

Comparative Analysis of the Performance of Selected PPE that Passed OSHC Testing Using the ANSI/ASTM and ISO Standard

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Department of Labor and Employment
Occupational Safety and Health Center
North Avenue corner Agham Road,
Diliman, Quezon City, Philippines



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Safety Control Division

Objective

1. To compare PPE test results using ANSI/ASTM standards and ISO standards.
2. To validate performance of passed PPEs used by workers using ANSI/ASTM standards.

Methodology

1. Two sets of pre-identified PPE research test specimen according to its type and model that passed the testing requirements of the OSHC were procured and be were tested using ANSI/ASTM and ISO standards.
2. This research utilized the existing equipment and test apparatus at the PPE testing laboratory of the Safety Control Division in determining the performance of the selected PPEs. Results of the validation testing were compared to the original test results of the PPEs. The outcome of the research test results will serve as the basis for policy adjustment.

PPE Testing Standards and the OSHC PPE Testing Laboratory

1. For Head Protection

Current Reference Standard in Use:
ANSI/ISEA Z89.1-2014 Industrial Head Protection

ISO Standard:
ISO 3873-1977 (E) Industrial Safety Helmet

All procured sample specimens were on a later manufacturing batches compared to the date of manufacture of the original request. Majority of the research samples exhibited the same test results using ANSI standard except for one which failed the force transmission test. Evident cracks on the shell were noted after impact during the original test conducted for the failed sample specimen. This research recommends that for a passed PPE sample with visible damage after testing be required to undergo another testing for the subsequent manufacturing batches.

Comparative Analysis: The OSHC PPE testing laboratory has updated testing equipment and apparatus for Type I – ANSI standard requirements. Only retrofitted equipment were used to test sample specimens for the ISO standard requirements, ANSI standard has a better electrical classification.

2. For Eye and Face Protection

Current Reference Standard in Use:
ANSI/ISEA Z87.1-2015 Occupational and Educational Personal Eye and Face Protection Devices

ISO Standard:
ISO 18526-2020 Family of Standards for Eye and Face Protection

Majority of procured sample specimens for safety spectacles, safety goggles and faceshields passed the same requirements compared to the original tests conducted. One safety goggle sample specimen with borderline test result from the original request failed on the validation test for prism requirements. This research suggests that chosen specific sample specimen that passed but with borderline passing outcomes may manifest failing result for the other specimens even in the same manufacturing batch.

Comparative Analysis: The OSHC PPE testing laboratory is better equipped for ANSI standard requirements. At the moment, testing equipment for refractive power test, astigmatism test and prism test required for ISO 18526-1 are not available at the OSHC.

3. For Personal Fall Arrest Systems

Current Reference Standard in Use:

ANSI/ASSE Z359.1-2007 Safety Requirements for Personal Fall Arrest Systems, Subsystems, and Components

ISO Standard:

ISO 10333 Family of Standards for Personal Fall Arrest Systems

All procured sample specimens achieved passing requirements as when originally requested for testing. Comparison of the dimension measurements of the components indicate the same manufacturing specifications. It is the recommendation of this research to mandate the use of 100 percent tie-off for workers using PFAS at elevated working level at all times.

Comparative Analysis: The OSHC PPE testing laboratory has a 100 kN UTM for tension testing of components of a PFAS for the ANSI requirements while the ISO standard requires a dynamic testing setup which the Safety Control Division is currently putting-up. The testing requirement are almost the same for the two standards. Both the standards require two consecutive intentional actions to open for components such as a self-locking and self-closing snap hooks and carabiners.

4. For Foot Protection

Current Reference Standard in Use:

PNS ASTM-F2412:2016 (adopted from ASTM F2412 – 2011) Philippine National Standard Test Method for Foot Protection

PNS ASTM-F2413:2016 (adopted from ASTM F2413 – 2011) Philippine National Standard Specifications for Performance Requirements for Protective (Safety) Toe Cap Footwear

The comparison of test results between the original request and the research test results shows that there are instances when manufacturing specifications may change while maintaining the model name for the brand. This may result to a non-conformance to the minimum performance requirements. This research recommends mandating manufacturers to change the model name or number should there be a change in the manufacturing specification and to request for performance test as well. This research also recommends to shorten the validity of safety footwear test results to one year to assure safety for workers.

