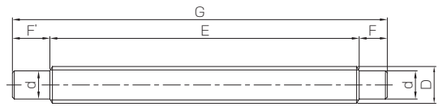
KSV Involute Spline Shafts

Involute Spline Shafts

Specifications	
Gear teeth	Stub teeth
Pressure angle	20°
Material	S45C
Heat treatment	Thermal refined
Tooth hardness	200 ～ 270HB
Surface treatment	Black oxide coating



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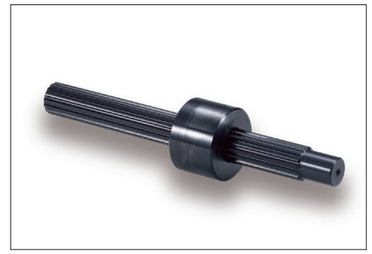
TB



Catalog No.	Module	No. of teeth	Shape	Outside dia. D	Shaft dia. d $^{+0.25}_{+0.15}$	Face width E	Shaft length (L) F'	Shaft length (R) F	Total length G	Backlash (mm)	Weight (kg)
KSV17-170	***m*1.667**	8	TA	16.67	13	135	20	15	170	0.06~0.15	0.26
KSV20-200		10	TA	19.67	15	165	20	15	200	0.06~0.15	0.43
KSV25-250		13	TB	24.67	20	220	—	30	250	0.06~0.15	0.88
KSV30-300		16	TB	29.67	25	270	—	30	300	0.06~0.15	1.55

[Caution on Secondary Operations] ① Be sure not to bend shafts or break teeth when performing secondary operations on SV Involute Spline shafts.

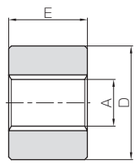
■ Characteristics of Involute Spline Shafts

- SV and SVI series are made according to the automotive involute spline standard, JIS B 1603: 1995 (Straight cylindrical involute splines, backlash 0.06 to 0.15).
- Involute spline shafts and bushings are thermal refined to have good abrasion-resistance.
- Spline bushings may be made in CAC (copper alloy) type material as a special custom order item.

KSVI Involute Spline Bushings

Involute Spline Bushings

Specifications	
Gear teeth	Stub teeth
Pressure angle	20°
Material	S45C
Heat treatment	Thermal refined
Tooth hardness	200 ～ 270HB
Surface treatment	Black oxide coating



T1

Catalog No.	Module	No. of teeth	Shape	Internal dia. A	Outside dia. D	Face width E	Allowable torque (N・m) Surface durability	Allowable torque (kgf・m) Surface durability	Backlash (mm)	Weight (kg)
KSVI17-40	***m*1.667**	8	T1	13.7	40	25	33.2	3.38	0.06~0.15	0.21
KSVI20-45		10		16.7	45	30	59.6	6.08	0.06~0.15	0.31
KSVI25-55		13		21.7	55	38	125	12.8	0.06~0.15	0.57
KSVI30-65		16		26.7	65	45	222	22.6	0.06~0.15	0.93

[Caution on Product Characteristics] ① The allowable torques are calculated based on "The surface strength of Spline" .
② It is essential to apply lubricant on the contact surface of the spline shaft and the bushing. To prevent scuffing, it is recommended to apply lubricating grease. If used in applications where oil contamination is not desirable, solid lubrication is recommended.

■ Surface Strength of Splines

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 F(N) of spline.

$$F = \eta \cdot z \cdot h_w \cdot l \cdot \sigma$$

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

$$T = \frac{F \cdot d_w}{2000}$$

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

Where

η : Contact ratio of surface → 0.75 (assumed)
z : Number of teeth → number of teeth of spline from the table
h_w : Contact depth of tooth (mm) → 1.485
l : Contact length of spline → spline hub face width E from the table
σ : Allowable surface stress of spline→ 19.61MPa (2kgf/mm^2) (assumed)
d_w : Contact diameter (mm) → Tip diameter of spline shaft D - h_w