

## AMERICAN NORMS



### ANSI/ISEA 105 (2016)

ANSI/ISEA 105 “American National Standard for Hand Protection” defines levels for the mechanical, thermal, chemical and dexterity performance of hand and arm personal protective equipment (PPE).

The American National Standards Institute (ANSI) and the International Safety Equipment Association (ISEA) have developed guidelines that help assure the safety of consumers. Where appropriate the ANSI performance rating is included to give a better understanding of the level of protection a specific product offers.

### CUT PROTECTION

In the US market, the standard is ASTM F2992-15.

This method allows cut resistance to be indicated by the required weight applied to the cutting blade to cut through the test sample. An ANSI level is determined by how much weight is needed to cut through a given material with 20 mm of blade travel when testing to ASTM F2992-15. Levels range from A1 to A9, with A9 providing the highest level of cut resistance. The table below shows the ANSI performance levels to assist in correct glove selection.

### ANSI/ISEA 105 (2016) TDM-100 CUT TEST METHOD

LEVEL	A1	A2	A3	A4	A5	A6	A7	A8	A9
WEIGHT*	≥ 200	≥ 500	≥ 1000	≥ 1500	≥ 2200	≥ 3000	≥ 4000	≥ 5000	≥ 6000

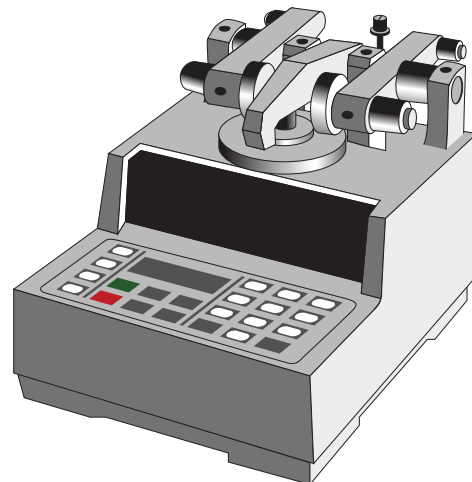
\*Weight (grams) needed to cut through material with 20 mm blade travel.

### ABRASION PROTECTION

The Taber Abrasion Test is an ASTM D3389 abrasion test. This test method determines the resistance to abrasion of rubber, and plastic-coated materials. A 4.5-inch circular test specimen is mounted on a horizontal-axis platform while being abraded to failure under a specified vertical weight load (of 500 or 1000 grams) by the sliding rotation of two vertically oriented abrading wheels. The abrading wheels are comprised of abrasive particles. The results, recorded in abrasion cycles, are classified by ANSI/ISEA 105-2000 Hand Selection Criteria as follows:

### ABRASION TESTING MACHINE

A taber abrader is used to test gloves for abrasion as per ASTM D3389.



#### PERFORMANCE LEVEL ABRASION (ABRASION CYCLES)

LEVEL	ABRASION CYCLES (tested at 500g load)
0	< 100
1	≥ 100
2	≥ 500
3	≥ 1000
(tested at 1000g load)	
4	≥ 3000
5	≥ 10,000
6	≥ 20,000

## ANSI/ISEA 138: 2019 STANDARD FOR HAND IMPACT PROTECTION

### Scope:

This standard establishes minimum performance, classification and labeling requirements for hand protection products designed to protect the knuckles and fingers from impact forces, while performing occupational tasks

### Purpose

The purpose of this standard is to provide manufacturers with a mechanism to classify their products for their specified impact protection. The information from this testing and classification can be used to help others to select appropriate hand protection.

### Accredited Laboratory

A laboratory having a certificate of accreditation meeting the requirements ISO/IEC 17025:2017, General requirements for the competence of testing and calibration laboratories for the collection and analysis of data within the parameters of this standard.




### Protective Bumpers

Additional material attached to the glove and to intended provides impact protection

### Impact Protection Classification (Industrial Safety Equipment Association)

The overall performance level of the glove is determined by the lowest performance level recorded. During testing, no part of the glove shall crack or shatter, producing sharp edges when impacted.

NOTE: for example, if fingers and thumb are rated as performance level 1 and the knuckles are performance level 2, the overall glove is rated as performance level 1. Note: for examples to achieve level 2, the mean shall be  $\leq 6.5$  kN and all impacts should be  $\leq 8.1$  kN. If one value achieved 8.8 kN, then this area would be classified as level 1, even if the mean was  $\leq 6.5$  kN.

Classification For Impact Resistance		
Performance Level	Mean Transmitted Force (kN)	All Impacts (kN)
ANSI / ISEA 138  1	$\leq 9$	$< 11.3$
ANSI / ISEA 138  2	$\leq 6.5$	$\leq 8.1$
ANSI / ISEA 138  3	$\leq 4$	$\leq 5$

### Test Procedure

Position the sample with the impact point in the center of the dome. Raise the striker to a height that will provide the required impact energy. Release the falling mass and record the peak force detected by the load cell or other sensor beneath the anvil.



### Knuckles

Both gloves shall be tested 8 impacts in total

### Fingers and Thumbs

Both gloves shall be tested 10 impacts in total

Calculate the mean and peak forces recorded during testing of each zone separately. Record the individual forces and the means of the forces.