



Semi-Automatic Edge Tester

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

Designed and manufactured by
Cutlery & Allied Trades Research Association



- Measures the sharpness and edge life of blades, knives and cutters for quality control, research, development and competitor product evaluation.
- Quickly and accurately provides important cutting performance data.
- Semi-automatic control / data system.
- Standard test details built in, simple blade position adjustment.
- Only proprietary cutting test machine on the market for sharpness and durability measurement.
- Designed to comply with International Standard BS EN ISO 8442-5- 2004.
- Quick, low-cost machine for small sample size testing and daily QA testing or test-house work.

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Available direct from the manufacturers.



CATRA has been involved in the testing of performance characteristics of knives and blades for over 60 years. The problems of evaluating the cutting ability have been studied using various manual and mechanical methods. This knowledge has enabled CATRA to design automatic and semi-automatic test machines that meets the requirements of consumers, manufacturers and standards organisations.

The International Cutting Test Standard BS EN ISO 8442-5: 2004

A group of specialists from various countries in conjunction with CATRA have developed a standard within the ISO Standards Committee for articles in contact with food. It specifies the detailed test method sharpness specification for knives for the preparation of food. However, the test is ideally suited to other types of blades, sometimes with slight modification, including:

- ✓ **Kitchen and professional knives**
- ✓ **Handicraft, utility and tool knives**
- ✓ **Industrial blades**
- ✓ **Machine blades and cutters**
- ✓ **Agricultural blades**
- ✓ **Chisels and other wood tools**

Testing Method

The blade is mounted in a position with the edge vertical and a pack of specially developed synthetic paper is lowered on to it. By oscillating the blade back and forth the blade cuts into the paper, the depth of the cut being the measurement of sharpness. The test media are loaded with 5% silica, which has a mild wearing effect on the blade edge. By repeating the back-and-forth motion, further cuts are made, which wears the cutting edge. The measurement of cut depth at each subsequent stroke can then be plotted to produce a wear curve for each blade tested.

The test produces two indications:

1. ICP (Initial Cutting Performance)

Represents the cutting ability (sharpness) of the blade as supplied.

2. TCC (Total Card Cut)

Represents the life of the blade by giving a measure of its total cutting ability.

The test is designed for straight or nearly straight blades. However, specially modified machinery can be provided for circular or curved blades.

Machine Overview

The Semi-Automatic Machine is to be bench mounted. It is supplied with complete with a safety screen and is constructed in anodised aluminium and black oxide treated steel.

Test Stroke	40mm to ISO 8442.5 (25mm for utility blades)
Test Cutting Speed	50 mm/second
Test Load	50 N
Max depth of media	50 mm
Overall vertical capacity (max blade width)	105 mm (inc. 50 mm of cut)
Size	700mm x 430mm x 1000mm
Weight	40 Kg
Typical test time plain edge blade	20 mins (60 cutting strokes)
Typical test time serrated edge blade	45 mins (200 cutting strokes)
Electrical supply requirements	230V or 110V AC single phase autosensing
Compressed air requirements	2 litre/min at 6 Bar

The CATRA Cutting Test Machine is generally as shown in the photos on the adjoining page. The machine comprises of a rigid aluminium frame (Base & Cantilever) to which all major sub-assemblies are mounted. It is configured such that the blade to be tested is fixed, edge upwards, on a reciprocating table mounted onto the base of the machine whilst the test paper is applied, under load, onto the knife edge from the cantilever.

The blades to be tested can be easily clamped into the blade vice. This design means that any length of blade can be accommodated, provided that the test portion is positioned over the vice jaws and is therefore supported. The equipment is supplied with a standard vice which covers a wide range of blade types, but optional special jaws can be supplied to accommodate small or unusually shaped blades.

The vice is mounted on a horizontal low friction slide which during the test is free to allow lateral float of the blade whilst cutting through the media but returns to the fixed datum position for the beginning of each new cutting block. This slide is in turn mounted onto a horizontal table, which facilitates the longitudinal motion of the blade for cutting strokes. Drive to the table and therefore the blade is via a stepper motor and lead screw arrangement, which allows positional and speed control over all or any part of the table's stroke.

The test media the strips of paper which are pneumatically clamped during cutting are mounted in a holder with a capacity of 50mm cutting thickness on a vertical low friction slide. Test load is applied vertically to the slide and therefore the media, by a calibrated weight. The method of

lowering the media to the blade, together with the vice jaw design allows a full range of blade widths to be accommodated. Measurement of the amount of the card cut is achieved electronically. At the beginning of each new test and after each cut through the 'block' of media, the card is fed forward automatically by a pneumatic indexing system.

Operation of the machine is semi-automatic

Except for the loading, setting up of the blade and replenishing the packs of cutting media, the machine functions are controlled by a microprocessor-based unit, which switches electro-pneumatic devices and controls the motor. The operator can monitor the control of the machine by the built-in display screen and see the automatically recorded test data and the calculated Sharpness (ICP) and edge life results (TCC or CER). This unit may be optionally connected to a separate computer (not supplied) to enable data to be collected, processed and stored via an excel programme.

Optional calibration package

This unit complete with specific hardware is to enable accurate physical and dynamic (cutting) calibration of the machine. This is a standalone unit which is connected to the machine to calibrate the process variables and to allow adjustment. CATRA offers this unit on a short-term rental arrangement if required.

The measurement of sharpness and edge durability is not an absolute attribute (such as weight or length are) and as this system uses a practical approach of cutting, there are a considerable number of variables which can and do change. These are often outside of the accurate control of both CATRA and users of these machines, which means the level of absolute accuracy is relatively low in comparison with measuring a length with a micrometre for example. This system should therefore be regarded as a comparator for relative sharpness rather than for absolute measurements. If for example it is required to compare a knife it is better to test all samples on the same machine in the one location over a relatively short time, this then increases the accuracy of the results.