Perspirometer and Incubator

Colour fastness and phenolic yellowing tester

The Perspirometer applies a specified pressure to a series of test specimens separated by acrylic or glass plates.

Two alternative loading weights make up the pressure to a value, which conforms to the different requirements of ISO and AATCC colour fastness standards.

The Perspirometer is used to determine colour fastness to perspiration, cold water and sea water.

The same instrument is employed to predict the potential of white or pastel-coloured textiles to yellow in transit or storage.

After insertion of the specimens, the Perspirometer is transferred to an Incubator for a pre-determined period.

Following incubation, the Perspirometer is removed and specimens are graded using grey scales.

Perspirometer

The Perspirometer comprises a stainless steel frame, having top and bottom plates and an intermediate spring plate. The springs, which act on this plate, are designed to maintain a uniform pressure on the specimens, as they are drying out in the Incubator.

Perspiration fastness testing is carried out by immersing the specimens in both alkaline and acidic solutions, and we recommend the use of separate units to prevent cross-contamination.

Acrylic separator plates are used for colour fastness tests and glass plates for phenolic yellowing tests.

Standards
Colour Fastness to Perspiration, Water and Sea Water
ISO 105 E01 – Colour Fastness to Water
ISO 105 E02 – Colour Fastness to Sea Water
ISO 105 E04 – Colour Fastness to Perspiration
BS 1006: UK-TB – Colour Fastness to Shampooing of Textile Floor Coverings
BS 1006: UK-TJ – Colour Fastness to Water of Textile Floor Coverings
AATCC 15 – Colour Fastness to Perspiration
AATCC 106 – Colour Fastness to Water: Sea
AATCC 107 – Colour Fastness to Water
Phenolic Yellowing
ISO 105-X18
M&S C20B
TESCO TM/137/01

Incubator

Incubation temperatures for colour fastness and phenolic yellowing tests are 37°C and 50°C respectively. Our Incubators are designed to hold these relatively low temperatures within the specified tolerances.

Two sizes of Incubator are offered - 30 litres and 60 litres. Both models are fan-assisted to promote uniform temperature distribution in the heated chamber.

An Incubator is a low-powered oven. If temperatures in excess of 50°C are required for other tests, they can be achieved up the maximum figures, stated in the table below, but the rate of temperature rise is slow. If in doubt, please consult with us.

Incubator

Technical Specifications		
	HX30	**HX60**
Useable Volume	30 litres	60 litres
Capacity	Up to 4 Perspirometers	Up to 8 Perspirometers
Internal Dimensions	300 x 320 x 295mm (width x depth x height)	400 x 420 x 395mm (width x depth x height)
No. of Shelves	2 (removable)	
Air Circulation	Fan-assisted	
Temperature Range	Ambient + 10°C - 220°C (230V) or 180°C (110V)	
Temperature Stability	± 2°C	
Temperature Controller	Digital (displaying preset and actual temperatures)	

Colour Fastness Testing

To test colour fastness to perspiration, specimens (of fibre, yarn or fabric) are treated in two different solutions of artificial perspirant – one alkaline and one acidic. Up to 20 alkaline or acidic specimens, each in contact with a piece of multifibre and separated by acrylic plates, are placed inside a Perspirometer.

The Perspirometer is placed in the Incubator for four hours at 37°C.

Evaluation of colour change and of staining is carried out using grey scales.

The test procedures for checking colour fastness to water and seawater are based on the same principles.

Phenolic Yellowing

This is a predictive test, typically used to assess the likelihood of white or pastel-coloured yarns, fabrics or garments yellowing in transit or during storage.

James Heal's Phenolic Yellowing Test Kit has been approved by many leading retailers including Marks & Spencer. It is the *original* kit, based on a technique developed by Courtaulds in the UK. *Beware of copies and counterfeit products, which do not produce accurate or consistent results or might cause serious health and safety issues.*

Five test specimens and one control fabric are sandwiched between impregnated test papers and separated by glass plates. The package is wrapped in BHT-free film and placed in the Perspirometer, before being transferred to the Incubator. The Perspirometer remains in the Incubator for four hours at a temperature of 50°C.

Evaluation is performed using a grey scale for assessing staining. Yellowing of the control fabric confirms the validity of the test.

- Impregnated test papers
- Control fabrics
- BHT-free film