

# Industrial Workwear

New ISO Standard to qualify workwear products for use in the textile rental industry



## Executive summary

**For several decades the retail textile clothing sector has made use of a suite of ISO standards to test and label its garments with care instructions for the benefit of its customers. The scheme includes both domestic laundering and professional dry and wet cleaning processes and is based on the use of pre-programmed equipment.**

The European Textile Services Association, ETSA, has led the development in ISO of a similar scheme for workwear on behalf of the professional laundry industry. However, the complexity of processing options in industrial laundering required a different emphasis. The purpose of the new standards is not to provide care

instructions, but to allow testing of fabrics and garments to representative laundering challenges, and to pass on the results in a simple symbol format. The objective is to qualify products as potentially suitable for use in the textile rental sector.

## Introduction

The last decade has seen the development and publication of two important ISO standards for the industrial laundry and textile rental industry. ISO 15797 describes test methods to challenge the suitability of workwear fabrics and garments offered for use in the textile rental industry. ISO 30023 will provide a labelling scheme to qualify the performance of these textile articles, tested according to ISO 15797 and assessed using a range of methods appropriate for the intended use of these products. ▶

The Development and Scope of ISO 15797 - Textiles - Industrial washing and finishing procedures for testing of workwear.

## Early days

In 1986 a project began in ISO to develop a test method to determine the response to industrial laundering of textile items commonly used by the textile rental industry such as healthcare textiles, hospitality linens (bedding and restaurant) and the developing market in workwear.

At that time there were a number of research and testing facilities globally which possessed fully programmable 25kg washer extractors and industrial-sized tumble dryers.

It proved relatively straightforward to write washing formulas for the small number of linen and workwear products (100% cotton, 100% PES and 60/40 or 50/50 blends of the two) and to show that several of the laboratories could reproducibly obtain much the same results in terms of fabric shrinkage or colour loss for a given number of cycles on representative fabrics.

## Limitations in finishing

The means of drying and finishing the textiles, however, could not be standardised in a meaningful way, because, with the exception of towelling fabrics the majority of items were not fully dried in tumble dryers.

Flatwork was ironed on calenders and workwear was tunnel finished, and no semi-scale equipment, suitable for discontinuous laboratory processing, was generally available in test houses.

The work was terminated and a technical report on the progress at that date was lodged with ISO.

## New initiative

Subsequently, the European Textile Services Association (ETSA) Working Group on Workwear had been considering specifications for workwear fabrics and it was clear that a test method to simulate an

“while ISO 15797 has made a significant beneficial impact, there remained a requirement to pass information on product performance in a clear and uncomplicated way”

industrial laundering challenge was still required.

Almost concurrently, laundry equipment suppliers were developing and launching batch tunnel finishing equipment. Thus it was possible to propose to ISO that the original project could be re-started, but limited in scope to workwear, since now both tunnel finishing and tumble drying methods could be standardised.

Work recommenced under convener Robert Ruffel, Elis, and with Robert Long, ETSA, as secretary. It was subsequently expanded to include restricted types of Personal Protective clothing, and concluded with the publication in 2002 of ISO 15797.

**The Development and Scope of ISO 30023 - Textiles - Qualification symbols for labelling workwear to be industrially laundered**

## Communication issue

While ISO 15797 has made a significant beneficial impact, there remained a requirement to pass information on product performance in a clear and uncomplicated way down an extended supply chain to the professional launderer.

A labelling code using symbols (ISO 3758) has been successfully used to convey care instructions to the consumer for many years and has, by and large, proved to be a success for the textile supply chain, the retail cleaner and home launderer. ▶

The purpose of the standard in development was to establish a system of pictographic symbols, intended for use in the marking of workwear articles and protective clothing, to indicate its suitability for industrial laundering.

## Differences between ISO 3758 and ISO 30023

There are major differences between the retail and industrial laundry labelling schemes, which must be clearly understood.

ISO 3758 is supported by two other standards:

- *ISO 6330, for home washing and drying, uses test methods which are the same as the processes programmed into domestic washing machines and tumble dryers or are available on domestic irons*
- *ISO 3175, in four parts, describes tests for retail cleaning in perchloroethylene, hydrocarbon solvent and professional wetcleaning, using searching programmes and full size professional cleaning equipment*

ISO 3758 and ISO 3175-1, drawing on published standards, assess the performance of the textile after testing to assist the selection of the appropriate care instructions and labels.

ISO 30023 is also supported - by a laundering test method standard, ISO 15797, and contains information and methods for the assessment of the textile articles after testing.

Complexity of industrial laundering - unlike the domestic situation, however, where limited types and sizes of equipment have allowed manufacturers to agree a set of pre-programmed laundering cycles, the diverse processing requirements of the laundry industry have created a market for a much wider variety of processing machinery.

As a consequence the test processes described in ISO 15797, although



performed in much larger machines, are simulations of the processes used in industrial laundering. As such, they represent neither care instructions nor recommendations to launderers on how to launder textiles. Rather, they simply provide the level of challenge textile rental articles are expected to withstand in use.

Furthermore, equipment available for laboratory use and the technical work carried out before and during the development of ISO 15797 mean that its use is restricted to general workwear, and to those articles of

PPE clothing which can withstand the particular test conditions given in the standard.

It follows that any extension of the scope of ISO 15797 to include other types of textile product would require both equipment (drying and finishing) capable of being standardised and technical data to justify the inclusion.

## ISO 15797 test methods

Washing machine - The standard gives a specification for a front ▶

or side loading open pocket washer extractor (corresponding to a nominal load capacity of ~25kg), together with specifications for an appropriately sized tumble dryer and tunnel/cabinet finisher.

Test programmes - Eight wash programmes, four each for both cotton and cotton blend workwear, are available:

1 and 2 - White work (with sensitive coloured trims) - bleached with peracetic acid

3 and 4 - White work - bleached with chlorine

5 and 6 - White work (with sensitive coloured trims) bleached with hydrogen peroxide

7 and 8 - Coloured work (no bleaching)

The specimen load to be tested is processed in the chosen wash programme and then dried by tumble drying and/or tunnel/cabinet finishing.

Where multiple launderings are required, the specimen shall be dried between washings.

While this standard does not contain any information on assessing the textiles after testing (see Annex A of ISO 30023), there is a requirement to provide a test report which also addresses other topics of relevance and interest to the launderer.

## ISO 30023 qualification labelling

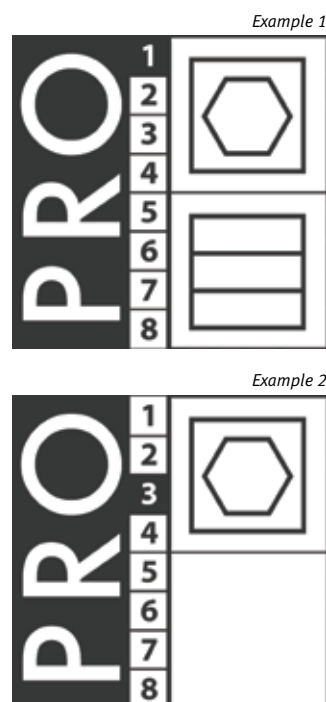
Attributes - Informative Annex A of this standard provides a scheme by which the attributes of textile items tested to ISO 15797 may be assessed (e.g. dimensional stability, colourfastness, abrasion resistance). It actually stops short of recommending minimum performance requirements for these assessments, but anyone interested in developing a specification, for example for purchasing, can apply to ETSA for a copy of its guidance specification on workwear fabrics (review 2010).

“the main body of the standard ISO 30023 deals with the pictographic representation of the results of testing - professional laundering of workwear”

Symbols - The main body of the standard deals with the pictographic representation of the results of testing and the various means by which these can be passed along the supply chain to the launderer.

Some examples of the labelling scheme are given below.

Ideally, the labels should be sewn into the garments to assist sorting/classification and to avoid giving the incorrect process in the laundry. However, this would be costly for large consignments, where it may be sufficient to append the labelling with the paperwork. Increasingly the use of RFID (radio frequency identification) also favours the latter method, since wash codes may also be uploaded onto transponders ensuring that the work is directed to the correct flow line. ▶



## Examples of labelling

The letters PRO denote professional laundering, to draw a clear distinction with domestic care labels. The numbering system refers to the wash process given in ISO 15797 (odd numbers for cotton; evens for blends). The upper right pictograph represents tumble drying and the lower right, tunnel/cabinet finishing.

Thus, in Example 1, the assessment indicated that the specimen successfully withstood processing in ISO 15797 to wash process 1 (white cotton with sensitive coloured trims, bleached with peracetic acid), and both tumble drying and tunnel/cabinet finishing.

In Example 2, the article withstood process 3 (white cotton, bleached with chlorine), but could only be tumble dried.



“the ISO 15797/30023 standards do not offer care instructions, but workwear garments which carry the qualification symbols will have attributes of sufficient performance to have withstood the exacting test methods of ISO 15797”

## Conclusions

The ISO 15797/30023 standards do not offer care instructions, but workwear garments which carry the qualification symbols will have attributes of sufficient performance to have withstood the exacting test methods of ISO 15797.

Textile rental companies who offer such tested and labelled products to their customers can be confident that they will perform well during the life of the service contract. ■

### Authors Details:

#### Mike Palin

Mike is a graduate of the Royal Society of Chemistry and gained his Masters degree at the Royal Military College of Science, Shrivenham, UK, where he researched the properties of semi-permeable reverse osmosis membranes for desalination. He describes his subsequent career as one of either “sticking things to surfaces or trying to remove them.” He has worked in the chemical industry in both production and research. He moved to the Woolmark Company in 1980 where he managed a group developing special finishes for wool products.

From 1990 to 1997 he was the Technical Director of the Fabric Care Research Association (FCRA), the UK's laundry and drycleaning research association, before moving to the post of Technical Director with the Textile Services Association (TSA), the UK Industry's trade association. In 2002 he started his own consultancy business TECHNICAL matters...

based in North Yorkshire, UK.  
(+44 (0) 1756 748 911;  
mjpalin@mjp.cymru247.net)

Part of Mike's job, extending more than 25 years, has been participation in British, European and International standardisation in textiles, laundry and drycleaning. In the last ten or more years activity has intensified in laundry-related areas, particularly healthcare and operating room textiles and PPE workwear. Mike is currently the UK Principal Expert to the ISO working group on industrial laundering (test methods and labelling), similarly the CEN working group on surgical textiles and also a UK delegate to the CEN working group on sterile barrier systems.



#### Robert Long

Robert Long is the Secretary General of ETSA, European Textile Services Association, the European Association set up by the industrial laundries in 1996 to lobby and help promote textiles services.

Extract from website on protective clothing.

Protective clothing refers to garments designed to protect the wearer's body from injury by blunt impacts, electrical hazards, heat, chemicals, and infection, for job-related occupational safety and health purposes.

Workwear is usually defined as clothing specifically designed to be worn in the workplace. Workwear can be worn both to protect the worker or to protect products and equipment from various sorts of contamination.

Well-dressed staff communicate a positive message about their company. Comfortable, safe, clean and attractive workwear helps staff to feel good about their jobs.

Textile rental firms deliver garments at the right time, in the right size, in a guaranteed clean state and ready for use. Garments range from:

- heavy-duty overalls for industrial plants, to
- lighter clothing worn by front office personnel where image is all-important

Personalised garments ensure safety protection for wearers, protect the company's production process and increase workers' sense of belonging to a company team.



[www.osedirectory.com/health-and-safety.php](http://www.osedirectory.com/health-and-safety.php)