Regulatory Compliance

EN 388 vs ANSI/ISEA 105: Understanding the Key Differences in Hand Protection Safety Standards

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When it comes to evaluating the protection levels of work gloves, two major industry standards are recognized worldwide: **ANSI/ISEA 105-2016** and **EN 388:2016**.

The **ANSI/ISEA 105-2016 standard**, developed by the **American National Standards Institute** (ANSI) and the **International Safety Equipment Association** (ISEA), is the U.S. standard for **hand protection**. More broad in application, EN 388:2016 is the European standard used internationally. Both standards assess cut, abrasion, puncture, and tear resistance, but they are not directly comparable due to their different testing methodologies and classification systems.

Glove Markings and Classification Systems

Each standard utilizes a structured classification system and rigorous testing procedure to ensure that gloves meet specific safety and performance criteria. It is important to understand the classification systems for both standards, as many work gloves will show both marketing on the ***wrist or back of the hand.*** ANSI/ISEA 105-2016 provides numeric levels for resistance, while EN 388: 2016 incorporates both numerical ratings and letter grades, offering a comprehensive view of glove protection. By examining these standards, users can gain insights into their similarities and differences, helping to make informed decisions about the most suitable hand protection for various tasks and applications.

ANSI/ISEA 105-2016

The ***ANSI/ISEA 105-2016*** standard is a widely recognized benchmark for assessing the performance of protective work gloves in the United States. This standard focuses on providing clear and separate testing classifications for various types of resistance, ensuring that gloves meet specific safety and performance criteria for different industrial and occupational hazards.

Separate Markings: The standard has distinct markings for cut, abrasion, and puncture resistance, each tested separately

Classification Levels: Features nine cut levels and five abrasion and puncture levels

Identification: Each level is represented by a unique shield with the protection level indicated numerically, where the higher the number rating indicates the higher the level of protection

Exclusions: Has a separate standard for Impact Resistance (ANSI/ISEA 138-2019)

EN 388: 2016

The ***EN 388:2016*** standard is commonly used for evaluating the protective qualities of gloves, not only in Europe but also gloves sold in North America, Australia, and New Zealand. It offers comprehensive testing and rating for multiple types of mechanical hazards, providing users with reliable information about the gloves' performance in various protective categories.

Marking Presence: Commonly found on cut-resistant and non-cut-resistant gloves sold in North America.

Third-Party Testing: Gloves are tested by third party ISO labs for cut, abrasion, puncture, tear, and impact resistance.

Two Cut Ratings: Includes a Coup Test with five numerical levels and a TDM-100 Test (added in 2016) with letter grades A-F for more accurate cut resistance.

Impact Resistance: The impact test is optional and applies only to gloves claiming back-of-the-hand protection. Ratings are P (Pass), F (Fail), or X (not tested).

PIP® has been testing all gloves to both ANSI/ISEA 105-2016 and EN 388:2016 since 2005, offering several advantages to ensure comprehensive protection across various environments and workplace hazards:

- Advanced safety and performance
- Varied testing approaches to assure reliability
- Market versatility and compliance to reach a wider acceptance
- Differentiation to gain competitive edge

Comparing the Testing Methods

Both ANSI/ISEA 105-2016 and EN 388:2016 use various methods to evaluate glove performance, though they differ in their approach.

Abrasion

ANSI 105-2016

Taber Test

The Taber Test involves securing the test fabric on a rotating disc while two wheels with a 180 grit abradant, such as emery board or sandpaper, rub the fabric in a circular motion. The number of cycles that the fabric can endure before its shows noticeable wear determines the abrasion rating on a 1-6 scale. This method is the most favored due to the wide range of materials it can evaluate.

- *Test Method: ASTM D3884-09 (uncoated gloves)*
- *ASTM D3884-10 (coated and unsupported gloves)*

EN 388:2016

Martindale Test

The Martindale Test uses a similar rotating disc to the Taber Test but rubs the fabric in a figure-eight motion. The number of cycles that the fabric can endure before it shows noticeable wear determines the abrasion rating.

- *Test Method: EN ISO 13997*

Cut

ANSI/ISEA 105-2016

TDM-100 Test

The sample is cut by a straight-edge blade, under a specific weight load that moves along a straight path. The sample is cut five times at three different weight loads, referred to as a cutting force, with a new size blade – short, medium, and long – for each load, providing 15 data-points. The cutting force is then used to determine the appropriate cut level.

- *Test Method: ASTM F2992-15*

EN 388:2016

TDM-100 Test

Coup Test

The Coup Test is conducted using a circular blade that rotates in cycles and moves back and forth along the same piece of material until the material is cut through. The test uses the same amount of force on all samples. Materials that achieve a higher cut score will contribute to the dulling of the blade.

- *Test Method: EN 388:2016*

Tear

ANSI/ISEA 105-2016

Tear testing is not specifically called out under the ANSI/ISEA 105-2016 standard.

EN 388:2016

Tear Resistance Test

The EN388 Tear Resistance Test is measured by testing the tensile strength of a glove by applying force to four separate tear points on the fabric. The force is increased until the material is torn. The amount of force used to tear the material is recorded and categorized on a 1-4 scale.

- *Test Method: EN ISO 13997*

Puncture

ANSI/ISEA 105-2016

Blunt Puncture Test

The Blunt Force Puncture Testing uses a 4.5mm probe, resembling a ballpoint pen, at a 90-degree angle to simulate a tear or burst hazard. The test measures the amount of force needed for a blunt probe to pierce through PPE material at a rate of 100mm per minute.

- *Test Method: ASTM D1342-2022*

EN 388:2016

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- *Test Method: EN 388:2016*

Impact

ANSI/ISEA 105-2016

Impact Resistance is testing under a separate standard: ANSI/ISEA 138-2019

EN 388:2016

Impact Resistance Test

The sample is cut open and laid out flat over a raised anvil. A 2.5kg striker force is dropped on the knuckles at an impact force of 5 joules. If the average transmitted force is less than or equal to 7kN, the gloves will be marked P for Pass. If the average transmitted force is higher than 9kN, the gloves will be marked F for Fail. Gloves that have not been tested will be marked X.

- *Test Method: EN 388:2016*

Navigating ANSI/ISEA 105-2016 and EN 388:2016 for Optimal Hand Protection

Selecting the right work gloves for your specific needs can make all the difference in ensuring safety and performance on the job. With the complexities of ANSI/ISEA 105-2016 and EN 388:2016, understanding these standards is crucial for making informed decisions.

PIP's team of hand protection experts are available to help you navigate these standards and find the best solutions for your safety requirements. ***Contact PIP*** for a personalized assessment and tailored recommendations to ensure you choose the perfect work gloves for your needs.

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