Mirrors

- **Laser Line Mirrors** with multilayer dielectric coatings for 0 and 45 degree incidence
- **Broadband Mirrors** with multilayer dielectric coatings
- **Femtosecond Laser Mirrors** with Low and Negative Dispersion
- **Ultra-broadband Mirrors** with enhanced metallic coatings
- **Metallized Mirrors** with protected aluminum coatings
- **Hot and Cold Mirrors** with multilayer dielectric coatings
- **Spherical Mirrors** with protected aluminum coatings
- **Parabolic Mirrors** with protected aluminum coatings

Mirrors are a critical and commonly used component in many optical systems. They are used to fold, bend and focus optical beams. They often allow a more compact and manageable system design. Optical quality mirrors are coated on their front surface with a metallic or dielectric coating to reflect the light. Three characteristics are important when choosing an optical mirror: surface figure, surface quality and the coating specification.

Surface figure refers to the geometric variation of the actual mirror surface from the ideal. By convention this is measured in fractions of a wave of light at 633nm. Note that because the light is reflected from the surface the actual wavefront degradation will be twice the deviation specified. Optical finishing techniques all suffer from a small boundary effect at the edge of a component. This results in a slight turn down of the surface in the outer 5% of the diameter. This turn down is typically less than two or three times the nominal specification. As a result, only the central 90% of a mirror should be used in demanding applications. Our best quality mirrors are the Laser Mirrors and the Broadband Mirrors; they should be selected in most situations where wavefront distortion and scattering are of concern.

Surface quality refers to residual defects in the surface of the mirror; normally slight scratches or sleeks and digs or pits. Apart from being unsightly, surface defects contribute to scattering of the reflected light. In most imaging applications these contributions are negligible and will not cause problems. In laser systems, however, scattering can cause unwanted diffraction patterns and even (in higher power applications) contribute to the failure of the coating. Our mirror specifications follow the US Military Specification Standard MIL-0-13830A for scratch and dig performance. Our Laser Mirrors and Broadband Mirrors provide the highest levels of surface quality and should be selected for critical applications.

Different coatings are available for different applications because no one coating is able to optimize all of the reflection criteria at one time. Coatings will affect the intensity and polarization state of the reflected beam and so should be chosen with care. Spectral reflectance curves for our various coatings are shown in the preceding coatings section. Note that the highest reflectivity is sometimes restricted to a narrow spectral range. While all of our mirror coatings are durable, first surface mirror coatings should be handled with care.

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