总的来说，齿宽与槽宽主要影响间隙内磁通密度模峰值和极靴长度利用率。

In general, the tooth width *Lt* and the groove width *Ls* mainly affect the extreme value of flux density in the [seal](D:/All%20Softwares/%E6%9C%89%E9%81%93/Dict/8.10.3.0/resultui/html/index.html#/javascript:;) gap and the utilization ratio of seal size.

在足够大的齿高下，相比于极齿，齿槽对应密封间隙磁阻要大很多.

The magnetic resistance of the seal gap corresponding to the groove is much larger than of the seal gap corresponding to the tooth, when the tooth height is large enough.

磁力线倾向于通过极齿

As a result, [magnetic](D:/All%20Softwares/%E6%9C%89%E9%81%93/Dict/8.10.3.0/resultui/html/index.html#/javascript:;) [field](D:/All%20Softwares/%E6%9C%89%E9%81%93/Dict/8.10.3.0/resultui/html/index.html#/javascript:;) [line](D:/All%20Softwares/%E6%9C%89%E9%81%93/Dict/8.10.3.0/resultui/html/index.html#/javascript:;)s tend to pass through the tooth.

齿槽对应密封间隙的磁通密度模较小，形成谷值，极齿对应密封间隙的磁通密度模较大，形成峰值，峰值与谷值的差值与该极齿的理论耐压能力成正比。

The flux density of the seal gap corresponding to the groove is valley value, and the flux density of the seal gap corresponding to the tooth is peak value. The difference between peak value and valley value is proportional to the theoretical pressure resistance of the tooth.

材料所允许的磁通密度是有限的。

The allowable flux density of the material is finite.

在其他条件相同时，若齿宽较小，则允许通过极齿的磁力线数较少，搭配较小的槽宽即可达到最大磁通密度模极差值。

Under the same conditions, if the tooth width is smaller, the number of magnetic field lines that are allowed to pass through the tooth is less. The maximum magnetic flux density [difference](D:/All%20Softwares/%E6%9C%89%E9%81%93/Dict/8.10.3.0/resultui/html/index.html#/javascript:;) [value](D:/All%20Softwares/%E6%9C%89%E9%81%93/Dict/8.10.3.0/resultui/html/index.html#/javascript:;) can be achieved with a smaller groove width.

单个极齿形成的磁通密度模极差值较小，此时主要靠增加密封级数来增加耐压能力.

However, the sealing capability provided by a single tooth is smaller. In this case, the sealing capability of the device is [guarantee](D:/All%20Softwares/%E6%9C%89%E9%81%93/Dict/8.10.3.0/resultui/html/index.html#/javascript:;)d mainly by the number of teeth.

若齿宽较大，极齿处的磁通密度模较难达到材料极限，需要搭配较大的槽宽，此时单个极齿形成的磁通密度模极差值较大，但是所能形成的密封级数较少。

If the tooth width is larger, it is difficult for the magnetic flux density at the tooth to reach the limit value of material. The tooth need to be fitted with a larger groove width to achieve a larger magnetic flux density [difference](D:/All%20Softwares/%E6%9C%89%E9%81%93/Dict/8.10.3.0/resultui/html/index.html#/javascript:;) [value](D:/All%20Softwares/%E6%9C%89%E9%81%93/Dict/8.10.3.0/resultui/html/index.html#/javascript:;).

In this case, the sealing capability provided by a single tooth is larger. However, the width of a single tooth and groove is too large to form too many seal stages for the same length of pole shoe.

因此，对密封装置的优化设计往往是对齿宽和槽宽的优化设计，在增加每个极齿耐压能力和增加密封级数之间寻求平衡。本文得到的矩形极齿优化设计满足以下关系：

Therefore, the optimal design of sealing device is often the optimal design of tooth width and groove width, seeking a balance between increasing the sealing capability of each tooth and increasing the sealing stage. The optimum design of rectangular tooth studied in this paper satisfies the following relations

1. 最佳齿高应大于齿高阈值。当齿高大于齿高阈值后，再增加齿高基本不会对装置耐压能力造成影响。齿高阈值与齿宽和密封间隙呈线性关系，为；齿高阈值与槽宽呈负指数关系，对于*Lg=0.1mm*，符合；对于*Lg=0.2mm*，符合；对于*Lg=0.3mm*，符合，关系式中的极值系数随密封间隙增大而增大。最终选取的齿高应大于根据齿宽和槽宽计算的齿高阈值中的最小值。

The optimum tooth height *Lh* should be larger than the tooth height threshold . When the tooth height is larger than the tooth height threshold, increasing the tooth height will not affect the sealing capability of the device. The tooth height threshold has a linear relation with tooth width and seal gap, . The tooth height threshold and groove width *LS* meet the negative exponential relation properly, for *Lg=0.1mm,* ; for *Lg=0.2mm,* ; for *Lg=0.3mm,* . The intercept coefficient in the equation increases with the increase of the seal gap. The final tooth height should be greater than the minimum tooth height threshold calculated based on the tooth width, seal gap, and groove width.

1. 最佳齿宽不只与密封间隙相关，还与极靴长度相关。对于*Lp=19.2mm*，*Lt=Lg*；对于*Lp=14.2mm*，*Lt=0.1mm+Lg*；对于*Lp=9.2mm*，*Lt=2Lg*。

The optimum tooth width is not only related to the seal gap, but also to the length of the pole shoe. For *Lp=19.2mm*, the tooth width is equal to the size of the seal gap, *Lt=Lg*; for *Lp=14.2mm*, the tooth width is equal to the size of the seal gap plus 1*mm*, *Lt=0.1+Lg*; for *Lp=9.2mm*, the tooth width is twice the size of the seal gap, *Lt=2Lg*.

1. 最佳槽宽与由密封间隙决定，应取*Ls=4Lg*。对于相同密封尺寸进行优化时，可稍微改变Ls的大小以充分利用密封尺寸。

The optimum groove width is determined by the seal gap. The groove width should be taken 4 times the size of the seal gap, *Ls=4Lg*. When optimizing for the same seal size, the groove width can be slightly increased or decreased to improve the utilization ratio of the seal size.