

Influence of Nano Particles of hBN as Additive in Rapessed Oil for Evaluating the Tribological Behavior

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Vegetal oils consist of triglycerides influencing their performance, as poor thermal, hydrolytic and oxidation stability, but also low viscosity. Most vegetal oils cannot withstand reservoir temperatures greater than 80°C [1]. Boron nitride is a compound with heat and chemical resistance, good thermal conductivity, making it an excellent choice for lubricant applications that require rapid heat evacuation and it exists in several crystalline structures. The hexagonal structure similar to graphite is the most stable and soft and is recommended as solid lubricant or as additive in liquid lubricants [2].

This paper presents results of testing the coarse rapeseed oil additivated with different concentrations of BN (1% wt). The additive was supplied by PlasmaChem, the particles having the following characteristics, size full range: 100-1000 nm, average particle size: 500 ± 100 nm. The rapeseed oil was supplied by Expur SA Bucharest.

Tests are done on a four-ball machine from the laboratory LubriTest, at “Dunarea de Jos” University of Galati. The test parameters were selected for

- mild regime: load on the main shaft of the machine: 100 N ... 300 N and the sliding speed of 0.38 m/s, 0.53 m/s and 0.69 m/s, test duration 1 h.
- seizure tests were done for 1 minute, and the sliding speed 0.53 m/s.

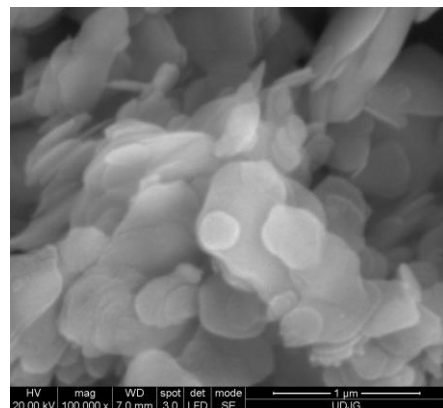


Fig. 1. Nano particles of hBN[3]

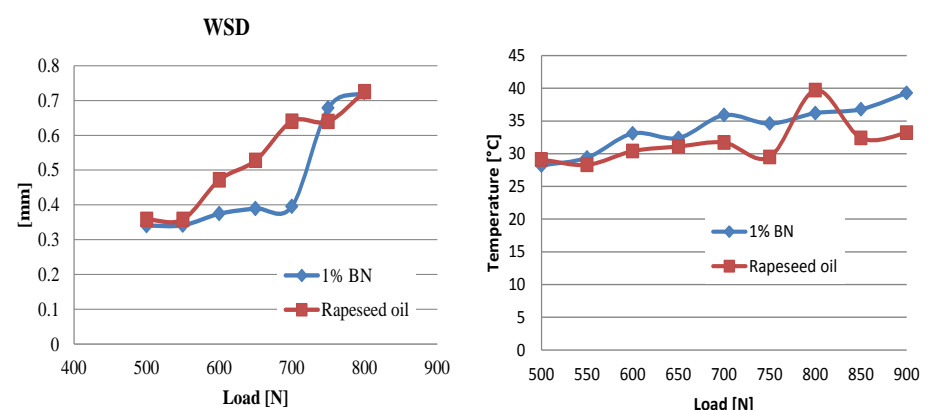


Fig. 3. Severe regime (till seizure)

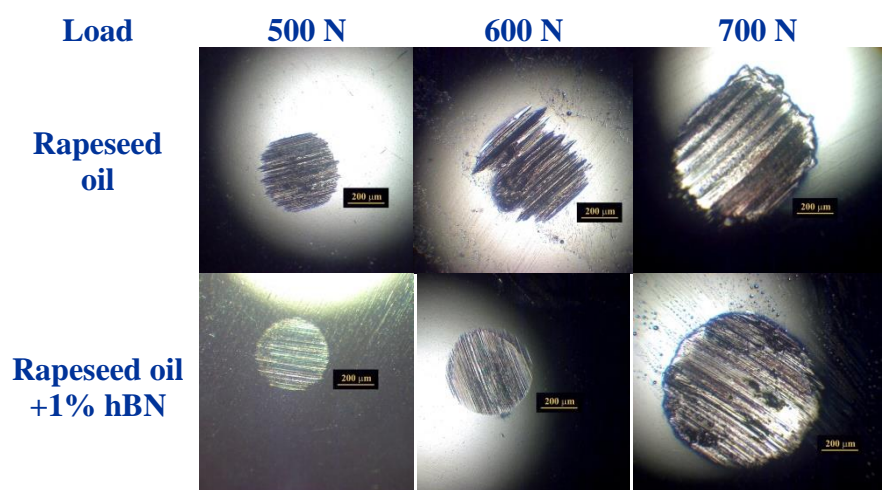


Fig. 4. Images of wear scar in the severe regime, v=0.69 m/s [4]

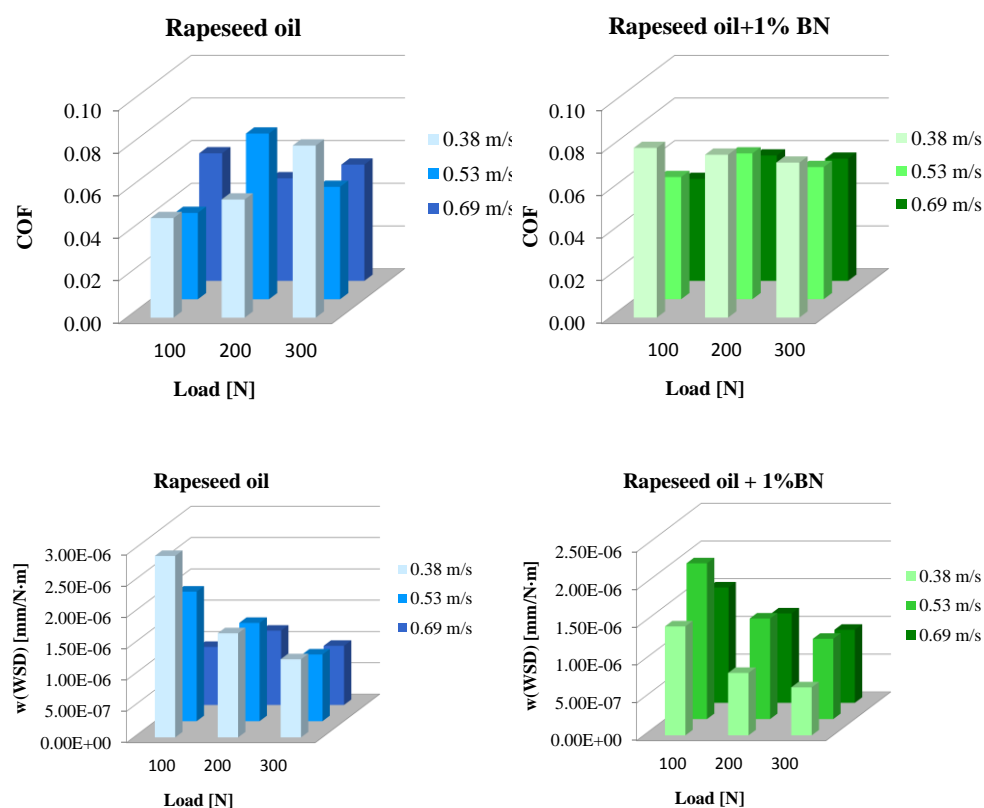


Fig. 2. The friction coefficient and wear rate of WSD

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