

T3 Shape

■ Involute Spline Shafts

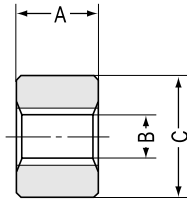
Catalog No.	Module	No. of teeth	Major dia. of spline	Shaft dia.	Shaft length (L)	Shaft length (R)	Face width	Total length	Shape	Allowable torque (N-m)	Allowable torque (kgf-m)	Weight (kgf)
	<i>m</i>	<i>z</i>	<i>D</i>	<i>d</i>	<i>E</i>	<i>F</i>	<i>G</i>	<i>H</i>		NOTE 2	NOTE 2	
										Surface durability	Surface durability	
SV 17-170	1.667	8	16.67	13	20	15	135	170	T3	32.36	(3.3)	0.3
SV 20-200	1.667	10	19.67	15	20	15	165	200	T3	60.6	(6.18)	0.4
SV 25-250 <small>NOTE 1</small>	1.667	13	24.67	20	30	—	220	250	T3	129.8	(13.24)	0.9
SV 30-300 <small>NOTE 1</small>	1.667	16	29.67	25	30	—	270	300	T3	233	(23.76)	2

NOTE 1: SV25-250 and SV30-300 have shafts on one end only.

NOTE 2: The allowable torques are calculated based on "The surface strength of Spline" on page 355.

■ Characteristics of Involute Splines

- SV and SVI series are made according to the automotive involute spline standard, JIS D 2001: 1959 (FLAT ROOT SIDE FIT, Backlash 0.06~0.15)
- Involute spline shafts and bushings are thermal refined to have good abrasion-resistance.
- Spline bushings may be made in CAC (bronze) type material as a special custom order item.



T1 Shape

Specifications

Catalog No.	SV	SVI
Gear teeth	Stub teeth	Stub teeth
Pressure angle	20°	20°
Material	S45C	S45C
Heat treatment	Thermal refined	Thermal refined
Tooth hardness	225~260HB	225~260HB
Surface treatment	Black oxide	Black oxide
Tooth surface finish	Cut	Cut
Datum reference surface for gear cutting	Shaft	Outside diameter
Secondary Operations	Possible	Possible

Involute Spline Bushings

Catalog No.	Module	No. of teeth	Total length	Minor dia. of spline	O.D. of bushing	Shape	Weight (kgf)
	m	z	A	B	C		
SVI 17-40	1.667	8	25	13.7	40	T1	0.2
SVI 20-45	1.667	10	30	16.7	45	T1	0.3
SVI 25-55	1.667	13	38	21.7	55	T1	0.6
SVI 30-65	1.667	16	45	26.7	65	T1	1

The surface strength of Spline

The design concept of the spline surface strength is the same as that of a key. Here is the formula for the allowable transmission force (N) of spline.

$$F = \eta z h l \sigma$$

And the formula of allowable torque T (N·m) of spline with respect to the surface strength

$$T = \frac{Fd}{2000}$$

In designing a spline shafts, besides considering the surface strength, we should take into account the torsional and bending stresses of the spline.

Here

η : Contact ratio of surface → 0.75 (assumed)

z : Number of teeth → number of teeth (z) of spline from the table

h : Contact depth of tooth → 1.65

l : Contact length of spline → Total length (A) of involute spline bushing

σ : Allowable surface stress of spline → 19.61MPa(2kgf/mm²) (assumed)

d : Effective diameter of spline shaft → Module (m) x number of teeth (z)