



The Need for Tight Synchronous Sprocket Diameter Tolerances

The finish O.D. tolerances Gates recommends for synchronous pulleys and sprockets are quite tight. There are a number of reasons for these recommendations.

The ultimate concern about sprocket finish O.D. relates directly to belt pitch fit. Belt length tolerances must also be considered, as well as the general nature of the drive application.

Sprocket O.D. can't deviate to the point that belts at either the short or long extremes of the allowable tolerance range begin to fit poorly under dynamic operating conditions. Power transmission drives have high, tight side span tensions resulting in slight levels of pitch elongation. Motion transfer drives are generally less sensitive to sprocket O.D. variations since they lack significant tight side span tensions, nor do problems resulting from poor pitch fit manifest themselves quickly under light loads.

When considering combinations of product tolerance extremes under rated operating loads, a tight sprocket O.D. tolerance is required to ensure consistent belt performance. This does not mean that sprockets made to wider tolerances will not work in all cases.

Plastic molders and some powdered metal suppliers are generally not capable of holding Gates recommended finish O.D. tolerances. Hob and shaper cutting are the only reasonable processes capable of this. Non critical and lightly loaded drive systems can operate quite well with sprockets built with slightly greater tolerances than Gates recommend. These systems should be reviewed individually and be thoroughly tested.