



Standard Test Methods for Tool-Resisting Steel Bars, Flats, and Shapes for Detention and Correctional Facilities¹

This standard is issued under the fixed designation A 627; 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 These test methods cover requirements for simulated service tests and testing equipment for determining the performance characteristics of various types and shapes of steels designated for use in detention and correctional facilities as fixed barriers to prevent egress and to control passage.

1.2 It is the intent of these test methods to help ensure that opening assemblies such as detention security windows, grilles, bar grating, and other physical barriers incorporating steel bars perform at or above minimum acceptable levels for control of passage to unauthorized or secure areas, for confinement of inmates and to delay or frustrate escape attempts. To meet the intent of these test methods, opening assemblies must perform to grade requirements shown in Tables X1.1 and X1.2 in Appendix X1.

1.3 These test methods apply primarily to the steels used as essential components of detention security windows, grilles, bar grating, and so forth, in opening assemblies enclosing or separating secure areas of detention/correctional facilities.

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

1.5 This standard updates and combines two previous standards, ASTM Specifications A 627-95 and A 629-94, establishing new security grades and time durations.

1.6 *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:

C 39/C 39M Test Method for Compressive Strength of Cylindrical Concrete Specimens²

E 4 Practices for Force Verification of Testing Machines³

¹ This specification is under the jurisdiction of ASTM Committee F33 on Detention and Correctional Facilities and is the direct responsibility of Subcommittee F33.02 on Physical Barriers.

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² Annual Book of ASTM Standards, Vol 04.02.

³ Annual Book of ASTM Standards, Vol 03.01.

E 18 Test Methods for Rockwell Hardness and Rockwell Superficial Hardness of Metallic Materials³

E 329 Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction⁴

3. Terminology

3.1 Definitions:

3.1.1 *bars, n*—round, ribbed, hexagonal, or other shaped bars that can be readily reduced to a round cross-sectional shape, 7/8 -in. (22.2-mm) or 1-in. (25.4-mm) diameter (see Fig. 1). Also flat bars: 1/4 by 2 in. (6.4 by 50.8 mm); 5/16 by 2 1/4 in. (7.9 by 57.2 mm) or 3/8 by 2 1/2 in. (9.6 by 63.5 mm).

3.1.2 *composite tool-resisting steel bar/flat, n*—a bar/flat that is a composite of a tungsten carbide or other hard material, for cutting resistance and of a high strength, low alloy steel, heat treated up to HRC 45 max. hardness for impact and deflection resistance.

3.1.3 *cutting test, n*—a simulated service test in which the rating is based on the number of a specific type of tungsten carbide rod saws required to cut through the bar.

3.1.4 *effective tool-resisting (ETR) area, n*—the cross-sectional area of the portion of the bar that is tool resistant.

3.1.5 *equipment manufacturer, n*—a manufacturer who fabricates and assembles security products, including tool-resisting steel bars, for installation in areas requiring security against ingress and egress. This manufacturer processes the semi-finished bar and fabricates finished products suitable for use in opening assemblies requiring these specified performance characteristics. This manufacturer is also responsible for heat treating, fabricating, and assembling all ancillary items so as not to impair the performance characteristics of the bar/flat.

3.1.6 *hardness, n*—indicated as HRC, refers to hardness measured according to Test Methods E 18 on the Rockwell C scale.

3.1.7 *homogeneous tool-resisting bar/flat, n*—a bar/flat that is nominally of uniform chemistry throughout, usually high strength, low alloy steel heat treated to HRC 61 min.—HRC 64 max. hardness to a case depth of 0.150 in. min. for rounds and each longitudinal edge hardened to 0.250-in. min. for flats.

⁴ Annual Book of ASTM Standards, Vol 04.02.