

Friction torque of wind-turbine pitch bearings – comparison of experimental results with available models

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10 *Non-disclosure of absolute torque values*

In addition to the former discussion of single items, we would like to detail the reasons for not disclosing absolute values:

15 Blade bearings are customized, very large roller bearings designed for a specific wind turbine type. No manufacturer of bearings offers a catalogue of blade bearings, as the requirements for the interfaces depend on the wind turbine design.

Further on, the adjacent parts (blade, hub, pitch drive) are specific to a wind turbine type as well. Tests of real blade bearings are exclusively tests of bearings designed for a serial application. Intellectual property rights on bearings and interface parts belong to the bearing manufacturer and/or the turbine OEM. Turbine OEMs in general are very sensitive towards data disclosing. The environment for turbine manufacturers is highly competitive, and massive price reductions due to the auction 20 mechanisms further promote this situation. The tests which data we used to do the scientific analysis were done on a test rig equipped with hub, blade and blade bearing by the company Senvion. Senvion did not agree in disclosing the absolute values, as these allow using a more detailed friction model and in turn designing pitch drives better tailored to the actual requirements. As such, this information is relevant for the competition and cannot be part of this part.

25 Yet, as we mentioned during the discussion, we deem the results of the work worthwhile nonetheless, as this is the first ever publication regarding full-scale blade bearing friction torque. The comparison with the models gives a very good indication on which model is suitable for practical implication.