

# HELPFUL DESIGN INFORMATION

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## Important Dimensional Considerations

### Tooth Design Parameters

#### Round Teeth:



The normal diameter for round teeth is .004/006 under the perforation diameter. This is dependent however, on the accuracy of the perforation spacing and the amount of 'wrap' (angular engagement) of the material on the sprocket. Consult LaVeZZi engineers for specifics.

The tooth arc must be designed to avoid damaging the perforation when engaging or disengaging. The radius is dependent on the sprocket radius and is determined by the involute curve generated by the perforation edge as it leaves the sprocket tooth. LaVeZZi engineers will advise as to the optimum tooth arc.

#### Rectangular Teeth:



The desire to control side-to-side (lateral) motion or front-to-back motion (backlash) is normally the controlling factor in the design of rectangular teeth. Accuracy of the perforation size and spacing (pitch) permitting, it is possible to fill the perforation allowing only .0003"/.0006" clearance. Consideration must be given to the radii in the corners of the perforation when requiring a maximum tooth width (see *VKF* and *Posi-Trol* Sprocket Tooth Designs). When this is not a consideration, then a tooth width that adequately fills the perforation across the driving face is sufficient.

The tooth arc is dependent on the sprocket diameter. The involute curve generated by the perforation face as it enters or leaves the sprocket tooth can be calculated by LaVeZZi engineers who will advise as to the best radius and the point of radius.

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## *Design Guide For Sprockets continued . . .*

### **Bore Sizing**

To avoid camber or excessive wear to the perforated material, it is mandatory that a proper fit be made between the sprocket bore and the mounting shaft. If the sprocket is held on with a set screw, the clearance between sprocket and bore will translate into eccentricity. A .001" total bore tolerance is maximum, with tighter tolerances dictated by need.

### **Diameter Considerations**

The sprocket diameter is usually determined by the amount of wrap (angular engagement) required or determined by the system design. The flexibility of the perforated material may be a determining factor. Once an approximate size is arrived at, the exact diameter is determined based on the material or film thickness.

Assuming the actual pitch diameter to be at the mid-point of the material thickness when the belt is fully engaged around the sprocket, the sprocket diameter is determined by the formula:

$$D = NP/\pi - T$$

Where: **D** = Sprocket Diameter  
**N** = Number of Pitch Lengths  
Around Sprocket Circumference  
**P** = Perforation Pitch (Spacing)  
 $\pi$  = 3.1416  
**T** = Material Thickness

LaVeZZi engineers are ready to assist in designing a sprocket that best suits your needs. The parameter sheet on the opposite page will help to supply us with the pertinent information for designing and quoting an optimum design. Just fill out as completely as possible and mail or fax to the attention of our Sales Department for a prompt response.

