

DR/Check User Guidance Document

The DR/Check Absorbance Standards (part number 2763900) are secondary standards used to verify instrument performance. The standards provide a specific absorbance at a specific wavelength. They are best used as part of a Quality Control Program to verify instrument response independent of sample or chemistry variables. The standards set consist of three absorbance standards plus a lot-specific absorbance blank in 25 mm glass sample cells. The standards were originally designed for use with the DR/800 instrument platform. Recently, their use has been extended to the DR/2400 and DR/2500 instrument platforms. [They are usable with any colorimeter or spectrophotometer that can accommodate a 25 mm round sample cell.](#) The standards use a modification of the technology used in the color cube product line. The final product is a soft gel formulated to be hard enough to not flow if tipped, but still soft enough to not separate from or crack the glass cell walls. To insure optimum performance the standards should be stored in an upright position in the box at room temperature. Standards that have separated from the cell walls should be replaced.

Because the DR/Checks were designed for the DR/800 instrument platform, the absorbance values are specified at 420 nm, 520 nm, 560nm, and 610 nm. Specific absorbance values plus a tolerance range are given for each of the three standards at each wavelength. These twelve values are listed on a Certificate of Analysis that accompanies each set. The three standards are designed to be of increasing absorbance with nominal targets of 0.6, 1.2 and 1.8 absorbance units. Formulating standards that have approximate equal absorbance values across the entire visible spectrum gives a gray color. The standards are similar to the glass neutral density filters that are commercially available. The standards may be used at other wavelengths; however a user will need to establish the absorbance values at each alternative wavelength.

The values listed on the COA for each lot of standards produced are determined at the time of production and are average mean values determined by sampling a specified number of sets determined by the lot size. Standards and blanks should always be kept together and never switched between lots of Spec Checks. Each lot of standards has an expiration date of approximately 18 months from the time of manufacture. The standards do not have NIST traceability.

The DR/Checks provide two primary benefits to the end-user. They function as an independent standard to confirm that an instrument is reading an absorbance value consistent with the value supplied with the standards set. This "Out of the Box" type confirmation gives an end-user confidence that his or her instrument is reading absorbance values correctly at four different wavelengths over an approximate absorbance range of 0 – 2 absorbance units at each wavelength. These initial values obtained on the user's specific instrument are then recorded on a blank table that is supplied with the kit. The table has an adhesive back that can be readily applied to a notebook or directly to the instrument. Secondly, the DR/Checks provide an easy means to confirm the instrument's continued performance on a daily basis. No solutions or chemical reagents need be prepared. This provides a means to effectively troubleshoot performance issues should they arise. All chemistry related issues can be eliminated and instrument performance can be confirmed. The performance checks also provide feedback to managers, supervisors or inspectors who are concerned with insuring optimum instrument performance in field applications. .

It is important to remember the DR/Checks do not specifically give confirmation of wavelength accuracy nor do they specifically indicate stray light or filter deterioration problems. When test results fall outside the tolerance limits it may be for one of the above reasons, but it cannot be specifically attributed to any one problem. The response of the instrument is an all-inclusive value encompassing all possible sources of instrument error. The DR/Checks can confirm if changes in instrument response have occurred, but they cannot specifically identify the cause of the changes.

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