



Designation: D 4414 – 95 (Reapproved 2001)

Standard Practice for Measurement of Wet Film Thickness by Notch Gages¹

This standard is issued under the fixed designation D 4414; 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 describes the use of thin rigid metal notched gages, also called step or comb gages, in the measurement of wet film thickness of organic coatings, such as paint, varnish, and lacquer.

1.2 Notched gage measurements are neither accurate nor sensitive, but they are useful in determining approximate wet film thickness of coatings on articles where size(s) and shape(s) prohibit the use of the more precise methods given in Methods D 1212.

1.3 This practice is divided into the following two procedures:

1.3.1 *Procedure A*—A square or rectangular rigid metal gage with notched sides is used to measure wet film thicknesses ranging from 3 to 2000 μm (0.5 to 80 mils). Such a gage is applicable to coatings on flat substrates and to coatings on articles of various sizes and complex shapes where it is possible to get the end tabs of the gage to rest in the same plane on the substrate.

1.3.2 *Procedure B*—A circular thin rigid metal notched gage is used to measure wet film thicknesses ranging from 25 to 2500 μm (1 to 100 mils). Such a gage is applicable to coatings on flat substrates and to coatings on objects of various sizes and complex shapes.

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

1.5 *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. Referenced Documents

2.1 ASTM Standards:

¹ This practice is under the jurisdiction of ASTM Committee D01 on Paint and Related Coatings, Materials, and Applications and is the direct responsibility of Subcommittee D01.23 on Physical Properties of Applied Paint Films.

Current edition approved Nov. 10, 1995. Published January 1996. Originally published as D 4414 – 84. Last previous edition D 4414 – 84 (1990)¹.

D 1212 Test Methods for Measurement of Wet Film Thickness of Organic Coatings²

3. Summary of Practice

3.1 The material is applied to the articles to be coated and the wet film thickness measured with a notched gage.

3.2 *Procedure A*—A square or rectangular thin rigid metal gage with notched sides, having tabs of varying lengths, is pushed perpendicularly into the film. After removal from the film, the gage is examined and the film thickness is determined to lie between the clearance of the shortest tab wet by the film and the clearance of the next shorter tab not wetted by the film.

3.3 *Procedure B*—A circular thin rigid metal gage having spaced notches of varying depths around its periphery is rolled perpendicularly across the film. After removal from the film, the gage is examined and the film thickness is determined as being between the clearance of the deepest face wetted and the clearance of the next deepest notch face not wetted by the film.

4. Significance and Use

4.1 Wet film thickness measurements of coatings applied on articles can be very helpful in controlling the thickness of the final dry coating, although in some specifications the wet film thickness is specified. Most protective and high performance coatings are applied to meet a requirement or specification for dry film thickness for each coat or for the completed coating system, or for both.

4.2 There is a direct relationship between dry film thickness and wet film thickness. The wet film/dry film ratio is determined by the volume of volatiles in the coating as applied, including permitted thinning. With some flat coatings the dry film thickness is higher than that calculated from the wet film thickness. Consequently, the results from the notch gage are not to be used to verify the nonvolatile content of a coating.

4.3 Measurement of wet film thickness at the time of application is most appropriate as it permits correction and adjustment of the film by the applicator at the time of application. Correction of the film after it has dried or chemically cured requires costly extra labor time, may lead to

² *Annual Book of ASTM Standards*, Vol 06.01.