



2 Disc Assembly  
Rolling Wear Test

Mannheim University of Applied Sciences



# Results

September 2012

Up to 33%  
less friction  
with REWITEC



## Test Method

The Competence Center for Tribology of Mannheim University of Applied Sciences examined with a rolling wear tester the effect of REWITEC in gear oils under rolling-sliding motion. The experiment was carried out on a modern 2-Disc Test Assembly (Fig. 1) which makes it possible to simulate tooth flank operating conditions. The evaluation showed the extent of change in friction behavior and in temperature after adding REWITEC.

Tests were carried out with 2 gear oils. A conventional mineral oil (Agip Blasias 150) and a high-performance PAO based oil (Agip Blasias SX320). Each performed **with** and **without** the addition of REWITEC. The results were compared. Two tests were performed. Short-Term tests for 20h 20min and Long-Term tests for 61 hours with higher stress.

A complete survey of the test results can be found on [www.rewitec.com](http://www.rewitec.com).

## Long Term Test

Agip Blasias SX320 **without** REWITEC (Fig. 4, left): The surface shows a rough structure with numerous scratches.

Agip Blasias SX320 **with** REWITEC (Fig. 4, right): After 61 hours the surface is much smoother compared to the sample with the untreated oil.



Fig. 1: 2-Disc Test Assembly of Company Optimol-Instruments

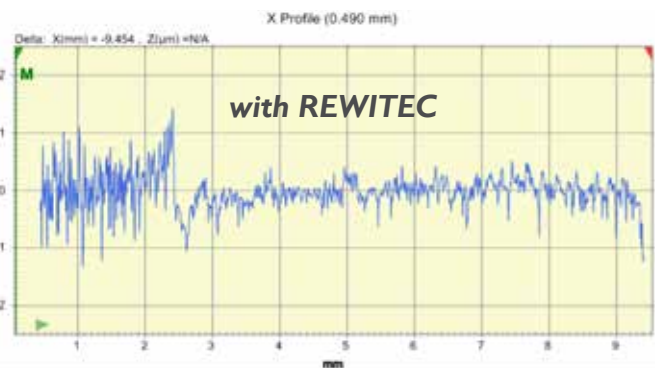


Fig. 2 and 3: Results of the surface topography in the short-term test with a white light interferometer with Agip Blasias 150

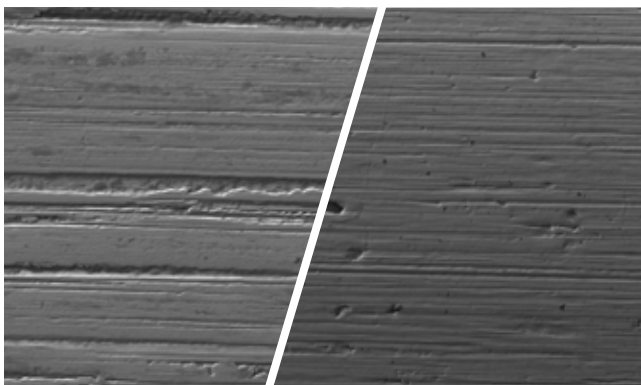


Fig. 4: Scanning Electron Microscope Picture Long Term Test. Left **without**, right **with** REWITEC

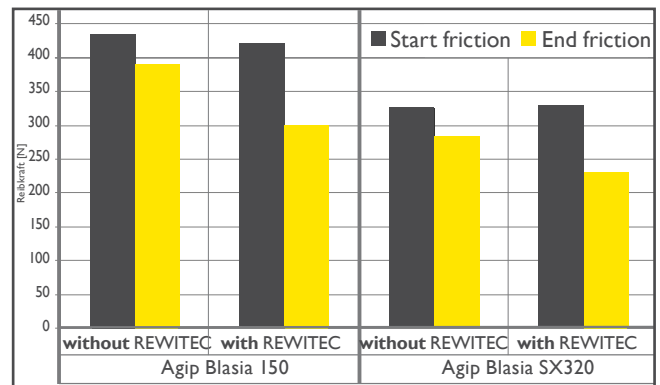


Fig. 5: Friction at beginning (grey) and end (yellow) of Short Term Test



## Long Term Test

### Agip Blasia SX320 **without** REWITEC:

The friction force goes from 260N down to 210N in the first 20 hours. After that, it continues steadily lower to get to 180N at the end of the test. The temperature of the test specimen drops slightly initially and then stays at around 125°C during the whole test run.

### Agip Blasia SX320 **with** REWITEC:

The friction force goes down very fast with REWITEC and in the first 5 hours drops down to just 145N (Fig. 6). After 16 hours lies the friction force at 120N and so it is around 33% lower than the friction of the test without REWITEC. Consequently the temperature of the test specimens drops markedly. The temperature stabilizes at around 100°C and so it lays 20% lower than the one of the test without REWITEC (125°C).

Friction [N] blue and temperature [°C] red during long term test with Agip Blasia SX320 **without** REWITEC and with REWITEC

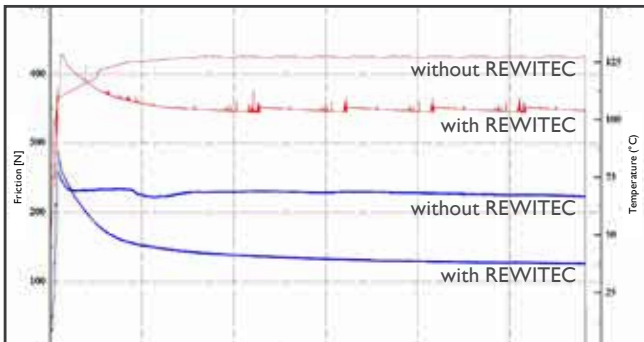


Fig. 6: after 20 hours

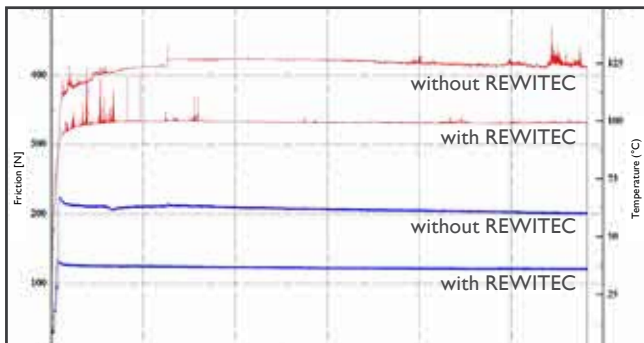


Fig. 7: after 40 hours

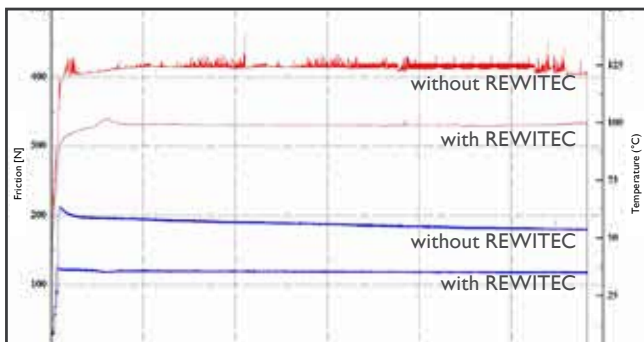


Fig. 8: after 60 hours

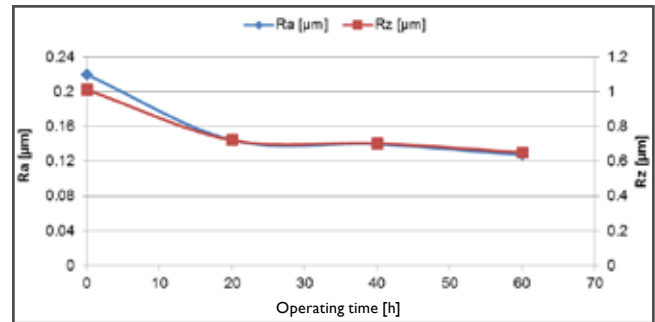


Fig. 9: Surface Roughness Data Long Term Test Agip Blasia SX320 **without** REWITEC

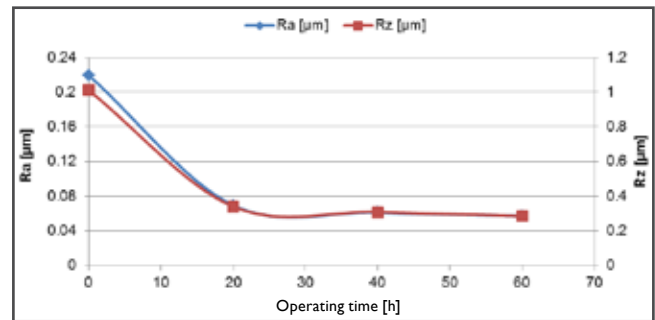


Fig. 10: Surface Roughness Data Long Term Test Agip Blasia SX320 **with** REWITEC. A clear reduction of roughness is visible (approx. - 50%)

## Summary

The Competence Centre of Tribology at Mannheim University of Applied Sciences performed a Rolling Wear Test on a 2-Disc Test Assembly with REWITEC.

1. During the Short Term Test REWITEC compared to a standard mineral oil lowered the friction by 23% and the temperature by 8%.

2. During the Short Term Test REWITEC compared to a high-performance PAO oil lowered the friction by 18% and the temperature by 4%.

3. During the Long Term Test and a higher pressure REWITEC compared to a high-performance PAO oil lowered the friction by 33%, the temperature by 20% and the surface roughness by approximately 50%.



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