



Guidelines for submission of samples for measurement

Technical note 6

1. Health and Safety

Although we will try to handle most materials, there are certain items we cannot accept, either for legal reasons, or because they may threaten the safety of our staff or the public.

Before sending any material to Aquila Instruments Ltd. please verify that it meets the requirements of this section and complete the attached safety declaration. A completed safety declaration must accompany all samples sent to Aquila Instruments: shipments of samples received without a safety declaration may be refused.

- **Toxic materials.** If you intend to submit samples containing toxic components, please ensure that all toxic hazards are clearly identified on the safety declaration. If any of your samples are likely to require handling precautions other than normal safe laboratory practise, please contact Aquila Instruments before submitting the sample.
- **Biological materials.** Please note that we do not have facilities for safe handling of biohazard materials. Under no circumstances should you send materials likely to contain infectious substances or pathogens in Hazard Group 4 to Aquila Instruments Ltd. We cannot accept clinical or medical waste.
- **Radioactive materials.** Do not send us any material which is, or may have become likely to emit ionising radiation.
- **Explosives.** Do not send us explosive materials, even in minute quantities.
- **Oxidising and reducing agents, other reactive chemicals.** Please contact us before submitting any sample requiring special handling precautions.
- **Flammable materials.** Please contact us before sending any highly flammable material (e.g. certain adhesives) as shipping or storage restrictions may apply.

2. Preparation and packaging

Please ensure that your samples are adequately and securely packed and that the **coated side(s) of the substrate are clearly identified**. If sending more than one sample please ensure that each sample is clearly identified.

Thin coatings of some physically soft materials can be damaged in transit by contact with surrounding packaging. If necessary, use a specially constructed substrate holder to ensure that the coated surfaces do not come into contact with anything.

Unlike other measurement techniques, such as ellipsometry, **no special precautions are needed to prevent reflections from the substrate**. We can measure coatings on opaque and transparent substrates without any need to sand-blast or paint the rear surface of the substrate to eliminate reflections.

3. Samples

To accurately analyse your sample, we need to know the optical properties (refractive index, absorption coefficient) of both the substrate and each of the layers. If the substrate is a high-quality optical glass, we can use the manufacturer's data for the substrate. However for optimum results, it is always preferable to submit a sample of the uncoated substrate material so we can characterise the actual substrate used in your samples. For the very highest precision, it is always necessary to submit an uncoated substrate for characterisation as material properties can vary from one manufacturer to another and even from one batch of substrates to another.

Thick substrates. If your substrate is thicker than 3mm please send two samples of uncoated substrate - one will be used to compensate for the deviation of the transmitted beam as it passes through the sample.

Curved surfaces. Please note that samples submitted for analysis with the nkd-6000 system should be nominally flat, with parallel surfaces. Only small deviations from flatness and parallelism can be tolerated. Samples in which the substrate itself is a thin flexible material, such as plastic films, can be handled without any problems, however.

Single-layer samples

Please send:

1. Uncoated substrate, plus
2. Coated substrate

Multi-layer samples

Our data analysis can extract up to two completely unknown parameters in systems containing up to 5 layers.

Please send:

1. Uncoated substrate,
2. Substrate coated with layer 1 only
3. Substrate coated with layer 2 only
4. Substrate coated with layer 3 only
5. etc...
6. The full multi-layer sample.

Minimum sample size:

20 mm diameter or 17 mm x 17 mm (if below 3 mm thick).

25 mm diameter or 25 mm x 25 mm (if between 3 mm and 7mm thick).

Preferred sample size:

Microscope slide: 75 mm x 25 mm x 1mm thick.

Wafer: 75 mm, 150 mm or 200 mm diameter.

Maximum sample size:

200 mm x 250mm x 7mm thick.

4. Shipment

Please use a signature-on-delivery service such as FedEx, UPS or TNT. The contents of the package should be described as "Samples" with a declared customs value of £1 or \$1.

If any of your samples have substrates made from precious metals or natural gem stones there may be additional import/export restrictions. If this is the case, please check with your shipper.

Send samples to:

Measurement Laboratory
Aquila Instruments Ltd.
Ickleton Road, Duxford
Cambridge
CB2 4XQ
United Kingdom

5. Return of Samples

Samples submitted to our measurement service:

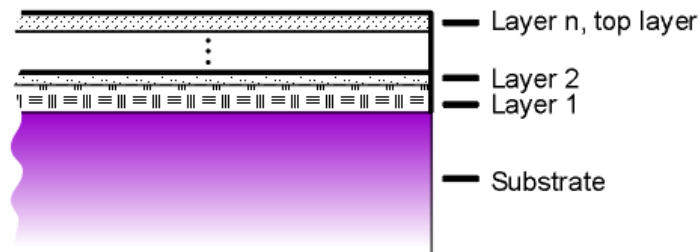
Please indicate whether you require your samples to be returned. The cost of the return shipping will be added to your invoice.

Samples sent for free evaluation:

If you require your samples to be returned, please provide your courier account number or a pre-paid envelope for the return shipping or include payment for the return shipping when submitting the samples.

6. Required information

Please supply as much information as you can about the substrate, the layers and their thickness. Use the following notation when referring to the layers:





Submission Form

Sample Measurement Service

1. Please indicate if this work is confidential: yes, no.

2. Your details:

Company:	
Address:	
	Zip/postal code:
Person to contact:	Name: E-mail: Telephone: Fax:
Return address:	
Your reference or PO number	

3. Measurements and results:

Measurement range:

<input type="checkbox"/> Not specified	<input type="checkbox"/> Standard (350-1000nm)	<input type="checkbox"/> UV (250-1000nm)
<input type="checkbox"/> NIR (800-1700nm)	<input type="checkbox"/> Wideband (350-1700nm)	<input type="checkbox"/> Other

Output:

<input type="checkbox"/> Written report	<input type="checkbox"/> Pro-Optix (OPP) files	<input type="checkbox"/> Spreadsheet (XLS) files
<input type="checkbox"/> Updated database files	<input type="checkbox"/> CSV files	<input type="checkbox"/> Text files

Report

<input type="checkbox"/> Printed paper	<input type="checkbox"/> PDF	<input type="checkbox"/> Text file
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Return shipping:

<input type="checkbox"/> E-mail	<input type="checkbox"/> Express courier	<input type="checkbox"/> Standard postage
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Objective:

Please indicate any special objectives of this measurement.

4. Samples

Please attach details of your samples. Refer to the guidelines for submission of samples and complete the attached safety declaration.

Aquila use only

Date Received:	Time Received:	Job number:
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Safety Declaration

Sample Measurement Service

I hereby certify that I have read the guidelines for submission of samples to Aquila Instruments Ltd. and confirm that the samples being submitted herewith comply with the safety requirements set out therein and that the possible presence of any toxic or hazardous material is indicated in the accompanying documentation. The samples have been packaged in accordance with any special requirements of the carrier or shipping agent concerned. The samples are not subject to any special import/export restrictions.

Total number of samples:

Signed:

Name:

Date:

If the samples contain any materials likely to need special handling precautions, give full details here:

Please note:

Any information supplied free of charge by Aquila Instruments Limited, including measured data and analysis, remains the property of Aquila Instruments Limited and may be used only for assessment of the nkd Thin Film Measuring System and no other purpose.