

ROUND ROBIN Exercise 3

(VERSION 1, 2015)

Collating wind data for the basic shapes of tensioned surface structures

This is Round Robin Exercise 3, launched by the TensiNet Working Group Specifications and WG5 of the COST Action TU1303 Novel Structural skins and aims at collating wind tunnel and CFD (Computational Fluid Dynamics) data for the basic shapes of tensioned surface structures. The wind loading on basic membrane shapes will be assessed and the outcomes will be related to the structural analysis of a membrane structure.

(available at: http://www.tensinet.com/files/General_information/NEW_CALL_ROUND_ROBIN_III-1.pdf)

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ANNEX B

1 Description test-setup

1.1 Wind Tunnel Test

Description Wind Tunnel Test	
Wind Tunnel Facility	
Wind tunnel type:	Figure
Fan type:	
Dimensions test section (L x W x H):	
Boundary layer profile:	
Velocity range:	
Maximum blockage ratio:	
Diameter turntable:	
Operating software:	
Measuring Equipment	
Equipment category:	Figure
Model type:	
Number of measuring channels:	
Number of reference pressure channels:	
Diameter measuring channels:	
Frequency range:	
Accuracy:	
Test Conditions	
Date of measurement:	Figure
Wind velocity:	
Flow type:	
Velocity gradient & Turbulence intensity:	
Wind directions:	
Sampling frequency:	
Sampling time:	
Temperature:	
Relative humidity:	
Air density:	

1.2 Computational Fluid Dynamics

Description Computational Fluid Dynamics	
CFD Package	
Software Package:	Figure
Meshing algorithm:	
Dimensions test section (L x W x H):	
Boundary layer profile:	
Velocity range:	
Maximum blockage ratio:	
Wind tunnel reference (accuracy):	
Operating sytem:	
Measuring Equipment	
Postprocessing software:	Figure
Postprocessing algorithm:	
Measuring category:	
Average mesh dimensions:	
type of output:	
Output parameters:	
Accuracy:	
Test Conditions	
Date of measurement:	Figure
Wind velocity:	
Flow type:	
Velocity gradient & Turbulence intensity:	
Wind directions:	
Sampling frequency:	
Sampling time:	
Temperature:	
Relative humidity:	
Air density:	

2 Description model

Hypar			
Type: Canopy / Building Roof	Scale:	Shape Parameter: :	
		B = mm	s = %
		L = mm	t = mm
		H = mm	
		h = mm	*s = sag boundaries / t = thickness
Drawings (plan and elevations)			
* measuring points / meshing			
Pictures (model and test-setup)			
* material and finishing			

3 Result data form

Pneumatic Couison Canopy												
(Figure of type)	Type of test:						Figure test setup					
	Wind speed:											
	Angle of Attack (AOA):											
	Sampling frequency & time:											
	Boundary layer profile:											
Shape parameter :												
Simplified Net Pressure Coefficient Distribution (zones)												
(figure of distribution pressure zones)							F		G		H	
							Cp,net	RMS	Cp,net	RMS	Cp,net	RMS
							I		J			
							Cp,net	RMS	Cp,net	RMS		
Extensive Net Pressure Coefficients (pressure taps)												
(figure of tap layout)	Tap	Cp,net	RMS	Tap	Cp,net	RSM	Tap	Cp,net	RMS	Tap	Cp,net	RMS
	11			31			51			71		
	12			32			52			72		
	13			33			53			73		
	14			34			54			74		
	15			35			55			75		
	16			36			56			76		
	17			37			57			77		
	18			38			58			78		
	21			41			61			81		
	22			42			62			82		
	23			43			63			83		
	24			44			64			84		
25			45			65			85			
26			46			66			86			
27			47			67			87			
28			48			68			88			