



Note on Engineering Details

No: DWR-MHS-extern-001, Rev. 0

Title: Certification Update from GL Wind Guideline Edition 1999 to Edition 2003/2004

Ref.: GL Wind "Guideline for the Certification of Wind Turbines", Edition 2003 with Supplement 2004. Section 5.5. and Section 6.2.

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This note is intended to specify the requirements for updating rotor blade certificates from GL Wind Guideline Edition 1999 to Edition 2003/2004.

- 1. Full-scale static blade test:** Compared to edition 1999, a full-scale static test in flap- and edgewise direction (both in positive and negative directions) is required. The test loading for GL Wind Guideline edition 2003 shall be 10% higher than the design load. (GL Wind Guideline Edition 2003, Section 6.2.5.1(3), $\gamma_{1T}=1.1$)
- 2. Inter-fibre failure:** According to GL Wind Guideline 2003/2004 a computational verification against inter-fibre failure for all materials used in the rotor blade, is required. Furthermore, the analysis has to consider any existent fibre direction and all given ultimate loads. Consider also document "Note on Engineering Details", DWR-Kaml-extern-001, Rev 1, dated 01-25-2006. http://www.gl-group.com/pdf/DWR-Kaml-extern-001_Rev1.pdf. Alternatively, there is the possibility to avoid computational verifications against inter-fibre failure: the blade manufacturer has to demonstrate in a plausible way, that during a period of 5 years no damages related to inter-fibre failure occurred at the operating wind turbines.
- 3. Verification of bonded joints:** To fulfil the requirements of GL Wind Guideline 2003/2004, a static and fatigue analysis of bonded joints according to Section 5.5.6(7) is required.

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