



# Razor Edge Sharpness Tester | Version 3

for **BLADES** | **RAZORS** | many other **CUTTING EDGES**

Designed and manufactured by  
**Cutlery & Allied Trades Research Association**



The measurement of sharpness of plain edge blades such as kitchen knives, professional knives, folding and sporting knives, razors, scalpels and many others can be achieved using this small tabletop machine.

CATRA has developed the REST machine which utilises silicone rubber test media to produce a force value for a sharpness measurement.

- Quickly and accurately produces sharpness data.
- Simple, semi-automatic operation.
- Can be used for Quality Control, Research and Development and product evaluation.
- Designed to evaluate a wide range of types and sizes of blades along with pointed instruments.
- Self-contained tabletop unit.
- Does not damage to edge during testing.

**NB:** This system uses a simpler system than that specified in ISO 8442.5.

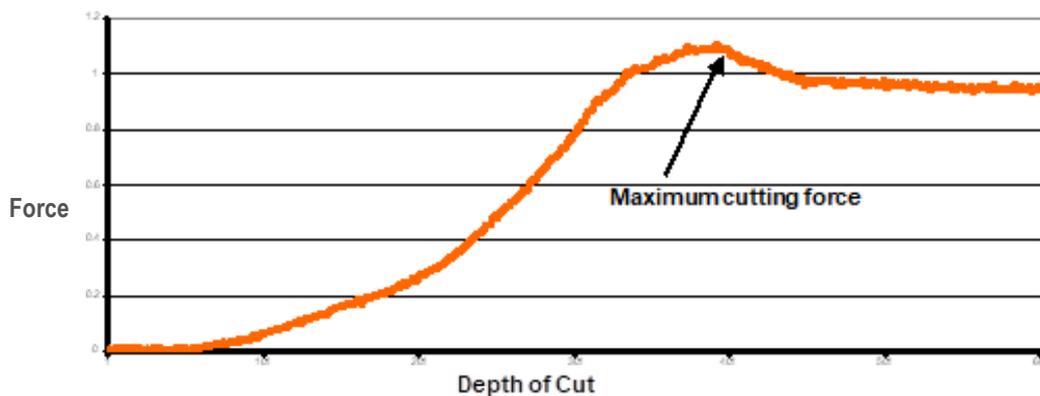


# The CATRA Razor Edge Sharpness Tester

CATRA has a 65-year history of sharpness measurement in all fields of sharp edge cutting technology. We have been designing, building and using sharpness testing machines coupled with a very detailed working knowledge of sharpening techniques. The developments technological improvements to blades and their coatings have created a demand for ever more accurate, realistic and precise methods of sharpness measurement.

## The Test System

The test utilises the constant cut depth method in which the blade is pushed without longitudinal travel into the test media. The cutting force is recorded as a measure of the sharpness. The lower the force, the sharper the blade. The test media is either 8 mm square or with a 3 mm wide side bead silicon rubber, which is bent around a 20 mm former. The cut is made into the outer periphery of this bend.



As the blade contacts the test media, the force increases until the blade cuts the media. At this point the force levels drop and a “peak” maximum force is produced (see above image). It is this maximum force that is used as the sharpness value. The above force curve is shown in the REST HMI unit along with a max force reading. An optional PC interface allows for export of these results to Microsoft Excel.

This test system has been proven by extensive trials to be able to accurately evaluate blade sharpening techniques and edge coatings, providing an essential tool in blade quality control and edge coating research and development.

## Machine Overview

The REST is an aluminium framed table-top machine and is generally as shown in the photograph. The static blade holder is located on the top of the machine. The test media is manually loaded through the feeder assembly. When a test is started the feeder assembly moves the test media into the blade at a contact velocity. The maximum force and curve are displayed on the touch screen along with the controls and settings for each test.

### Detailed Description

The silicone rubber test media is manually loaded around a self-gripping former. The manual advance function allows the operator to present a fresh surface accurately and repeatedly towards the blade. A variety of test medias can be specified depending on the type of blade being tested.

The REST is provided with a 3D printed generic blade holder which is suitable for most types of blades. Custom 3D printed blade holders can also be produced which allows for more accurate and repeatable results.

The feeder assembly is attached to a low friction linear slide which is coupled to a force measurement load cell. This ensures the load being measured is from the cutting force of the test media and not any friction in the system. The motor automatically adjusts to a constant velocity of 0.1mm/s while the force measurement is taken.

The depth of cut can be adjusted on the touch screen interface to a maximum of 4.5mm (standard cut depth is 1.5mm).

The touch screen control panel produces a maximum peak force value after the test has finished along with a force curve shown in either Newtons (N) or Pounds-Force (lbf).

An optional USB interface program for data logging within Microsoft Access is available. The software produces a detailed real time graph and force value which can be exported to Microsoft Excel.

A typical sharpness measurement typically takes under 1 minute to perform.

The unit will carry out 100 sharpness tests per metre of test rubber making consumable costs very low. CATRA carries large quantities of calibrated test media in stock.

The REST is 24v DC and is provided with a 110-230V transformer. Dimensions are 500mmx220mmx200mm and weighs under 5kg allowing it to be portable.

Please specify the type of blades being used when ordering so we can advise if a special blade clamp is required.

## New to the REST MK.3

**Fully Integrated Touch Screen Control Unit** – The REST is controlled by a touch screen interface which controls the start & stop along with easy access to change settings, such as cut depth.

**Current and Maximum Force Readings** – These forces are shown live throughout the test with the maximum value being shown until the next test is begun.

**Force Curve** – The force curve is shown on the touch screen after the test has completed, allowing for the operator to easily see if the blade is loaded correctly or if the cut depth needs to be altered to produce a peak.

**Newtons and Pounds-Force** – The force output type can be easily changed in the settings of the REST to allow Newtons for Pounds-Force to be the output value.

**Media Factor** – If a new batch of rubber has a different calibration value, the REST media factor can be simple adjusted instead of having to carry out a full calibration.

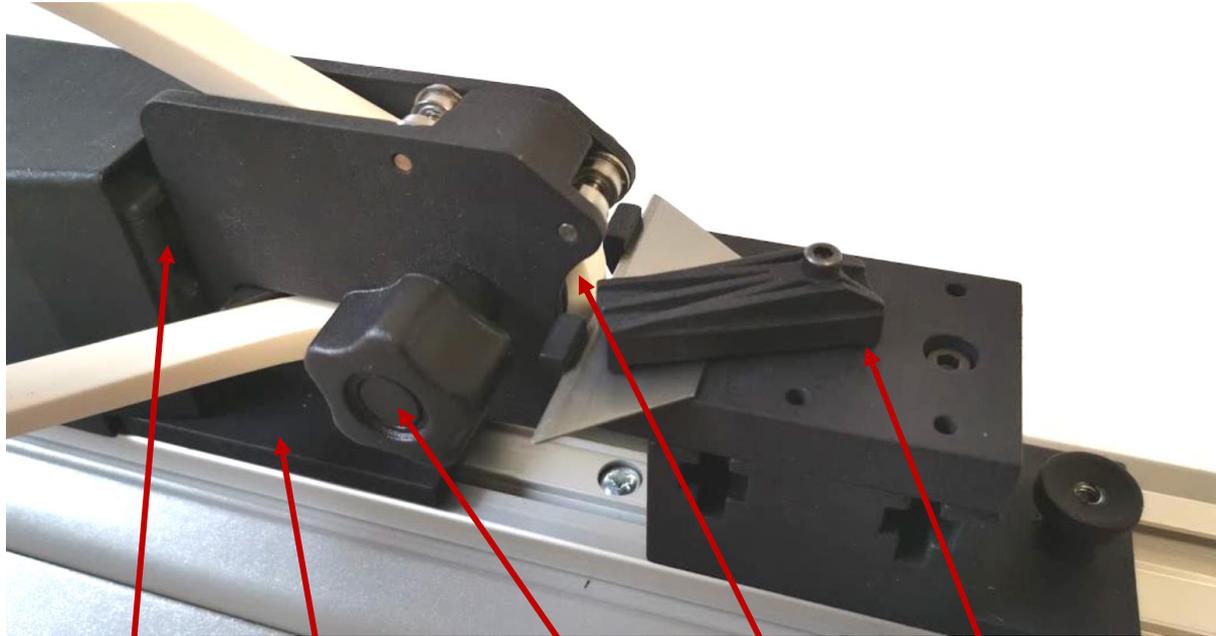
**Adjustable Cut Depth** – The cut depth is alterable though the settings screen and can be adjusted in increments of 0.01mm.

**More Accurate Cut Depth** – The REST now takes the cut depth distance from the moment the blades come into contact with the test media rather than full travel distance. If the blade is too far away from the test media for the cut depth to be achieved, a warning will show.

**3D Printed Blade Holders** – CATRA is now able to provide a wide range of plastic 3D printed blade holders to suit the type of blade being tested, allowing for more accurate and repeatable results.

**NB:** As this system of cutting is different to the ISO 8442.5 technique, the results are not directly comparable. This is due to the cutting performance of any specific knife or blade can vary dependant on the material being cut and the method of cutting

## Close up of Blade Location and Cutting Area



**High Accuracy  
Load Cell**

**Low Friction Slide**

**Media Feed  
Knob & Feed  
Mechanism**

**Test Media**

**Blade Clamp  
(Standard Blade  
Clamp Shown)**