



CFD analysis of vortex generator flow.

↑
for demonstration
purposes only: not a
VORTEX GENERATOR^{PRO}

CortEnergy BV

CortEnergy BV is a highly knowledge based company that focuses on energy related innovation, research and patents. CortEnergy is specialised in the aerodynamics of wind turbines and wind farms.

© Copyright 2012 by CortEnergy BV.

CortEnergy BV
Dr. ir. G.P. Corten
P.O. Box 3105
1801 GC Alkmaar
The Netherlands
M: +31 (0)6-24403858
Vortex@CortEnergy.com

VORTEX GENERATORS^{PRO}

- ✓ 20 year design life
- ✓ Inherently UV-stable
- ✓ Field and wind tunnel tested
- ✓ High aero-performance
- ✓ Sizes for chords from 0.3-5m.

Typical
increase
of yield: **3%** !

References

- [1] Patent application PCT/NL2007/050137, 'Wind Turbine with Slender Blade'.
- [2] VBT, Vortex Blade Technology, Corten, G.P. (Ph.D wind turbine aerodynamics), WindPower 2007, Los Angeles, Oral Presentation.
- [3] Active Load Control Techniques for Wind Turbines, Dale Berg, Scott J. Johnson, C.P. "Case" van Dam SANDIA REPORT, SAND2008-4809, July 2008.

Disclaimer:

This brochure does not claim to provide all the ins and outs or all the conditions of validity for the different aspects under the different conditions. The information is offered in good faith but without any guarantee, as the conditions, and methods of application or production are beyond the control of CortEnergy.



Summary

The VORTEX GENERATOR^{PRO} is an easily applicable, non-intrusive vortex generator designed for 20 years maintenance free operation on a wind turbine. The vgs are applicable to all wind turbine rotors. The VORTEX GENERATOR^{PRO} increases yield by typically 3% for variable speed turbines and up to 10% and in some case even 20% for constant speed turbines. The VORTEX GENERATOR^{PRO} is available in 6 sizes suitable for blade chord length between 0.3 and 5 metres.

Slender Blades

Slender Blades have become a breakthrough in rotor design. CortEnergy further developed the concept with Suzlon Blade Technology. The resulting rotor has 6-10% higher yield compared to conventional rotors (see refs 1,2,3). Slender Blade rotor preferably utilize vortex generators The VORTEX GENERATOR^{PRO} was developed to ensure the available of a vortex generator of extreme high quality.



Vortex Generator test by Suzlon and CortEnergy.

VORTEX GENERATORS^{PRO} by CortEnergy

- Design life: 20 yrs
- UV durability (accel. test): 20 yrs
- Tested minimum temp: -40°C (-40° F)
- Tested maximum temp: +90°C (+194° F)
- Abrasion resistance: ++
- Bonding to epoxy: ++
- Bonding to polyester: ++
- Bonding to polyurethane: ++
- Yellowing: almost invisible
- Colours: blue / white
- Blade-intrusiveness: none
- Maintenance required: none
- Patents pending: yes
- Application time: 5-20 seconds/vg
- CFD optimised: yes
- Wind tunnel tested: yes
- Chord range covered: 0.3m – 5m



Wind turbine blade equipped with VG's (not the VORTEX GENERATOR^{PRO} type of this brochure)

Vortex Generator Insights

Insight in vortex generators changed drastically during the last few years.

	Insight now	Insight past
Yield	Well designed rotor blades with vg's outperform those without.	Underperforming rotor blades are 'fixed' by installing vg's later on.
Roughness	Yield drops a factor of 2 less for rotor blades with vg's compared to ones without.	It was unknown that vg's reduce roughness sensitivity drastically.
Underperformance / Premature stalling	Blades with vg's can be adapted to optimal performance. The power curve will be good from the start.	Rotor blades without vg's often need a trouble-shooting period of 1-2 years to obtain an acceptable PV-curve. Often vg's are needed.
Vortex Generator Reliability	Robust and easily applicable vortex generators with a 20 year design life are available.	Vortex generator - failures harmed the reputation of blades with vortex generators.