

Specification

Spectral range	nkd-8000 350nm – 1000nm (standard model) nkd-8000v 280nm – 1000nm (UV enhanced model) nkd-8000r 800nm – 1700nm (infrared model) nkd-8000w 350nm – 1700nm (wide spectrum model*) nkd-8000e 350nm – 2500nm (extra wide spectrum model*) *wide spectrum model is supplied with two detectors covering 350nm to 1000nm and 800nm to 1700nm or 2500nm for nkd-8000e, which cannot be used simultaneously																										
Data acquisition time	2 to 10 minutes depending on range and options selected																										
Data analysis time	5 seconds to 5 minutes depending on complexity																										
Spectral resolution	1 or 2nm (selectable)																										
Light source	nkd-8000v 150W Xenon arc lamp Others High stability 100W quartz tungsten halogen lamp																										
Sample size	10x10mm to 200x250mm standard system Up to 100mm diameter for X-Y mapping stage																										
Layers	Up to 5 layers with 2 unknown parameters																										
Film thickness range	5nm to 20µm depending on angle, polarization and wavelength																										
Substrates	Transparent, opaque or semi-absorbing or semi-conductor																										
Materials	Dielectrics, polymers, semiconductors and metals																										
Accuracy	<table border="1"> <thead> <tr> <th>For semi-absorbing film</th> <th>Typical</th> <th>Maximum</th> </tr> </thead> <tbody> <tr> <td>Film thickness</td> <td>< 1%</td> <td>< 3%</td> </tr> <tr> <td>Refractive index</td> <td>< 0.1%</td> <td>< 1%</td> </tr> <tr> <td>Extinction coefficient</td> <td>< 1%</td> <td>< 3%</td> </tr> <tr> <td colspan="3">For metallic film</td> </tr> <tr> <td>Film thickness</td> <td>< 1%</td> <td>< 3%</td> </tr> <tr> <td>Refractive index</td> <td>< 1%</td> <td>< 3%</td> </tr> <tr> <td>Extinction coefficient</td> <td>< 1%</td> <td>< 3%</td> </tr> </tbody> </table>			For semi-absorbing film	Typical	Maximum	Film thickness	< 1%	< 3%	Refractive index	< 0.1%	< 1%	Extinction coefficient	< 1%	< 3%	For metallic film			Film thickness	< 1%	< 3%	Refractive index	< 1%	< 3%	Extinction coefficient	< 1%	< 3%
For semi-absorbing film	Typical	Maximum																									
Film thickness	< 1%	< 3%																									
Refractive index	< 0.1%	< 1%																									
Extinction coefficient	< 1%	< 3%																									
For metallic film																											
Film thickness	< 1%	< 3%																									
Refractive index	< 1%	< 3%																									
Extinction coefficient	< 1%	< 3%																									
Repeatability	<table border="1"> <tbody> <tr> <td>Transmittance</td> <td>< 0.01%</td> <td>< 0.1%</td> </tr> <tr> <td>Reflectance</td> <td>< 0.01%</td> <td>< 1%</td> </tr> <tr> <td>Refractive index</td> <td>< 0.01%</td> <td>< 0.1%</td> </tr> </tbody> </table>			Transmittance	< 0.01%	< 0.1%	Reflectance	< 0.01%	< 1%	Refractive index	< 0.01%	< 0.1%															
Transmittance	< 0.01%	< 0.1%																									
Reflectance	< 0.01%	< 1%																									
Refractive index	< 0.01%	< 0.1%																									
Incident beam angle	30, 50 or 70 degrees (standard unit) or any customer specified angle 20 to 70 degrees continuously variable (variable angle version) or 3 position Multi angle.																										
Spot size at sample	5mm (standard system), 250µm option																										
Power	220V, 50Hz, 2A or 110V, 60Hz, 3A																										
Overall dimensions	890 x 540 x 720 mm																										
Weight	105Kg																										
Options and accessories	Multi-angle, Variable angle, X-Y sample mapping platform, various standard size sample inserts, Sample viewing microscope, Manual or fully software controlled polarisation selection (s-, p- or unpolarised), Heated sample chuck, Pedestal and Industrial PC.																										

nkd-8000

UV-VIS-NIR Spectrophotometer

Advanced Thin Film Characterisation



nkd-8000



Advanced Thin Film Measurement

The nkd-8000 combines optics, electronics and advanced analysis software to provide the most precise and easy to use system available, for determining the refractive index, absorption coefficient and layer thickness of multilayer films and substrates. The 8000 series features fully automated, simultaneous measurement of transmittance and reflectance spectra at incident angles, continuously variable from 0 to 90

degrees. This represents unparalleled functionality in a spectrophotometer and makes the nkd-8000 suitable for the most challenging optical measurements. Unambiguous determination of n, k and d for multilayer thin films and substrates is achieved quickly and accurately.

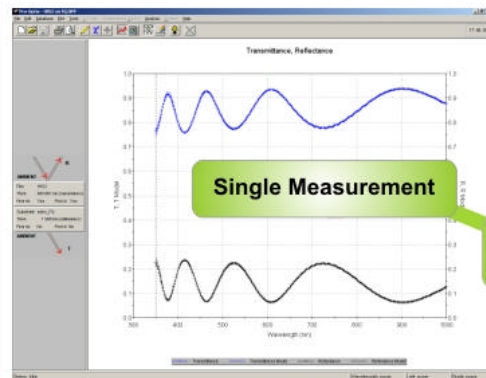


Key Features

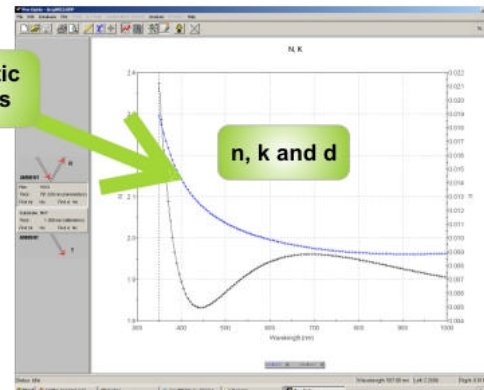
- Measurement of Transmittance & Reflectance spectra from 280 to 2300nm
- Simultaneous measurement of T & R from same area
- Precise unambiguous determination of refractive index (n), absorption coefficient (k) and layer thickness (d)
- Sample mapping with X Y platform - option
- Fixed, Multi-angle and continuously variable angle options 0 to 90 Incidence.
- Measurement of T & R using s-, p- or unpolarised incident light
- Measurement of transparent substrates and no sample preparation
- Inbuilt materials database
- Environmentally sealed sample chamber
- Selection of Dispersion models
- Online & offline analysis capability



Simultaneous T & R measurement



Automatic Analysis



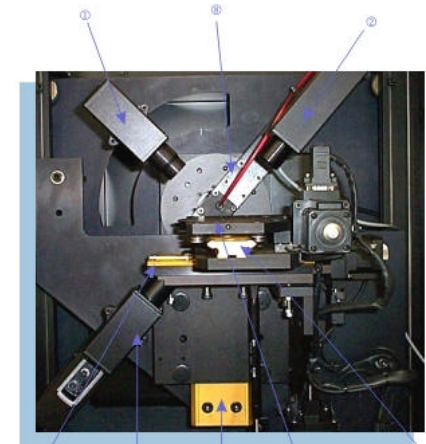
The nkd-8000 measures transmittance and reflectance spectra simultaneously from exactly the same spot, ensuring direct correlation between the two sets of data. Fully automatic control and analysis software then determines n, k and d from the measured spectra. All from one measurement. A selection of dispersion models provide analysis for a wide range of materials and users may choose from default or advanced analysis modes.



Variable Incident Angles

The variable angle option of the nkd-8000 provides full motorised PC control of the angle of incidence from 0 to 90 degrees with an angular resolution of 1 arc second. Incident light polarisation (s-, p- or unpolarised), can be selected using the standard manual or computer controlled polarisation option. S- and P- spectra for T and R can be analysed separately or combined using the merger tool in the software for use in the analysis.

The powerful Pro-Optix™ control and analysis software includes an editable database of pre defined materials to facilitate speedy analysis. Other software features include colour co-ordinate and solar calculations as well as metal films algorithms. Samples can be transparent, opaque or semi-absorbing with no preparation required. The nkd-8000 is the only spectrophotometer to offer all this functionality and sets the standard for thin film characterisation.

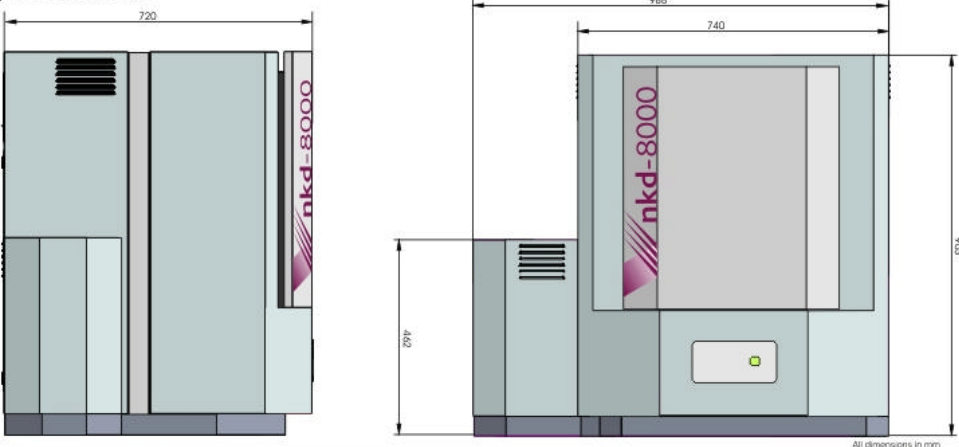


- ① Reflectance detector
- ② Beam tube
- ③ Y axis
- ④ Transmittance detector
- ⑤ Z axis
- ⑥ X axis
- ⑦ Sample platform
- ⑧ Motorised variable angle selection

Mapping of large samples is provided for with the optional X Y platform, which provides 100mm travel in both directions whilst maintaining a clear aperture through the center of travel. A range of standard sample inserts are available for simple exchange between measurements and can accommodate a wide variety of sample types. Full PC control makes this a simple yet powerful tool for collecting and analysing data for the whole sample, accurately and rapidly.

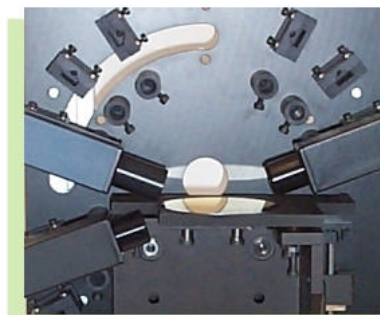


Dimensions



Multiple Angle

For applications where only a discrete set of incident angles are required, the multiple angle option provides an ideal solution. Three user defined angles can be chosen from 0 to 90 degrees.



Accessories

The nkd-8000 has a range of accessories designed to suite a wide variety of applications. The heated sample chuck fits neatly onto the X Y platform or the standard workpiece, providing T and R measurements for temperatures up to 150 degrees C and is useful for determining spectral shift of optical coatings and substrates. A sample viewing microscope/camera is available, which provides a magnified image of the sample for alignment of small features to the beam axis. The micro-spot accessory can be used to focus the beam down to 200µm, and is particularly useful for characterising small samples or areas not selectable with the standard beam size of 5mm. Various sample inserts are also available for convenient sample mounting and can be supplied in standard sizes or to the users specification. An industrial PC and pedestal system is also available for convenient installation of this desktop system in any facility.