

Ropes, Chains, and Slings

TABLE 23-G

GROOVE DIAMETER TOLERANCE IN RELATION TO WIRE ROPE DIAMETER

Rope Size (in)	Amount that groove diameter should be larger than nominal rope diameter (in)	
	Used	New
1/4 and 5/16	1/64	1/32
3/8 to 7/8 incl	1/32	1/16
1 3/16 to 1 1/8 incl	3/64	3/32
1 3/8 to 1 1/2 incl	1/16	1/8
1 7/8 to 2 1/4 incl	3/32	3/16
2 3/8 and larger	1/8	1/4

Source A P I Spec RP-9B, March 1966, Use and Care of Wire Rope

off to the circular contour which will provide the recommended groove depth

So far as the life of wire rope is concerned, the condition and contour of sheave grooves are important. Sheave grooves should be checked periodically and should not be allowed to wear to a smaller diameter than those shown for used grooves in Table 23-G. If they become worn more than this, a reduction in rope life can be expected. Reconditioned sheave grooves should conform to the tolerance shown in Table 23-G for new (or remachined) grooves.

On all new sheaves, the grooves should be made for the size of rope specified. The bottom of the groove should have a 150-degree arc of support, and the sides of the groove should be tangent to the ends of the bottom arc. The total depth of the groove should be 1 1/4 times the nominal diameter of the rope, and the radius of the arc should be one-half the nominal rope diameter plus the tolerance shown in Table 23-G for new (or remachined) grooves.

Multiple layer winding on drums should be avoided, if possible, because the rope will mash and jam and its life will be shortened materially, particularly at the point where the rope rises to the next layer. Where practicable, the drum should be of such diameter and length as to take all the rope in a single layer.

Crushing and excessive wear of wire rope are minimized by use of helically grooved

drums with capacity for one layer of rope. In any case, the number of layers should be limited to three. Rope lifters are recommended when two or more layers are wound on drums. To distribute wear at crossover points uniformly, 1 1/4 wraps can be cut off every six months or three or four times during the life of the rope. In no case should there be fewer than three full wraps on a drum.

In general, bending of wire rope—first in one direction and then in the opposite—over sheaves or drums wears out rope faster than any other known cause and should be avoided.

It is desirable that the fleet angle* not exceed 1 degree, 30 minutes, to reduce any tendency for the rope to open-wind. Also, a minimum limit of 0 degree, 30 minutes, to assure the rope's starting back on the next layer, has been found desirable. Adherence to these specifications will help ensure uniform winding on smooth-faced drums and will also increase the efficiency of grooved drums. For smooth-faced drums, proper direction of lay of rope for specified winding conditions further helps ensure uniform winding.

The head sheave groove should be checked for poor alignment, worn bearings, broken flanges, and size and shape of the groove at intervals of two or three months, depending

* The fleet angle is the included angle between the rope winding on the drum and a line perpendicular to the drum shaft and running through the head or lead sheave.