

Cut Resistance Testing

Background

Personal protective equipment (PPE) designed to offer mechanical protection is tested to EN388, the mechanical hazards standard for gloves. The cut resistance test as laid out in this standard can be carried out using two methods;

1. Coup test

This is the original cut test method and has often been found to be inappropriate for the latest generation of highly cut resistant yarns. This method works by comparing the cut resistance of the test glove, to a known standard fabric material. This test can fail for highly cut resistant products because the standard material is tested first, followed by the cut resistant glove, then the standard material for a second time. As the same blade is used throughout the tests, a highly cut resistant glove will blunt the blade, leading to an artificially high result for the second test against the standard material as the now very blunt blade will struggle to cut it. As the cut resistance is determined by dividing the glove result by the mean average of the two results from the standard material, a high result from the second standard material test will reduce the cut resistance result, leading to a highly cut resistant material being assessed at a far lower blade cut level than is the case in reality.



2. ISO cut test

This is a newer method designed to deal with new and highly cut resistant materials. The method determines the force in Newtons (N) to make a 20mm cut in the sample of the cut resistant glove. Under this test a glove is assessed as being cut level 4 if it scores $\geq 13N$ but $< 22N$, while cut level 5 is $\geq 22N$. This method, while included in EN388:2003, is an internationally recognised standard known as ISO13997. The force acting on the sample is varied by adding weights, so the test assess the actually force needed to make a cut, rather than using a comparison to a known standard material. Additionally, after every cut is performed, the blade is changed, so a fresh blade is used for every cut performed.



Performance Levels

EN388 Performance Level - Cut	1	2	3	4	5
Cutting Index (Coup test)	1.2	2.5	5	10	20
ISO Cut Load (N)				≥ 13	≥ 22