

The purpose of this amendment is to answer questions posed by a potential offeror. The questions and answers are as follows:

1. NRL's Specification A6 requires Goniometer base translation range = -5 to 20mm, resolution = 0.002mm/step. Why is this specification required to meet the research needs of the Naval Research Laboratory?

As the incident beam optical systems are automatically changed from slit collimation to the variety of monochromator conditions (Ge (220) 2-bounce, Ge (440) 2-bounce, and Ge (440) 4-bounce), the goniometer must automatically translate to the set translation specification to accommodate the lateral beam shift. This allows researchers to pre-program data acquisition of a variety of measurements at both high and low resolution to be performed unattended using different optical systems, as described.

2. Why are Specifications 7a, 7b, and 7d required to meet the research needs of the Naval Research Laboratory? Are they really needed for the analysis of samples?

Crystals can be classified between perfectly perfect and perfectly imperfect. To determine the degree of perfection or imperfection, one needs to change from low resolution to high resolution frequently. This allows the system to be pre-programmed to make a variety of measurements at different resolutions on the same sample yielding important information on the sample. So, yes, all three items are necessary. The attenuator exchanger is important because of the large dynamic range of the 18kW rotating anode generator.

3. Under Specification B3 for the monochromator, why is it required that the crystal rotation be 2 axes: w_1 , w_2 and stepper motor driven? What additional sample information is obtained by this?

The two axes w_1 and w_2 are needed to rotate the monochromator crystals in and out of the x-ray beam to achieve either high or low-resolution measurements. Different degrees of crystal quality require different degrees of resolution. The axes automate this procedure. Again, data acquisition can be pre-programmed to perform a variety of low and high-resolution measurements on the sample while the system is unattended.

4. Under Specification B4 for the optical system changeover, why is there a requirement that this system be computer controlled and software selectable? Why is it required that the changeover be completed without manual intervention or the removal of optical components? This has no bearing on obtaining excellent sample data.

This increases laboratory throughput through automated data acquisition procedures using many different optical systems.

5. Under Specification D for the sample stage, an open Eulerian Cradle is required to hold a 4 inch wafer. Our Eulerian Cradles hold 3 and 5 inch wafers. Also, why are the axis items in Specification 1-5 required? Our specifications are similar but not identical.

The system must be able to hold 4" wafers. It must also be able to fully map the 4" wafer to look at structural inhomogeneity. The translation ranges and step resolution ranges specified for these axes are required for full range of motion for sample mapping and high-resolution measurement conditions. The Z-axis is critical to measuring thick films by reflectometry without the need for a Knife Edge Collimator.

6. Under Specification E for the diffracted beam optical system, why is it required that the analyzer crystal be Ge (220) channel-cut crystal 2-bounce standard with optional 4-bounce capability? Our specifications are similar but not identical.

A Ge (220) 2-bounce analyzer crystal is required for high-resolution mode. The analyzer crystal must also have a w_A axis so it can be automatically switched from slits to 2-bounce mode. This also requires that the scintillation counter detector have a translation (D) to accommodate for lateral beam shift. Again, this provides the necessary automation to allow a variety of low and high-resolution measurements to be pre-programmed and performed on the same sample. The system must be upgradeable to a 4-bounce analyzer crystal for ultra high-resolution measurements, which would be added to the system at a later date.

All other terms and conditions remain unchanged. The closing date and time for the receipt of proposals remains February 24, 2004 at 4:00 p.m.