

*Improving process development of
product and material properties
with innovative wear tests –*

try the SANDER!

About us

Research and development for you!

Under the umbrella of the **machtTechnik AG**, an interdisciplinary team, consisting of all age groups and diverse academic specifications, is working in the field of research and development.

We are a company of generations – and that distinguishes us. Long experienced experts work closely together with young professionals.

We don't stick with the routines, but try to find the new solution.

The core focus of our work is on aerospace as well as renewable energies. If you are in need of a partner who implements your projects and works with fresh and new ideas, we will support you with your technical realization: This is because we love to do research – not just for ourselves, but for our customers, too.

Your benefit from working with us: We can find the new and unexpected, because we are open for it and for a new way of thinking!

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SANDER

*Sand-Trickling-Tester for
determination of abrasive wear
on surfaces*

Finding solutions

Wind and sand ...

*... are the main cause of loss of
efficiency and damage on optical
surfaces.*



Desert simulation

Parabolic trough, dish-Stirling and photovoltaic power plants are exposed to the forces of weathering – which will shorten their lifetimes.

No matter if they are made out of glass, plastic or covered with foil – most surfaces are extremely delicate against dust and soil. The consequences are fine scratches, which result in a quality loss of the product.



With the sand trickling abrasion tester **SANDER**, we offer our customers a test facility to inspect the wear resistance of the materials: Improve its quality and quantity in time to reduce the consequential costs consisting of maintenance and repair works.



Abrasion test

Abrasion and wear tests of glass and foils will be carried out according to DIN, ASTM or MIL standards – in addition to your individual requirements.

In detail: Sand falls freely down from your defined height – with a max. velocity of 6 m/s.

One possible application is accelerated life span abrasion tests of mirror components with sand and wind loads.

With the **SANDER**, you will get the optimal wear and scratch resistance testing of glass, plastic, metal or even foil: The simulation of arid environments, where solar thermal power plants are erected.

Like a desert storm

The **SANDER DS** features specifications like a sandstorm in the desert, in one compact test stand with acceleration of the sand up to 50 m/s and temperatures of 60°C at a relative humidity under 10%.

These are the basic demands of the sandstorm wind tunnel, manufactured by us – every test stand a high-quality facility, individually custom-made.

SANDER DS is equipped with parameters being variable and arbitrary to simulate the given conditions of the environment.



Resist the elements

The consideration of local environmental conditions has become a very important part to determine adjusted models for the life span of renewable power plants. Hence, we offer you mobile sensor equipped extension masts for monitoring wind conditions, as well as sand loadings, fitted out with sensors for altitude profiles of 25 m.

Furthermore, we will support you with wind tunnel testing of your facilities – all our experiences with granulate and aerodynamic systems will serve the setting up of correlation models. This way, you will produce reliable and reproducible results.



Impact Abrasion

Sander – Standard Methods

Wind speed:	Up to 7 m/s
Size:	3 m x 0.7 m x 0.7 m
Power:	230 V, 50 Hz
<u>Note:</u>	Integrated sensor system

DIN 52 348 *Wear and abrasion test*

- Surface wear resistance of glass, plastic and metal panels via sand-trickling method
- DIN nozzle and tube DN 125 mm
- Sand: \varnothing 0.5 – 0.7 mm
Additional sand: \varnothing 0.1 – 1.2 mm
- Falling height: 1.69 m
Adaptive to max. 2.1 m

ASTM D 968-05 *Abrasion resistance of organic coatings by falling abrasive*

- Surface wear resistance of glass, plastic and metal panels via sand-trickling method
- DN 19 mm, without nozzle/sieve
- Sand: 0.5 – 1.2 mm (method A),
silicon carbide (method B)
- Falling height: 0.94 m

Further features are available!

Starting at EUR 9.000

Impact and Grinding Abrasion

Sander DS – Sandstorm Wind Tunnel

Wind speed:	Up to 50 m/s
Rel. humidity:	Below 10% RH
Temperature:	Up to 60°C
Sand:	Ø 0.3 – 1.2 mm
Size:	3 m x 1.5 m x 1.5 m
Power:	400 V, 50 Hz
<u>Note:</u>	Compressed air needed for climate conditioning Sand injection and extraction technology Integrated sensor system PC based control technology

Impact Abrasion

Damage caused by impacting sand particles on optical surfaces can be simulated in desert like conditions with wind speeds of up to 50 m/s.

Grinding Abrasion

Sand may not simply impact on optical surfaces but can also accumulate on collector components. This causes grinding damage as grains of sand move over flat surface areas.

Accelerated Life Time Testing

The test rig has the capacity to simulate 20 years of typical CSP environments and sand exposure in less than one hour of experiment time.

Further features are available!

Starting at EUR 50.000

Services

Aerodynamic Analysis and Wind Tunnel Testing

We design sophisticated, modular scaled wind tunnel models for use in both German and European aerospace testing facilities. machtTechnik AG also performs complete and customized test campaigns.

CSP Academy

We offer specialized courses at intermediate and advanced levels on design and aerodynamics in the CSP industry. These feature parabolic trough, dish-Stirling and photovoltaic power plants and in particular, how to enhance design efficiency and advance sustainability.

Consulting

machtTechnik AG's strength lies not only in its aerodynamic analysis and wind tunnel testing expertise. Please see our portfolio in

- Customized Test Rig Design
- Fatigue Testing
- Accelerated Life Time Testing

machtTechnik AG's services are of optimal value to a project when implemented early in the design phase. We are more than happy to discuss the specific needs of your project at any time.

Services

Individual In-House Testing

For glass, mirrors, and other surfaces, machtTechnik AG offers sand abrasion testing to perform complete and customized test campaigns with individual probes:

For our customers we provide day-long testing in order to establish the impact and grinding abrasion on all types of optical surfaces with respect to DIN 52 348 and ASTM D 968-05. The costs start at EUR 500 per day, subject to test specifications.

As many of our customers are not completely aware of their own specific test conditions, we have developed a model for up to 25-years-lifecycle testing which can provide assistance at the conceptual phase of your tests. We are also happy to accept samples of sand with which to perform the tests (min. of 5 kg required). We do all that we can to ensure an optimal outcome regarding your individual test specifications.