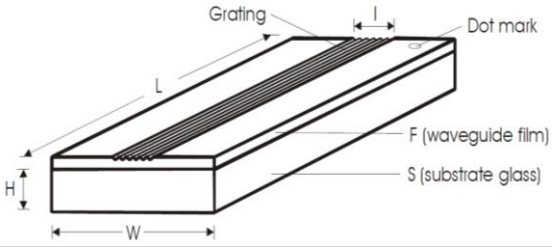
INTEGRATED OPTICAL CHEMICAL AND BIOCHEMICAL SENSORS

OW 2400

OPTICAL WAVEGUIDE GRATING COUPLER SENSOR CHIP



Introduction

The optical grating coupler sensor responds to the change of optical refractive index of the liquid or gas cover medium and to the adsorption or binding of molecules on the surface.

The optical grating coupler sensor chip is based on a fine optical grating prepared on a thin waveguide layer carried by a glass substrate. The optical grating couples the light of a He-Ne laser at a given resonance angle into the waveguide layer. This incoupling angle is very sensitive to the presence of adsorbed molecules and to any change of refractive index of the medium covering the surface of the chip. By precise measurement of the incoupling angle, the amount of the adsorbed material can be determined with ultrahigh sensitivity. OW 2400c chip implements a coating layer on the waveguide surface, that modifies the optical, chemical or biochemical properties of the chip to the required extent.

OW 2400 sensor chips are used in high-resolution optical waveguide lightmode spectroscopy (OWLS).

Main Biosensing Applications

- Adsorption of proteins at surfaces
- Ligand/receptor binding (antibody/antigen)
- Immunosensing
- Drug screening
- Protein - lipid bilayer interactions
- Protein - DNA interactions
- Molecular self-assembly & nanoscience
- Analysis of association and dissociation kinetics
- Kinetics of adhesion, growth and spreading of living cells
- Food monitoring

TECHNICAL SPECIFICATION

Diffraction Grating

Surface relief structure:
- depth~20 nm

Grating periodicity:
- 2400 lines/mm (0,4166 μm)

Grating area dimensions:
- length (l)~2 mm
- length (L)=12 mm

Grating lines direction:
- parallel to the longer edge of the sensor chip

Dot-mark:
- diffraction grating is uppermost, when dot mark or number is in the upper right corner

Planar Monomode Waveguide

Waveguide material (SOL-GEL)
- $Si_xTi_{(1-x)}O_2$, where x=0.25±0.05

Waveguide film
- refractive index (n_F)=1.77±0.03
- thickness (d_F)=170-220 nm

Substrate glass slide
- length (L)=12 mm
- width (w)= 8 mm
- thickness (H)=0,50 mm
- refractive index (n_S)=1.53
- Other substrate sizes are available on request.

OW 2400c - Coating on the Sensor Surface

Full coverage of the surface is standard, while partly coverage is available on request.

Thin films (~10 nm):
- SiO_2; ITO

Functionalization:
- Silanization with APTS
- Other functionalizations are available on request, for updated information see our website.

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