

The NASA Langley Research Center Hypersonic Materials Environmental Test System (HYMETS) 400kw arcjet facility is looking to purchase an Integrating Sphere/Uniform Spectral Source to perform spectral response calibrations for the facility's spectrometers. The following items present the requirements for the procurement of the Integrating Sphere/Uniform Spectral Source for the HYMETS Facility. The purchased item shall:

- 1) Not be used or reconditioned hardware
- 2) Have a spherical housing that is approximately 6 inches in diameter
- 3) Accommodate instrumentation with a field of view less than or equal to a 20 degree full angle
- 4) Have a PTFE liner
- 5) Have an operational spectral range from 220 nm to 2500 nm, with current wavelengths of interest from 950 nm to 1700 nm
- 6) Have a diffuse reflectance coating with a reflectance greater than 93% across the operational spectral range (220 nm to 2500 nm), with a reflectance greater than 98% across the current wavelengths of interest (950 nm to 1700 nm)
- 7) Have the following dedicated ports and hardware appropriately mounted on the spherical housing for (NOTE: Vendor to supply drawings to NASA for approval prior to manufacturing of hardware.):
 - i. an external halogen light source with variable attenuator
 - ii. a future fiber fed UV light source with appropriate baffling installed (NOTE: Port to be covered at time of manufacturing and calibration with a removable plug that has the same liner and reflectance coating described in lines 4, 5, and 6 above.)
 - iii. an unfiltered detector/radiometer
 - iv. a gaseous nitrogen ¼ NPT Nipple purge port
 - v. a 1.5 inches in diameter exit port
- 8) The external halogen light source shall:
 - i. in conjunction with a variable attenuator provide an equivalent or greater system radiance to that of a 20 Watt internal halogen light source
 - ii. be a tungsten halogen lamp
 - iii. have a rhodium reflector
 - iv. have an estimated lifetime greater than or equal to 1000 hrs
 - v. come with an appropriate power supply
- 9) The variable attenuator shall:
 - i. consist of a 50,000 step stepper motor and gear assembly that positions a single attenuator blade from fully closed to fully open with associated limit switch
 - ii. come with an appropriate power supply
 - iii. come with an appropriate controller
 - iv. be operated by user friendly software provided for a PC
- 10) The detector/radiometer shall:
 - i. be unfiltered
 - ii. have two-color detector components
 - a. a silicon detector with operational spectral range between 220 nm to 1100 nm
 - b. an InGaAs detector with operational spectral range between 1000 nm to 2500 nm
 - iii. be a sandwich style configuration (i.e. both detectors in one housing)
 - iv. be thermoelectrically cooled
 - v. come with an appropriate power supply
 - vi. be capable of storing programmable calibrations

- vii. be operated by user friendly software provided for a PC
- 11) The exit port shall:
- i. have a removable port frame reducer to reduce the exit port from 1.5 inches in diameter to 1.0 inches in diameter (NOTE: Port frame reducer shall be installed at time of manufacturing and calibration and have the same liner and reflectance coating described in lines 4, 5, and 6 above.)
 - ii. come with a 1.0 inch in diameter optical black fiber optic connector Sub Miniature A (SMA) 905 adapter
 - iii. come with a 1.0 inch in diameter removable cover that can be put in place when not in use
- 12) Have all of the appropriate cords, connections, controllers, and communication devices (excluding PC) for immediate setup and operation “out of the box”
- 13) Be compatible with the Windows®7 Professional 64-bit English Operating System
- 14) Have an operational temperature range from 10°C to 35°C (ambient environment)
- 15) Have Reference Guides and Documentation for all associated hardware and software in English
- 16) Have a basic hardware and software support service and warranty
- 17) Spectral Radiance Calibration shall:
- i. be performed with the following installed:
 - a. UV port removable plug (Line 7ii.)
 - b. 1.0 inch in diameter port frame reducer (Line 11i.)
 - c. 1.0 inch in diameter optical black SMA adaptor (Line 11ii.)
 - ii. be performed with variable attenuator fully open
 - iii. be NIST traceable
 - iv. be from 300 nm to 2400 nm
 - v. record detector currents and program radiometer to display 950 nm to 1700 nm in-band radiance
 - vi. have all certificates and data from the Spectral Radiance Calibration provided