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Test Intention: Wear assessment of iglidur® W300, iglidur® G and iglidur® P running on customer shaft

Test description and results: The customer sent shafts made of unknown hard chromed steel to the igus® laboratory to test the wear of iglidur® W300, iglidur® G and iglidur® P on these shafts.

Client:

Name: René Achnitz	Team: iglidur® bearings	Date: 21/03/2014
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Order-Info:

Customer / No.: intern

Series / No: intern	Installation type:
Customer test: No <input type="checkbox"/> Yes <input checked="" type="checkbox"/>	Development test: No <input checked="" type="checkbox"/> Yes <input type="checkbox"/>
Technical data	
iglidur® materials	iglidur® W300, iglidur® G, iglidur® P
Load	15 MPa
Movement	Oscillation; Oscillation angle 60°
Shaft material	Cf53 (1050) hard chrome plated
Speed:	0,01 m/s
Lubrication	No

Experimental setup

Picture 1: customer shafts



The first step was finding a material with equal hardness and surface roughness Ra. A shaft material with an equal hardness and surface roughness is Cf53 (1050) hard chrome plated. The results of these measurements are shown in table 1.

Table 1: measurement results of shaft hardness and surface roughness

Shaft	Rockwell hardness [HRC]	Surface roughness Ra [μm]
Customer shaft	63	0,12 to 0,13
Cf53 (1050) hard chrome plated	63	0,11 to 0,12

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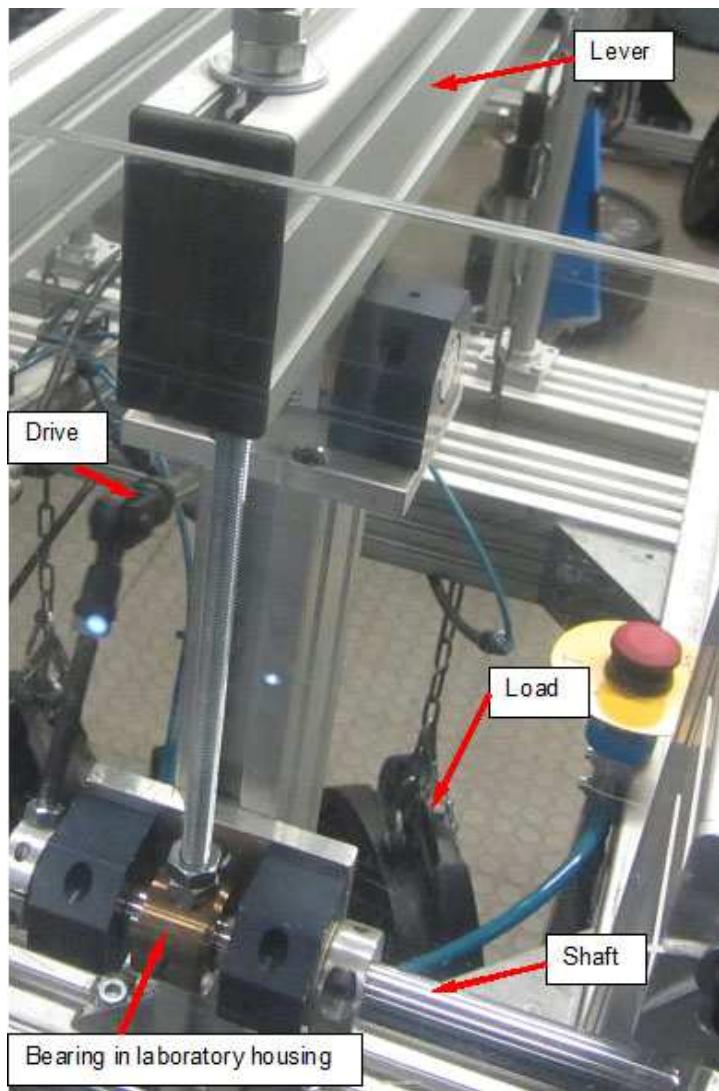
The managing data show the results of the accomplished examinations. With all data it still acts neither around one or more warranties of certain characteristics around one or more warranties regarding the suitability of a product for a certain targeted application, since the examinations on laboratory conditions took place. The warranty of certain characteristics of the products and/or their suitability for a certain application requires writing in the confirmation of order. Finally we recommend user-specific measurements under genuine operating conditions.

The bearings were tested on an igus® laboratory test machine with the following test parameters.

Table 2: test parameters

Parameter	Value
iglidur® materials	iglidur® W300, iglidur® G and iglidur® P
Shaft material	Cf53 (1050) hard chrome plated
Movement	Oscillation
Oscillation angle	60°
Load	15 MPa
Speed	0,01 m/s
Lubrication	No

Picture 2: Test machine



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Result

The wear was located by measuring the inner diameter of the bearing while pressed in a laboratory housing before and after testing with a micrometer screw in main load direction. The measurement results are shown in table 3.

Table 3: measurement results of the inner diameter of the bearings

test no.	iglidur® material	shaft material	load p [MPa]	speed v [m/s]	oscillation angle [°]	cycles	inner diameter before testing [mm]	inner diameter after testing [mm]	wear [µm]	running age [km]	wear rate [µm/km]
1	W300	Cf53 (1050) hard chrome plated	15	0,01	60	323181	20,07	20,15	80	3,38	23,64
2	W300	Cf53 (1050) hard chrome plated	15	0,01	60	338439	20,10	20,18	80	3,54	22,57
3	G	Cf53 (1050) hard chrome plated	15	0,01	60	268303	20,18	20,27	90	2,81	32,03
4	G	Cf53 (1050) hard chrome plated	15	0,01	60	269466	20,20	20,27	70	2,82	24,81
5	P	Cf53 (1050) hard chrome plated	15	0,01	60	302697	20,21	20,53	320	3,17	100,95
6	P	Cf53 (1050) hard chrome plated	15	0,01	60	182305	20,14	20,34	200	1,91	104,76

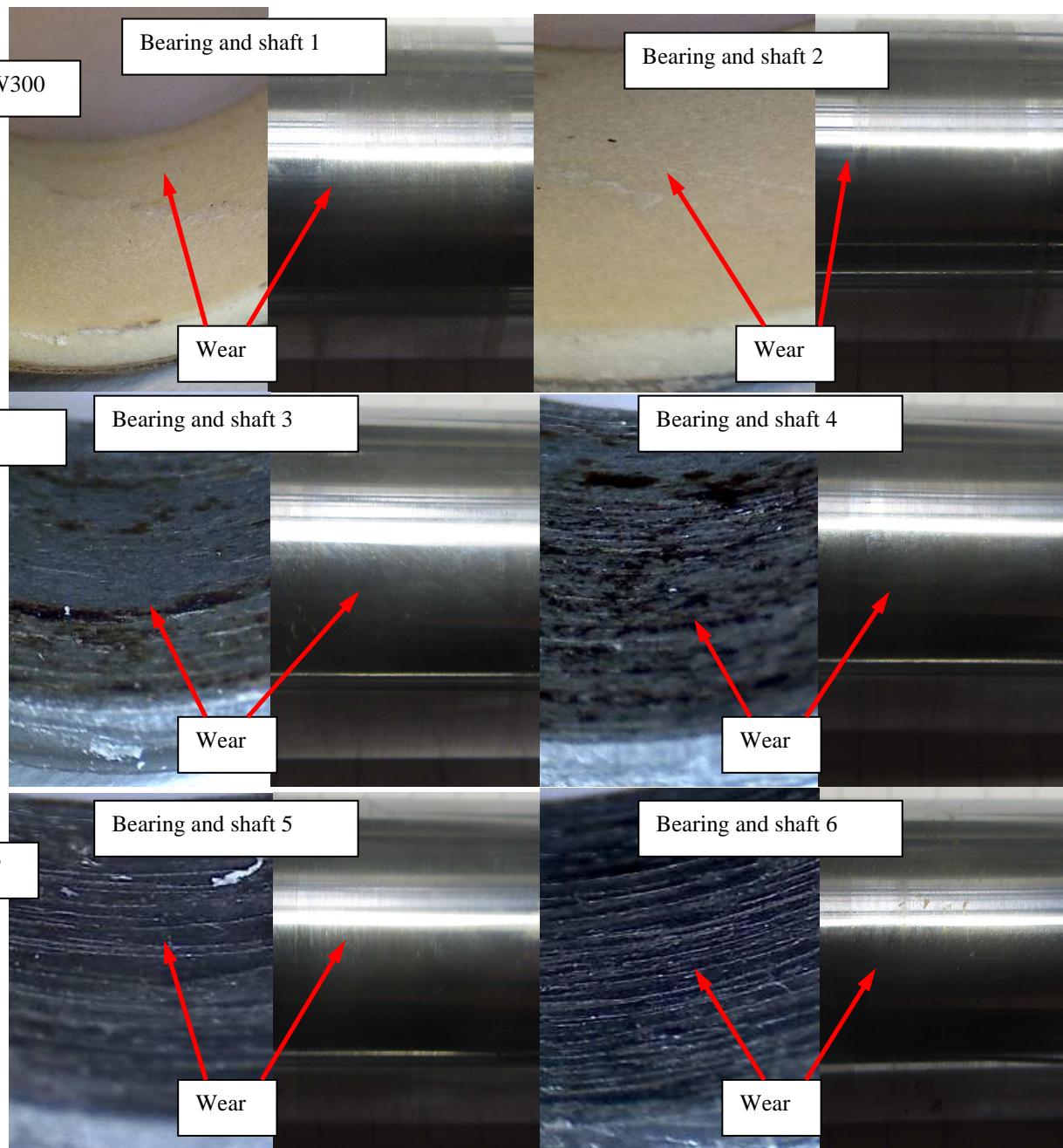
In this test, the iglidur® W300 bearings had a wear rate of 22,57 µm/km to 23,64 µm/km, the iglidur® G bearings had a wear rate of 24,81 µm/km to 32,03 µm/km and the iglidur® P bearings had a wear rate of 100,95 µm/km to 104,76 µm/km.

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The shafts and bearings were also examined after testing (see picture 3).

Picture 3: gliding areas on the shafts and bearings after testing



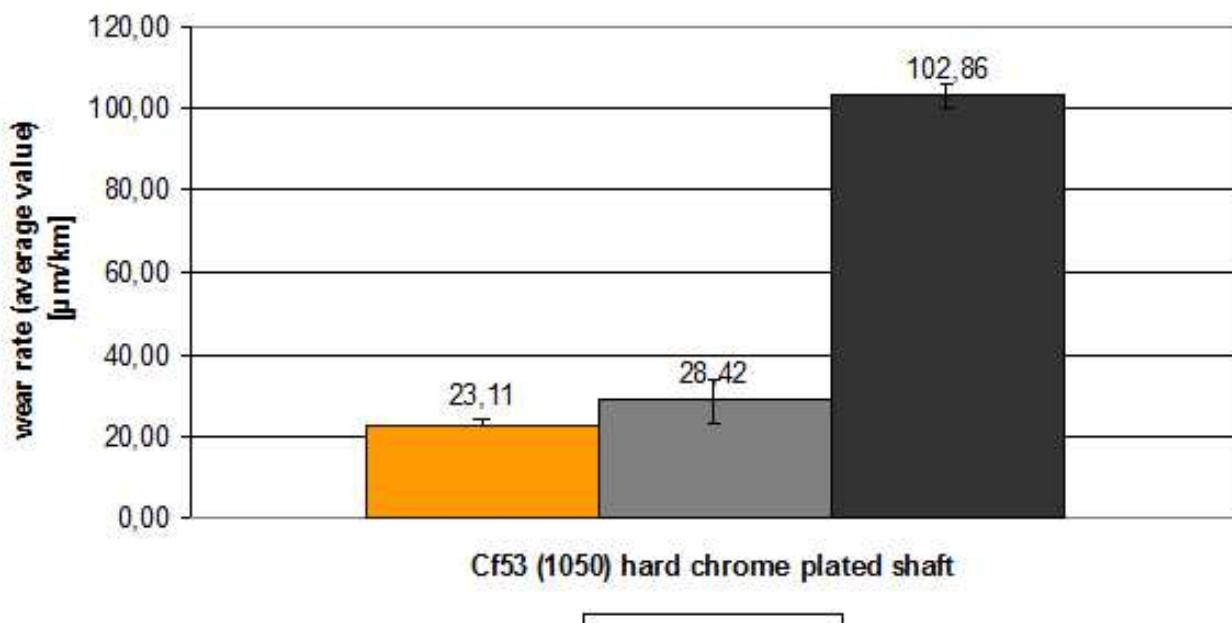
On all used shafts is wear visible, but not measurable. The bearings made of iglidur® W300 and iglidur® G have just small wear traces. On the inner diameter oft the iglidur® P bearings are deep scratches.

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Conclusion / optimization

In this test the iglidur® W300 bearing has the best wear rate.

Wear rate of iglidur® W300, iglidur® G and iglidur® P on Cf53 (1050) hard chrome plated, load 15 MPa, speed 0,01 m/s, oscillation angle 60°



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Name:	René Achnitz	Date:	21/03/2014
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