

A summary of the most  
important news in  
the revised EN388:2016



EN 388:2016



## **PROTECTIVE GLOVES AGAINST MECHANICAL RISKS EN 388:2016**

**This pictogram shows that the glove is intended to protect against mechanical risks.**

Changes have been made in EN388:2016. However, much remains the same. Testing of resistance to abrasion, tear and puncture are carried out as before but with some clarifications regarding test procedure and test materials. For example it is now mandatory to use a specified sandpaper during abrasion test. Gloves that earlier been tested with less harsh sandpaper can experience lower abrasion result when testing according to EN 388:2016.

The obtained test results corresponds to different levels of protection in the same way as in the 2003 version, which for resistance to abrasion, tear and puncture is 0-4, with 4 being the highest performance level.

The major differences in the new edition compared to the previous is related to cut resistance and impact protection. There are now two methods available for testing the cut resistance and the standard clearly states that there is no correlation between the old and new cut test methods. For details, see the table on the next page.

## EN 388 :2016 - TESTING

(specifies the requirements that apply for each safety level).

Level of protection	1	2	3	4	5
a) Resistance to abrasion (No. of revolutions)	100	500	2000	8000	
b) Resistance to cutting (Index)	1,2	2,5	5,0	10,0	20,0
c) Tear resistance (N)	10	25	50	75	
d) Puncturing resistance (N)	20	60	100	150	

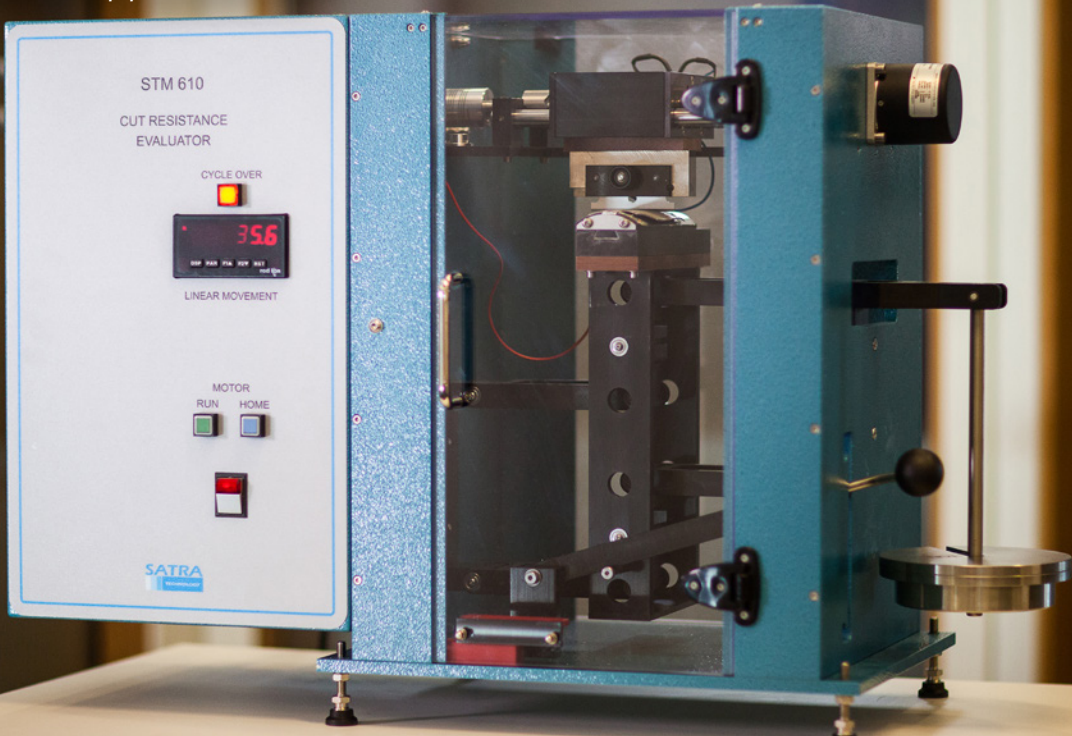
  

Level of protection	A	B	C	D	E	F
e) Cut resistance, EN ISO 13997 (N)	2	5	10	15	22	30

Level of protection	P
f) Impact protection, EN 13594:2015	Pass (Level 1 $\leq$ 9 kN)

TDM test equipment





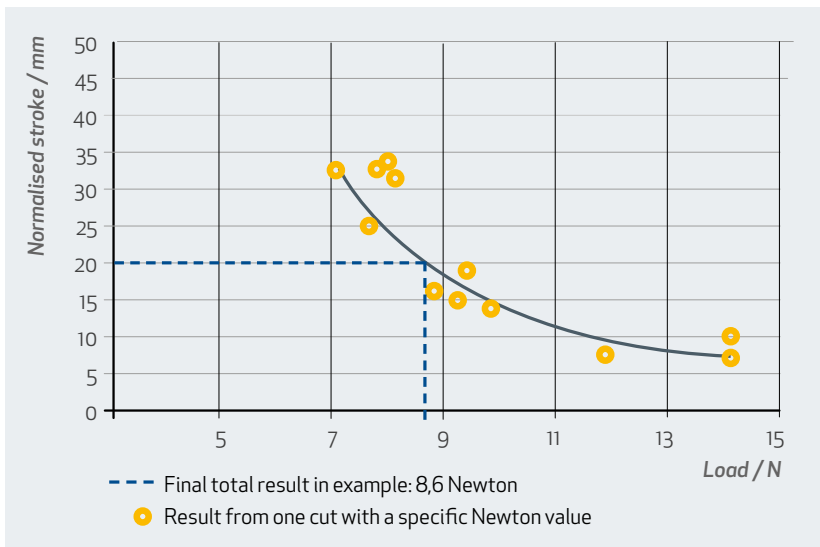
### **CHANGES RELATED TO CUT PROTECTION IN EN 388:2016**

The new added test method is described in the standard EN ISO 13997. The test method is also called 'TDM' which is an abbreviation for the equipment in use: tomodynamometer.

There are two variables in the TDM test; applied force (Newton) and distance in millimeters, describing how far the blade can move before it cuts through the glove material.

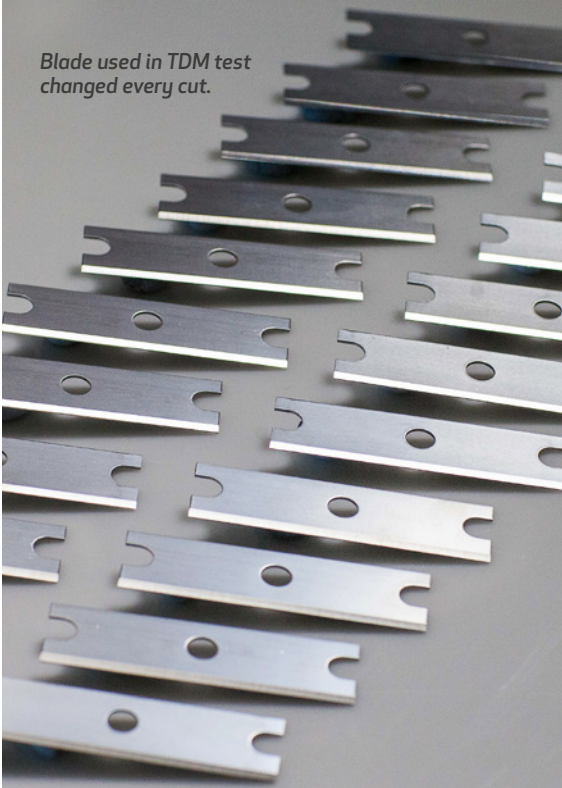
The test sample from the glove is cut diagonally. Before each cut a new test area is prepared, the blade is changed and specific force in Newton applied. Different forces causing the blade to move different lengths before it cuts through. The higher force the shorter distance before cutting through the glove material.

Several tests are carried out and each specific force correlates to a measurement in millimeters. A chart is created based on the different forces in the form of Newton values (x) and length in mm where the glove breaks (y). The test result is the Newton value needed to cut through the glove material at 20 mm. The highest cut protection level is F, which corresponds to 30 Newtons.





Shows how test sample is cut out from glove.



Blade used in TDM test changed every cut.



Weights used in test.



STM 610

CUT RESISTANCE  
EVALUATOR

CYCLE OVER



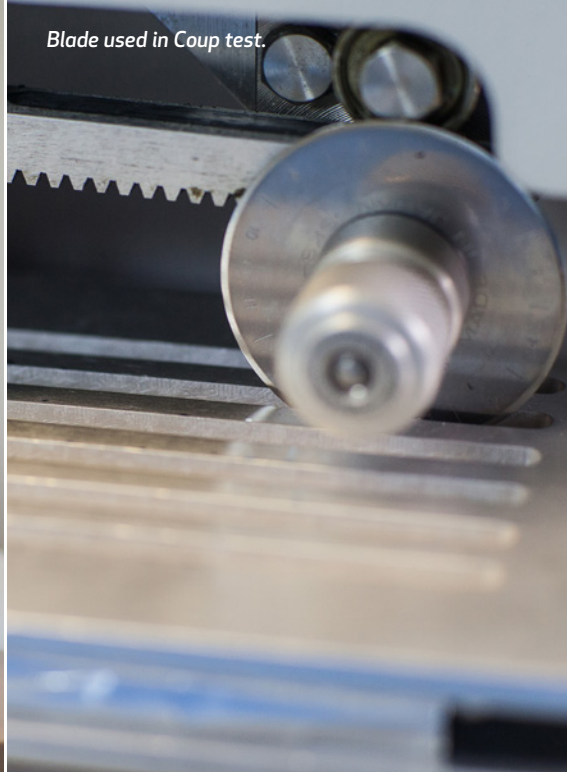
LINEAR MOVEMENT

Result for one cut.

*Coup test equipment.*



*Blade used in Coup test.*



The only test method used in the previous version of EN388, is called Coup method. It remains but is now only to be used for materials that do not affect the sharpness of the blade.

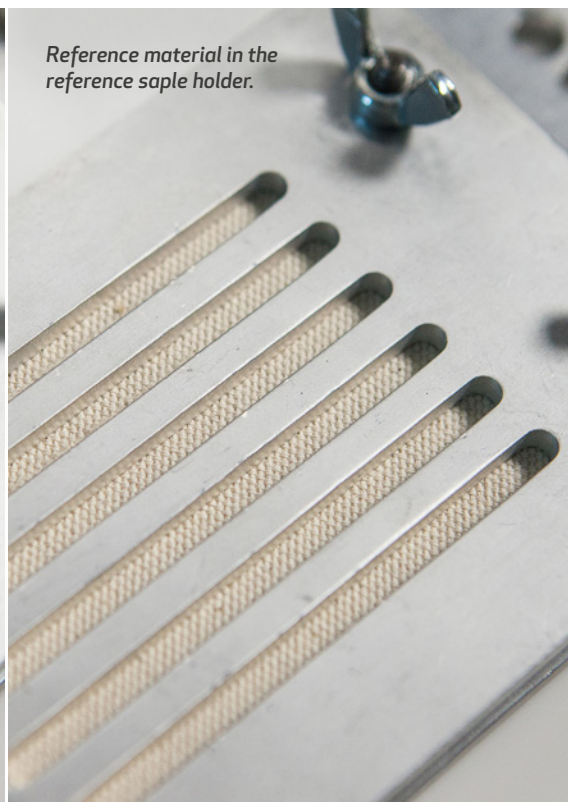
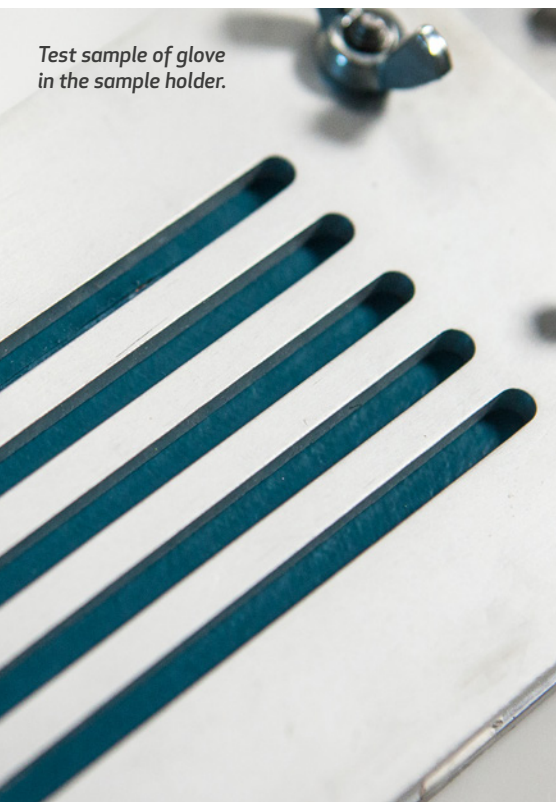
First a reference material is tested, followed by the glove material and then the reference material is tested again. These three tests are made with the same knife blade going back and forth at a constant force.

In EN 388:2016 Coup test the blade used is somewhat sharper, which can result in lower cut index compared to EN 388:2003.



The definition of when the glove material has a dulling effect on the blade is when the number of cycles on the second reference material test is minimum three times higher compared to the first reference material test. If the glove material has a dulling effect the COUP test is not suitable. Instead the ISO 13997 test method should be used. In this case the marking for Coup method will be an X. If the glove material has no dulling effect on the blade the COUP test result is valid and corresponds to performance level 0-5 as before. In addition TDM result can be added.

Also new in EN388:2016 is that the COUP test of the glove material should stop after maximum 60 cycles. Before it was no limit. *In reality this means that cut level 5 is no longer achievable with the cut material available on the market today.*





## CHANGES RELATED TO IMPACT PROTECTION IN EN 388:2016

Impact protection verification has been added to the EN 388:2016. The test method is taken from the motorcycle standard EN 13594:2015. The area where the impact protection is claimed is to be tested, but due to technical reasons, the area around the fingers cannot be tested.

With an impact energy of 5 Joule, the transmitted force should be equal or less than 9 kN for a single hit and average should be equal or less than 7 kN.

If the requirements are fulfilled the glove will be marked with a "P" (Pass). If fail no marking.

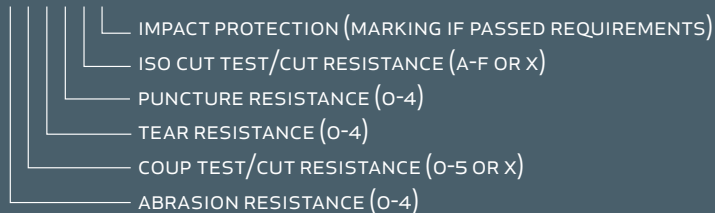


4 4 4 3

EN388:2003

4 X 4 3 C P

EN388:2016 *NEW!*







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