

Case Study: **NanoLub® GH-X** Grease Additive for Heavy Machinery

Main Finding: Increase in service life of bearings by nearly 100% and their dynamic load by about 30%.

Client

ZVL Slovakia, a.s

The test purpose was lubricity improvement of tested grease by determination of bearing durability. The tests were conducted on Closed ZVL Bearing type 6202-2Z and lubricated with RAS neat grease vs. RAS grease formulated with NanoLub® product. Both tests were conducted on 16 samples of 6202-2Z bearings. The tests were run simultaneously at the same testing station RAH-2D. Each one of the 2 tests ran on 2 testing spindles, with 4 bearings on each one. The tests were carried out until the 1st bearing from each tested foursome of bearings dropped out during the process.

Closed ZVL Bearing type 6202-2Z



Test conditions:

Test equipment used: RAH-3D	
Radial load:	1400 N
Axial load:	0
Method of testing:	Until the first bearing dropped out from each tested foursome
Test frequency of rotation:	7300 / min

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Type of used lubricating grease	
1st test	RAS
2nd test	RAS + Nanolub [®] additive

	RAS	RAS + Nanolub [®] additive
Initial heating range temperature:	65-68°C	65°C
Reached temperature measured at the end of the test:	90-95°C	80-85°C

Test results:

Lifetime of the tested bearings:

	RAS	RAS + Nanolub [®] additive
First Foursome	371 hours	859 hours
Second Foursome	504 hours	938 hours

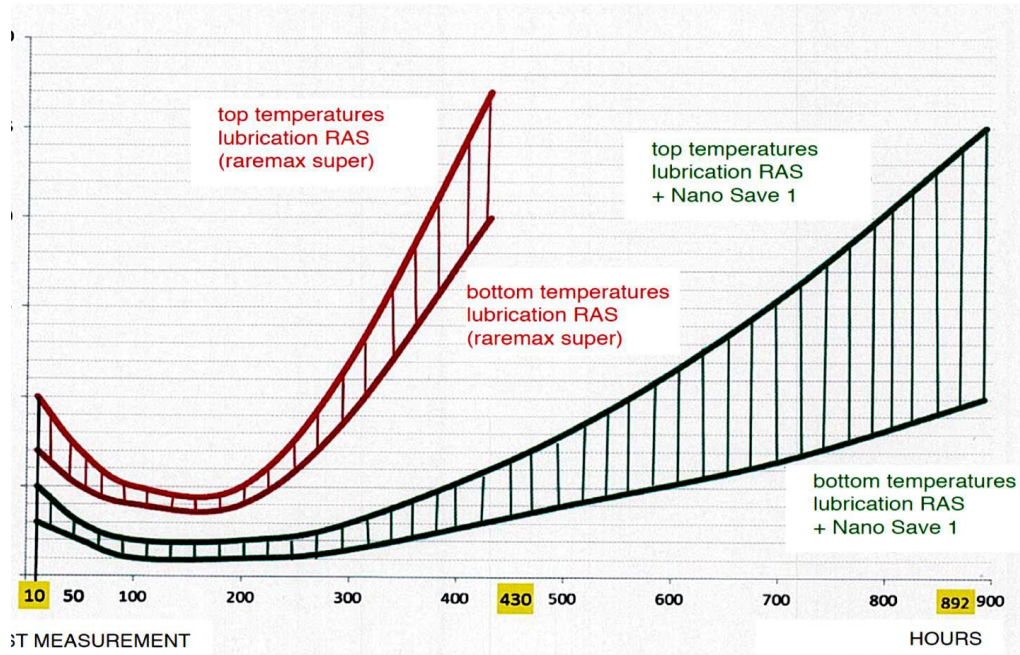
Mathematical-statistical estimate of BDBC value of produced batch:

	RAS	RAS + Nanolub [®] additive
Unbiased estimate of basic dynamic bearing capacity (BDBC) of produced batch	8024 N	10235 N
Ratio of unbiased estimate of basic dynamic bearing capacity (BDBC) of produced batch and catalogue (defined) value	113%	144%

The calculation of the durability results, bearing capacity and overall evaluation was carried out in accordance with ISO 281, PN 5 0209 and work procedure no. PP 42.01-910.4 Durability Tests.

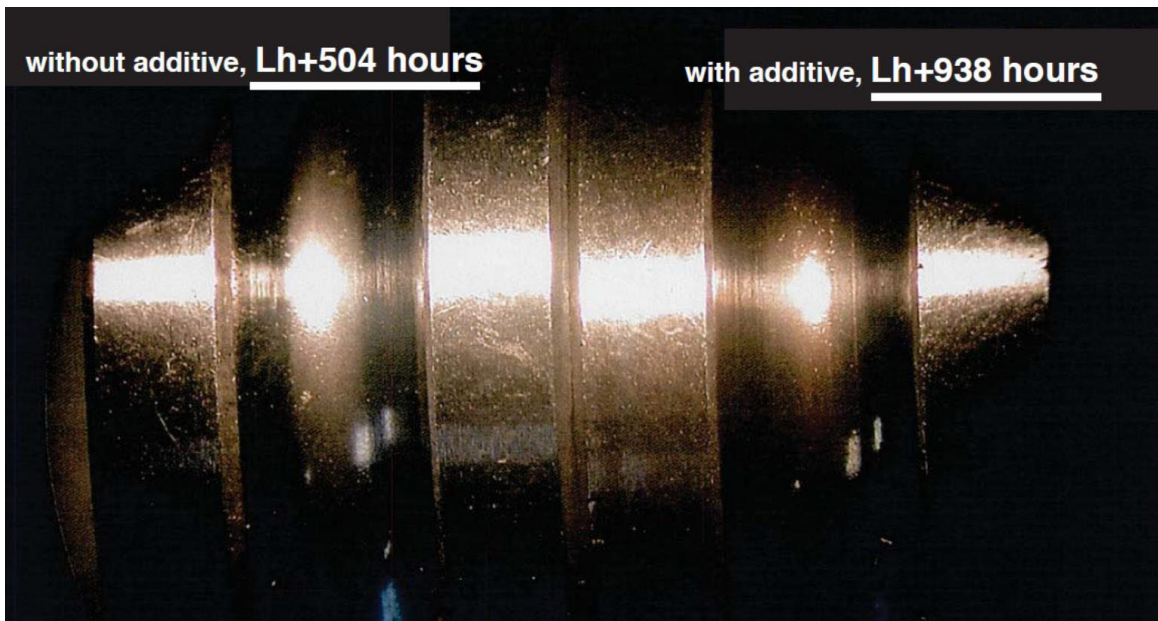
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The graph below demonstrates the development of the temperatures pursuant to lubrication technology with the addition of NanoLub®:



Comparison of wear and tear of the inner bearing rings of Closed ZVL Bearings type 6202-2Z:

Wear and tear of orbits is about the same even though the bearing lubricated with grease with the additive ran about a two fold number of hours:



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Conclusions:

From the comparison of the obtained results it is clear, that the NanoLub[®] GH-X additive has a positive impact on the bearing lubricity which led to:

1. Bearing friction reduction
2. Reduction in the operating temperature of bearings during the test
3. Significant improvement of the bearing service time (in about 100%),
4. Increasing of bearing dynamic load by about 30%.