Guide to the

Provision of a

Managed PPE Workwear

Rental Service

2007

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Textile Services Association Ltd
7 Churchill Court
58 Station Road
North Harrow
Middlesex
HA2 7SA

Tel: ***020 8863 7755***
Fax: ***020 8861 2115***
Email: ***tsa@tsa-uk.org***
Website: ***www.tsa-uk.org***

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GUIDE TO THE PROVISION OF A PPE RENTAL SERVICE

1. EXECUTIVE SUMMARY

Textile renters, faced with an increasing number of claims and litigation, need to educate and train sales personnel and other staff on the proper selection, application and management control of workwear contracts to ensure compliance with PPE Regulations. This Guide provides an appreciation of the responsibilities of PPE manufacturers and suppliers, textile rental service providers and their customers, the Employers of PPE wearers.
The emphasis is on how to comply and succeed rather than avoid this market because of its complexity.

The Guide defines the responsibilities of a textile rental company in the two key areas of supplying and processing of a PPE rental contract. The latter will also apply to wash-only contracts.

Supplying the service: A review of EU Directives, CE marking and UK regulations and legal requirements is followed by an assessment of their application to PPE rental. Guidance is given on determining the fitness for purpose of the garment in service, managing maintenance of the garment and establishing full traceability.

Processing: Guidance is given on developing practical, structured methods for compliance with the Regulations and the demonstration of compliance

2. RELATIONSHIP BETWEEN EU AND MEMBER STATE LEGISLATION

There are two types of European legislation which member states are required to implement at national level. These are DIRECTIVES and REGULATIONS. Directives allow some scope on implementation. They may be incorporated into a member state's legislation using the state's existing legislative framework and they may be adopted at shorter timescales than required in the Directive. Conditions of fulfilment may also be made more, but not less, severe. Regulations, on the other hand, are totally prescriptive and must be implemented in their entirety, unchanged. Examples of each which affect the laundering and dry cleaning industry are the Medical Devices Directive (MDD), the Personal Protective Equipment 'product' Directive (PPED, 89/686/EEC), the PPE 'use' Directive (89/656/EEC), the Solvent Emissions Directive (SED) and the Ozone Depleting Substances Regulations (ODSR).

Thus, in the UK, the implementation of the PPEDs fell to the Standards and Technical Regulations Directorate (STRD) of the DTI. It drew up proposals for incorporating the meaning and intention of the Directives into UK legislation and circulated them for consultation to all interested parties at that time (circa 1990). The resulting legislation was published under the Consumer Protection Act 1987 as the Personal Protective Equipment (EC Directive) Regulations 1992 – the Principal Regulations. They contained a list all the offences on which the enforcement agency, the Trading Standards Office (TSO), could prosecute. The Principal Regulations were subsequently amended three times (1993, 1994 and 1996).

In 2002, the Principal Regulations and amendments were consolidated in order to clarify the legislation and provide additional enforcement powers to the Trading Standards Departments. The previous regulations were revoked when, on 15th May 2002, the Personal Protective Equipment Regulations 2002 (SI 2002 No. 1144) came into effect. In October 2002 the DTI published Guidance Notes on these regulations.

3. APPLICATION OF THE DIRECTIVE AND LEGISLATION

3.1 Both the Directive and the UK legislation are set up for the relatively straight forward case of the manufacturer of PPE supplying an Employer who has decided that his employees need to be provided with PPE to fulfil their duties safely.

***Definition of PPE*: A PPE is any equipment worn or held by the employee to protect him/her against one or more health or safety risks at the workplace, including all complementary equipment or accessories that can contribute to this purpose.**

***General rule*: It is a general rule (and referred to in COSHH and the PPE Directive) that PPE shall only be used if the risks associated with a hazard cannot be removed or sufficiently reduced by collective protection devices or by organisational measures, methods or processes.**

3.2 The Manufacturer is required to have the PPE certified by an approved body (test house) and to attach a CE mark (obligatory for products claimed to meet the essential requirements of an EU Directive). Information must be supplied to the purchaser on the selection, use, care and maintenance of the PPE attributes of the product. Any limit on the use or lifetime of the product e.g. number of laundry processes permitted must also be notified.

3.3 The Employer is responsible for assessing the needs of his Employees, selecting the correct PPE, ensuring the Employees understand its purpose and are trained in its use such that they are capable of reporting any defects which arise, including fit and comfort.

3.4 So what complications arise to confuse this simple arrangement? Consider the manufacturing and distribution chain for FR cotton boiler suits. A fabric manufacturer may produce the cloth and FR treat it under licence from the owner of the FR process. The licence is subject to the owner's quality assurance scheme and requires the satisfactory testing of batches to confirm the flame retardant properties according to a method appropriate for the end product.

3.5 The certificated rolls of fabric, complete with technical information, are sold on to a garment manufacturer who produces the boiler suit. This, of course, is the potential PPE and the garment manufacturer is responsible for ensuring it conforms in its manufacture to one of the three categories of protection (see 5.2) described in the Regulations and that it is certificated and CE marked before it may be placed on the market.

3.6 The actual placing on the market may be done by an Authorized Representative of the PPE manufacturer, in which case he is responsible for ensuring that the above mentioned conformity assessment procedures are carried out fully and correctly, on the PPE manufacturer's behalf.

3.7 In the case of manufacture outside the EC the Importer must ensure that the PPE brought into the EC has been manufactured in accordance with the Regulations and carries the CE mark. This could mean that the Importer himself must arrange for the conformity assessment procedures to be undertaken, if not done in the place of origin.

3.8 The final category in the supply chain is referred to as *other suppliers* and includes wholesalers, distributors, retailers, etc. These all have a statutory duty to ensure that the PPE that they supply satisfies the safety requirements of Schedule 2 of the Regulations and carries the CE mark. (A summary of Schedule 2, as far as it is relevant to most common types of PPE offered for rental, is contained in Annex A)

3.9 The Employer has a further duty to satisfy himself that his suppliers are discharging their responsibilities under the Regulations. *Increasingly there will be an expectation from the TSO that this will include auditing suppliers' procedures.*

3.10 So which category does the textile rental company fall into? Some textile rental operators manufacture their own PPE and the duties attached to this are mentioned above. But what about operators who buy from manufacturers or their agents, wholesalers etc. and rent out the PPE to the Employer who thus becomes their customer?

3.11 They have the duty of the *other suppliers* in respect of Schedule 2 safety and CE marking, which is described in Regulation 9 of SI 2002 No. 1144 as "…no person shall supply any PPE unless that PPE is safe."

3.12 These few words encompass a considerable duty under the Regulations. However as in most instances where 'duty' is concerned the expectancy in UK law is set at a level of 'reasonableness' and is not an absolute. There is also a strong element of commercial decision-making, both in the level of service to be competitive and in deciding what the courts may consider reasonable. The remainder of this guide will examine and discuss systems for delivering reasonableness.

4. WHAT IS REASONABLE?

Increasingly in Health & Safety matters and in Employment Law the onus lies with companies to demonstrate that they have taken a reasonable course of action in certain circumstances. Inevitably this means having transparent and auditable systems in place which will stand the test of severe scrutiny. This is so that every significant occurrence leading to a particular event or incident can be accurately documented and traced. Traceability is the key.

All companies in the chain must operate a quality system which will allow traceability. If potential partners cannot demonstrate this ability it may be a good idea to look elsewhere. It goes without saying that the staff in those companies must also be fully conversant with the requirements or their individual systems will not function properly. This includes the textile rental company. The need for training is strongly emphasized in many of the legislative matters applied to modern business. However with Regulations as complex and as important to individuals as PPE, staff members, especially those of the sales force who are in direct contact with customers, must have a thorough knowledge of the Regulations **and** their implications.

The rental operator can expect that most small, many medium and even some large customer companies will be ignorant of their responsibilities with respect to PPE. Many are still not fully aware of the Control of Substances Hazardous to Health Regulations (COSHH).

4.1 SUPPLYING THE SERVICE

The service should include an auditable QA scheme, which assures that all aspects of the service first meets, then continues to meet, the application.

The customer (Employer) may or may not be able to carry out his own hazard and risk assessment nor have the expertise to select the correct PPE for the tasks of his work force. It is therefore essential that sales staff can offer help and accurate advice to the customer. This might range from provision of appropriate literature, joint meetings with suppliers, to even a full assessment, perhaps on a consultancy basis. The reasons for this are:

a) The rental operator ought not to rely on the declared expertise of the customer
b) There may well be further selling opportunities as a result of better understanding the customer's business

It is also essential that the Employer and PPE wearers have a full appreciation of the design, use and application of the PPE.

Staff and customers must be aware of the consequences of non-compliance with Regulations.

See Annex B –Selection and installation of a PPE contract

4.2 PROCESSING PPE

The Manufacturer of the PPE is legally responsible for supplying information on its care and maintenance. This should include information on the circumstances which could lead to a reduction in the protective attributes of the PPE i.e. its fitness for purpose. This said, the manufacturer will not have prior knowledge of the soiling characteristics and frequency of change in a particular application or contract in which the PPE will be used.

The textile rental company should discuss the manufacturer's information with the Employer and explain restrictions on the use or cycle of use. Additionally the rental company should discuss the requirements of particular PPE with its own suppliers, who must be made aware of any restrictions in the processing of a PPE item in order to preserve its protective attributes e.g. detergent suppliers who design wash processes for the laundry.

4.2.1 Building a traceable history of use

Key to the whole operation is a system for validating every aspect of laundry processing and the service.

A PPE tracking system will be necessary to tag individual items for identification from the point of injection into a contract (to individual wearer level) and through repeated returns to the laundry for processing. This will allow a full service history to be built up for the garment from how often it is returned (especially important for PPE used in dirty environments), to rewash counts, repair details and subsequent sorting back into contracts, again to individual wearers level.

4.2.2 Processing

At the outset, machines for processing PPE must be validated to show that they are operating correctly. Afterwards the PPE and the process, which has been designed for it, must be validated to show that the PPE can retain its protective attributes for the number of processing cycles claimed by manufacturer, for the soiling levels anticipated in the contract. The key process variables in the specification are then identified for monitoring processing between validations e.g. soiling classification, load weight, main wash temperature and time, detergent and supplies concentrations.

Then the question of monitoring the continuing PPE attributes arises.

The TSO seems to have a straight forward approach to this situation. Currently it considers that it is not reasonable for the cleaner of the PPE to engage in in-process monitoring of attributes. In its view the Manufacturer stipulates how many processes of a defined nature the item can withstand and the cleaner should use this advice. Clearly this is a rather simplistic approach born out of ignorance of the real situation and may be subject to change as TSOs gain more experience in this sector. After all, the supplier, at each supply, has a duty to ensure (as is reasonable) that the PPE is safe. This will

inevitably mean the textile rental operator carrying out testing of the attributes of the PPE *where reasonably practicable*.

The testing of attributes will be problematical in some cases. This will arise because effectiveness of PPE will depend very much on its history of use. Testing individual PPE will NOT always serve as a good predictor or the performance of other PPE in the contract. The situation is exacerbated where a destructive test method, e.g. FR testing is required; the tested article can neither be returned to service nor provide information about other articles. In this instance alternative verification will be needed. This would reasonably include the product and documentation audit trail from manufacture and processing of the fabric, making-up and product certification, proper assessment of the application of use, education and training of the Employer and wearer, and tracking of service history in laundering and wear (frequency of return, rewashes, repairs etc.)

See Annex C – Setting up a validated, fully traceable system

5. PRINCIPAL PPE PRODUCTS FOR TEXTILE RENTAL

5.1 SAFETY ATTRIBUTES

PPE with the following *primary safety attributes* makes up the majority of the products offered by textile rental companies

5.1.1 *Flame retardant* (FR) workwear e.g. firefighters' turnout coats, cotton, polyester/cotton. The fabric may be treated to render it Flame Retardant or as in the case of Nomex, have inherent properties.

Types of exposure:

a) Protective clothing for use in welding and allied processes (BS EN 470-1:1995)
These products are intended to protect against *small* metal droplets and *accidental* contact with igniting flames. Garment design is addressed in the standard. Operators are *strongly* advised to refer to the TSA guidance document on possible UV exposure to welders wearing a holed or worn thin PPE garment whilst undertaking all forms of arc- welding.

b) Protective clothing for workers exposed to heat (BS EN 531:1995)
Applies to PPE worn by employees who *may* be exposed to heat in contrast to welders, who would *probably* be exposed to heat and spatter. All fabrics must show resistance to flame spread and at least one of the following properties:
i) Convective heat: BS EN 367 defines performance levels for Heat Transfer Index (HDI)
ii) Radiant heat: BS EN 366 defines performance levels for heat transfer levels
iii) Molten aluminium splash: BS EN 373 defines performance levels for molten aluminium splash index
iv) Molten iron splash: BS EN 373 defines performance levels for molten iron splash index

Garment design detail in respect of openings, fastening, pockets, etc is critical for PPE intended for protection against molten aluminium and iron splash. The wearer must be fully trained in how to wear the PPE and the need for the correct use of complementary PPE.

Causes of failure due to processing

All FR PPE will be subject to failure if a) the manufacturer's care instructions are not adhered to e.g. wrong type of detergents and/or bleaches are used and b) the PPE becomes too soiled for the recommended wash procedure to cope with. The residual soiling will add to the fuel load during an incident and this may exceed the ability of the FR system to protect the fabric (and the wearer).

5.1.2 *Chemical resistant workwear* e.g. coveralls for protection against the light splash of chemicals.

Types of exposure:

BS EN 13034 describes methods to assess the protection against acid, alkali, oil and alcohol. Fabrics are classified for repellence and penetration and must exceed highest performance level requirements for at least one of the chemicals. Garment design shall ensure that there are no features that would catch or trap liquid.

Causes of failure due to processing

The commonest reasons for failure in laundering this PPE is a) residual soiling (level too high for the process or incorrect processing), b) inadequate rinsing, leaving detergent on the fabric to aid wetting by the chemical splash or c) wrong detergent leading to inadequate rinsing.

If there is normally a required re-proofing frequency within the garment life then the controls and process specification must be followed to ensure the chemical repellent properties are maintained.

5.1.3 *High visibility/conspicuity workwear:* fabrics and reflective adornments e.g. coveralls for use offshore oil rigs, railway workers, road workers

Types for different exposure:

BS EN 471 specifies three classes of conspicuity (the minimum areas of luminance provided by the base colour of the garment to make it stand out against its surroundings), with Class 3 being the highest; and two classes of retro-reflective performance of the strips (Class 2, the more visible).

It is the Employer's duty to decide which is the most appropriate combination e.g. the balance between conspicuity and reflectance will be affected by the level of light in the work environment; the choice of colour will depend on the surroundings.

Again, the PPE Manufacturer and Service provider can provide expertise in making this decision.

Causes of failure due to processing

Obviously any cause of loss of conspicuity or reflectance will reduce the safety attributes of this PPE. This includes failure to remove soiling (poor processing, excessive soiling for the recommended processing) such that it masks the attribute, and damage to the article, particularly the retro-reflective strips. These are highly susceptible to a) mechanical action and abrasion, alkalinity and pH in the wash, and drying temperature. Products are available

which perform well in this regard, but it is advised that special attention is paid to ensuring the correct strip is used for the application.

5.2 CATEGORIES OF PPE

PPE must be tested, certified to a PPE category, CE marked and labelled with specified information BEFORE it may be placed on the market. The testing and certifying body shall be an approved test house in one of the EU partner laboratories. PPE so certified may be offered for sale anywhere in the EU.

A more extensive list of the common PPE test methods, to that provided in 5.1 above, is given in Appendix D.

The Directive provides exclusive lists of so-called 'simple' and 'complex' design PPE. The manufacturer (or his authorised representative in the EC) has the responsibility of not only deciding if his product is covered by the Directive, but also into which category it falls.

5.2.1 'Simple' design PPE

Regulation 2(2) defines 'simple PPE' (also known, unofficially as Category I PPE) as PPE models of simple design where the designer assumes that the user can himself assess the level of protection provided against the minimal risks concerned, the effects of which, when they are gradual, can be safely identified by the user in good time.

Whilst 'simple' often includes gloves and headwear for protection against knocks, scrapes and bumps, more relevant to textile rental may be seasonal clothing and aprons for protection against hot components which do not exceed 50C.

5.2.2 'Complex' design PPE

Regulation 2(2) defines 'complex PPE' (unofficially known as Category III PPE) as PPE of complex design intended to protect against mortal danger, or against dangers that may seriously and irreversibly harm health, the immediate effects of which the designer assumes that the user cannot identify in sufficient time.

Products of interest to textile rental may include:

a) PPE providing only limited protection against chemical attack (or ionising radiation)
b) PPE for protection against electrical risks
c) PPE for protection against heat and flame

5.2.3 'Intermediate' design PPE

In true bureaucratic fashion this category (unofficially Category II PPE) covers everything covered neither by 'simple' nor 'complex'.

Guidance may be found on this 'grey' area by visiting:
http://ec.europa.eu/enterprise/mechan_equipment/ppe/index.htm
and by consulting one of the Approved Bodies (test houses) authorised to certify PPE.

5.3 OTHER FEATURES IMPORTANT FOR SAFETY IN THE SELECTION OF FABRICS AND GARMENTS

Fabric and garment design is important to ensure that the product is fit for purpose in each individual application. Some reference is made to the importance of this statement in 5.1 above and it should be stressed that the following need to be taken into account for *each* of the above primary safety attributes.

5.3.1 *Physical properties of fabrics:*
Factors affecting comfort, wear life and cleanability.

5.3.2 *Special finishes:*
E.g. soil resistant finishes – whilst these may reduce soiling potential and thereby residual soiling, care must be taken that they do not compromises other safety attributes.

5.3.3 *Garment design:*
Pockets, wrist and ankle fastenings (other closures), soil and liquid shedding features etc.

6. IN SERVICE PROBLEMS

There are a number of on-going issues with workwear which cause particular problems of compliance for PPE. The list given below is not exhaustive and the means to remove or reduce these problems has been discussed in the various sections of this Guide.

6.1 Garment sizing and shrinkage, especially for natural fibre workwear, makes compliance with the PPE Directive occasionally problematical

6.2 Clothing for protection against UV, especially for outdoor workers and welders

6.3 Correct and accurate tracking for use and processing history

6.4 Incorrect use of emblems

6.5 Abuse of garments – use for purposes other than intended.

6.6 Wearers who do not control their own garments correctly and even take home to process

ANNEX A: SUMMARY OF SCHEDULE 2 OF SI 2002 NO. 1144

Schedule 2 of the Regulations effectively reproduces ANNEX II of the PPE Directive which describes the **BASIC HEALTH AND SAFETY REQUIREMENTS.** ANNEX II is set out in three sections:

1. GENERAL REQUIREMENTS APPLICABLE TO ALL PPE
2. ADDITIONAL REQUIREMENTS COMMON TO SEVERAL CLASSES OR TYPES OF PPE
3. ADDITIONAL REQUIREMENTS SPECIFIC TO PARTICULAR RISKS

Textile rental operators already servicing PPE contracts or considering doing so are *strongly* advised to study the Directive and the Regulations carefully. **The following information has been interpreted from the Regulations as the most relevant to the types of PPE and protection discussed in this guide. However, it cannot replace the official text in either above mentioned document.**

A1. GENERAL REQUIREMENTS

Clause 1.1 deals with the design principles and includes requirements on ergonomics, levels and classes of protection (appropriate to different levels of risk)

Clause 1.2 requires PPE to be designed and manufacture free from risks or other nuisance factors in use, including materials of manufacture and areas in direct contact with the wearer. Impediment to movement must be at a minimum.

Clause 1.3 sets out the requirements for comfort and efficiency, including adaptability to fit the individual user, lightness and strength and compatibility with other PPE, which may need to be worn simultaneously. It also lists the information which must be supplied by the manufacturer: including storage, use, care, maintenance, servicing and disinfecting; limitations on protection and number of uses.

A2. ADDITIONAL REQUIREMENTS

Many of the clauses in section 2 are not relevant to PPE that is commonly rented.

Clause 2.2 requires that 'as far as possible' PPE enclosing parts of the body must be sufficiently ventilated to limit perspiration resulting from use; or possibly have the means to absorb perspiration.

Clause 2.4 deals with PPE subject to ageing and requires that the manufacturer either details the obsolescence date or provides the user with the means to establish when the PPE has reached the end of its useful life.

Clause 2.13 states that PPE in the form of clothing intended for foreseeable conditions of use in which the user's presence must be visibly and individually signalled must have one (or more) judiciously positioned means or devices for emitting direct or reflected visible radiation of appropriate luminous intensity and photometric and colorimetric properties.

Clause 2.14 requires that all PPE designed to protect the user against several potentially simultaneous risks must be so designed and manufactured as to satisfy, in particular, the basic requirements specific to each of those risks ('multi-risk' PPE)

A3. SPECIFIC REQUIREMENTS

Many of the clauses in section 3 are not relevant to PPE that is commonly rented.

Clause 3.3 details that PPE constituent materials and other components designed to protect against superficial injury caused by machinery, such as abrasion, perforation, cuts or bites, must be chosen or designed and incorporated as to ensure that these PPE classes provide sufficient resistance to abrasion, perforation and gashing under foreseeable conditions of use.

Clause 3.6 requires that PPE designed to protect against the effects of heat and/or fire must possess thermal capacity and mechanical strength appropriate to the foreseeable use. Materials suitable for protection against radiant and convective heat must have a transmission of heat flux, and be sufficiently incombustible, to preclude any risk of spontaneous ignition under the foreseeable conditions of use.

Clause 3.8 states that protection against electric shock must provide insulation against the voltages to which the user is likely to be exposed under the most unfavourable foreseeable conditions of use.

ANNEX B: SELECTION AND INSTALLATION OF A PPE CONTRACT

The selection and installation of PPE workwear requires a systematic approach, though no single written procedure will satisfy completely all company strategies or individual requirements. The purpose here is to provide a useful approach by highlighting the key points that need to be considered.

B1. WHAT IS THE APPLICATION PROFILE?

B1.1 Assessment of the wearer's job function

The first question to ask in opening discussions on ***any*** workwear contract is

"Has the Employer carried out a Health and Safety Hazard and Risk Assessment of his/her premises and of the different job functions as required by law in the Health & Safety at Work Act 1974 and the Management of Health and Safety Regulations 1999?"

If the answer is 'No' the need for these assessments should be explained and help given as appropriate if the Employer is unsure about how to proceed. (See the TSA's Health, Safety and Environment Management Guidelines)

If the answer is 'yes' the follow-up question is

"Was an assessment under the COSHH Regulations indicated (including lead and asbestos) and, if so, has one been completed?"

If no assessment has been done or the customer cannot show satisfactory documentation, the textile rental company representative will need to urge the customer to do so and, at least, be able to make a preliminary assessment of the need for PPE(1), taking into account the following points:

a) What is the working environment like? E.g. cold, hot, dusty
b) Are hazardous substances in use? (COSHH) If present, how are these controlled? Is there a residual risk which requires the use of PPE?
c) Are there indications that the wearer will have a main requirement for PPE? (Remember the definition of PPE and the General Rule on its use; section 3.1)

(1) The textile rental company may wish to offer an assessment, perhaps limited to the area requiring PPE as part of its service, or advise the customer where such a service could be obtained. Whilst this is a commercial decision it is reasonable to expect the representative to be knowledgeable about the legal obligations of both the customer and his/her own company as an *'other supplier'*

c) What other minor, but significant, activities are undertaken which might require ancillary PPE?
d) Is the wearer active in a number of tasks which may be served by the same PPE garment or does he/she require alternative wear, even non-PPE?

See section B4. For a systematic approach to Hazard and Risk Assessment in this context.

B1.2 Requirements of the PPE

B1.2.1 What are the key safety attributes the PPE must provide?

a) Environment, cold, heat, foul weather?
b) Material handling?
c) Heat/flame requiring FR PPE?
d) Casual chemical splash?
e) High visibility/conspicuity?

B1.2.2 What secondary attributes are required

a) Identity: To distinguish seniority? Colour coding by work areas?
b) Corporate identity: External? Internal to the customer?

These may or may not have a safety or security implication.

B1.3 Servicing Needs

What do the answers to the preceding questions reveal about -

a) Likely composition required of fabrics?
b) Mix of fabrics in the garment?
c) Design and styling needed?
d) Cleansing severity and frequency
e) Frequency of change and number of garments per wearer?
f) Pool (not realistic for most PPE) or individual garment issue?
g) PPE life and contract duration?

B1.4 Previous PPE History

Don't miss the chance to benefit from the Employer's previous experience.

a) What experiences has the customer already gained with different fabrics/garment styles?
b) Was the previous colour, style and cleaning satisfactory?
c) Were any special needs identified in certain job functions?

B2. SELECTION AND MAKING UP

Is there a product in the textile rental company's/supplier's certificated PPE range that will satisfy the requirement for

a) Fabric weight?
b) Primary PPE attribute?
c) Secondary attributes?
d) Strength and durability?
e) Blend and construction?
f) Colour?
g) Finish?
h) Cleaning and type and level of soiling expected, can it be processed satisfactorily and economically – ask the processing department?
i) Consistency of corporate image across the range which might be supplied?
j) Colour combinations (colour bleed)?
k) Garment style?
l) Are all sizes available in the chosen styles?
m) Requirements for emblems/labels; adhesive, embroidered. Be cautious of size, process impact, colour bleed, etc.

B3. INSTALLATION

In preparing for the installation of a contract two other important areas should be addressed by the textile rental company's QA system:

B3.1 Sizing - for individual wearers

It is a requirement in Schedule 2 that all PPE should fit the wearer and be comfortable (the wearer has a duty to advise the Employer *if either is not the case*)

a) If garments are already in use, are the sizes correct?
b) Will replacements come from the same supplier, in the same fabric style and colour?
c) If sizing sets are in use, is their initial and progressive shrinkage in washing and finishing known and acceptable?
d) Can the supplier provide the required sizes in the correct style and colour?
e) Have outer garments been sized to allow, for example, for extra undergarments in cold weather?
f) Have individual wearers been consulted on the styles selected if appropriate?
g) How will data on the PPE be recorded and maintained e.g. date of installation, PPE traceability, uses, repairs?

B3.2 Pre-washing

Pre-washing of PPE, perhaps as an extra service, can be a benefit in the following ways:

a) Avoids the customer's experience of initial shrinkage
b) Removes loose sewing threads and packing creases
c) Softens the handle and improves the aesthetics *and comfort* of some fabrics
d) Reduces the risk of cross staining in future mixed loads
e) Badging after pre-washing reduces problems of cross-staining onto badges

Whilst the textile rental company might formalise this approach in a training programme or notes for representatives and use questionnaires to gain information from customers, it will be much more useful to discuss many of these topics directly with the Employer. A conversation will usually lead to a better understanding of the Employer's needs and level of knowledge of duties and may open other opportunities to provide additional services now and in the future.

B4. A SYSTEMATIC APPROACH TO HAZARD AND RISK ASSESSMENT

It is important to remember that the Employer cannot delegate the responsibility for this assessment to another person or organisation, but providers of advice and information do have a duty of care and must not exceed their competence. The Employer could reasonably expect that somebody advising him on the purchase of PPE knew what they were talking about.

The Law requires that every Employer shall make suitable and sufficient assessment of:

a) The risks to health and safety of his employees to which they are exposed whilst they are at work;
b) The risks to the health and safety of persons not in his employment arising out of or in connection with the conduct by him of his undertaking.

This duty extends to such hazards as fire, machinery, VDUs, trips, slips and falls etc. which will normally be outside the immediate interest of the textile rental representative seeking to place a workwear or PPE contract.

Hazards that would be of interest in this situation will include:

a) Heat, and hot objects and flame
b) Visibility
c) Chemical splash (which will arise from a COSHH assessment[1])
d) Electrical discharge

(1) Control of Substances Hazardous to Health (COSHH). These regulations require a hazard and risk assessment to be carried out on all hazardous substances used in the workplace. Regulation 6 prohibits Employers from carrying out any work which is liable to expose employees to a substance hazardous to health without first making a "suitable and sufficient" assessment of the risks created by that work and the steps that need to be taken to comply with the regulations

Identify the hazards present by discussing with the Employer and walking the site

Who, by worker or job, might be affected by the hazard. Don't forget to ask about part time workers, casual workers, cleaners, visitors, contractors etc.

Assess those precautions which have been taken to reduce risk. Are they adequate? Could more be done? What is the residual risk? Is PPE called for?

Select the appropriate type of PPE and the category of protection needed. Using the information in sections 4 and 5, select the correct type and category of PPE

It may help to complete a table such as that which follows, so that you and the Employer could have a written record of the process for your respective files.

Hazards	**Operator/Job**	**Residual risks**	**PPE type & class**
Molten Aluminium	J Wyke, occasional metal pouring	Low chance of metal splatter	PPE to BS EN 373 performance level E1
High traffic area, all conditions	Load checkers	One-way system, but still significant risk for pedestrians	PPE to BE EN 471 Class 3
Etc.			

ANNEX C: SETTING UP A VALIDATED AND FULLY TRACEABLE LAUNDRY PROCESSING SYSTEM

C1. FIRST STEPS

The validation and monitoring of a process are actually 'points along the way' in a quality assured system. The actual QA system should start with the representative at the Employer's, with answers to the following considerations (discussed in Annex B):

a) The (H&S) assessment of the wearer's job function
b) The selection of the appropriate PPE
c) The frequency of change matched to
d) The anticipated soiling levels in respect of
e) The manufacturer's processing guidelines for maintaining PPE attributes

C2. PROCESS PRE-DESIGN

The manager in charge of processing now has the necessary basic information to begin discussions about the processing design with suppliers e.g.

a) Detergent suppliers, who may have undertaken responsibility for wash processes
b) Washing, drying and finishing machinery suppliers e.g. heat sensitive garments, fabrics or sensitive adornments are to be processed
c) ID suppliers to ensure the design of a fully automated system for logging PPE in on reception, tracking through each stage of the laundry process (including condemned items, new injections, re-issues, repairs, rewash), and packing out and invoicing.

If the PPE cannot be satisfactorily and economically processed the matter should be referred back *immediately* to

d) The PPE manufacturer
e) The purchasing department and
f) The sales team

before orders are placed and the contract agreed

C3. PROCESS DESIGN SPECIFICATION AND VALIDATION

The pre-design discussions will result in the writing up of a design specification which must then be validated to show that the process will restore the PPE to use for its intended purpose for the number of processes approved by the manufacturer. Of course, the fit of the PPE and its aesthetic properties must also be maintained.

Validation is the final phase of the design and a QA system should require that validation procedures and results are kept as part of the documented and auditable record. The design specification and validation process should identify process points, procedures and parameters (key performance indicators), which must be monitored and linked to each PPE item in each batch processed. Monitoring results from each processing stage must be assessed for compliance before the batch is released to the subsequent stage. Non-compliant batches must be isolated and dealt with by agreed procedures e.g. reprocessed from the beginning, rewashed etc.

Process monitoring results should also be reviewed at a frequency based on historical experience. This may be half daily to begin with and, if no problems are indicated, may be extended to longer periods. If the number of non-compliances increases the frequency of review must be increased. The design and validation specification should contain limits for the key performance indicators) e.g. main wash temperature 75±3C. Graphing of key indicators will show trends in the processing which should be addressed before non-compliance occurs.

Monitoring equipment e.g. thermocouples should be recalibrated at agreed intervals to ensure that recorded data is accurate and correct decisions may be taken.

Any changes to processing, planned or brought on by immediate events, must be considered for impact on compliance and may result in the need for isolation of the affected batches and re-validation. Re-validation will be needed at intervals in any case. In the first instance caution is required, but again as an historical record is built up, re-validation frequencies can be readjusted.

There is a clear hierarchy of validation that is more easily explained by considering a new installation, but which is equally applicable to existing operations, namely:

a) Machines - type tests

The machine designer and manufacturer should supply information about the machine specification and performance under test conditions, e.g. utilities consumption, production rates to a given set of conditions, such as moisture retention, etc. There are international standards that set out procedures for machine type tests for laundry equipment. (ISO 9398 and ISO 10472 series)

b) Machines - installation tests

The supplier must check that all equipment is assembled and connected correctly, e.g. motors are turning in the right directions, signal transfer between sub systems are sent, received and acted upon correctly, all instruments are calibrated.

c) Process - design, specification, validation

Experience of machines, textiles and detergents, together with discussions with suppliers as mentioned above, will indicate the starting point for the design of a process based on specific types and levels of soiling and the intended use of the textile. Planned variation of the process variables, and the effect this has on process parameters will lead to an optimum process that may then be specified in writing.

d) Monitoring - recording and inspection of data

To ensure that the process remains within specification between validation procedures, key performance indicators should be routinely monitored and recorded as a permanent record (or retained for an agreed period). This data must also be inspected routinely for trends that could lead to the process going out of specification. A procedure must be in place to identify, compensate and report on adverse trends and the taking of corrective action.

e) Re-validation

Periodically a re-validation must be undertaken which will involve steps (c) and (d) and usually will require parts of (b) to be checked also.

f) Staff - training and motivation

Product quality depends largely on the decisions made by staff and clearly their continuous training and motivation is very important.

C4. MONITORING THE PPE

Any rental contract may require that the quality of the processed textiles is monitored against the specification of the customer. This step is an obligatory requirement for the supply of PPE, certainly as far as the PPE attributes are concerned. Those engaged in the processing of workwear for the food industry are aware that bio-contaminated garments must be processed as quickly as possible to avoid the growth of micro-organisms in a warm, damp environment inside a laundry bag. There is a direct analogy for PPE.

a) Sorting and classification

The process of monitoring should start with the reception of the PPE item in the laundry. It should be logged in to the ID system, sorted and classified soon after arrival. Whilst it may be anticipated that the majority of items in a contract will be batched and weighed together for washing, there is a major opportunity, provided by the inspection, to detect and isolate PPE with a higher degree of soiling than expected. It is possible, and even probable, that this work will not be restored to the desired condition after cleaning. If the maximum allowable treatment is already being given, rewash with the same process probably will not restore it and a more severe treatment may not be given without shortening the life of the article, to the point of seriously

affecting the PPE attribute. Documented and recorded procedures for rewash must be used where this practice is followed.

b) Rewash, repair, condemning

For most workwear processing, garments are inspected for staining, repairs or rejection after the tunnel finisher or at the end of the dry cleaning cycle. Items under the three categories above are separated off from the flow line and their computer record changed accordingly. The majority of items then pass on to be sorted into contracts etc. PPE needs to be similarly treated at an appropriate point in the flow line. Items returning from rewash or repair, together with new injections need to have their computer records amended as they pass through the same inspection point.

c) PPE attributes

Testing for PPE attributes may be considered to fall into two types – non-destructive and destructive.

Hi-vis/conspicuity PPE can be non-destructively monitored for reflectance and colour using simple comparator methods specified by the manufacturers. The results can be added to the PPE history in the computer and, which will also pass or fail the item, again amending its record accordingly and even including it on the invoice. The hi-vis/conspicuity PPE can usually pass on into service.

For resistance to chemical splash, monitoring may be non-destructive or destructive depending on the nature of the chemical and the composition of the PPE. In either case it may be a useful idea to include a requirement on the user to report incidents of chemical splash.

For items which remain undamaged when tested with specific chemicals the ID system may be programmed to flag up each tenth appearance in the laundry (say), when the item may be removed from the flow line and measured using the appropriate test method.

For cases where the PPE will be destroyed by the test, and this applies in particular for protection against heat, flame and molten metal splash, alternative means of examination are needed. The FR properties of a PPE may not actually be degraded, by wear and processing *per se*, but the PPE might still not offer sufficient protection because the soiling level retained on the item after laundering contributes significantly to the fire load. The soiling may be more than the maximum process can remove or the process itself might have been at fault.

How may an alternative scheme work for FR PPE which cannot be tested without destroying the item?

1. There will be a paper trail from the fabric manufacturer, through the maker-up and supplier which will show the traceability of the FR properties of the PPE.

2. The textile rental company representative should have documented the discussions with the Employer for the selection, installation and training of staff and wearers.
3. The processing should have been carried out according to the process design specification, which had been validated and properly monitored.
4. This included an inspection during sorting to assess the soiling level (compared to, for example, photographs of acceptable soiling levels).
5. Inspection at the end of processing will assess finished appearance in terms of soil and stain removal in the same way. Together with an assessment of the state of repair this will give a good qualitative measure of the fitness for purpose.

What else can be done to check soiling level removal? The process agreed between the PPE manufacturer, the detergent supplier and the laundry can be assessed using artificially soiled test pieces. These are cotton or polyester/cotton fabric swatches which have been reproducibly impregnated with different types of soiling designed to just defeat even the most severe wash process. The swatches start off dark and get progressively lighter as the wash process they are given becomes more severe. The lightening can be measured using an appropriate reflectance meter.

Experimentation with the test pieces with the agreed wash process will give a base line expectation for the performance of the wash process in terms of improved reflectance. Further experimentation would allow an incremental range of soiled PPE to be processed and the final outcome to be assessed. The point at which the processed PPE is just acceptable will correspond to the most soiled PPE that the process can handle. These PPE would serve as the basis for the QA photographs to be used in sorting and at final inspection.

ANNEX D: TEST METHODS FOR PPE

There follows a table of the test methods most relevant to PPE offered by textile rental companies.

Standard	Title	Hazard				
		Heat etc.	Static	Chem splash	Hi-Vis	Other
BS EN 340	Protective Clothing: General requirements	★	★	★	★	★
DD ENV 342	Protective Clothing: Ensembles for protection against cold					★
DD ENV 343	Protective Clothing: Protection against foul weather					★
BS EN 348	Protective Clothing: Determination of behaviour of materials on impact of small splashes of molten metal	★				
BS EN 366	Protective Clothing: Protection against heat and fire – Method of test: evaluation of materials and material assemblies when exposed to a source of radiant heat	★				
BS EN 367	Protective Clothing: Protection against heat and fire – Method of determining heat transmission on exposure to flame	★				
BS EN 368	Protective Clothing: Protection against liquid chemicals – Test method: resistance of materials to penetration by liquids			★		
BS EN 369	Protective Clothing: Protection against liquid chemicals – Test method: resistance of materials to penetration by liquids			★		
BS EN 373	Protective Clothing: Assessment of resistance of materials to molten metal splash	★				
BS EN 463	Protective Clothing: Protection against liquid chemicals – Test method: determination of resistance to penetration by a jet of liquid – jet test			★		
BS EN 470-1	Protective clothing for use in welding and allied processes – General requirements	★				
BS EN 471: 2003	Specification for high visibility warning clothing				★	
BS EN 530	Abrasion resistance of protective clothing material – Test methods					★
BS EN 531	Protective clothing: for workers exposed to heat, excluding firefighters' and welders' clothing	★				
BS EN 532	Protective Clothing: Protection against heat and flame – Test method for limited flame spread	★				
BS EN 533	Protective Clothing: Protection against heat and flame – Limited flame spread materials and material assemblies	★				
BS EN 1149-1	Protective Clothing: Electrostatic properties – Surface resistivity (test methods and requirements)		★			
prEN 13034	Protective clothing against liquid chemicals – Performance requirements for chemical protective suits offering limited performance against liquid chemicals (type 6 equipment)			★		