Bearing Life

Mechanical Engineering

What an L10 rating means, and how load exponent punishes overloading.

Bearing life is a statistical rating: L10 is the life that ninety per cent of a batch reaches or exceeds.

L10 = (C ÷ P)^p million rev · p = 3 ball, 10/3 roller

C = 30 kN, P = 3 kN — **1000 million rev**

Ball bearing, cubed.

Running at 1500 rpm — **About 11100 hours**

Divide by rev per hour.

Double the load — **Life falls eight times**

Cubic for balls.

THE COMMON MISTAKE

× **Treating L10 as the life of your bearing**

✓ **It is a ninety per cent survival figure**

One in ten is expected to fail before L10. Median life is roughly five times longer, and any single bearing may fail far sooner.

The basic rating ignores lubrication, contamination, misalignment and temperature. Makers' modified life factors govern.