

Spectroscopic interference displacement multilayer film thickness measuring instrument

SM210

Features

- Using xenon light source, wide band range (190nm-1100nm), high luminous efficiency and long life;
- From single layer to multiple layers, stability measurement can be achieved;
- Adhesion layer can also achieve stable measurement;
- Wide measurable range 39nm-2.1um;
- The sensor head has no circuit, no electromagnetic interference, no heat;
- Small, light weight, installation space is not limited;
- The selection of "six-wind-one" type 7-core Y-type flexible optical fiber can not only adapt to frequent and high-speed movement on the production line, but also improve the utilization rate of reflected light, thereby improving the signal-to-noise ratio;
- The software interface is intuitive, easy to operate and time-saving;
- Fast surveying and mapping speed;

Description

SM210 is a film thickness measuring instrument based on the principle of spectrophotometric interference. It uses xenon lamp light source emitted wide wavelength light, part of the workpiece surface and the sensor head internal reflection surface back to the sensor head interior, two reflective beams interfere with each other, the intensity of each wavelength of interference light depends on the spacing between the reflector surface, when the spacing is an integer multiple of the wavelength, it will reach the relative maximum interference with the help of a spectroscope interference light into different wavelengths. The light intensity distribution of the wavelength can be obtained, and the distance between the reflecting surfaces can be calculated after the waveform analysis of the distribution. The maximum mapping range of its thickness can reach 39nm-2.1um.

SM210 optical interference multilayer thickness measuring instrument is built by measuring sensor head, controller and upper computer software, combined with the unique algorithm technology of AoPU Tiancheng, to provide users with a new generation of leading multilayer thickness measuring instrument.

Application

Virtually all smooth, translucent or low absorption coefficient films can be mapped, which includes almost all dielectric and semiconductor materials, including silicon dioxide, nitriding layer, diamond-like carbon, polycrystalline silicon, polycrystalline silicon, photoresist, macromolecule, polyimide, amorphous silicon, etc.

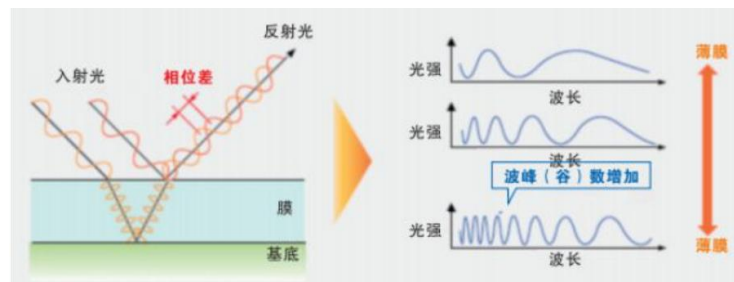
- Semiconductor coating: photoresist, oxide, desalination layer, silicon-on-insulator, wafer back grinding;
- Liquid crystal display: gap thickness, polyimide, ITO transparent conductive film;
- Optical coating: hard coating, anti-reflection layer;
- Microelectronic system: photoresist, silicon film,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



Product data information is current as of publication date. Products conform to specifications per the terms of Optosky Standard warranty.

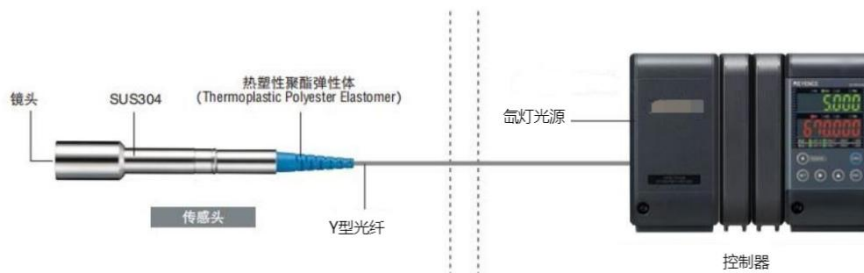
1. Work Principle

When the incident light enters the film sample, multiple reflections will occur inside the film, and these multiple reflections will enhance or weaken each other with the phase difference. The phase difference of each multiple reflected light is determined by the wavelength of the light and the length of the light path. This phase difference causes the light reflected or transmitted from the sample to produce a unique spectrum reflecting the thickness of the film. Spectroscopic interferometry is a technique to measure the thickness of a thin film by analyzing a specific spectrum through curve fitting or FFT (Fast Fourier transform), as shown below.



The working principle of SM210 type online film thickness meter

The light emitted by the light source in the controller of SM210 is irradiated to the surface of the tested sample through Y-shaped optical fiber, and then the interference light is returned to the spectrometer inside the controller through Y-shaped optical fiber for spectral analysis. Finally, the unique algorithm is used to accurately calculate the thickness of the film.



System composition

2. Specification parameters

Sensor head		
Measuring range	30nm-100um	
Fastest measurement speed	4 KHz	
Reference distance	9mm	
Light source for measurement	xenon lamp	
Beam diameter	30μm	
Linearity	±0.3μm	
Accuracy	±2nm or 0.2%	
Sampling period	40ms	
LED indicator	Target near the measurement center green light; The target is orange light in the measuring range; Target is red light outside the measurement range.	
Environmental resistance	Enclosure protection	IP64
	Ambient brightness	Incandescent lamp, fluorescent lamp: 1000lux or less
	Ambient temperature	0-40°C
	Relative humidity	35-80%RH(Non-condensing)
	Vibration	10-50HZ, 1.5mm double amplitude in the XYZ direction, 2 hours each
Material	SUS304	
Weight (with cable)	≈100g	
Remark:		
1. Indicate the frontal distance from the sensing head, there will be a certain individual error;		
2. Indicates the minimum beam diameter in the measurement range;		
3. the value obtained when measuring the glass surface of the object and setting the average number of measurements to 64 times;		

controller	
485 interface	Measurement data output and control input/output
USB interface	Compatible with USB2.0 HI-SPEED
Ethernet interface	100Base-TX/10Base-T

Main Functions		Measurement surface setting/measurement surface spacing calculation function, layer number verification function, light quantity accumulation function, automatic deflection compensation function, 12OUT simultaneous measurement function, calculation function, average function, filtering function, correction function, measurement function, measurement value alarm setting function, tolerance setting function, automatic zero adjustment function, data storage function, light monitoring function, setting software connection Function.
Power	Voltage	24V DC
	Maximum current consumption	0.6A or less when a sensor head is connected
Environmental characteristics	Ambient temperature	0-50°C
	Relative humidity	35-80%RH(Non-condensing)
	Vibration	10-50HZ, 0.5mm double amplitude in the XYZ direction, 2 hours each
Weight		≈1KG
Material		aluminium alloy
Packing list		Main unit, controller, measuring head, power cord, optical fiber