



Designation: D6530 – 19

Standard Test Method for Total Active Biomass in Cooling Tower Waters (Kool Kount Assay; KKA)¹

This standard is issued under the fixed designation D6530; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ϵ) indicates an editorial change since the last revision or reapproval.

1. Scope*

1.1 This test method covers the determination of viable active biomass in cooling tower water in the range from 10^2 to 10^8 cfu/mL. It is a semiquantitative test method.

1.2 This test method was used successfully with reagent water, physiologic saline, and cooling tower waters. It is the user's responsibility to ensure the validity of this test method for waters of untested matrices.

1.3 The values stated in SI units are to be regarded as standard. The values given in parentheses after SI units are provided for information only and are not considered standard.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use. For specific hazard statements, see Section 9.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

D1129 Terminology Relating to Water

D1192 Guide for Equipment for Sampling Water and Steam in Closed Conduits (Withdrawn 2003)³

D1193 Specification for Reagent Water

D2777 Practice for Determination of Precision and Bias of Applicable Test Methods of Committee D19 on Water
D3370 Practices for Sampling Water from Flowing Process Streams

3. Terminology

3.1 *Definitions:*

3.1.1 For definitions of terms used in this standard, refer to Terminology D1129.

3.2 *Definitions of Terms Specific to This Standard:*

3.2.1 *cfu/mL, n*—colony forming units per millilitre.

3.2.2 *snapping cup, n*—container provided for holding the sample and snapping tip of the vial.

3.2.3 *vial, n*—sealed glass ampoule under vacuum containing reagents for the Kool Kount Test.

4. Summary of Test Method

4.1 This test method consists of adding a specific volume of water to nutrients and a color indicator contained in a glass vial. The contents of the vial are then mixed and incubated at $35 \pm 3^\circ\text{C}$ (95°F); that is, in a shirt pocket, incubator, or heat block. The color of the sample after addition into the vial containing the nutrients and color indicator is yellow. Viable active biomass in the sample replicates using the nutrients provided and reduces the color indicator. At a critical biomass concentration, sufficient quantities of the color indicator are reduced resulting in a visible change in the indicator from the original yellow sample color to orange. The time required for conversion of the oxidized indicator to the reduced indicator resulting in an orange color as directly correlated with the concentration of viable active biomass in the water sample tested. High concentrations of active biomass in the sample produce the positive orange color more rapidly than low concentrations of viable biomass.

5. Significance and Use

5.1 This test method is useful for rapid determination of viable active biomass concentrations in cooling tower waters. The efficiency of cooling towers is directly affected by the concentration of biomass in the cooling tower waters. As biomass concentrations increase, biofilm formation occurs

¹ This test method is under the jurisdiction of ASTM Committee D19 on Water and is the direct responsibility of Subcommittee D19.24 on Water Microbiology.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ The last approved version of this historical standard is referenced on www.astm.org.

*A Summary of Changes section appears at the end of this standard