

S3F Point Sensor

Surface Stress Sensitive Film (S3F) is an optical instrument for measurements of skin friction. The basis of this measurement is an elastic film that deforms under the action of the applied loads. The reaction of the film is monitored by imaging the surface. The film reaction is then modeled using finite element analysis resulting in a continuous distribution of skin friction and pressure over the filmed surface.

The S3F point sensor utilizes ISSI's patented Surface Stress Sensitive Film (S3F) layer, polymerized over a displacement sensor. The point sensor is fully submersible and can be integrated into model walls. The casting process makes the sensor customizable to match model geometry.

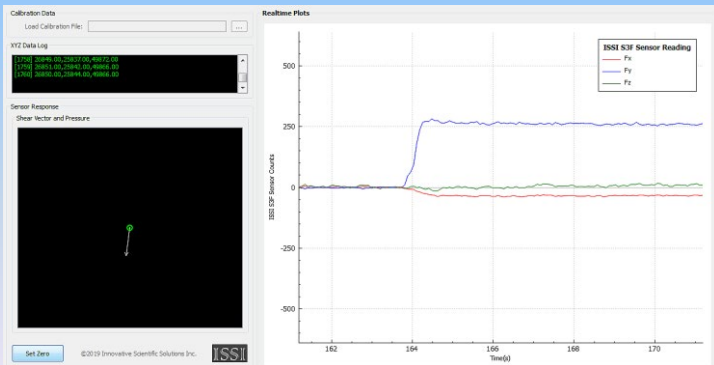
A displacement sensor is embedded within the S3F layer. The sensor is displaced laterally during contact, primarily by shear forces. Cross-correlation analysis quantifies the displacements produced by shear. Normal displacements can also be detected by the sensor.

3-D displacement maps provide rapid visualization of the shear patterns produced by contact. Reconstruction of the shear forces is provided by offline analysis using a calibration of the S3F with the measured displacements as inputs.

Why S3F?

S3F provides high spatial-resolution data of shear data at contact surface for a wide range of applications. The chemistry of an S3F layer can be altered or tuned to a specific application, making the S3F a versatile sensor for a wide range of applications from insect locomotion studies to hydrodynamics research to aircraft tire research.

Interface	USB 3.0
Pressure Range	15-700 kPa.
Linear Shear Range	3 to ± 100 kPa. Also not the saturation point.
Accuracy	$\pm 5\%$ of full scale for both pressure and shear
Data Capture Rate	Up to 1 kHz
Spatial Resolution	3 mm
Crosstalk	Less than 3% between pressure and shear
Active Measurement Area	80 mm ²
Size	User selectable
ECCN	EAR99



XYZ Response of Point Sensor



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