

Liquid Color Standards

Visual Comparison for Gardner Color

Operating Manual

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1 Overview



6720
6724
6726
6727

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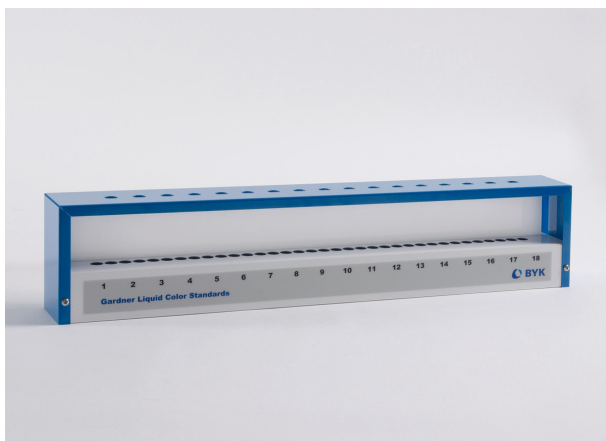
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2 Description

The instrument consists of a sturdy rack in which eighteen tubes of colored fluids are inserted into numbered positions. Empty spaces between these positions allow the placing of a tube filled with sample solution between two adjacent standards to assist in comparing colors. A panel of frosted acrylic behind the tubes provides a background of diffuse white light when viewing the tubes. Sunlight from a window or a source of indoor light is usually sufficient for using the regular Liquid Color Standards (catalog number 6724). The illuminated Liquid Color Standards are provided with their own source of cool white fluorescent light behind the frosted glass panel. Use of this standard light source allows for comparison of evaluation. The catalog number of the illuminated rack alone is 6720.



The colors of the Gardner Scale range from almost colorless “water white” through shades of yellow and range to rusty red. Standards 1 through 8 are solutions of potassium chloroplatinate; they are light in value and have a very slight greenish hue. These standards are most often used in testing preparations that have not been heated during the manufacturing process. Standards 9 through 18 are solutions of ferric chloride and cobalt chloride; they are darker and are used to test varnish, oil and resin preparations which have reached full color development through heating.

The solutions are standardized at 25 °C (77 °F), but color determinations made between 20 °C and 30 °C are substantially correct, since no appreciable change in color occurs within this range.

WARNING!



This manual cannot address all of the safety consideration associated with its use. It is the responsibility of the user to consult this manual and establish appropriate safety practices for use with this equipment and the individual materials being used.

3 Information

Because liquid color standards first appeared over 50 years ago many old sets are still in use whose colors do not exactly agree with each other, a brief history of the Gardner Liquid Color Standards will be helpful.

In the 1920's, several sets of colored liquids were developed for use in describing the colors of varnishes, resin solutions and drying oils. Of these, the most widely used was a set made of ferric chloride and cobalt chloride dissolved in hydrochloride acid, which was developed by Henry A. Gardner. These standards were described in ASTM D1544, Method of Test for Varnishes, and were widely known as the Gardner 1933 Standards. About the same time, the Hellige Company was marketing a set of glass disks with designations 1, 1L, 2, 2L, etc. Later, the Hellige Company shifted over to marketing glass disks which presumably matched the Gardner 1933 Standards.

In the late 1940's, a committee of the Intersociety Color Council undertook the investigation of various sets of color standards for liquids. As a result of this, a revision of D1544 was drawn up in which the lighter tubes (up to 8) were made with potassium chloroplatinate, and all colors were specified by the spectrophotometric color values rather than by composition. This was published as ASTM D1544-53.

In the design of this specification, a serious effort was made to retain the colors described by D1544 and the Gardner 1933 Standards, since these had been widely adopted by the trade. Unfortunately, it turned out that three of the tubes (7, 8 and 9) were significantly lighter than the accepted colors of the 1933 Standards, so these tubes gave higher numbers than did the old tubes for oils in this range. These tubes were adjusted to bring them into line with accepted usage, and a slight change was made in Tube #6 to equalize the spacing. This was published as a new method, D1544-58.

However, continuing problems with production and standardization of the liquid colors at that time resulted in demand for glass disks as primary standards. The method was again revised to use glass disks whose color is specified spectrophotometrically as the primary standard. This revision was published as D1544-63 and describes the scale used in the Gardner Delta Comparator (catalog number 6750).

At the present time, both the liquid and glass standards meet the requirements of ASTM, DIN, ISO and other specifications. The choice of instrument is principally a matter of personal preference.

4 Operation

Pour a sample of the test liquid into an empty color comparison tube (catalog number 6756). Insert the filled tube in the space between the standards which appear closest in color to the sample. Determine if the color appears to be equal to, slightly more, or slightly less in intensity than the color of the adjoining standards. Express your conclusion numerically; i.e., if the sample appears identical to 8, give it a value of 8. If it is slightly darker than 14 but much lighter than 15, call it 14+. If it is slightly lighter than 14, call it 14-. If the color appears to be between 4 and 5, but no closer to one than the other, give it a score of 4.5 or 4-5.

5 Maintenance

Replaceable Parts

The only user-replaceable part on the illuminated rack is the lamp. To service the lamp, first remove the power cord from the receptacle. Next, open the top cover and twist the lamp $\frac{1}{4}$ turn and lift the lamp from the end fixtures. Replace with a new lamp.

Replacement Lamp – Cool White Fluorescent – BYK catalog number 6035

Cleaning Procedure

Do not use any acetone for cleaning the unit! The instrument housing is resistant to a number of solvents, but cannot be guaranteed to withstand all chemicals. You should therefore use a soft, moist cloth for cleaning. For cleaning excessive dirt, use propanol.

6 Declaration

We,

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herewith declare that the product

- **Gardner Liquid Standards**

complies with the requirements of the following EC directive:

- 2014/30/EU - Electromagnetic Compatibility (EMC)

The following harmonized standards were applied:

- EN 61010-1:2010/A1:2019 - Safety requirements for electrical equipment for measurement, control, and laboratory use
- EN IEC 61326-1:2021 - Electrical equipment for measurement, control, and laboratory use - EMC requirements

March 31, 2025 BYK-Gardner USA



Timothy A. Cassell
President and General Manager



EC - Declaration of Conformity

7 Specifications

Weight: 7.3 kg (16 lbs)

Height: 13.3 cm (5.25 in)

Depth: 14.0 cm (5.50 in)

Width: 64.1 cm (25.25 in)

Power: 100 - 240 V  ; 50 - 60 Hz ; max. 25 W

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<https://www.byk-instruments.com/p/6720>

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