



North American Coating Laboratories Broadband Anti-reflective Coating Technical Data Sheet

North American Coating Laboratories broadband anti-reflective coating treatment is designed to reduce visible light reflectance by using transparent thin film structures with alternating layers of contrasting refractive indexes. The layers are deposited on the substrate using electron beam, ion assisted, vacuum deposition technology to produce destructive interference in the beams reflected from the interfaces, and constructive interference in the corresponding transmitted beams.

North American Coating Laboratories broadband anti-reflective coating treatment reduces up to 99% of glare and reflections. This reduction in reflections also improves the contrast of the image by elimination of stray light. North American Coating Laboratories anti-reflective coating is perfect for touch screens, optical windows, display clusters, and most substrates that will display an image or transmit light waves.

North American Coating Laboratories can customize the broad band anti-reflective coating structure's performance to change with wavelength and incident angle, so that color effects can appear at oblique angles. A wavelength range must be specified when ordering such coatings, but outstanding performance can often be achieved for a relatively wide range of frequencies across the visible spectrum and into the near infra-red spectrum.

North American Coating Laboratories broadband anti-reflective coating treatment can also be coupled with a hydrophobic treatment to aid in the cleaning of substrates. HydroSeal® is North American Coating Laboratories proprietary hydrophobic treatment, and is engineered to create a molecular bond with an anti-reflective coated substrate using vapor deposition technology. This coating combination creates a barrier against dirt, dust, grease and liquid that easily sheds rain, skin oils, fingerprints, salt, dirt and dust. The substrates are easy to clean and they stay clean longer than ordinary untreated substrates, maintaining the highest level of clarity.

North American Coating Laboratories broadband anti-reflective coating treatment was rigorously tested and compared to competitive coatings. North American Coating Laboratories broadband anti-reflective coating treatment proved to be an excellent performer through rigors such as the Ease of Cleaning Test and Real Life Simulation Test from COLTS Laboratories.

COLTS Laboratories' Ease of Cleaning Test simulates cleaning by putting the lens surface through 100 wiping cycles. Then, a piece of tape is attached to the lens. Less force required to remove the tape means better hydrophobic properties. This test also confirms the adhesion of the coating per MIL-C-675 and MIL-14806A for anti-reflective and standard interference coatings.

COLTS Laboratories' Real Life Simulation Test uses five tests, AR Cloth Rub, luminous transmittance and haze evaluations, the Tumble Test, and the CHOCA test, to determine the strength of coatings. North American Coating Laboratories broadband anti-reflective coating treatment again proved to be an excellent performer when tested and compared to competitive coatings.



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North American Coating Laboratories broadband anti-reflective coating treatment has also been tested and approved for the standard Military Specifications. MIL-STD 810E Method 506.3 (Rain) MIL-STD 810E Method 507.3 (Humidity) MIL-STD 810E Method 509.3 (Salt Fog) MIL-STD 810E Method 510.3 (Sand and Dust) MIL-STD 810E Method 521.1 (Icing, Freezing Rain).

As a multi-layer broadband anti-reflective coating this coating also must exceed all durability requirements of: MIL-C-675C, MIL-C-14806A, MIL-C-48497A and MIL-F-48616. North American Coating Laboratories broadband anti-reflective coating treatment conforms to the spectral requirements of the above listed military specifications.

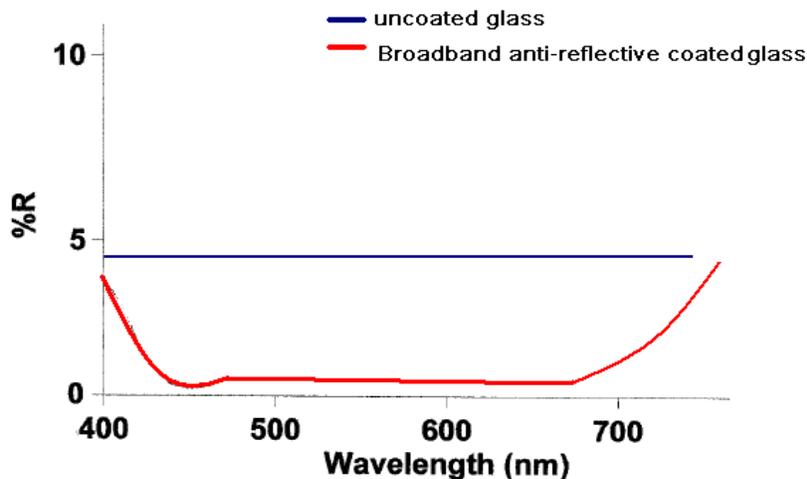
North American Coating Laboratories provides specialized optical coatings for a wide variety of customers in both the polymer and glass optics markets. Our specialized knowledge and experience in both dip-applied and vacuum-applied processes make NAACL one of the most respected and trusted organizations in the optical coatings field. Our

coating competencies include Protective, Scratch-resistant, Reflective, Anti-reflective, Hydrophobic, Filter, Conductive, ITO, and Chemically Resistive coatings. North American Coating Laboratories is certified to ISO 9001:2000 quality standards and has been in business since 1974.

Currently North American Coating Laboratories services clients in the automotive, aeronautic, consumer electronic, military, medical, and ophthalmologic fields as well as many others. Our customers range from high end sunglass manufacturers to military attack planes. Because of the ubiquitous nature of our technology we are able to add value and increase the performance of virtually any optical element that light passes through or that images are viewed through.

For more information on North American Coating Laboratories broadband anti-reflective coating treatment please contact Dan Fiore, Director of Business Development for North American Coating Laboratories at 866-216-6225, or visit our website at www.nacl.com.

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