



Designation: G 29 – 96

Standard Practice for Determining Algal Resistance of Plastic Films¹

This standard is issued under the fixed designation G 29; 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 practice covers the determination of the susceptibility of plastic films to the attachment and proliferation of surface-growing algae.

1.2 The values in SI units are to be regarded as the standard. The inch-pound units given in parentheses are for information only.

1.3 *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 and health practices and determine the applicability of regulatory limitations prior to use.*

2. Summary of Practice

2.1 In this practice, test strips of plastic film are suspended in glass jars maintained at room temperature. The test strips are exposed to fluorescent light and in direct contact with a standardized inoculum of the filamentous blue-green alga *Oscillatoria* in culture medium. The sample test jars are reinoculated with fresh alga every second or third day. A control using untreated plastic film is used as a basis of comparison. The inoculum is prepared with the help of a propagation apparatus made from a small fish tank. The test is terminated at the end of two weeks, or whenever the test film shows dense algal growth.

3. Significance and Use

3.1 Bodies of water, such as swimming pools, artificial ponds, and irrigation ditches often are lined with plastic films. Algae tend to grow in such bodies of water under the proper atmospheric conditions, and they can produce slimy and unsightly deposits on the film. The method described herein is useful in evaluating the degree and permanency of protection against surface growth of algae afforded by various additives incorporated in the film.

4. Apparatus

4.1 Propagation Tank² (see Fig. 1):

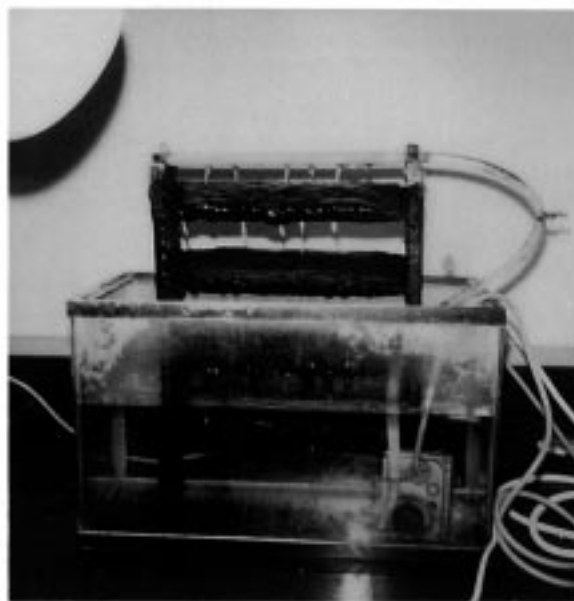


FIG. 1 Propagation Tank

4.1.1 A small fish tank (10 gal) is used to contain a simulated cooling tower, made of redwood slats, over which culture medium is recirculated through a plastic tube with holes punched in the bottom. This design was developed in order to provide ideal conditions for propagation of the algae that serve as inocula for each test. Three redwood slats are joined by two supports in such a way that water cascades over each slat in turn from a distributor tube above the upper slat. A small, fully immersed recirculating pump³ rests on the bottom of the tank and operates continuously to deliver the tank contents to the distributor tube. The light required for algal propagation is provided by a 100-W bulb placed 300 mm (12 in.) away from the redwood slats. A timing device turns the light on for 12 h each day.

4.1.2 The propagation tank, that is used as the permanent source of inoculum, is filled to approximately one-third capacity with the culture medium.⁴ Heavy growth of *Oscillatoria* rapidly develops on the redwood tower and, at different phases, this growth appears light green, dark green, or black.

¹ This practice is under the jurisdiction of ASTM Committee G-3 on Durability of Nonmetallic Materials and is the direct responsibility of Subcommittee G03.04 on Biological Deterioration.

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² The redwood tower should be soaked in water before use, until the water is colorless. Water is changed daily.

³ Model 1 MA manufactured by the Little Giant Corp., 3800 N. Tulsa Ave., Oklahoma City, OK 73107, has been found suitable for this purpose.

⁴ Culture medium in the propagation tank is discarded, and the tank is refilled with fresh medium at monthly intervals.