



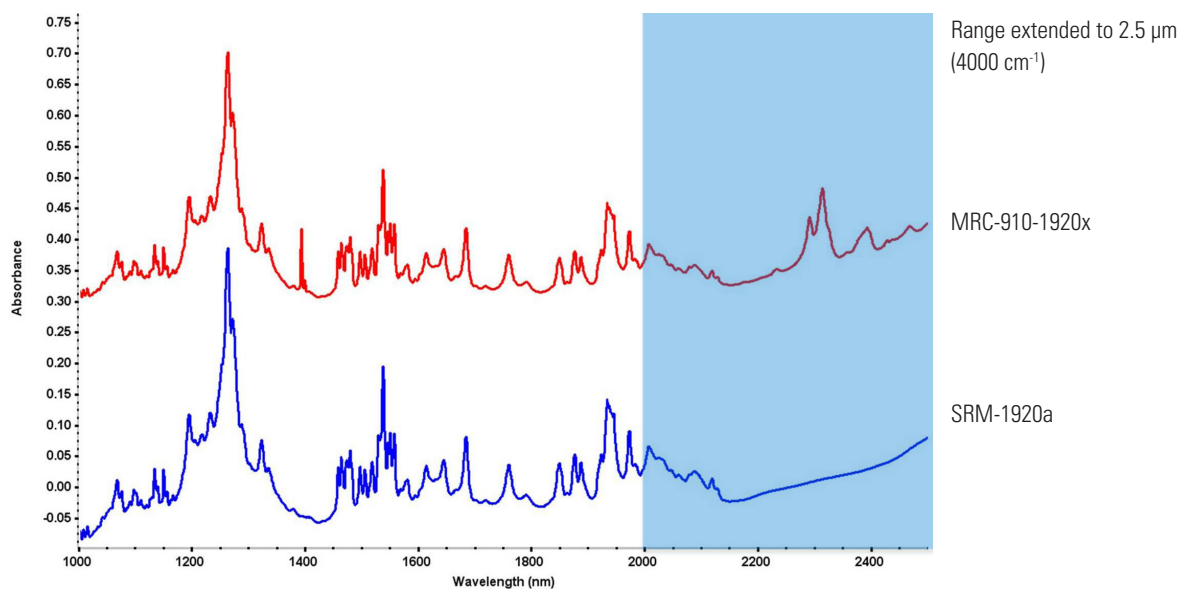
## NIST Traceable Extended Range Near-Infrared Wavelength Standard



- For dispersive and FT near-infrared instrument calibration
- Meets USP wavelength calibration requirements
- The only reflectance standard with wavelength range extended beyond 2.0  $\mu\text{m}$
- Peer reviewed, published multi-laboratory calibration with wavelength scale accuracy better than 0.02  $\text{cm}^{-1}$
- NIST traceable to SRM-1920a
- Serial number, expiration date, certificate, table of bands and spectrum enclosed with each standard
- Immediate availability
- Short recalibration turnaround time

A collaborative multi-laboratory group involving academia, industry and government set out to establish a putative diffuse reflectance standard, measure the reflectance bands with accuracy unrivalled by any other spectral measurement on condensed phase materials in the near-infrared wavelength range. The standard is a natural extension of the established SRM-1920a standard<sup>1</sup> with all bands of the NIST standard, with additional sharp and stable bands available in the 2.0-2.5  $\mu\text{m}$  region (4000-5000  $\text{cm}^{-1}$ )<sup>2,3</sup>.

The Middleton Spectral Vision 1920x is the only diffuse reflectance near-infrared standard studied for its thermal behavior. Cooled to 7°C and gradually heated to 60°C, all analytical bands are characterized with a very small thermal gradient<sup>2</sup>.

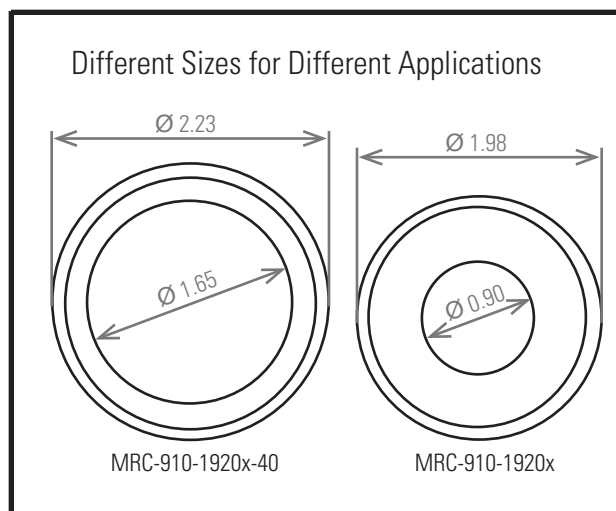


## Calibration of Dispersive Instrumentation

Dispersive instruments require known bands to establish an accurate wavelength scale. Dispersive instruments have constant wavelength resolution, whereas Fourier transform instruments have a constant wavenumber resolution. The 1920x Wavelength Standards are calibrated with FT-NIR instruments that have higher resolution, better wavelength accuracy and precision than dispersive instruments. Thus, in order to make the 1920x standard the most useful for dispersive instruments, the diffuse reflectance bands were calculated at constant-wavelength resolution to simulate spectra that would have been measured on a grating monochromator<sup>4</sup>. The table of accurate wavelengths in the 2-10 nm resolution range is enclosed with each standard.



*The 1920x series standards have optical mounts most commonly used with dispersive near-infrared instrumentation.*



## References

1. V. R. Weidner, P. Y. Barnes and K. L. Eckerle, *J. Res. Natl. Bur. Stand.* 91: 243-253 (1986).
2. T. Isaksson, H. Yang, G. J. Kemeny, R. S. Jackson, Q. Wang, M. K. Alam and P. R. Griffiths, *Appl. Spectroscopy*, 57 (2): 176-185 (2003).
3. H. Yang, T. Isaksson, R. S. Jackson, P. R. Griffiths, *J. Near Infrared Spectrosc.*, 11: 241-255 (2003).
4. *Ibid.*, 229-240 (2003).

## Ordering Information

### MRC-910-1920x

( $\varnothing 2.00''$ )

### 1920x Extended Range Near-Infrared Wavelength Standard

Complete with case, certificate, traceability measurement documentation

### MRC-910-1920x-40

( $\varnothing 2.25''$ )

### 1920x Extended Range Near-Infrared Wavelength Standard

Complete with case, certificate, traceability measurement documentation

## Related Products and Services

### MRC-910-G25

#### Diffuse Gold Reference

1 inch diameter high reflectivity diffuse scattering gold  
Mounted in a 2 inch diameter holder without window

### MRC-910-GW

#### Diffuse Gold Reference

Sealed in 2 inch diameter holder with optical window

### MRC-910-G40

#### Diffuse Gold Reference

1.7 inch diameter high reflectivity diffuse scattering gold  
Mounted in a 2.25 inch diameter holder without window

### MRC-910-RC

**Recertification** of either of the 1920x standards (MRC-910-1920x-XX)