MinWaterCSP

Minimized water consumption in CSP plants

Scale model of CSP cooling system fan
WP 3, Deliverable 3.5

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Document History

Project Acronym	MinWaterCSP		
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Project Coordinator	Falk Mohasseb (Falk.Mohasseb@kelvion.com)		
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	X	Final	
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WP Lead	*Stellenbosch University*		
Contributing beneficiary(ies)	1 – Kelvion Holding	**7 – Notus**	
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	3 – Fraunhofer	9 – Enexio	
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Date	Version	Person/Partner	Comments
29/11/2017	REV00	Johan van der Spuy (SUN)	Proof of delivered scale fan

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1 Introduction

This report confirms the delivery and installation of 1.542 m diameter (shroud) scale model of the 24 ft diameter MinwaterCSP cooling fan (see Figure 1). The scale model was supplied by NOTUS Fan Engineering and has been installed in the BS848 Type A fan test facility at the Department of Mechanical and Mechatronic Engineering of Stellenbosch University.

The design of the CSP fan is detailed in the deliverable reports:

- D3.3-Month_ 21_MinWaterCSP_Aerodynamic noise and structural design report for CSP cooling fan_REV01.doc
- D_3.2-Month_ 12_MinWaterCSP_Concept Design of CSP Cooling Fan_REV02.doc

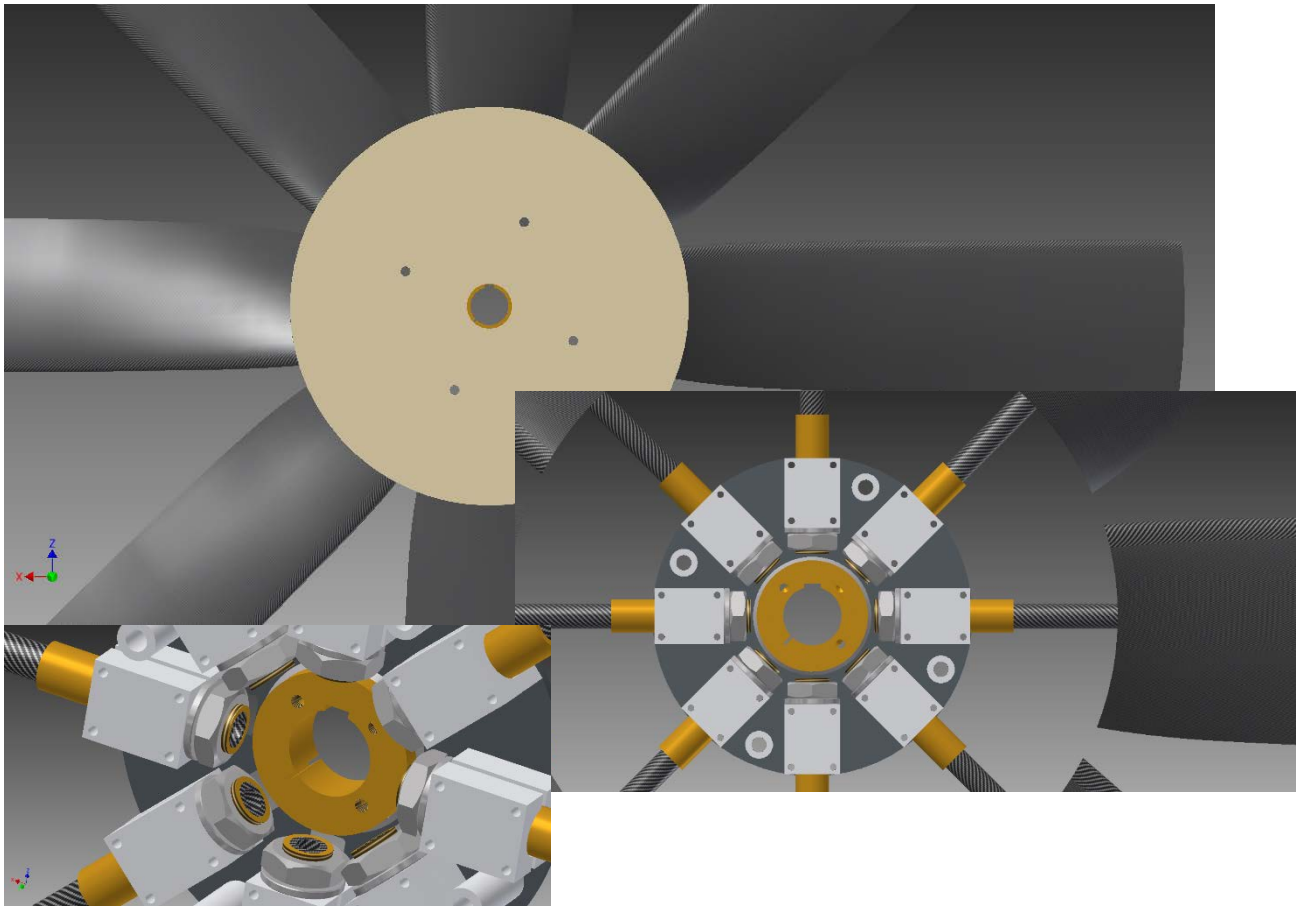

Figure 1 : 1.5 m diameter scale model of CSP fan.

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2 Fan scale model

2.1 Test facility

Testing of the scaled fan will be done in the BS848, type A fan test facility at Stellenbosch University. This facility is an open inlet to open outlet configuration that allows the fan performance characteristic curves to be produced. Figure 2 shows a schematic representation of the facility.

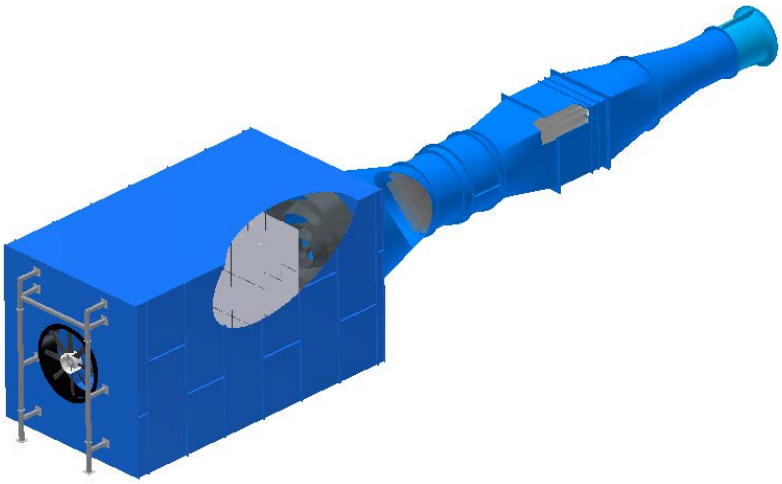

Figure 2: BS848, Type A fan test facility.

2.2 Installation

The test fan was installed in the test facility, as shown in Figure 3. The fan was initially equipped with a simple box hub to emulate the designed configuration. The configuration was amended to also make provision for the planned full-scale installed configuration of a flat plate hub.

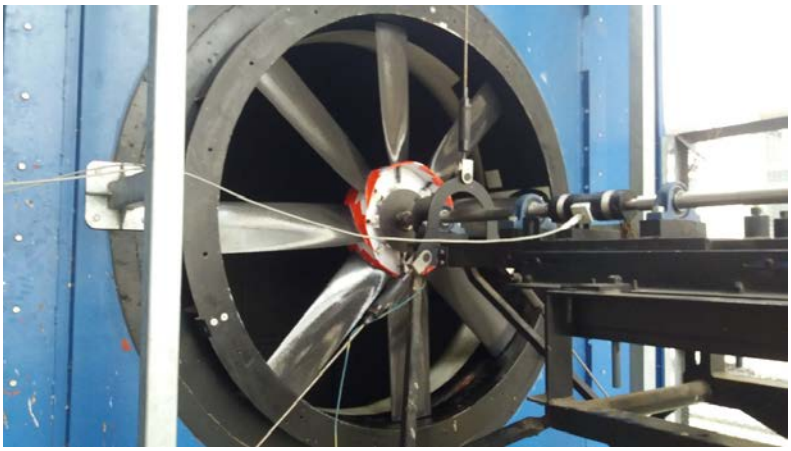

Figure 3: Installed scale fan.

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2.3 Initial test results

Initial test results show a disparity between design and measured data. Subsequent tests have however shown that fan tip clearance, hub configuration and blade setting angle all have a significant effect on the test results. The testing of the scale fan will be reported in Deliverable D 3.6, which is due in month 29.

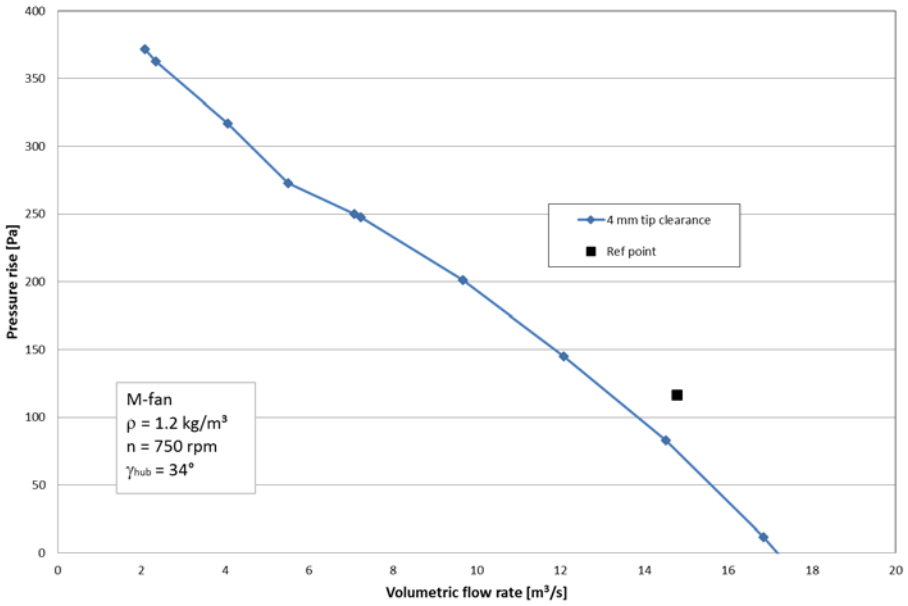

Figure 4: Fan static pressure measured for scale fan.

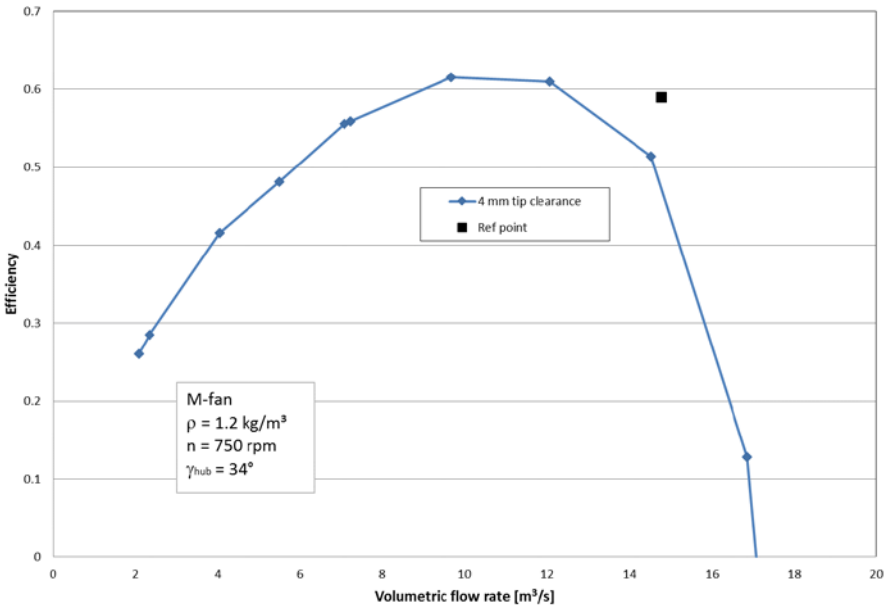

Figure 5: Fan static efficiency measured for scale fan.

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3 Concluding remarks

The scale model of the CSP fan has been delivered and installed, as planned. Initial tests have shown the model to be affected by blade setting angle, tip clearance and hub configuration.

Continued testing of the scale fan is currently in progress and the results of these will be reported in the fan test deliverable, which is due in month 29.

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