



Windflow Technology Limited

Windflow 500 Wind Turbine

ISO and IEC Certificates

© Windflow Technology Limited
P O Box 42-125
Christchurch, New Zealand
Phone +643 365 8960
www.windflow.co.nz

Document Control

Version History

Revision N°	Date	Comments
Rev 0	25 January 2011	
Rev 1	29 August 2011	The ISO 9001:2008 Certificate has been renewed and updated in page 7.
Rev 2	26 March 2014	The ISO 9001:2008 Certificate has been renewed and updated in page 6.
Rev 3	10 April 2017	The ISO 9001:2008 Certificate has been renewed and updated in page 6.

This Issue

Prepared	Checked	Approved for Use:
Richard Trudgian	Geoff Henderson	

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1. Introduction

Windflow Technology is a New Zealand based wind turbine designer and manufacturer, with its primary product being the Windflow 500 (a 500 kW turbine).

The Windflow 500 is certified to IEC Class 1A (Edition 3), the most recent and rigorous wind turbine standard. It is one of the first turbines in the world to achieve this highest level of certification and one of two IEC certified turbines in the 100 – 500 kW size range available in the United Kingdom.

Windflow Technology is ISO 9001 certified and uses only quality assured component manufacturers. Components are made in NZ, Australia and Europe, and the nacelle is assembled and pre-commissioned by Windflow in Christchurch, New Zealand. Towers for the UK market are intended to be manufactured in the UK.

Lloyd's Register awarded its Type Approval Certificate to the Windflow 500 turbine in September 2010 in what was the final step in a process that spanned four years. The certificate confirms that the turbine meets Class 1A of the latest design standard IEC 61400-1:2005 (edition 3) which attests that the Windflow 500 will operate for more than 20 years in the strongest, most turbulent wind regime in the IEC classification. It gives interested parties and purchasers of the Windflow 500 turbine confidence that the turbine has been rigorously tested to operate in the highest strength winds.

International standards and their use in technical regulations on products, production methods and services play an important role in sustainable development and trade facilitation through the promotion of safety, quality and technical compatibility. With the increasing globalisation of markets, International Standards as opposed to regional or national standards have become critical to the trading process ensuring a level playing field for exports.

This document contains international certificates achieved by Windflow Technology and its wind turbine, the WF500.



2. Certificates Descriptions

2.1 ISO 9001:2000

Windflow achieved ISO 9001:2000 on the 17th June 2008, subsequently recertified to ISO 9001:2008, and has renewed it in February 2014. The ISO 9001 certification is regarded by many as a baseline activity for companies moving into international trade and export arrangements. The International Organisation for Standardisation better known as ISO falls into the same bracket of international standards bodies as International Electrotechnical Commission (IEC) and the International Telecommunication Union (ITU).

2.2 IEC Certification

Lloyd's Register awarded its Type Approval Certificate to the Windflow 500 turbine in September 2010 in what was the final step in a process that spanned four years. The certificate confirms that the turbine meets Class 1A of the latest design standard IEC 61400-1:2005 (edition 3). Class 1A certification attests that the Windflow 500 will operate for more than 20 years in the strongest, most turbulent wind regime in the IEC classification. It gives interested parties and purchasers of the Windflow 500 turbine confidence that the turbine has been rigorously tested to operate in the highest strength winds.

The IEC process involved the following stages:

1. Gaining ISO 9001:2000 Certification (subsequently recertified to ISO 9001:2008) from Lloyd's Register Quality Assurance.
2. Gaining Type Approval from Lloyd's Register. This includes:
 - a. A Manufacturing Conformity Statement and
 - b. Three Design Appraisal Documents (Structural Design, Process Plant and Machinery Design and Electrical and Instrumentation Design). These DADs approve 2,800 pages of engineering calculations, 37 specifications and more than 200 drawings as well as measurements of acoustics and power output, function and safety tests of the machine and static and fatigue tests of the blade.

The current ISO 9001 Certificate, Type Approval Certificate and the Type Approval Design Appraisal Document are reproduced on the next pages. Originals are available for viewing at the Christchurch, New Zealand office of Windflow Technology, and other Design Appraisal Documents are also available on request.

3. Lloyd's Register Quality Assurance ISO 9001:2008 Certificate



CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

**Windflow Technology Limited
42 - 44 Mandeville Street
Riccarton, Christchurch
New Zealand**

has been approved by Lloyd's Register Quality Assurance Limited
to the following Quality Management System Standard:

AS/NZS ISO 9001:2008

The Quality Management System is applicable to:

**The design, development, production, installation and
servicing of wind turbines.**

Approval
Certificate No: MEL4000394

Original Approval: 17 June 2008
Current Certificate: 22 February 2017
Certificate Expiry: 30 September 2018

Issued by: Lloyd's Register Quality Assurance Limited

JAS-ANZ



Level 16, 461 Bourke Street, Melbourne, Vic, 3000

This approval is carried out in accordance with the LRQA assessment and certification procedures and monitored by LRQA.
To confirm the validity of the accreditation for this certificate please visit www.ias-anz.org/register

Macro Revision 13

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4. Lloyd's Register IEC Type Approval Certificate



Type Approval Certificate

This is to certify that the undernoted product(s) has/have been tested with satisfactory results in accordance with the relevant requirements of the Lloyd's Register Type Approval System.

This certificate is issued to:

PRODUCER	WINDFLOW TECHNOLOGY LIMITED
PLACE OF PRODUCTION	44 Mandeville Street Christchurch, New Zealand
DESCRIPTION	2 Bladed Wind turbine
TYPE	WINDFLOW 500 WIND TURBINE
APPLICATION	Land based Wind turbine
STANDARDS	IEC 61400-1: 2005 IEC 61400-11: 2003 IEC 61400-12: 1998 IEC TS 61400-13: 2001 IEC 61400-21: 2001 IEC TS 61400-23: 2001
RATINGS	500 kW

"This Certificate is not valid for equipment, the design, ratings or operating parameters of which have been varied from the specimen tested. The manufacturer should notify Lloyd's Register EMEA of any modification or changes to the equipment in order to obtain a valid certificate."

The Design Appraisal Document No O-16845 and its supplementary Type Approval Terms and Conditions form part of this Certificate.

Certificate No.	RE 1005
Issue Date	17 September 2010 Issue 02
Expiry Date	16 September 2015
Sheet	1 of 1


Peter Davies
 Compliance & Engineering Services Dep't, Aberdeen
 Lloyd's Register EMEA

Lloyd's Register EMEA
 25 Union Terrace, Aberdeen, AB10 1NN

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5. Lloyd's Register Design Appraisal Document for Type Approval

Document no **O-16845**
Issue number **01**
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Lloyd's Register Oil and Gas
Design Appraisal Document

Lloyd's Register EMEA
Compliance & Engineering Services Department
Denburn House
25 Union Terrace
Aberdeen, ABN10 INN
44 1224 267400: Fax: 44 1224 267751

Date
13 September 2010

Quote this reference on all future communications
CESD/0690626/PD/O-16845

LLOYD'S REGISTER TYPE APPROVAL SYSTEM, 2002.
Issued to: WINDFLOW TECHNOLOGY LIMITED
for: WINDFLOW 500 WIND TURBINE
TYPE APPROVAL CERTIFICATE No. RE 1005

1. The undernoted documents have been reviewed for compliance with the requirements of the Lloyd's Register Type Approval System, 2002 and this Design Appraisal Document forms part of the Certificate. Subject to the following comments listed in paragraphs 2 ~ 4

Document No.	Date.	Title
LR TA form	18/03/10	Inspection & Surveillance of production facilities (Windflow Technology Ltd)
LR TA form	11/03/10	Inspection & Surveillance of production facilities (Wind Gears Ltd)
LR TA form	24/02/10	Inspection & Surveillance of production facilities (Acme Engineering)
LR TA form	02/03/10	Inspection & Surveillance of production facilities (Wind Blades Ltd)
O-16690	10 Sep. 10	Electrical and Instrumentation Design Approval Document
O-16691	10 Sep. 10	Process Plant and Machinery Design Approval Document
O-16692	10 Sep. 10	Structural Design Approval Document

2. The following are the basis for the approval of the turbine:

Wind turbine class	1A (as defined in IEC 61400-1: 2005)
Number of blades	2
Maximum power rating	500 kW
Hub height	30 m
Cut in wind speed	5 m/s
Rated wind speed	14 m/s
Cut out wind speed	30 m/s

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Form 64380G (2008.07)

Lloyd's Register Design Appraisal Document for Type Approval *Continued...*

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Issue number 01
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- 3. It is noted that high wind measured data (wind speeds above 26 m/s) have not been submitted.
- 4. We would recommend caution in using the turbine outside IEC 1A conditions until fuller data can be provided for verification (such as additional measurements).

In preparing this report, the undersigned surveyor is acting as an independent person in accordance with the applicable policy on conflict of interest.



PETER DAVIES
Lead Rotating Equipment Specialist,
Facilities & Safety Engineering Group
Compliance & Engineering Services Department

Appraisal Status Key

A	Approved
Ri	Retained as supporting documentation for information only

Supplementary Type Approval Terms and Conditions

Type Approval certifies that a representative sample of the product(s) referred to herein has/have been found to meet the applicable design criteria for the use specified herein. It does not mean or imply approval for any other use, nor approval of any product(s) designed or manufactured otherwise than in strict conformity with the said representative sample.

Type Approval is based on the understanding that the manufacturer's recommendations and instructions and any relevant requirements of the Rules and Regulations are complied with.

Type Approval does not eliminate the need for normal inspection and survey procedures required by the Rules and Regulations.

Lloyd's Register EMEA reserves the right to cancel or withdraw this Type Approval Certificate in accordance with the Lloyd's Register Type Approval System Procedure.

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