

Mortenson Safety Helmet Guidance & FAQ



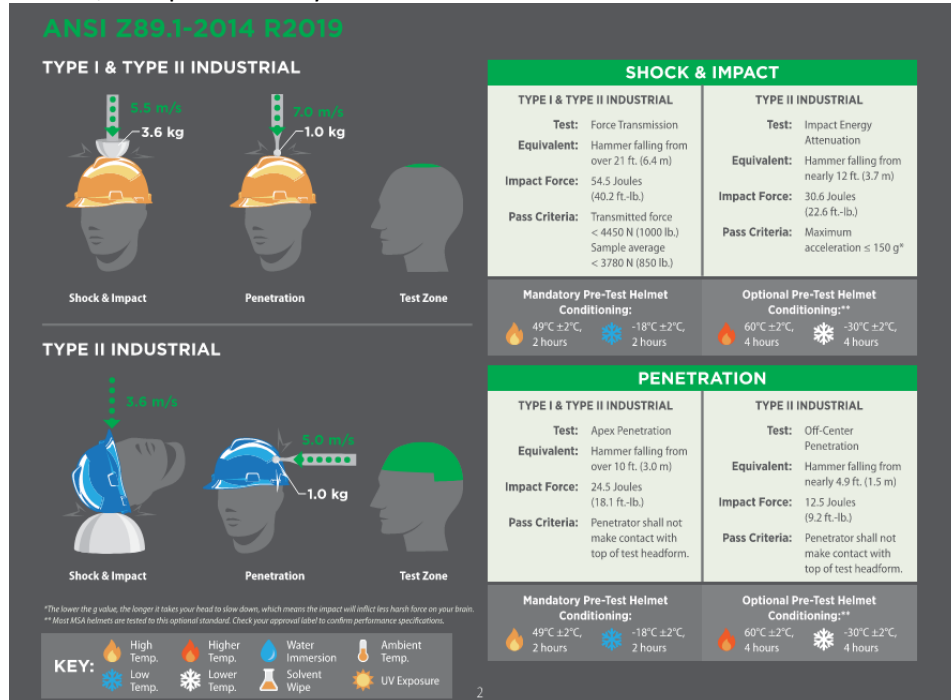
Effective July 1, 2022 Mortenson has progressed its mandatory head protection program for all Mortenson team members from traditional hard hats to the more advanced protection offered by Safety Helmets. Effective January 1, 2023, these changes apply to all project personnel including subcontractors and tiered subcontractors, vendors and visitors. These head protection requirements are stipulated in Mortenson's Zero Injury Manual Section 27 – Personal Protective Equipment, and extended to our trade partners through the Subcontract Agreement – Exhibit E, Safety Program Requirements.

Question	Guidance
<p>FAQ #1 What is a <i>Safety Helmet</i>?</p>	<p>Mortenson defines minimally acceptable <i>Safety Helmets</i> as:</p> <ul style="list-style-type: none"> • A helmet with a retention system that includes a chin strap with at least four (4) points of independent attachment to the helmet shell and conforms to EN 12492 clause 4.1.3 or EN 397 (clause 5.1.4) retention tests. • ANSI approved Type I or Type II safety helmets that meet or exceed ANSI Standard Z89.1-2014 and EN 12492 shock absorbing, and roll-off standards (clauses 4.2.1.2; 4.2.1.3; 4.2.1.4; and 4.2.4).
<p>FAQ #2 What are Mortenson's safety helmet requirements?</p>	<p>All personnel on Mortenson project sites must wear safety helmets. The appropriate <i>Class</i> of helmet must be selected based on the anticipated hazards associated with work being performed (i.e. Class C – Conductive, offers no protection from electrical hazards; Class E – Electrical, for work on or near electrically energized systems).</p> <p>Additionally, helmets shall be worn in accordance with helmet manufacturer's recommendations and must display the individual's name, and name and/or logo of their employer. Helmets must be worn facing forward, and the chin strap must be fastened under the chin.</p>
<p>FAQ #3 Are chin straps required to be fastened all the time, or only while performing work at heights?</p>	<p>Chin straps must remain secured under the chin at all times while the helmet is worn, regardless of work activity. Helmets are designed with secured chinstraps as part of the functional protective system. To ensure your helmet stays on when you need it most, it must be secured, and snug (e.g., no more than 2 fingers fit between your chin and the strap). None of us ever know when we're going to slip, trip, or be struck from overhead. When it happens, we want to ensure the helmet remains on our head. We've already experienced at least one situation where a properly worn helmet with a secured chin strap proved effective in preventing a serious injury during a slip and fall incident when no work was taking place.</p>
<p>FAQ #4 Which safety helmets are approved by Mortenson?</p>	<p>Mortenson has not developed a list of "approved" helmet brands or styles, only a list of industry recognized testing standards to which the safety helmet must conform. The use of safety helmets on construction sites in the U.S. is still very much an emerging trend. The products available that meet or exceed the Mortenson adopted standards is constantly evolving. Whatever the brand or style, if it meets the standards outlined in Zero Injury Manual Section 27-3.4 for Head Protection, it is acceptable for use on Mortenson projects.</p>

Mortenson Safety Helmet Guidance & FAQ

FAQ #5
 What is the difference between ANSI Type I and Type II?

ANSI Type I hard hats and safety helmets have passed tests represented by the yellow-orange hard hats in the graphic below, for the test zone indicated. ANSI Type II have passed additional tests for shock & impact, conducted by placing a test weight inside of the helmet, as well as penetration, for a larger test zone, as represented by the blue hard hats below.



FAQ #6
 I found an ANSI Type II hard hat with labeling that indicates it also meets EN12492. It can be fitted with an accessory 4-point chin strap. Is this acceptable?

No. Mortenson's transition from hard hats to safety helmets is not just about having a chin strap. We've carefully considered the enhanced levels of protection that safety helmets offer as demonstrated through additional testing standards, such as the EN12492 mountaineering standard inclusive of the clause for roll-off and EN397 retention tests. Traditional hard hats tested to ANSI Type I or Type II impact and penetration resistance have most likely not undergone any testing with the accessory or after-market chin straps in place. Mortenson also requires that the chin straps attach directly to the helmet shell. Most currently available accessory chin straps for hard hats clip to the head band of the hat's suspension system.

FAQ #7
 I found a helmet I like, and the manufacturer says it meets EN14502. Does that work instead of EN12492?

No. While EN14502 is a European standard covering high performance industrial helmets, its testing requirements do not address the front and rear shock absorption protection specified in EN12492.

FAQ #8
 What are all these ANSI and EN standards that define a safety helmet, and what do they mean?

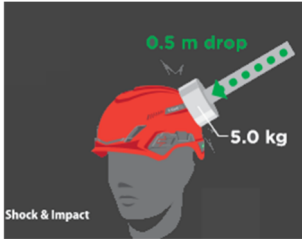




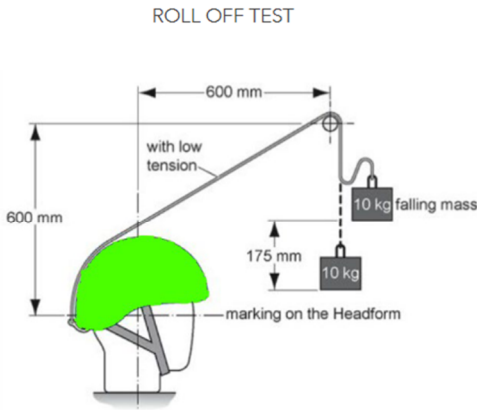
ANSI is the American National Standard Institute which oversees the development of voluntary consensus standards and conformity assessment activities in the United States. ANSI Z89.1 is the voluntary consensus standard for head protection that has been promulgated as law by the

Mortenson Safety Helmet Guidance & FAQ

	<p>Occupational Safety and Health Administration (OSHA) to affirm shock, impact and penetration capacity.</p> <p>EN12492 is a European Standard approved by the European Committee for Standardization and it applies to the safety requirements and test methods for mountaineering equipment, specifically helmets for mountaineers. Mortenson adopted specific clauses from these standards because they demonstrate additional protection properties for helmet roll-off and chin strap retention, as well as front, rear, and side energy absorption capacity to protect against anticipated hazards in the construction environment.</p> <p>EN397 is a European Standard approved by the European Committee for Standardization and it applies to Industrial Safety Helmets. Mortenson adopted the clause specifically applicable to the performance requirements of chin strap anchorages on safety helmets.</p> <p>See the 'ANSI / EN12492 / EN397 Standard Details' at the end of this FAQ for more specifics related to these standards and the testing criteria.</p>
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ANSI / EN12492 / EN397 Standard Details	
Standard	Details/Explanation
ANSI Z89.1 1. ANSI Type I 2. ANSI Type II 3. ANSI Helmet Classes	ANSI Z89.1 is the voluntary consensus standard for head protection. Promulgated into law by OSHA 1926.100. 1. Designed to reduce the force of impact and resist shell penetration resulting from a blow to the top of the head 2. Designed to reduce the force of impact and resist shell penetration resulting from a blow to the top, front, back, and sides of the head. 3. To improve comprehension and usefulness, there are electrical-protective classifications for helmets as follows: <ul style="list-style-type: none"> • Class G – General helmet: Designed to reduce exposure to low voltage conductors, proof tested at 2200V • Class E – Electrical helmet: Designed to reduce exposure to high voltage conductors, proof tested at 20,000V • Class C – Conductive helmet: Not intended to provide protection against contact with electrical conductors
EN12492 Performance Requirements: 1. 4.2.1.2 – Front Energy Absorption Capacity 2. 4.2.1.3 – Side Energy Absorption Capacity 3. 4.2.1.4 – Rear Energy Absorption Capacity	1. <i>Front Energy Absorption Capacity:</i> When a helmet is tested by the method described in 5.5, the force transmitted to the head form shall not exceed 10 kN, for a drop height of (500±10) mm of the flat striker described in 5.5.3.4. 2. <i>Side Energy Absorption Capacity:</i> When a helmet is tested by the method described in 5.5, the force transmitted to the head form shall not exceed 10 kN, for a drop height of (500±10) mm of the flat striker described in 5.5.3.4. 3. <i>Rear Energy Absorption Capacity :</i> When a helmet is tested by the method described in 5.5, the force transmitted to the head form shall not exceed 10 kN, for a drop height of (500±10) mm of the flat striker described in 5.5.3.4.

Mortenson Safety Helmet Guidance & FAQ

<p>4. 5.5 – Shock absorption Testing Principle</p>	<p>4. <i>Shock Absorption Testing Principle:</i> A specified striker is allowed to fall with specified energy on to a helmet which is fitted to a rigidly mounted head form. The transmitted force is measured by means of a force transducer located beneath the head form.</p> <div style="display: flex; justify-content: space-around; align-items: center;">  <div data-bbox="1283 334 1780 570" style="border: 1px solid black; padding: 5px; background-color: #f0f0f0;"> <p style="text-align: center; background-color: #008000; color: white; margin: 0;">SHOCK & IMPACT</p> <p style="text-align: center; margin: 0;">INDUSTRIAL</p> <p style="text-align: center; margin: 0;">Test: Shock Absorption</p> <p style="text-align: center; margin: 0;">Impact Force: 24.0 Joules (17.70 ft.-lb.)</p> <p style="text-align: center; margin: 0;">Pass Criteria: Transmitted force ≤ 10000 N (2250 lb.)</p> <p style="text-align: center; margin: 0;">Mandatory Pre-Test Helmet Conditioning:</p> <div style="display: flex; justify-content: space-between; font-size: small;"> <div style="text-align: center;">  35°C 2 hours </div> <div style="text-align: center;">  -20°C 2 hours </div> <div style="text-align: center;">  23°C ±2°C 4 hours </div> <div style="text-align: center;">  UV aging 400 hours </div> </div> </div> </div>
<p>5. 4.2.4 Retention System Effectiveness (roll off)</p>	<p>5. When a helmet is tested by the method described in 5.8, for the front way and rear way tests, the helmet shall not come off the head form.</p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div data-bbox="640 738 1113 1144" style="text-align: center;"> <p>ROLL OFF TEST</p>  </div> <div data-bbox="1134 738 2003 1193" style="width: 60%;"> <p>RETENTION SYSTEM EFFECTIVENESS</p> <p>The Principle The helmet is mounted on a test headform and then subjected to a sudden force applied at the front and rear edge of the helmet, tending to rotate it on the headform. The degree of any rotation is observed.</p> <p>The Procedure Mark a horizontal datum line on the outside of the helmet. Fit the helmet in accordance with the</p> <p>Adjust the retention system as tight as possible, by hand.</p> <p>Attach the hook over the front/rear edge of the helmet at the centre and arrange the wire to pass over the longitudinal vertical median plane of the helmet.</p> <p>Arrange for the falling mass to drop through a distance of (175 ± 5) mm and release the mass.</p> <p>Observe whether the helmet comes off the headform completely. If it does not, measure the angle that the helmet has rotated to the nearest degree, being the angle between the datum line drawn on the helmet and the horizontal.</p> </div> </div>
<p>EN397 Performance Requirements 5.1.4 – Chin Strap Anchorages</p>	<p>When tested in accordance with 6.9, the artificial jaw shall be released at a force of no less than 150 N and no more than 250 N, due to failure only of the anchorages.</p>