



轴承使用寿命的计算

Calculation for the service life of bushing

自润滑轴承的寿命，除激烈的烧焦情况外，通常是以轴承内径的磨损来决定的。自润滑轴承在干摩擦状态、边界润滑、流体润滑状态下使用，其磨损情形有很大差异。决定自润滑轴承寿命主要因素有：负载特性及方向、润滑条件、运转速度、环境温度、相配轴硬度、对偶面的粗糙度、相配轴材料、周围空气（气体）的性质等，所以通过计算来求取确切的磨损量是非常困难的。

With the exception of being burnt, the service life of self-lubricating bushing depends on the abrasion degree of the bushing's inner diameter. In conditions like dry friction, boundary lubrication and oil lubrication, the abrasion of the same bushing will be different. Main factors that may influence the service life are: character and direction of the load, lubrication condition, running speed, environment temperature, hardness of the mating axis, roughness of the mating surface, material of the mating axis, air quality around etc. Therefore, it's difficult to calculate the actual abrasion quantity.

在不考虑速度及负载对轴承的影响、轴承运动方向的差异、润滑的种类、配合间隙的大小、表面粗糙度及杂质渗入程度——等等因素，可以给出磨损量 W 计算的公式：

Regardless the factors like influence from the load and speed, difference caused by running direction, kinds of lubricating oil, mating clearance, roughness and impurities penetration degree, the abrasion W can be calculated by the following formula.

$$W = K \cdot P \cdot V \cdot T \quad (\text{mm}^3)$$

P: 负载压力 Load pressure(N/mm²)

V: 运转速度 Running velocity(m/s);

K: 磨损系数 Abrasion coefficient(mm²/(N/mm²·m/s·Hr))

T: 运转时间 Running time (Hr)

不同润滑条件下，实验所得的磨损系数 K 值见下表：

Abrasion coefficient K gained under different lubrication conditions in the laboratory. Consult the following form for K value.

润滑条件 Lubrication conditions mm²/(N/mm²·m/s·Hr)

无润滑（干摩擦） Non-lubrication(dry friction)	$3 \times 10^3 \sim 6 \times 10^4$
定期润滑（边界润滑） Periodical lubrication(marginal lubrication)	$3 \times 10^4 \sim 6 \times 10^5$
油润滑（流体润滑） Oil lubrication(fluids lubrication)	$3 \times 10^5 \sim 6 \times 10^6$