

## SAND STORM TESTING – EXPERIMENT 2



**PLACE:** UCEEB Bustehrad

**DATE:** 27/03/2019 – 10:00

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**Testing material and methodology;**

It was understood from the previous experiment by Dr. Adamovsky and Kny; the protective surface had shown higher resistance against sand particle and wind velocity. Therefore; improved design of window screen with different protective mesh was investigated under the same conditions which are listed below.

Wind velocity	20 m/s
Sand Particles	3 different (coarse to very fine sand)
	
Used window screen	Reinforced by Ulester 32S from Silk and progress
	

**Images of Testing Setup**



**Result and discussion;**

Improved window screen with Ulester 32S protective mesh has been performed excellent resistance against extreme wind conditions such as 20 m/s. There was no delamination damage during rough and

medium size of the sand particle. Improved window screen performed excellent filtration performance that none of the sand particle (1.5 liters) was able to penetrate through it. (Please see below photos)



Photos of the sand cabin after medium and coarse sand particle loading

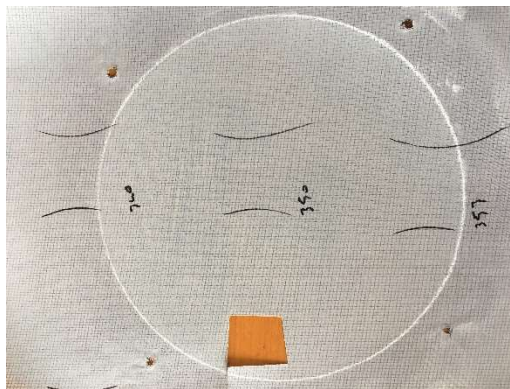
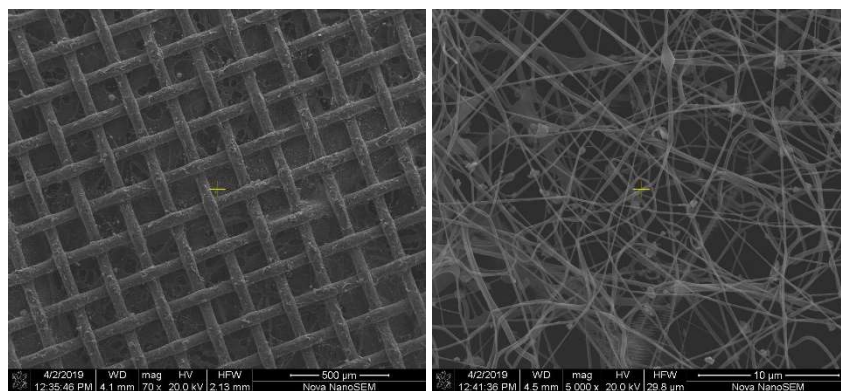


Photo of Undamaged window screen



SEM images of undamaged window screen

Air permeability before the test	346	383	353	373	346	316	340	350	400	390	360	<b>Av</b> <b>359</b>
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Air permeability after test	400	430	460	371	340	337	411	<b>Av 392</b>				
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SEM images and Air permeability test shows window screen has performed good resistance to strong effects of sand particle and air velocity 20 m/s Window screen did not get a damage and kept its original shape.

However, when it comes to powder like sands which has particle size 1 – 5 micron, the window screen was blocked in a second and high wind with pressure caused delamination between the layer of window screen. Hence, powder sand particle was able to penetrate through a window screen.



Photos of the sand cabin after fine sand particle loading



Window screen fully loaded and blocked by fine sand particle

### Conclusion

Using protective side as an outer side and changing protective material with robust mesh were provided excellent resistance to against sand/storm loading on the window screen. The disadvantages of the improved window screen product against sand storm condition is higher production cost on the final window screen product.