



Designation: ~~D3596-92 (Reapproved 2001)~~ Designation: D 3596 - 09

Standard Practice for Determination of Gels (Fisheyes) In General-Purpose Poly(Vinyl Chloride) (PVC) Resins¹

This standard is issued under the fixed designation D 3596; 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 provides a quantitative measure of the gels remaining in a flexible vinyl compound processed from general-purpose poly(vinyl chloride) (PVC) resins under a prescribed set of working conditions.

1.2 The values stated in SI units are to be regarded as the standard. The values in parentheses are for information only.

1.3 *This standard does not purport to address all of the safety problems, 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.*

NOTE 1—There are no ISO standards covering the primary subject of this practice. 1—There is no known ISO equivalent to this standard.

2. Referenced Documents

2.1 *ASTM Standards:*²

D 883 [Terminology Relating to Plastics](#)

~~D 1249 Specification for Octyl Ortho-Phthalate Ester Plasticizers~~ [Terminology Relating to Plastics](#)

D 1600 [Terminology for Abbreviated Terms Relating to Plastics](#)

3. Terminology

3.1 *General*—Definitions are in accordance with Terminology D 883 and abbreviations with Terminology D 1600, unless otherwise indicated.

4. Summary of Practice

~~4.1 A sample of PVC resin is mixed with calcium stearate and di-2-ethylhexyl phthalate plasticizer (DOP) in a laboratory mixer. After mixing, the dry blend is milled on a two-roll laboratory mill; carbon black dispersion is added during the milling.~~

4.1 A sample of PVC resin is mixed with calcium/zinc stabilizer, stearic acid, carbon black, and a plasticizer in a laboratory mixer. The dry blend is milled on a two-roll laboratory mill.

4.2 The milled sheet is press-polished and the gels counted using a bottom-lighted viewing box and a magnifying comparator.

5. Significance and Use

5.1 The gel (fisheye) in PVC resins is generally recognized as a hard particle of resin which will not fuse when the plastic mass is subjected to set conditions of hot processing. The number of unfused particles present is related to the conditions used. The presence of an excess of such particles is detrimental to many applications.

6. Apparatus

6.1 *Laboratory Mixer*, with stainless steel mixing bowl.

6.2 *Two-Roll Mill*, 152.4 by 304.8 mm (6 by 12 in.), ~~263.5~~263.5 mm (10.5 in.) between guides, differential speed ratio 1.40 \pm 0.04, fast roll speed 34 ± 2 rpm, ~~suitably heated to maintain roll with an adjustable temperature range of $154 \pm 3^\circ\text{C}$ ($310 \pm 5^\circ\text{F}$).~~ $120\text{--}205^\circ\text{C}$ ($250\text{--}400^\circ\text{F}$).

NOTE 2—If the mill available does not meet these criteria, the specifications of the mill used should be included in the report.

¹ This practice is under the jurisdiction of ASTM Committee D20 on Plastics and is the direct responsibility of Subcommittee D20.15 on Thermoplastic Materials. Current edition approved October 15, 1992. Published December 1992. Originally published as D3596-77. Last previous edition D3596-88.

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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.

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