



Designation: A1073/A1073M – 21

# Standard Practice for Using Hand Micrometers to Measure the Thickness of Uncoated Steel Sheet and Nonmetallic and Metallic-Coated Steel Sheet<sup>1</sup>

This standard is issued under the fixed designation A1073/A1073M; 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 approval. A superscript epsilon ( $\epsilon$ ) indicates an editorial change since the last revision or reapproval.

## 1. Scope\*

1.1 This practice covers definitions and procedures for measuring the thickness of uncoated steel sheet and nonmetallic and metallic-coated steel sheet. The methods described are designed and intended for use in both laboratory and plant situations and their environments.

1.2 The flat steel product shall conform to all the requirements of the appropriate specifications as follows: Specifications [A109/A109M](#), [A505](#), [A568/A568M](#), [A635/A635M](#), [A684/A684M](#), and [A924/A924M](#).

1.3 Quantitative limits are not addressed and are established in the general requirements, or individual product specifications, or both; or when applicable, as agreed to between supplier and user.

1.4 *Units*—This specification is applicable to orders in either inch-pound units or SI units. Values in inch-pound and SI units are not necessarily equivalent. Within the text, SI units are shown in brackets. Each system shall be used independently of the other.

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

1.6 *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.*

<sup>1</sup> This practice is under the jurisdiction of ASTM Committee [A05](#) on Metallic-Coated Iron and Steel Products and is the direct responsibility of Subcommittee [A05.07](#) on Methods of Testing.

Current edition approved May 1, 2021. Published May 2021. Originally approved in 2012. Last previous edition approved in 2017 as A1073/A1073M – 17. DOI:10.1520/A1073\_A1073M-21.

## 2. Referenced Documents

### 2.1 *ASTM Standards*:<sup>2</sup>

[A109/A109M](#) Specification for Steel, Strip, Carbon (0.25 Maximum Percent), Cold-Rolled

[A505](#) Specification for Steel, Sheet and Strip, Alloy, Hot-Rolled and Cold-Rolled, General Requirements for

[A568/A568M](#) Specification for Steel, Sheet, Carbon, Structural, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for

[A635/A635M](#) Specification for Steel, Sheet and Strip, Heavy-Thickness Coils, Hot-Rolled, Alloy, Carbon, Structural, High-Strength Low-Alloy, and High-Strength Low-Alloy with Improved Formability, General Requirements for

[A684/A684M](#) Specification for Steel, Strip, High-Carbon, Cold-Rolled

[A902](#) Terminology Relating to Metallic Coated Steel Products

[A924/A924M](#) Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

## 3. Terminology

3.1 *Definitions*—See Terminology [A902](#) for definitions of general terminology relating to metallic-coated hot-dip products.

## 4. Significance and Use

4.1 This practice provides procedures commonly used for measuring the thickness of steel sheet products under the jurisdiction of ASTM Committees A01 and A05 and their subcommittees as designated by a purchaser in a purchase order or contract.

4.2 Thickness is a significant quality characteristic of steel sheet products. The ability to accurately measure thickness

<sup>2</sup> For referenced ASTM standards, visit the ASTM website, [www.astm.org](http://www.astm.org), or contact ASTM Customer Service at [service@astm.org](mailto: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

using hand micrometers is critical in determining product conformance to specifications. The procedures for measuring thickness characteristics of steel sheet products are provided so that purchasers and suppliers have common measuring procedures for thickness measurements. The intention of these measuring methods is not to provide dimensional specifications for thickness characteristics, but rather common procedures for quantifying thickness values. For determining compliance with thickness specifications, references are provided to appropriate ASTM standards.

4.3 This practice may be used by other ASTM Committees and other standards writing bodies for the purpose of measuring thickness of metal sheet products.

**5. Apparatus**

5.1 Micrometers used for thickness measurement shall be constructed with anvils and spindles having minimum diameters of 0.188 in. [4.80 mm]. The tip of the anvil shall be flat or rounded with a minimum radius of curvature of 0.10 in. [2.55 mm] and the tip of the spindle shall be flat. Micrometers with conical tips, rounded anvil with rounded spindle, pointed tips or any surface that may penetrate the surface of the item being measured shall not be used for thickness measurements of sheet steels. Micrometers can be electronic digital, mechanical digital, or analog with vernier scale, as shown in Fig. 1(a), (b), and (c).

5.2 Unlock the micrometer and if electronic digital, turn it on.

5.3 Typical ways to hold/secure the micrometer are:

5.3.1 Grasp the micrometer as shown in Fig. 2, with the small finger placed in the frame of the micrometer for support. This allows the other hand to insert the sample for measuring after cleaning (see 5.4).

5.3.2 Support the micrometer with a micrometer mount. This allows the other hand to insert the sample after cleaning (see 5.4). Inserting the sample with one hand while lightly clamping with the other hand, as shown in Fig. 3.

5.4 Clean the micrometer tips at regular intervals. Place cleaning material, such as clean dry paper, lint free cloth, cardboard or fabric (not abrasive such as sandpaper) in

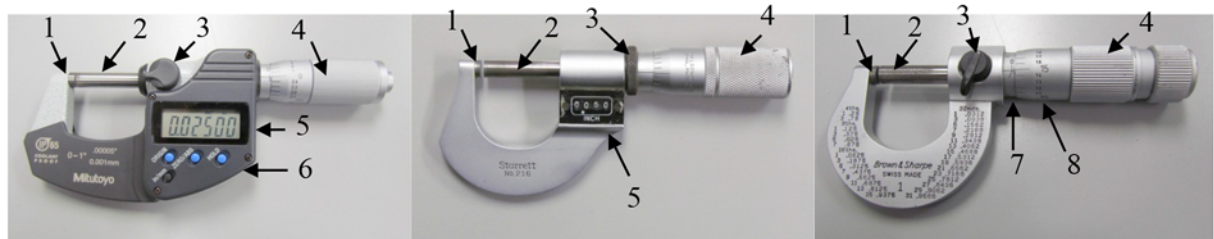


**FIG. 2 Holding a Micrometer**

between the anvil and spindle. Tighten the micrometer until lightly snug. Pull the cleaning material until free of the micrometer. Repeat until the micrometer is clean. Usually once or twice is adequate.

5.5 Close the micrometer by turning the friction thimble and zero out (reset) the micrometer in accordance with manufacturer’s instructions. For mechanical vernier micrometers, adjust the barrel to read zero in accordance with manufacturer’s instructions, and as mechanical micrometers are sensitive to barrel adjustments, recalibrate in accordance with the manufacturer’s instructions.

5.6 Measure material thickness by opening the micrometer wide enough so the sample can be placed between the anvil and



(a)

Electronic Digital

(b)

Mechanical Digital

(c)

Analog with Vernier Scale

- 1—Anvil
- 2—Spindle
- 3—Lock
- 4—Thimble
- 5—Display
- 6—Controls
- 7—Scale
- 8—Vernier Scale

**FIG. 1 Micrometer Types**