Case Study: Effectiveness of NanoSave™ N1-G Additive in Bearing applications

July 1, 2013

Main Finding: The Durability of Bearings is 4.34 Times higher when treated with 6% of NanoSave™ N1-G formulation.

Client
The tests were conducted by a multi-national corporation with over 400 stock-carrying distributor locations throughout North America and seven manufacturing facilities. The corporation manufactures and distributes bearings worldwide.

The lifetime durability of bearing 6202 was compared using traditional bearing oil versus the bearing oil with the addition of 6% NanoSave™ N1-G. In both cases the tests were conducted on 20 samples of 6202 bearings. The tests were conducted one after the other at the same testing station. The tests ran on 5 testing heads, with 4 bearings on each head.

Test load was Fr = 1,990N (roughly 200kg)

Test revolutions nz = 9730 per minute

The test was in accordance with ISO 281 standard.
Each time a bearing failed it was reported and changed.

Results

A course of individual failures is stated in hours and millions of revolutions:

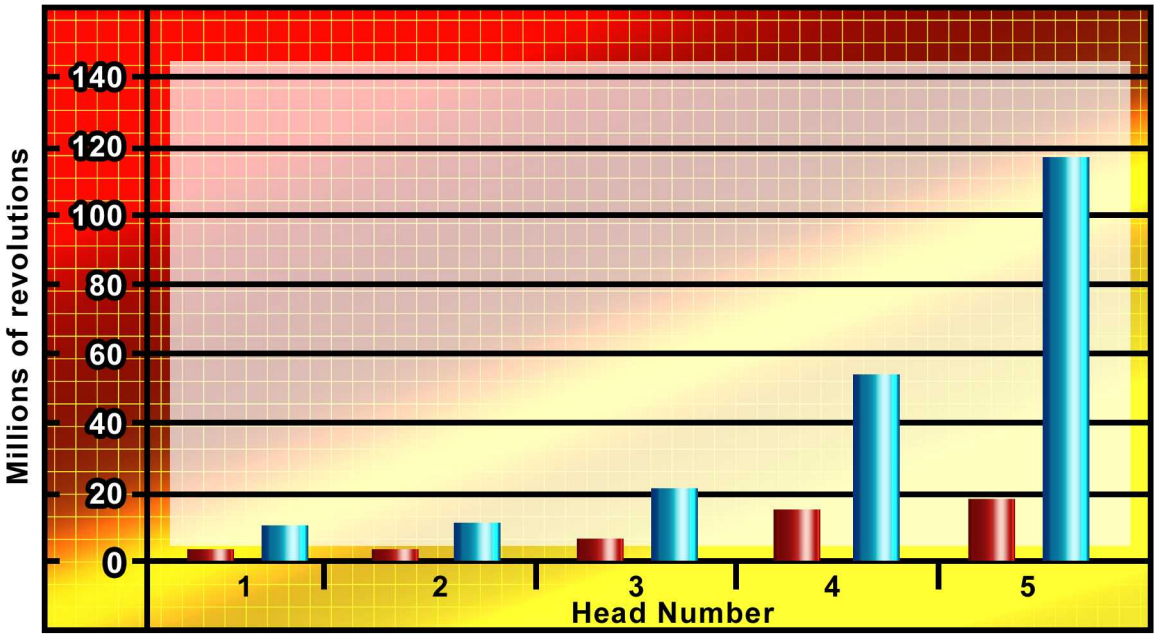
Bearing head	Traditional Bearing Oil		Traditional bearing oil + 6% NanoSave™N1-G	
	Hours (cumulative)	Revolutions (millions)	Hours (cumulative)	Revolutions (millions)
1	4	2.34	23	13.43
2	5	2.92	25	14.6
3	13	7.59	37	21.6
4	33	19.27	96	56.04
5	34	19.85	198	115.59

The graph below demonstrates the increased durability of bearings with the addition of NanoSave™ N1-G:

Case Study: Effectiveness of NanoSave™ N1-G Additive in Bearing applications

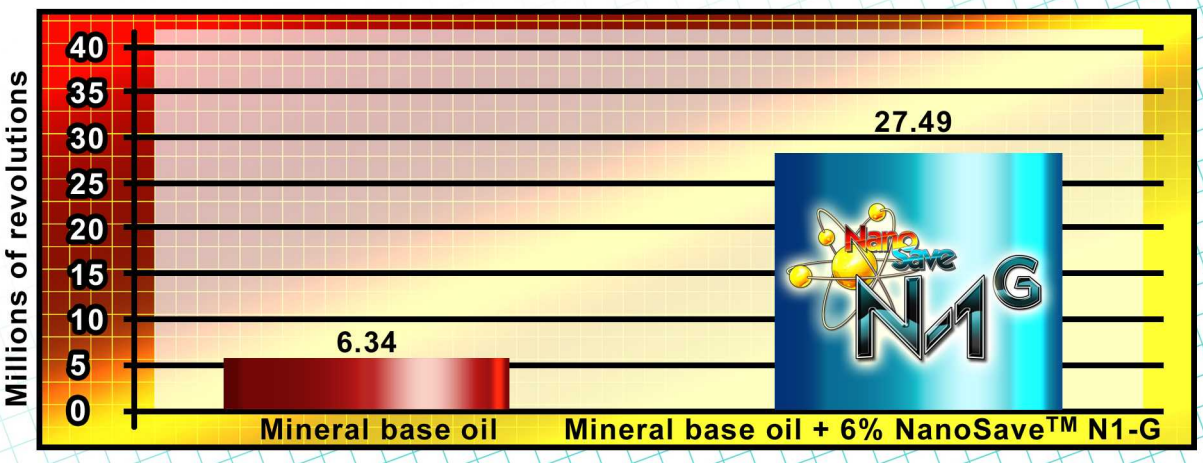
July 1, 2013

TEST OF BEARING DURABILITY



Statistical tests (2-parametric Weibull distributions) showed that the L10 life of bearings (a measure of classical bearing fatigue failure) was 6.34 million revolutions for the mineral base oil and 27.49 million revolutions with the addition of NanoSave™ N1-G. This is demonstrated below:

RESULTS: DURABILITY OF BEARINGS



It is clear from the results that the L10 of bearings 6202 when lubricated with NanoSave™ N1-G is 4.34 times higher than when lubricated with base mineral oil.