OPTOSKY Spectroscopy Solutions

# Datasheet

## Automatic Microfilm Thickness Mapper | SM280

## Features

- Non-contact, non-destructive testing system;
- Ultra-long life light source, higher efficiency;
- High-resolution, high-sensitivity spectrometer, more accurate and reliable mapping results;
- The software interface is intuitive, easy to operate;
- Integrated real-time camera to monitor measurement points;
- Equipped with a microscope objective lens to support the detection of small-sized samples;
- The surveying and mapping speed is fast, and it supports multi-point surveying and mapping point map drawing;
- Support drawing 2D/3D thickness distribution map of samples;
- High-precision, long-life 3-axis mobile platform;
- Historical data storage to help users better grasp the results;
- Desktop-style distributed design, rich in applicable scenarios;
- Low maintenance cost and easy maintenance;

## Description

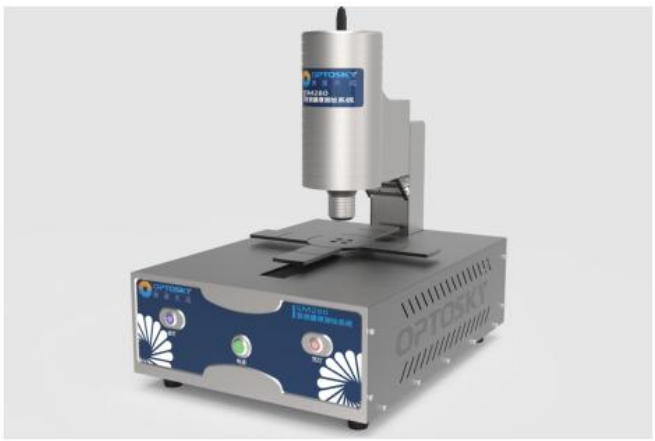
SM280 is a microscopic thin film thickness measuring instrument developed by using the principle of thin film reflected light interference. It uses the light with the widest wavelength range of 200-1700nm to be vertically incident on the surface of the film. As long as the film has a certain degree of transmission, the SM280 can calculate the thickness of the film according to the reflected interference spectrum. 10nm~100um, SM280 is equipped with a dedicated microscope system, which can support the test of tiny samples with a minimum size of 10um. The software has template matching and auto-focus functions, and supports the drawing of measurement point paths and the presentation of measurement results in 2D/3D.

SM280 automatic microscopic film thickness measuring instrument adopts integrated design, the core components adopt high-resolution, high-sensitivity spectrometer, high-performance industrial CCD and high-precision 3-axis mobile platform, combined with OPTOSKY unique algorithm technology, to provide users with The new generation of leading automatic microfilm thickness mapper.

## Application

Essentially all smooth, translucent, or low-absorption films can be mapped, which includes nearly all dielectric and semiconductor materials, including:Silicon oxide, nitride layer, diamond-like film, polysilicon, photoresist, polymer, polyimide, amorphous silicon, etc.

- Semiconductor coating: photoresist, oxide, desalination layer, silicon on insulator, wafer back grinding;
- Liquid crystal display: gap thickness, polyimide, ITO transparent conductive film;
- Optical coating: hard coating, anti-reflection layer;
- Microelectronics system: photoresist, silicon-based film, printed circuit board;
- Biomedical: medical equipment, Parylene







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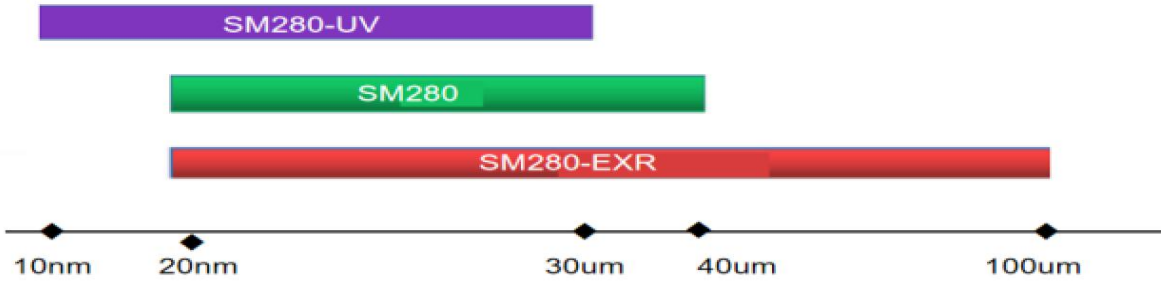
# 1. Performance




| Model | | SM280-UV | SM280 | SM280-EXR |
|---|---|---|---|---|
| General Specifications | | | | |
| Spectral wavelength | | 200nm-1000nm | 400nm-1000nm | 400nm-1400nm |
| Light source | | Deuterium Halogen Combination Lamp | Tungsten Halogen Lamp | |
| Measurement Specifications | | | | |
| Thick | 5X objective lens | / | 20nm-40um | 20nm-100um |
| Spend | 10X objective lens | / | 20nm-30um | 20nm-70um |
| Fan | 20X objective lens | 10nm-30um | 20nm-40um | 20nm-80um |
| Around1 | 50X objective lens | | 20nm-1um | 20nm-2um |
| Accuracy2 | | ±2nm or 0.2% | | |
| Angle of incidence | | 90° | | |
| Film thickness and number of layers | | 1st floor to 3rd floor | | |
| Sample material | | Transparent or translucent film | | |
| Measurement mode | | Single-point measurement/multi-point measurement/automatic measurement | | |
| Light | objective lens | Standard 500um aperture | Optional 100um aperture | Optional 50um aperture |
| Spot | 5X objective lens | 100um | 20um | 10um |

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| | | | | |
|---|---|---|---|---|
| Ruler | 10X objective lens | 50um | 10um | 5um |
| Inch3 | 20X objective lens | 30um | 5um | 3um |
| | 50X objective lens | 10um | 2um | 1um |
| Sample size | | Diameter from 1um to 300mm or larger | | |
| Basic requirements | | | | |
| Operating system | | Windows10/11 | | |
| Indicator light | | Deuterium lamp indication, halogen lamp indication | Halogen indicator | |
| Button | | Power button, deuterium lamp, halogen lamp | Power button, Halogen light switch | |
| External interface | | Power outlet, USB 2.0, RJ45 | | |
| Scanning platform | | Rotation + X-axis movement + Z-axis movement | | |
| Movable stroke | | 150mm*360°, 30mm | | |
| Material | | Aluminum alloy | | |
| Power supply | | DC24V | | |
| Packing list | | Host, power cord, standard film thickness samples | | |
| Remarks: 1. Depends on the material; 2. Whichever is larger depends on the material; 3. Clear aperture; | | | | |




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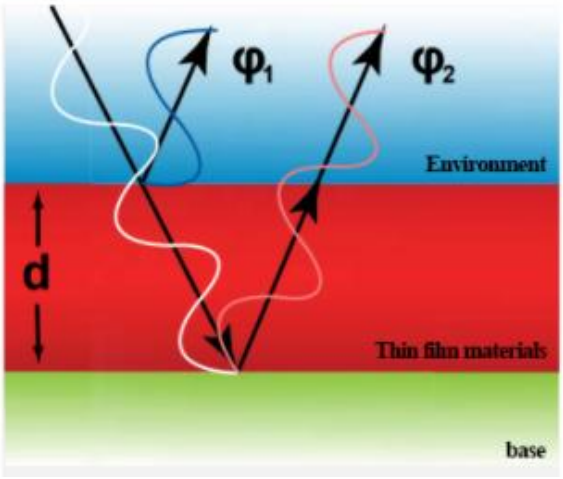
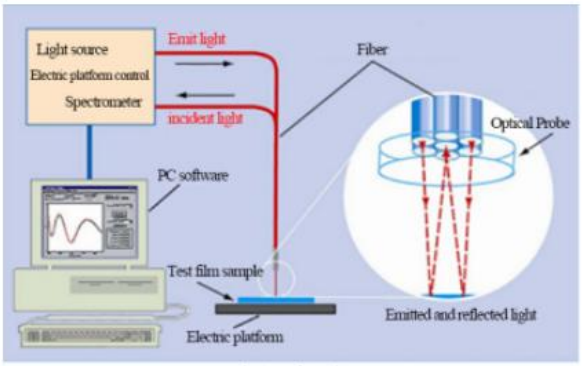
# 2. The working principle of SM280

When the incident light penetrates the interface of different substances, part of the light will be reflected. Due to the fluctuation of light, the reflected light from multiple interfaces interferes with each other, thus causing the multi-wavelength spectrum of the reflected light to oscillate. From the oscillation frequency of the spectrum, we can judge the distance between different interfaces and obtain the thickness of the material (more oscillations represent greater thickness), and other material properties such as refractive index and roughness can also be measured at the same time, as shown in the picture.




OPTOSKY discovered the needs of customers and built the domestic leading automatic film thickness mapper - SM280. The main engine light source emits light, and irradiates the surface of the sample to be tested through the Y-shaped optical fiber. The Y-shaped optical fiber is composed of 7 thin optical fibers in a plum blossom shape. The outer 6 optical fibers emit light, and the middle optical fiber guides the reflected interference light back to the spectrometer inside the host for measurement and calculation. The principle of the SM280 system is shown in the picture.




The surveying and mapping methods of SM280 can be polar, rectangular or linear. The built-in high-performance motion controller in the host enables the rotatable platform to support a variety of predefined surveying and mapping methods. The equipped upper computer software supports users to create their own surveying and mapping methods without measurement The number of points is limited, the measurement results support 2D and 3D presentation, and the supported forms of the point map:

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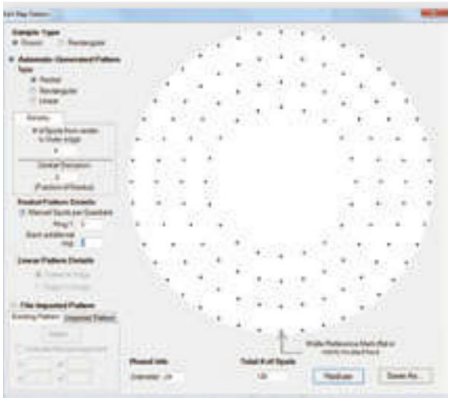
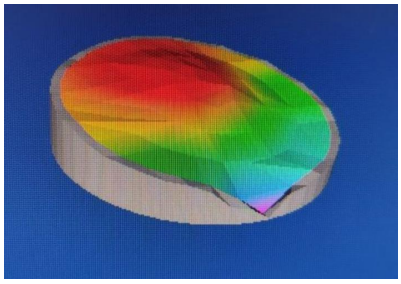
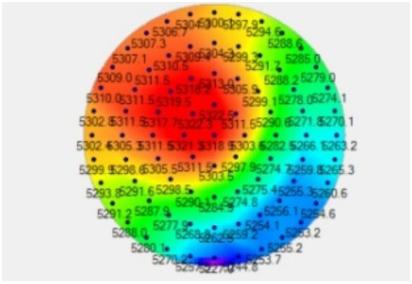






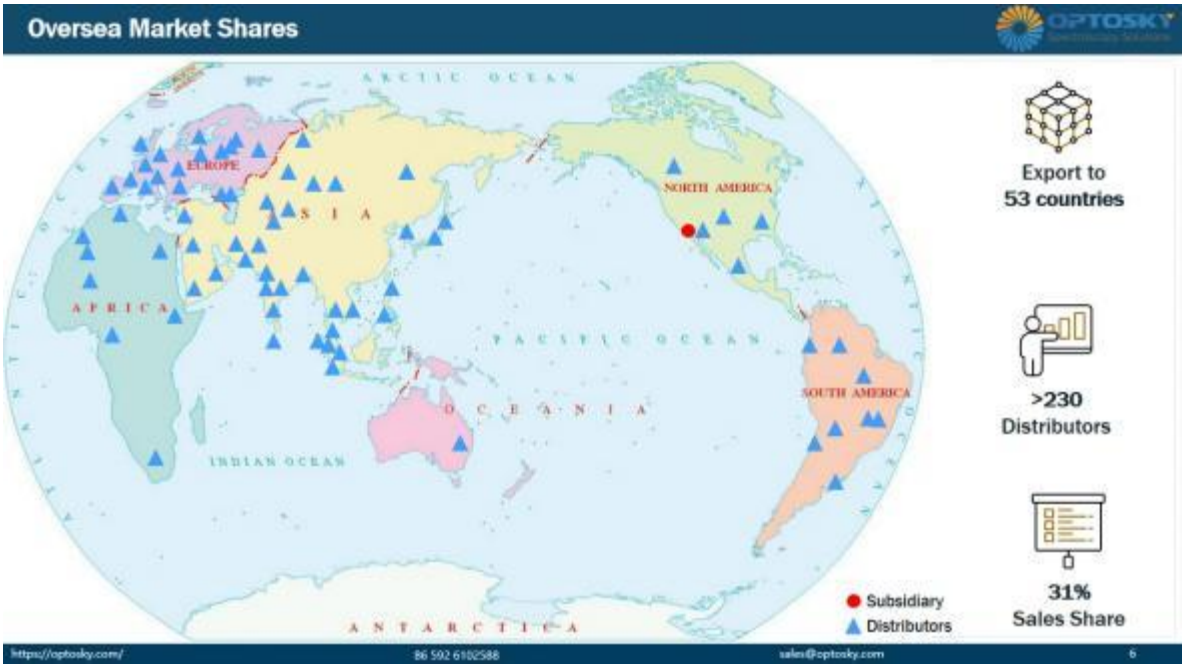
*Round/square

*Radial

*Center or edge exclusion

*Point density

# 3.Company Profile




Oversea Market Shares

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Optosky Chair and Draft National Standards Lists


Qualification




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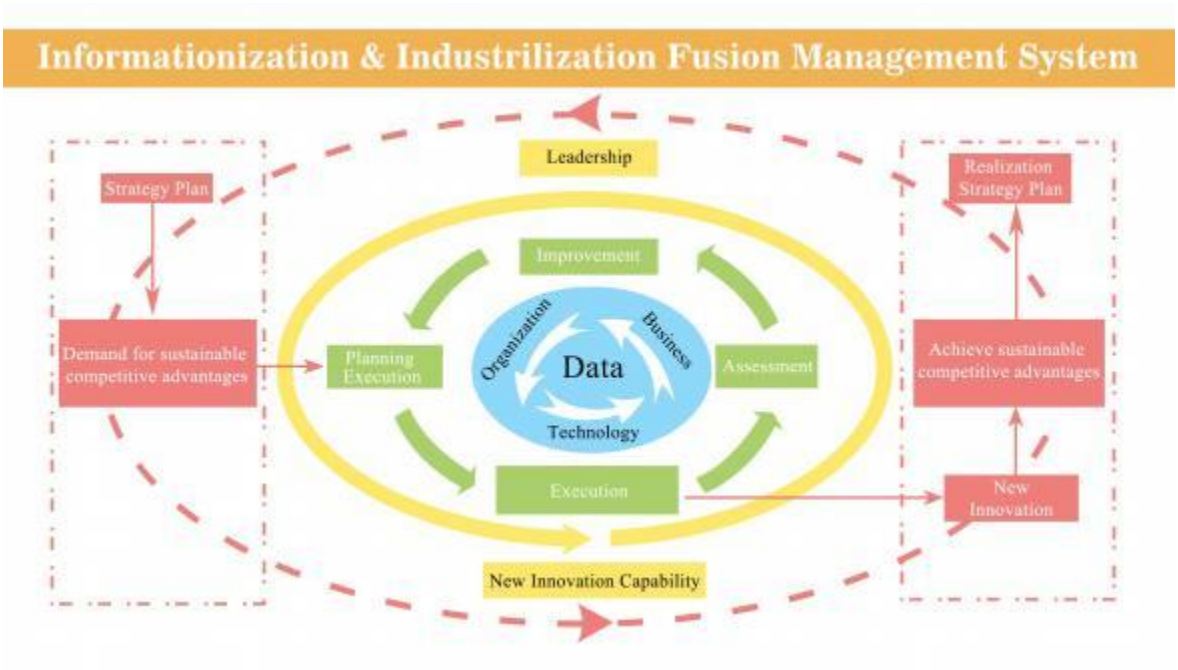


GB/T 23001_Informationization & Industrilization Fusion Management System


Optosky's Co-founder_Dr. Hongfei Liu




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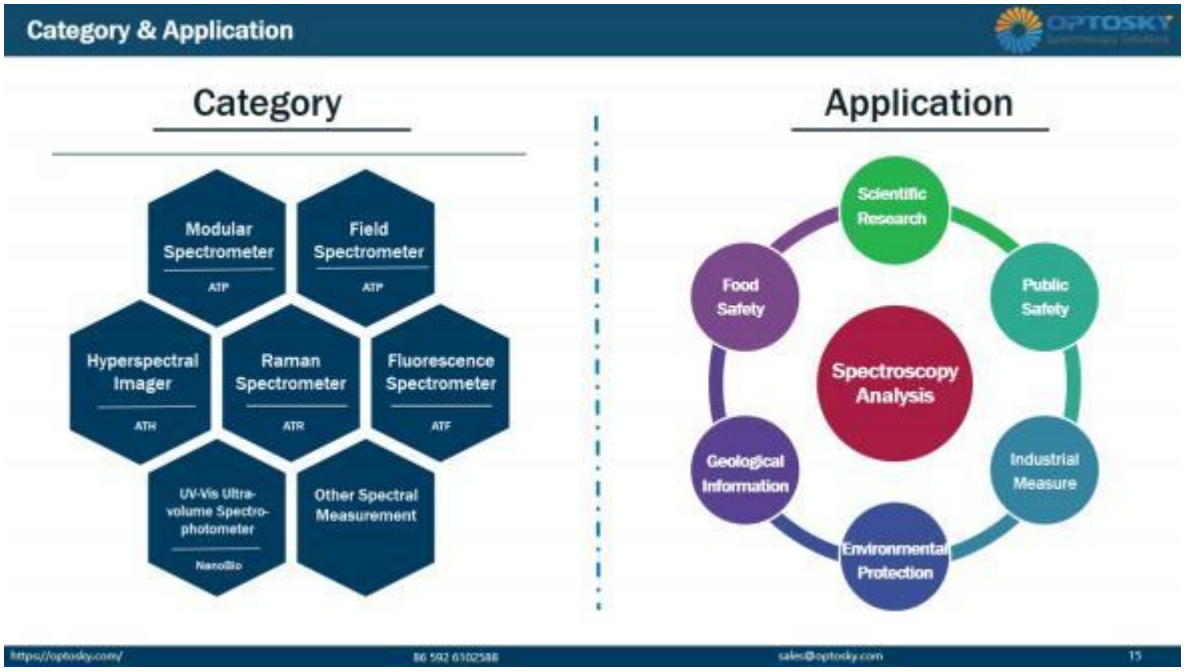


Category & Application




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