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Tech Note #4: Codes: Means of Escape (Egress), Life Safety, and Forced

Registered to ISO 900:1:2000

Originally, a window was intended to provide two things: light and ventilation. Today, various codes and regulations have required that a window provide more. Specifically, window units must also provide a means of escape for the occupant as well as prevent the forced entry of outsiders. The purpose of this note, therefore, is to demonstrate how AmesburyTruth can help your window provide all required and essential elements.

Means of Escape

According to the International Building Code, "Basements and sleeping rooms below the fourth story shall have at least one exterior emergency escape and rescue opening. . .. Such opening shall open directly into a public street, alley, yard or court." This "escape and rescue opening" can be a window, skylight or patio door, but it must meet certain criteria:

- It must have a minimum net clear opening of 5.7 sq. ft. [.529 sq m]. Net clear opening refers to the actual free and clear space that exists when the window is open. It is not the rough opening size, or the glass panel size, or any other size, but the actual opening a person can crawl through. Code officials want the opening large enough so firefighters can comfortably crawl through the window in full protective gear with an oxygen tank on their back. Ground-floor windows only need a net clear opening of 5 sq. ft. [.464 sq m]; they can be smaller because a rescue ladder doesn't take up part of the opening.

- The opening height must be at least 24 in. [609.6 mm], and the opening width must be at least 20 in. [508 mm]. The bottom of the clear opening must be within 44 in. [1117.6 mm] of the floor. The window or other opening must be operational from the inside without keys or tools. Bars, grilles and grates over windows must be operational without tools or keys and still allow the minimum clear opening.

Note that a window opening that's the bare minimum of 24 in. [609.6 mm] high and 20 in. [508 mm] wide does not meet egress requirements, since its net clear opening is only 3.33 sq. ft. [.309 sq m] A window has to be taller and/or wider than these minimums to meet the 5.7 sq. ft. [.529 sq m] opening requirement.

In order to help our customers meet egress codes, AmesburyTruth has designed several different “Egress” hinges which allow the window manufacturer the ability to achieve a larger clear opening with a window than they would if they used a standard or wash ability hinge. AmesburyTruth also manufactures Butt hinges which will provide the maximum clear opening that a window can achieve. The Egress hinges are designed to work with Dual arm, single arm or reverse dyad operators. Butt hinges are recommended to work with single arm operators only. Regular dyad operators do not work with Egress or Butt hinges and AmesburyTruth does not recommend using that combination of hardware.

The charts below show egress hinges and their wash ability hinge equivalent with the approximate additional clear opening resulting from using the egress hinge.

MAXIM 2 BAR	14.97.00.XXX WASHABILITY
14.12.00.XXX EGRESS	4.31” [109 mm]

STANDARD 2 BAR	14.05.00.XXX 14.75.00.XXX WASHABILITY	14.06.00.XXX 14.76.00.XXX WASHABILITY
14.77.00.XXX WASHABILITY	2.63” [66 mm]	3.25” [82 mm]

STANDARD 4 BAR	34.55.00.XXX 12” 401 SERIES	34.56.00.XXX 14” 401 SERIES
35.09.00.XXX 12” 222 SERIES	4.21” [107 mm]	4.74” [120 mm]

STANDARD 4 BAR	34.57.00.XXX 16” 401 SERIES	34.58.00.XXX 18” 401 SERIES
35.10.00.XXX 16” 222 SERIES	5.24” [133 mm]	5.71” [145 mm]
35.11.00.XXX 16” 224 SERIES	5.30” [135 mm]	5.78” [147 mm]

HEAVY DUTY 4 BAR	34.59.00.XXX 14” 601 SERIES	34.60.00.XXX 16” 601 SERIES	34.61.00.XXX 18” 601 SERIES
35.12.00.XXX 16.5” 333 SERIES	4.35” [110 mm]	3.97” [101 mm]	3.78” [96 mm]
35.13.00.XXX 16.5” 334 SERIES	4.41” [112 mm]	4.04” [103 mm]	3.85” [98 mm]

State and local codes can add additional requirements that you will need to take into consideration so please make sure you check with local authorities on what the codes are in your area. An example of this is that Oregon and Washington have codes stating that “no locking mechanism can be above 56 In. [1422mm] from the floor.” The objective of this code is to provide children and handicapped persons with a means of escape where locks previously were too high and hindered escape.

AmesburyTruth's multi-point lock systems work well in addressing this need; there are several multipoint systems to choose from. From Maxim to Mirage, to Encore each lock system has features and benefits that will fit your specific needs and design. These products allow lock activation from a low point on window frame, ensuring that egress windows can meet state and local codes on locking mechanism heights with ease.

Life Safety

In contrast to the hinge for means of escape, AmesburyTruth has also designed the 99 and 37 series Limit Stop Devices for our customers who fabricate products for high rise buildings, hospitals and institutions. This product restricts the window to limited opening without a key, allowing ventilation only. The objective of this product is to restrain a human being from falling through an open sash. However, it can be disconnected to provide for custodial cleaning of the window. Also available for single arm or dual arm operators is the 31727 Limit Stop Track which stops the window at a predetermined opening dependent on mounting location.

Forced Entry

The American Society for Testing and Materials (ASTM) in ANSI/ASTM F588, "Resistance of Window Assemblies to Forced Entry" has created test methods "…to establish a measure of resistance for window assemblies subjected to attacks by unskilled or opportunistic burglars."

The tests themselves involve timed, hand and specified tool manipulation along with predetermined load applications in an attempt to open the window. Loads and exact means of application are detailed for hung and sliding units, out-swinging and in-swinging hinged units, and pivoted window units. ANSI/ASTM F588 furthermore outlines the format for the test report as well as provides definitions and illustrations of window assemblies.

In response to these tests, AmesburyTruth has designed locks for awning, casement, double hung and glider/slider windows to withstand the static load and locking device strength requirements within the parameters of a complete window system. While hand and tool manipulation can be resisted by hardware design such as AmesburyTruth's Button Operated Check Rail Lock, most manipulation can be discouraged by proper design of the sash, jambs, and stops.

By offering a complete line of locking and operating hardware for the window industry, AmesburyTruth is able to help the window manufacturer and fabricator effectively meet existing building code requirements.