OMNIGEAR
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INVOLUTE SPLINE FOR AUTOMOBILES (JAPANESE INDUSTRIAL STANDARD)

This standard is based on straight (non-helical) involute splines and are mainly in automobile mechanisms, specifically for coupling driving shafts and mating parts. They are based on 20˚ stub tooth form and provide a smooth transmission of torque.

1. Module

Consists of the following 15 modules classified in 3 series.

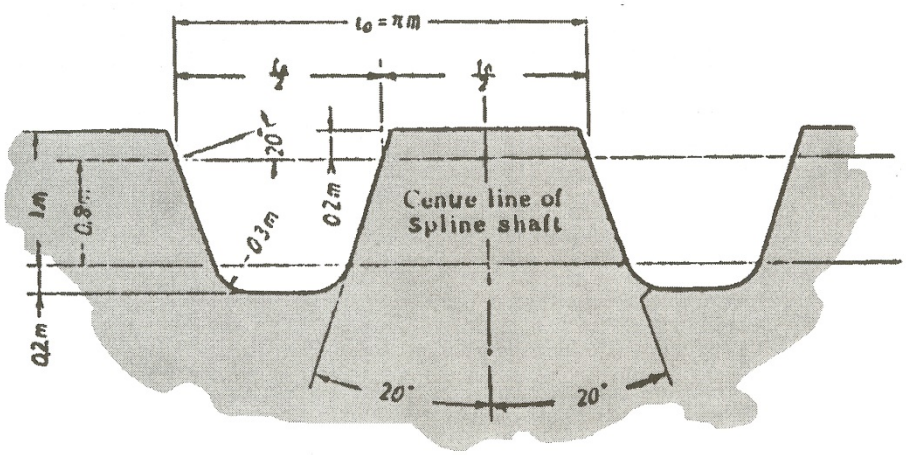
(1) 1 st series 0.5 1 1.25 1.667 2.5 5 10
(2) 2nd series 0.75 3.75 7.5
(3) 3rd series 1.5 2 3 4.5 6

Remarks: The modules is the 1st and the 2nd series are equal to the numerical valve of 10 and 7.5 divided by integers respectively, and are same as those in the ISO draft. Most of the nominal diameters of shafts for which these series are used coincide with the nominal inner diameters of radial ball and roller bearings.

The modules in the 3rd series are those providing the intermediate figures between two modules with a large step in the 1st and the 2nd series. The number of teeth is from 6 to 40.

2. Basic Form of Tooth

The tooth form of basic rack for spline shafts is shown in Fig. 1



In Fig.1 the standard pitch line is the pitch line specified so that the tooth thickness measured along the line is one half of the basic pitch.

The tip of basic rack is distant by 0.2 from standard pitch line.

The effective height of tooth of spline is equal to 1 m. When the shaft and the hole are meshed, the minimum radial clearance between two minor diameters is 0.2, and the root radius is 0.3m considering the amount of radial clearance.

Remarks
1. The elements of the spline hole is defined from those of the spline shaft.
2. The distance between the standard pitch line and the generating pitch line is the amount of profile shifting.

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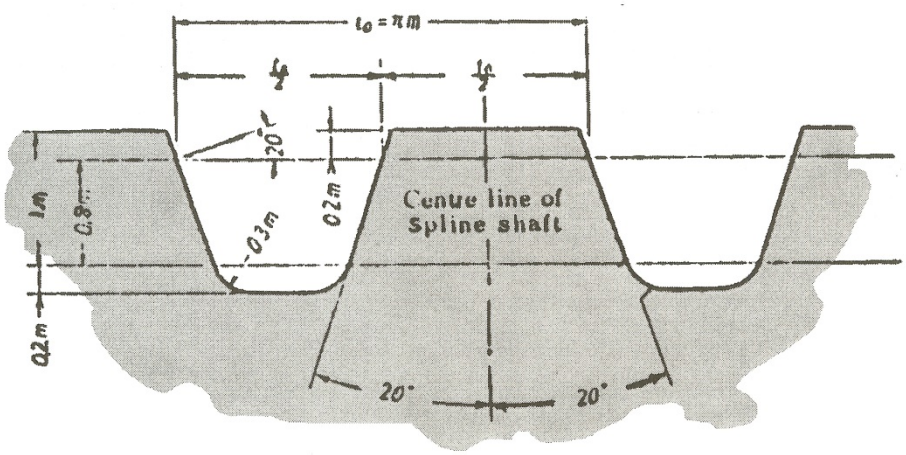

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3. Class

To minimize the number of tools for cutting holes, the basic hole system is adopted, various classes of fit being obtained by varying the dimensions of the shaft. For this purpose the following grades for the measure of tooth surface and the major diameter of the shaft are prescribed without reference to their respective sizes and independently of each other.

Tooth Flank	Class A	Class B	Class C	Class D
Major diameter	—	Class 2	Class 3	—
Fit	Loose fit	Sliding fit	Fixed fit	Press Fit

3a. Fit

The standard fits for both flank fits and flank major diameter fits are four classes as follows:
(1) Loose fit: A clearance is always left.
(2) Sliding fit: Generally a slight clearance is left (2).
(3) Fixing fit: Generally a slight interference is kept (3).
(4) Press fit: An interference is always kept. This class of fit is used flank fit only.

When a hole and a shaft with the class specified in 3.A respectively are meshed each other, the method of alignment varies in relation to the clearance (interference) between the major diameters and the clearance (interference) normal to the flank surfaces of the mating members. However, any desired alignment and fit can be obtained by adlopting the following combination of the grades of dimensions for the measure of tooth surface and the major diameter of spline shafts.

Alignment	Fitting / Combination	Loose	Sliding	Fixed	Press
Tooth Flank fit	Major Diameter	----	----	-----	----
	Tooth Flank	Class A	Class B (3)	Class C (4)	Class D
Major Diameter Fit	Major Diameter	----	Class 2	Class 3 (4)	----
	Tooth Flank	---	Class A	Class A or B	----

Remarks: In the case of flank fit, since the major diameter of shaft is used as the basic dimension, grades for it are not required.

Notes (3) In the case of b class, a slight interence may rarely occur.
(4) A slight-clearance may occour sometimes.

Flat Root Side Fit	Non-Chamfering	WD 1.2m
Full Fillet Side Fit	Non-Chamfering	WD 1.346m
Flat Root Major Diameter Fit	Chamfering	WD 1.2m
Full Fillet Major Diameter Fit	Chamfering	WD 1.345m