Understanding BHMA Standards

BHMA currently sponsors over 40 separate standards covering several types of hinges, locks, door closers and related hardware, as well as exit devices, cylinders, push pads and other input devices. Learn how they are developed and how they benefit the industry.

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Standards. Everyone's talking about them – standard transmissions, dating standards, standard time, standard oil, standards of care, standard equipment and standard poodles.

The Builders Hardware Manufacturers Association (BHMA) has standards. BHMA has been in the business of developing and publishing American National Standards for hardware since 1983.

As an accredited standards developing organization, BHMA standards are developed in accordance with the ANSI Essential Requirements, which ensure openness, balance, consensus and due process. In turn, BHMA standards provide requirements for builders hardware to benefit manufacturers, laboratories, specifiers, architects, builders, users and society in general.

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The standards define terms, set performance requirements and test methods, provide dimensions and measures for interchangeability and include general information such as building code requirements. The duties of selected hardware have been summarized as "hanging the door, controlling the door and securing the door" with life safety, durability, aesthetic and accessibility responsibilities.

What Do BHMA Standards Cover?

BHMA currently sponsors over 40 separate standards covering several types of hinges, locks, door closers and related hardware, as well as exit devices, cylinders, push pads and other input devices. Standards also include pedestrian power-operated doors, revolving doors and low-power operators for sliding, folding and swinging doors.

Due to the increasing electrification of hardware, there are standards for power supplies and battery life for both commercial and residential hardware. BHMA is also working on several new standards for energy consumption, resistance to environmental conditions and acoustic properties to keep up with ever-changing industry needs and technologies.

What Are ANSI Grades?

A typical BHMA standard addresses selection of hardware appropriate for its intended use through the assignment of grades. There are generally three grades: one, two and three, with grade one being the highest performance. Each test, of which there can be up to 15 to 20, has three levels. For example, the cycle test for a mortise lock — a type of high-performance lockset — requires 1 million cycles to achieve grade one and 800,000 cycles to meet grades two and three.

These demanding laboratory tests typically exceed actual real world usage in order to ensure high performance. Providing graded hardware can guide selection along with economic considerations.

To better understand how the grade of a given product is determined, it is helpful to know some details of the process and requirements. For illustration, consider ANSI/BHMA A156.13 for mortise locks, a product typically used in commercial and institutional facilities. In this standard, as in most other lock standards, the tests are grouped into six categories: operational, cycle, strength, security, material evaluation and finish. The tests are all done in carefully

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controlled laboratory conditions with defined methods. Each is discussed below:

OPERATIONAL

This includes tests to verify that the door will latch easily when pushed closed. All grades must be a maximum of 4.5 pounds force. Another test measures the force to retract the latch by lever, ensuring accessibility. All levers are required to retract with 28 inch pounds or less rotational force.

CYCLE

The lockset is installed on a mechanically operated test door and operated until the required cycles are obtained and then rechecked for operational compliance. The grade one test runs for one million cycles; grades two and three require 800,000.

STRENGTH

Strength tests are meant to ensure the trim, latches, deadbolts and lock mechanisms hold up to daily use, such as excessive forces on a lever, and still operate properly. For all the tests in this section, all grades must withstand a minimum of 360 pounds applied to the lever.

SECURITY

This array of tests could be described as attacks to gain entry. The differential between the grades can be significant. For example, the differences in results of a test using a ram to impact the cylinder face is shown in Figure 1.

FIGURE 1

GRADE ONE	GRADE TWO	GRADE THREE
75 ft.-lbf (100 J) 10 Blows	75 ft.-lbf (100 J) 5 Blows	75 ft.-lbf (100 J) 2 Blows

MATERIAL EVALUATION

The trim must meet requirements such as an impact to the rose with a pointed probe. Figure 2 shows how grade one is a more heavy-duty than grades two and three.

FIGURE 2

GRADE ONE	GRADES TWO AND THREE
0.075 in. (1.9 mm)	0.100 in. (2.5 mm)

FINISH TESTS

This set of tests ensures the lock will look acceptable after exposure to various environmental conditions. As is typical for most BHMA standards, all grades must meet the same requirements. In the mortise lock standard, it is permitted for a model to designate an operational grade (the minimum level met by all tests except security), which is different from the security grade.

Because these are laboratory tests, there is no absolute correlation to actual field performance, such as a product's life span. However, BHMA standards are meant to ensure their respective builders hardware products are evaluated to meet the most challenging expectations in the built environment, and grades are provided to offer choices depending on the role of the hardware. It may also be helpful to consult manufacturer literature for guidance. +

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