

New evaluation equipment for material surface strength

■ Micro Slurry-jet Erosion (MSE) method

With the projection of constant solid particle at the surface of material, the wear amount change comply with the surface strength. MSE tester shows this change of wear amount as wear rate which can be use to evaluation and comparison of surface intensity of various materials.

■ MSE Tester



MSE-S

Application for super accurate process

Super accurate processing for nanosize in compact size. Smoother evaluation control.



MSE-A

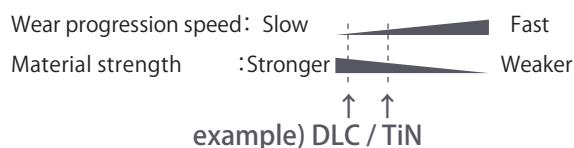
Accurate processing + auto measurement set

Pot all wear measurement from accurate wear processing. Auto measurement process for all MSE test.

■ What do you get from MSE measurement

1 Strength of Thin film and Substrate

Material strength evaluation using wear progression.



2 Material strength distribution (depth direction)

The wear intensity of material surface until inner layer (multi-layer film) changes according to surface process and deposition.

With MSE tester, while using continuous measurement at sub-micron unit from the surface, the evaluation of material surface is possible.

3 Film thickness

The change in material and composition is not purely can be evaluate through thickness. With MSE tester, while visualized interface slope intensity, it is also functional as thickness accurate measurement.

4 Interface layer strength

The visualization of a very thin inner slope layer changes form from material diffusion.

With the detail plot focusing at interface layer, the change of strength can be visualized.

5 Change in properties (substrate)

Substrate strength changes (change in properties, reformation) according to deposition process. With MSE tester, this change in substrate properties can be spotted and evaluate.

>>Detail of MSE tester features explanation is on another paper



■ Specifications



Super accurate process

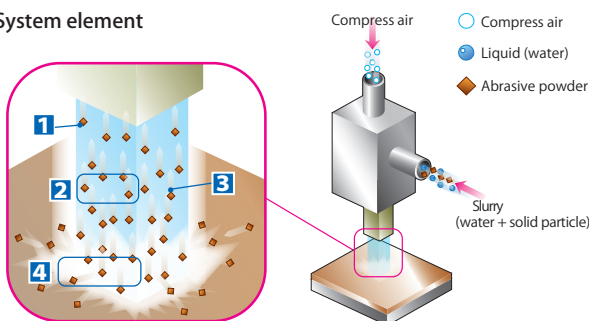


Accurate processing
+ Auto measurement set

	MSE-S	MSE-A
Basic specification		
Structure	Body : wear processing system	Body : wear processing system
	-	Specimen cleaning unit
	-	Auto measurement system
	-	Data processing system
Test specification		
Specimen size	□30mm ×t10mm	□30mm ×t10mm
Wear processing area	□ 1 mm	□ 1 mm
Particle type	Average diameter 1.2μm(WA8000)	Average diameter 1.2μm(WA8000)
Slurry density	3wt% (Constant)	3wt% (Constant)
Slurry tank capacity	1 L	1 L
Projection angle(degree)	90 (Constant)	90° (Constant)
Projection degradation ability	0.5 g	0.5 g
Continuous measurement accuracy	±8 %	±8 %
Measurement part specification		
Method	-	Vertical -Scanning Shape - Measurement Interferometry
	-	1330 ×1760μ m
Depth	-	20μ m
Degradation ability	-	20nm
Body specification		
Size	w700 × d500 × h620.5	w1100 × d500 × h650
Measurement control part	-	w550 × d550 × h580
Monitor	-	w400 × d200 × h400
Utility		
Power supply	100V 0.8kVA	100V 1kVA
Air supply	Dry air (0.55 MPa above) 15L / min (ANR 0.4kw estimated)	Dry air (0.55 MPa above) 15L / min (ANR 0.4kw estimated)
Other	Air and water evacuation	Water supply , air and water

■ MSE Principle

■ System element



1 Solid particle

Wear generating element.
1 μm in diameter, and can generate 10-50 nm of wear depth per particle.

2 Slurry

Water and solid particle (powder) mixture.
Accurate control of slurry injected pressure and flow rate.

3 High velocity projection

Wear progression by solid particles collision with up to 100 m/s in velocity using air pressure.

4 Large amount of solid particle impact

High velocity wears progression by some hundred million of solid particle impact per second.

This technology is developed from the collaborate development with Prof. Iwai research lab at Fukui university.

