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Technical Bulletin

April 2023

3M™ SecureFit™ Safety Helmet X5000 – Climbing Style Safety Helmets and Their Use in the US and Other ANSI Markets

Description

In the past 10 years, some employers in the U.S. have begun incorporating climbing style safety helmets into their workplaces. Initially they were used by workers at heights or those entering confined spaces, but their use has expanded for three primary reasons which we will discuss in more detail as they relate to the 3M™ SecureFit™ Safety Helmet X5000-ANSI Series.

1) Products in the U.S. are designed to meet the ANSI Z89.1 Industrial Head Protection standard, typically Type 1
2) They are designed to provide additional front/side/rear impact resistance more than a traditional ANSI Type 1 hard hat if they meet certain clauses of European Standard EN 12492 "Mountaineering Equipment – Helmets for Mountaineers – Safety Requirements and Test Methods"
3) They are designed with a four point chinstrap assembly to help keep the helmet in place

NOTE: U.S. employers must assess the workplace to determine if hazards are present, or are likely to be present, which necessitate the use of personal protective equipment (PPE). If such hazards are present or likely to be present, the employer shall select and have each affected employee use the types of PPE that will protect the affected employee from the hazards identified in the hazard assessment. In the case of head protection, the employer shall ensure that employees wear appropriate head protection when working in areas where there is a potential for injury to the head from falling objects and/or to reduce electrical shock hazard when working near exposed electrical conductors which could contact the head. This is regulated by the U.S. Occupational Safety and Health Administration (OSHA) CFR 1910.135 Head Protection regulation.[1] Per OSHA, head protection must meet the requirements of ANSI Z89.1, "American National Standard for Industrial Head Protection."

What ANSI standards does the SecureFit X-5000 helmet meet?

- ANSI/ISEA Z89.1-2014 – American National Standard for Industrial Head Protection
  - All models meet ANSI Type I requirements – intended to reduce the force of impact from a blow to the top of the head
    - Required to meet ANSI Z89.1 by U.S. OSHA
  - Non-vented versions meet the ANSI Z89.1 Type I requirements and Class G and E requirements
    - Intended to reduce the danger of contact with low voltage conductors (2200 volts - Class G) and higher voltage conductors (20,000 volts – Class E)
  - All models meet the optional ANSI low temperature requirement (-22 °F / -30 °C)
  - Models that are Hi Viz Green meet the optional ANSI High Visibility requirement

What about EN 12492?

- This is a European Standard—EN 12492 "Mountaineering equipment – Helmets for mountaineers – Safety requirements and test methods"

- The scope of this European Standard "specifies safety requirements and test methods for safety helmets for use in mountaineering." It is not an industrial head protection standard in Europe or the US. The European Standard for Industrial Safety Helmets is EN 397.
- The 3M™ SecureFit™ Safety Helmet X5000 was tested to and meets various impact and penetration requirements of the European Standard EN 12492: specifically, clauses 4.2.1.1, 4.2.1.2, 4.2.1.3, and 4.2.1.4 for shock absorption and clause 4.2.2 for penetration. 3M has had a third-party lab test our X5000 helmets to these performance clauses of the EN 12492 standard. Reports are available upon request.
- The 3M™ SecureFit™ Safety Helmet X5000 with all 4 selectable chinstrap switches engaged in the EN 12492 position will meet both EN 12492 Chinstrap Retention Strength (Clause 4.2.3) and EN 12492 Retention/Roll Off (Clause 4.2.4)
- As a manufacturer we chose not to certify and mark our SecureFit X5000 helmet to EN12492 in the United States as that would indicate that we meet all of the requirements of that standard. For customers outside the U.S., EN 12492 certified versions of the SecureFit X5000 helmet are available for purchase.
- U.S. OSHA has not adopted EN 12492 requirements.
- Although the EN 12492 standard is not a requirement in the U.S. nor a replacement for the ANSI Z89.1 Type II hard hat requirements, these tests demonstrate the helmet's capability during a front, side, and rear impact when hit at 30° from the horizontal reference line (Figure 1).
- Bumps and other points of contact can be common in some jobs and having this additional performance capability may help reduce potential impact trauma experienced by a worker.

EN 12492 Design Requirements:

4.1.1 Materials: No Materials adverse to health – SecureFit X5000 helmet meets the requirements of this clause

4.1.2 Projections: No sharp edges roughness or projections that could contact wearer – SecureFit X5000 helmet meets the requirements of this clause

4.1.3 Retention: Chin strap. Minimum three points of attachment. Adjustable. 15mm min. width – SecureFit X5000 helmet meets the requirements of this clause

4.1.4 Ventilation: Ventilation not less than 4 square cm – vented SecureFit X5000 helmets meet this. However, a significant portion of our customer base requires ANSI Z89.1 Class G or Class E electrical ratings for their hard hats – our non-vented SecureFit X5000 helmets meet that ANSI requirement but would not meet this ventilation requirement.

EN 12492 Performance Requirements:

4.2.1.1 Vertical Energy Absorption – SecureFit X5000 helmet passes in third party testing

4.2.1.2 Front Energy Absorption – SecureFit X5000 helmet passes in third party testing

4.2.1.3 Side Energy Absorption – SecureFit X5000 helmet passes in third party testing

4.2.1.3 Rear Energy Absorption – SecureFit X5000 helmet passes in third party testing

4.2.2 Penetration – SecureFit X5000 helmet passes in third party testing

- Note that the above performance tests are equivalent or beyond ANSI Z89.1 Type I requirements; however, they are not equivalent to ANSI Z89.1 Type II requirements for front, side or rear energy absorption

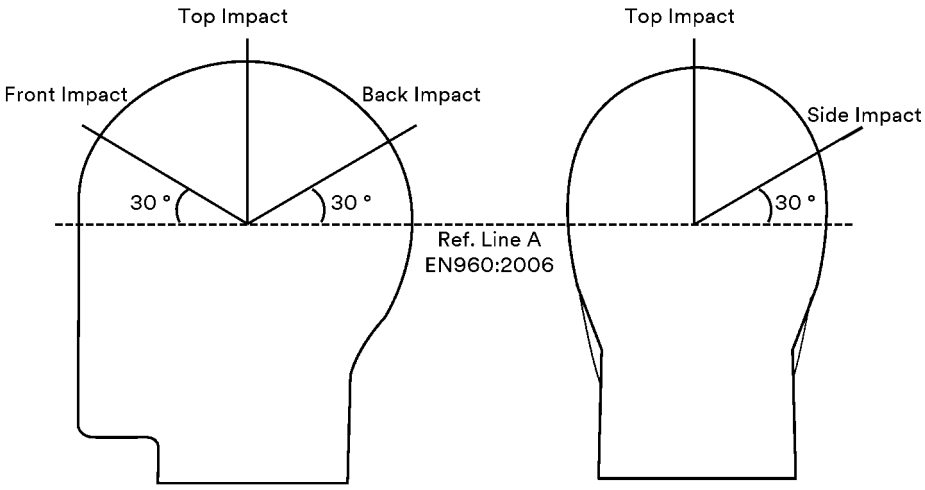


Figure 1. Schematic of the vertical, front, side, and rear impact at 30° as referenced in the EN12492 clauses 4.2.1.1, 4.2.1.2, 4.2.1.3, and 4.2.1.4 for shock absorption and 4.2.2 for penetration.

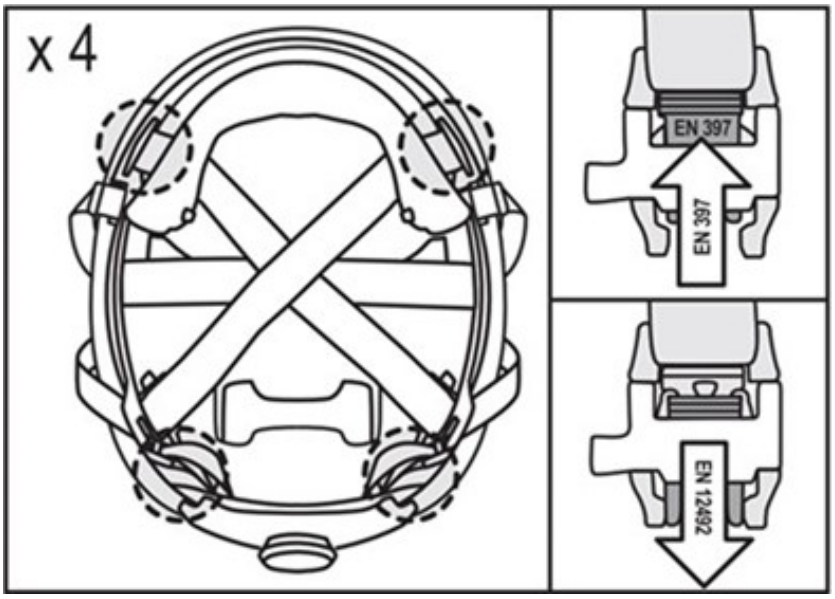
4.2.3 Retention Strength – 500 N for 2 minutes minimum - X5000 with selectable chinstrap will meet this requirement when all 4 switches are in the EN 12492 position

- Note that the EN 12492 Retention Strength requirement is equivalent to the ANSI Z89.1 Type II Chinstrap Retention test (for Type II helmets sold with chinstraps)

4.2.4 Retention / Roll Off – X5000 with selectable chinstrap will meet this requirement when all 4 switches are in the EN 12492 position

- The selection of the appropriate chinstrap position should be based on a risk assessment of the exposure to hazards in the workplace.
- For selectable chinstraps only – the default position is the EN 397 position. If left in this position, the chinstrap will break free between 150 and 250 N in order to reduce potential strangulation hazards if working around industrial machinery (US OSHA Guidance –(4)). This is also the acceptable chinstrap anchorage range stated in the European EN 397 Industrial Safety Helmets Standard.

- For selectable chinstraps only – once the four chinstrap keys are in place, if EN 12492 retention strength and retention/roll off clauses are desired, push red switch down to engage this feature. Ensure all four switches have been placed in the same setting.



Additional Benefits of the 3M™ SecureFit™ Safety Helmet X5000-ANSI Series

- The helmet suspension features 3M™ Pressure Diffusion Technology, reducing pressure on the forehead by 20% on average compared to 3M conventional hard hat suspensions.
- The low-profile brimless design of the 3M™ SecureFit™ Safety Helmet X5000 Series helps with upward visibility and movement around overhead objects.
- The 3M™ SecureFit™ Safety Helmets come with a four-point chin strap that is designed to be more adjustable for a comfortable fit. The vented models come with a premium magnetic chinstrap and the non-vented models come with a metal free chinstrap. Selectable chinstraps were added to the X5000 ANSI version in 2023.
- The helmet comes with accessory clips and slots to be used with other 3M hearing protection, eye and face protection, lighting and communication devices.

IMPORTANT: 3M™ SecureFit™ Safety Helmet X5000 series DOES NOT MEET ANSI Z89.1 Type II head protection requirements.

3M™ SecureFit™ Safety Helmets and You

Always perform a hazard assessment to help ensure appropriate personal protective equipment selection. Also be sure to read and understand all product User Instructions, including the limitations of head protection equipment. Inspect the helmet, including the suspension and shell, before and after each use; replace the helmet immediately if you notice any signs of wear, damage, abuse or degradation as this may be a sign that protection is reduced. For additional information, call 3M Personal Safety Division at 1-800-243-4630 or visit 3M.com/WorkerSafety.

References

1) Occupational Safety and Health Administration. (2012). Occupational safety and health standards: Head Protection (Standard No. 1910.135). Retrieved from https://www.osha.gov/laws-regs/regulations/standard-number/1910/1910.135
2) International Safety Equipment Association/American National Standards Institute, Inc. (2014). American National Standard for Industrial Head Protection (Z89.1-2014).
3) European Committee for Standardization. (2012). Mountaineering equipment – Helmets for mountaineers – Safety Requirements and Test Methods (Standard No. EN 12492:2012).
4) Occupational Safety and Health Administration. (2014). Occupational safety and health standards: Nonmandatory Com- pliance Guidelines for Hazard Assessment and Personal Protective Equipment Selection (Standard No. 1910 Subpart I App B). Retrieved from https://www.osha.gov/laws-regs/regulations/standardnumber/1910/1910SubpartI-AppB

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3M PSD products are occupational use only.

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