

Micro pitting test 500h - 1.5 million load cycles**Contents:**

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1. Test definition

In order to verify the potential of extension of the operating range of the WinDrive with the best possible efficiency, the WinDrive is systematically run at operating points with the most probable occurrence of micropitting. These are operating points having the highest surface pressure on the gear tooth flank at minimal lubrication.

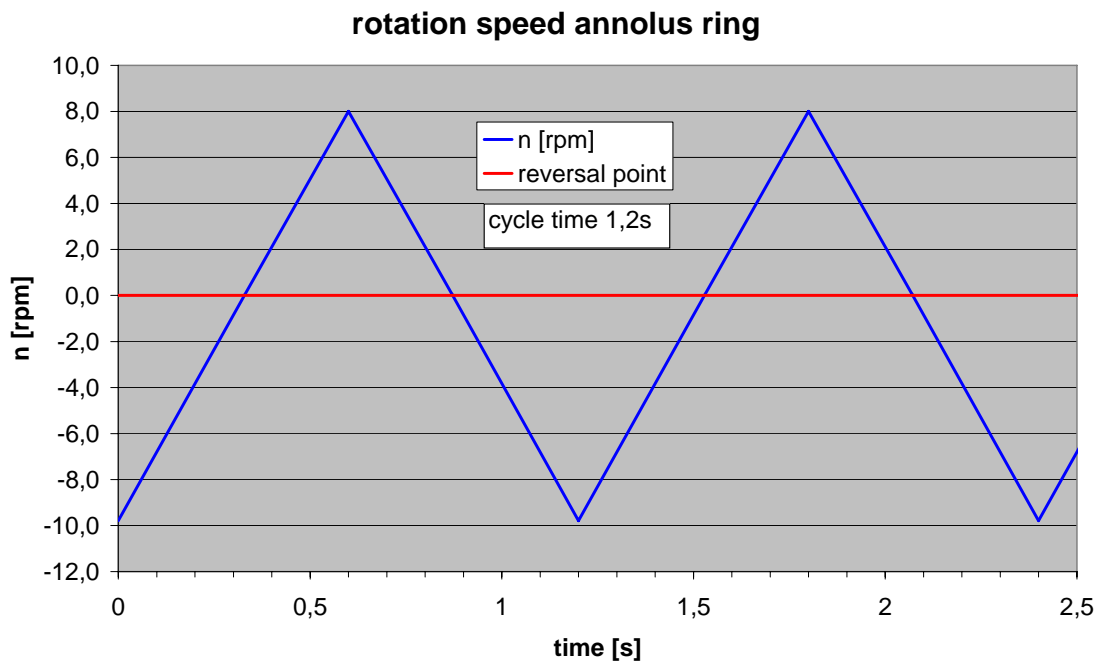
2. Test execution**2.1. Zero passage**

The WinDrive's susceptibility to micropitting is tested on a 50 Hz machine during a test period of 500 h at 140% nominal load with an input speed of 482 - 494 rpm.

In particular, the test is aimed at the possible formation of micropitting in the WinDrive gear unit. The zero passage of the superimposing branch of the gear is in the range of this operating point, causing the high surface pressure at minimal lubrication mentioned above.

At constant guide vane position, the input speed varies between 482 and 494 rpm. The superimposing branch turns 13° clockwise and 19° counterclockwise. Due to the difference of 6° the superimposing branch rotates once within 70 s.

Input speed nE:	482 - 494 rpm
Input power PE:	2800 kW
Input torque ME:	54 - 56 kNm
Number of cycles:	1.500.000
Cycle time:	1.2 s
Test period:	500 h
Control cycle:	after 50, 100, 200, 300, 400 h ± 10 h



2.2. Operating conditions:

2.2.1. Lube oil

Gear component:

Oil type:	Mobil Mobilgear SHC XMP 320
Viscosity class:	ISO VG 320
Cleanliness:	-/14/11 as per ISO 4406
Gear inlet temperature:	60 °C

Converter working oil

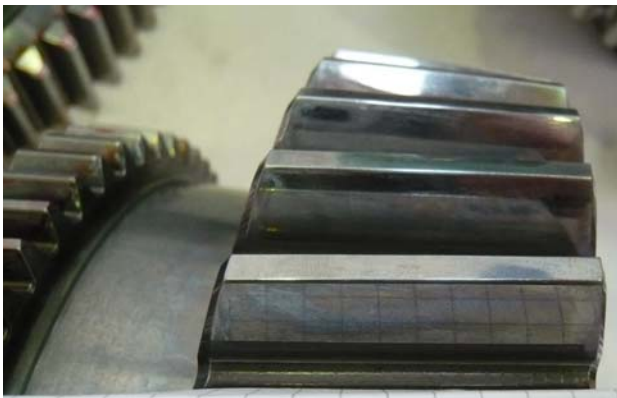
Oil type:	Total Azolla VTE 22
Viscosity class:	ISO VG 22
Cleanliness:	-/14/11 as per ISO 4406
Converter inlet temperature:	80 °C

3. Result

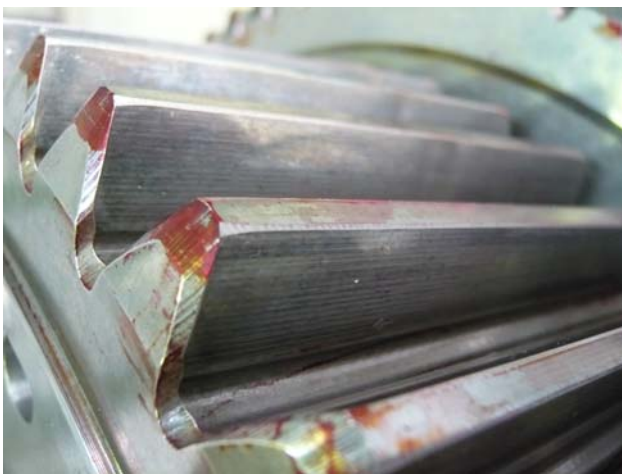
No micropitting on suns, annulus gears or planets of the gear unit.
The surfaces resisted the high surface pressure and low lubrication.
The appearance of the bearings is equal to those in newly installed condition.

4. Summary:

It was possible to prove the potential of extending of the WinDrive's operating range at best possible efficiency.
The fact that no micropitting developed at these "most difficult operating points" shows that it is permissible to consider these operating points for future developments.



Sun of fixed planetary gear stage



planet of planetary gear stage



Bearing fix planetary gear stage