

## **19A NCAC 03D .0552 PHOTOMETER DESIGN AND PERFORMANCE REQUIREMENTS**

- (a) Multi-piece photometers shall be designed to be operated by one person on front windows, roll-down and non-roll-down side windows, and rear windows with up to 1/4-inch glass thickness. The multi-piece photometer shall have a three-digit digital readout capable of displaying from 00.0% to 99.9% transmittance with a resolution to the nearest 1/10 of 1%.
- (b) The multi-piece photometer shall incorporate an automatic alignment feature or positive alignment indication such that the alignment of the transmitter and receiver are accomplished either automatically by respective devices or through an electronic noise indicating proper alignment, a light indicating alignment, or a feature that prevents readings being taken without the device being aligned. The automatic field of view of the transmitter and receiver shall be large enough to provide an accurate reading of the true net transmittance of the measured window.
- (c) All photometric devices shall maintain unit accuracy within plus or minus three percentage points of reference samples between ten and seventy percent net light transmission.
- (d) All photometric devices shall have a repeatability of plus or minus one percentage point from reading to reading.
- (e) If the unit's supply voltage falls below the usable operating range, the device shall produce a low battery indication or fail to perform testing. Accurate readings must not be affected by the unit's supply voltage. The unit's power supply shall be capable of producing a minimum of 200 readings before replacement or recharge.
- (f) Photometric devices shall fail the Division's certification if it is affected by outside stray or ambient light sources. In addition to physical light barriers, such as felt covers and rubber gaskets, the photometer shall include some form of electronic filtration or cancellation of any stray or ambient light sources.
- (g) Photometric devices shall not be affected by interference generated by electric equipment, tools, or lighting devices. Readings shall not fluctuate when close to operating electric motors or lighting sources.
- (h) Operating humidity range shall be 0-100% non-condensing. Operating temperature range shall be zero to 110 degrees F.
- (i) Photometric devices shall incorporate a means of compensating for temperature and humidity changes within the stated ranges of this Rule. Acceptable units shall be capable of demonstrating both accuracy and repeatability of transmittance readings throughout the operating temperature and humidity ranges under Paragraph (h) of this Rule.
- (j) The multi-piece photometer's transmitter shall have a light source capable of providing a uniform intensity beam that can accommodate the alignment capabilities of the receiver. Multi-piece photometers shall incorporate a means of self-alignment or positive alignment indication that shall be accomplished when the source and detector units are placed on their respective surfaces of the glazing to be measured as described in Paragraph (a) of this Rule. The alignment shall be accurate enough to position the detector unit within the uniform beam of the source. The result of this alignment feature shall be data that meets the accuracy and repeatability requirements of this Rule.
- (k) Reference samples shall be glass with a warranted transmittance stability of at least one year. Reference samples shall provide a uniform surface reading at four points with a variation not to exceed one percentage point as measured by a calibrated spectrophotometer over an indicated range within 560nm with a variance of no more than 20nm. Reference samples shall be labeled or inscribed with the manufacturer's name, address, and date of calibration. Manufacturers shall ensure replacement reference samples are available to the consumer within two working days in the event of damage or breakage.
- (l) Photometric devices shall include an all segments display option for testing the unit's LCD display segments. This test may be performed prior to each reading or through a separate test button.
- (m) Photometric units shall incorporate devices that shall protect the light source and detector from direct contact with environmental elements, dust, grease, and other products associated with automotive repair shops. These devices shall also prevent the user from touching either the light source or detector.

*History Note: Authority G.S. 20-2; 20-39; 20-127; 20-183.7(a);  
Temporary Adoption Eff. November 1, 1995 for a period of 180 days or until the permanent rule becomes effective, whichever is sooner;  
Eff. February 1, 1996;  
Readopted Eff. October 1, 2021.*