36 MSGB4-36
12 x 3.3 14 x 3.8	2120	2290	216	234	0.16~0.26	6.49 6.33	MSGA4-40 MSGB4-40
12 x 3.3 14 x 3.8	2460	2930	251	299	0.16~0.26	8.17 8.01	MSGA4-45 MSGB4-45
12 x 3.3 14 x 3.8	2660	3350	272	342	0.16~0.26	7.97 7.81	MSGA4-48 MSGB4-48
12 x 3.3 14 x 3.8	2800	3650	285	372	0.16~0.26	8.71 8.37	MSGA4-50 MSGB4-50

NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

An example of KHK's inspection report on various pitch errors.

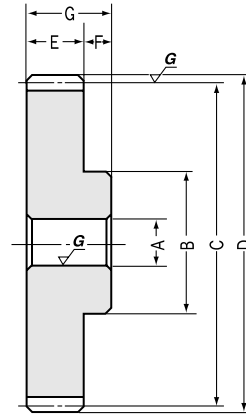
The precision of spur gear (JIS B 1702-1) is determined by factors such as single pitch error, pitch variation error, accumulated pitch error, tooth profile error, run out error, lead error etc.





SSG Ground Spur Gears **Module 1**

Spur Gears



S1 Shape

Module 1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width <small>NOTE 1</small>	Hub width	Total length	Keyway
				A _{H7}	B	C	D	E	F	G	Width × Depth
SSG1-15	m1.	15	S1	6	12	15	17	8	10	18	—
SSG1-16		16	S1	6	13	16	18				
SSG1-17		17	S1	6	14	17	19				
SSG1-18		18	S1	6	15	18	20				
SSG1-19		19	S1	6	16	19	21				
SSG1-20		20	S1	6	17	20	22	8	10	18	—
SSG1-21		21	S1	8	18	21	23				
SSG1-22		22	S1	8	18	22	24				
SSG1-23		23	S1	8	20	23	25				
SSG1-24		24	S1	8	20	24	26				
SSG1-25		25	S1	8	20	25	27	8	10	18	—
SSG1-26		26	S1	8	20	26	28				
SSG1-27		27	S1	8	20	27	29				
SSG1-28		28	S1	8	20	28	30				
SSG1-29		29	S1	8	25	29	31				
SSG1-30		30	S1	10	25	30	32	8	10	18	—
SSG1-32		32	S1	10	25	32	34				
SSG1-34		34	S1	10	25	34	36				
SSG1-35		35	S1	10	25	35	37				
SSG1-36		36	S1	10	25	36	38				
SSG1-38		38	S1	10	30	38	40	5	10	18	—
SSG1-40		40	S1	10	30	40	42				
SSG1-42		42	S1	10	30	42	44				
SSG1-44		44	S1	10	30	44	46				
SSG1-45		45	S1	10	30	45	47				
SSG1-48		48	S1	10	30	48	50	8	10	18	—
SSG1-50		50	S1	12	35	50	52				
SSG1-55		55	S1	12	35	55	57				
SSG1-56		56	S1	12	35	56	58				
SSG1-60		60	S1	12	40	60	62				
SSG1-64	64	S1	12	40	64	66	8	10	18	—	
SSG1-70	70	S1	12	40	70	72					
SSG1-75	75	S1	12	40	75	77					
SSG1-80	80	S1	15	50	80	82					
SSG1-90	90	S1	15	50	90	92					
SSG1-100	100	S1	15	50	100	102	8	10	18	—	
SSG1-120	120	S1	15	50	120	122					

NOTE 1: Secondary operations may be performed on these gears except for modification of the gear face width.



Specifications

Precision grade	JIS N7 grade (JIS B1702-1: 1996) OLD JIS 3 grade (JIS B1702: 1976)	Tooth hardness	48~53HRC
Gear teeth	Standard full depth	Surface treatment	Black oxide except ground surfaces
Pressure angle	20°	Tooth surface finish	Ground
Material	S45C	Datum reference surface for gear grinding	Bore
Heat treatment	Tooth surface Induction hardened	Secondary Operations	Possible except tooth area

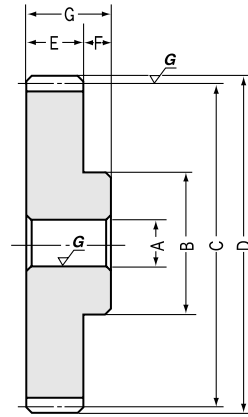
Threaded hole		Allowable torque (N · m) <small>NOTE 2</small>		Allowable torque (kgf · m)		Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
Thread size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	2.96	1.03	0.30	0.11	0.08~0.16	0.016	SSG1-15
—	—	3.28	1.19	0.33	0.12	0.08~0.16	0.019	SSG1-16
—	—	3.60	1.36	0.37	0.14	0.08~0.16	0.022	SSG1-17
—	—	3.93	1.54	0.40	0.16	0.08~0.16	0.026	SSG1-18
—	—	4.26	1.73	0.43	0.18	0.08~0.16	0.030	SSG1-19
—	—	4.60	1.94	0.47	0.20	0.08~0.16	0.034	SSG1-20
—	—	4.94	2.14	0.50	0.22	0.08~0.16	0.035	SSG1-21
—	—	5.28	2.36	0.54	0.24	0.08~0.16	0.037	SSG1-22
—	—	5.63	2.59	0.57	0.26	0.08~0.16	0.044	SSG1-23
—	—	5.98	2.83	0.61	0.29	0.08~0.16	0.046	SSG1-24
—	—	6.33	3.07	0.65	0.31	0.08~0.16	0.048	SSG1-25
—	—	6.68	3.33	0.68	0.34	0.08~0.16	0.051	SSG1-26
—	—	7.04	3.60	0.72	0.37	0.08~0.16	0.054	SSG1-27
—	—	7.39	3.89	0.75	0.40	0.08~0.16	0.056	SSG1-28
—	—	7.75	4.18	0.79	0.43	0.08~0.16	0.073	SSG1-29
—	—	8.11	4.48	0.83	0.46	0.08~0.16	0.072	SSG1-30
—	—	7.37	4.27	0.75	0.43	0.08~0.16	0.078	SSG1-32
—	—	7.98	4.84	0.81	0.49	0.08~0.16	0.084	SSG1-34
—	—	8.28	5.14	0.84	0.52	0.08~0.16	0.088	SSG1-35
—	—	8.59	5.45	0.88	0.56	0.08~0.16	0.091	SSG1-36
—	—	9.21	6.10	0.94	0.62	0.08~0.16	0.12	SSG1-38
—	—	9.83	6.79	1.00	0.69	0.08~0.16	0.12	SSG1-40
—	—	10.5	7.51	1.07	0.77	0.08~0.16	0.13	SSG1-42
—	—	11.1	8.28	1.13	0.84	0.08~0.16	0.14	SSG1-44
—	—	11.4	8.67	1.16	0.88	0.08~0.16	0.14	SSG1-45
—	—	12.3	9.92	1.26	1.01	0.08~0.16	0.16	SSG1-48
—	—	13.0	10.8	1.32	1.10	0.08~0.16	0.18	SSG1-50
—	—	14.6	13.2	1.48	1.34	0.10~0.18	0.21	SSG1-55
—	—	14.9	13.7	1.52	1.40	0.10~0.18	0.21	SSG1-56
—	—	16.2	15.8	1.65	1.61	0.10~0.18	0.26	SSG1-60
—	—	17.4	18.1	1.78	1.84	0.10~0.18	0.28	SSG1-64
—	—	19.4	21.8	1.97	2.22	0.10~0.18	0.32	SSG1-70
—	—	21.0	25.2	2.14	2.57	0.10~0.18	0.36	SSG1-75
—	—	22.6	28.8	2.30	2.94	0.10~0.18	0.44	SSG1-80
—	—	25.8	36.9	2.64	3.77	0.10~0.18	0.53	SSG1-90
—	—	26.9	42.5	2.74	4.34	0.10~0.18	0.62	SSG1-100
—	—	32.9	62.5	3.36	6.37	0.12~0.20	0.84	SSG1-120

NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SSG Ground Spur Gears **Module 1.5**



S1 Shape

Module 1.5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width <small>NOTE 1</small>	Hub width	Total length	Keyway
				A _{H7}	B	C	D	E	F	G	Width × Depth
SSG1.5-14	m1.5	14	S1	10	17	21	24	15	14	29	—
SSG1.5-15		15	S1	10	18	22.5	25.5				
SSG1.5-16		16	S1	10	20	24	27				
SSG1.5-17		17	S1	10	21	25.5	28.5				
SSG1.5-18		18	S1	10	22	27	30				
SSG1.5-19		19	S1	10	23	28.5	31.5				
SSG1.5-20		20	S1	10	24	30	33				
SSG1.5-21		21	S1	10	25	31.5	34.5				
SSG1.5-22		22	S1	12	26	33	36				
SSG1.5-23		23	S1	12	27	34.5	37.5				
SSG1.5-24		24	S1	12	28	36	39	15	14	29	—
SSG1.5-25		25	S1	12	30	37.5	40.5				
SSG1.5-26		26	S1	12	32	39	42				
SSG1.5-27		27	S1	15	34	40.5	43.5				
SSG1.5-28		28	S1	15	36	42	45				
SSG1.5-29		30	S1	15	37	43.5	46.5				
SSG1.5-30		32	S1	15	38	45	48				
SSG1.5-32		34	S1	15	40	48	51				
SSG1.5-34		35	S1	15	42	51	54				
SSG1.5-35		36	S1	15	42	52.5	55.5				
SSG1.5-36		36	S1	15	45	54	57	15	14	29	—
SSG1.5-38		38	S1	15	45	57	60				
SSG1.5-40		40	S1	15	50	60	63				
SSG1.5-42		42	S1	15	50	63	66				
SSG1.5-44		44	S1	15	50	66	69				
SSG1.5-45		45	S1	18	50	67.5	70.5				
SSG1.5-48		48	S1	18	50	72	75				
SSG1.5-50		50	S1	18	60	75	78				
SSG1.5-55		55	S1	18	60	82.5	85.5				
SSG1.5-56		56	S1	18	60	84	87				
SSG1.5-60	60	S1	20	60	90	93	15	14	29	—	
SSG1.5-64	64	S1	20	60	96	99					
SSG1.5-70	70	S1	20	60	105	108					
SSG1.5-75	75	S1	20	60	112.5	115.5					
SSG1.5-80	80	S1	20	70	120	123					
SSG1.5-90	100	S1	20	70	135	138					15
SSG1.5-100	120	S1	20	70	150	153					

NOTE 1: Secondary operations may be performed on these gears except for modification of the gear face width.



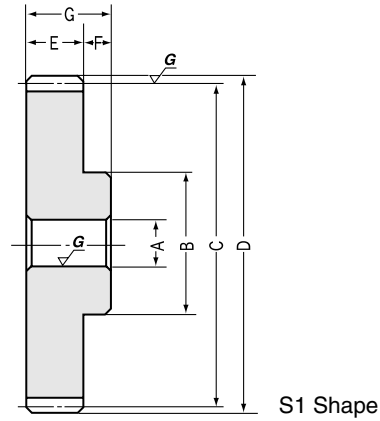
Specifications

Precision grade	JIS N7 grade (JIS B1702-1: 1998) OLD JIS 3 grade (JIS B1702: 1976)	Tooth hardness	48~53HRC
Gear teeth	Standard full depth	Surface treatment	Black oxide except ground surfaces
Pressure angle	20°	Tooth surface finish	Ground
Material	S45C	Datum reference surface for gear grinding	Bore
Heat treatment	Tooth surface Induction hardened	Secondary Operations	Possible except tooth area

Threaded hole		Allowable torque (N · m) <small>NOTE 2</small>		Allowable torque (kgf · m)		Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
Thread size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	11.1	3.73	1.14	0.38	0.08~0.16	0.048	SSG1.5-14
—	—	12.5	4.35	1.27	0.44	0.08~0.16	0.057	SSG1.5-15
—	—	13.8	5.02	1.41	0.51	0.08~0.16	0.070	SSG1.5-16
—	—	15.2	5.74	1.55	0.58	0.08~0.16	0.080	SSG1.5-17
—	—	16.6	6.51	1.69	0.66	0.08~0.16	0.091	SSG1.5-18
—	—	18.0	7.33	1.83	0.75	0.08~0.16	0.10	SSG1.5-19
—	—	19.4	8.20	1.98	0.84	0.08~0.16	0.12	SSG1.5-20
—	—	20.8	9.12	2.12	0.93	0.08~0.16	0.13	SSG1.5-21
—	—	18.6	8.41	1.89	0.86	0.08~0.16	0.13	SSG1.5-22
—	—	19.8	9.27	2.02	0.95	0.08~0.16	0.15	SSG1.5-23
—	—	21.0	10.2	2.14	1.04	0.08~0.16	0.16	SSG1.5-24
—	—	22.2	11.1	2.27	1.13	0.08~0.16	0.18	SSG1.5-25
—	—	23.5	12.1	2.39	1.23	0.08~0.16	0.20	SSG1.5-26
—	—	24.7	13.1	2.52	1.33	0.08~0.16	0.21	SSG1.5-27
—	—	26.0	14.1	2.65	1.44	0.08~0.16	0.23	SSG1.5-28
—	—	27.3	15.2	2.78	1.55	0.08~0.16	0.25	SSG1.5-29
—	—	28.5	16.3	2.91	1.66	0.08~0.16	0.27	SSG1.5-30
—	—	31.1	18.6	3.17	1.90	0.08~0.16	0.31	SSG1.5-32
—	—	33.6	21.1	3.43	2.15	0.10~0.18	0.35	SSG1.5-34
—	—	34.9	22.4	3.56	2.29	0.10~0.18	0.37	SSG1.5-35
—	—	36.2	23.8	3.70	2.43	0.10~0.18	0.40	SSG1.5-36
—	—	38.8	26.6	3.96	2.71	0.10~0.18	0.44	SSG1.5-38
—	—	41.5	29.6	4.23	3.02	0.10~0.18	0.51	SSG1.5-40
—	—	44.1	32.8	4.50	3.35	0.10~0.18	0.54	SSG1.5-42
—	—	46.7	36.2	4.77	3.69	0.10~0.18	0.58	SSG1.5-44
—	—	48.1	37.9	4.90	3.86	0.10~0.18	0.58	SSG1.5-45
—	—	52.0	43.4	5.31	4.42	0.10~0.18	0.64	SSG1.5-48
—	—	54.7	47.2	5.58	4.82	0.10~0.18	0.77	SSG1.5-50
—	—	61.4	57.7	6.26	5.88	0.10~0.18	0.88	SSG1.5-55
—	—	62.8	59.9	6.40	6.11	0.10~0.18	0.91	SSG1.5-56
—	—	68.1	69.2	6.95	7.06	0.10~0.18	0.99	SSG1.5-60
—	—	67.9	73.2	6.92	7.46	0.10~0.18	1.09	SSG1.5-64
—	—	75.4	88.4	7.69	9.01	0.12~0.20	1.26	SSG1.5-70
—	—	81.7	102	8.33	10.4	0.12~0.20	1.41	SSG1.5-75
—	—	88.0	117	8.97	12.0	0.12~0.20	1.68	SSG1.5-80
—	—	101	150	10.3	15.3	0.12~0.20	2.04	SSG1.5-90
—	—	113	187	11.6	19.1	0.12~0.20	2.43	SSG1.5-100

NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



Module 2

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width <small>NOTE 1</small>	Hub width	Total length	Keyway
				A _{H7}	B	C	D	E	F	G	Width × Depth
SSG2-14	m2	14	S1	12	22	28	32	20	16	36	—
SSG2-15		15	S1	12	24	30	34				
SSG2-16		16	S1	12	26	32	36				
SSG2-17		17	S1	12	28	34	38				
SSG2-18		18	S1	12	30	36	40				
SSG2-19		19	S1	12	31	38	42	20	16	36	—
SSG2-20		20	S1	15	32	40	44				
SSG2-21		21	S1	15	34	42	46				
SSG2-22		22	S1	15	36	44	48				
SSG2-23		23	S1	15	37	46	50				
SSG2-24		24	S1	15	38	48	52	20	16	36	—
SSG2-25		25	S1	15	40	50	54				
SSG2-26		26	S1	15	42	52	56				
SSG2-27		27	S1	15	44	54	58				
SSG2-28		28	S1	15	45	56	60				
SSG2-29		30	S1	15	48	58	62	20	16	36	—
SSG2-30		32	S1	18	50	60	64				
SSG2-32		34	S1	18	50	64	68				
SSG2-34		35	S1	18	50	68	72				
SSG2-35		36	S1	18	50	70	74				
SSG2-36		36	S1	18	50	72	76	20	16	36	—
SSG2-38		38	S1	18	50	76	80				
SSG2-40		40	S1	20	60	80	84				
SSG2-42		42	S1	20	60	84	88				
SSG2-44		44	S1	20	60	88	92				
SSG2-45		45	S1	20	60	90	94	20	16	36	—
SSG2-48		48	S1	20	60	96	100				
SSG2-50		50	S1	25	60	100	104				
SSG2-55		55	S1	25	60	110	114				
SSG2-56		56	S1	25	60	112	116				
SSG2-60	60	S1	25	65	120	124	20	16	36	—	
SSG2-64	64	S1	25	65	128	132					
SSG2-70	70	S1	25	70	140	144					
SSG2-75	75	S1	25	70	150	154					
SSG2-80	80	S1	25	80	160	164					
SSG2-90	100	S1	25	80	180	184	20	16	36	—	
SSG2-100	120	S1	25	80	200	204					

NOTE 1: Secondary operations may be performed on these gears except for modification of the gear face width.



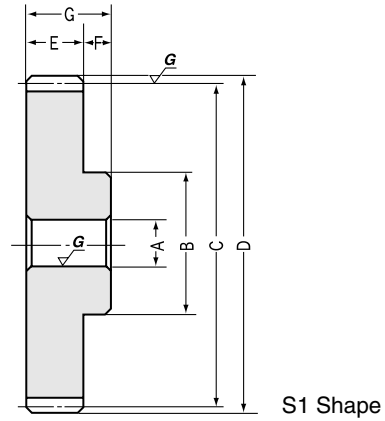
Specifications

Precision grade	JIS N7 grade (JIS B1702-1: 1998) OLD JIS 3 grade (JIS B1702: 1976)	Tooth hardness	48~53HRC
Gear teeth	Standard full depth	Surface treatment	Black oxide except ground surfaces
Pressure angle	20°	Tooth surface finish	Ground
Material	S45C	Datum reference surface for gear grinding	Bore
Heat treatment	Tooth surface Induction hardened	Secondary Operations	Possible except tooth area

Threaded hole		Allowable torque (N · m) <small>NOTE 2</small>		Allowable torque (kgf · m)		Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
Thread size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	26.4	9.01	2.69	0.92	0.10~0.20	0.11	SSG2-14
—	—	29.6	10.5	3.01	1.07	0.10~0.20	0.14	SSG2-15
—	—	27.3	10.1	2.78	1.03	0.10~0.20	0.16	SSG2-16
—	—	30.0	11.6	3.06	1.18	0.10~0.20	0.19	SSG2-17
—	—	32.7	13.1	3.34	1.34	0.10~0.20	0.22	SSG2-18
—	—	35.5	14.8	3.62	1.51	0.10~0.20	0.24	SSG2-19
—	—	38.3	16.6	3.91	1.69	0.10~0.20	0.25	SSG2-20
—	—	41.1	18.4	4.20	1.88	0.10~0.20	0.28	SSG2-21
—	—	44.0	20.4	4.49	2.08	0.10~0.20	0.32	SSG2-22
—	—	46.9	22.5	4.78	2.30	0.10~0.20	0.35	SSG2-23
—	—	49.8	24.7	5.08	2.52	0.10~0.20	0.38	SSG2-24
—	—	52.7	27.0	5.38	2.75	0.10~0.20	0.42	SSG2-25
—	—	55.7	29.3	5.68	2.99	0.12~0.22	0.46	SSG2-26
—	—	58.6	31.7	5.98	3.23	0.12~0.22	0.50	SSG2-27
—	—	61.6	34.2	6.28	3.49	0.12~0.22	0.54	SSG2-28
—	—	64.6	36.8	6.59	3.75	0.12~0.22	0.59	SSG2-29
—	—	67.6	39.5	6.89	4.03	0.12~0.22	0.62	SSG2-30
—	—	73.7	45.2	7.51	4.61	0.12~0.22	0.68	SSG2-32
—	—	79.8	51.3	8.13	5.23	0.12~0.22	0.74	SSG2-34
—	—	82.8	54.5	8.45	5.56	0.12~0.22	0.78	SSG2-35
—	—	85.9	57.8	8.76	5.90	0.12~0.22	0.81	SSG2-36
—	—	92.1	64.8	9.39	6.60	0.12~0.22	0.89	SSG2-38
—	—	98.3	72.1	10.0	7.35	0.12~0.22	1.06	SSG2-40
—	—	105	79.9	10.7	8.15	0.12~0.22	1.14	SSG2-42
—	—	111	88.1	11.3	8.98	0.12~0.22	1.22	SSG2-44
—	—	114	92.3	11.6	9.41	0.12~0.22	1.27	SSG2-45
—	—	114	97.6	11.6	9.95	0.12~0.22	1.40	SSG2-48
—	—	120	106	12.2	10.8	0.12~0.22	1.45	SSG2-50
—	—	134	130	13.7	13.3	0.14~0.24	1.71	SSG2-55
—	—	137	135	14.0	13.8	0.14~0.24	1.76	SSG2-56
—	—	149	156	15.2	15.9	0.14~0.24	2.05	SSG2-60
—	—	161	179	16.4	18.3	0.14~0.24	2.30	SSG2-64
—	—	179	216	18.2	22.0	0.14~0.24	2.76	SSG2-70
—	—	194	249	19.7	25.4	0.14~0.24	3.12	SSG2-75
—	—	194	265	19.8	27.0	0.14~0.24	3.65	SSG2-80
—	—	222	338	22.6	34.5	0.14~0.24	4.49	SSG2-90
—	—	250	421	25.4	43.0	0.14~0.24	5.42	SSG2-100

NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



Module 2.5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width <small>NOTE 1</small>	Hub width	Total length	Keyway
				A _{H7}	B	C	D	E	F	G	Width × Depth
SSG2.5-14	m2.5	14	S1	15	28	35	40	25	18	43	—
SSG2.5-15		15	S1	15	30	37.5	42.5				
SSG2.5-16		16	S1	15	32	40	45				
SSG2.5-17		17	S1	15	35	42.5	47.5				
SSG2.5-18		18	S1	15	38	45	50	25	18	43	—
SSG2.5-19		19	S1	15	39	47.5	52.5				
SSG2.5-20		20	S1	18	40	50	55				
SSG2.5-21		21	S1	18	42	52.5	57.5				
SSG2.5-22		22	S1	18	44	55	60				
SSG2.5-23		23	S1	18	46	57.5	62.5	25	18	43	—
SSG2.5-24		24	S1	18	48	60	65				
SSG2.5-25		25	S1	20	50	62.5	67.5				
SSG2.5-26		26	S1	20	54	65	70				
SSG2.5-27		27	S1	20	56	67.5	72.5	25	18	43	—
SSG2.5-28		28	S1	20	60	70	75				
SSG2.5-29		30	S1	20	60	72.5	77.5				
SSG2.5-30		32	S1	20	65	75	80				
SSG2.5-32		34	S1	20	70	80	85	25	18	43	—
SSG2.5-34		35	S1	20	70	85	90				
SSG2.5-35		36	S1	20	70	87.5	92.5				
SSG2.5-36		36	S1	20	70	90	95				
SSG2.5-38		38	S1	20	70	95	100				
SSG2.5-40		40	S1	25	70	100	105				
SSG2.5-42		42	S1	25	75	105	110				
SSG2.5-44		44	S1	25	75	110	115	25	18	43	—
SSG2.5-45		45	S1	25	75	112.5	117.5				
SSG2.5-48		48	S1	25	75	120	125				
SSG2.5-50		50	S1	25	80	125	130				
SSG2.5-55		55	S1	25	80	137.5	142.5	25	18	43	—
SSG2.5-56		56	S1	25	80	140	145				
SSG2.5-60		60	S1	25	80	150	155	25	18	43	—
SSG2.5-70		70	S1	25	80	175	180				
SSG2.5-75	75	S1	25	90	187.5	192.5					
SSG2.5-80	80	S1	25	90	200	205					

NOTE 1: Secondary operations may be performed on these gears except for modification of the gear face width.



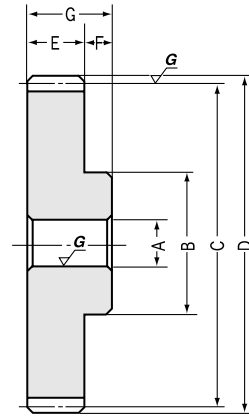
Specifications

Precision grade	JIS N7 grade (JIS B1702-1: 1996) OLD JIS 3 grade (JIS B1702: 1976)	Tooth hardness	48~53HRC
Gear teeth	Standard full depth	Surface treatment	Black oxide except ground surfaces
Pressure angle	20°	Tooth surface finish	Ground
Material	S45C	Datum reference surface for gear grinding	Bore
Heat treatment	Tooth surface Induction hardened	Secondary Operations	Possible except tooth area

Threaded hole		Allowable torque (N · m) <small>NOTE 2</small>		Allowable torque (kgf · m)		Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
Thread size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	43.0	14.9	4.39	1.52	0.10~0.20	0.22	SSG2.5-14
—	—	48.1	17.4	4.91	1.77	0.10~0.20	0.26	SSG2.5-15
—	—	53.3	20.1	5.44	2.05	0.10~0.20	0.30	SSG2.5-16
—	—	58.6	23.0	5.97	2.34	0.10~0.20	0.35	SSG2.5-17
—	—	63.9	26.1	6.52	2.66	0.10~0.20	0.41	SSG2.5-18
—	—	69.4	29.4	7.07	3.00	0.10~0.20	0.46	SSG2.5-19
—	—	74.8	32.9	7.63	3.36	0.10~0.20	0.48	SSG2.5-20
—	—	80.4	36.7	8.20	3.74	0.12~0.22	0.53	SSG2.5-21
—	—	86.0	40.6	8.77	4.14	0.12~0.22	0.60	SSG2.5-22
—	—	91.6	44.8	9.34	4.57	0.12~0.22	0.66	SSG2.5-23
—	—	97.3	49.2	9.92	5.02	0.12~0.22	0.72	SSG2.5-24
—	—	103	53.8	10.5	5.48	0.12~0.22	0.77	SSG2.5-25
—	—	109	58.4	11.1	5.95	0.12~0.22	0.87	SSG2.5-26
—	—	115	63.2	11.7	6.44	0.12~0.22	0.94	SSG5.5-27
—	—	120	68.2	12.3	6.95	0.12~0.22	1.05	SSG2.5-28
—	—	126	73.3	12.9	7.48	0.12~0.22	1.10	SSG2.5-29
—	—	132	78.7	13.5	8.03	0.12~0.22	1.23	SSG2.5-30
—	—	144	90.1	14.7	9.19	0.12~0.22	1.42	SSG2.5-32
—	—	156	102	15.9	10.4	0.12~0.22	1.55	SSG2.5-34
—	—	162	109	16.5	11.1	0.12~0.22	1.62	SSG2.5-35
—	—	168	115	17.1	11.8	0.12~0.22	1.69	SSG2.5-36
—	—	180	129	18.3	13.2	0.12~0.22	1.83	SSG2.5-38
—	—	177	133	18.1	13.6	0.12~0.22	1.92	SSG2.5-40
—	—	188	147	19.2	15.0	0.14~0.24	2.16	SSG2.5-42
—	—	200	163	20.4	16.6	0.14~0.24	2.32	SSG2.5-44
—	—	205	170	20.9	17.4	0.14~0.24	2.41	SSG2.5-45
—	—	222	195	22.7	19.9	0.14~0.24	2.68	SSG2.5-48
—	—	234	213	23.8	21.7	0.14~0.24	2.95	SSG2.5-50
—	—	262	260	26.8	26.5	0.14~0.24	3.46	SSG2.5-55
—	—	268	270	27.3	27.5	0.14~0.24	3.57	SSG2.5-56
—	—	291	311	29.7	31.8	0.14~0.24	4.01	SSG2.5-60
—	—	324	399	33.1	40.7	0.14~0.24	5.26	SSG2.5-70
—	—	351	461	35.8	47.0	0.14~0.24	6.15	SSG2.5-75
—	—	378	527	38.6	53.7	0.14~0.24	6.90	SSG2.5-80

NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



S1 Shape

Module 3

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width <small>NOTE 1</small>	Hub width	Total length	Keyway
				A _{H7}	B	C	D	E	F	G	Width × Depth
SSG3-14	m3	14	S1	16	34	42	48	30	20	50	—
SSG3-15		15	S1	16	36	45	51				
SSG3-16		16	S1	16	38	48	54				
SSG3-17		17	S1	16	37	51	57				
SSG3-18		18	S1	16	40	54	60				
SSG3-19		19	S1	16	45	57	63	30	20	50	—
SSG3-20		20	S1	20	50	60	66				
SSG3-21		21	S1	20	52	63	69				
SSG3-22		22	S1	20	54	66	72				
SSG3-23		23	S1	20	56	69	75				
SSG3-24		24	S1	20	58	72	78	30	20	50	—
SSG3-25		25	S1	20	60	75	81				
SSG3-26		26	S1	20	62	78	84				
SSG3-27		27	S1	20	65	81	87				
SSG3-28		28	S1	20	70	84	90				
SSG3-29		30	S1	20	70	87	93	30	20	50	—
SSG3-30		32	S1	25	75	90	96				
SSG3-32		34	S1	25	75	96	102				
SSG3-34		35	S1	25	75	102	108				
SSG3-35		36	S1	25	80	105	111				
SSG3-36		36	S1	25	80	108	114	30	20	50	—
SSG3-38		38	S1	25	80	114	120				
SSG3-40		40	S1	25	80	120	126				
SSG3-42		42	S1	25	80	126	132				
SSG3-44		44	S1	25	80	132	138				
SSG3-45		45	S1	25	80	135	141	30	20	50	—
SSG3-48		48	S1	25	85	144	150				
SSG3-50		50	S1	30	85	150	156				
SSG3-55		55	S1	30	90	165	171				
SSG3-56		56	S1	30	90	168	174				
SSG3-60		60	S1	30	100	180	186	30	20	50	—
SSG3-70		70	S1	30	100	210	216				
SSG3-75	75	S1	30	100	225	231					
SSG3-80	80	S1	30	100	240	246					

NOTE 1: Secondary operations may be performed on these gears except for modification of the gear face width.



Specifications

Precision grade	JIS N7 grade (JIS B1702-1: 1998) OLD JIS 3 grade (JIS B1702: 1976)	Tooth hardness	48~53HRC
Gear teeth	Standard full depth	Surface treatment	Black oxide except ground surfaces
Pressure angle	20°	Tooth surface finish	Ground
Material	S45C	Datum reference surface for gear grinding	Bore
Heat treatment	Tooth surface Induction hardened	Secondary Operations	Possible except tooth area

Threaded hole		Allowable torque (N · m) <small>NOTE 2</small>		Allowable torque (kgf · m)		Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
Thread size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	74.3	26.1	7.58	2.66	0.10~0.20	0.39	SSG3-14
—	—	83.1	30.5	8.48	3.11	0.10~0.20	0.46	SSG3-15
—	—	92.1	35.2	9.39	3.59	0.10~0.20	0.53	SSG3-16
—	—	101	40.3	10.3	4.11	0.12~0.22	0.57	SSG3-17
—	—	110	45.8	11.3	4.67	0.12~0.22	0.66	SSG3-18
—	—	120	51.6	12.2	5.26	0.12~0.22	0.77	SSG3-19
—	—	129	57.8	13.2	5.90	0.12~0.22	0.85	SSG3-20
—	—	139	64.4	14.2	6.57	0.12~0.22	0.94	SSG3-21
—	—	149	71.3	15.1	7.28	0.12~0.22	1.04	SSG3-22
—	—	158	78.7	16.1	8.02	0.12~0.22	1.14	SSG3-23
—	—	168	86.4	17.1	8.81	0.12~0.22	1.25	SSG3-24
—	—	178	94.5	18.1	9.64	0.12~0.22	1.36	SSG3-25
—	—	188	103	19.2	10.5	0.12~0.22	1.48	SSG3-26
—	—	198	111	20.2	11.3	0.12~0.22	1.61	SSG3-27
—	—	208	120	21.2	12.2	0.12~0.22	1.79	SSG3-28
—	—	218	129	22.2	13.2	0.12~0.22	1.88	SSG3-29
—	—	228	138	23.3	14.1	0.12~0.22	2.00	SSG3-30
—	—	229	146	23.4	14.9	0.12~0.22	2.21	SSG3-32
—	—	248	166	25.3	17.0	0.14~0.24	2.43	SSG3-34
—	—	258	177	26.3	18.0	0.14~0.24	2.64	SSG3-35
—	—	268	188	27.3	19.1	0.14~0.24	2.75	SSG3-36
—	—	287	210	29.2	21.4	0.14~0.24	3.00	SSG3-38
—	—	306	234	31.2	23.9	0.14~0.24	3.26	SSG3-40
—	—	326	260	33.2	26.5	0.14~0.24	3.53	SSG3-42
—	—	345	286	35.2	29.2	0.14~0.24	3.82	SSG3-44
—	—	355	300	36.2	30.6	0.14~0.24	3.97	SSG3-45
—	—	384	343	39.2	35.0	0.14~0.24	4.53	SSG3-48
—	—	404	374	41.2	38.1	0.14~0.24	4.78	SSG3-50
—	—	421	423	42.9	43.2	0.14~0.24	5.76	SSG3-55
—	—	430	439	43.9	44.8	0.14~0.24	5.94	SSG3-56
—	—	467	508	47.6	51.8	0.14~0.24	6.95	SSG3-60
—	—	560	699	57.1	71.3	0.14~0.24	9.11	SSG3-70
—	—	607	806	61.9	82.2	0.14~0.24	10.3	SSG3-75
—	—	654	921	66.7	93.9	0.14~0.24	11.6	SSG3-80

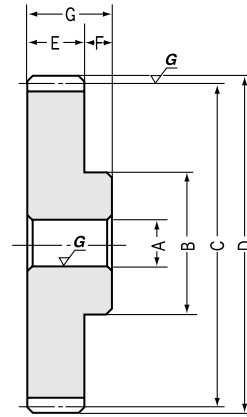
NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SSG Ground Spur Gears **Module 4**

Spur Gears



S1 Shape

Module 4

Catalog No. <small>New items indicated in blue letters.</small>	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width <small>NOTE 1</small>	Hub width	Total length
				A _{H7}	B	C	D	E	F	G
SSG4-14	m4	14	S1	20	40	56	64	40	25	65
SSG4-15		15	S1	20	45	60	68	40	25	65
SSG4-16		16	S1	20	50	64	72	40	25	65
SSG4-18		18	S1	20	60	72	80	40	25	65
SSG4-20		20	S1	20	65	80	88	40	25	65
SSG4-22		22	S1	20	70	88	96	40	25	65
SSG4-24		24	S1	20	75	96	104	40	25	65
SSG4-25		25	S1	20	80	100	108	40	25	65
SSG4-28		28	S1	20	85	112	120	40	25	65
SSG4-30		30	S1	20	90	120	128	40	25	65
SSG4-32		32	S1	25	90	128	136	40	25	65
SSG4-35		35	S1	25	90	140	148	40	25	65
SSG4-36		36	S1	25	90	144	152	40	25	65
SSG4-40		40	S1	25	90	160	168	40	25	65
SSG4-42		42	S1	25	90	168	176	40	25	65
SSG4-44		44	S1	30	90	176	184	40	25	65
SSG4-45		45	S1	30	90	180	188	40	25	65
SSG4-48		48	S1	30	100	192	200	40	25	65
SSG4-50		50	S1	30	100	200	208	40	25	65
SSG4-55		55	S1	30	100	220	228	40	25	65
SSG4-56	56	S1	30	110	224	232	40	25	65	
SSG4-60	60	S1	30	110	240	248	40	25	65	

NOTE 1: Secondary operations may be performed on these gears except for modification of the gear face width.



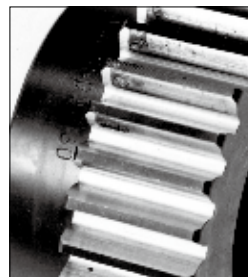
Specifications

Precision grade	JIS N7 grade (JIS B1702-1: 1998) OLD JIS 3 grade (JIS B1702: 1976)	Tooth hardness	48~53HRC
Gear teeth	Standard full depth	Surface treatment	Black oxide except ground surfaces
Pressure angle	20°	Tooth surface finish	Ground
Material	S45C	Datum reference surface for gear grinding	Bore
Heat treatment	Tooth surface Induction hardened	Secondary Operations	Possible except tooth area

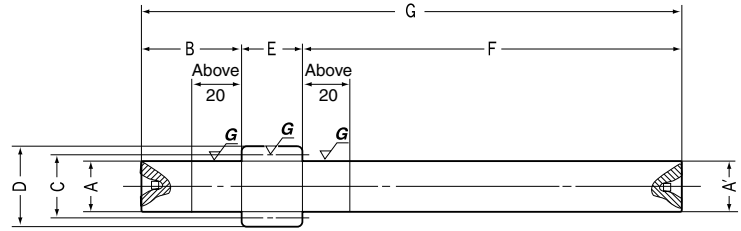
Allowable torque (N · m) <small>NOTE 2</small>		Allowable torque (kgf · m)		Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No. <small>New items indicated in blue letters.</small>
Bending strength	Surface durability	Bending strength	Surface durability			
176	63.4	18.0	6.47	0.14~0.24	0.86	SSG4-14
197	74.1	20.1	7.55	0.14~0.24	1.04	SSG4-15
218	85.6	22.3	8.73	0.14~0.24	1.24	SSG4-16
262	111	26.7	11.4	0.14~0.24	1.67	SSG4-18
307	141	31.3	14.3	0.14~0.24	2.07	SSG4-20
352	174	35.9	17.7	0.14~0.24	2.50	SSG4-22
368	194	37.5	19.8	0.14~0.24	2.98	SSG4-24
389	213	39.7	21.7	0.14~0.24	3.29	SSG4-25
455	270	46.4	27.5	0.16~0.26	4.05	SSG4-28
499	313	50.9	31.9	0.16~0.26	4.64	SSG4-30
544	358	55.5	36.5	0.16~0.26	5.04	SSG4-32
612	432	62.4	44.0	0.16~0.26	5.83	SSG4-35
634	458	64.7	46.7	0.16~0.26	6.11	SSG4-36
674	529	68.7	54.0	0.16~0.26	7.31	SSG4-40
717	586	73.1	59.7	0.16~0.26	7.96	SSG4-42
760	646	77.5	65.8	0.16~0.26	8.53	SSG4-44
781	677	79.6	69.0	0.16~0.26	8.88	SSG4-45
846	774	86.3	79.0	0.16~0.26	10.3	SSG4-48
889	842	90.7	85.9	0.16~0.26	11.0	SSG4-50
998	1030	102	105	0.16~0.26	13.1	SSG4-55
1020	1060	104	109	0.16~0.26	13.9	SSG4-56
1110	1230	113	125	0.16~0.26	15.7	SSG4-60

NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



■ This picture is an example of poor tooth contact of an SSG3-30 gear which had only 30% of the gear tooth in proper contact. In this example the gear oil used is equivalent to JIS gear oil category 2, No.3, and the design conditions were 417 N·m load torque at 278 min⁻¹ (12 kW) which was 1.5 times the allowable bending strength and 3 times the allowable surface durability torque. The pitting occurred due to poor tooth contact area after 60 hours of continuous operation.



S7 Shape

Module 1.5~3

Catalog No.	Module	No. of teeth <i>NOTE 1</i>	Profile shift coefficient	Shape	Shaft dia. (L)	Shaft length (L)	Pitch dia.	Outside dia.	Face width <i>NOTE 2</i>	Shaft dia. (R)	Shaft length (R)	Total length
					A'	F'	C	D	E	A	F	G
SSGS1.5-10	m1.5	10	+0.5	S7	12.2	25	15	19.35	15	12.2	100	140
SSGS1.5-11		11	+0.5	S7	13.7	25	16.5	20.85	15	13.7	100	140
SSGS1.5-12		12	0	S7	13.7	25	18	21	15	13.7	100	140
SSGS1.5-13		13	0	S7	15.2	25	19.5	22.5	15	15.2	100	140
SSGS2-10	m2	10	+0.5	S7	16.2	30	20	25.8	20	16.2	120	170
SSGS2-11		11	+0.5	S7	18.2	30	22	27.8	20	18.2	120	170
SSGS2-12		12	0	S7	18.2	30	24	28	20	18.2	120	170
SSGS2-13		13	0	S7	20.2	30	26	30	20	20.2	120	170
SSGS2.5-10	m2.5	10	+0.5	S7	20.2	35	25	32.25	25	20.2	135	195
SSGS2.5-11		11	+0.5	S7	22.7	35	27.5	34.75	25	22.7	135	195
SSGS2.5-12		12	0	S7	22.7	35	30	35	25	22.7	135	195
SSGS2.5-13		13	0	S7	25.2	35	32.5	37.5	25	25.2	135	195
SSGS3-10	m3	10	+0.5	S7	24.2	40	30	38.7	30	24.2	150	220
SSGS3-11		11	+0.5	S7	27.2	40	33	41.7	30	27.2	150	220
SSGS3-12		12	0	S7	27.2	40	36	42	30	27.2	150	220
SSGS3-13		13	0	S7	30.2	40	39	45	30	30.2	150	220

NOTE 1: Since 10- and 11-tooth gears are profile shifted gears ($x=+0.5$), please note that the center distance must be obtained by using the formulas for profile shifted gears.
NOTE 2: Secondary operations may be performed on these gears except for modification of the gear face width.

Center distance when gear has 12 to 30 teeth (unit:mm)

Number(x=0)	10	11
12	11.4410	11.9428
13	11.9428	12.4446
14	12.4446	12.9462
15	12.9462	13.4477
16	13.4477	13.9492
17	13.9492	14.4505
18	14.4505	14.9518
19	14.9518	15.4530
20	15.4530	15.9542
21	15.9542	16.4553
22	16.4553	16.9564
23	16.9564	17.4574
24	17.4574	17.9583
25	17.9583	18.4592
26	18.4592	18.9601
27	18.9601	19.4610
28	19.4610	19.9618
29	19.9618	20.4625
30	20.4625	20.9633

Center distance when gear has 32 to 62 teeth (unit:mm)

Number(x=0)	10	11
32	21.4640	21.9647
34	22.4653	22.9660
35	22.9660	23.4666
36	23.4666	23.9671
38	24.4677	24.9683
40	25.4688	25.9693
42	26.4698	26.9703
44	27.4707	27.9712
45	27.9712	28.4716
46	28.4716	28.9721
48	29.4725	29.9729
50	30.4733	30.9736
52	31.4740	31.9744
54	32.4747	32.9750
55	32.9750	33.4754
56	33.4754	33.9757
58	34.4760	34.9763
60	35.4766	35.9769
62	36.4772	36.9774

The following tables present the center distances when a profile shifted module 1 spur gears ($x=+0.5$) with 10 or 11 teeth meshes with standard stock spur gear ($x=0$). Multiply the values with the module of gears for other than module 1 gears.



Specifications

Precision grade	JIS N7 grade (JIS B1702-1: 1998) OLD JIS 3 grade (JIS B1702: 1976)	Tooth hardness	48~53HRC
Gear teeth	Standard full depth	Surface treatment	Black oxide except ground surfaces
Pressure angle	20°	Tooth surface finish	Ground
Material	S45C	Datum reference surface for gear grinding	Shaft (ground portion)
Heat treatment	Thermal refining, tooth surfaces induction hardened	Secondary Operations	Possible except tooth area

Allowable torque (N · m) <small>NOTE 3</small>		Allowable torque (kgf · m)		Backlash (mm) <small>NOTE 4</small>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
12.7	3.76	1.30	0.38	0.08~0.16	0.14	SSGS1.5-10 SSGS1.5-11 SSGS1.5-12 SSGS1.5-13
14.5	4.61	1.48	0.47	0.08~0.16	0.17	
12.0	4.70	1.22	0.48	0.08~0.16	0.17	
13.6	5.51	1.39	0.56	0.08~0.16	0.21	
30.2	9.07	3.08	0.93	0.11~0.21	0.30	SSGS2-10 SSGS2-11 SSGS2-12 SSGS2-13
34.3	11.0	3.50	1.12	0.11~0.21	0.38	
28.4	11.3	2.90	1.15	0.11~0.21	0.38	
32.3	13.3	3.30	1.35	0.11~0.21	0.46	
58.9	17.9	6.01	1.83	0.11~0.21	0.54	SSGS2.5-10 SSGS2.5-11 SSGS2.5-12 SSGS2.5-13
67.1	22.0	6.84	2.24	0.11~0.21	0.68	
55.5	22.4	5.66	2.28	0.11~0.21	0.68	
52.6	21.9	5.36	2.23	0.11~0.21	0.83	
102	31.3	10.4	3.19	0.11~0.21	0.89	SSGS3-10 SSGS3-11 SSGS3-12 SSGS3-13
96.6	31.9	9.85	3.26	0.11~0.21	1.10	
79.9	32.6	8.15	3.32	0.11~0.21	1.10	
90.9	38.3	9.27	3.91	0.11~0.21	1.40	

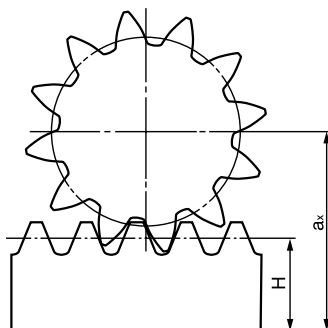
NOTE 3: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 4: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

■ Center distance when gear has 64 to 200 teeth (unit: mm)

Number(x=0)	Number(x=+0.5)	
	10	11
64	37.4777	37.9780
65	37.9780	38.4782
66	38.4782	38.9785
68	39.4787	39.9790
70	40.4792	40.9794
72	41.4796	41.9799
75	42.9803	43.4805
76	43.4805	43.9807
80	45.4813	45.9814
84	47.4820	47.9822
85	47.9822	48.4823
88	49.4826	49.9828
90	50.4830	50.9831
95	52.9837	53.4838
100	55.4844	55.9845
120	65.4866	65.9867
150	80.4890	80.9890
200	105.4915	105.9915

■ Assembly distance of profile shifted gear and meshing rack



$$a_x = \frac{zm}{2} + H + xm$$

where

a_x : Assembly distance

H: Height of pitch line of rack

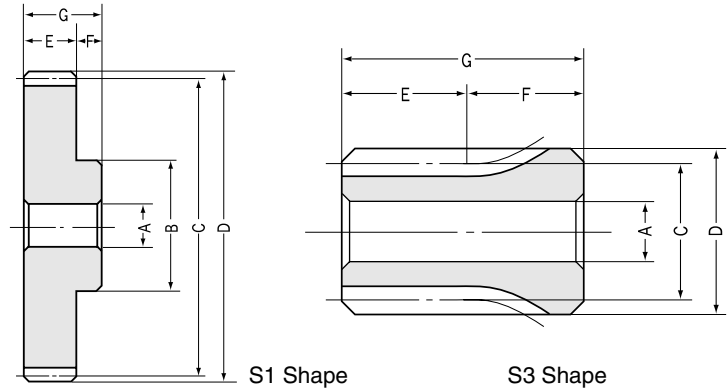
m: Module

z: No. of teeth

x: Coefficient of profile shift



SS Steel Spur Gears Module 1



Module 1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Keyway
				A _{H7}	B	C	D	E	F	G	Width × Depth
SS1-15	m1	15	S3	8	17	15	17	10	20	30	—
SS1-16		16	S3	8	18	16	18	10	20	30	—
SS1-17		17	S3	8	19	17	19	10	20	30	—
SS1-18		18	S3	8	20	18	20	10	20	30	—
SS1-19		19	S3	8	21	19	21	10	20	30	—
SS1-20		20	S1	8	16	20	22	10	20	30	—
SS1-21		21	S1	8	17	21	23	10	20	30	—
SS1-22		22	S1	8	18	22	24	10	20	30	—
SS1-23		23	S1	8	18	23	25	10	20	30	—
SS1-24		24	S1	8	20	24	26	10	20	30	—
SS1-25		25	S1	8	20	25	27	10	20	30	—
SS1-26		26	S1	8	22	26	28	10	20	30	—
SS1-27		27	S1	8	22	27	29	10	20	30	—
SS1-28		28	S1	8	22	28	30	10	20	30	—
SS1-29		29	S1	8	24	29	31	10	20	30	—
SS1-30		30	S1	10	25	30	32	10	20	30	—
SS1-32		32	S1	10	26	32	34	10	20	30	—
SS1-34		34	S1	10	26	34	36	10	20	30	—
SS1-35		35	S1	10	26	35	37	10	20	30	—
SS1-36		36	S1	10	28	36	38	10	20	30	—
SS1-38		38	S1	10	32	38	40	10	20	30	—
SS1-40		40	S1	10	35	40	42	10	20	30	—
SS1-42		42	S1	10	35	42	44	10	20	30	—
SS1-44		44	S1	10	35	44	46	10	20	30	—
SS1-45		45	S1	10	35	45	47	10	20	30	—
SS1-46		46	S1	10	35	46	48	10	20	30	—
SS1-48		48	S1	10	35	48	50	10	20	30	—
SS1-50		50	S1	10	35	50	52	10	20	30	—
SS1-52		52	S1	10	35	52	54	10	20	30	—
SS1-54		54	S1	10	35	54	56	10	20	30	—
SS1-55		55	S1	10	35	55	57	10	20	30	—
SS1-56		56	S1	10	35	56	58	10	20	30	—
SS1-58		58	S1	10	35	58	60	10	20	30	—
SS1-60		60	S1	10	35	60	62	10	20	30	—
SS1-62		62	S1	10	40	62	64	10	20	30	—
SS1-64		64	S1	10	40	64	66	10	20	30	—
SS1-65		65	S1	10	40	65	67	10	20	30	—
SS1-66		66	S1	10	40	66	68	10	20	30	—
SS1-68		68	S1	10	40	68	70	10	20	30	—
SS1-70		70	S1	10	40	70	72	10	20	30	—
SS1-72		72	S1	10	40	72	74	10	20	30	—
SS1-75		75	S1	10	40	75	77	10	20	30	—
SS1-76		76	S1	10	40	76	78	10	20	30	—
SS1-80		80	S1	10	40	80	82	10	20	30	—
SS1-84		84	S1	10	40	84	86	10	20	30	—
SS1-85		85	S1	10	40	85	87	10	20	30	—
SS1-88		88	S1	10	40	88	90	10	20	30	—
SS1-90		90	S1	10	40	90	92	10	20	30	—
SS1-95		95	S1	10	40	95	97	10	20	30	—
SS1-96		96	S1	10	40	96	98	10	20	30	—
SS1-100		100	S1	10	40	100	102	10	20	30	—
SS1-110		110	S1	15	50	110	112	10	20	30	—
SS1-120		120	S1	15	50	120	122	10	20	30	—
SS1-150		150	S1	20	120	150	152	10	20	30	—
SS1-200		200	S1	20	160	200	202	10	20	30	—



Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Threaded hole		Allowable torque (N · m) <i>NOTE 1</i>		Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 2</i>	Weight (kg)	Catalog No.
Thread size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	3.69	0.17	0.38	0.018	0.08~0.18	0.038	SS1-15
—	—	4.09	0.2	0.42	0.021	0.08~0.18	0.044	SS1-16
—	—	4.5	0.23	0.46	0.023	0.08~0.18	0.050	SS1-17
—	—	4.91	0.26	0.5	0.027	0.08~0.18	0.057	SS1-18
—	—	5.33	0.29	0.54	0.030	0.08~0.18	0.065	SS1-19
—	—	5.75	0.33	0.59	0.033	0.08~0.18	0.033	SS1-20
—	—	6.17	0.36	0.63	0.037	0.08~0.18	0.037	SS1-21
—	—	6.6	0.4	0.67	0.041	0.08~0.18	0.042	SS1-22
—	—	7.03	0.45	0.72	0.045	0.08~0.18	0.045	SS1-23
—	—	7.47	0.49	0.76	0.050	0.08~0.18	0.052	SS1-24
—	—	7.91	0.54	0.81	0.055	0.08~0.18	0.055	SS1-25
—	—	8.35	0.58	0.85	0.059	0.08~0.18	0.064	SS1-26
—	—	8.79	0.63	0.9	0.064	0.08~0.18	0.067	SS1-27
—	—	9.24	0.68	0.94	0.070	0.08~0.18	0.070	SS1-28
—	—	9.69	0.73	0.99	0.075	0.08~0.18	0.079	SS1-29
—	—	10.1	0.79	1.03	0.081	0.08~0.18	0.082	SS1-30
—	—	11.1	0.90	1.13	0.092	0.08~0.18	0.092	SS1-32
—	—	12.0	12.0	1.22	0.10	0.08~0.18	0.10	SS1-34
—	—	12.4	12.4	1.27	0.11	0.08~0.18	0.10	SS1-35
—	—	12.9	12.9	1.31	0.12	0.08~0.18	0.12	SS1-36
—	—	13.8	1.30	1.41	0.13	0.08~0.18	0.14	SS1-38
—	—	14.7	1.45	1.50	0.15	0.08~0.18	0.16	SS1-40
—	—	15.7	1.61	1.60	0.16	0.08~0.18	0.17	SS1-42
—	—	16.6	1.77	1.69	0.18	0.08~0.18	0.18	SS1-44
—	—	17.1	1.86	1.74	0.19	0.08~0.18	0.19	SS1-45
—	—	17.6	1.95	1.79	0.20	0.08~0.18	0.19	SS1-46
—	—	18.5	2.13	1.89	0.22	0.08~0.18	0.21	SS1-48
—	—	19.5	2.32	1.98	0.24	0.08~0.18	0.22	SS1-50
—	—	20.4	2.52	2.08	0.26	0.08~0.18	0.23	SS1-52
—	—	21.4	2.73	2.18	0.28	0.08~0.18	0.24	SS1-54
—	—	21.8	2.83	2.23	0.29	0.08~0.18	0.25	SS1-55
—	—	22.3	2.94	2.28	0.30	0.08~0.18	0.26	SS1-56
—	—	23.3	3.17	2.37	0.32	0.08~0.18	0.27	SS1-58
—	—	24.2	3.40	2.47	0.35	0.08~0.18	0.29	SS1-60
—	—	25.2	3.64	2.57	0.37	0.08~0.18	0.32	SS1-62
—	—	26.2	3.89	2.67	0.40	0.08~0.18	0.34	SS1-64
—	—	26.6	4.02	2.72	0.41	0.08~0.18	0.35	SS1-65
—	—	27.1	4.15	2.77	0.42	0.08~0.18	0.35	SS1-66
—	—	28.1	4.42	2.86	0.45	0.08~0.18	0.37	SS1-68
—	—	29.1	4.70	2.96	0.48	0.08~0.18	0.39	SS1-70
—	—	30.0	4.98	3.06	0.51	0.08~0.18	0.41	SS1-72
—	—	31.5	5.43	3.21	0.55	0.08~0.18	0.43	SS1-75
—	—	32.0	5.59	3.26	0.57	0.08~0.18	0.44	SS1-76
—	—	33.9	6.23	3.46	0.63	0.08~0.18	0.48	SS1-80
—	—	35.8	6.90	3.66	0.7	0.08~0.18	0.52	SS1-84
—	—	36.3	7.08	3.71	0.72	0.08~0.18	0.53	SS1-85
—	—	37.8	7.62	3.85	0.78	0.08~0.18	0.56	SS1-88
—	—	38.8	7.98	3.95	0.81	0.08~0.18	0.59	SS1-90
—	—	41.2	8.95	4.20	0.91	0.08~0.18	0.64	SS1-95
—	—	41.7	9.15	4.25	0.93	0.08~0.18	0.65	SS1-96
—	—	43.7	9.97	4.45	1.02	0.08~0.18	0.70	SS1-100
—	—	48.6	12.2	4.95	1.24	0.08~0.18	0.87	SS1-110
—	—	53.5	14.7	5.45	1.50	0.08~0.18	1.01	SS1-120
—	—	68.2	23.6	6.96	2.41	0.08~0.18	2.23	SS1-150
—	—	71.5	33.6	7.29	3.42	0.08~0.18	4.00	SS1-200

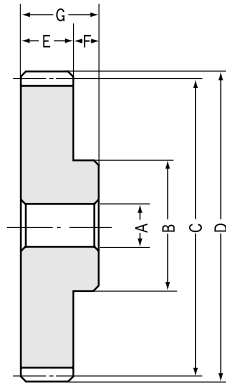
NOTE 1: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 2: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

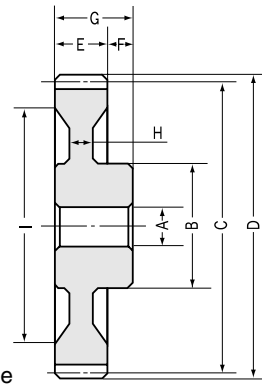


SS Steel Spur Gears Module 1.5

Spur Gears



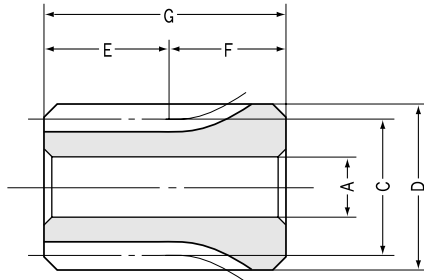
S1 Shape



S2 Shape

Module 1.5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A _{H7}	B	C	D	E	F	G	H	I	Width × Depth
SS1.5-12	m1.5	12	S3	8	21	18	21	15	15	30	—	—	—
SS1.5-13		13	S3	8	22.5	19.5	22.5	15	15	30	—	—	—
SS1.5-14		14	S1	8	16	21	24	15	10	25	—	—	—
SS1.5-15		15	S1	8	18	22.5	25.5	15	10	25	—	—	—
SS1.5-16		16	S1	8	20	24	27	15	10	25	—	—	—
SS1.5-17		17	S1	8	21	25.5	28.5	15	10	25	—	—	—
SS1.5-18		18	S1	8	22	27	30	15	10	25	—	—	—
SS1.5-19		19	S1	8	23	28.5	31.5	15	10	25	—	—	—
SS1.5-20		20	S1	8	24	30	33	15	10	25	—	—	—
SS1.5-21		21	S1	8	25	31.5	34.5	15	10	25	—	—	—
SS1.5-22		22	S1	8	26	33	36	15	10	25	—	—	—
SS1.5-23		23	S1	8	27	34.5	37.5	15	10	25	—	—	—
SS1.5-24		24	S1	8	28	36	39	15	10	25	—	—	—
SS1.5-25		25	S1	8	30	37.5	40.5	15	10	25	—	—	—
SS1.5-26		26	S1	10	32	39	42	15	10	25	—	—	—
SS1.5-27		27	S1	10	34	40.5	43.5	15	10	25	—	—	—
SS1.5-28		28	S1	10	36	42	45	15	10	25	—	—	—
SS1.5-29		29	S1	10	37	43.5	46.5	15	10	25	—	—	—
SS1.5-30		30	S1	10	38	45	48	15	10	25	—	—	—
SS1.5-32		32	S1	10	40	48	51	15	10	25	—	—	—
SS1.5-34	34	S1	10	40	51	54	15	10	25	—	—	—	
SS1.5-35	35	S1	10	42	52.5	55.5	15	10	25	—	—	—	
SS1.5-36	36	S1	10	45	54	57	15	10	25	—	—	—	
SS1.5-38	38	S1	12	45	57	60	15	10	25	—	—	—	
SS1.5-40	40	S1	12	45	60	63	15	10	25	—	—	—	
SS1.5-42	42	S1	12	45	63	66	15	10	25	—	—	—	
SS1.5-44	44	S1	12	45	66	69	15	10	25	—	—	—	
SS1.5-45	45	S1	12	45	67.5	70.5	15	10	25	—	—	—	
SS1.5-46	46	S1	12	45	69	72	15	10	25	—	—	—	
SS1.5-48	48	S1	12	45	72	75	15	10	25	—	—	—	
SS1.5-50	50	S1	12	45	75	78	15	10	25	—	—	—	
SS1.5-52	52	S1	15	50	78	81	15	10	25	—	—	—	
SS1.5-54	54	S1	15	50	81	84	15	10	25	—	—	—	
SS1.5-55	55	S1	15	50	82.5	85.5	15	10	25	—	—	—	
SS1.5-56	56	S1	15	50	84	87	15	10	25	—	—	—	
SS1.5-58	58	S1	15	50	87	90	15	10	25	—	—	—	
SS1.5-60	60	S1	15	50	90	93	15	10	25	—	—	—	
SS1.5-62	62	S1	15	55	93	96	15	10	25	—	—	—	
SS1.5-64	64	S1	15	55	96	99	15	10	25	—	—	—	
SS1.5-65	65	S1	15	55	97.5	100.5	15	10	25	—	—	—	
SS1.5-66	66	S1	15	55	99	102	15	10	25	—	—	—	
SS1.5-68	68	S1	15	55	102	105	15	10	25	—	—	—	
SS1.5-70	70	S1	15	55	105	108	15	10	25	—	—	—	
SS1.5-72	72	S1	15	55	108	111	15	10	25	—	—	—	
SS1.5-75	75	S1	15	60	112.5	115.5	15	10	25	—	—	—	
SS1.5-76	76	S1	15	60	114	117	15	10	25	—	—	—	
SS1.5-80	80	S1	15	60	120	123	15	10	25	—	—	—	
SS1.5-84	84	S1	15	60	126	129	15	10	25	—	—	—	
SS1.5-85	85	S1	15	60	127.5	130.5	15	10	25	—	—	—	
SS1.5-88	88	S1	15	60	132	135	15	10	25	—	—	—	
SS1.5-90	90	S1	15	60	135	138	15	10	25	—	—	—	
SS1.5-95	95	S1	15	60	142.5	145.5	15	10	25	—	—	—	
SS1.5-100	100	S2	15	60	150	153	15	10	25	9	125	—	
SS1.5-120	120	S2	15	70	180	183	15	10	25	10	153	—	
SS1.5-150	150	S1	20	180	225	228	15	10	25	—	—	—	
SS1.5-200	200	S1	25	240	300	303	15	10	25	—	—	—	



S3 Shape

Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Threaded hole	Allowable torque (N · m) <i>NOTE 1</i>	Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 2</i>	Weight (kg)	Catalog No.		
		Bending strength	Surface durability					
—	—	8.59	0.36	0.88	0.037	0.10~0.22	0.059	SS1.5-12
—	—	9.86	0.44	1.01	0.045	0.10~0.22	0.070	SS1.5-13
—	—	11.2	0.52	1.14	0.053	0.10~0.22	0.047	SS1.5-14
—	—	12.5	0.60	1.27	0.062	0.10~0.22	0.057	SS1.5-15
—	—	13.8	0.70	1.41	0.071	0.10~0.22	0.068	SS1.5-16
—	—	15.2	0.80	1.55	0.082	0.10~0.22	0.077	SS1.5-17
—	—	16.6	0.91	1.69	0.093	0.10~0.22	0.087	SS1.5-18
—	—	18.0	1.03	1.83	0.11	0.10~0.22	0.098	SS1.5-19
—	—	19.4	1.15	1.98	0.12	0.10~0.22	0.11	SS1.5-20
—	—	20.8	1.29	2.12	0.13	0.12~0.26	0.12	SS1.5-21
—	—	22.3	1.43	2.27	0.15	0.12~0.26	0.13	SS1.5-22
—	—	23.7	1.58	2.42	0.16	0.12~0.26	0.15	SS1.5-23
—	—	25.2	1.73	2.57	0.18	0.12~0.26	0.16	SS1.5-24
—	—	26.7	1.90	2.72	0.19	0.12~0.26	0.18	SS1.5-25
—	—	28.2	2.06	2.87	0.21	0.12~0.26	0.19	SS1.5-26
—	—	29.7	2.23	3.03	0.23	0.12~0.26	0.21	SS1.5-27
—	—	31.2	2.41	3.18	0.25	0.12~0.26	0.23	SS1.5-28
—	—	32.7	2.60	3.34	0.26	0.12~0.26	0.24	SS1.5-29
—	—	34.2	2.79	3.49	0.28	0.12~0.26	0.26	SS1.5-30
—	—	37.3	3.19	3.80	0.33	0.12~0.26	0.30	SS1.5-32
—	—	40.4	3.63	4.12	0.37	0.12~0.26	0.32	SS1.5-34
—	—	41.9	3.85	4.28	0.39	0.12~0.26	0.35	SS1.5-35
—	—	43.5	4.09	4.43	0.42	0.12~0.26	0.38	SS1.5-36
—	—	46.6	4.58	4.75	0.47	0.12~0.26	0.40	SS1.5-38
—	—	49.8	5.10	5.07	0.52	0.12~0.26	0.44	SS1.5-40
—	—	52.9	5.65	5.40	0.58	0.14~0.32	0.47	SS1.5-42
—	—	56.1	6.23	5.72	0.64	0.14~0.32	0.51	SS1.5-44
—	—	57.7	6.53	5.88	0.67	0.14~0.32	0.52	SS1.5-45
—	—	59.3	6.83	6.04	0.70	0.14~0.32	0.54	SS1.5-46
—	—	62.4	7.47	6.37	0.76	0.14~0.32	0.58	SS1.5-48
—	—	65.7	8.15	6.69	0.83	0.14~0.32	0.62	SS1.5-50
—	—	68.9	8.85	7.02	0.90	0.14~0.32	0.68	SS1.5-52
—	—	72.1	9.59	7.35	0.98	0.14~0.32	0.73	SS1.5-54
—	—	73.7	9.96	7.51	1.02	0.14~0.32	0.75	SS1.5-55
—	—	75.3	10.4	7.68	1.06	0.14~0.32	0.77	SS1.5-56
—	—	78.5	11.2	8.01	1.14	0.14~0.32	0.82	SS1.5-58
—	—	81.8	12.0	8.34	1.22	0.14~0.32	0.87	SS1.5-60
—	—	85.0	12.8	8.67	1.31	0.14~0.32	0.95	SS1.5-62
—	—	88.3	13.7	9.00	1.40	0.14~0.32	1.00	SS1.5-64
—	—	89.9	14.2	9.17	1.45	0.14~0.32	1.03	SS1.5-65
—	—	91.5	14.6	9.33	1.49	0.14~0.32	1.06	SS1.5-66
—	—	94.8	15.6	9.66	1.59	0.14~0.32	1.11	SS1.5-68
—	—	98.0	16.6	10.0	1.69	0.14~0.32	1.17	SS1.5-70
—	—	101	17.6	10.3	1.79	0.14~0.32	1.23	SS1.5-72
—	—	106	19.2	10.8	1.95	0.14~0.32	1.36	SS1.5-75
—	—	108	19.7	11.0	2.01	0.14~0.32	1.39	SS1.5-76
—	—	114	22.0	11.7	2.24	0.14~0.32	1.52	SS1.5-80
—	—	121	24.4	12.3	2.49	0.18~0.38	1.66	SS1.5-84
—	—	123	25.1	12.5	2.56	0.18~0.38	1.69	SS1.5-85
—	—	128	27.0	13.0	2.75	0.18~0.38	1.80	SS1.5-88
—	—	131	28.3	13.3	2.89	0.18~0.38	1.87	SS1.5-90
—	—	139	31.8	14.2	3.24	0.18~0.38	2.07	SS1.5-95
—	—	147	35.5	15.0	3.62	0.18~0.38	1.88	SS1.5-100
—	—	180	52.3	18.4	5.33	0.18~0.38	2.74	SS1.5-120
—	—	192	70.3	19.6	7.17	0.18~0.38	6.62	SS1.5-150
—	—	261	131	26.7	13.3	0.22~0.46	11.8	SS1.5-200

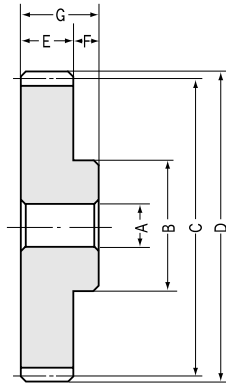
NOTE 1: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 2: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

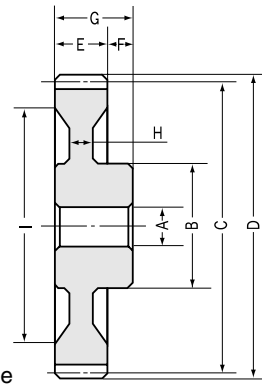


SS Steel Spur Gears Module 2

Spur Gears



S1 Shape



S2 Shape

Module 2

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A _{H7}	B	C	D	E	F	G	H	I	Width × Depth
SS2-12	m2	12	S1	10	18	24	28	20	10	30	—	—	—
SS2-13		13	S1	10	20	26	30	20	10	30	—	—	—
SS2-14		14	S1	10	20	28	32	20	10	30	—	—	—
SS2-15		15	S1	12	24	30	34	20	10	30	—	—	—
SS2-16		16	S1	12	26	32	36	20	10	30	—	—	—
SS2-17		17	S1	12	28	34	38	20	10	30	—	—	—
SS2-18		18	S1	12	30	36	40	20	10	30	—	—	—
SS2-19		19	S1	12	31	38	42	20	10	30	—	—	—
SS2-20		20	S1	12	32	40	44	20	10	30	—	—	—
SS2-21		21	S1	12	34	42	46	20	10	30	—	—	—
SS2-22		22	S1	12	36	44	48	20	10	30	—	—	—
SS2-23		23	S1	12	37	46	50	20	10	30	—	—	—
SS2-24		24	S1	12	38	48	52	20	10	30	—	—	—
SS2-25		25	S1	12	40	50	54	20	10	30	—	—	—
SS2-26		26	S1	12	42	52	56	20	10	30	—	—	—
SS2-27		27	S1	12	45	54	58	20	10	30	—	—	—
SS2-28		28	S1	12	45	56	60	20	10	30	—	—	—
SS2-29		29	S1	12	47	58	62	20	10	30	—	—	—
SS2-30		30	S1	12	50	60	64	20	10	30	—	—	—
SS2-32		32	S1	12	50	64	68	20	10	30	—	—	—
SS2-34		34	S1	12	50	68	72	20	10	30	—	—	—
SS2-35		35	S1	12	52	70	74	20	10	30	—	—	—
SS2-36		36	S1	12	55	72	76	20	10	30	—	—	—
SS2-38		38	S1	12	55	76	80	20	10	30	—	—	—
SS2-40		40	S1	15	55	80	84	20	10	30	—	—	—
SS2-42		42	S1	15	55	84	88	20	10	30	—	—	—
SS2-44		44	S1	15	55	88	92	20	10	30	—	—	—
SS2-45		45	S1	15	55	90	94	20	10	30	—	—	—
SS2-46		46	S1	15	55	92	96	20	10	30	—	—	—
SS2-48		48	S1	15	55	96	100	20	10	30	—	—	—
SS2-50		50	S1	15	55	100	104	20	10	30	—	—	—
SS2-52		52	S1	15	55	104	108	20	10	30	—	—	—
SS2-54	54	S1	15	55	108	112	20	10	30	—	—	—	
SS2-55	55	S1	15	55	110	114	20	10	30	—	—	—	
SS2-56	56	S1	15	55	112	116	20	10	30	—	—	—	
SS2-58	58	S1	15	60	116	120	20	10	30	—	—	—	
SS2-60	60	S1	15	60	120	124	20	10	30	—	—	—	
SS2-62	62	S1	15	60	124	128	20	10	30	—	—	—	
SS2-64	64	S1	15	60	128	132	20	10	30	—	—	—	
SS2-65	65	S1	15	60	130	134	20	10	30	—	—	—	
SS2-66	66	S1	15	60	132	136	20	10	30	—	—	—	
SS2-68	68	S1	15	60	136	140	20	10	30	—	—	—	
SS2-70	70	S1	15	60	140	144	20	10	30	—	—	—	
SS2-72	72	S1	15	60	144	148	20	10	30	—	—	—	
SS2-75	75	S1	20	60	150	154	20	10	30	—	—	—	
SS2-76	76	S1	20	60	152	156	20	10	30	—	—	—	
SS2-80	80	S2	20	60	160	164	20	10	30	12	136	—	
SS2-84	84	S2	20	70	168	172	20	10	30	12	140	—	
SS2-85	85	S2	20	70	170	174	20	10	30	12	146	—	
SS2-88	88	S2	20	70	176	180	20	10	30	12	150	—	
SS2-90	90	S2	20	70	180	184	20	10	30	12	156	—	
SS2-95	95	S2	20	70	190	194	20	10	30	12	166	—	
SS2-100	100	S2	20	70	200	204	20	10	30	12	176	—	
SS2-120	120	S2	20	90	240	244	20	10	30	12	210	—	
SS2-150	150	S1	25	240	300	304	20	10	30	—	—	—	



Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Threaded hole		Allowable torque (N · m) <i>NOTE 1</i>		Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 2</i>	Weight (kg)	Catalog No.
Thread size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	20.4	0.88	2.08	0.090	0.12~0.26	0.073	SS2-12
—	—	23.4	1.07	2.38	0.11	0.12~0.26	0.090	SS2-13
—	—	26.4	1.26	2.69	0.13	0.12~0.26	0.10	SS2-14
—	—	29.6	1.48	3.01	0.15	0.12~0.26	0.12	SS2-15
—	—	32.7	1.71	3.34	0.17	0.12~0.26	0.14	SS2-16
—	—	36.0	1.96	3.67	0.20	0.12~0.26	0.16	SS2-17
—	—	39.3	2.23	4.01	0.23	0.12~0.26	0.19	SS2-18
—	—	42.6	2.52	4.35	0.26	0.12~0.26	0.21	SS2-19
—	—	46.0	2.83	4.69	0.29	0.12~0.26	0.23	SS2-20
—	—	49.4	3.15	5.04	0.32	0.14~0.30	0.26	SS2-21
—	—	52.8	3.50	5.39	0.36	0.14~0.30	0.29	SS2-22
—	—	56.3	3.86	5.74	0.39	0.14~0.30	0.32	SS2-23
—	—	59.8	4.24	6.09	0.43	0.14~0.30	0.35	SS2-24
—	—	63.3	4.64	6.45	0.47	0.14~0.30	0.38	SS2-25
—	—	66.8	5.04	6.81	0.51	0.14~0.30	0.42	SS2-26
—	—	70.4	5.45	7.17	0.56	0.14~0.30	0.46	SS2-27
—	—	73.9	5.89	7.54	0.60	0.14~0.30	0.48	SS2-28
—	—	77.5	6.33	7.91	0.65	0.14~0.30	0.52	SS2-29
—	—	81.1	6.80	8.27	0.69	0.14~0.30	0.57	SS2-30
—	—	88.4	7.78	9.01	0.79	0.14~0.30	0.63	SS2-32
—	—	95.7	8.84	9.76	0.90	0.14~0.30	0.70	SS2-34
—	—	99.3	9.39	10.1	0.96	0.14~0.30	0.74	SS2-35
—	—	103	9.96	10.5	1.02	0.14~0.30	0.80	SS2-36
—	—	111	11.2	11.3	1.14	0.14~0.30	0.87	SS2-38
—	—	118	12.5	12.0	1.27	0.14~0.30	0.93	SS2-40
—	—	125	13.8	12.8	1.41	0.18~0.36	1.01	SS2-42
—	—	133	15.2	13.6	1.55	0.18~0.36	1.10	SS2-44
—	—	137	16.0	13.9	1.63	0.18~0.36	1.14	SS2-45
—	—	140	16.7	14.3	1.71	0.18~0.36	1.19	SS2-46
—	—	148	18.3	15.1	1.87	0.18~0.36	1.28	SS2-48
—	—	156	19.9	15.9	2.03	0.18~0.36	1.38	SS2-50
—	—	163	21.7	16.6	2.21	0.18~0.36	1.48	SS2-52
—	—	171	23.4	17.4	2.39	0.18~0.36	1.58	SS2-54
—	—	175	24.4	17.8	2.48	0.18~0.36	1.64	SS2-55
—	—	179	25.3	18.2	2.58	0.18~0.36	1.69	SS2-56
—	—	186	27.3	19.0	2.78	0.18~0.36	1.84	SS2-58
—	—	194	29.3	19.8	2.99	0.18~0.36	1.96	SS2-60
—	—	202	31.5	20.6	3.21	0.18~0.36	2.08	SS2-62
—	—	209	33.7	21.3	3.44	0.18~0.36	2.20	SS2-64
—	—	213	34.8	21.7	3.55	0.18~0.36	2.26	SS2-65
—	—	217	36.0	22.1	3.67	0.18~0.36	2.33	SS2-66
—	—	225	38.4	22.9	3.91	0.18~0.36	2.46	SS2-68
—	—	232	40.8	23.7	4.16	0.18~0.36	2.60	SS2-70
—	—	240	43.3	24.5	4.42	0.18~0.36	2.74	SS2-72
—	—	252	47.3	25.7	4.82	0.18~0.36	2.92	SS2-75
—	—	256	48.6	26.1	4.96	0.18~0.36	3.00	SS2-76
—	—	271	54.3	27.7	5.53	0.18~0.36	2.67	SS2-80
—	—	287	60.2	29.2	6.14	0.20~0.44	3.09	SS2-84
—	—	291	61.7	29.6	6.30	0.20~0.44	3.09	SS2-85
—	—	302	66.5	30.8	6.78	0.20~0.44	3.29	SS2-88
—	—	310	69.7	31.6	7.11	0.20~0.44	3.38	SS2-90
—	—	330	78.2	33.6	7.97	0.20~0.44	3.69	SS2-95
—	—	291	72.7	29.7	7.42	0.20~0.44	4.01	SS2-100
—	—	357	108	36.4	11.0	0.20~0.44	5.91	SS2-120
—	—	455	174	46.4	17.7	0.20~0.44	14.5	SS2-150

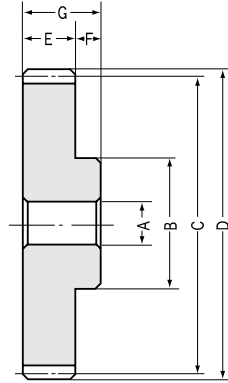
NOTE 1: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 2: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

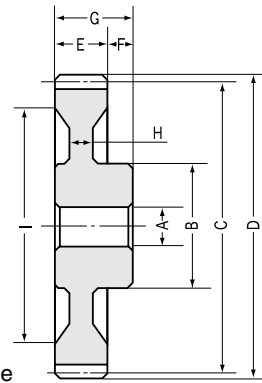


SS Steel Spur Gears Module 2.5

Spur Gears



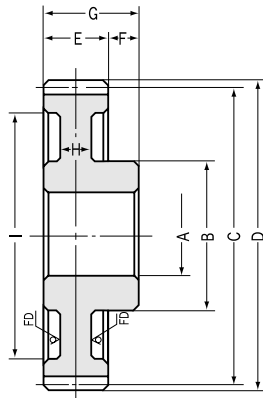
S1 Shape



S2 Shape

Module 2.5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A _{H7}	B	C	D	E	F	G	H	I	Width × Depth
SS2.5-12	m2.5	12	S1	12	23	30	35	25	12	37	—	—	—
SS2.5-13		13	S1	12	25	32.5	37.5	25	12	37	—	—	—
SS2.5-14		14	S1	12	25	35	40	25	12	37	—	—	—
SS2.5-15		15	S1	15	30	37.5	42.5	25	12	37	—	—	—
SS2.5-16		16	S1	15	32	40	45	25	12	37	—	—	—
SS2.5-17		17	S1	15	35	42.5	47.5	25	12	37	—	—	—
SS2.5-18		18	S1	15	38	45	50	25	12	37	—	—	—
SS2.5-19		19	S1	15	39	47.5	52.5	25	12	37	—	—	—
SS2.5-20		20	S1	15	40	50	55	25	12	37	—	—	—
SS2.5-21		21	S1	15	42	52.5	57.5	25	12	37	—	—	—
SS2.5-22		22	S1	15	44	55	60	25	12	37	—	—	—
SS2.5-23		23	S1	15	46	57.5	62.5	25	12	37	—	—	—
SS2.5-24		24	S1	15	48	60	65	25	12	37	—	—	—
SS2.5-25		25	S1	15	50	62.5	67.5	25	12	37	—	—	—
SS2.5-26		26	S1	15	55	65	70	25	12	37	—	—	—
SS2.5-27		27	S1	15	60	67.5	72.5	25	12	37	—	—	—
SS2.5-28		28	S1	15	60	70	75	25	12	37	—	—	—
SS2.5-29		29	S1	15	62	72.5	77.5	25	12	37	—	—	—
SS2.5-30		30	S1	15	65	75	80	25	12	37	—	—	—
SS2.5-32		32	S1	15	70	80	85	25	12	37	—	—	—
SS2.5-34		34	S1	15	70	85	90	25	12	37	—	—	—
SS2.5-35		35	S1	15	70	87.5	92.5	25	12	37	—	—	—
SS2.5-36		36	S1	15	70	90	95	25	12	37	—	—	—
SS2.5-38		38	S1	20	70	95	100	25	12	37	—	—	—
SS2.5-40		40	S1	20	70	100	105	25	12	37	—	—	—
SS2.5-42		42	S1	20	70	105	110	25	12	37	—	—	—
SS2.5-44		44	S1	20	70	110	115	25	12	37	—	—	—
SS2.5-45		45	S1	20	70	112.5	117.5	25	12	37	—	—	—
SS2.5-46		46	S1	20	70	115	120	25	12	37	—	—	—
SS2.5-48		48	S1	20	70	120	125	25	12	37	—	—	—
SS2.5-50		50	S1	20	70	125	130	25	12	37	—	—	—
SS2.5-52		52	S1	20	70	130	135	25	12	37	—	—	—
SS2.5-54		54	S1	20	70	135	140	25	12	37	—	—	—
SS2.5-55		55	S1	20	70	137.5	142.5	25	12	37	—	—	—
SS2.5-56		56	S1	20	70	140	145	25	12	37	—	—	—
SS2.5-58		58	S1	20	70	145	150	25	12	37	—	—	—
SS2.5-60		60	S4	25	70	150	155	25	12	37	(10)	(127)	—
SS2.5-62		62	S2	25	80	155	160	25	12	37	15	130	—
SS2.5-64		64	S2	25	80	160	165	25	12	37	15	131	—
SS2.5-65		65	S2	25	80	162.5	167.5	25	12	37	15	134	—
SS2.5-66		66	S2	25	80	165	170	25	12	37	15	140	—
SS2.5-68		68	S2	25	80	170	175	25	12	37	15	140	—
SS2.5-70		70	S2	25	80	175	180	25	12	37	15	146	—
SS2.5-72		72	S2	25	80	180	185	25	12	37	15	151	—
SS2.5-75		75	S2	25	80	187.5	192.5	25	12	37	15	159	—
SS2.5-76		76	S2	25	80	190	195	25	12	37	15	160	—
SS2.5-80		80	S4	25	80	200	205	25	12	37	(10)	(177)	—
SS2.5-90		90	S4	30	90	225	230	25	12	37	(10)	(202)	—
SS2.5-100		100	S4	30	90	250	255	25	12	37	(10)	(227)	—
SS2.5-120		120	S4	30	100	300	305	25	12	37	(10)	(277)	—



S4 Shape

* FD has the die-forged finish.

Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Threaded hole	Allowable torque (N · m) <i>NOTE 1</i>	Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 2</i>	Weight (kg)	Catalog No.		
		Bending strength	Surface durability					
—	—	39.8	1.77	4.06	0.18	0.14~0.28	0.15	SS2.5-12
—	—	45.6	2.14	4.65	0.22	0.14~0.28	0.18	SS2.5-13
—	—	51.6	2.53	5.26	0.26	0.14~0.28	0.20	SS2.5-14
—	—	57.7	2.96	5.89	0.30	0.14~0.28	0.23	SS2.5-15
—	—	64	3.43	6.52	0.35	0.14~0.28	0.27	SS2.5-16
—	—	70.3	3.93	7.17	0.40	0.14~0.28	0.32	SS2.5-17
—	—	76.7	4.47	7.82	0.46	0.14~0.28	0.37	SS2.5-18
—	—	83.2	5.05	8.49	0.51	0.14~0.28	0.41	SS2.5-19
—	—	89.8	5.66	9.16	0.58	0.14~0.28	0.45	SS2.5-20
—	—	96.4	6.30	9.83	0.64	0.16~0.34	0.50	SS2.5-21
—	—	103	6.99	10.5	0.71	0.16~0.34	0.56	SS2.5-22
—	—	110	7.71	11.2	0.79	0.16~0.34	0.61	SS2.5-23
—	—	117	8.47	11.9	0.86	0.16~0.34	0.67	SS2.5-24
—	—	124	9.26	12.6	0.94	0.16~0.34	0.74	SS2.5-25
—	—	130	10.1	13.3	1.03	0.16~0.34	0.82	SS2.5-26
—	—	137	10.9	14.0	1.11	0.16~0.34	0.92	SS2.5-27
—	—	144	11.7	14.7	1.20	0.16~0.34	0.97	SS2.5-28
—	—	151	12.6	15.4	1.29	0.16~0.34	1.04	SS2.5-29
—	—	159	13.6	16.2	1.39	0.16~0.34	1.13	SS2.5-30
—	—	173	15.6	17.6	1.59	0.16~0.34	1.30	SS2.5-32
—	—	187	17.7	19.1	1.80	0.16~0.34	1.42	SS2.5-34
—	—	194	18.8	19.8	1.92	0.16~0.34	1.49	SS2.5-35
—	—	201	20.0	20.5	2.04	0.16~0.34	1.56	SS2.5-36
—	—	216	22.4	22.0	2.28	0.16~0.34	1.66	SS2.5-38
—	—	230	24.9	23.5	2.54	0.16~0.34	1.81	SS2.5-40
—	—	245	27.6	25.0	2.82	0.18~0.40	1.97	SS2.5-42
—	—	260	30.5	26.5	3.11	0.18~0.40	2.14	SS2.5-44
—	—	267	31.9	27.2	3.26	0.18~0.40	2.22	SS2.5-45
—	—	274	33.5	28.0	3.41	0.18~0.40	2.31	SS2.5-46
—	—	289	36.7	29.5	3.74	0.18~0.40	2.49	SS2.5-48
—	—	304	40.0	31.0	4.08	0.18~0.40	2.68	SS2.5-50
—	—	319	43.5	32.5	4.44	0.18~0.40	2.88	SS2.5-52
—	—	334	47.2	34.0	4.81	0.18~0.40	3.08	SS2.5-54
—	—	341	49.1	34.8	5.01	0.18~0.40	3.19	SS2.5-55
—	—	349	51.0	35.6	5.20	0.18~0.40	3.29	SS2.5-56
—	—	364	55.0	37.1	5.61	0.18~0.40	3.51	SS2.5-58
—	—	379	59.1	38.6	6.03	0.18~0.40	2.80	SS2.5-60
—	—	394	63.4	40.1	6.46	0.18~0.40	3.54	SS2.5-62
—	—	409	67.8	41.7	6.92	0.18~0.40	3.76	SS2.5-64
—	—	416	70.1	42.4	7.15	0.18~0.40	3.84	SS2.5-65
—	—	424	72.4	43.2	7.39	0.18~0.40	3.87	SS2.5-66
—	—	439	77.2	44.7	7.87	0.18~0.40	4.13	SS2.5-68
—	—	454	82.1	46.3	8.37	0.18~0.40	4.30	SS2.5-70
—	—	469	87.1	47.8	8.89	0.18~0.40	4.49	SS2.5-72
—	—	492	95.0	50.1	9.69	0.18~0.40	4.77	SS2.5-75
—	—	499	97.7	50.9	9.97	0.18~0.40	4.90	SS2.5-76
—	—	441	90.9	45.0	9.27	0.18~0.40	4.42	SS2.5-80
—	—	505	117	51.5	12.0	0.22~0.48	5.64	SS2.5-90
—	—	569	147	58.0	15.0	0.22~0.48	6.78	SS2.5-100
—	—	696	218	71.0	22.2	0.22~0.48	9.38	SS2.5-120

NOTE 1: The allowable torques shown in the table are calculated values according to the assumed usage conditions.

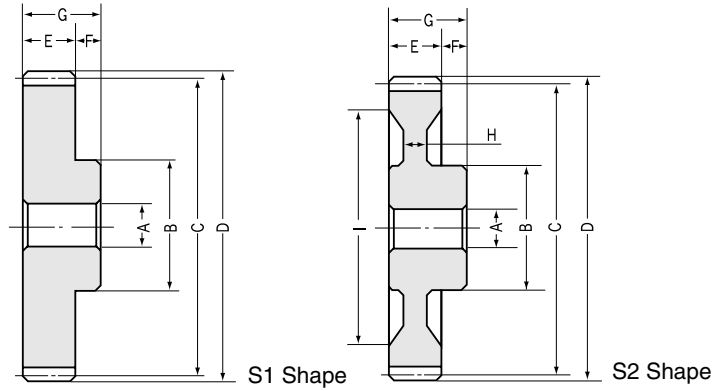
Please see page 27 for more details.

NOTE 2: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



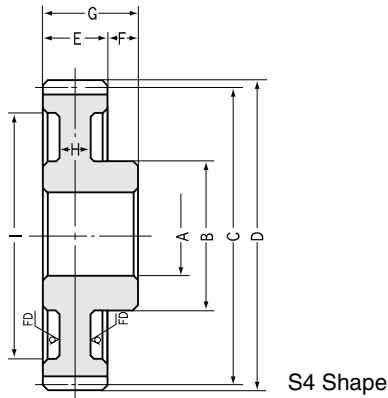
SS Steel Spur Gears **Module 3**

Spur Gears



Module 3

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	Keyway
				A _{H7}	B	C	D	E	F	G	H	I	Width × Depth
SS3-12	m2.5	12	S1	15	28	36	42	30	15	45	—	—	—
SS3-13		13	S1	15	30	39	45	30	15	45	—	—	—
SS3-14		14	S1	15	32	42	48	30	15	45	—	—	—
SS3-15		15	S1	15	36	45	51	30	15	45	—	—	—
SS3-16		16	S1	15	38	48	54	30	15	45	—	—	—
SS3-17		17	S1	15	39	51	57	30	15	45	—	—	—
SS3-18		18	S1	15	40	54	60	30	15	45	—	—	—
SS3-19		19	S1	15	45	57	63	30	15	45	—	—	—
SS3-20		20	S1	15	50	60	66	30	15	45	—	—	—
SS3-21		21	S1	15	52	63	69	30	15	45	—	—	—
SS3-22		22	S1	15	54	66	72	30	15	45	—	—	—
SS3-23		23	S1	15	56	69	75	30	15	45	—	—	—
SS3-24		24	S1	15	58	72	78	30	15	45	—	—	—
SS3-25		25	S1	20	60	75	81	30	15	45	—	—	—
SS3-26		26	S1	20	65	78	84	30	15	45	—	—	—
SS3-27		27	S1	20	65	81	87	30	15	45	—	—	—
SS3-28		28	S1	20	70	84	90	30	15	45	—	—	—
SS3-29		29	S1	20	70	87	93	30	15	45	—	—	—
SS3-30		30	S1	20	75	90	96	30	15	45	—	—	—
SS3-32		32	S1	20	75	96	102	30	15	45	—	—	—
SS3-34		34	S1	20	80	102	108	30	15	45	—	—	—
SS3-35		35	S1	20	80	105	111	30	15	45	—	—	—
SS3-36		36	S1	20	80	108	114	30	15	45	—	—	—
SS3-38		38	S1	25	80	114	120	30	15	45	—	—	—
SS3-40		40	S1	25	80	120	126	30	15	45	—	—	—
SS3-42		42	S1	25	80	126	132	30	15	45	—	—	—
SS3-44		44	S1	25	80	132	138	30	15	45	—	—	—
SS3-45		45	S1	25	80	135	141	30	15	45	—	—	—
SS3-46		46	S1	25	80	138	144	30	15	45	—	—	—
SS3-48		48	S1	25	80	144	150	30	15	45	—	—	—
SS3-50		50	S4	25	80	150	156	30	15	45	(10)	(123)	—
SS3-52		52	S2	25	80	156	162	30	15	45	16	126	—
SS3-54		54	S2	25	80	162	168	30	15	45	16	132	—
SS3-55		55	S2	25	80	165	171	30	15	45	16	131	—
SS3-56		56	S2	25	80	168	174	30	15	45	16	134	—
SS3-58		58	S2	25	80	174	180	30	15	45	16	144	—
SS3-60		60	S4	25	80	180	186	30	15	45	(10)	(153)	—
SS3-62		62	S2	25	80	186	192	30	15	45	16	150	—
SS3-64		64	S2	25	80	192	198	30	15	45	16	158	—
SS3-65		65	S2	25	80	195	201	30	15	45	16	161	—
SS3-66	66	S2	25	90	198	204	30	15	45	16	160	—	
SS3-68	68	S2	25	90	204	210	30	15	45	16	170	—	
SS3-70	70	S2	25	90	210	216	30	15	45	16	176	—	
SS3-72	72	S2	25	90	216	222	30	15	45	16	182	—	
SS3-75	75	S2	25	90	225	231	30	15	45	16	190	—	
SS3-76	76	S2	25	90	228	234	30	15	45	16	190	—	
SS3-80	80	S4	30	90	240	246	30	15	45	(10)	(213)	—	
SS3-90	90	S2	30	100	270	276	30	15	45	16	240	—	
SS3-100	100	S4	30	100	300	306	30	15	45	(10)	(273)	—	
SS3-120	120	S4	30	130	360	366	30	15	45	(10)	(333)	—	



* FD has the die-forged finish.

Specifications			
Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Threaded hole		Allowable torque (N · m) <small>NOTE 1</small>		Allowable torque (kgf · m)		Backlash (mm) <small>NOTE 2</small>	Weight (kg)	Catalog No.
Thread size	J	Bending strength	Surface durability	Bending strength	Surface durability			
—	—	68.7	3.12	7.01	0.32	0.14~0.32	0.25	SS3- 12
—	—	78.8	3.77	8.04	0.38	0.14~0.32	0.30	SS3- 13
—	—	89.2	4.47	9.09	0.46	0.14~0.32	0.36	SS3- 14
—	—	99.7	5.23	10.2	0.53	0.14~0.32	0.43	SS3- 15
—	—	111	6.05	11.3	0.62	0.14~0.32	0.50	SS3- 16
—	—	122	6.93	12.4	0.71	0.14~0.32	0.56	SS3- 17
—	—	133	7.87	13.5	0.80	0.14~0.32	0.62	SS3- 18
—	—	144	8.88	14.7	0.91	0.14~0.32	0.73	SS3- 19
—	—	155	9.95	15.8	1.02	0.14~0.32	0.83	SS3- 20
—	—	167	11.1	17.0	1.13	0.18~0.38	0.92	SS3- 21
—	—	178	12.3	18.2	1.25	0.18~0.38	1.01	SS3- 22
—	—	190	13.6	19.4	1.38	0.18~0.38	1.11	SS3- 23
—	—	202	14.9	20.6	1.52	0.18~0.38	1.21	SS3- 24
—	—	214	16.3	21.8	1.66	0.18~0.38	1.26	SS3- 25
—	—	226	17.7	23.0	1.81	0.18~0.38	1.41	SS3- 26
—	—	237	19.2	24.2	1.96	0.18~0.38	1.49	SS3- 27
—	—	250	20.7	25.4	2.11	0.18~0.38	1.65	SS3- 28
—	—	262	22.3	26.7	2.27	0.18~0.38	1.74	SS3- 29
—	—	274	24.0	27.9	2.44	0.18~0.38	1.91	SS3- 30
—	—	298	27.4	30.4	2.80	0.18~0.38	2.11	SS3- 32
—	—	323	31.2	32.9	3.18	0.18~0.38	2.41	SS3- 34
—	—	335	33.1	34.2	3.38	0.18~0.38	2.52	SS3- 35
—	—	348	35.2	35.5	3.59	0.18~0.38	2.64	SS3- 36
—	—	373	39.4	38.0	4.02	0.18~0.38	2.82	SS3- 38
—	—	398	44.0	40.6	4.49	0.18~0.38	3.08	SS3- 40
—	—	423	48.9	43.2	4.98	0.20~0.44	3.35	SS3- 42
—	—	449	54.0	45.7	5.50	0.20~0.44	3.64	SS3- 44
—	—	461	56.6	47.0	5.78	0.20~0.44	3.79	SS3- 45
—	—	474	59.4	48.3	6.05	0.20~0.44	3.94	SS3- 46
—	—	500	65.0	50.9	6.63	0.20~0.44	4.25	SS3- 48
—	—	525	70.9	53.6	7.23	0.20~0.44	3.72	SS3- 50
—	—	551	77.1	56.2	7.86	0.20~0.44	4.38	SS3- 52
—	—	577	83.6	58.8	8.52	0.20~0.44	4.61	SS3- 54
—	—	590	86.9	60.1	8.86	0.20~0.44	4.81	SS3- 55
—	—	602	90.3	61.4	9.21	0.20~0.44	4.94	SS3- 56
—	—	628	97.3	64.1	9.92	0.20~0.44	5.10	SS3- 58
—	—	654	105	66.7	10.7	0.20~0.44	4.60	SS3- 60
—	—	680	112	69.4	11.4	0.20~0.44	5.76	SS3- 62
—	—	588	99.9	60.0	10.2	0.20~0.44	5.99	SS3- 64
—	—	599	103	61.1	10.5	0.20~0.44	6.13	SS3- 65
—	—	610	107	62.2	10.9	0.20~0.44	6.67	SS3- 66
—	—	632	114	64.4	11.6	0.20~0.44	6.86	SS3- 68
—	—	654	121	66.6	12.4	0.20~0.44	7.15	SS3- 70
—	—	675	129	68.9	13.1	0.20~0.44	7.46	SS3- 72
—	—	708	141	72.2	14.3	0.20~0.44	7.95	SS3- 75
—	—	719	145	73.3	14.8	0.20~0.44	8.20	SS3- 76
—	—	763	162	77.8	16.5	0.20~0.44	6.92	SS3- 80
—	—	872	208	89.0	21.2	0.26~0.52	10.6	SS3- 90
—	—	983	261	100	26.6	0.26~0.52	9.36	SS3-100
—	—	1200	386	123	39.4	0.26~0.52	15.7	SS3-120

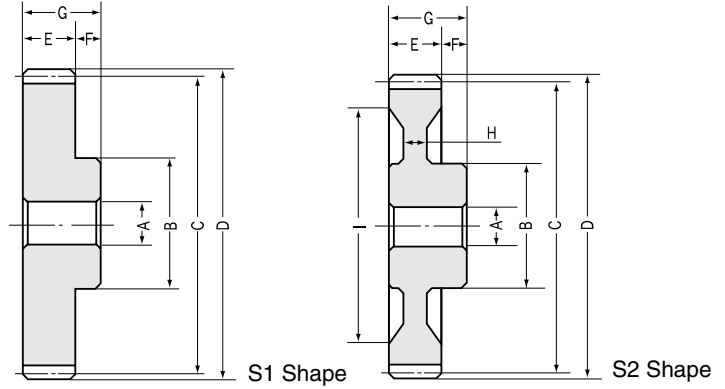
NOTE 1: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 2: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



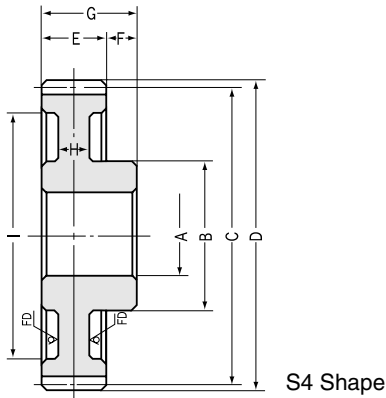
SS Steel Spur Gears **Module 4**

Spur Gears



Module 4

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A _{H7}	B	C	D	E	F	G	(H)	(I)
SS4-12	m4	12	S1	20	35	48	56	40	20	60	—	—
SS4-13		13	S1	20	38	52	60	40	20	60	—	—
SS4-14		14	S1	20	40	56	64	40	20	60	—	—
SS4-15		15	S1	20	45	60	68	40	20	60	—	—
SS4-16		16	S1	20	50	64	72	40	20	60	—	—
SS4-17		17	S1	20	53	68	76	40	20	60	—	—
SS4-18		18	S1	20	55	72	80	40	20	60	—	—
SS4-19		19	S1	20	60	76	84	40	20	60	—	—
SS4-20		20	S1	20	65	80	88	40	20	60	—	—
SS4-21		21	S1	20	69	84	92	40	20	60	—	—
SS4-22		22	S1	20	73	88	96	40	20	60	—	—
SS4-23		23	S1	20	77	92	100	40	20	60	—	—
SS4-24		24	S1	20	80	96	104	40	20	60	—	—
SS4-25		25	S1	20	84	100	108	40	20	60	—	—
SS4-26		26	S1	20	87	104	112	40	20	60	—	—
SS4-27		27	S1	20	90	108	116	40	20	60	—	—
SS4-28		28	S1	20	95	112	120	40	20	60	—	—
SS4-29		29	S1	20	95	116	124	40	20	60	—	—
SS4-30		30	S1	20	100	120	128	40	20	60	—	—
SS4-32		32	S1	22	100	128	136	40	16	56	—	—
SS4-34		34	S1	22	100	136	144	40	16	56	—	—
SS4-35		35	S1	22	100	140	148	40	16	56	—	—
SS4-36		36	S1	22	100	144	152	40	16	56	—	—
SS4-38		38	S1	22	100	152	160	40	16	56	—	—
SS4-40		40	S1	25	100	160	168	40	16	56	—	—
SS4-42		42	S1	25	100	168	176	40	16	56	—	—
SS4-44		44	S1	25	100	176	184	40	16	56	—	—
SS4-45		45	S1	25	100	180	188	40	16	56	—	—
SS4-46		46	S1	25	100	184	192	40	16	56	—	—
SS4-48		48	S2	25	100	192	200	40	16	56	26	150
SS4-50		50	S4	30	100	200	208	40	16	56	(12)	(168)
SS4-52		52	S2	30	100	208	216	40	16	56	26	165
SS4-54		54	S2	30	100	216	224	40	16	56	26	175
SS4-55		55	S2	30	100	220	228	40	16	56	26	178
SS4-56		56	S2	30	100	224	232	40	16	56	26	182
SS4-58		58	S2	30	110	232	240	40	16	56	26	190
SS4-60		60	S4	30	110	240	248	40	16	56	(12)	(208)
SS4-62		62	S2	30	110	248	256	40	16	56	20	210
SS4-64		64	S2	30	110	256	264	40	16	56	16	214
SS4-65		65	S2	30	110	260	268	40	16	56	16	218
SS4-66	66	S2	30	120	264	272	40	16	56	16	220	
SS4-68	68	S2	30	120	272	280	40	16	56	16	225	
SS4-70	70	S4	30	120	280	288	40	16	56	(12)	(248)	
SS4-80	80	S4	30	120	320	328	40	16	56	(12)	(288)	



* FD has the die-forged finish.

Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

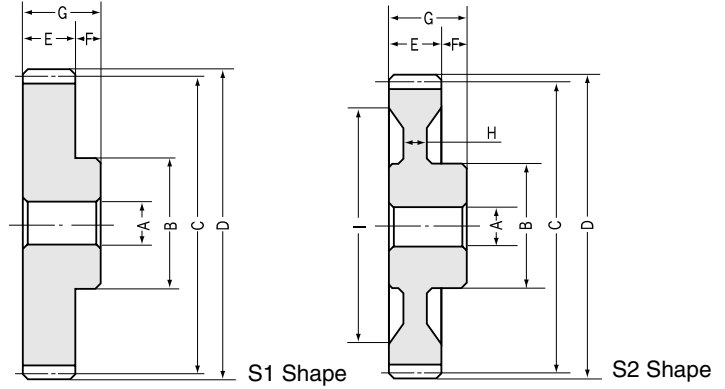
Allowable torque (N · m) NOTE 1		Allowable torque (kgf · m)		Backlash (mm) NOTE 2	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
163	7.62	16.6	0.78	0.18~0.38	0.57	SS4-12
187	9.22	19.1	0.94	0.18~0.38	0.70	SS4-13
211	10.9	21.6	1.11	0.18~0.38	0.82	SS4-14
236	12.8	24.1	1.30	0.18~0.38	0.99	SS4-15
262	14.7	26.7	1.50	0.18~0.38	1.17	SS4-16
288	16.9	29.4	1.72	0.18~0.38	1.34	SS4-17
314	19.2	32.0	1.96	0.18~0.38	1.50	SS4-18
341	21.7	34.8	2.21	0.18~0.38	1.72	SS4-19
368	24.3	37.5	2.48	0.18~0.38	1.95	SS4-20
395	27.1	40.3	2.76	0.20~0.44	2.18	SS4-21
423	30.1	43.1	3.06	0.20~0.44	2.42	SS4-22
450	33.2	45.9	3.38	0.20~0.44	2.67	SS4-23
478	36.4	48.8	3.72	0.20~0.44	2.91	SS4-24
506	39.9	51.6	4.07	0.20~0.44	3.19	SS4-25
534	43.3	54.5	4.42	0.20~0.44	3.45	SS4-26
563	46.9	57.4	4.78	0.20~0.44	3.73	SS4-27
591	50.6	60.3	5.16	0.20~0.44	4.06	SS4-28
620	54.5	63.2	5.56	0.20~0.44	4.28	SS4-29
649	58.7	66.2	5.98	0.20~0.44	4.64	SS4-30
707	67.4	72.1	6.87	0.20~0.44	4.86	SS4-32
766	76.7	78.1	7.82	0.20~0.44	5.38	SS4-34
795	81.6	81.1	8.32	0.20~0.44	5.65	SS4-35
825	86.7	84.1	8.84	0.20~0.44	5.93	SS4-36
884	97.3	90.1	9.92	0.20~0.44	6.52	SS4-38
943	109	96.2	11.1	0.20~0.44	7.08	SS4-40
1000	120	102	12.3	0.24~0.52	7.73	SS4-42
1060	133	108	13.6	0.24~0.52	8.41	SS4-44
1090	139	112	14.2	0.24~0.52	8.76	SS4-45
1120	146	115	14.9	0.24~0.52	9.12	SS4-46
987	133	101	13.6	0.24~0.52	9.12	SS4-48
1040	146	106	14.8	0.24~0.52	8.00	SS4-50
1090	158	111	16.1	0.24~0.52	10.2	SS4-52
1140	172	116	17.5	0.24~0.52	10.8	SS4-54
1160	179	119	18.2	0.24~0.52	11.1	SS4-55
1190	186	121	18.9	0.24~0.52	11.5	SS4-56
1240	200	127	20.4	0.24~0.52	12.5	SS4-58
1290	215	132	22	0.24~0.52	10.7	SS4-60
1340	231	137	23.6	0.24~0.52	13.1	SS4-62
1390	248	142	25.2	0.24~0.52	13.4	SS4-64
1420	256	145	26.1	0.24~0.52	13.7	SS4-65
1450	265	148	27	0.24~0.52	14.7	SS4-66
1500	282	153	28.8	0.24~0.52	15.5	SS4-68
1550	300	158	30.6	0.24~0.52	13.6	SS4-70
1810	400	184	40.8	0.24~0.52	16.3	SS4-80

NOTE 1: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 2: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

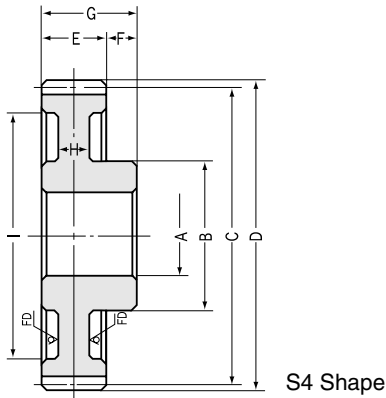


SS Steel Spur Gears **Module 5**



Module 5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.
				A _{H7}	B	C	D	E	F	G	(H)	(I)
SS5-12	m5	12	S1	22	46	60	70	50	25	75	—	—
SS5-13		13	S1	22	50	65	75	50	25	75	—	—
SS5-14		14	S1	22	52	70	80	50	25	75	—	—
SS5-15		15	S1	22	60	75	85	50	25	75	—	—
SS5-16		16	S1	22	65	80	90	50	25	75	—	—
SS5-17		17	S1	22	68	85	95	50	25	75	—	—
SS5-18		18	S1	22	70	90	100	50	25	75	—	—
SS5-19		19	S1	22	76	95	105	50	25	75	—	—
SS5-20		20	S1	22	82	100	110	50	25	75	—	—
SS5-21		21	S1	25	90	105	115	50	25	75	—	—
SS5-22		22	S1	25	95	110	120	50	25	75	—	—
SS5-23		23	S1	25	100	115	125	50	25	75	—	—
SS5-24		24	S1	25	100	120	130	50	25	75	—	—
SS5-25		25	S1	25	105	125	135	50	25	75	—	—
SS5-26		26	S1	25	110	130	140	50	25	75	—	—
SS5-27		27	S1	25	110	135	145	50	25	75	—	—
SS5-28		28	S1	25	110	140	150	50	25	75	—	—
SS5-29		29	S1	25	115	145	155	50	25	75	—	—
SS5-30		30	S1	25	120	150	160	50	25	75	—	—
SS5-32		32	S1	30	120	160	170	50	21	71	—	—
SS5-34		34	S1	30	120	170	180	50	21	71	—	—
SS5-35		35	S1	30	120	175	185	50	21	71	—	—
SS5-36		36	S1	30	120	180	190	50	21	71	—	—
SS5-38		38	S1	30	120	190	200	50	21	71	—	—
SS5-40		40	S2	30	120	200	210	50	21	71	36	160
SS5-42		42	S2	30	120	210	220	50	21	71	36	170
SS5-44		44	S2	30	120	220	230	50	21	71	36	175
SS5-45		45	S2	30	120	225	235	50	21	71	36	185
SS5-46		46	S2	30	120	230	240	50	21	71	30	185
SS5-48		48	S2	30	120	240	250	50	21	71	30	200
SS5-50		50	S4	30	120	250	260	50	21	71	(16)	(212)
SS5-52		52	S2	30	130	260	270	50	21	71	30	220
SS5-54		54	S2	30	130	270	280	50	21	71	30	230
SS5-55		55	S2	30	130	275	285	50	21	71	30	235
SS5-56		56	S2	30	130	280	290	50	21	71	30	240
SS5-58		58	S2	30	130	290	300	50	21	71	30	240
SS5-60		60	S4	30	130	300	310	50	21	71	(20)	(260)



* FD has the die-forged finish.

Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Allowable torque (N · m) NOTE 1		Allowable torque (kgf · m)		Backlash (mm) NOTE 2	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
318	15.2	32.4	1.55	0.20~0.44	1.21	SS5-12
365	18.4	37.2	1.88	0.20~0.44	1.46	SS5-13
413	21.8	42.1	2.22	0.20~0.44	1.70	SS5-14
462	25.5	47.1	2.60	0.20~0.44	2.07	SS5-15
512	29.5	52.2	3.01	0.20~0.44	2.40	SS5-16
562	33.8	57.3	3.45	0.20~0.44	2.72	SS5-17
614	38.4	62.6	3.92	0.20~0.44	3.03	SS5-18
666	43.4	67.9	4.42	0.20~0.44	3.45	SS5-19
718	48.6	73.3	4.96	0.20~0.44	3.90	SS5-20
772	54.2	78.7	5.53	0.24~0.50	4.36	SS5-21
825	60.1	84.1	6.13	0.24~0.50	4.83	SS5-22
879	66.3	89.7	6.77	0.24~0.50	5.33	SS5-23
934	73.0	95.2	7.45	0.24~0.50	5.69	SS5-24
989	80.0	101	8.16	0.24~0.50	6.23	SS5-25
1040	87.1	106	8.88	0.24~0.50	6.79	SS5-26
1100	94.4	112	9.62	0.24~0.50	7.19	SS5-27
1160	102	118	10.4	0.24~0.50	7.62	SS5-28
1210	110	124	11.2	0.24~0.50	8.23	SS5-29
1270	118	129	12.1	0.24~0.50	8.87	SS5-30
1380	136	141	13.8	0.24~0.50	9.36	SS5-32
1500	154	153	15.7	0.24~0.50	10.4	SS5-34
1550	164	158	16.7	0.24~0.50	10.9	SS5-35
1610	174	164	17.8	0.24~0.50	11.5	SS5-36
1730	195	176	19.9	0.24~0.50	12.6	SS5-38
1540	182	157	18.5	0.24~0.50	13.2	SS5-40
1630	202	167	20.6	0.28~0.58	14.2	SS5-42
1730	223	177	22.8	0.28~0.58	15.4	SS5-44
1780	234	182	23.9	0.28~0.58	15.8	SS5-45
1830	246	187	25.1	0.28~0.58	16.2	SS5-46
1930	269	197	27.5	0.28~0.58	17.0	SS5-48
2030	294	207	30.0	0.28~0.58	15.0	SS5-50
2130	320	217	32.6	0.28~0.58	19.8	SS5-52
2220	347	227	35.4	0.28~0.58	20.9	SS5-54
2270	361	232	36.8	0.28~0.58	21.5	SS5-55
2320	375	237	38.3	0.28~0.58	22.0	SS5-56
2420	405	247	41.3	0.28~0.58	23.8	SS5-58
2520	435	257	44.4	0.28~0.58	21.4	SS5-60

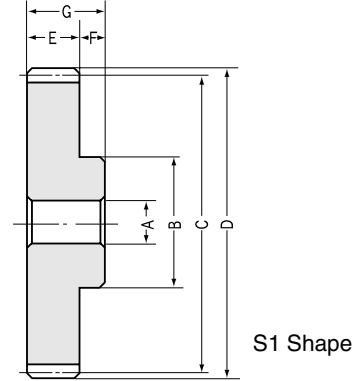
NOTE 1: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 2: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SS Steel Spur Gears Modules 6 ~ 10

Spur Gears



Module 6, 8, 10

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness	Web O.D.	
				A _{H7}	B	C	D	E	F	G	H	I	
SS6-12	m6	12	S1	25	55	72	84	60	28	88	—	—	
SS6-13		13	S1	25	58	78	90	60	28	88	—	—	
SS6-14		14	S1	25	60	84	96	60	28	88	—	—	
SS6-15		15	S1	25	70	90	102	60	28	88	—	—	
SS6-16		16	S1	25	75	96	108	60	28	88	—	—	
SS6-17		17	S1	25	78	102	114	60	28	88	—	—	
SS6-18		18	S1	25	80	108	120	60	28	88	—	—	
SS6-19		19	S1	25	90	114	126	60	28	88	—	—	
SS6-20		20	S1	25	100	120	132	60	28	88	—	—	
SS6-21		21	S1	28	105	126	138	60	28	88	—	—	
SS6-22		22	S1	28	110	132	144	60	28	88	—	—	
SS6-23		23	S1	28	115	138	150	60	28	88	—	—	
SS6-24		24	S1	28	120	144	156	60	28	88	—	—	
SS6-25		25	S1	28	125	150	162	60	28	88	—	—	
SS6-26		26	S1	28	130	156	168	60	28	88	—	—	
SS6-27		27	S1	28	135	162	174	60	28	88	—	—	
SS6-28		28	S1	28	140	168	180	60	28	88	—	—	
SS6-30		30	S1	30	150	180	192	60	28	88	—	—	
SS6-32		32	S1	30	150	192	204	60	23	83	—	—	
SS6-34		34	S1	30	150	204	216	60	23	83	—	—	
SS6-35		35	S1	30	150	210	222	60	23	83	—	—	
SS6-36		36	S1	30	150	216	228	60	23	83	—	—	
SS6-38		38	S1	30	150	228	240	60	23	83	—	—	
SS6-40		40	S1	30	150	240	252	60	23	83	—	—	
SS6-42		42	S1	40	150	252	264	60	23	83	—	—	
SS6-44		44	S1	40	150	264	276	60	23	83	—	—	
SS6-45		45	S1	40	180	270	282	60	23	83	—	—	
SS6-46		46	S1	40	180	276	288	60	23	83	—	—	
SS6-48		48	S1	40	180	288	300	60	23	83	—	—	
SS6-50		50	S1	40	180	300	312	60	23	83	—	—	
SS8-12	m8	12	S1	28	75	96	112	75	35	110	—	—	
SS8-13		13	S1	28	80	104	120	75	35	110	—	—	
SS8-14		14	S1	28	85	112	128	75	35	110	—	—	
SS8-15		15	S1	28	90	120	136	75	35	110	—	—	
SS8-16		16	S1	28	100	128	144	75	35	110	—	—	
SS8-17		17	S1	28	105	136	152	75	35	110	—	—	
SS8-18		18	S1	28	110	144	160	75	35	110	—	—	
SS8-19		19	S1	28	120	152	168	75	35	110	—	—	
SS8-20		20	S1	28	130	160	176	75	35	110	—	—	
SS8-21		21	S1	30	140	168	184	75	35	110	—	—	
SS8-22		22	S1	30	150	176	192	75	35	110	—	—	
SS8-23		23	S1	30	155	184	200	75	35	110	—	—	
SS8-24		24	S1	30	160	192	208	75	35	110	—	—	
SS8-25		25	S1	30	170	200	216	75	35	110	—	—	
SS8-26		26	S1	30	170	208	224	75	35	110	—	—	
SS8-27		27	S1	30	170	216	232	75	35	110	—	—	
SS8-28		28	S1	30	180	224	240	75	35	110	—	—	
SS8-30		30	S1	30	180	240	256	75	35	110	—	—	
SS10-15		m10	15	S1	30	115	150	170	90	40	130	—	—
SS10-20			20	S1	30	165	200	220	90	40	130	—	—
SS10-25			25	S1	40	200	250	270	90	40	130	—	—



Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Allowable torque (N · m) <i>NOTE 1</i>		Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 2</i>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
550	26.8	56.1	2.73	0.22~0.48	2.10	SS6-12
631	32.4	64.3	3.31	0.22~0.48	2.49	SS6-13
713	38.4	72.8	3.92	0.22~0.48	2.89	SS6-14
798	44.9	81.4	4.58	0.22~0.48	3.50	SS6-15
884	52	90.2	5.3	0.22~0.48	4.04	SS6-16
972	59.6	99.1	6.07	0.22~0.48	4.56	SS6-17
1060	67.7	108	6.9	0.22~0.48	5.08	SS6-18
1150	76.4	117	7.79	0.22~0.48	5.87	SS6-19
1240	85.9	127	8.75	0.22~0.48	6.71	SS6-20
1330	95.9	136	9.78	0.26~0.56	7.35	SS6-21
1430	107	145	10.9	0.26~0.56	8.11	SS6-22
1520	118	155	12	0.26~0.56	8.90	SS6-23
1610	129	165	13.2	0.26~0.56	9.73	SS6-24
1710	142	174	14.5	0.26~0.56	10.6	SS6-25
1800	154	184	15.7	0.26~0.56	11.5	SS6-26
1900	167	194	17	0.26~0.56	12.4	SS6-27
2000	181	204	18.4	0.26~0.56	13.4	SS6-28
2190	209	223	21.3	0.26~0.56	15.4	SS6-30
1990	200	203	20.4	0.26~0.56	16.4	SS6-32
2150	228	220	23.2	0.26~0.56	18.1	SS6-34
2240	242	228	24.7	0.26~0.56	19.0	SS6-35
2320	258	237	26.3	0.26~0.56	20.0	SS6-36
2490	289	254	29.5	0.26~0.56	22.0	SS6-38
2650	323	271	33	0.26~0.56	24.0	SS6-40
2820	359	288	36.6	0.30~0.64	25.9	SS6-42
2990	397	305	40.5	0.30~0.64	28.2	SS6-44
3080	416	314	42.5	0.30~0.64	30.7	SS6-45
3160	436	322	44.5	0.30~0.64	32.0	SS6-46
3330	478	340	48.8	0.30~0.64	34.5	SS6-48
3500	522	357	53.2	0.30~0.64	37.1	SS6-50
1220	62.6	125	6.39	0.28~0.58	4.94	SS8-12
1400	75.2	143	7.66	0.28~0.58	5.85	SS8-13
1590	88.9	162	9.06	0.28~0.58	6.83	SS8-14
1770	104	181	10.6	0.28~0.58	7.87	SS8-15
1970	121	200	12.3	0.28~0.58	9.20	SS8-16
2160	139	220	14.1	0.28~0.58	10.4	SS8-17
2360	158	240	16.1	0.28~0.58	11.7	SS8-18
2560	178	261	18.2	0.28~0.58	13.3	SS8-19
2760	200	281	20.4	0.28~0.58	15.0	SS8-20
2960	223	302	22.8	0.32~0.66	16.7	SS8-21
3170	248	323	25.3	0.32~0.66	18.6	SS8-22
3380	273	344	27.9	0.32~0.66	20.2	SS8-23
2990	250	305	25.5	0.32~0.66	22.0	SS8-24
3160	273	323	27.8	0.32~0.66	24.1	SS8-25
3340	297	341	30.3	0.32~0.66	25.6	SS8-26
3520	322	359	32.8	0.32~0.66	27.2	SS8-27
3700	348	377	35.5	0.32~0.66	29.6	SS8-28
4060	404	414	41.2	0.32~0.66	33.0	SS8-30
3330	203	339	20.7	0.34~0.68	15.0	SS10-15
4310	323	440	33	0.34~0.68	28.2	SS10-20
5930	529	605	54	0.36~0.76	43.3	SS10-25

NOTE 1: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

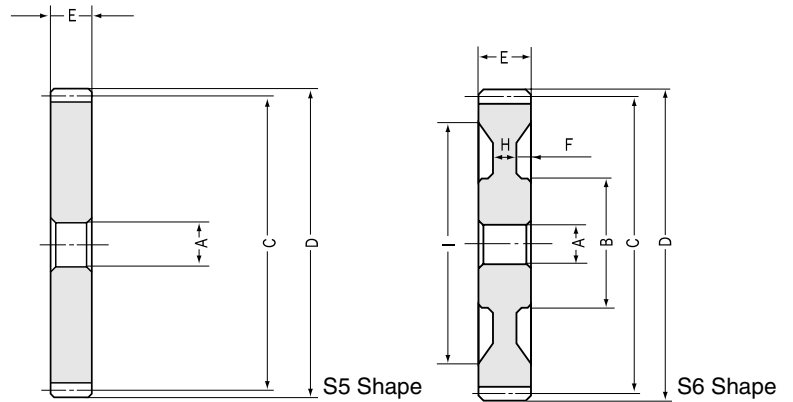
NOTE 2: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SSA Steel Hubless Spur Gears Module 1 ~ 1.5

Spur Gears

A 300



Module 1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Web thickness	Web O.D.
				A _{H7} NOTE 1	B	C	D	E	H	I
SSA1-20	m1	20	S5	8	—	20	22	10	—	—
SSA1-24		24	S5	8	—	24	26	10	—	—
SSA1-25		25	S5	8	—	25	27	10	—	—
SSA1-28		28	S5	8	—	28	30	10	—	—
SSA1-30		30	S5	8	—	30	32	10	—	—
SSA1-32		32	S5	8	—	32	34	10	—	—
SSA1-35		35	S5	8	—	35	37	10	—	—
SSA1-36		36	S5	8	—	36	38	10	—	—
SSA1-40		40	S5	8	—	40	42	10	—	—
SSA1-45		45	S5	8	—	45	47	10	—	—
SSA1-48		48	S5	8	—	48	50	10	—	—
SSA1-50		50	S5	10	—	50	52	10	—	—
SSA1-55	55	S5	10	—	55	57	10	—	—	
SSA1-56	56	S5	10	—	56	58	10	—	—	
SSA1-60	60	S5	10	—	60	62	10	—	—	
SSA1-70	70	S5	10	—	70	72	10	—	—	
SSA1-80	80	S5	10	—	80	82	10	—	—	
SSA1-100	100	S5	10	—	100	102	10	—	—	
SSA1-120	120	S5	10	—	120	122	10	—	—	

Module 1.5

SSA1.5-20	m1.5	20	S5	10	—	30	33	15	—	—
SSA1.5-24		24	S5	10	—	36	39	15	—	—
SSA1.5-25		25	S5	10	—	37.5	40.5	15	—	—
SSA1.5-28		28	S5	10	—	42	45	15	—	—
SSA1.5-30		30	S5	10	—	45	48	15	—	—
SSA1.5-32		32	S5	10	—	48	51	15	—	—
SSA1.5-35		35	S5	10	—	52.5	55.5	15	—	—
SSA1.5-36		36	S5	10	—	54	57	15	—	—
SSA1.5-40		40	S5	15	—	60	63	15	—	—
SSA1.5-45		45	S5	15	—	67.5	70.5	15	—	—
SSA1.5-48		48	S5	15	—	72	75	15	—	—
SSA1.5-50		50	S5	15	—	75	78	15	—	—
SSA1.5-55	55	S5	15	—	82.5	85.5	15	—	—	
SSA1.5-56	56	S5	15	—	84	87	15	—	—	
SSA1.5-60	60	S5	15	—	90	93	15	—	—	
SSA1.5-70	70	S5	15	—	105	108	15	—	—	
SSA1.5-80	80	S5	15	—	120	123	15	—	—	
SSA1.5-100	100	S6	15	70	150	153	15	9	125	

NOTE 1: Please design the maximum bore so that the tooth strength is less than the strength of remaining material.



Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Allowable torque (N · m) <small>NOTE 2</small>		Allowable torque (kgf · m)		Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
5.75	0.33	0.59	0.033	0.08~0.18	0.021	SSA1-20
7.47	0.49	0.76	0.050	0.08~0.18	0.032	SSA1-24
7.91	0.54	0.81	0.055	0.08~0.18	0.035	SSA1-25
9.24	0.68	0.94	0.070	0.08~0.18	0.044	SSA1-28
10.1	0.79	1.03	0.081	0.08~0.18	0.052	SSA1-30
11.1	0.90	1.13	0.092	0.08~0.18	0.059	SSA1-32
12.4	1.09	1.27	0.11	0.08~0.18	0.072	SSA1-35
12.9	1.16	1.31	0.12	0.08~0.18	0.076	SSA1-36
14.7	1.45	1.50	0.15	0.08~0.18	0.095	SSA1-40
17.1	1.86	1.74	0.19	0.08~0.18	0.12	SSA1-45
18.5	2.13	1.89	0.22	0.08~0.18	0.14	SSA1-48
19.5	2.32	1.98	0.24	0.08~0.18	0.15	SSA1-50
21.8	2.83	2.23	0.29	0.08~0.18	0.18	SSA1-55
22.3	2.94	2.28	0.30	0.08~0.18	0.19	SSA1-56
24.2	3.40	2.47	0.35	0.08~0.18	0.22	SSA1-60
29.1	4.70	2.96	0.48	0.08~0.18	0.30	SSA1-70
33.9	6.23	3.46	0.63	0.08~0.18	0.39	SSA1-80
43.7	9.97	4.45	1.02	0.08~0.18	0.61	SSA1-100
53.5	14.7	5.45	1.50	0.08~0.18	0.88	SSA1-120

19.4	1.15	1.98	0.12	0.10~0.22	0.074	SSA1.5-20
25.2	1.73	2.57	0.18	0.12~0.26	0.11	SSA1.5-24
26.7	1.90	2.72	0.19	0.12~0.26	0.12	SSA1.5-25
31.2	2.41	3.18	0.25	0.12~0.26	0.15	SSA1.5-28
34.2	2.79	3.49	0.28	0.12~0.26	0.18	SSA1.5-30
37.3	3.19	3.80	0.33	0.12~0.26	0.20	SSA1.5-32
41.9	3.85	4.28	0.39	0.12~0.26	0.25	SSA1.5-35
43.5	4.09	4.43	0.42	0.12~0.26	0.26	SSA1.5-36
49.8	5.10	5.07	0.52	0.12~0.26	0.31	SSA1.5-40
57.7	6.53	5.88	0.67	0.14~0.32	0.40	SSA1.5-45
62.4	7.47	6.37	0.76	0.14~0.32	0.46	SSA1.5-48
65.7	8.15	6.69	0.83	0.14~0.32	0.50	SSA1.5-50
73.7	9.96	7.51	1.02	0.14~0.32	0.61	SSA1.5-55
75.3	10.4	7.68	1.06	0.14~0.32	0.63	SSA1.5-56
81.8	12.0	8.34	1.22	0.14~0.32	0.73	SSA1.5-60
98.0	16.6	10.0	1.69	0.14~0.32	1.00	SSA1.5-70
114	22.0	11.7	2.24	0.14~0.32	1.31	SSA1.5-80
147	35.5	15.0	3.62	0.18~0.38	1.72	SSA1.5-100

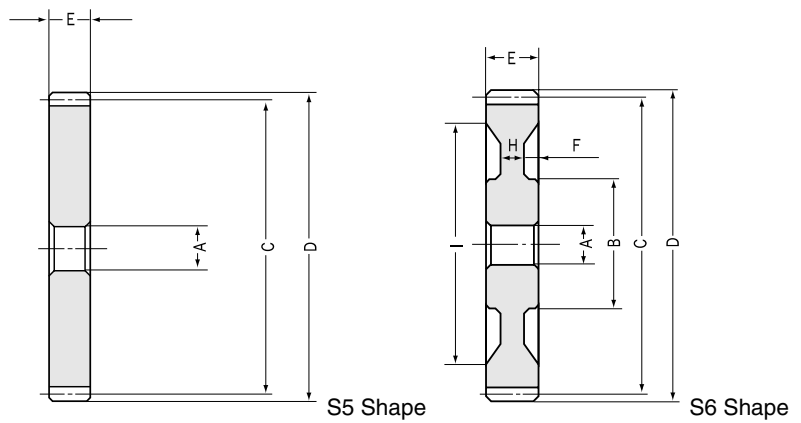
NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SSA Steel Hubless Spur Gears Modules 2~2.5

Spur Gears



Module 2

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Web thickness	Web O.D.
				A _{H7}	B	C	D	E	H	I
SSA2-20	m2	20	S5	12	—	40	44	20	—	—
SSA2-24		24	S5	12	—	48	52	20	—	—
SSA2-25		25	S5	12	—	50	54	20	—	—
SSA2-28		28	S5	15	—	56	60	20	—	—
SSA2-30		30	S5	15	—	60	64	20	—	—
SSA2-32		32	S5	15	—	64	68	20	—	—
SSA2-35		35	S5	15	—	70	74	20	—	—
SSA2-36		36	S5	15	—	72	76	20	—	—
SSA2-40		40	S5	18	—	80	84	20	—	—
SSA2-45		45	S5	18	—	90	94	20	—	—
SSA2-48		48	S5	18	—	96	100	20	—	—
SSA2-50		50	S5	18	—	100	104	20	—	—
SSA2-55		55	S5	18	—	110	114	20	—	—
SSA2-56		56	S5	18	—	112	116	20	—	—
SSA2-60		60	S5	18	—	120	124	20	—	—
SSA2-70		70	S5	18	—	140	144	20	—	—
SSA2-80		80	S6	18	70	160	164	20	12	136
SSA2-100		100	S6	18	90	200	204	20	12	176

Module 2.5

SSA2.5-20	m2.5	20	S5	15	—	50	55	25	—	—
SSA2.5-24		24	S5	15	—	60	65	25	—	—
SSA2.5-25		25	S5	15	—	62.5	67.5	25	—	—
SSA2.5-28		28	S5	18	—	70	75	25	—	—
SSA2.5-30		30	S5	18	—	75	80	25	—	—
SSA2.5-32		32	S5	18	—	80	85	25	—	—
SSA2.5-35		35	S5	18	—	87.5	92.5	25	—	—
SSA2.5-36		36	S5	18	—	90	95	25	—	—
SSA2.5-40		40	S5	22	—	100	105	25	—	—
SSA2.5-45		45	S5	22	—	112.5	117.5	25	—	—
SSA2.5-48		48	S5	22	—	120	125	25	—	—
SSA2.5-50		50	S5	22	—	125	130	25	—	—
SSA2.5-55		55	S5	22	—	137.5	142.5	25	—	—
SSA2.5-56		56	S5	22	—	140	145	25	—	—
SSA2.5-60		60	S6	22	70	150	155	25	15	121
SSA2.5-70		70	S6	22	80	175	180	25	15	146
SSA2.5-80		80	S6	22	90	200	205	25	15	171

NOTE 1: Please design the maximum bore so that the tooth strength is less than the strength of remaining material.



Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Allowable torque (N · m)		Allowable torque (kgf · m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
46.0	2.83	4.69	0.29	0.12~0.26	0.18	SSA2-20
59.8	4.24	6.09	0.43	0.14~0.30	0.27	SSA2-24
63.3	4.64	6.45	0.47	0.14~0.30	0.29	SSA2-25
73.9	5.89	7.54	0.60	0.14~0.30	0.36	SSA2-28
81.1	6.80	8.27	0.69	0.14~0.30	0.42	SSA2-30
88.4	7.78	9.01	0.79	0.14~0.30	0.48	SSA2-32
99.3	9.39	10.1	0.96	0.14~0.30	0.58	SSA2-35
103	9.96	10.5	1.02	0.14~0.30	0.61	SSA2-36
118	12.5	12.0	1.27	0.14~0.30	0.75	SSA2-40
137	16.0	13.9	1.63	0.18~0.36	0.96	SSA2-45
148	18.3	15.1	1.87	0.18~0.36	1.10	SSA2-48
156	19.9	15.9	2.03	0.18~0.36	1.19	SSA2-50
175	24.4	17.8	2.48	0.18~0.36	1.45	SSA2-55
179	25.3	18.2	2.58	0.18~0.36	1.51	SSA2-56
194	29.3	19.8	2.99	0.18~0.36	1.74	SSA2-60
232	40.8	23.7	4.16	0.18~0.36	2.38	SSA2-70
271	54.3	27.7	5.53	0.18~0.36	2.55	SSA2-80
291	72.7	29.7	7.42	0.20~0.44	3.90	SSA2-100

89.8	5.66	9.16	0.58	0.14~0.28	0.35	SSA2.5-20
117	8.47	11.9	0.86	0.16~0.34	0.52	SSA2.5-24
124	9.26	12.6	0.94	0.16~0.34	0.57	SSA2.5-25
144	11.7	14.7	1.20	0.16~0.34	0.71	SSA2.5-28
159	13.6	16.2	1.39	0.16~0.34	0.82	SSA2.5-30
173	15.6	17.6	1.59	0.16~0.34	0.94	SSA2.5-32
194	18.8	19.8	1.92	0.16~0.34	1.13	SSA2.5-35
201	20.0	20.5	2.04	0.16~0.34	1.20	SSA2.5-36
230	24.9	23.5	2.54	0.16~0.34	1.47	SSA2.5-40
267	31.9	27.2	3.26	0.18~0.40	1.88	SSA2.5-45
289	36.7	29.5	3.74	0.18~0.40	2.14	SSA2.5-48
304	40.0	31.0	4.08	0.18~0.40	2.33	SSA2.5-50
341	49.1	34.8	5.01	0.18~0.40	2.84	SSA2.5-55
349	51.0	35.6	5.20	0.18~0.40	2.95	SSA2.5-56
379	59.1	38.6	6.03	0.18~0.40	2.93	SSA2.5-60
454	82.1	46.3	8.37	0.18~0.40	3.89	SSA2.5-70
441	90.9	45.0	9.27	0.18~0.40	4.99	SSA2.5-80

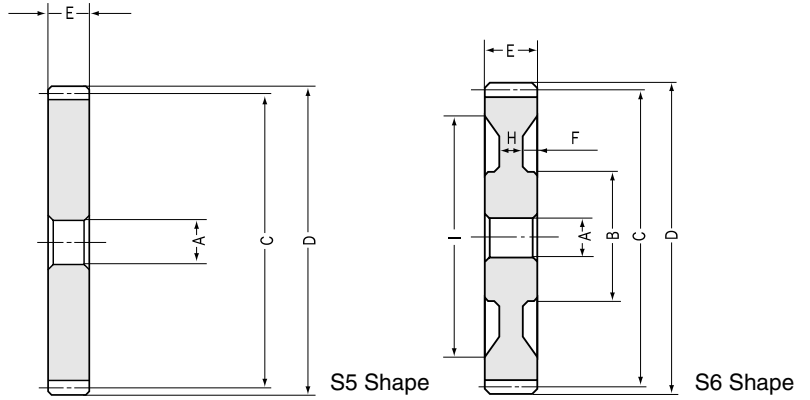
NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SSA Steel Hubless Spur Gears Modules 3~5

Spur Gears



Module 3, 4, 5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Web thickness	Web O.D.
				A _{H7}	B	C	D	E	H	I
SSA3-20	m3	20	S5	15	—	60	66	30	—	—
SSA3-24		24	S5	15	—	72	78	30	—	—
SSA3-25		25	S5	15	—	75	81	30	—	—
SSA3-28		28	S5	20	—	84	90	30	—	—
SSA3-30		30	S5	20	—	90	96	30	—	—
SSA3-32		32	S5	20	—	96	102	30	—	—
SSA3-35		35	S5	20	—	105	111	30	—	—
SSA3-36		36	S5	20	—	108	114	30	—	—
SSA3-40		40	S5	25	—	120	126	30	—	—
SSA3-45		45	S5	25	—	135	141	30	—	—
SSA3-48		48	S5	25	—	144	150	30	—	—
SSA3-50		50	S6	25	70	150	156	30	18	116
SSA3-55		55	S6	25	80	165	171	30	18	131
SSA3-56		56	S6	25	80	168	174	30	18	134
SSA3-60		60	S6	25	90	180	186	30	18	146
SSA3-70	70	S6	25	90	210	216	30	18	176	
SSA3-80	80	S6	25	90	240	246	30	18	205	
SSA4-20	m4	20	S5	20	—	80	88	40	—	—
SSA4-24		24	S5	20	—	96	104	40	—	—
SSA4-25		25	S5	20	—	100	108	40	—	—
SSA4-28		28	S5	25	—	112	120	40	—	—
SSA4-30		30	S5	25	—	120	128	40	—	—
SSA4-32		32	S5	25	—	128	136	40	—	—
SSA4-35		35	S5	25	—	140	148	40	—	—
SSA4-36		36	S5	25	—	144	152	40	—	—
SSA4-40		40	S6	30	80	160	168	40	26	118
SSA4-45		45	S6	30	100	180	188	40	26	138
SSA4-48		48	S6	30	100	192	200	40	26	150
SSA4-50		50	S6	30	100	200	208	40	26	158
SSA4-55		55	S6	30	110	220	228	40	26	178
SSA4-56		56	S6	30	110	224	232	40	26	182
SSA4-60		60	S6	30	120	240	248	40	26	198
SSA5-20	m5	20	S5	22	—	100	110	50	—	—
SSA5-24		24	S5	22	—	120	130	50	—	—
SSA5-25		25	S5	22	—	125	135	50	—	—
SSA5-28		28	S5	25	—	140	150	50	—	—
SSA5-30		30	S5	25	—	150	160	50	—	—
SSA5-32		32	S5	25	—	160	170	50	—	—
SSA5-35		35	S5	25	—	175	185	50	—	—
SSA5-36		36	S5	25	—	180	190	50	—	—
SSA5-40		40	S6	30	100	200	210	50	36	160
SSA5-45		45	S6	30	120	225	235	50	36	185
SSA5-48		48	S6	30	120	240	250	50	36	200
SSA5-50		50	S6	30	130	250	260	50	36	210

NOTE 1: Please design the maximum bore so that the tooth strength is less than the strength of remaining material.



Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

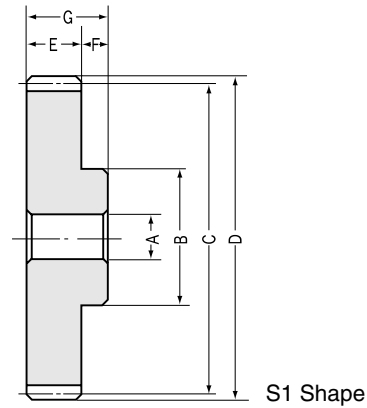
Allowable torque (N · m)		Allowable torque (kgf · m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
155	9.95	15.8	1.02	0.14~0.32	0.62	SSA3-20
202	14.9	20.6	1.52	0.18~0.38	0.92	SSA3-24
214	16.3	21.8	1.66	0.18~0.38	1.00	SSA3-25
250	20.7	25.4	2.11	0.18~0.38	1.23	SSA3-28
274	24.0	27.9	2.44	0.18~0.38	1.42	SSA3-30
298	27.4	30.4	2.80	0.18~0.38	1.63	SSA3-32
335	33.1	34.2	3.38	0.18~0.38	1.97	SSA3-35
348	35.2	35.5	3.59	0.18~0.38	2.08	SSA3-36
398	44.0	40.6	4.49	0.18~0.38	2.55	SSA3-40
461	56.6	47	5.78	0.20~0.44	3.26	SSA3-45
500	65.0	50.9	6.63	0.20~0.44	3.72	SSA3-48
525	70.9	53.6	7.23	0.20~0.44	3.60	SSA3-50
590	86.9	60.1	8.86	0.20~0.44	4.34	SSA3-55
602	90.3	61.4	9.21	0.20~0.44	4.47	SSA3-56
654	105	66.7	10.7	0.20~0.44	5.14	SSA3-60
654	121	66.6	12.4	0.20~0.44	6.64	SSA3-70
763	162	77.8	16.5	0.20~0.44	8.37	SSA3-80
368	24.3	37.5	2.48	0.18~0.38	1.48	SSA4-20
478	36.4	48.8	3.72	0.20~0.44	2.17	SSA4-24
506	39.9	51.6	4.07	0.20~0.44	2.37	SSA4-25
591	50.6	60.3	5.16	0.20~0.44	2.94	SSA4-28
649	58.7	66.2	5.98	0.20~0.44	3.40	SSA4-30
707	67.4	72.1	6.87	0.20~0.44	3.89	SSA4-32
795	81.6	81.1	8.32	0.20~0.44	4.68	SSA4-35
825	86.7	84.1	8.84	0.20~0.44	4.96	SSA4-36
943	109	96.2	11.1	0.20~0.44	5.70	SSA4-40
1090	139	112	14.2	0.24~0.52	7.29	SSA4-45
987	133	101	13.6	0.24~0.52	8.12	SSA4-48
1040	146	106	14.8	0.24~0.52	8.70	SSA4-50
1160	179	119	18.2	0.24~0.52	10.4	SSA4-55
1190	186	121	18.9	0.24~0.52	10.7	SSA4-56
1290	215	132	22.0	0.24~0.52	12.3	SSA4-60
718	48.6	73.3	4.96	0.20~0.44	2.93	SSA5-20
934	73.0	95.2	7.45	0.24~0.50	4.29	SSA5-24
989	80.0	101	8.16	0.24~0.50	4.67	SSA5-25
1160	102	118	10.4	0.24~0.50	5.85	SSA5-28
1270	118	129	12.1	0.24~0.50	6.74	SSA5-30
1380	136	141	13.8	0.24~0.50	7.70	SSA5-32
1550	164	158	16.7	0.24~0.50	9.25	SSA5-35
1610	174	164	17.8	0.24~0.50	9.80	SSA5-36
1540	182	157	18.5	0.24~0.50	11.1	SSA5-40
1780	234	182	23.9	0.28~0.58	14.0	SSA5-45
1930	269	197	27.5	0.28~0.58	15.7	SSA5-48
2030	294	207	30.0	0.28~0.58	17.1	SSA5-50

NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SSY Steel Thin Face Spur Gears Modules 0.8~1



Module 0.8

Catalog No.	Module	No. of teeth	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width <small>NOTE 1</small>	Hub width	Total length	Web thickness	Web O.D.
	<i>m</i>	<i>z</i>	AH7	B	C	D	E	F	G	H	I
SSY0.8-20	0.8	20	5	13.5	16	17.6	4	8	12	—	—
SSY0.8-25	0.8	25	5	17	20	21.6	4	8	12	—	—
SSY0.8-30	0.8	30	5	20	24	25.6	4	8	12	—	—
SSY0.8-40	0.8	40	5	25	32	33.6	4	8	12	—	—
SSY0.8-50	0.8	50	5	25	40	41.6	4	8	12	—	—

Module 1

SSY1- 12	1	12	5	9	12	14	6	8	14	—	—
SSY1- 14	1	14	5	11	14	16	6	8	14	—	—
SSY1- 15	1	15	6	12	15	17	6	8	14	—	—
SSY1- 16	1	16	6	13	16	18	6	8	14	—	—
SSY1- 18	1	18	6	14	18	20	6	8	14	—	—
SSY1- 20	1	20	6	16	20	22	6	8	14	—	—
SSY1- 24	1	24	6	16	24	26	6	8	14	—	—
SSY1- 25	1	25	6	16	25	27	6	8	14	—	—
SSY1- 28	1	28	6	16	28	30	6	8	14	—	—
SSY1- 30	1	30	6	25	30	32	6	8	14	—	—
SSY1- 32	1	32	6	25	32	34	6	8	14	—	—
SSY1- 35	1	35	6	25	35	37	6	8	14	—	—
SSY1- 36	1	36	6	25	36	38	6	8	14	—	—
SSY1- 40	1	40	8	28	40	42	6	8	14	—	—
SSY1- 45	1	45	8	28	45	47	6	8	14	—	—
SSY1- 48	1	48	8	28	48	50	6	8	14	—	—
SSY1- 50	1	50	8	28	50	52	6	8	14	—	—
SSY1- 55	1	55	8	28	55	57	6	8	14	—	—
SSY1- 56	1	56	8	28	56	58	6	8	14	—	—
SSY1- 60	1	60	8	35	60	62	6	8	14	—	—
SSY1- 64	1	64	8	35	64	66	6	8	14	—	—
SSY1- 65	1	65	8	35	65	67	6	8	14	—	—
SSY1- 70	1	70	8	35	70	72	6	8	14	—	—
SSY1- 72	1	72	8	35	72	74	6	8	14	—	—
SSY1- 75	1	75	8	35	75	77	6	8	14	—	—
SSY1- 80	1	80	10	40	80	82	6	8	14	—	—
SSY1- 85	1	85	10	40	85	87	6	8	14	—	—
SSY1- 90	1	90	10	40	90	92	6	8	14	—	—
SSY1- 95	1	95	10	40	95	97	6	8	14	—	—
SSY1- 96	1	96	10	40	96	98	6	8	14	—	—
SSY1-100	1	100	10	50	100	102	6	8	14	—	—
SSY1-110	1	110	10	50	110	112	6	8	14	—	—
SSY1-120	1	120	10	50	120	122	6	8	14	—	—

CAUTION: The gears with wider face widths such as SS and SSA series can be used as the mating gears to these.

NOTE 1: Due to the thin face width, if you wish to perform secondary operations on these gears, please use care to avoid side run out and deformation. If you heat treat them, there is the possibility of warping these gears.



Steel, Thin Face Spur Gears

Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Shape	Allowable torque (N·m) <small>NOTE 2</small>		Allowable torque (kgf·m)		Backlash (mm) <small>NOTE 3</small>	Weight (kgf)	Catalog No.
	Bending strength	Surface durability	Bending strength	Surface durability			
S1	1.471	0.085	(0.15)	(0.0087)	0 ~ 0.10	0.014	SSYO.8-20
S1	2.025	0.134	(0.207)	(0.0137)	0 ~ 0.10	0.023	SSYO.8-25
S1	2.596	0.197	(0.265)	(0.0201)	0 ~ 0.10	0.032	SSYO.8-30
S1	3.774	0.362	(0.385)	(0.0369)	0 ~ 0.10	0.054	SSYO.8-40
S1	4.98	0.58	(0.508)	(0.0591)	0 ~ 0.10	0.068	SSYO.8-50

S1	1.527	0.0686	(0.1557)	(0.007)	0.08 ~ 0.18	0.01	SSY1- 12
S1	1.982	0.0961	(0.2021)	(0.0098)	0.08 ~ 0.18	0.01	SSY1- 14
S1	2.216	0.1118	(0.226)	(0.0114)	0.08 ~ 0.18	0.01	SSY1- 15
S1	2.457	0.1275	(0.2505)	(0.013)	0.08 ~ 0.18	0.02	SSY1- 16
S1	2.946	0.1618	(0.3004)	(0.0165)	0.08 ~ 0.18	0.02	SSY1- 18
S1	3.448	0.201	(0.3516)	(0.0205)	0.08 ~ 0.18	0.02	SSY1- 20
S1	4.482	0.2952	(0.457)	(0.0301)	0.08 ~ 0.18	0.03	SSY1- 24
S1	4.744	0.3217	(0.4838)	(0.0328)	0.08 ~ 0.18	0.03	SSY1- 25
S1	5.545	0.4089	(0.5654)	(0.0417)	0.08 ~ 0.18	0.04	SSY1- 28
S1	6.084	0.4737	(0.6204)	(0.0483)	0.08 ~ 0.18	0.06	SSY1- 30
S1	6.629	0.5423	(0.676)	(0.0553)	0.08 ~ 0.18	0.06	SSY1- 32
S1	7.453	0.6551	(0.76)	(0.0668)	0.08 ~ 0.18	0.07	SSY1- 35
S1	7.73	0.6963	(0.7882)	(0.071)	0.08 ~ 0.18	0.08	SSY1- 36
S1	8.844	0.8698	(0.9018)	(0.0887)	0.08 ~ 0.18	0.09	SSY1- 40
S1	10.25	1.115	(1.045)	(0.1137)	0.08 ~ 0.18	0.11	SSY1- 45
S1	11.1	1.277	(1.132)	(0.1302)	0.08 ~ 0.18	0.12	SSY1- 48
S1	11.67	1.392	(1.19)	(0.1419)	0.08 ~ 0.18	0.13	SSY1- 50
S1	13.1	1.699	(1.336)	(0.1733)	0.08 ~ 0.18	0.14	SSY1- 55
S1	13.39	1.765	(1.365)	(0.18)	0.08 ~ 0.18	0.15	SSY1- 56
S1	14.53	2.04	(1.482)	(0.208)	0.08 ~ 0.18	0.19	SSY1- 60
S1	15.69	2.336	(1.6)	(0.2382)	0.08 ~ 0.18	0.21	SSY1- 64
S1	15.97	2.412	(1.629)	(0.246)	0.08 ~ 0.18	0.21	SSY1- 65
S1	17.43	2.817	(1.777)	(0.2873)	0.08 ~ 0.18	0.24	SSY1- 70
S1	18	2.989	(1.836)	(0.3048)	0.08 ~ 0.18	0.25	SSY1- 72
S1	18.88	3.259	(1.925)	(0.3323)	0.08 ~ 0.18	0.26	SSY1- 75
S1	20.34	3.735	(2.074)	(0.3809)	0.08 ~ 0.18	0.31	SSY1- 80
S1	21.8	4.246	(2.223)	(0.433)	0.08 ~ 0.18	0.34	SSY1- 85
S1	23.26	4.79	(2.372)	(0.4885)	0.08 ~ 0.18	0.37	SSY1- 90
S1	24.72	5.369	(2.521)	(0.5475)	0.08 ~ 0.18	0.4	SSY1- 95
S1	25.02	5.489	(2.551)	(0.5597)	0.08 ~ 0.18	0.41	SSY1- 96
S1	26.19	5.981	(2.671)	(0.6099)	0.08 ~ 0.18	0.48	SSY1-100
S1	29.14	7.309	(2.971)	(0.7453)	0.08 ~ 0.18	0.56	SSY1-110
S1	32.08	8.799	(3.271)	(0.8973)	0.08 ~ 0.18	0.65	SSY1-120

*The blue catalog numbers indicate the new products.

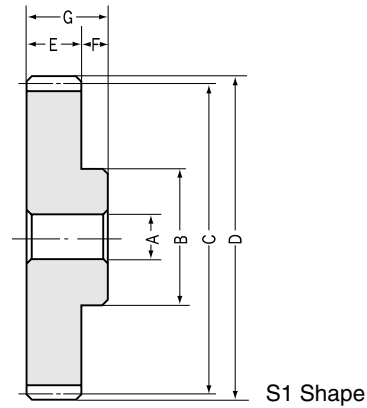
NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SSY Steel Thin Face Spur Gears Module 1.25

Spur Gears



Module 1.25

Catalog No.	Module	No. of teeth	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width <small>NOTE 1</small>	Hub width	Total length	Web thickness	Web O.D.
	m	z	AH7	B	C	D	E	F	G	H	I
SSY1.25- 12	1.25	12	5	11	15	17.5	8	10	18	—	—
SSY1.25- 14	1.25	14	5	13	17.5	20	8	10	18	—	—
SSY1.25- 15	1.25	15	6	15	18.75	21.25	8	10	18	—	—
SSY1.25- 16	1.25	16	6	16	20	22.5	8	10	18	—	—
SSY1.25- 18	1.25	18	6	18	22.5	25	8	10	18	—	—
SSY1.25- 20	1.25	20	8	20	25	27.5	8	10	18	—	—
SSY1.25- 24	1.25	24	8	24	30	32.5	8	10	18	—	—
SSY1.25- 25	1.25	25	8	24	31.25	33.75	8	10	18	—	—
SSY1.25- 28	1.25	28	8	28	35	37.5	8	10	18	—	—
SSY1.25- 30	1.25	30	10	30	37.5	40	8	10	18	—	—
SSY1.25- 32	1.25	32	10	30	40	42.5	8	10	18	—	—
SSY1.25- 35	1.25	35	10	36	43.75	46.25	8	10	18	—	—
SSY1.25- 36	1.25	36	10	36	45	47.5	8	10	18	—	—
SSY1.25- 40	1.25	40	10	40	50	52.5	8	10	18	—	—
SSY1.25- 45	1.25	45	10	40	56.25	58.75	8	10	18	—	—
SSY1.25- 48	1.25	48	10	40	60	62.5	8	10	18	—	—
SSY1.25- 50	1.25	50	12	45	62.5	65	8	10	18	—	—
SSY1.25- 55	1.25	55	12	45	68.75	71.25	8	10	18	—	—
SSY1.25- 56	1.25	56	12	45	70	72.5	8	10	18	—	—
SSY1.25- 60	1.25	60	12	50	75	77.5	8	10	18	—	—
SSY1.25- 64	1.25	64	12	50	80	82.5	8	10	18	—	—
SSY1.25- 65	1.25	65	12	50	81.25	83.75	8	10	18	—	—
SSY1.25- 70	1.25	70	15	55	87.5	90	8	10	18	—	—
SSY1.25- 72	1.25	72	15	55	90	92.5	8	10	18	—	—
SSY1.25- 75	1.25	75	15	55	93.75	96.25	8	10	18	—	—
SSY1.25- 80	1.25	80	15	60	100	102.5	8	10	18	—	—
SSY1.25- 85	1.25	85	15	60	106.25	108.75	8	10	18	—	—
SSY1.25- 90	1.25	90	15	65	112.5	115	8	10	18	—	—
SSY1.25- 95	1.25	95	15	65	118.75	121.25	8	10	18	—	—
SSY1.25- 96	1.25	96	15	65	120	122.5	8	10	18	—	—
SSY1.25-100	1.25	100	15	65	125	127.5	8	10	18	—	—

NOTE 1: Due to the thin face width, if you wish to perform secondary operations on these gears, please use care to avoid side run out and deformation. If you heat treat them, there is the possibility of warping these gears.



Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

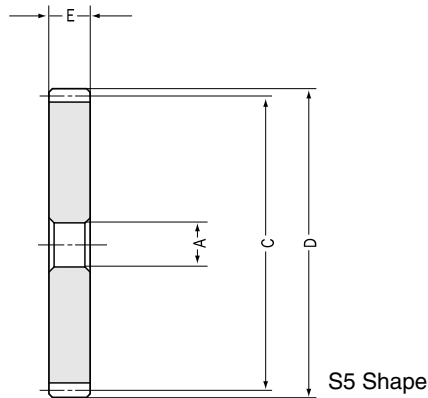
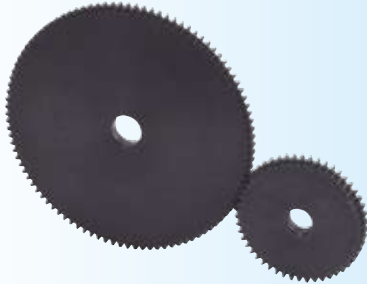
Shape	Allowable torque (N·m) <small>NOTE 2</small>		Allowable torque (kgf·m)		Backlash (mm) <small>NOTE 3</small>	Weight (kgf)	Catalog No.
	Bending strength	Surface durability	Bending strength	Surface durability			
S1	3.181	0.1442	(0.3244)	(0.0147)	0.08 ~ 0.18	0.02	SSY1.25- 12
S1	4.129	0.201	(0.421)	(0.0205)	0.08 ~ 0.18	0.02	SSY1.25- 14
S1	4.618	0.2334	(0.4709)	(0.0238)	0.08 ~ 0.18	0.03	SSY1.25- 15
S1	5.117	0.2687	(0.5218)	(0.0274)	0.08 ~ 0.18	0.03	SSY1.25- 16
S1	6.137	0.3432	(0.6258)	(0.035)	0.08 ~ 0.18	0.04	SSY1.25- 18
S1	7.183	0.4295	(0.7325)	(0.0438)	0.08 ~ 0.18	0.05	SSY1.25- 20
S1	9.337	0.6315	(0.9521)	(0.0644)	0.1 ~ 0.22	0.07	SSY1.25- 24
S1	9.885	0.6884	(1.008)	(0.0702)	0.1 ~ 0.22	0.08	SSY1.25- 25
S1	11.55	0.8738	(1.178)	(0.0891)	0.1 ~ 0.22	0.1	SSY1.25- 28
S1	12.68	1.011	(1.293)	(0.1031)	0.1 ~ 0.22	0.11	SSY1.25- 30
S1	13.81	1.159	(1.408)	(0.1182)	0.1 ~ 0.22	0.12	SSY1.25- 32
S1	15.52	1.4	(1.583)	(0.1428)	0.1 ~ 0.22	0.16	SSY1.25- 35
S1	16.1	1.487	(1.642)	(0.1516)	0.1 ~ 0.22	0.17	SSY1.25- 36
S1	18.43	1.855	(1.879)	(0.1892)	0.1 ~ 0.22	0.21	SSY1.25- 40
S1	21.36	2.376	(2.178)	(0.2423)	0.12 ~ 0.26	0.24	SSY1.25- 45
S1	23.12	2.72	(2.358)	(0.2774)	0.12 ~ 0.26	0.26	SSY1.25- 48
S1	24.31	2.964	(2.479)	(0.3022)	0.12 ~ 0.26	0.3	SSY1.25- 50
S1	27.29	3.617	(2.783)	(0.3688)	0.12 ~ 0.26	0.34	SSY1.25- 55
S1	27.89	3.756	(2.844)	(0.383)	0.12 ~ 0.26	0.35	SSY1.25- 56
S1	30.28	4.345	(3.088)	(0.4431)	0.12 ~ 0.26	0.42	SSY1.25- 60
S1	32.69	4.981	(3.333)	(0.5079)	0.12 ~ 0.26	0.45	SSY1.25- 64
S1	33.29	5.146	(3.3395)	(0.5248)	0.12 ~ 0.26	0.46	SSY1.25- 65
S1	36.3	6.018	(3.702)	(0.6137)	0.12 ~ 0.26	0.54	SSY1.25- 70
S1	37.52	6.387	(3.826)	(0.6513)	0.12 ~ 0.26	0.56	SSY1.25- 72
S1	39.33	6.962	(4.011)	(0.7099)	0.12 ~ 0.26	0.59	SSY1.25- 75
S1	42.37	7.975	(4.321)	(0.8132)	0.12 ~ 0.26	0.69	SSY1.25- 80
S1	45.41	9.059	(4.631)	(0.9238)	0.16 ~ 0.32	0.75	SSY1.25- 85
S1	48.46	10.22	(4.942)	(1.042)	0.16 ~ 0.32	0.86	SSY1.25- 90
S1	51.51	11.47	(5.253)	(1.17)	0.16 ~ 0.32	0.93	SSY1.25- 95
S1	52.12	11.73	(5.315)	(1.196)	0.16 ~ 0.32	0.94	SSY1.25- 96
S1	54.57	12.81	(5.565)	(1.306)	0.16 ~ 0.32	1	SSY1.25-100

NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions.
Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SSAY Steel, Hubless, Thin Face Spur Gears Module 1 ~ 1.25



Module 1

Catalog No.	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width <i>NOTE 1</i>	Allowable torque (N · m) <i>NOTE 2</i>		Allowable torque (kgf · m)	
				A _{H7}	C	D	E	Bending strength	Surface durability	Bending strength	Surface durability
SSAY1-20	m1	20	S5	6	20	22	6	3.45	0.20	0.35	0.021
SSAY1-24		24	S5	6	24	26	6	4.48	0.30	0.46	0.030
SSAY1-25		25	S5	6	25	27	6	4.74	0.32	0.48	0.033
SSAY1-28		28	S5	6	28	30	6	5.55	0.41	0.57	0.042
SSAY1-30		30	S5	6	30	32	6	6.08	0.47	0.62	0.048
SSAY1-32		32	S5	6	32	34	6	6.63	0.54	0.68	0.055
SSAY1-35		35	S5	6	35	37	6	7.45	0.66	0.76	0.067
SSAY1-36		36	S5	6	36	38	6	7.73	0.70	0.79	0.071
SSAY1-40		40	S5	6	40	42	6	8.84	0.87	0.90	0.089
SSAY1-45		45	S5	6	45	47	6	10.3	1.12	1.05	0.11
SSAY1-48		48	S5	6	48	50	6	11.1	1.28	1.13	0.13
SSAY1-50		50	S5	8	50	52	6	11.7	1.39	1.19	0.14
SSAY1-55		55	S5	8	55	57	6	13.1	1.70	1.34	0.17
SSAY1-56		56	S5	8	56	58	6	13.4	1.77	1.37	0.18
SSAY1-60		60	S5	8	60	62	6	14.5	2.04	1.48	0.21
SSAY1-70	70	S5	8	70	72	6	17.4	2.82	1.78	0.29	
SSAY1-80	80	S5	10	80	82	6	20.3	3.74	2.07	0.38	
SSAY1-100	100	S5	10	100	102	6	26.2	5.98	2.67	0.61	

Module 1.25

SSAY1.25-20	m1.25	20	S5	8	25	27.5	8	7.183	0.4295	0.7325	0.0438
SSAY1.25-24		24	S5	8	30	32.5	8	9.337	0.6315	0.9521	0.0644
SSAY1.25-25		25	S5	8	31.25	33.75	8	9.885	0.6884	1.008	0.0702
SSAY1.25-28		28	S5	8	35	37.5	8	11.55	0.8738	1.178	0.0891
SSAY1.25-30		30	S5	10	37.5	40	8	12.68	1.011	1.293	0.1031
SSAY1.25-32		32	S5	10	40	42.5	8	13.81	1.159	1.408	0.1182
SSAY1.25-35		35	S5	10	43.75	46.25	8	15.52	1.400	1.583	0.1428
SSAY1.25-36		36	S5	10	45	47.5	8	16.1	1.487	1.642	0.1516
SSAY1.25-40		40	S5	10	50	52.5	8	18.43	1.855	1.879	0.1892
SSAY1.25-45		45	S5	10	56.25	58.75	8	21.36	2.376	2.178	0.2423
SSAY1.25-48		48	S5	10	60	62.5	8	23.12	2.72	2.358	0.2774
SSAY1.25-50		50	S5	12	62.50	65	8	24.31	2.964	2.479	0.3022
SSAY1.25-55		55	S5	12	68.75	71.25	8	27.29	3.617	2.783	0.3688
SSAY1.25-56		56	S5	12	70	72.5	8	27.89	3.756	2.844	0.3830
SSAY1.25-60		60	S5	12	75	77.5	8	30.28	4.345	3.088	0.4431
SSAY1.25-70	70	S5	15	87.5	90	8	36.3	6.018	3.702	0.6137	
SSAY1.25-80	80	S5	15	100	102.5	8	42.37	7.975	4.321	0.8132	
SSAY1.25-100	100	S5	15	125	127.5	8	54.57	12.81	5.565	1.3060	

NOTE 1: Due to the thin face width, if you wish to perform secondary operations on these gears, please use care to avoid side run out and deformation. If you heat treat them, there is the possibility of warping these gears.

NOTE 2: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.



Steel, Hubless, Thin Face Spur Gears

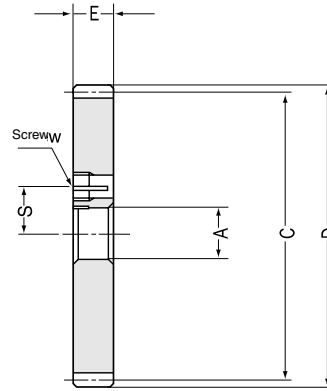
Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
0.08~0.18	0.013	SSAY1-20
0.08~0.18	0.020	SSAY1-24
0.08~0.18	0.022	SSAY1-25
0.08~0.18	0.028	SSAY1-28
0.08~0.18	0.032	SSAY1-30
0.08~0.18	0.037	SSAY1-32
0.08~0.18	0.044	SSAY1-35
0.08~0.18	0.047	SSAY1-36
0.08~0.18	0.058	SSAY1-40
0.08~0.18	0.074	SSAY1-45
0.08~0.18	0.084	SSAY1-48
0.08~0.18	0.090	SSAY1-50
0.08~0.18	0.11	SSAY1-55
0.08~0.18	0.11	SSAY1-56
0.08~0.18	0.13	SSAY1-60
0.08~0.18	0.18	SSAY1-70
0.08~0.18	0.23	SSAY1-80
0.08~0.18	0.37	SSAY1-100

0.08~0.18	0.03	SSAY1.25-20
0.10~0.22	0.04	SSAY1.25-24
0.10~0.22	0.05	SSAY1.25-25
0.10~0.22	0.06	SSAY1.25-28
0.10~0.22	0.06	SSAY1.25-30
0.10~0.22	0.07	SSAY1.25-32
0.10~0.22	0.09	SSAY1.25-35
0.10~0.22	0.1	SSAY1.25-36
0.10~0.22	0.12	SSAY1.25-40
0.12~0.26	0.15	SSAY1.25-45
0.12~0.26	0.17	SSAY1.25-48
0.12~0.26	0.19	SSAY1.25-50
0.12~0.26	0.23	SSAY1.25-55
0.12~0.26	0.23	SSAY1.25-56
0.12~0.26	0.27	SSAY1.25-60
0.12~0.26	0.37	SSAY1.25-70
0.12~0.26	0.48	SSAY1.25-80
0.16~0.32	0.76	SSAY1.25-100

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



S5 Shape

Module 0.8

Catalog No.	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Threaded hole		Allowable torque (N · m) <i>NOTE 1</i>	
				A _{H7}	C	D	E	Thread size	J	Bending strength	Surface durability
SSAY0.8-28/K6	m0.8	28	S5	6	22.4	24	6	M5	6.3	3.55	0.26
SSAY0.8-30/K6 /K8		30	S5	6 8	24 24	25.6	6	M5	6.3 7.3	3.89	0.30
SSAY0.8-32/K6 /K8		32	S5	6 8	25.6	27.2	6	M5	6.3 7.3	4.24	0.34
SSAY0.8-35/K6 /K8		35	S5	6 8	28 28	29.6	6	M5	6.3 7.3	4.77	0.41
SSAY0.8-36/K6 /K8		36	S5	6 8	28.8 28.8	30.4	6	M5	6.3 7.3	4.95	0.43
SSAY0.8-40/K6 /K8 /K10		40	S5	6 8 10	32 32 32	33.6	6	M5	6.3 7.3 8.3	5.66	0.54
SSAY0.8-45/K6 /K8 /K10		45	S5	6 8 10	36 36 36	37.6	6	M5	6.3 7.3 8.3	6.56	0.70
SSAY0.8-48/K6 /K8 /K10		48	S5	6 8 10	38.4 38.4 38.4	40	6	M5	6.3 7.3 8.3	7.11	0.80
SSAY0.8-50/K6 /K8 /K10		50	S5	6 8 10	40 40 40	41.6	6	M5	6.3 7.3 8.3	7.47	0.87
SSAY0.8-55/K6 /K8 /K10		55	S5	6 8 10	44 44 44	45.6	6	M5	6.3 7.3 8.3	8.39	1.06
SSAY0.8-56/K6 /K8 /K10		56	S5	6 8 10	44.8 44.8 44.8	46.4	6	M5	6.3 7.3 8.3	8.57	1.10
SSAY0.8-60/K6 /K8 /K10		60	S5	6 8 10	48 48 48	49.6	6	M5	6.3 7.3 8.3	9.30	1.28

CAUTION: It is not possible to perform secondary operations on the bore or the area around the clamp.

NOTE 1: The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 27 for more details.





Spur Gears with Built-In Clamps

Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Cannot modify bore or clamping area

*The gear grade listed is the value before clamping.

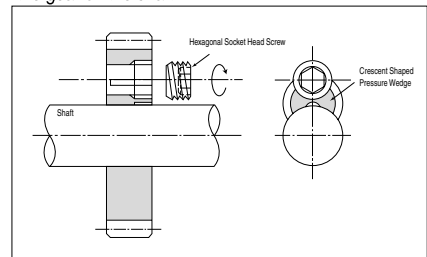
Allowable torque (kgf · m)		Reference slipping torque (N · m) <i>NOTE 2</i>		Backlash (mm) <i>NOTE 3</i>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Screw fastening torque	Ref. slipping torque			
0.36	0.026	2.8	2.4	0 ~0.10	0.017	SSAY0.8-28/K6
0.40	0.030	2.8	2.4 3.7	0 ~0.10	0.020 0.019	SSAY0.8-30/K6 /K8
0.43	0.035	2.8	2.4 3.7	0 ~0.10	0.023 0.022	SSAY0.8-32/K6 /K8
0.49	0.042	2.8	2.4 3.7	0 ~0.10	0.028 0.027	SSAY0.8-35/K6 /K8
0.50	0.044	2.8	2.4 3.7	0 ~0.10	0.029 0.028	SSAY0.8-36/K6 /K8
0.58	0.055	2.8	2.4 3.7 3.9	0 ~0.10	0.036 0.035 0.034	SSAY0.8-40/K6 /K8 /K10
0.67	0.071	2.8	2.4 3.7 3.9	0 ~0.10	0.046 0.045 0.044	SSAY0.8-45/K6 /K8 /K10
0.72	0.081	2.8	2.4 3.7 3.9	0 ~0.10	0.053 0.052 0.051	SSAY0.8-48/K6 /K8 /K10
0.76	0.089	2.8	2.4 3.7 3.9	0 ~0.10	0.058 0.057 0.055	SSAY0.8-50/K6 /K8 /K10
0.86	0.11	2.8	2.4 3.7 3.9	0 ~0.10	0.070 0.069 0.068	SSAY0.8-55/K6 /K8 /K10
0.87	0.11	2.8	2.4 3.7 3.9	0 ~0.10	0.073 0.072 0.070	SSAY0.8-56/K6 /K8 /K10
0.95	0.13	2.8	2.4 3.7 3.9	0 ~0.10	0.084 0.083 0.081	SSAY0.8-60/K6 /K8 /K10

NOTE 2: The slipping torques shown was experimentally obtained by attaching the gears to shafts with g6 tolerance and 0.4a surface finish. The clamping area was wiped with a cloth to remove excess oil.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

How does it work?

K-Clamp uses a “crescent” shaped piece, optimum for the size of the shaft, as a pressure wedge to secure the gear on the shaft.

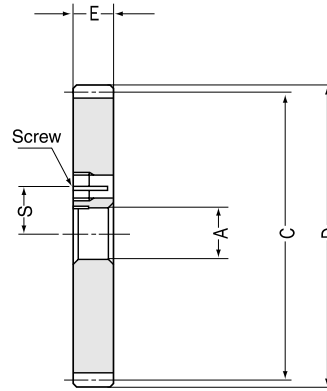


*The sizes and shapes of the K-clamps are standardized for various bore sizes.

Application Hints

1. The slipping torque is affected by the fits and clamping surface conditions. Remove as much lubricant as possible, and use the same size shaft as the bore with h7 or better tolerances.
2. K-clamp gears are suitable for relatively small gears in light loads with the bore size ranging between 6 and 12 mm. The gear will slip on the shaft when the actual load exceeds the slipping torque. The use of a key in addition to the K-clamp is recommended for heavier loads or large bore sizes. This modification must be done at the KHK factory.





S5 Shape

Module 1

Catalog No.	Module	No. of teeth	Shape	Bore	Pitch dia.	Outside dia.	Face width	Threaded hole		Allowable torque (N · m)	
				A _{H7}	C	D	E	Thread size	J	Bending strength	Surface durability
SSAY1-24/K6	m1	24	S5	6	24	26	6	M5	6.3	4.48	0.30
SSAY1-25/K6 /K8		25	S5	6 8	25	27	6	M5	6.3 7.3	4.74	0.32
SSAY1-28/K6 /K8 /K10		28	S5	6 8 10	28	30	6	M5	6.3 7.3 8.3	5.55	0.41
SSAY1-30/K6 /K8 /K10		30	S5	6 8 10	30	32	6	M5	6.3 7.3 8.3	6.08	0.47
SSAY1-32/K6 /K8 /K10		32	S5	6 8 10	32	34	6	M5	6.3 7.3 8.3	6.63	0.54
SSAY1-35/K6 /K8 /K10		35	S5	6 8 10	35	37	6	M5	6.3 7.3 8.3	7.45	0.66
SSAY1-36/K6 /K8 /K10		36	S5	6 8 10	36	38	6	M5	6.3 7.3 8.3	7.73	0.70
SSAY1-40/K6 /K8 /K10		40	S5	6 8 10	40	42	6	M5	6.3 7.3 8.3	8.84	0.87
SSAY1-45/K6 /K8 /K10		45	S5	6 8 10	45	47	6	M5	6.3 7.3 8.3	10.3	1.12
SSAY1-48/K6 /K8 /K10		48	S5	6 8 10	48	50	6	M5	6.3 7.3 8.3	11.1	1.28
SSAY1-50/K8 /K10 /K12		50	S5	8 10 12	50	52	6	M5 M5 M6	7.3 8.3 9.9	11.7	1.39
SSAY1-55/K8 /K10 /K12		55	S5	8 10 12	55	57	6	M5 M5 M6	7.3 8.3 9.9	13.1	1.70
SSAY1-56/K8 /K10 /K12		56	S5	8 10 12	56	58	6	M5 M5 M6	7.3 8.3 9.9	13.4	1.77
SSAY1-60/K8 /K10 /K12		60	S5	8 10 12	60	62	6	M5 M5 M6	7.3 8.3 9.9	14.5	2.04

CAUTION: It is not possible to perform secondary operations on the bore or the area around the clamp.

NOTE 1: The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 27 for more details.



Spur Gears with Built-In Clamps

Specifications

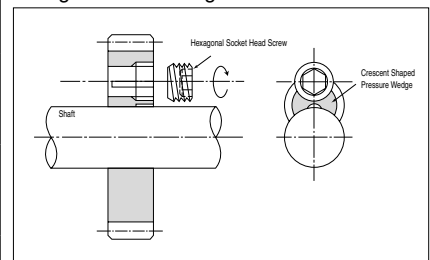
Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 194HB
Gear teeth	Standard full depth	Surface treatment	Black oxide
Pressure angle	20°	Tooth surface finish	Cut
Material	S45C	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Cannot modify bore or clamping area

*The gear grade listed is the value before clamping.

Allowable torque (kgf · m)		Reference slipping torque (N · m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Screw fastening torque	Ref. slipping torque			
0.46	0.030	2.8	2.4	0.08~0.18	0.020	SSAY1-24/K6
0.48	0.033	2.8	2.4	0.08~0.18	0.022	SSAY1-25/K6 /K8
		2.8	3.7		0.021	
0.57	0.042	2.8	2.4	0.08~0.18	0.028	SSAY1-28/K6 /K8 /K10
		2.8	3.7		0.027	
		2.8	3.9		0.025	
0.62	0.048	2.8	2.4	0.08~0.18	0.032	SSAY1-30/K6 /K8 /K10
		2.8	3.7		0.031	
		2.8	3.9		0.029	
0.68	0.055	2.8	2.4	0.08~0.18	0.036	SSAY1-32/K6 /K8 /K10
		2.8	3.7		0.035	
		2.8	3.9		0.034	
0.76	0.067	2.8	2.4	0.08~0.18	0.044	SSAY1-35/K6 /K8 /K10
		2.8	3.7		0.043	
		2.8	3.9		0.041	
0.79	0.071	2.8	2.4	0.08~0.18	0.046	SSAY1-36/K6 /K8 /K10
		2.8	3.7		0.045	
		2.8	3.9		0.044	
0.90	0.089	2.8	2.4	0.08~0.18	0.058	SSAY1-40/K6 /K8 /K10
		2.8	3.7		0.057	
		2.8	3.9		0.055	
1.05	0.11	2.8	2.4	0.08~0.18	0.073	SSAY1-45/K6 /K8 /K10
		2.8	3.7		0.072	
		2.8	3.9		0.071	
1.13	0.13	2.8	2.4	0.08~0.18	0.084	SSAY1-48/K6 /K8 /K10
		2.8	3.7		0.083	
		2.8	3.9		0.081	
1.19	0.14	2.8	3.7	0.08~0.18	0.090	SSAY1-50/K8 /K10 /K12
		2.8	3.9		0.089	
		4	6.6		0.087	
1.34	0.17	2.8	3.7	0.08~0.18	0.11	SSAY1-55/K8 /K10 /K12
		2.8	3.9		0.11	
		4	6.6		0.11	
1.37	0.18	2.8	3.7	0.08~0.18	0.11	SSAY1-56/K8 /K10 /K12
		2.8	3.9		0.11	
		4	6.6		0.11	
1.48	0.21	2.8	3.7	0.08~0.18	0.13	SSAY1-60/K8 /K10 /K12
		2.8	3.9		0.13	
		4	6.6		0.13	

How does it work?

K-Clamp uses a “crescent” shaped piece, optimum for the size of the shaft, as a pressure wedge to secure the gear on the shaft.



*The sizes and shapes of the K-clamps are standardized for various bore sizes.

Application Hints

1. The slipping torque is affected by the fits and clamping surface conditions. Remove as much lubricant as possible, and use the same size shaft as the bore with h7 or better tolerances.
2. K-clamp gears are suitable for relatively small gears in light loads with the bore size ranging between 6 and 12 mm. The gear will slip on the shaft when the actual load exceeds the slipping torque. The use of a key in addition to the K-clamp is recommended for heavier loads or large bore sizes. This modification must be done at the KHK factory.

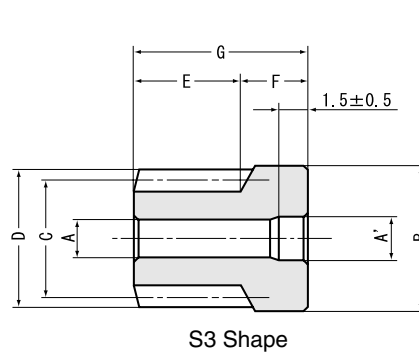


NOTE 2: The slipping torques shown was experimentally obtained by attaching the gears to shafts with g6 tolerance and 0.4a surface finish. The clamping area was wiped with a cloth to remove excess oil.
NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

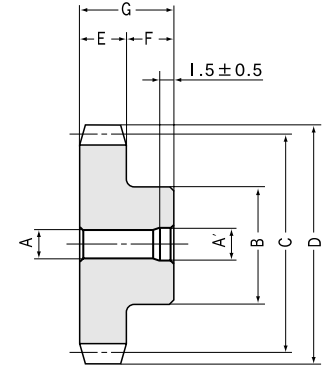


LS Sintered Metal Spur Gears Module 0.5~0.8

Spur Gears



S3 Shape



S1 Shape

Module 0.5, 0.8

Catalog No.	Module	No. of teeth	Shape	Bore 1	Bore 2	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Web thickness
				A $\begin{smallmatrix} -0.005 \\ -0.020 \end{smallmatrix}$	A' ± 0.1	B	C	D	E	F	G	H
LS0.5-12	m0.5	12	S3	2	2.1	7.4	6	7	4	3	7	—
LS0.5-16		16	S3	2	2.1	9.4	8	9	4	3	7	—
LS0.5-20		20	S3	3	3.1	11.4	10	11	4	4	8	—
LS0.5-25		25	S1	3	3.1	8.5	12.5	13.5	3	4	7	—
LS0.5-30		30	S1	3	3.1	9	15	16	3	4	7	—
LS0.5-40		40	S9	3	3.1	9	20	21	3	4	7	1.5
LS0.5-50		50	S9	4	4.1	12	25	26	3	5	8	1.5
LS0.5-60		60	S9	4	4.1	12	30	31	3	5	8	1.5
LS0.5-70		70	S9	4	4.1	12	35	36	3	5	8	1.5
LS0.5-80		80	S9	4	4.1	12	40	41	3	5	8	1.5
LS0.8-12	m0.8	12	S3	3	3.1	11.6	9.6	11.2	5	4	9	—
LS0.8-16		16	S1	3	3.1	8	12.8	14.4	4	4	8	—
LS0.8-20		20	S1	3	3.1	9	16	17.6	4	4	8	—
LS0.8-25		25	S1	3	3.1	9	20	21.6	4	4	8	—
LS0.8-30		30	S1	4	4.1	12	24	25.6	4	5	9	—
LS0.8-40		40	S9	4	4.1	12	32	33.6	4	5	9	2
LS0.8-50		50	S9	4	4.1	12	40	41.6	4	5	9	2
LS0.8-60		60	S9	4	4.1	12	48	49.6	4	5	9	2
LS0.8-70		70	S9	5	5.1	15	56	57.6	4	6	10	2
LS0.8-80		80	S9	5	5.1	15	64	65.6	4	6	10	2

CAUTION: Although the sintering process allows for the inclusion of oil to maintain lubricity, these gears have not been oil impregnated.

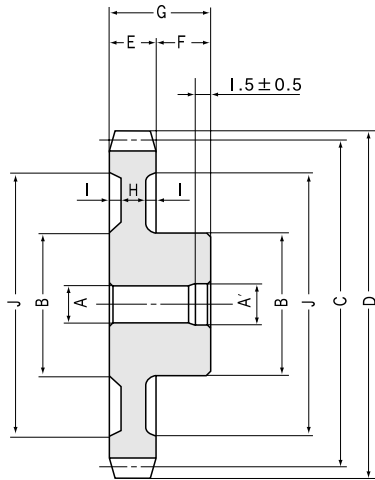
CAUTION: The rust prevention process involves treating the gears with steam (in effect, creating surface oxidation). A black oxide treatment cannot be done on these gears.

CAUTION: Gears with wider face widths such as SS and SSA series can be used as the mating gears to these.

NOTE 1: The bore1 is machined to minus tolerance so that the gear can simply be pressed onto the shaft. You can also open up the bore.

Characteristics of Sintered Steel Spur Gears

1. The cost is minimized due to the elimination of machining costs and a reduction in wasted material.
2. High precision for sintered products (JIS N8 Class). Has high reliability for maintaining its precision.
3. Oil-impregnated sintering creates interconnecting pores in which lubricating oil is stored for long, trouble-free operations.



S9 Shape

Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998)	Tooth hardness	70~95HRB
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Sintered
Material	SMF5040 (Equivalent to S45C)	Datum reference surface for tooth forming	Bore
Heat treatment	—	Secondary Operations	Possible

Web O.D. 	Allowable torque (N · m)		Allowable torque (kgf · m)		Backlash (mm)	Weight (kg)	Catalog No.
	Bending strength	Surface durability	Bending strength	Surface durability			
—	0.14	0.0078	0.014	0.0008	0.06~0.16	2	LS0.5-12 LS0.5-16 LS0.5-20 LS0.5-25 LS0.5-30
—	0.23	0.015	0.023	0.0015	0.06~0.16	2	
—	0.32	0.023	0.032	0.0024	0.06~0.16	4	
—	0.33	0.027	0.033	0.0028	0.10~0.20	4	
—	0.42	0.040	0.043	0.0040	0.10~0.20	5	
16.5	0.61	0.072	0.062	0.0073	0.10~0.20	6	LS0.5-40 LS0.5-50 LS0.5-60 LS0.5-70 LS0.5-80
21.5	0.81	0.11	0.082	0.012	0.12~0.24	10	
26.5	1.00	0.17	0.10	0.017	0.12~0.24	14	
31.5	1.20	0.23	0.12	0.024	0.12~0.24	16	
36.5	1.41	0.31	0.14	0.032	0.12~0.24	20	
—	0.45	0.026	0.046	0.0027	0.06~0.16	4	LS0.8-12 LS0.8-16 LS0.8-20 LS0.8-25 LS0.8-30
—	0.58	0.038	0.059	0.0039	0.06~0.16	4	
—	0.81	0.060	0.083	0.0061	0.06~0.16	6	
—	1.12	0.095	0.11	0.0097	0.10~0.20	10	
—	1.43	0.14	0.15	0.014	0.10~0.20	16	
26.4	2.09	0.26	0.21	0.026	0.10~0.20	20	LS0.8-40 LS0.8-50 LS0.8-60 LS0.8-70 LS0.8-80
34.4	2.75	0.41	0.28	0.042	0.12~0.24	26	
42.4	3.43	0.60	0.35	0.062	0.12~0.24	36	
50.4	4.11	0.84	0.42	0.085	0.12~0.24	48	
58.4	4.80	1.11	0.49	0.11	0.12~0.24	60	

NOTE 2: The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 27 for more details.

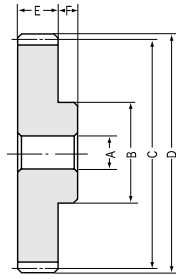
NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



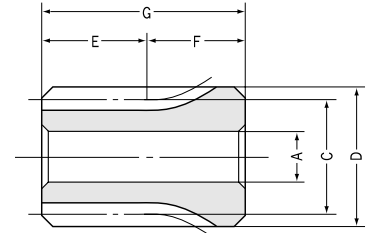
SUS Stainless Steel Spur Gears Modules 1 ~ 1.5

Spur Gears

nCS



S1 Shape



S3 Shape

Module 1, 1.5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A _{H7}	B	C	D	E	F	G
SUS1-15	m1	15	S3	8	17	15	17	10	20	30
SUS1-16		16	S3	8	18	16	18	10	20	30
SUS1-18		18	S3	8	20	18	20	10	20	30
SUS1-20		20	S1	8	16	20	22	10	10	20
SUS1-22		22	S1	8	18	22	24	10	10	20
SUS1-24		24	S1	8	20	24	26	10	10	20
SUS1-25		25	S1	8	20	25	27	10	10	20
SUS1-28		28	S1	8	23	28	30	10	10	20
SUS1-30		30	S1	8	25	30	32	10	10	20
SUS1-32		32	S1	8	26	32	34	10	10	20
SUS1-35		35	S1	8	26	35	37	10	10	20
SUS1-36		36	S1	8	28	36	38	10	10	20
SUS1-40		40	S1	10	35	40	42	10	10	20
SUS1-42		42	S1	10	35	42	44	10	10	20
SUS1-45		45	S1	10	35	45	47	10	10	20
SUS1-48		48	S1	10	35	48	50	10	10	20
SUS1-50		50	S1	10	35	50	52	10	10	20
SUS1-55		55	S1	10	40	55	57	10	10	20
SUS1-56		56	S1	10	40	56	58	10	10	20
SUS1-60		60	S1	10	40	60	62	10	10	20
SUS1-64	64	S1	10	45	64	66	10	10	20	
SUS1-70	70	S1	10	50	70	72	10	10	20	
SUS1-75	75	S1	10	55	75	77	10	10	20	
SUS1-80	80	S1	10	60	80	82	10	10	20	
SUS1-90	90	S1	10	60	90	92	10	10	20	
SUS1-100	100	S1	12	60	100	102	10	10	20	
SUS1-120	120	S1	12	60	120	122	10	10	20	
SUS1.5-15	m1.5	15	S1	8	18	22.5	25.5	15	14	29
SUS1.5-16		16	S1	8	20	24	27	15	14	29
SUS1.5-18		18	S1	8	22	27	30	15	14	29
SUS1.5-20		20	S1	8	24	30	33	15	14	29
SUS1.5-22		22	S1	8	26	33	36	15	14	29
SUS1.5-24		24	S1	8	28	36	39	15	14	29
SUS1.5-25		25	S1	8	30	37.5	40.5	15	14	29
SUS1.5-28		28	S1	10	36	42	45	15	14	29
SUS1.5-30		30	S1	10	38	45	48	15	14	29
SUS1.5-32		32	S1	10	40	48	51	15	14	29
SUS1.5-35		35	S1	10	42	52.5	55.5	15	14	29
SUS1.5-36		36	S1	10	45	54	57	15	14	29
SUS1.5-40		40	S1	12	45	60	63	15	14	29
SUS1.5-42		42	S1	12	45	63	66	15	14	29
SUS1.5-45		45	S1	12	45	67.5	70.5	15	14	29
SUS1.5-48		48	S1	12	45	72	75	15	14	29
SUS1.5-50		50	S1	12	50	75	78	15	14	29
SUS1.5-55		55	S1	12	55	82.5	85.5	15	14	29
SUS1.5-56		56	S1	12	55	84	87	15	14	29
SUS1.5-60		60	S1	15	60	90	93	15	14	29
SUS1.5-64	64	S1	15	60	96	99	15	14	29	
SUS1.5-70	70	S1	15	70	105	108	15	14	29	
SUS1.5-75	75	S1	15	70	112.5	115.5	15	14	29	
SUS1.5-80	80	S1	15	80	120	123	15	14	29	
SUS1.5-90	90	S1	15	80	135	138	15	14	29	
SUS1.5-100	100	S1	15	80	150	153	15	14	29	



Stainless Steel Spur Gears

Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 187HB
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	SUS303	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Allowable torque (N · m)		Allowable torque (kgf · m)		Backlash (mm)	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
2.04	0.12	0.21	0.013	0.08~0.18	0.04	SUS1-15
2.26	0.14	0.23	0.015	0.08~0.18	0.04	SUS1-16
2.71	0.18	0.28	0.019	0.08~0.18	0.06	SUS1-18
3.18	0.23	0.32	0.024	0.08~0.18	0.04	SUS1-20
3.65	0.29	0.37	0.029	0.08~0.18	0.04	SUS1-22
4.13	0.35	0.42	0.036	0.08~0.18	0.06	SUS1-24
4.37	0.38	0.45	0.039	0.08~0.18	0.06	SUS1-25
5.11	0.48	0.52	0.049	0.08~0.18	0.07	SUS1-28
5.6	0.56	0.57	0.057	0.08~0.18	0.09	SUS1-30
6.11	0.64	0.62	0.066	0.08~0.18	0.10	SUS1-32
6.87	0.78	0.70	0.079	0.08~0.18	0.11	SUS1-35
7.12	0.82	0.73	0.084	0.08~0.18	0.12	SUS1-36
8.15	1.03	0.83	0.11	0.08~0.18	0.16	SUS1-40
8.66	1.14	0.88	0.12	0.08~0.18	0.17	SUS1-42
9.44	1.32	0.96	0.13	0.08~0.18	0.19	SUS1-45
10.2	1.51	1.04	0.15	0.08~0.18	0.21	SUS1-48
10.8	1.65	1.10	0.17	0.08~0.18	0.22	SUS1-50
12.1	2.01	1.23	0.21	0.08~0.18	0.28	SUS1-55
12.3	2.09	1.26	0.21	0.08~0.18	0.28	SUS1-56
13.4	2.42	1.37	0.25	0.08~0.18	0.31	SUS1-60
14.5	2.77	1.47	0.28	0.08~0.18	0.37	SUS1-64
16.1	3.34	1.64	0.34	0.08~0.18	0.47	SUS1-70
17.4	3.86	1.77	0.39	0.08~0.18	0.53	SUS1-75
18.7	4.42	1.91	0.45	0.08~0.18	0.60	SUS1-80
21.4	5.67	2.19	0.58	0.08~0.18	0.72	SUS1-90
24.1	7.08	2.46	0.72	0.08~0.18	0.82	SUS1-100
29.6	10.4	3.01	1.06	0.08~0.18	1.10	SUS1-120
6.89	0.43	0.70	0.044	0.10~0.22	0.06	SUS1.5-15
7.63	0.50	0.78	0.051	0.10~0.22	0.08	SUS1.5-16
9.16	0.65	0.93	0.066	0.10~0.22	0.10	SUS1.5-18
10.7	0.82	1.09	0.084	0.10~0.22	0.12	SUS1.5-20
12.3	1.01	1.26	0.10	0.12~0.26	0.15	SUS1.5-22
13.9	1.23	1.42	0.13	0.12~0.26	0.18	SUS1.5-24
14.8	1.35	1.50	0.14	0.12~0.26	0.19	SUS1.5-25
17.2	1.71	1.76	0.17	0.12~0.26	0.26	SUS1.5-28
18.9	1.98	1.93	0.20	0.12~0.26	0.29	SUS1.5-30
20.6	2.27	2.10	0.23	0.12~0.26	0.33	SUS1.5-32
23.2	2.74	2.36	0.28	0.12~0.26	0.39	SUS1.5-35
24.0	2.91	2.45	0.30	0.12~0.26	0.42	SUS1.5-36
27.5	3.62	2.80	0.37	0.12~0.26	0.48	SUS1.5-40
29.2	4.01	2.98	0.41	0.14~0.32	0.56	SUS1.5-42
31.9	4.64	3.25	0.47	0.14~0.32	0.57	SUS1.5-45
34.5	5.31	3.52	0.54	0.14~0.32	0.63	SUS1.5-48
36.3	5.79	3.70	0.59	0.14~0.32	0.71	SUS1.5-50
40.7	7.08	4.15	0.72	0.14~0.32	0.87	SUS1.5-55
41.6	7.36	4.24	0.75	0.14~0.32	0.90	SUS1.5-56
45.2	8.51	4.61	0.87	0.14~0.32	1.00	SUS1.5-60
48.8	9.75	4.97	0.99	0.14~0.32	1.10	SUS1.5-64
54.2	11.8	5.52	1.20	0.14~0.32	1.40	SUS1.5-70
58.7	13.6	5.99	1.39	0.14~0.32	1.60	SUS1.5-75
63.2	15.6	6.45	1.59	0.14~0.32	1.80	SUS1.5-80
72.3	20.1	7.37	2.05	0.18~0.38	2.20	SUS1.5-90
81.4	25.2	8.30	2.57	0.18~0.38	2.60	SUS1.5-100

*Available on special order: Same gears made in SUS304

NOTE 1: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

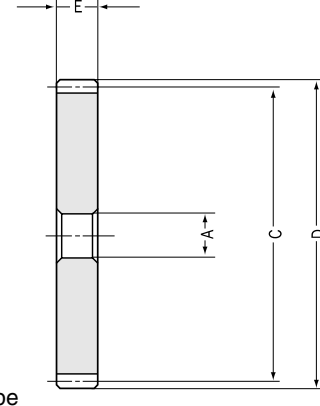
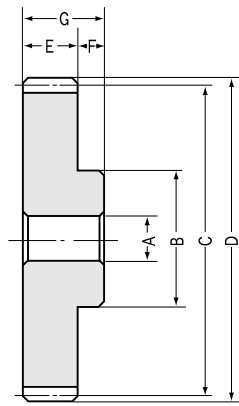
NOTE 2: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SUS·SUSA Stainless Steel Spur Gears Modules 2~2.5

Spur Gears

A n C S · S C S



S1 Shape

S5 Shape

Module 2, 2.5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A _{H7}	B	C	D	E	F	G
SUS2-15	m2	15	S1	12	24	30	34	20	16	36
SUS2-16		16	S1	12	26	32	36	20	16	36
SUS2-18		18	S1	12	30	36	40	20	16	36
SUS2-20		20	S1	12	32	40	44	20	16	36
SUS2-22		22	S1	12	36	44	48	20	16	36
SUS2-24		24	S1	12	38	48	52	20	16	36
SUS2-25		25	S1	12	40	50	54	20	16	36
SUS2-28		28	S1	12	45	56	60	20	16	36
SUS2-30		30	S1	12	50	60	64	20	16	36
SUSA2-32		m2	32	S5	15	—	64	68	20	—
SUSA2-35	35		S5	15	—	70	74	20	—	—
SUSA2-36	36		S5	15	—	72	76	20	—	—
SUSA2-40	40		S5	15	—	80	84	20	—	—
SUSA2-42	42		S5	15	—	84	88	20	—	—
SUSA2-45	45		S5	15	—	90	94	20	—	—
SUSA2-48	48		S5	15	—	96	100	20	—	—
SUSA2-50	50		S5	15	—	100	104	20	—	—
SUSA2-55	55		S5	15	—	110	114	20	—	—
SUSA2-56	56		S5	15	—	112	116	20	—	—
SUSA2-60	60	S5	15	—	120	124	20	—	—	
SUSA2-64	64	S5	15	—	128	132	20	—	—	
SUSA2-70	70	S5	15	—	140	144	20	—	—	
SUS2.5-15	m2.5	15	S1	15	30	37.5	42.5	25	18	43
SUS2.5-16		16	S1	15	32	40	45	25	18	43
SUS2.5-18		18	S1	15	38	45	50	25	18	43
SUS2.5-20		20	S1	15	40	50	55	25	18	43
SUS2.5-22		22	S1	15	44	55	60	25	18	43
SUS2.5-24		24	S1	15	48	60	65	25	18	43
SUS2.5-25		25	S1	15	50	62.5	67.5	25	18	43
SUS2.5-28		28	S1	15	60	70	75	25	18	43
SUS2.5-30		30	S1	15	65	75	80	25	18	43
SUSA2.5-32		m2.5	32	S5	15	—	80	85	25	—
SUSA2.5-35	35		S5	15	—	87.5	92.5	25	—	—
SUSA2.5-36	36		S5	15	—	90	95	25	—	—
SUSA2.5-40	40		S5	20	—	100	105	25	—	—
SUSA2.5-42	42		S5	20	—	105	110	25	—	—
SUSA2.5-45	45		S5	20	—	112.5	117.5	25	—	—
SUSA2.5-48	48		S5	20	—	120	125	25	—	—
SUSA2.5-50	50		S5	20	—	125	130	25	—	—
SUSA2.5-55	55		S5	20	—	137.5	142.5	25	—	—
SUSA2.5-56	56		S5	20	—	140	145	25	—	—
SUSA2.5-60	60	S5	20	—	150	155	25	—	—	
SUSA2.5-64	64	S5	20	—	160	165	25	—	—	



Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 187HB
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	SUS303	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

*Available on special order: Same gears made in SUS304

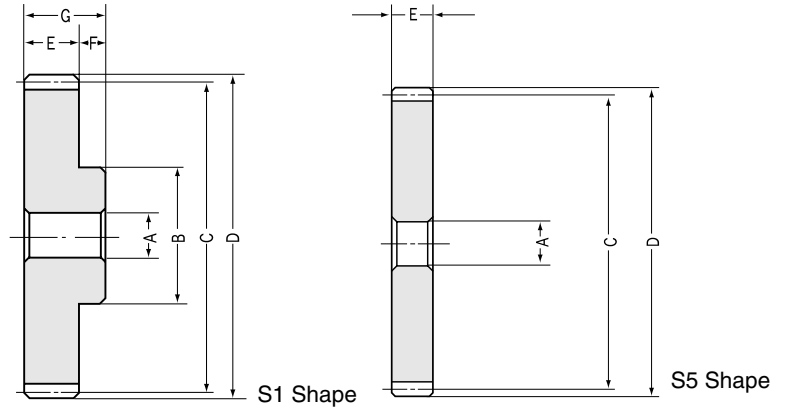
Allowable torque (N · m) <i>NOTE 1</i>		Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 2</i>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
16.3	1.05	1.67	0.11	0.12~0.26	0.14	SUS2-15
18.1	1.22	1.85	0.12	0.12~0.26	0.16	SUS2-16
21.7	1.59	2.21	0.16	0.12~0.26	0.22	SUS2-18
25.4	2.01	2.59	0.20	0.12~0.26	0.27	SUS2-20
29.2	2.48	2.98	0.25	0.14~0.30	0.34	SUS2-22
33.0	3.01	3.37	0.31	0.14~0.30	0.39	SUS2-24
35.0	3.30	3.57	0.34	0.14~0.30	0.43	SUS2-25
40.9	4.18	4.17	0.43	0.14~0.30	0.56	SUS2-28
44.8	4.83	4.57	0.49	0.14~0.30	0.66	SUS2-30
48.9	5.53	4.98	0.56	0.14~0.30	0.48	SUSA2-32
54.9	6.67	5.60	0.68	0.14~0.30	0.58	SUSA2-35
57.0	7.08	5.81	0.72	0.14~0.30	0.61	SUSA2-36
65.2	8.85	6.65	0.90	0.14~0.30	0.78	SUSA2-40
69.3	9.81	7.07	1.00	0.18~0.36	0.85	SUSA2-42
75.5	11.4	7.70	1.16	0.18~0.36	0.97	SUSA2-45
81.8	13.0	8.34	1.33	0.18~0.36	1.10	SUSA2-48
86.0	14.2	8.77	1.44	0.18~0.36	1.20	SUSA2-50
96.5	17.3	9.84	1.77	0.18~0.36	1.50	SUSA2-55
98.7	18.0	10.1	1.83	0.18~0.36	1.50	SUSA2-56
107	20.8	10.9	2.13	0.18~0.36	1.70	SUSA2-60
116	23.9	11.8	2.44	0.18~0.36	2.00	SUSA2-64
128	29.0	13.1	2.96	0.18~0.36	2.40	SUSA2-70
31.9	2.11	3.25	0.21	0.14~0.28	0.26	SUS2.5-15
35.3	2.44	3.6	0.25	0.14~0.28	0.30	SUS2.5-16
42.4	3.18	4.32	0.32	0.14~0.28	0.41	SUS2.5-18
49.6	4.02	5.06	0.41	0.14~0.28	0.50	SUS2.5-20
57.0	4.96	5.81	0.51	0.16~0.34	0.63	SUS2.5-22
64.5	6.01	6.58	0.61	0.16~0.34	0.75	SUS2.5-24
68.3	6.58	6.96	0.67	0.16~0.34	0.82	SUS2.5-25
79.8	8.34	8.14	0.85	0.16~0.34	1.10	SUS2.5-28
87.6	9.65	8.93	0.98	0.16~0.34	1.30	SUS2.5-30
95.4	11.1	9.73	1.13	0.16~0.34	0.95	SUSA2.5-32
107	13.4	10.9	1.36	0.16~0.34	1.10	SUSA2.5-35
111	14.2	11.3	1.45	0.16~0.34	1.20	SUSA2.5-36
127	17.7	13.0	1.81	0.16~0.34	1.50	SUSA2.5-40
135	19.6	13.8	2.00	0.18~0.40	1.70	SUSA2.5-42
148	22.7	15.0	2.31	0.18~0.40	1.90	SUSA2.5-45
160	26.1	16.3	2.66	0.18~0.40	2.20	SUSA2.5-48
168	28.4	17.1	2.90	0.18~0.40	2.30	SUSA2.5-50
189	34.9	19.2	3.56	0.18~0.40	2.90	SUSA2.5-55
193	36.2	19.6	3.70	0.18~0.40	3.00	SUSA2.5-56
209	42.0	21.3	4.28	0.18~0.40	3.40	SUSA2.5-60
226	48.2	23.0	4.91	0.18~0.40	3.90	SUSA2.5-64

NOTE 1: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 2: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SUS-SUSA Stainless Steel Spur Gears Modules 3~4



Module 3, 4

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				AH7	B	C	D	E	F	G
SUS3-15	m3	15	S1	15	36	45	51	30	20	50
SUS3-16		16	S1	15	38	48	54	30	20	50
SUS3-18		18	S1	15	40	54	60	30	20	50
SUS3-20		20	S1	15	50	60	66	30	20	50
SUS3-22		22	S1	15	54	66	72	30	20	50
SUS3-24		24	S1	15	58	72	78	30	20	50
SUS3-25		25	S1	20	60	75	81	30	20	50
SUS3-28		28	S1	20	70	84	90	30	20	50
SUS3-30		30	S1	20	75	90	96	30	20	50
SUSA3-32		32	S5	20	—	96	102	30	—	—
SUSA3-35		35	S5	20	—	105	111	30	—	—
SUSA3-36		36	S5	20	—	108	114	30	—	—
SUSA3-40	40	S5	25	—	120	126	30	—	—	
SUSA3-42	42	S5	25	—	126	132	30	—	—	
SUSA3-45	45	S5	25	—	135	141	30	—	—	
SUSA3-48	48	S5	25	—	144	150	30	—	—	
SUSA3-50	50	S5	25	—	150	156	30	—	—	
SUSA3-55	55	S5	25	—	165	171	30	—	—	
SUSA3-56	56	S5	25	—	168	174	30	—	—	
SUSA3-60	60	S5	25	—	180	186	30	—	—	
SUS4-15	m4	15	S1	20	45	60	68	40	25	65
SUS4-20		20	S1	20	65	80	88	40	25	65
SUS4-25		25	S1	20	84	100	108	40	25	65
SUS4-30		30	S1	20	100	120	128	40	25	65
SUSA4-40		40	S5	30	—	160	168	40	—	—
SUSA4-50		50	S5	30	—	200	208	40	—	—



Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 187HB
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	SUS303	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

*Available on special order: Same gears made in SUS304

Allowable torque (N · m) <i>NOTE 1</i>		Allowable torque (kgf · m)		Backlash (mm) <i>NOTE 2</i>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability			
55.1	3.71	5.62	0.38	0.14~0.32	0.47	SUS3-15
61.1	4.29	6.23	0.44	0.14~0.32	0.54	SUS3-16
73.3	5.59	7.47	0.57	0.14~0.32	0.67	SUS3-18
85.8	7.07	8.74	0.72	0.14~0.32	0.97	SUS3-20
98.5	8.73	10.0	0.89	0.18~0.38	1.10	SUS3-22
111	10.6	11.4	1.08	0.18~0.38	1.30	SUS3-24
118	11.6	12.0	1.18	0.18~0.38	1.40	SUS3-25
138	14.7	14.1	1.50	0.18~0.38	1.80	SUS3-28
151	17.0	15.4	1.74	0.18~0.38	2.10	SUS3-30
165	19.5	16.8	1.99	0.18~0.38	1.60	SUSA3-32
185	23.6	18.9	2.40	0.18~0.38	2.00	SUSA3-35
192	25.0	19.6	2.55	0.18~0.38	2.10	SUSA3-36
220	31.3	22.4	3.19	0.18~0.38	2.50	SUSA3-40
234	34.7	23.9	3.54	0.20~0.44	2.90	SUSA3-42
255	40.2	26.0	4.10	0.20~0.44	3.30	SUSA3-45
276	46.2	28.2	4.71	0.20~0.44	3.80	SUSA3-48
290	50.4	29.6	5.14	0.20~0.44	4.00	SUSA3-50
326	61.7	33.2	6.30	0.20~0.44	5.00	SUSA3-55
333	64.1	33.9	6.54	0.20~0.44	5.20	SUSA3-56
362	74.3	36.9	7.58	0.20~0.44	5.90	SUSA3-60
131	9.06	13.3	0.92	0.18~0.38	1.10	SUS4-15
203	17.3	20.7	1.76	0.18~0.38	2.10	SUS4-20
280	28.3	28.5	2.89	0.20~0.44	3.40	SUS4-25
359	41.7	36.6	4.25	0.20~0.44	5.00	SUS4-30
521	77.1	53.2	7.86	0.20~0.44	6.20	SUSA4-40
573	103	58.5	10.5	0.24~0.52	9.70	SUSA4-50

*The blue catalog numbers indicate the new products.

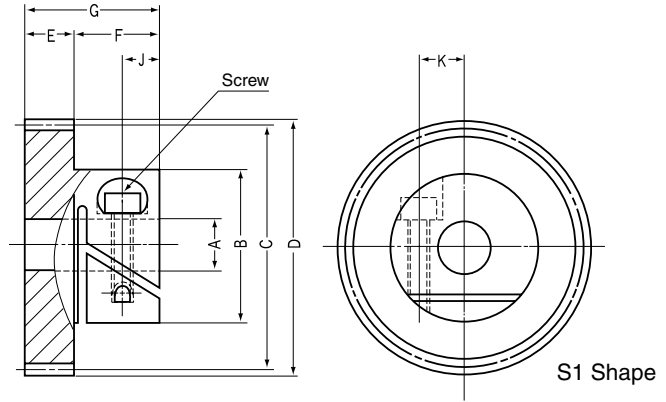
NOTE 1: The allowable torques shown in the table are calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 2: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SUSL Stainless Steel Fairloc Hub Spur Gears Module 0.5

Spur Gears



Module 0.5

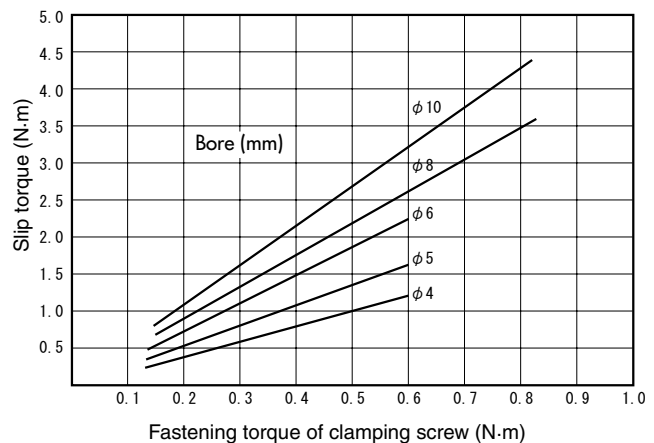
Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Cap screw dimensions		
				A _{H7} NOTE 1	B	C	D	E	F	G	M	J	K
SUSL0.5-16	m0.5	16	S3	4	14	8	9	7	8	22	M2.5	3.3	4.4
SUSL0.5-18		18	S3	4	14	9	10	7	8	22	M2.5	3.3	4.4
SUSL0.5-20		20	S3	4	14	10	11	7	8	22	M2.5	3.3	4.4
SUSL0.5-24		24	S3	5	14	12	13	7	8	22	M2.5	3.3	4.4
SUSL0.5-25		25	S3	5	14	12.5	13.5	7	8	22	M2.5	3.3	4.4
SUSL0.5-28		28	S3	5	14	14	15	7	8	22	M2.5	3.3	4.4
SUSL0.5-30		30	S3	5	14	15	16	7	8	22	M2.5	3.3	4.4
SUSL0.5-32		32	S3	6	17	16	17	5	10	15	M3	4.5	5.3
SUSL0.5-36		36	S3	6	17	18	19	5	10	15	M3	4.5	5.3
SUSL0.5-40		40	S1	6	17	20	21	5	10	15	M3	4.5	5.3
SUSL0.5-45		45	S1	6	17	22.5	23.5	5	10	15	M3	4.5	5.3
SUSL0.5-48		48	S1	6	17	24	25	5	10	15	M3	4.5	5.3
SUSL0.5-50		50	S1	6	17	25	26	5	10	15	M3	4.5	5.3
SUSL0.5-54		54	S1	6	17	27	28	5	10	15	M3	4.5	5.3
SUSL0.5-56		56	S1	6	17	28	29	5	10	15	M3	4.5	5.3
SUSL0.5-60		60	S1	8	17	30	31	5	10	15	M3	4.5	6
SUSL0.5-64		64	S1	8	17	32	33	5	10	15	M3	4.5	6
SUSL0.5-70		70	S1	8	17	35	36	5	10	15	M3	4.5	6
SUSL0.5-72		72	S1	8	17	36	37	5	10	15	M3	4.5	6
SUSL0.5-75		75	S1	8	17	37.5	38.5	5	10	15	M3	4.5	6
SUSL0.5-80		80	S1	10	24	40	41	5	14	19	M4	5.3	7.7
SUSL0.5-90		90	S1	10	24	45	46	5	14	19	M4	5.3	7.7
SUSL0.5-96		96	S1	10	24	48	49	5	14	19	M4	4.9	8
SUSL0.5-100		100	S1	10	24	50	51	5	14	19	M4	4.9	8
SUSL0.5-112	112	S1	10	24	56	57	5	14	19	M4	4.9	8	
SUSL0.5-120	120	S1	10	24	60	61	5	14	19	M4	4.9	8	

NOTE 1: The bore cannot be modified. It is possible to pin the gear to the shaft to prevent slippage.

Fastening torque vs. Slip torque

The slip torque which is dependent on the fastening torque can sometimes be less than the gear strength. Please use caution in selecting. The chart on the right shows the relationship between the slip torque and the fastening torque.

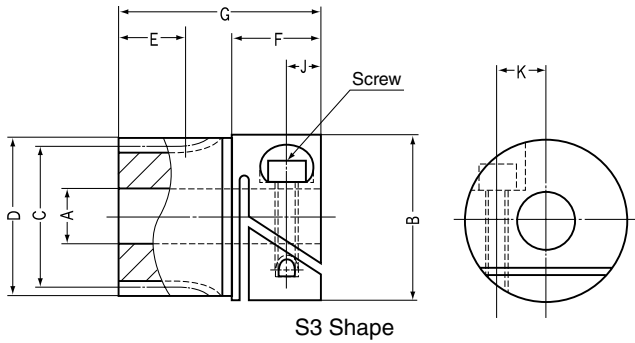
Fastening torque vs. Slip torque



*Data supplied by Designatronics Inc.



Stainless Steel Fairloc Hub Spur Gears



Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 187HB
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	SUS303	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Not Possible

Allowable torque (N · m) <i>NOTE 2</i>		Allowable torque (kgf · m)		Recommended fastening torque <i>NOTE 3</i>		Backlash (mm) <i>NOTE 4</i>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability	(N · m)	(kgf · m)			
0.40	0.023	0.04	0.0023	0.60	0.061	0~0.10	0.02	SUSL0.5-16
0.47	0.03	0.048	0.0031	0.60	0.061	0~0.10	0.02	SUSL0.5-18
0.56	0.038	0.057	0.0039	0.60	0.061	0~0.10	0.02	SUSL0.5-20
0.72	0.056	0.074	0.0057	0.60	0.061	0~0.10	0.02	SUSL0.5-24
0.76	0.061	0.078	0.0062	0.60	0.061	0~0.10	0.02	SUSL0.5-25
0.89	0.079	0.091	0.0080	0.60	0.061	0~0.10	0.02	SUSL0.5-28
0.98	0.091	0.10	0.0093	0.60	0.061	0~0.10	0.02	SUSL0.5-30
0.76	0.076	0.078	0.0077	0.60	0.061	0~0.10	0.02	SUSL0.5-32
0.89	0.096	0.091	0.0098	0.60	0.061	0~0.10	0.02	SUSL0.5-36
1.02	0.12	0.10	0.012	0.60	0.061	0~0.10	0.02	SUSL0.5-40
1.18	0.15	0.12	0.016	0.60	0.061	0~0.10	0.02	SUSL0.5-45
1.28	0.17	0.13	0.018	0.60	0.061	0~0.10	0.04	SUSL0.5-48
1.34	0.19	0.14	0.019	0.60	0.061	0~0.10	0.04	SUSL0.5-50
1.48	0.22	0.15	0.023	0.60	0.061	0~0.10	0.04	SUSL0.5-54
1.54	0.24	0.16	0.025	0.60	0.061	0~0.10	0.04	SUSL0.5-56
1.67	0.28	0.17	0.029	0.80	0.082	0~0.10	0.04	SUSL0.5-60
1.81	0.32	0.18	0.033	0.80	0.082	0~0.10	0.04	SUSL0.5-64
2.01	0.39	0.20	0.04	0.80	0.082	0~0.10	0.04	SUSL0.5-70
2.07	0.41	0.21	0.042	0.80	0.082	0~0.10	0.06	SUSL0.5-72
2.17	0.45	0.22	0.046	0.80	0.082	0~0.10	0.06	SUSL0.5-75
2.34	0.51	0.24	0.053	0.80	0.082	0~0.10	0.08	SUSL0.5-80
2.68	0.66	0.27	0.067	0.80	0.082	0~0.10	0.08	SUSL0.5-90
2.88	0.76	0.29	0.077	0.80	0.082	0~0.10	0.10	SUSL0.5-96
3.02	0.82	0.31	0.084	0.80	0.082	0~0.10	0.10	SUSL0.5-100
3.42	1.05	0.35	0.11	0.80	0.082	0~0.10	0.12	SUSL0.5-112
3.69	1.21	0.38	0.12	0.80	0.082	0~0.10	0.14	SUSL0.5-120

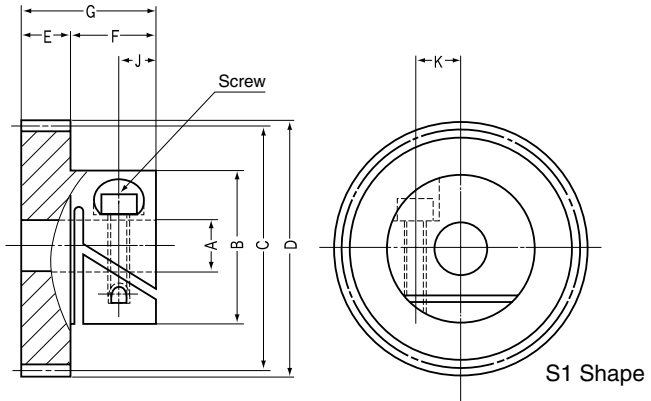
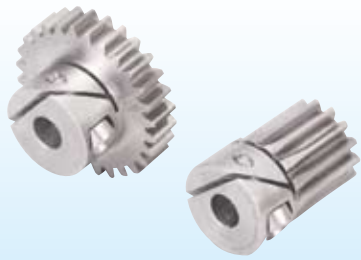
NOTE 2: The allowable torques shown in the table are calculated values to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: Do not tighten the clamping screw without inserting a shaft, or the bore will be permanently deformed and will not accept a shaft.

NOTE 4: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SUSL Stainless Steel Fairloc Hub Spur Gears Module 0.8~1



Module 0.8

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Cap screw dimensions		
				AH7 NOTE 1	B	C	D	E	F	G	M	J	K
SUSL0.8-14	m0.8	14	S3	4	14	11.2	12.8	7	8	22	M2.5	3.3	4.4
SUSL0.8-15		15	S3	4	14	12	13.6	7	8	22	M2.5	3.3	4.4
SUSL0.8-16		16	S3	4	14	12.8	14.4	7	8	22	M2.5	3.3	4.4
SUSL0.8-18		18	S3	4	14	14.4	16	7	8	22	M2.5	3.3	4.4
SUSL0.8-20		20	S1	4	14	16	17.6	5	8	13	M2.5	3.3	4.4
SUSL0.8-22		22	S1	4	14	17.6	19.2	5	8	13	M2.5	3.3	4.4
SUSL0.8-24		24	S1	5	14	19.2	20.8	5	8	13	M2.5	3.3	4.4
SUSL0.8-25		25	S1	5	14	20	21.6	5	8	13	M2.5	3.3	4.4
SUSL0.8-28		28	S1	5	14	22.4	24	5	8	13	M2.5	3.3	4.4
SUSL0.8-30		30	S1	5	14	24	25.6	5	8	13	M2.5	3.3	4.4
SUSL0.8-32		32	S1	5	14	25.6	27.2	5	8	13	M2.5	3.3	4.4
SUSL0.8-36		36	S1	6	17	28.8	30.4	5	10	15	M3	4.5	5.3
SUSL0.8-40		40	S1	6	17	32	33.6	5	10	15	M3	4.5	5.3
SUSL0.8-45		45	S1	6	17	36	37.6	5	10	15	M3	4.5	5.3
SUSL0.8-48		48	S1	6	17	38.4	40	5	10	15	M3	4.5	5.3
SUSL0.8-50		50	S1	6	17	40	41.6	5	10	15	M3	4.5	5.3
SUSL0.8-54		54	S1	6	17	43.2	44.8	5	10	15	M3	4.5	5.3
SUSL0.8-56		56	S1	6	17	44.8	46.4	5	10	15	M3	4.5	5.3
SUSL0.8-60		60	S1	8	17	48	49.6	5	10	15	M3	4.5	6
SUSL0.8-64		64	S1	8	17	51.2	52.8	5	10	15	M3	4.5	6
SUSL0.8-72	72	S1	8	17	57.6	59.2	5	10	15	M3	4.5	6	
SUSL0.8-80	80	S1	10	24	64	65.6	5	14	19	M4	4.9	8	
SUSL0.8-90	90	S1	10	24	72	73.6	5	14	19	M4	4.9	8	
SUSL0.8-100	100	S1	10	24	80	81.6	5	14	19	M4	4.9	8	
SUSL1-14	m1	14	S3	6	17	14	16	8	10	25	M3	4.5	5.3
SUSL1-15		15	S3	6	17	15	17	8	10	25	M3	4.5	5.3
SUSL1-16		16	S3	6	17	16	18	8	10	25	M3	4.5	5.3
SUSL1-18		18	S3	6	17	18	20	8	10	25	M3	4.5	5.3
SUSL1-20		20	S1	6	17	20	22	6	10	16	M3	4.5	5.3
SUSL1-24		24	S1	6	17	24	26	6	10	16	M3	4.5	5.3
SUSL1-25		25	S1	6	17	25	27	6	10	16	M3	4.5	5.3
SUSL1-28		28	S1	6	17	28	30	6	10	16	M3	4.5	5.3
SUSL1-30		30	S1	8	17	30	32	6	10	16	M3	4.5	6
SUSL1-32		32	S1	8	17	32	34	6	10	16	M3	4.5	6
SUSL1-35		35	S1	8	17	35	37	6	10	16	M3	4.5	6
SUSL1-36		36	S1	8	17	36	38	6	10	16	M3	4.5	6
SUSL1-40		40	S1	8	17	40	42	6	10	16	M3	4.5	6
SUSL1-45		45	S1	8	17	45	47	6	10	16	M3	4.5	6
SUSL1-48		48	S1	8	17	48	50	6	10	16	M3	4.5	6
SUSL1-50		50	S1	10	24	50	52	6	14	20	M4	4.9	8
SUSL1-56		56	S1	10	24	56	58	6	14	20	M4	4.9	8
SUSL1-60		60	S1	10	24	60	62	6	14	20	M4	4.9	8
SUSL1-64		64	S1	10	24	64	66	6	14	20	M4	4.9	8
SUSL1-70		70	S1	10	24	70	72	6	14	20	M4	4.9	8
SUSL1-72	72	S1	10	24	72	74	6	14	20	M4	4.9	8	
SUSL1-80	80	S1	10	24	80	82	6	14	20	M4	4.9	8	
SUSL1-90	90	S1	10	24	90	92	6	14	20	M4	4.9	8	
SUSL1-100	100	S1	10	24	100	102	6	14	20	M4	4.9	8	

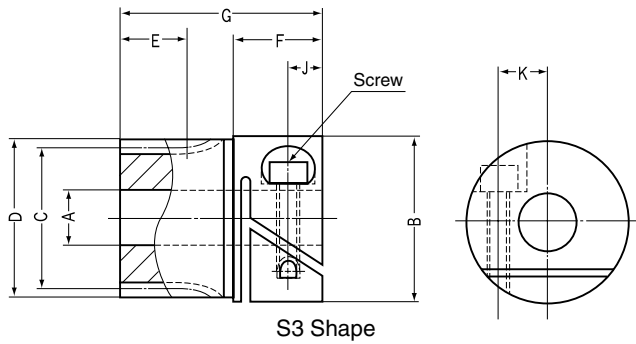
CAUTION: Gears with wider face widths such as SS and SSA series can be used as the mating gears to these.

NOTE 1: The bore cannot be modified. It is possible to pin the gear to the shaft to prevent slippage.

NOTE 2: The hub configurations are slightly different from the drawings shown above. But there is no difference in functionality.



Stainless Steel Fairloc Hub Spur Gears



S3 Shape

Specifications

Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)	Tooth hardness	Less than 187HB
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	SUS303	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Not Possible

Allowable torque (N · m) NOTE 2		Allowable torque (kgf · m)		Recommended fastening torque		Backlash (mm) NOTE 4	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability	(N · m)	(kgf · m)			
0.82	0.048	0.083	0.0049	0.60	0.061	0~0.10	0.02	SUSLO.8-14
0.92	0.056	0.093	0.0057	0.60	0.061	0~0.10	0.02	SUSLO.8-15
1.01	0.065	0.10	0.0066	0.60	0.061	0~0.10	0.02	SUSLO.8-16
1.22	0.083	0.12	0.0085	0.60	0.061	0~0.10	0.02	SUSLO.8-18
1.02	0.076	0.10	0.0077	0.60	0.061	0~0.10	0.02	SUSLO.8-20
1.17	0.091	0.12	0.0093	0.60	0.061	0~0.10	0.02	SUSLO.8-22
1.32	0.11	0.13	0.011	0.60	0.061	0~0.10	0.02	SUSLO.8-24
1.40	0.12	0.14	0.012	0.60	0.061	0~0.10	0.02	SUSLO.8-25
1.63	0.15	0.17	0.015	0.60	0.061	0~0.10	0.02	SUSLO.8-28
1.79	0.17	0.18	0.018	0.60	0.061	0~0.10	0.02	SUSLO.8-30
1.95	0.20	0.20	0.020	0.60	0.061	0~0.10	0.02	SUSLO.8-32
2.28	0.26	0.23	0.026	0.60	0.061	0~0.10	0.04	SUSLO.8-36
2.61	0.32	0.27	0.033	0.60	0.061	0~0.10	0.04	SUSLO.8-40
3.02	0.41	0.31	0.042	0.60	0.061	0~0.10	0.06	SUSLO.8-45
3.27	0.47	0.33	0.048	0.60	0.061	0~0.10	0.06	SUSLO.8-48
3.44	0.51	0.35	0.053	0.60	0.061	0~0.10	0.06	SUSLO.8-50
3.78	0.61	0.39	0.062	0.60	0.061	0~0.10	0.06	SUSLO.8-54
3.95	0.65	0.40	0.067	0.60	0.061	0~0.10	0.08	SUSLO.8-56
4.28	0.76	0.44	0.077	0.80	0.082	0~0.10	0.08	SUSLO.8-60
4.63	0.87	0.47	0.088	0.80	0.082	0~0.10	0.08	SUSLO.8-64
5.31	1.11	0.54	0.11	0.80	0.082	0~0.10	0.10	SUSLO.8-72
6.00	1.38	0.61	0.14	0.80	0.082	0~0.10	0.16	SUSLO.8-80
6.86	1.77	0.70	0.18	0.80	0.082	0~0.10	0.20	SUSLO.8-90
7.72	2.21	0.79	0.23	0.80	0.082	0~0.10	0.22	SUSLO.8-100
1.46	0.088	0.15	0.0090	0.60	0.061	0~0.10	0.04	SUSL1-14
1.63	0.10	0.17	0.010	0.60	0.061	0~0.10	0.04	SUSL1-15
1.81	0.12	0.18	0.012	0.60	0.061	0~0.10	0.04	SUSL1-16
2.17	0.15	0.22	0.016	0.60	0.061	0~0.10	0.04	SUSL1-18
1.91	0.14	0.19	0.015	0.60	0.061	0~0.10	0.02	SUSL1-20
2.48	0.21	0.25	0.021	0.60	0.061	0~0.10	0.04	SUSL1-24
2.62	0.23	0.27	0.023	0.60	0.061	0~0.10	0.04	SUSL1-25
3.06	0.29	0.31	0.030	0.60	0.061	0~0.10	0.04	SUSL1-28
3.36	0.34	0.34	0.034	0.80	0.082	0~0.10	0.04	SUSL1-30
3.66	0.39	0.37	0.039	0.80	0.082	0~0.10	0.04	SUSL1-32
4.12	0.47	0.42	0.048	0.80	0.082	0~0.10	0.06	SUSL1-35
4.27	0.49	0.44	0.050	0.80	0.082	0~0.10	0.06	SUSL1-36
4.89	0.62	0.50	0.063	0.80	0.082	0~0.10	0.06	SUSL1-40
5.67	0.79	0.58	0.081	0.80	0.082	0~0.10	0.08	SUSL1-45
6.14	0.91	0.63	0.093	0.80	0.082	0~0.10	0.10	SUSL1-48
6.45	0.99	0.66	0.10	0.80	0.082	0~0.10	0.12	SUSL1-50
7.40	1.25	0.75	0.13	0.80	0.082	0~0.10	0.14	SUSL1-56
8.03	1.45	0.82	0.15	0.80	0.082	0~0.10	0.16	SUSL1-60
8.67	1.66	0.88	0.17	0.80	0.082	0~0.10	0.18	SUSL1-64
9.63	2.00	0.98	0.20	0.80	0.082	0~0.10	0.20	SUSL1-70
9.95	2.12	1.02	0.22	0.80	0.082	0~0.10	0.22	SUSL1-72
11.2	2.65	1.15	0.27	0.80	0.082	0~0.10	0.26	SUSL1-80
12.9	3.40	1.31	0.35	0.80	0.082	0~0.10	0.32	SUSL1-90
14.5	4.25	1.48	0.43	0.80	0.082	0~0.10	0.38	SUSL1-100

NOTE 3: The allowable torques shown in the table are calculated values to the assumed usage conditions. Please see page 27 for more details.

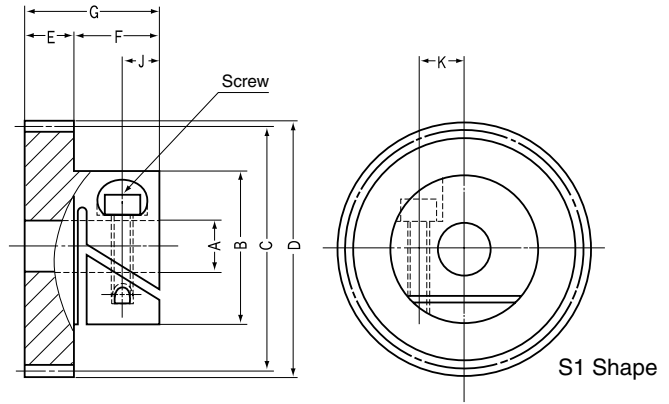
NOTE 4: Do not tighten the clamping screw without inserting a shaft, or the bore will be permanently deformed and will not accept a shaft.

NOTE 5: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



DSL Acetal Fairloc Hub Spur Gears Module 0.5

Spur Gears



Module 0.5

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Cap screw dimensions		
				AH7 NOTE 1	B	C	D	E	F	G	M	J	K
DSL0.5-28	m0.5	28	S1	5	14	14	15	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-30		30	S1	5	14	15	16	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-32		32	S1	5	14	16	17	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-36		36	S1	5	14	18	19	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-40		40	S1	5	14	20	21	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-45		45	S1	5	14	22.5	23.5	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-48		48	S1	5	14	24	25	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-50		50	S1	5	14	25	26	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-56		56	S1	5	14	28	29	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-60		60	S1	5	14	30	31	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-64		64	S1	5	14	32	33	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-70		70	S1	5	14	35	36	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-72		72	S1	5	14	36	37	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-75		75	S1	5	14	37.5	38.5	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-80		80	S1	5	14	40	41	5	8.5	13.5	M2.5	3.3	4.4
DSL0.5-90		90	S1	8	17	45	46	5	9.8	14.8	M3	4.3	5.9
DSL0.5-96		96	S1	8	17	48	49	5	9.8	14.8	M3	4.3	5.9
DSL0.5-100		100	S1	8	17	50	51	5	9.8	14.8	M3	4.3	5.9
DSL0.5-120		120	S1	8	17	60	61	5	9.8	14.8	M3	4.3	5.9

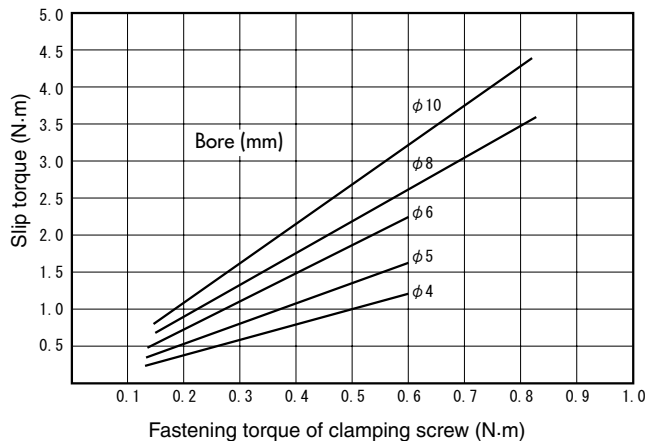
NOTE 1: The bore cannot be modified. It is possible to pin the gear to the shaft to prevent slippage.

NOTE 2: Do not tighten the clamping screw without inserting a shaft, or the bore will be permanently deformed and will not accept a shaft.

Fastening torque vs. Slip torque

The slip torque which is dependent on the fastening torque can sometimes be less than the gear strength. Please use caution in selecting. The chart on the right shows the relationship between the slip torque and the fastening torque.

Fastening torque vs. Slip torque



*Data supplied by Designatronics Inc.



Specifications

Precision grade	JIS N10 grade (JIS B1702-2: 1998)	Tooth hardness	110~120HRR
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	Acetal with SUS303 Insert	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Not Possible

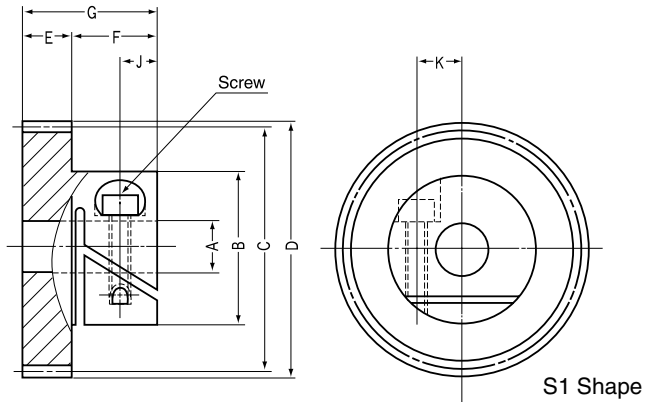
Allowable torque (N · m) <i>NOTE 3</i>		Allowable torque (kgf · m)		Recommended fastening torque		Backlash (mm) <i>NOTE 4</i>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability	(N · m)	(kgf · m)			
0.39	—	0.04	—	0.60	0.061	0~0.10	12	DSL0.5-28 DSL0.5-30 DSL0.5-32 DSL0.5-36 DSL0.5-40
0.43	—	0.044	—	0.60	0.061	0~0.10	12	
0.46	—	0.047	—	0.60	0.061	0~0.10	12	
0.54	—	0.055	—	0.60	0.061	0~0.10	12	
0.62	—	0.063	—	0.60	0.061	0~0.10	12	
0.71	—	0.073	—	0.60	0.061	0~0.10	12	DSL0.5-45 DSL0.5-48 DSL0.5-50 DSL0.5-56 DSL0.5-60
0.78	—	0.079	—	0.60	0.061	0~0.10	13	
0.82	—	0.083	—	0.60	0.061	0~0.10	13	
0.93	—	0.095	—	0.60	0.061	0~0.10	14	
1.01	—	0.10	—	0.80	0.082	0~0.10	14	
1.08	—	0.11	—	0.80	0.082	0~0.10	15	DSL0.5-64 DSL0.5-70 DSL0.5-72 DSL0.5-75 DSL0.5-80
1.20	—	0.12	—	0.80	0.082	0~0.10	16	
1.24	—	0.13	—	0.80	0.082	0~0.10	16	
1.29	—	0.13	—	0.80	0.082	0~0.10	17	
1.39	—	0.14	—	0.80	0.082	0~0.10	19	
1.58	—	0.16	—	0.80	0.082	0~0.10	24	DSL0.5-90 DSL0.5-96 DSL0.5-100 DSL0.5-120
1.70	—	0.17	—	0.80	0.082	0~0.10	25	
1.78	—	0.18	—	0.80	0.082	0~0.10	25	
2.15	—	0.22	—	0.80	0.082	0~0.10	32	

NOTE 3: The allowable torques shown in the table are calculated values using the Lewis formula. Please see page 27 for more details.

NOTE 4: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



DSL Acetal Fairloc Hub Spur Gears Module 0.8~1



Module 0.8, 1

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Cap screw dimensions <i>NOTE 2</i>		
				AH7 <i>NOTE 1</i>	B	C	D	E	F	G	M	J	K
DSL0.8-20	m0.8	28	S1	5	14	14	15	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-24		30	S1	5	14	15	16	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-25		32	S1	5	14	16	17	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-28		36	S1	5	14	18	19	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-30		40	S1	5	14	20	21	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-32		45	S1	5	14	22.5	23.5	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-36		48	S1	5	14	24	25	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-40		50	S1	5	14	25	26	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-45		56	S1	5	14	28	29	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-48		60	S1	5	14	30	31	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-50	m0.8	64	S1	5	14	32	33	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-56		70	S1	5	14	35	36	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-60		72	S1	5	14	36	37	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-72		75	S1	5	14	37.5	38.5	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-80		80	S1	5	14	40	41	5	8.5	13.5	M2.5	3.3	4.4
DSL0.8-90		90	S1	8	17	72	73.6	5	9.8	14.8	M3	4.3	5.9
DSL0.8-100	100	S1	8	17	80	81.6	5	9.8	14.8	M3	4.3	5.9	
DSL1-15	m1	15	S1	5	14	15	17	5	8.5	13.5	M2.5	3.3	4.4
DSL1-16		16	S1	5	14	16	18	5	8.5	13.5	M2.5	3.3	4.4
DSL1-18		18	S1	5	14	18	20	5	8.5	13.5	M2.5	3.3	4.4
DSL1-20		20	S1	5	14	20	22	5	8.5	13.5	M2.5	3.3	4.4
DSL1-24		24	S1	5	14	24	26	5	8.5	13.5	M2.5	3.3	4.4
DSL1-25		25	S1	5	14	25	27	5	8.5	13.5	M2.5	3.3	4.4
DSL1-28		28	S1	5	14	28	30	5	8.5	13.5	M2.5	3.3	4.4
DSL1-30		30	S1	8	17	30	32	5	9.8	14.8	M3	4.3	5.9
DSL1-32		32	S1	8	17	32	34	5	9.8	14.8	M3	4.3	5.9
DSL1-35		35	S1	8	17	35	37	5	9.8	14.8	M3	4.3	5.9
DSL1-36	m1	36	S1	8	17	36	38	5	9.8	14.8	M3	4.3	5.9
DSL1-40		40	S1	8	17	40	42	5	9.8	14.8	M3	4.3	5.9
DSL1-45		45	S1	8	17	45	47	5	9.8	14.8	M3	4.3	5.9
DSL1-48		48	S1	8	17	48	50	5	9.8	14.8	M3	4.3	5.9
DSL1-50		50	S1	8	17	50	52	5	9.8	14.8	M3	4.3	5.9
DSL1-56		56	S1	8	17	56	58	5	9.8	14.8	M3	4.3	5.9
DSL1-60	60	S1	8	17	60	62	5	9.8	14.8	M3	4.3	5.9	
DSL1-64	64	S1	8	17	64	66	5	9.8	14.8	M3	4.3	5.9	
DSL1-70	70	S1	8	17	70	72	5	9.8	14.8	M3	4.3	5.9	
DSL1-72	72	S1	8	17	72	74	5	9.8	14.8	M3	4.3	5.9	
DSL1-80	80	S1	8	17	80	82	5	9.8	14.8	M3	4.3	5.9	
DSL1-90	90	S1	8	17	90	92	5	9.8	14.8	M3	4.3	5.9	
DSL1-100	100	S1	8	17	100	102	5	9.8	14.8	M3	4.3	5.9	

CAUTION: Gears with wider face widths such as SS and SSA series can be used as the mating gears to these.

NOTE 1: The bore cannot be modified. It is possible to pin the gear to the shaft to prevent slippage.

NOTE 2: Do not tighten the clamping screw without inserting a shaft, or the bore will be permanently deformed and will not accept a shaft.



Acetal Fairloc Hub Spur Gears

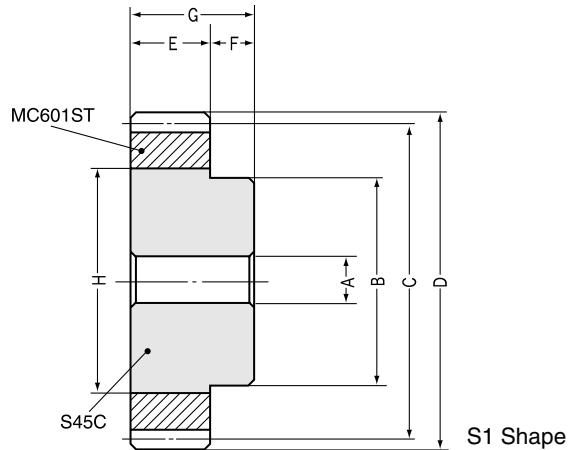
Specifications

Precision grade	JIS N10 grade (JIS B1702-2: 1998)	Tooth hardness	110~120HRR
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	Acetal with SUS303 Insert	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Not Possible

Allowable torque (N · m) <i>NOTE 3</i>		Allowable torque (kgf · m)		Recommended fastening torque		Backlash (mm) <i>NOTE 4</i>	Weight (kg)	Catalog No.
Bending strength	Surface durability	Bending strength	Surface durability	(N · m)	(kgf · m)			
0.58	—	0.059	—	0.60	0.061	0~0.10	11	DSL0.8-20
0.73	—	0.075	—	0.60	0.061	0~0.10	12	DSL0.8-24
0.78	—	0.079	—	0.60	0.061	0~0.10	12	DSL0.8-25
0.89	—	0.091	—	0.60	0.061	0~0.10	12	DSL0.8-28
0.97	—	0.099	—	0.60	0.061	0~0.10	13	DSL0.8-30
1.06	—	0.11	—	0.60	0.061	0~0.10	14	DSL0.8-32
1.23	—	0.13	—	0.60	0.061	0~0.10	15	DSL0.8-36
1.41	—	0.14	—	0.60	0.061	0~0.10	15	DSL0.8-40
1.62	—	0.17	—	0.60	0.061	0~0.10	16	DSL0.8-45
1.76	—	0.18	—	0.60	0.061	0~0.10	18	DSL0.8-48
1.85	—	0.19	—	0.60	0.061	0~0.10	19	DSL0.8-50
2.11	—	0.22	—	0.60	0.061	0~0.10	20	DSL0.8-56
2.28	—	0.23	—	0.80	0.082	0~0.10	25	DSL0.8-60
2.8	—	0.29	—	0.80	0.082	0~0.10	30	DSL0.8-72
3.15	—	0.32	—	0.80	0.082	0~0.10	35	DSL0.8-80
3.58	—	0.37	—	0.80	0.082	0~0.10	42	DSL0.8-90
4.03	—	0.41	—	0.80	0.082	0~0.10	48	DSL0.8-100
0.53	—	0.054	—	0.60	0.061	0~0.10	10	DSL1-15
0.59	—	0.06	—	0.60	0.061	0~0.10	10	DSL1-16
0.69	—	0.07	—	0.60	0.061	0~0.10	11	DSL1-18
0.80	—	0.081	—	0.60	0.061	0~0.10	11	DSL1-20
1.00	—	0.10	—	0.60	0.061	0~0.10	12	DSL1-24
1.06	—	0.11	—	0.60	0.061	0~0.10	12	DSL1-25
1.22	—	0.12	—	0.60	0.061	0~0.10	14	DSL1-28
1.33	—	0.14	—	0.80	0.082	0~0.10	17	DSL1-30
1.44	—	0.15	—	0.80	0.082	0~0.10	19	DSL1-32
1.62	—	0.17	—	0.80	0.082	0~0.10	20	DSL1-35
1.68	—	0.17	—	0.80	0.082	0~0.10	20	DSL1-36
1.92	—	0.20	—	0.80	0.082	0~0.10	22	DSL1-40
2.22	—	0.23	—	0.80	0.082	0~0.10	25	DSL1-45
2.41	—	0.25	—	0.80	0.082	0~0.10	25	DSL1-48
2.53	—	0.26	—	0.80	0.082	0~0.10	27	DSL1-50
2.88	—	0.29	—	0.80	0.082	0~0.10	30	DSL1-56
3.12	—	0.32	—	0.80	0.082	0~0.10	33	DSL1-60
3.35	—	0.34	—	0.80	0.082	0~0.10	35	DSL1-64
3.71	—	0.38	—	0.80	0.082	0~0.10	40	DSL1-70
3.83	—	0.39	—	0.80	0.082	0~0.10	41	DSL1-72
4.30	—	0.44	—	0.80	0.082	0~0.10	48	DSL1-80
4.89	—	0.50	—	0.80	0.082	0~0.10	58	DSL1-90
5.49	—	0.56	—	0.80	0.082	0~0.10	68	DSL1-100

NOTE 3: The allowable torques shown in the table are calculated values using the Lewis formula. Please see page 27 for more details.

NOTE 4: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



Module 1

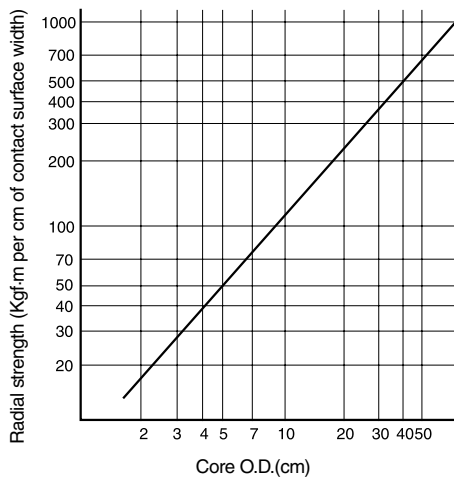
Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Metal core dia. <small>NOTE 3</small>
				A _{H7}	B	C	D	E	F	G	H
NSU1-30	m1	30	S1	8	20	30	32	10	10	20	20
NSU1-32		32	S1	8	22	32	34	10	10	20	22
NSU1-34		34	S1	8	25	34	36	10	10	20	25
NSU1-35		35	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	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	

NOTE 1: Even though the holding strength at the material interface is designed to be stronger than the teeth, any secondary operation may weaken the holding strength. 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.

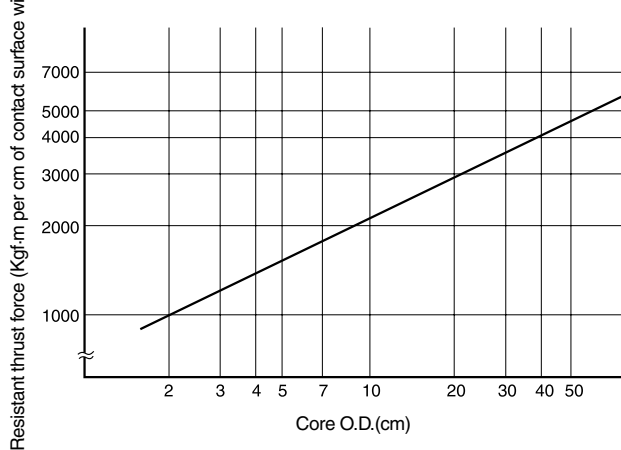
Definition of holding strength and safety factor

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





Specifications

Precision grade	JIS N9 grade (JIS B1702-1: 1998) OLD JIS S grade (JIS B1702: 1976)	Tooth hardness	115~120HRR
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	MC601ST with S45C core	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Allowable torque (N · m)	Allowable torque (kgf · m)	Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
Bending strength	Bending strength			
1.42	0.14	0.12~0.26	0.05	NSU1-30
1.54	0.16	0.12~0.26	0.06	NSU1-32
1.66	0.17	0.12~0.26	0.08	NSU1-34
1.73	0.18	0.12~0.26	0.08	NSU1-35
1.79	0.18	0.12~0.26	0.08	NSU1-36
2.05	0.21	0.12~0.26	0.08	NSU1-40
2.37	0.24	0.12~0.26	0.12	NSU1-45
2.56	0.26	0.12~0.26	0.13	NSU1-48
2.70	0.28	0.12~0.26	0.13	NSU1-50
3.33	0.34	0.14~0.28	0.23	NSU1-60
3.96	0.40	0.14~0.28	0.24	NSU1-70
4.60	0.47	0.14~0.28	0.25	NSU1-80
5.24	0.53	0.14~0.28	0.32	NSU1-90
5.89	0.60	0.14~0.28	0.40	NSU1-100

NOTE 2: The allowable torques shown in the table are calculated values using the Lewis formula. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

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 or 5 in the calculation.

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

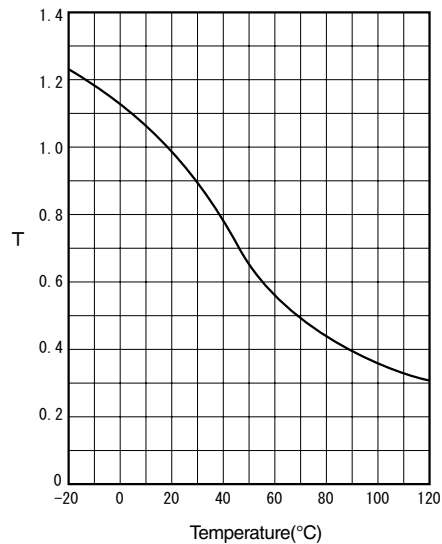
where

T_{al} = Allowable holding strength at the contact surface

T_{max} = Radial strength - Find from the charts on the left

T = Temperature compensation factor from the chart on the right

■ Ambient temperature compensation factor T

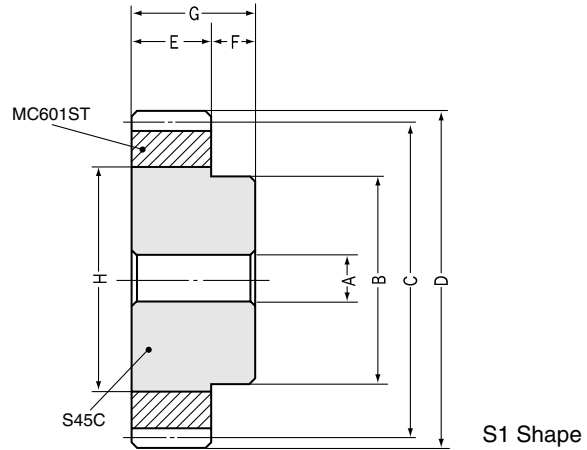


* Data supplied by Japan Polypenco Limited.



NSU Plastic Spur Gears with Steel Core Modules 1.5~2

Spur Gears
CusZ



Module 1.5, 2

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Metal core dia. <small>NOTE 1</small>	
				A _{H7}	B	C	D	E	F	G	H	
NSU1.5-28	m1.5	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	
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	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	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		

NOTE 1: 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. 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.



Plastic Spur Gears with Steel Core

Specifications

Precision grade	JIS N9 grade (JIS B1702-1: 1998) OLD JIS S grade (JIS B1702: 1976)	Tooth hardness	115~120HRR
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	MC601ST with S45C core	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Allowable torque (N · m) <small>NOTE 2</small>	Allowable torque (kgf · m)	Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
Bending strength	Bending strength			
4.39	0.45	0.14~0.30	0.15	NSU1.5-28
4.78	0.49	0.14~0.30	0.15	NSU1.5-30
5.19	0.53	0.14~0.30	0.18	NSU1.5-32
5.61	0.57	0.16~0.32	0.19	NSU1.5-34
5.83	0.59	0.16~0.32	0.21	NSU1.5-35
6.05	0.62	0.16~0.32	0.21	NSU1.5-36
6.9	0.70	0.16~0.32	0.31	NSU1.5-40
7.98	0.81	0.16~0.32	0.33	NSU1.5-45
8.66	0.88	0.16~0.32	0.34	NSU1.5-48
9.11	0.93	0.16~0.32	0.34	NSU1.5-50
10.4	1.06	0.16~0.32	0.50	NSU1.5-56
11.2	1.15	0.16~0.32	0.52	NSU1.5-60
12.9	1.32	0.18~0.36	0.66	NSU1.5-68
13.4	1.36	0.18~0.36	0.69	NSU1.5-70
15.5	1.58	0.18~0.36	1.00	NSU1.5-80
17.7	1.80	0.18~0.36	1.28	NSU1.5-90
6.77	0.69	0.18~0.34	0.10	NSU2-20
7.66	0.78	0.18~0.34	0.19	NSU2-22
8.55	0.87	0.18~0.34	0.20	NSU2-24
9.03	0.92	0.18~0.34	0.20	NSU2-25
10.4	1.06	0.20~0.36	0.27	NSU2-28
11.3	1.15	0.20~0.36	0.28	NSU2-30
12.3	1.25	0.20~0.36	0.36	NSU2-32
13.3	1.36	0.20~0.36	0.41	NSU2-34
13.8	1.41	0.20~0.36	0.41	NSU2-35
14.3	1.46	0.20~0.36	0.42	NSU2-36
16.4	1.67	0.20~0.36	0.71	NSU2-40
18.4	1.88	0.20~0.36	0.73	NSU2-44
18.9	1.93	0.20~0.36	0.75	NSU2-45
20.5	2.09	0.20~0.36	0.88	NSU2-48
21.6	2.20	0.20~0.36	0.90	NSU2-50
24.6	2.51	0.22~0.38	0.94	NSU2-56
26.6	2.72	0.22~0.38	1.30	NSU2-60
30.7	3.13	0.22~0.38	1.65	NSU2-68
31.7	3.23	0.22~0.38	1.78	NSU2-70
36.8	3.76	0.22~0.38	2.37	NSU2-80

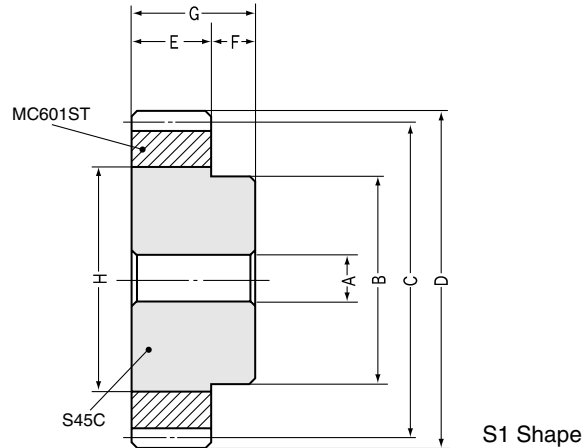
NOTE 2: The allowable torques shown in the table are calculated values using the Lewis formula.
Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



NSU Plastic Spur Gears with Steel Core Modules 2.5~3

Spur Gears
CusZ



Module 2.5, 3

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Metal core dia. <small>NOTE 1</small>
				A _{H7}	B	C	D	E	F	G	H
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		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
NSU2.5-36		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	

NOTE 1: 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. 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.



Plastic Spur Gears with Steel Core

Specifications

Precision grade	JIS N9 grade (JIS B1702-1: 1998) OLD JIS 5 grade (JIS B1702: 1976)	Tooth hardness	115~120HRR
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	MC601ST with S45C core	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Allowable torque (N · m) <small>NOTE 2</small>	Allowable torque (kgf · m)	Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
Bending strength	Bending strength			
11.4	1.17	0.20~0.36	0.15	NSU2.5-18
13.2	1.35	0.20~0.36	0.20	NSU2.5-20
15.0	1.53	0.22~0.38	0.31	NSU2.5-22
16.7	1.70	0.22~0.38	0.33	NSU2.5-24
17.6	1.80	0.22~0.38	0.33	NSU2.5-25
20.3	2.07	0.22~0.38	0.44	NSU2.5-28
22.1	2.25	0.22~0.38	0.62	NSU2.5-30
24.0	2.45	0.22~0.38	0.63	NSU2.5-32
26.0	2.65	0.22~0.38	0.76	NSU2.5-34
27.0	2.75	0.22~0.38	0.90	NSU2.5-35
28.0	2.85	0.22~0.38	0.91	NSU2.5-36
32.0	3.26	0.22~0.38	1.20	NSU2.5-40
35.9	3.67	0.24~0.40	1.35	NSU2.5-44
37.0	3.77	0.24~0.40	1.40	NSU2.5-45
40.1	4.09	0.24~0.40	1.60	NSU2.5-48
42.2	4.30	0.24~0.40	1.90	NSU2.5-50
48.0	4.90	0.24~0.40	2.23	NSU2.5-56
52.0	5.30	0.24~0.40	2.60	NSU2.5-60
59.9	6.11	0.24~0.40	3.41	NSU2.5-68
61.9	6.32	0.24~0.40	3.63	NSU2.5-70
16.9	1.72	0.28~0.44	0.17	NSU3-16
19.7	2.01	0.30~0.46	0.28	NSU3-18
22.9	2.33	0.30~0.46	0.35	NSU3-20
25.8	2.64	0.30~0.46	0.46	NSU3-22
28.8	2.94	0.30~0.46	0.59	NSU3-24
30.5	3.11	0.30~0.46	0.65	NSU3-25
35.1	3.58	0.30~0.46	0.78	NSU3-28
38.2	3.90	0.30~0.46	1.10	NSU3-30
41.5	4.23	0.30~0.46	1.20	NSU3-32
44.9	4.58	0.32~0.48	1.30	NSU3-34
46.6	4.75	0.32~0.48	1.50	NSU3-35
48.4	4.93	0.32~0.48	1.70	NSU3-36
55.2	5.63	0.32~0.48	1.90	NSU3-40
62.1	6.33	0.32~0.48	2.30	NSU3-44
63.9	6.51	0.32~0.48	2.70	NSU3-45
69.2	7.06	0.32~0.48	2.70	NSU3-48
72.9	7.43	0.32~0.48	2.80	NSU3-50
83.0	8.46	0.32~0.48	3.80	NSU3-56
89.9	9.17	0.32~0.48	4.60	NSU3-60
104	10.6	0.32~0.48	5.80	NSU3-68
107	10.9	0.32~0.48	6.40	NSU3-70

NOTE 2: The allowable torques shown in the table are calculated values using the Lewis formula. Please see page 27 for more details.

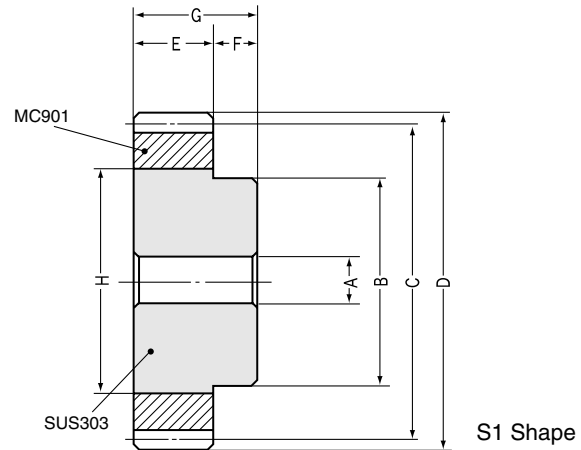
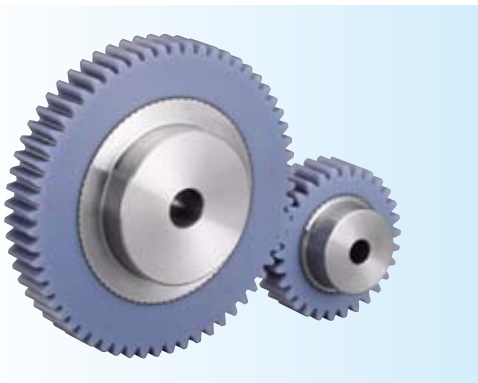
NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



PU Plastic Spur Gears with Stainless Steel Core Modules 1~2

Modules 1~2

Spur Gears



Module 1, 1.5, 2

Catalog No.	Module	No. of teeth	Shape	Bore	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	Metal core dia. <small>NOTE 1</small>
				A _{H7}	B	C	D	E	F	G	H
PU1-30	m1	30	S1	8	20	30	32	10	10	20	20
PU1-35		35	S1	8	25	35	37	10	10	20	25
PU1-40		40	S1	10	25	40	42	10	10	20	28
PU1-50		50	S1	10	30	50	52	10	10	20	34
PU1-60		60	S1	10	40	60	62	10	10	20	45
PU1-80		80	S1	10	40	80	82	10	10	20	45
PU1.5-30	m1.5	30	S1	10	30	45	48	15	12	27	30
PU1.5-35		35	S1	10	33	52.5	55.5	15	12	27	36
PU1.5-40		40	S1	10	40	60	63	15	12	27	45
PU1.5-50		50	S1	12	40	75	78	15	12	27	45
PU1.5-60		60	S1	12	50	90	93	15	12	27	55
PU1.5-80		80	S1	12	60	120	123	15	12	27	85
PU2-20	m2	20	S1	10	22	40	44	20	14	34	22
PU2-25		25	S1	10	30	50	54	20	14	34	30
PU2-30		30	S1	10	35	60	64	20	14	34	35
PU2-35		35	S1	12	40	70	74	20	14	34	45
PU2-40		40	S1	15	55	80	84	20	14	34	60
PU2-50		50	S1	15	60	100	104	20	14	34	65
PU2-60		60	S1	15	60	120	124	20	14	34	85

NOTE 1: 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. 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.



Plastic Spur Gears with Stainless Steel Core

Specifications

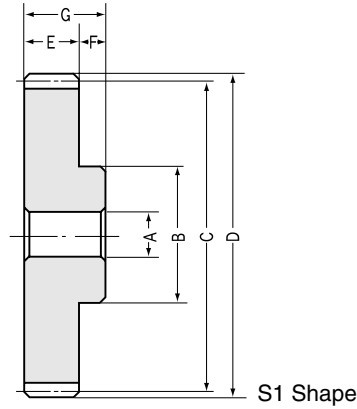
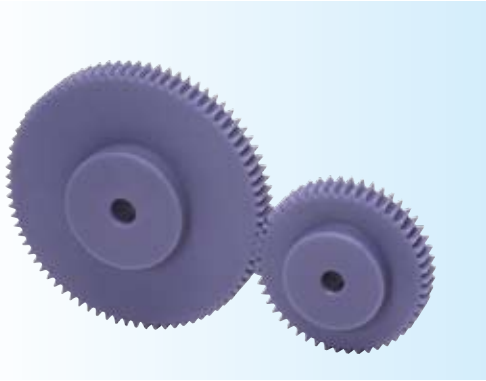
Precision grade	JIS N9 grade (JIS B1702-1: 1998) OLD JIS 5 grade (JIS B1702: 1976)	Tooth hardness	115~120HRR
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	MC901 with SUS303 core	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Allowable torque (N · m) <small>NOTE 2</small>	Allowable torque (kgf · m)	Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
Bending strength	Bending strength			
1.03	0.10	0.12~0.26	0.05	PU1-30
1.25	0.13	0.12~0.26	0.08	PU1-35
1.48	0.15	0.12~0.26	0.08	PU1-40
1.96	0.20	0.12~0.26	0.13	PU1-50
2.41	0.25	0.14~0.28	0.23	PU1-60
3.34	0.34	0.14~0.28	0.25	PU1-80
3.46	0.35	0.14~0.30	0.15	PU1.5-30
4.22	0.43	0.16~0.32	0.21	PU1.5-35
5.00	0.51	0.16~0.32	0.31	PU1.5-40
6.60	0.67	0.16~0.32	0.34	PU1.5-50
8.14	0.83	0.16~0.32	0.52	PU1.5-60
11.26	1.15	0.18~0.36	1.00	PU1.5-80
4.91	0.50	0.18~0.34	0.10	PU2-20
6.54	0.67	0.18~0.34	0.20	PU2-25
8.20	0.84	0.20~0.36	0.28	PU2-30
10.0	1.02	0.20~0.36	0.41	PU2-35
11.9	1.21	0.20~0.36	0.71	PU2-40
15.7	1.60	0.20~0.36	0.90	PU2-50
19.3	1.97	0.22~0.38	1.30	PU2-60

NOTE 2: The allowable torques shown in the table are calculated values using the Lewis formula.

Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



Module 1

Catalog No.	Module	No. of teeth	Shape	Bore NOTE 1	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				A _{H7}	B	C	D	E	F	G
PS1-15	m1	15	S1	6	12	15	17	10	10	20
PS1-16		16	S1	6	12	16	18	10	10	20
PS1-18		18	S1	6	14	18	20	10	10	20
PS1-20		20	S1	6	16	20	22	10	10	20
PS1-22		22	S1	8	18	22	24	10	10	20
PS1-24		24	S1	8	20	24	26	10	10	20
PS1-25		25	S1	8	20	25	27	10	10	20
PS1-26		26	S1	8	20	26	28	10	10	20
PS1-28		28	S1	8	22	28	30	10	10	20
PS1-30		30	S1	8	25	30	32	10	10	20
PS1-32		32	S1	8	26	32	34	10	10	20
PS1-35		35	S1	8	26	35	37	10	10	20
PS1-36		36	S1	8	28	36	38	10	10	20
PS1-40		40	S1	10	35	40	42	10	10	20
PS1-45		45	S1	10	35	45	47	10	10	20
PS1-48		48	S1	10	35	48	50	10	10	20
PS1-50		50	S1	10	35	50	52	10	10	20
PS1-55		55	S1	10	35	55	57	10	10	20
PS1-60		60	S1	10	35	60	62	10	10	20
PS1-65		65	S1	10	35	65	67	10	10	20
PS1-70	70	S1	10	40	70	72	10	10	20	
PS1-75	75	S1	10	40	75	77	10	10	20	
PS1-80	80	S1	10	40	80	82	10	10	20	
PS1-85	85	S1	10	40	85	87	10	10	20	
PS1-90	90	S1	10	40	90	92	10	10	20	
PS1-95	95	S1	10	40	95	97	10	10	20	
PS1-100	100	S1	10	40	100	102	10	10	20	

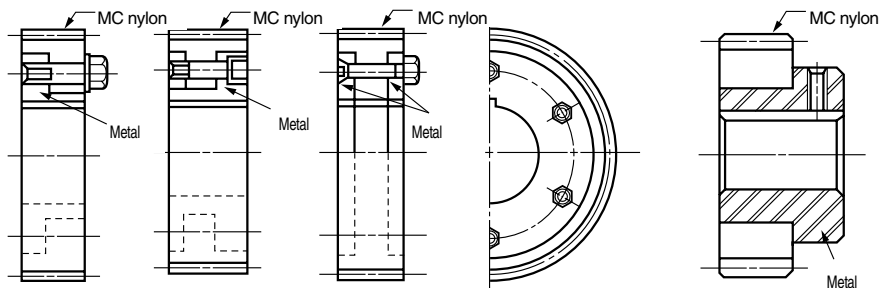
NOTE 1: The bore tolerance at the time of production is H8. Significant variations in temperature or humidity can cause dimensional changes plastic gears (MC Nylon). Please see page 32 for more details.

USEFUL HINT

A key, taper pin, roll or spiral pin, set screw or pressed bushing can be used to fasten a plastic gear to a shaft. For conditions shown below, there is a tendency for the gear to loosen. Therefore, a metal hub must be used to fix the gear:

1. When the ambient temperature is high.
2. When the gear diameter is large.
3. When the gear is subjected to reversing load which causes high impact on the key.

The diagrams on the right are three examples of methods for fastening plastic gears to metal hubs. If the shape of a gear is not suitable for bolt fastening, then the overmolding of plastic on a metal hub is recommended (shown in the far right diagram).



The overmolding of plastic on a metal hub



Specifications

Precision grade	JIS N9 grade (JIS B1702-1: 1998) OLD JIS S grade (JIS B1702: 1976)	Tooth hardness	115~120HRR
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	MC901	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Allowable torque (N·m) <small>NOTE 2</small>	Allowable torque (kgf·m)	Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
Bending strength	Bending strength			
0.41	0.042	0.10~0.24	0.0030	PS1-15
0.45	0.046	0.10~0.24	0.0030	PS1-16
0.53	0.054	0.10~0.24	0.0040	PS1-18
0.61	0.063	0.10~0.24	0.0060	PS1-20
0.69	0.071	0.12~0.26	0.0060	PS1-22
0.77	0.079	0.12~0.26	0.0070	PS1-24
0.82	0.083	0.12~0.26	0.0070	PS1-25
0.86	0.088	0.12~0.26	0.0080	PS1-26
0.94	0.096	0.12~0.26	0.0090	PS1-28
1.03	0.10	0.12~0.26	0.011	PS1-30
1.11	0.11	0.12~0.26	0.015	PS1-32
1.25	0.13	0.12~0.26	0.016	PS1-35
1.30	0.13	0.12~0.26	0.018	PS1-36
1.48	0.15	0.12~0.26	0.023	PS1-40
1.71	0.17	0.12~0.26	0.028	PS1-45
1.86	0.19	0.12~0.26	0.030	PS1-48
1.96	0.20	0.12~0.26	0.032	PS1-50
2.18	0.22	0.14~0.28	0.037	PS1-55
2.41	0.25	0.14~0.28	0.042	PS1-60
2.64	0.27	0.14~0.28	0.048	PS1-65
2.87	0.29	0.14~0.28	0.057	PS1-70
3.11	0.32	0.14~0.28	0.064	PS1-75
3.34	0.34	0.14~0.28	0.073	PS1-80
3.57	0.36	0.14~0.28	0.078	PS1-85
3.80	0.39	0.14~0.28	0.086	PS1-90
4.03	0.41	0.14~0.28	0.095	PS1-95
4.27	0.44	0.14~0.28	0.10	PS1-100

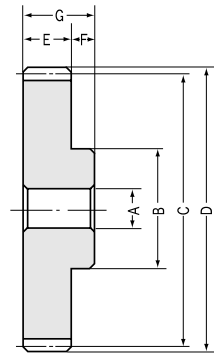
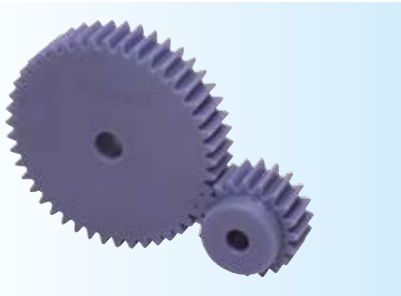
NOTE 2: The allowable torques shown in the table are calculated values using the Lewis formula. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

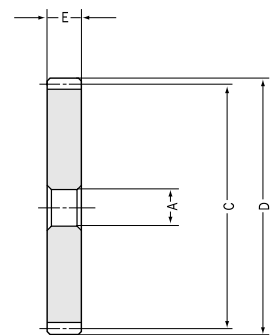


PS·PSA Plastic Spur Gears Modules 1.5~2

Spur Gears
A S P · S P



S1 Shape



S5 Shape

Module 1.5

Catalog No.	Module	No. of teeth	Shape	Bore NOTE 1	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length	
				A _{H7}	B	C	D	E	F	G	
PS1.5-15	m1.5	15	S1	8	18	22.5	25.5	15	10	25	
PS1.5-16		16	S1	8	20	24	27	15	10	25	
PS1.5-18		18	S1	8	22	27	30	15	10	25	
PS1.5-20		20	S1	8	24	30	33	15	10	25	
PS1.5-22		22	S1	8	26	33	36	15	10	25	
PS1.5-24		24	S1	8	28	36	39	15	10	25	
PS1.5-25		25	S1	8	30	37.5	40.5	15	10	25	
PS1.5-26		26	S1	8	32	39	42	15	10	25	
PS1.5-28		28	S1	8	36	42	45	15	10	25	
PS1.5-30		30	S1	8	38	45	48	15	10	25	
PS1.5-32		32	S1	8	40	48	51	15	10	25	
PS1.5-35		35	S1	8	42	52.5	55.5	15	10	25	
PS1.5-36		36	S1	8	45	54	57	15	10	25	
PS1.5-40		40	S1	10	45	60	63	15	10	25	
PS1.5-45		45	S1	10	45	67.5	70.5	15	10	25	
PS1.5-48		48	S1	10	45	72	75	15	10	25	
PS1.5-50		50	S1	10	45	75	78	15	10	25	
PS1.5-55		55	S1	10	45	82.5	85.5	15	10	25	
PS1.5-60		60	S1	10	50	90	93	15	10	25	
PS1.5-65		65	S1	12	50	97.5	100.5	15	10	25	
PS1.5-70	70	S1	12	50	105	108	15	10	25		
PS1.5-75	75	S1	12	50	112.5	115.5	15	10	25		
PS1.5-80	80	S1	12	55	120	123	15	10	25		
PS1.5-85	85	S1	12	55	127.5	130.5	15	10	25		
PS1.5-90	90	S1	12	55	135	138	15	10	25		
PS1.5-95	95	S1	12	60	142.5	145.5	15	10	25		
PS1.5-100	100	S1	12	60	150	153	15	10	25		
PS2-12	m2	12	S1	10	18	24	28	20	10	30	
PS2-13		13	S1	10	20	26	30	20	10	30	
PS2-14		14	S1	10	20	28	32	20	10	30	
PS2-15		15	S1	10	24	30	34	20	10	30	
PS2-16		16	S1	10	26	32	36	20	10	30	
PS2-18		18	S1	10	30	36	40	20	10	30	
PS2-20		20	S1	10	32	40	44	20	10	30	
PS2-22		22	S1	10	35	44	48	20	10	30	
PS2-24		24	S1	10	38	48	52	20	10	30	
PS2-25		25	S1	10	40	50	54	20	10	30	
PS2-26		26	S1	10	42	52	56	20	10	30	
PS2-28		28	S1	10	45	56	60	20	10	30	
PS2-30		30	S1	10	50	60	64	20	10	30	
PSA2-32		m2	32	S5	12	—	64	68	20	—	—
PSA2-35			35	S5	12	—	70	74	20	—	—
PSA2-36	36		S5	12	—	72	76	20	—	—	
PSA2-40	40		S5	12	—	80	84	20	—	—	
PSA2-45	45		S5	12	—	90	94	20	—	—	
PSA2-48	48		S5	12	—	96	100	20	—	—	
PSA2-50	50		S5	12	—	100	104	20	—	—	
PSA2-55	55		S5	12	—	110	114	20	—	—	
PSA2-60	60		S5	12	—	120	124	20	—	—	
PSA2-65	65		S5	15	—	130	134	20	—	—	
PSA2-70	70		S5	15	—	140	144	20	—	—	
PSA2-75	75		S5	15	—	150	154	20	—	—	
PSA2-80	80		S5	15	—	160	164	20	—	—	
PSA2-85	85		S5	15	—	170	174	20	—	—	
PSA2-90	90		S5	15	—	180	184	20	—	—	
PSA2-95	95	S5	15	—	190	194	20	—	—		
PSA2-100	100	S5	15	—	200	204	20	—	—		

NOTE 1: The bore tolerance at the time of production is H8. Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon) leading to distortions of bore, outside diameter etc. Please see page 32 for more details.



Specifications

Precision grade	JIS N9 grade (JIS B1702-1: 1998) OLD JIS 5 grade (JIS B1702: 1976)	Tooth hardness	115~120HRR
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	MC901	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Allowable torque (N·m) <small>NOTE 2</small>		Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
Bending strength	Allowable torque (kgf·m)			
1.39	0.14	0.14~0.30	0.0090	PS1.5-15
1.53	0.16	0.14~0.30	0.010	PS1.5-16
1.79	0.18	0.14~0.30	0.013	PS1.5-18
2.07	0.21	0.14~0.30	0.018	PS1.5-20
2.34	0.24	0.14~0.30	0.019	PS1.5-22
2.61	0.27	0.14~0.30	0.028	PS1.5-24
2.76	0.28	0.14~0.30	0.029	PS1.5-25
2.91	0.3	0.14~0.30	0.030	PS1.5-26
3.18	0.32	0.14~0.30	0.035	PS1.5-28
3.46	0.35	0.14~0.30	0.045	PS1.5-30
3.76	0.38	0.14~0.30	0.045	PS1.5-32
4.22	0.43	0.16~0.32	0.050	PS1.5-35
4.38	0.45	0.16~0.32	0.059	PS1.5-36
5.00	0.51	0.16~0.32	0.065	PS1.5-40
5.79	0.59	0.16~0.32	0.078	PS1.5-45
6.27	0.64	0.16~0.32	0.086	PS1.5-48
6.60	0.67	0.16~0.32	0.092	PS1.5-50
7.36	0.75	0.16~0.32	0.11	PS1.5-55
8.14	0.83	0.16~0.32	0.13	PS1.5-60
8.91	0.91	0.16~0.32	0.15	PS1.5-65
9.69	0.99	0.18~0.36	0.17	PS1.5-70
10.5	1.07	0.18~0.36	0.19	PS1.5-75
11.3	1.15	0.18~0.36	0.22	PS1.5-80
12.0	1.23	0.18~0.36	0.25	PS1.5-85
12.8	1.31	0.18~0.36	0.27	PS1.5-90
13.6	1.39	0.18~0.36	0.30	PS1.5-95
14.4	1.47	0.18~0.36	0.34	PS1.5-100
2.25	0.23	0.18~0.34	0.011	PS2-12
2.59	0.26	0.18~0.34	0.013	PS2-13
2.96	0.30	0.18~0.34	0.015	PS2-14
3.29	0.34	0.18~0.34	0.016	PS2-15
3.63	0.37	0.18~0.34	0.022	PS2-16
4.24	0.43	0.18~0.34	0.029	PS2-18
4.91	0.50	0.18~0.34	0.032	PS2-20
5.55	0.57	0.18~0.34	0.043	PS2-22
6.19	0.63	0.18~0.34	0.052	PS2-24
6.54	0.67	0.18~0.34	0.059	PS2-25
6.90	0.70	0.20~0.36	0.062	PS2-26
7.54	0.77	0.20~0.36	0.074	PS2-28
8.20	0.84	0.20~0.36	0.087	PS2-30
8.91	0.91	0.20~0.36	0.072	PSA2-32
10.0	1.02	0.20~0.36	0.086	PSA2-35
10.4	1.06	0.20~0.36	0.089	PSA2-36
11.9	1.21	0.20~0.36	0.11	PSA2-40
13.7	1.40	0.20~0.36	0.15	PSA2-45
14.9	1.52	0.20~0.36	0.16	PSA2-48
15.7	1.60	0.20~0.36	0.18	PSA2-50
17.5	1.78	0.22~0.38	0.22	PSA2-55
19.3	1.97	0.22~0.38	0.28	PSA2-60
21.1	2.15	0.22~0.38	0.30	PSA2-65
23.0	2.34	0.22~0.38	0.35	PSA2-70
24.9	2.54	0.22~0.38	0.41	PSA2-75
26.7	2.72	0.22~0.38	0.46	PSA2-80
28.5	2.91	0.22~0.38	0.52	PSA2-85
30.4	3.10	0.22~0.38	0.59	PSA2-90
32.3	3.29	0.22~0.38	0.65	PSA2-95
34.2	3.48	0.22~0.38	0.72	PSA2-100

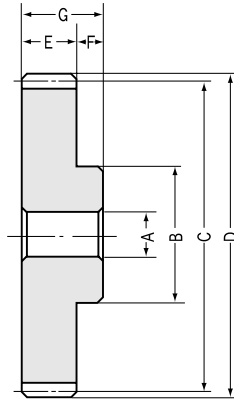
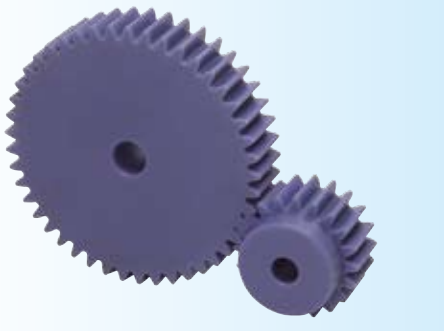
NOTE 2: The allowable torques shown in the table are calculated values using the Lewis formula. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

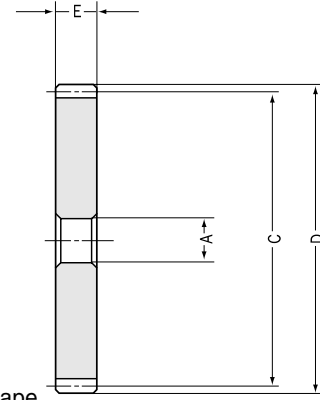


PS·PSA Plastic Spur Gears Modules 2.5~3

Spur Gears



S1 Shape



S5 Shape

Module 2.5, 3

Catalog No.	Module	No. of teeth	Shape	Bore NOTE 1	Hub dia.	Pitch dia.	Outside dia.	Face width	Hub width	Total length
				AH7	B	C	D	E	F	G
PS2.5-12	m2.5	12	S1	10	23	30	35	25	12	37
PS2.5-13		13	S1	10	25	32.5	37.5	25	12	37
PS2.5-14		14	S1	10	25	35	40	25	12	37
PS2.5-15		15	S1	12	30	37.5	42.5	25	12	37
PS2.5-16		16	S1	12	32	40	45	25	12	37
PS2.5-18		18	S1	12	38	45	50	25	12	37
PS2.5-20		20	S1	12	40	50	55	25	12	37
PS2.5-22		22	S1	12	44	55	60	25	12	37
PS2.5-24		24	S1	12	48	60	65	25	12	37
PS2.5-25		25	S1	12	50	62.5	67.5	25	12	37
PS2.5-26		26	S1	12	55	65	70	25	12	37
PS2.5-28		28	S1	12	60	70	75	25	12	37
PS2.5-30		30	S1	12	65	75	80	25	12	37
PSA2.5-32		32	S5	15	—	80	85	25	—	—
PSA2.5-35		35	S5	15	—	87.5	92.5	25	—	—
PSA2.5-36		36	S5	15	—	90	95	25	—	—
PSA2.5-40		40	S5	15	—	100	105	25	—	—
PSA2.5-45		45	S5	15	—	112.5	117.5	25	—	—
PSA2.5-48	48	S5	15	—	120	125	25	—	—	
PSA2.5-50	50	S5	15	—	125	130	25	—	—	
PSA2.5-55	55	S5	15	—	137.5	142.5	25	—	—	
PSA2.5-60	60	S5	15	—	150	155	25	—	—	
PS3-12	m3	12	S1	12	28	36	42	30	15	45
PS3-13		13	S1	12	30	39	45	30	15	45
PS3-14		14	S1	12	32	42	48	30	15	45
PS3-15		15	S1	14	36	45	51	30	15	45
PS3-16		16	S1	14	38	48	54	30	15	45
PS3-18		18	S1	14	40	54	60	30	15	45
PS3-20		20	S1	14	50	60	66	30	15	45
PS3-22		22	S1	14	54	66	72	30	15	45
PS3-24		24	S1	14	58	72	78	30	15	45
PS3-25		25	S1	14	60	75	81	30	15	45
PS3-26		26	S1	14	65	78	84	30	15	45
PS3-28		28	S1	14	70	84	90	30	15	45
PS3-30		30	S1	14	75	90	96	30	15	45
PSA3-32		32	S5	18	—	96	102	30	—	—
PSA3-35		35	S5	18	—	105	111	30	—	—
PSA3-36		36	S5	18	—	108	114	30	—	—
PSA3-40		40	S5	18	—	120	126	30	—	—
PSA3-45		45	S5	18	—	135	141	30	—	—
PSA3-48	48	S5	18	—	144	150	30	—	—	
PSA3-50	50	S5	18	—	150	156	30	—	—	
PSA3-55	55	S5	18	—	165	171	30	—	—	
PSA3-60	60	S5	18	—	180	186	30	—	—	

NOTE 1: The bore tolerance at the time of production is H8. Significant variations in temperature or humidity can cause dimensional changes in plastic gears (MC Nylon) leading to distortions of bore, outside diameter etc. Please see page 32 for more details.



Specifications

Precision grade	JIS N9 grade (JIS B1702-1: 1998) OLD JIS S grade (JIS B1702: 1976)	Tooth hardness	115~120HRR
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Cut
Material	MC901	Datum reference surface for gear cutting	Bore
Heat treatment	—	Secondary Operations	Possible

Allowable torque (N·m) <small>NOTE 2</small>	Allowable torque (kgf·m)	Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
Bending strength	Bending strength			
4.39	0.45	0.20~0.36	0.026	PS2.5-12
5.06	0.52	0.20~0.36	0.027	PS2.5-13
5.77	0.59	0.20~0.36	0.031	PS2.5-14
6.42	0.65	0.20~0.36	0.034	PS2.5-15
7.09	0.72	0.20~0.36	0.037	PS2.5-16
8.28	0.84	0.20~0.36	0.074	PS2.5-18
9.59	0.98	0.20~0.36	0.065	PS2.5-20
10.8	1.11	0.22~0.38	0.084	PS2.5-22
12.1	1.23	0.22~0.38	0.096	PS2.5-24
12.8	1.30	0.22~0.38	0.10	PS2.5-25
13.5	1.37	0.22~0.38	0.12	PS2.5-26
14.7	1.50	0.22~0.38	0.15	PS2.5-28
16.0	1.63	0.22~0.38	0.18	PS2.5-30
17.4	1.77	0.22~0.38	0.16	PSA2.5-32
19.5	1.99	0.22~0.38	0.16	PSA2.5-35
20.3	2.07	0.22~0.38	0.17	PSA2.5-36
23.2	2.36	0.22~0.38	0.18	PSA2.5-40
26.8	2.73	0.24~0.40	0.28	PSA2.5-45
29.0	2.96	0.24~0.40	0.32	PSA2.5-48
30.6	3.12	0.24~0.40	0.36	PSA2.5-50
34.1	3.48	0.24~0.40	0.42	PSA2.5-55
37.7	3.84	0.24~0.40	0.51	PSA2.5-60
7.58	0.77	0.28~0.44	0.04	PS3-12
8.74	0.89	0.28~0.44	0.048	PS3-13
9.97	1.02	0.28~0.44	0.056	PS3-14
11.1	1.13	0.28~0.44	0.059	PS3-15
12.3	1.25	0.28~0.44	0.074	PS3-16
14.3	1.46	0.30~0.46	0.10	PS3-18
16.6	1.69	0.30~0.46	0.12	PS3-20
18.7	1.91	0.30~0.46	0.15	PS3-22
20.9	2.13	0.30~0.46	0.18	PS3-24
22.1	2.25	0.30~0.46	0.19	PS3-25
23.3	2.37	0.30~0.46	0.21	PS3-26
25.5	2.60	0.30~0.46	0.25	PS3-28
27.7	2.82	0.30~0.46	0.26	PS3-30
30.1	3.07	0.30~0.46	0.23	PSA3-32
33.8	3.44	0.32~0.48	0.29	PSA3-35
35.1	3.57	0.32~0.48	0.31	PSA3-36
40.0	4.08	0.32~0.48	0.38	PSA3-40
46.3	4.72	0.32~0.48	0.49	PSA3-45
50.2	5.12	0.32~0.48	0.55	PSA3-48
52.8	5.39	0.32~0.48	0.53	PSA3-50
58.9	6.01	0.32~0.48	0.73	PSA3-55
65.1	6.64	0.32~0.48	0.88	PSA3-60

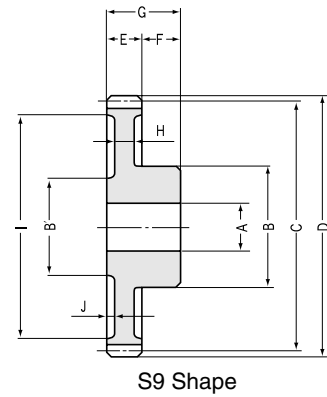
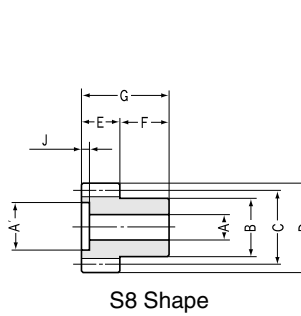
NOTE 2: The allowable torques shown in the table are calculated values using the Lewis formula. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



DS Injection Molded Spur Gears Modules 0.5~0.8

Spur Gears
mD



Module 0.5, 0.8

Catalog No.	Module	No. of teeth	Shape	Bore 1 <small>NOTE 1</small>		Bore 2	Hub dia. 1	Hub dia. 2	Pitch dia.	Outside dia.	Face width	Hub width
				A	A'	B	B'	C	D	E	F	
DS0.5-12	m0.5	12	S8	2	4	4.5	—	6	7	3	4	
DS0.5-15		15	S8	2	5	4.5	—	7.5	8.5	3	4	
DS0.5-16		16	S8	3	6	6	—	8	9	3	4	
DS0.5-18		18	S8	3	7	6	—	9	10	3	4	
DS0.5-20		20	S9	4	—	8	5	10	11	3	4	
DS0.5-24		24	S9	4	—	8	5	12	13	3	4	
DS0.5-25		25	S9	4	—	8	6	12.5	13.5	3	4	
DS0.5-28		28	S9	4	—	8	6	14	15	3	4	
DS0.5-30		30	S9	5	—	10	7	15	16	3	4	
DS0.5-32		32	S9	5	—	10	7	16	17	3	4	
DS0.5-35		35	S9	5	—	10	7	17.5	18.5	3	4	
DS0.5-36		36	S9	5	—	10	7	18	19	3	4	
DS0.5-40		40	S9	5	—	12	8	20	21	3	4	
DS0.5-45		45	S9	5	—	12	8	22.5	23.5	3	4	
DS0.5-48		48	S9	5	—	12	8	24	25	3	4	
DS0.5-50		50	S9	5	—	12	8	25	26	3	4	
DS0.5-56		56	S9	6	—	14	10	28	29	3	5	
DS0.5-60		60	S9	6	—	14	10	30	31	3	5	
DS0.5-64		64	S9	6	—	14	10	32	33	3	5	
DS0.5-70		70	S9	6	—	14	10	35	36	3	5	
DS0.5-72	72	S9	6	—	14	10	36	37	3	5		
DS0.5-80	80	S9	6	—	14	10	40	41	3	5		
DS0.8-12	m0.8	12	S9	3	—	6	4	9.6	11.2	4	5	
DS0.8-15		15	S9	3	—	6	5	12	13.6	4	5	
DS0.8-16		16	S9	4	—	8	6	12.8	14.4	4	5	
DS0.8-18		18	S9	4	—	8	6	14.4	16	4	5	
DS0.8-20		20	S9	5	—	10	8	16	17.6	4	5	
DS0.8-24		24	S9	5	—	10	8	19.2	20.8	4	5	
DS0.8-25		25	S9	5	—	10	8	20	21.6	4	5	
DS0.8-28		28	S9	5	—	10	8	22.4	24	4	5	
DS0.8-30		30	S9	6	—	12	10	24	25.6	4	5	
DS0.8-32		32	S9	6	—	12	10	25.6	27.2	4	5	
DS0.8-35		35	S9	6	—	12	10	28	29.6	4	5	
DS0.8-36		36	S9	6	—	12	10	28.8	30.4	4	5	
DS0.8-40		40	S9	6	—	12	10	32	33.6	4	5	
DS0.8-45		45	S9	6	—	12	10	36	37.6	4	5	
DS0.8-48		48	S9	6	—	14.5	11.7	38.4	40	4	6	
DS0.8-50		50	S9	6	—	14.5	11.7	40	41.6	4	6	
DS0.8-56		56	S9	6	—	14.5	11.7	44.8	46.4	4	6	
DS0.8-60		60	S9	6	—	14.5	11.7	48	49.6	4	6	
DS0.8-64		64	S9	6	—	15.5	11.7	51.2	52.8	4	6	
DS0.8-70		70	S9	6	—	15.5	11.7	56	57.6	4	6	
DS0.8-72	72	S9	6	—	15.5	11.7	57.6	59.2	4	6		
DS0.8-80	80	S9	6	—	15.5	11.7	64	65.6	4	6		

NOTE 1: The bore tolerance is generally -0.05 to -0.1 but may be + values at the central portion of the hole. Re-machining the bore is not recommended since reworking material may expose voids.



Injection Molded Spur Gears

Specifications

Precision grade	JIS N12 grade (JIS B1702-2: 1998) OLD JIS 8 grade (JIS B1702: 1976)	Tooth hardness	110~120HRR
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Injection molded
Material	DURACON acetal (M90-44)	Datum reference surface for tooth forming	Bore
Heat treatment	—	Secondary Operations	Please avoid reworking material as this may expose voids.

Total length	Web thickness	Web O.D.	Depth of counterbore	Allowable torque (N · m) <i>NOTE 2</i>	Allowable torque (kgf · m)	Backlash (mm) <i>NOTE 3</i>	Weight (kg)	Catalog No.
G	H	I	J	Bending strength	Bending strength			
7	—	—	0.6	0.063	0.0064	0.05~0.30	1	DS0.5-12
7	—	—	0.6	0.092	0.0094	0.05~0.30	1	DS0.5-15
7	—	—	0.6	0.10	0.010	0.05~0.30	1	DS0.5-16
7	—	—	0.6	0.12	0.012	0.05~0.30	1	DS0.5-18
7	2.4	8	—	0.14	0.014	0.05~0.30	1	DS0.5-20
7	1.8	9.5	—	0.17	0.018	0.05~0.30	1	DS0.5-24
7	1.8	10	—	0.18	0.019	0.05~0.30	1	DS0.5-25
7	1.8	12	—	0.21	0.022	0.05~0.30	1	DS0.5-28
7	1.8	12	—	0.23	0.023	0.05~0.30	1	DS0.5-30
7	1.8	13	—	0.25	0.025	0.05~0.30	1	DS0.5-32
7	1.8	14.5	—	0.28	0.029	0.05~0.30	1	DS0.5-35
7	1.8	15	—	0.29	0.030	0.05~0.30	1	DS0.5-36
7	1.8	17	—	0.33	0.034	0.05~0.30	1	DS0.5-40
7	1.8	19	—	0.38	0.039	0.05~0.30	2	DS0.5-45
7	1.8	21	—	0.42	0.043	0.05~0.30	2	DS0.5-48
7	1.8	22	—	0.44	0.045	0.05~0.30	2	DS0.5-50
8	1.8	24.5	—	0.50	0.051	0.05~0.30	3	DS0.5-56
8	1.8	26.5	—	0.54	0.055	0.05~0.30	3	DS0.5-60
8	1.8	28.5	—	0.58	0.059	0.05~0.30	3	DS0.5-64
8	1.8	31.5	—	0.64	0.066	0.05~0.30	4	DS0.5-70
8	1.8	32.5	—	0.67	0.068	0.05~0.30	4	DS0.5-72
8	1.8	36.5	—	0.75	0.076	0.05~0.30	5	DS0.5-80
9	2	6.7	—	0.22	0.022	0.08~0.48	1	DS0.8-12
9	2	8.8	—	0.31	0.032	0.08~0.48	1	DS0.8-15
9	2	9.2	—	0.35	0.035	0.08~0.48	1	DS0.8-16
9	2	10.7	—	0.41	0.041	0.08~0.48	1	DS0.8-18
9	2	12.7	—	0.47	0.048	0.08~0.48	2	DS0.8-20
9	2	15.5	—	0.59	0.060	0.08~0.48	2	DS0.8-24
9	2	15.5	—	0.63	0.064	0.08~0.48	2	DS0.8-25
9	2	19	—	0.72	0.074	0.08~0.48	2	DS0.8-28
9	2	20	—	0.79	0.080	0.08~0.48	3	DS0.8-30
9	2	21.7	—	0.85	0.087	0.08~0.48	3	DS0.8-32
9	2	24	—	0.96	0.098	0.08~0.48	3	DS0.8-35
9	2	25	—	0.99	0.10	0.08~0.48	3	DS0.8-36
9	2	28.3	—	1.13	0.12	0.08~0.48	4	DS0.8-40
9	2	32	—	1.31	0.13	0.08~0.48	4	DS0.8-45
10	2	34.3	—	1.42	0.15	0.08~0.48	5	DS0.8-48
10	2	36	—	1.50	0.15	0.08~0.48	6	DS0.8-50
10	2	41	—	1.70	0.17	0.08~0.48	7	DS0.8-56
10	2	44	—	1.85	0.19	0.08~0.48	8	DS0.8-60
10	2	45.5	—	1.98	0.20	0.08~0.48	8	DS0.8-64
10	2	52	—	2.20	0.22	0.08~0.48	9	DS0.8-70
10	2	54	—	2.27	0.23	0.08~0.48	10	DS0.8-72
10	2	60	—	2.55	0.26	0.08~0.48	12	DS0.8-80

NOTE 2: The allowable torques shown in the table are calculated values using the Lewis formula. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

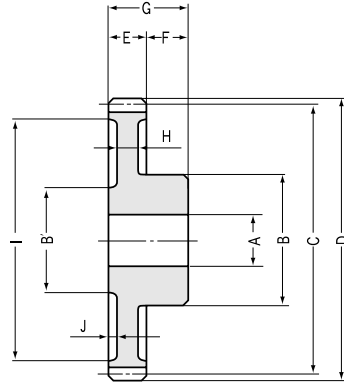


DS Injection Molded Spur Gears Module 1

Module 1

Spur Gears

BB · S9



S9 Shape

Module 1

Catalog No.	Module	No. of teeth	Shape	Bore 1 <i>NOTE 1</i>	Bore 2	Hub dia. 1	Hub dia. 2	Pitch dia.	Outside dia.	Face width	Hub width
				A	A'	B	B'	C	D	E	F
DS1-12	m1	12	S9	4	—	8	6	12	14	6	6
DS1-15		15	S9	4	—	8	7	15	17	6	6
DS1-16		16	S9	5	—	10	8	16	18	6	6
DS1-18		18	S9	5	—	10	8	18	20	6	6
DS1-20		20	S9	5	—	11.7	9	20	22	6	6
DS1-24		24	S9	5	—	11.7	9	24	26	6	6
DS1-25		25	S9	5	—	11.7	9	25	27	6	6
DS1-28		28	S9	5	—	11.7	9	28	30	6	6
DS1-30		30	S9	6	—	14	12	30	32	6	6
DS1-32		32	S9	6	—	14	12	32	34	6	6
DS1-35		35	S9	6	—	14	12	35	37	6	6
DS1-36		36	S9	6	—	14	12	36	38	6	6
DS1-40		40	S9	8	—	16	14	40	42	6	6
DS1-45		45	S9	8	—	16	14	45	47	6	6
DS1-48		48	S9	8	—	16	14	48	50	6	8
DS1-50		50	S9	8	—	16	14	50	52	6	8
DS1-56		56	S9	8	—	18	15.6	56	58	6	8
DS1-60		60	S9	8	—	18	15.6	60	62	6	8
DS1-64		64	S9	8	—	18	15.6	64	66	6	8
DS1-70		70	S9	8	—	18	15.6	70	72	6	8
DS1-72	72	S9	8	—	18	15.6	72	74	6	8	
DS1-80	80	S9	8	—	18	15.6	80	82	6	8	

CAUTION: Gears with wider face widths such as SS and SSA series can be used as the mating gears to these.

NOTE 1: The bore tolerance is generally -0.05 to -0.1 but may be + values at the central portion of the hole. Re-machining the bore is not recommended since reworking material may expose voids.

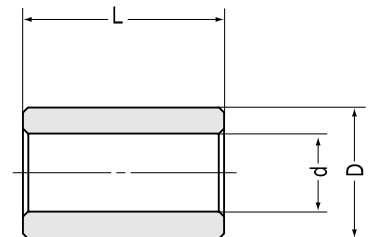
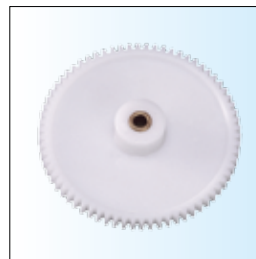


BB Sintered Metal Bushings

The table below shows a series of standard metal bushings that can be pressed into standard injection molded gears.

(unit: mm)

Catalog No.	I.D. of bushing	O.D. of bushing	Length	Products that can use the bushing
	$d^{+0.02}_0$	$D^{+0.02}_{-0.01}$	$L^0_{-0.3}$	
BB30507	3	5	7	DS0.5, DM0.8, DB0.8
BB30608	3	6	8	DS0.5, DS0.8, DM1
BB40609	4	6	9	DS0.8, DM1
BB40612	4	6	12	DS1, DB1
BB50812	5	8	12	DS1
BB50814	5	8	14	DS1, DM1.5



Material: Oil impregnated sintered bronze.



Specifications

Precision grade	JIS N12 grade (JIS B1702-2: 1998) OLD JIS 8 grade (JIS B1702: 1976)	Tooth hardness	110~120HRR
Gear teeth	Standard full depth	Surface treatment	—
Pressure angle	20°	Tooth surface finish	Injection molded
Material	DURACON acetal (M90-44)	Datum reference surface for tooth forming	Bore
Heat treatment	—	Secondary Operations	Please avoid reworking material as this may expose voids.

Total length	Web thickness	Web O.D.	Depth of counterbore	Allowable torque (N · m) <i>NOTE 2</i>	Allowable torque (kgf · m)	Backlash (mm) <i>NOTE 3</i>	Weight (kg)	Catalog No.
G	H	I	J	Bending strength	Bending strength			
12	3	8.5	—	0.44	0.045	0.10~0.60	1	DS1-12
12	3	11	—	0.65	0.066	0.10~0.60	2	DS1-15
12	3	11.5	—	0.71	0.073	0.10~0.60	2	DS1-16
12	3	13.5	—	0.83	0.085	0.10~0.60	2	DS1-18
12	3	15	—	0.96	0.098	0.10~0.60	3	DS1-20
12	3	17	—	1.22	0.12	0.10~0.60	4	DS1-24
12	3	20	—	1.28	0.13	0.10~0.60	4	DS1-25
12	3	23	—	1.48	0.15	0.10~0.60	4	DS1-28
12	3	24	—	1.61	0.16	0.10~0.60	5	DS1-30
12	3	26.5	—	1.75	0.18	0.10~0.60	6	DS1-32
12	3	29	—	1.96	0.20	0.10~0.60	6	DS1-35
12	3	30	—	2.04	0.21	0.10~0.60	6	DS1-36
12	3	34	—	2.33	0.24	0.10~0.60	8	DS1-40
12	3	39.5	—	2.69	0.27	0.10~0.60	9	DS1-45
14	3	40	—	2.92	0.30	0.10~0.60	11	DS1-48
14	3	42.5	—	3.07	0.31	0.10~0.60	12	DS1-50
14	3	48.5	—	3.49	0.36	0.10~0.60	15	DS1-56
14	3	52.5	—	3.78	0.39	0.10~0.60	16	DS1-60
14	3	56.5	—	4.07	0.41	0.10~0.60	18	DS1-64
14	3	62.5	—	4.50	0.46	0.10~0.60	21	DS1-70
14	3	64	—	4.65	0.47	0.10~0.60	21	DS1-72
14	3	72.5	—	5.23	0.53	0.10~0.60	26	DS1-80

NOTE 2: The allowable torques shown in the table are calculated values using the Lewis formula. Please see page 27 for more details.

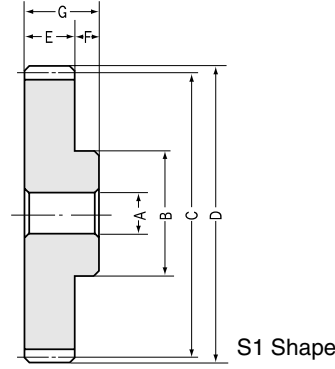
NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.

■ Tolerance of Injection Molded Products (unit: mm)

Range	Tolerance
below 3	±0.2
3 up to 6	±0.25
6 up to 10	±0.3
10 up to 18	±0.35
18 up to 30	±0.4
30 up	±0.5



BSS Brass Spur Gears Modules 0.5~0.8



Specifications	
Precision grade	JIS N8 grade (JIS B1702-1: 1998) OLD JIS 4 grade (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	Free cutting brass (C3604BD-F)
Heat treatment	—
Tooth hardness	Less than 80HRR
Surface treatment	—
Tooth surface finish	Cut
Datum reference surface for gear cutting	Bore
Secondary Operations	Possible

Module 0.5

Catalog No.	Module <i>m</i>	No. of teeth <i>z</i>	Bore AH7	Hub dia. B	Pitch dia. C	Outside dia. D	Face width E	Hub width F	Total length G	Shape	Allowable torque (N·m) NOTE 1		Backlash (mm) NOTE 2	Weight (gf)
											Bending strength	Bending strength		
BSS0.5-20	0.5	20	4	8.5	10	11	3	7	10	S1	0.091	(0.0093)	0~0.1	4
BSS0.5-25	0.5	25	4	11	12.5	13.5	3	7	10	S1	0.12	(0.013)	0~0.1	8
BSS0.5-30	0.5	30	4	13	15	16	3	7	10	S1	0.16	(0.016)	0~0.1	11
BSS0.5-40	0.5	40	4	17	20	21	3	7	10	S1	0.23	(0.024)	0~0.1	20

Module 0.8

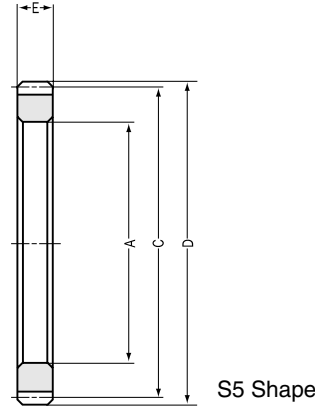
BSS0.8-20	0.8	20	5	13.5	16	17.6	4	8	12	S1	0.31	(0.032)	0~0.1	14
BSS0.8-25	0.8	25	5	17	20	21.6	4	8	12	S1	0.43	(0.043)	0~0.1	24
BSS0.8-30	0.8	30	5	20	24	25.6	4	8	12	S1	0.55	(0.056)	0~0.1	34
BSS0.8-40	0.8	40	5	20	32	33.6	4	8	12	S1	0.79	(0.081)	0~0.1	46

NOTE 1: The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 2: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.



SSR Steel Ring Gears (Spur Gears) Modules 2~3



Specifications	
Precision grade	JIS N9 grade (JIS B1702-1: 1998) OLD JIS S grade (JIS B1702: 1976)
Gear teeth	Standard full depth
Pressure angle	20°
Material	S45C
Heat treatment	—
Tooth hardness	Less than 194HB
Surface treatment	—
Tooth surface finish	Cut
Datum reference surface for gear cutting	Bore
Secondary Operations	Possible

Module 2, 2.5, 3

Catalog No.	Module	No. of teeth	Shape	Bore <small>NOTE 1</small>	Pitch dia.	Outside dia.	Face width	Allowable torque (N · m) <small>NOTE 2</small>		Allowable torque (kgf · m)	
				A _{H8}	C	D	E	Bending strength	Surface durability	Bending strength	Surface durability
SSR2-120 SSR2-200	m2	120	S5	194	240	244	20	366	44.0	37.4	4.49
		200	S5	354	400	404	20	630	84.2	64.3	8.59
SSR2.5-120 SSR2.5-200	m2.5	120	S5	245	300	305	25	715	88.5	72.9	9.02
		200	S5	445	500	505	25	1230	169	126	17.2
SSR3-120 SSR3-160	m3	120	S5	296	360	366	30	1240	157	126	16.0
		160	S5	416	480	486	30	1680	226	171	23.0

Backlash (mm) <small>NOTE 3</small>	Weight (kg)	Catalog No.
0.17~0.37	2.50	SSR2-120
0.20~0.41	4.30	SSR2-200
0.19~0.41	4.60	SSR2.5-120
0.22~0.46	8.00	SSR2.5-200
0.22~0.45	7.80	SSR3-120
0.22~0.45	10.6	SSR3-160

NOTE 1: Although the inside diameter of these gears are made to H8 tolerance, since the ring shape is easily deformed, some error may occur beyond the stated tolerance.

NOTE 2: The allowable torques shown in the table are the calculated values according to the assumed usage conditions. Please see page 27 for more details.

NOTE 3: The backlash values shown in the table are the theoretical values of a pair of identical gears in mesh.