

# **Roughness Inspector Product Requirements Document Sydor Optics Inc.**

Document Number 001

Revisions Level

Date

E

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Authentication Block

## Roughness Inspector Product Requirements Document

Rev	Description	Date	Authorization
A	Release	10-24-14	TWI
B	Revision to parameters of the system	11-07-14	TWI
C	Changes to Conceptual design, budget	11-16-14	TWI
D	Name change, added/edited sections	12-06-14	TWI
E	Slight Wording Change	12-08-14	TWI

The Roughness Inspector is a customer driven product. As such its design inputs were derived from the needs of our customer Sydor Optics INC.

## **Vision:**

The product vision is:

In process metrology system to determine the grade of the optic by examining the surface roughness of optical flats.

## **Environment:**

As a laboratory instrument, it needs to operate in the following environment:

### **Temperature**

55-85 °F - safe operation

65-75 °F - Meets Specifications

### **Relative Humidity**

Non-condensing – safe operation

The instrument will be in a production laboratory environment .Wall power is necessary; a computer network or modem connection is an option. The instrument should not be damaged by contact with the part under test. It should not be damaged by standard optical cleaning compounds and procedures. The instrument and it's supporting devices should take no more room than a standard workbench. The system process should be rugged and easily used by a trained technician. Background light should be minimized either by being in a dim room or placed inside of a box to block out large amounts of background light.

## **Fitness for use:**

The system will:

Be restricted to the measurement of flat surfaces.

Be able to test multiple size and shape parts. Including but not limited to a 13 inch disk, 200mm disk, a 6" x 4.3" pentangle, and a 4.3" x 3.2" rectangle. With thicknesses ranging from 1 - 9.5 mm.

Be able to be used by a trained technician.

Be able to characterize the part in 5 minutes or less per optical surface.

Be non-destructive to the surface under test.

Be able distinguish the threshold between standard and laser grade.

It is desirable that:

Be able to distinguish the threshold between standard grade and failed.

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Be able to characterize the part in 2 minutes or less per optical surface.  
Be able to scan over the entire clear aperture.  
Be able to evaluate both sides at once.

### Scope:

#### We are Responsible for:

evaluating a variety of methods that can potentially distinguish between grades of parts.

trying to find a successful method to characterize the parts.

designing and carrying out optical experiments to characterize the parts.

delivering in depth documentation of our experiments, results, and their ability to characterize the parts.

#### We are NOT Responsible for:

scanning across the parts, or accounting for different sizes or shapes of parts.

software development.

producing a final prototype instrument to deliver to our customer. However, *if* a successful method is found and *if* time permits we will prototype an instrument and deliver it to our customer (then taking into account different dimensions of parts and other specifications listed above in this document).