

# MSE tester application

## A Evaluation technique

MSE tester evaluates physical quality level of material by using wear progression degree of fine wear erosion generated from solid particle impact (slurry jet).

Is there any efficient tester machine for hard coating material development?

**1**  
Research and development field



Is there any newest tester machine for coating development?



**MSE tester**

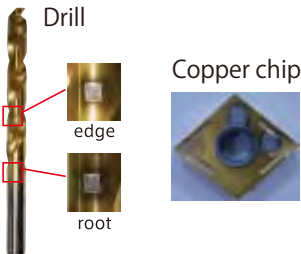
Is there any machine that is useful for equipment maintenance?

**2**  
Manufacture field

Is there any new machine that can be use for standardization of quality guarantee?

## B Applications

### 1 Research and development field



#### a Lifetime prediction for cutting tools and grind tools

For research and development field, MSE tester data provide comparison of coating quality evaluation of edge tool coating. And also spot wear strength, surface boundary strength, and thickness quality measurement. At the same time, MSE tester also can be use together with elemental analysis, indentation test and scratch test.



Hard coated thin film part  
(above; TiN coating, below; HDCr coating)

#### b New hard coated thin film material development field

Started from DLC, the research and development of various hard coated film is widely been conducts. MSE tester offer hard coated thin film material development fields, faster way to confirm their physical characteristic. For example, for TiN thin films take about 350 sec and on DLC about 8000 sec in evaluation time.



Nozzle parts

#### c Hard novel material development field

The development of hard material and high-temperature material for cutting-edge technology such as airplane and rocket manufacture are undergoing. By using wear rate as physical index, faster evaluation can be achieve and speed up development progression. MSE tester also contributes to material quality of the new material.

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# MSE tester application

## >>>Research and development field



CVD equipment

### **d** Thin film manufacture process development field

The quality of DLC, TiN, etc., is different according to manufacture process. In the other word, the development of high quality thin film is basically depends on process development. MSE tester offers a simple evaluation using wear rate on differential determination of thin film.



Sintering equipment

### **e** Sintered material manufacture process development field

Sintering is a material composition technology that use fine particle as basic material. MSE tester can strongly support physical and mechanical characteristic just in time evaluation for try and error normalized development.

## **2** Manufacture field

### **a** Variation inspection of manufacture equipment quality

A lot of PVD or CVD production equipment is using numerous batch techniques that inherent a variation problem on thin film quality and thickness. For the purpose of observation, by using MSE tester indexing at machine internal position, countermeasure and attribution can be taken in advanced.

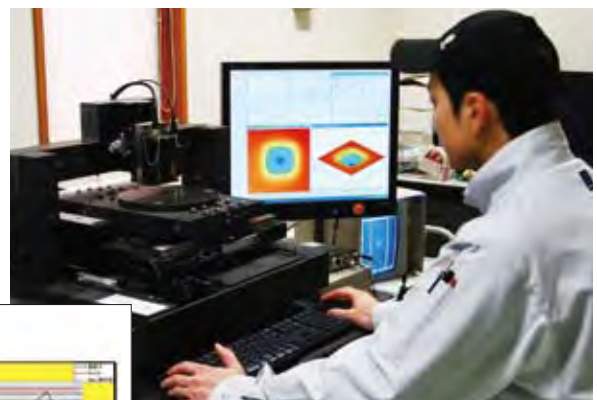
### **b** Indirect equipment maintenance by time-series test

The management item of thin film manufacture is wide-ranging and at top of the list is the gas quality. Because of that, it is important to keep a record of product inspection at time to time to improve or maintain production quality. As an item for that case, physical evaluation data by MSE tester is useful in quality guarantee maintenance while managing equipment condition.

### **c** Quality guarantee

The problem of thin film that has been produced by PVD or CVD method is, even if material is similar, but through slight differences of equipment and production management, the property of thin films sometime effected. As a requirement for similar quality, it is important to inquire products at proper similar company and equipment.

One of the solution measures for this problem is by using evaluation method by wear mechanism of MSE tester, the standardization item of quality guarantee can use for production and equipment management.



Measurement site



XR bar management sheet

