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Standard Practice for Testing Forced Entry Resistance of Security Fence Systems¹

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1. Scope

1.1 The forced entry resistance of fence systems is evaluated relative to three levels of forced entry threat using the limited hand tool inventory outlined in [Table 1](#). It also establishes a system for rating the forced entry resistance of those systems (see [Table 2](#)). The tools specified to be used for testing at each threat level are those that are known to have a maximum destructive effect on structures and their sub-assemblies and are readily available to aggressors categorized as posing that level of threat.

1.1.1 *Low Threat Level (L)*—Specifically exempted from the inventory of available tools for the low (L) threat level category are power tools (gasoline, electric or hydraulic), and devices requiring more than one person to transport and operate.

1.1.2 *Medium Threat Level (M)*—Specifically exempted from the inventory of available tools for the medium (M) threat level category are power tools requiring an outside power source or self contained gasoline or battery driven tools and devices requiring more than two persons to transport and operate.

1.1.3 *Aggressive Threat Level (A)*—Specifically exempted from the inventory of available tools for the high (H) threat level category are devices requiring more than two persons to transport and operate.

2. Terminology

2.1 *Definitions of Terms Specific to This Standard:*

2.1.1 *test director*—the individual identified by the independent testing laboratory as being responsible to complete the specified tests and to document the results.

2.1.2 *forced entry*—creating a four square feet opening.

3. Summary of Practice

3.1 For each rating a structured portion and a discretionary portion as described in [3.2](#) and [3.3](#) is required.

¹ This practice is under the jurisdiction of ASTM Committee F14 on Fences and is the direct responsibility of Subcommittee F14.50 on High Security Fences and Perimeter Barriers.

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3.2 The structured portion of the test provides for a zero to five minute test with specific tools selected as the most debilitating from the tool list in [Table 1](#), regardless of the fence system being tested.

3.3 Following the structured portion of the test, the discretionary portion of the test provides up to 55 minutes of testing, optimizing forced entry efforts by selecting any (or all) tools from the applicable category of the list (low (A), medium (B), or aggressive (C)). Selection of tools is based on the perception of the test director as to which tools will most effectively result in a forced entry.

3.4 Testing of security fence systems in accordance with the requirements of this test method shall result in a rating reflecting the severity of the threat and the cumulative resistance time (see [Table 2](#)).

3.5 The times used to establish the protection ratings of [Table 2](#) range from 0–60 minutes and are intended to reflect the elapsed time of forced entry resistance necessary for a response force to arrive and counter the threat with additional defensive personnel and equipment. It is important to recognize that the lowest threat level time will establish the maximum time limit for a greater threat level.

4. Significance and Use

4.1 The success or failure of any attempt to forcefully penetrate a fence system is dependent upon three primary factors that collectively define the threat—the tools and devices employed, the number of aggressors, and their level of sophistication.

4.2 Normally, a test procedure of this scope would be supported by years of laboratory testing intended to qualify and accurately reproduce the destructive effects of a variety of tools, implements, and devices. However, rapidly changing social conditions have created an immediate need for building components resistant to evolving forced entry techniques. Accordingly, the procedures presented herein are based more on field experience than laboratory analysis. They are more representative than inclusive, are intended to provide a basis for the comparative evaluation of different fence systems using

forced penetration procedures and are not intended to be used to establish or confirm the absolute prevention of forced entries.

TABLE 1 Schedule of Testing—All Levels of Threat Severity

Tool(s)	Time of Application (minutes)					
	Structured Testing			Discretionary Testing		
	L	M	A	L	M	A
Crowbar 5 lb by 28 in. (2)	3-5	3-5	3-5	0-55	0-55	0-55
Cold Chisels and Hammer (2)	3-5	3-5	3-5	0-55	0-55	0-55
Hacksaw and Two HSS Blades	3-5	3-5	3-5	0-55	0-55	0-55
Sledgehammer 16 in. by 6 lb	3-5	3-5	3-5	0-55	0-55	0-55
Fire Axe 36 in. by 6 lb	3-5	3-5	3-5	0-55	0-55	0-55
Bolt Cutter (2)	-	3-5	3-5	-	0-55	0-55
Fire Axe 36 in. by 10 lb	-	3-5	3-5	-	0-55	0-55
Hole Saw 2 in. (1)	-	0-5	0-5	-	0-55	0-55
Pry Bar 30 in. Steel (2)	-	0-5	0-5	-	0-55	0-55
Sledgehammer 30 in. by 12 lb	-	0-5	0-5	-	0-55	0-55
Steel Wedge 6 in. long (2)	-	0-5	0-5	-	0-55	0-55
Circular Saw 8 in., 1100 W, and 3 Blades (1)	-	-	0-5	-	-	0-55
Disc Grinder 5 in., 1100 W, and 3 Blades (1)	-	-	0-5	-	-	0-55
Rotary and Hammer Drill 750 W and 5 Drill Bits, ½ in. (1)	-	-	0-5	-	-	0-55
Hole Saw Greater than 2 in. (1)	-	-	0-5	-	-	0-55
Steel Pinch Bar 60 in. long (2)	-	-	0-5	-	-	0-55
Reciprocating Saw 750 W and 3 Carbide Blades (1)	-	-	0-5	-	-	0-55
Sledgehammer 30 in. by 15 lb (1)	-	-	0-5	-	-	0-55
Oxyacetylene Torch with 80 ft ³ Oxygen and 40 ft ³ Acetylene Tanks (1)	-	-	0-5	-	-	0-55
Cut-Off Saw 5 KW or HD Gasoline 18 in. Dia. and 3 Blades (1)	-	-	0-5	-	-	0-55
Breaker (1900 W) 30 lb with 3 Bits (1)	-	-	0-5	-	-	0-55
Scissor Jack 1500 lb with 4 in. min retraction and 8 in. Stroke (1)	-	-	0-5	-	-	0-55
Adhesive Tape (1)	-	-	-	0-55	0-55	0-55

TABLE 1 *Continued*

Tool(s)	Time of Application (minutes)					
	Structured Testing			Discretionary Testing		
	L	M	A	L	M	A
Fishing Line (250')	-	-	-	0-55	0-55	0-55
Grappling Hook (1)	-	-	-	0-55	0-55	0-55
5-in. Knife (1)	-	-	-	0-55	0-55	0-55
8 in. Std and Self Grip Pliers (2)	-	-	-	0-55	0-55	0-55
10 in. Multiple Slip Pliers (2)	-	-	-	0-55	0-55	0-55
10 in. Pipe Wrench (2)	-	-	-	0-55	0-55	0-55
1.660 in. O.D. by 12 ft. pipe (2)	-	-	-	0-55	0-55	0-55
8 in. Plate Shears (1)	-	-	-	0-55 (1)	0-55 (1)	0-55 (2)
Screwdrivers 7 in., 10 in., and 16 in. (1)	-	-	-	0-55	0-55	0-55
Cordless ½ in. Drill with spare power pack and carbide bits (1)	-	-	-	0-55	0-55	0-55
Butane Torch (1)	-	-	-	0-55	0-55	0-55
Rope (1)	-	-	-	0-55	0-55	0-55

TABLE 2 **Forced Entry Resistant Ratings**

Threat Level	Active Test Personnel	Resistance Time (minute)			Rating
		Structured Test	Discretionary Test	Cumulative	
Low (L)	2	Less than 5	0	Less than 5	L0 to L4.9
		5	Less than 5	Less than 10	L5 to L9.9
		5	5 to 9.9	Less than 15	L10 to L14.9
		5	10 to 14.9	Less than 20	L15 to L19.9
		5	20 to 25	30	L20 to L30
		5	31 to 55	60	L31 to L60
Medium (M)	2	Less than 5	0	Less than 5	M0 to M4.9
		5	Less than 5	Less than 10	M5 to M9.9
		5	5 to 9.9	Less than 15	M10 to M14.9
		5	10 to 14.9	Less than 20	M15 to M19.9
		5	20 to 25	30	M20 to M30
		5	31 to 55	60	M31 to M60
Aggressive (A)	4	Less than 5	0	Less than 5	A0 to A4.9
		5	Less than 5	Less than 10	A5 to A9.9
		5	5 to 9.9	Less than 15	A10 to A14.9
		5	10 to 14.9	Less than 15	A15 to A19.9
		5	20 to 25	30	A20 to A30
		5	31 to 55	60	M31 to A60

4.3 The test requirements specified herein have been established for use in evaluating the penetration resistance characteristics of standard fence systems to be used in commercial, government and military installations.

4.3.1 The success of any forced entry threat is dependent on the cumulative effect of the implements used, the elapsed time, and the sophistication and motivation of the personnel affecting the forced entry.

4.3.2 Absolute penetration resistance from forced entry by a determined and well-equipped attack group is impossible.

4.3.3 Aggressor groups range from unsophisticated criminals and vandals to organized criminals.

4.3.4 Attempts to force an entry may be thwarted by increasing the time necessary to affect such an entry and by early detection. Intrusion sensors positioned as far as possible from the protected environment in conjunction with optimal