Process Guidance Note 6/46(04)

Secretary of State's Guidance for Dry Cleaning

Defra would like to acknowledge the work of the Environment Agency's Local Authority Unit in the drafting of this guidance note.

Environment Agency

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1 Introduction

1.1 This note is issued by the Secretary of State, the Welsh Assembly Government (WAG) and the Scottish Ministers ("the Government") to give guidance on the conditions appropriate for the control of volatile organic compounds (VOC) emissions from the following industrial sector: Dry Cleaning.

1.2 This is one of a series of notes giving guidance on Best Available Techniques (BAT)[1]. The notes are all aimed at providing a strong framework for consistent and transparent regulation of installations.

General guidance setting out LA-PPC policy and procedures is contained in the "General Guidance Manual on Policy and Procedures for A2 and Part B installations" available from **www.defra.gov.uk/environment/ppc/index.htm** referred to in this document as the "General Guidance Manual" [2].

Guidance on solvent consumption in dry cleaning and good housekeeping measures for solvents is available from Envirowise, the Government-funded programme offering free, independent advice on practical ways to minimise waste and increase profit **www.envirowise.gov.uk** (GG87 Solvent Consumption in Dry-Cleaning and GG28 Good Housekeeping Measures for Solvents).

1.3 This note is for use under Local Air Pollution Prevention and Control (LAPPC) established by the Pollution Prevention and Control Act 1999. It constitutes statutory guidance to regulators under Regulation 37 of The Pollution Prevention and Control (England and Wales) Regulations 2000, SI 1973[3]. To the extent it provides guidance on techniques and regulators are expected to have regard to it. The note will be treated as one of the material considerations when determining any appeals made against a decision under 1999 Act. This note also includes mandatory requirements contained in the EU Solvent Emissions Directive (SED).

1.4 The SED was adopted by the European Commission on 11 March 1999. Its aim is to reduce emissions of VOC from specified industrial processes. In order to achieve this in the UK, the Directive is being implemented through the Pollution Prevention and Control Regulations 2000.

Who is affected

1.5 This guidance is for:

- regulators: who must have regard to the guidance when determining applications and reviewing extant permits
- operators: who are best advised also to have regard to it when making applications, and in the subsequent operation of their process
- members of the public: who may be interested to know what the Government considers (in accordance with the legislation) amounts to appropriate conditions for controlling emissions for the generality of processes in this particular industry sector.

Activities covered by note

1.6 PG 6/46 (04) deals with VOC releases to all media from dry cleaning activities using organic solvents, except for the manual removal of stains and spots in the textile and clothing manufacturing industries. **Section 3** of this note advises on which type of activities/processes it covers.

1. BAT is used in the Pollution Prevention and Control Act 1999.
2. The General Guidance Manual does not apply in Scotland.
3. In Scotland, section 24 of the Pollution Prevention and Control (Scotland) Regulations 2000.

Help in using this Guidance note

1.7 Most dry cleaning plant will have essentially the same characteristics and, although paragraph **1.9** (Site Specific BAT) below applies, it is expected that the outline application form and outline permit [4] in **Appendix 2** and **Appendix 3** can normally be used in order to simplify for businesses the process of applying for a permit and to simplify for regulators the process of issuing a permit. The outline permit comprises conditions 1-25 which are likely to be needed in all cases, and then additional conditions 26-38 to cater for three additional circumstances:

- new and substantially changed installations (although substantial changes are likely to be rare - see guidance in **Section 3** of the note)
- cases where dry cleaning solvents are stored on-site in tanks (bulk storage)
- cases where certain substances or preparations which contain VOC and the nature or amount of VOC means that the substances or preparations are assigned one or more of the risk phrases R45, R46, R49, R60 or R61 are used (which will trigger the mandatory requirements of the SED - see SED Box 6 in PG6/45(04), Surface Cleaning guidance). Suppliers of materials to the dry cleaners should be able to advise them whether any such substances or preparations are being supplied. At the time of publication of this note, there is little or no likelihood of these materials being used in the dry cleaning sector.

1.8 The SED gives limited discretion to Member States to adopt different measures if the Directive requirements are demonstrated not to be technically and economically feasible. Any such alternative measures would need to be clearly justified and approved by the regulator. The operator must demonstrate to the satisfaction of the regulator that the best available technique is being used and that there are no significant risks to human health or the environment. Before the derogation is permitted for SED activities, the regulator must notify Defra and give full justification of each case where SED requirements, SED Boxes 1, 2 and 3 of the note, are not applied. Defra's view at the time of publication of this guidance is that, while each case must be considered by regulators on its merits and each notification by regulators will be carefully examined by Defra, this guidance note has been written to reflect what is BAT for the sector as a whole, and it is not envisaged generally that there will be a need for different measures to be adopted for reasons of technical and economical feasibility.

Site Specific BAT / BATNEEC

1.9 All processes are subject to BAT. In general terms, what is BAT for one process in a sector is likely to be BAT for a comparable process; but in each case it is, in practice, for regulators (subject to appeal) to decide what is BAT for the individual process and the regulator should take into account variable factors (such as configuration, size and other individual characteristics of the process) and the locality (such as proximity of particularly sensitive receptors[5]). Ultimately, therefore, what constitutes BAT is site specific but this guidance note comprises guidance for the generality of processes in the sector and careful regard should be had to it, in order to maximise consistency of permits as appropriate.

1.10 The guidance is based on the state of knowledge and understanding at the time of writing of:

- dry cleaning activities
- their potential impact on the environment; and
- what constitutes BAT for preventing and reducing VOC emissions.

The note may be amended from time to time in order to keep abreast with developments in BAT including improvements in techniques and new understanding of environmental impacts and risks. Such changes may be issued in a complete revision of this document, or in separate additional guidance notes

4. The outline application form and outline permit are not applicable in Scotland.
5. Guidance on the relationship between BAT and air quality objectives is contained in the General Guidance Manual on policy and procedures for A2 and B installations.

which address specific issues. (It may not always be possible to issue amending guidance quickly enough to keep in absolute step with rapid changes, which is another circumstance where paragraph **1.9** above might apply.)

1.11 Steps will be taken to ensure that those who need to know about changes are informed. Operators (and their advisers) are, however, strongly advised to check with the regulator whether there have been any changes before relying on this note for the purposes of making an application under the 1999 Act or making any other decisions where BAT may be a consideration.

Consultation

1.12 This note has been produced in consultation with relevant trade bodies, representatives of regulators including members of the Industrial Pollution Liaison Committee, and other interested organisations.

Publication

1.13 This and the other published guidance in this series is available, free of charge, via Defra at **www.defra.gov.uk**. There are links to this site from the following web sites:

- Scottish Executive at **www.scotland.gov.uk**.
- Environment Agency at **www.environment-agency.gov.uk**.
- Scottish Environment Protection Agency at **www.sepa.org.uk**.

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1.14 In addition to the General Guidance Manual referred to above, explanation or clarification of certain terms used in this guidance note may be found in a general guidance note issued under Part I of the Environmental Protection Act 1991: 'Interpretation of terms used in process guidance notes', known as General Guidance Note 4 - GG4 - published by HMSO in 1991. Where there is any conflict between GG4 and the guidance issued in this note or in the General Guidance Manual, the latter two documents should prevail, as should any subsequent guidance issued in relation to LAPPC.

2 Timetable for compliance and reviews

Existing installations

2.1 Existing installations must meet the requirements of this note from 31 October 2007.

New installations

2.2 For new installations as from the first day of operation following the publication of this guidance note, the permit must have regard to the full standards of this guidance.

Substantially changed installations

2.3 For substantially changed installations (see definitions in **Section 5** of the note) as from the first day of operation following publication of this revised guidance note, the permit must have regard to the full standards of this guidance.

Permit reviews

Reviewing permits

2.4 Under LAPPC the legislation requires permits to be reviewed periodically but does not specify a frequency. It is considered for this sector that a frequency of once every eight years ought normally to be sufficient for the purposes of Regulation 15(1) Pollution Prevention and Control Regulations 2000.

More frequent review may be necessary in individual cases for the reasons given in Regulation 15(2). Further guidance on permit reviews is contained in the “General Guidance Manual on Policy and Procedures for A2 and B Installations” available from **www.defra.gov.uk/environment/ppc/index.htm** to be referred to in this document as the "General Guidance Manual.”

2.5 Under LAPPC, conditions should be reviewed where complaint is attributable to the operation of the process and is, in the opinion of the regulator, justified.

3 Process description

Regulations

3.1 Dry Cleaning Processes/Installations are prescribed for:

- **LAPPC** under Section 7 Part of Schedule 1 of the Pollution Prevention and Control (England and Wales) Regulations 2000 SI 1973. [6](amended).

3.2 This note refers to any dry cleaning using organic solvents in particular: perchloroethylene (PER), hydrocarbon solvent (HCS) and siloxane. The use of carbon dioxide in dry cleaning is not covered by this note

In the rest of **this section only** “process” should be understood to describe the various stages involved in the dry cleaning operations. It does not necessarily have the same meaning as elsewhere in this note.

3.3 In the context of this note, "process" or “activity” comprises the whole process from receipt of raw materials via processing dispatch of finished products, including the treating, handling and storage of all materials and wastes relating to the process.

3.4 The vast majority of machines within the UK are PER machines, although both HCS and siloxane machines are used in some installations. HCS machines use flammable solvents. As such they have specific controls and interlocks placed on them to prevent possible ignition of the solvent. The majority of the PER machines operating within the UK are either the refrigerated closed circuit, or the more modern, closed circuit carbon adsorption type. A small number of open circuit machines may still be in operation in existing installations. However, this type of machine will not comply with the 31 October 2007 compliance requirements.

3.5 Products to be dry cleaned are received at the installation; ticketed, checked for foreign bodies (coins etc.), loose items (buttons), sorted by colour (lights and darks) and material (woollen blankets, suits etc.). Sorting of the materials and colours enables the optimum loads to be made up which will minimise solvent consumption, as a result of materials within the load needing similar drying times. Certain items should not be dry cleaned in PER machines due to their high solvent retention e.g. duvets.

3.6 Before or after sorting of the products for cleaning, stains which may require addition treatment are treated with spot cleaning solutions. Most of these solutions are supplied by specialist suppliers to the industry and the amount of organic solvent is usually very low. However, some dry cleaning installations will still make up their own spot cleaning solutions containing organic solvents using recipes which they may have used for many years. The use of such spot cleaning solutions should be minimised as much as possible as the VOC contained within them may be released to environment.

Note:from a health and safety point of view COSHH assessments should be made of all spot cleaning solutions.

3.7 Before loading into the machine the load should be weighed to optimise the loading of the machine and to ensure that the machine is not over loaded. Overloading and under loading of the machine will increase solvent consumption.

3.8 Most modern machines have set programmes for different types of cleaning cycles. Cleaning of products using the appropriate programme will reduce the solvent consumption. The majority of machines have counters on them which indicate the number of cleaning cycles which have taken place. Although the counters can be reset, these figures may be used to help in auditing against compliance provisions. (If the average solvent consumption per cycle is known).

6. In Scotland, chapter 7 in Part I of Schedule I of the Pollution Prevention and Control (Scotland) Regulations 2000 (SSI 2000/323) (amended).

3.9 The products to be cleaned are taken to the machine and the door of the machine is then opened and the products loaded in. Care is required to ensure that door seal is not damaged in anyway during the loading operation. The door of the machine is then closed and not opened again until the cycle has finished.

3.10 As well as dry cleaning, some machines have options for specialist treatments of products notably waterproofing. Solutions of the waterproofing agent are often made up in the solvent used in the machine and added in during the cleaning cycle via specifically designed equipment. These additional solvents need to be accounted for in the overall solvent balance for the installation.

3.11 Once the cleaning and drying cycle is completed the products are removed from the machine. A solvent odour associated with the products indicates that the solvent recovery process may not have been optimised. This may be due to a number of reasons: poor loading of the machine (over loading or inadequate sorting of materials to be cleaned); use of the wrong programme for the particular load, leading to poor solvent recovery, as a result of insufficient drying time, or a possible fault within the machine.

3.12 During the drying cycle of the machine, water which was present in the garments to be cleaned and within the atmosphere of the dry cleaning machine is condensed out within the water separator. This water is likely to contain small quantities of the dry cleaning solvent. Careful disposal of the water may be required, particularly if secondary treatment of the water separator water has not been carried out. Water contaminated with solvent will often appear cloudy.

3.13 After a number of cleaning operations the residues which collect in the still of the dry cleaning machine must be removed. On dry systems this is done by distilling to dry the contents of the still. Once cooled the residues are then raked out and disposed of via a licensed waste contractor. On pumpable systems the residue is distilled until the remaining product is just pumpable, the residues are then pumped into a sealed holding container. The residues with any residual solvent are then sent for specialist recovery of the solvent prior to disposal of the solid residues.

3.14 A survey of dry cleaning operations, carried out in 1996, indicated that 41% of the most up to date closed circuit carbon adsorption machines failed to comply with the requirements, whilst 60% of the refrigerated closed circuit failed to comply. Hence, maintenance and training of the operators in methods of optimising the consumption of dry cleaning solvent are key in ensuring compliance with the requirements of the SED.

Manufacturers of machines supply operating and maintenance manuals for their machines in order to optimise the machine performance. Good practice and common requirements in these manufacturers' manuals are checks daily, weekly and at other intervals in the following areas: (particularly for PER machines). The following describes typical checks found in machine manufacturers' manuals.

Daily leak tests from areas such as:
- cage door gasket
- button trap lid
- air duct inspection hatch
- filter seals
- lint filter
- main bearing seal
- vapour line
- filter dump valve
- fan housing inspection hatch
- heating coil battery
- fresh air dampers
- solvent valves
- recovery head
- cooling coil battery
- still doors
- solvent tank sight glasses
- solvent pipe flanges

Vapour leaks are best detected during the early stages of the drying cycle.

Weekly checks of common components:
- all drying and still thermostats
- level controls in the cage and still
- the still pressure relief device
- draining line on the drum
- for by-passing of the lint filter, which may lead to blocking of the drying circuit
- button trap is functioning correctly and debris cannot pass the trap.

Common parts on machines which may need replacement or cleaning include:
- door seals: wipe clean all door seals daily and replace annually
- button trap (manual): clean sieve twice daily and after lint loads
- lint filter (manual): clean twice daily
- water separator: drain and clean every two weeks; drain excess water daily
- solvent pump: check for leaks after repair or maintenance
- filters: drain spent cartridges in the machine overnight; check for leaks after replacement
- still: empty at least once per week
- recovery condensers: clean condenser fins on air cooled refrigeration systems on a monthly basis.

3.15 Un-manned coin operated machines: only PER coin operated machines are found in the UK. Un-manned coin operated machines are unlikely to comply with the requirements of the directive.

Un-manned coin operated machines will only comply if all of the below are in place in addition to all the other relevant provisions of this note:
- the manufacture of the machine can guarantee that under all load conditions the compliance requirements of this note will be met;
- the machine has some method of measuring the weight of the garments etc. loaded into the machine;
- a method of measuring the PER concentration in the cage at the end of each cleaning cycle
- a continuous method of detecting leakage of solvent whilst the machine is unattended is provided

3.16 The SED requires that dry cleaning installations are operated in such a manner that no more than 20 grams of solvent per kilogram of product cleaned and dried shall be emitted as measured on an annual basis. The 20 grams includes all organic solvents used within the installation e.g. dry cleaning solvent, water-proofing solutions and spot cleaning solutions. The regulator will be required to check compliance with this directive requirement using the return submitted by the operator to demonstrate compliance. Other information may be used by the reguluator to audit the returns from the operator for example:

- Turnover of the installation;
- Customer/ticket counts;
- Solvent purchased reconciliation

Figure 3.1: Potential VOC release points from a typical dry cleaning machine

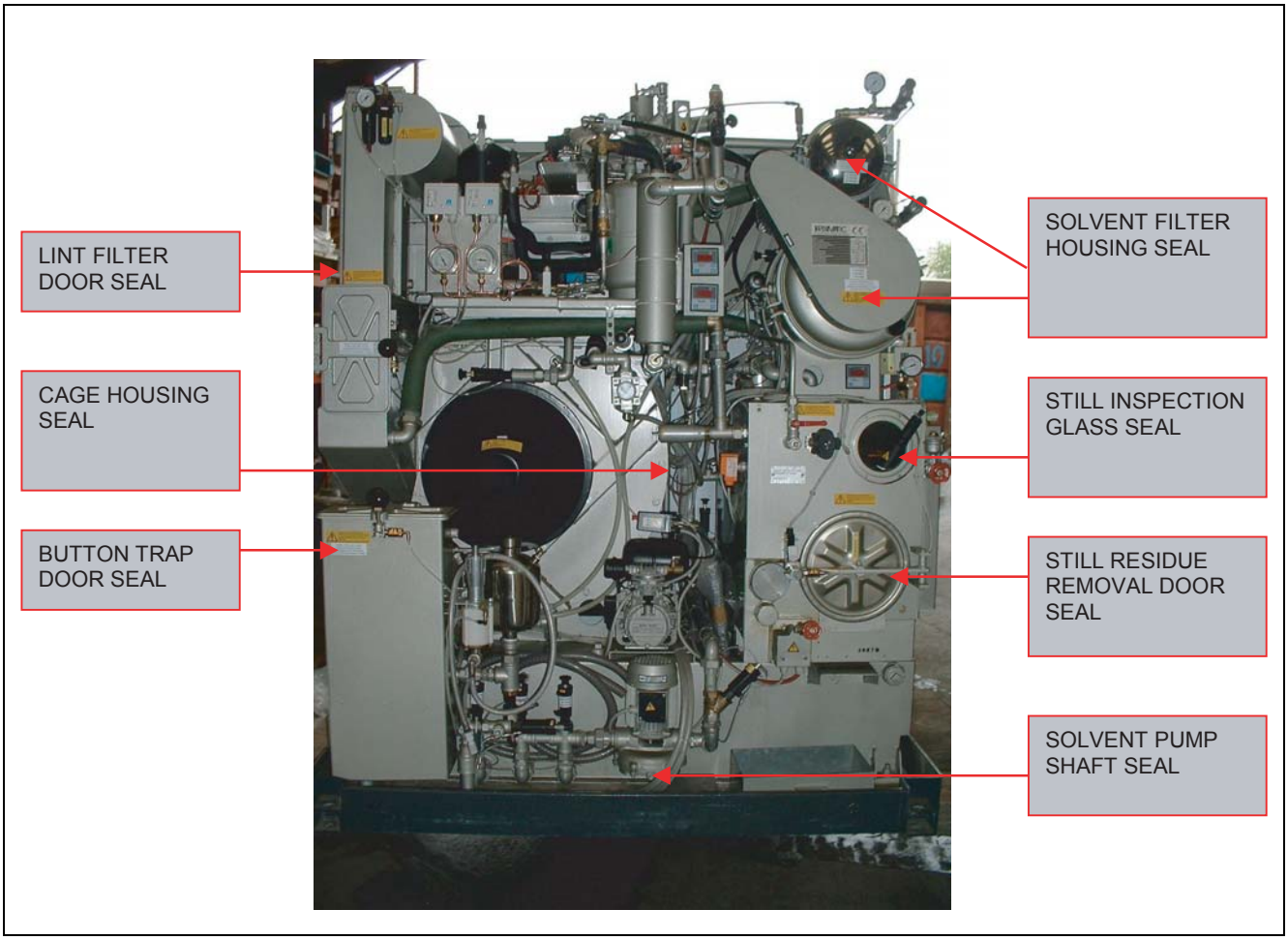
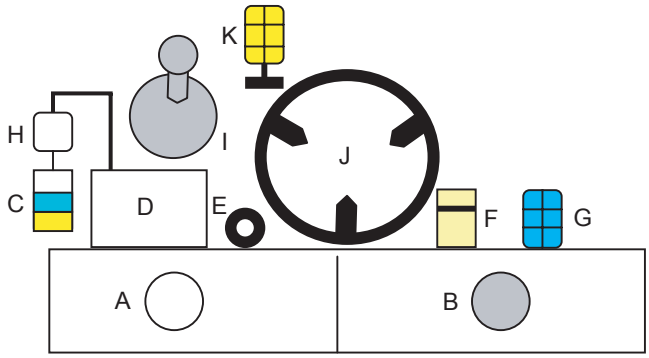
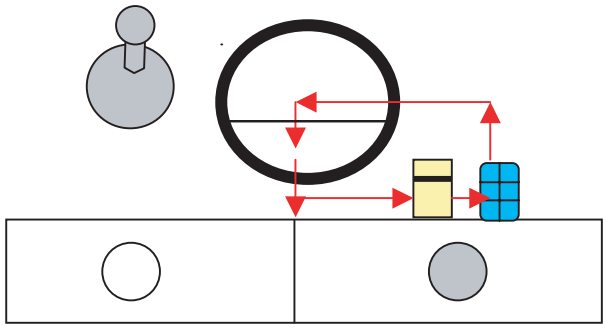


Figure 3.2: Schematic of a typical dry cleaning machine



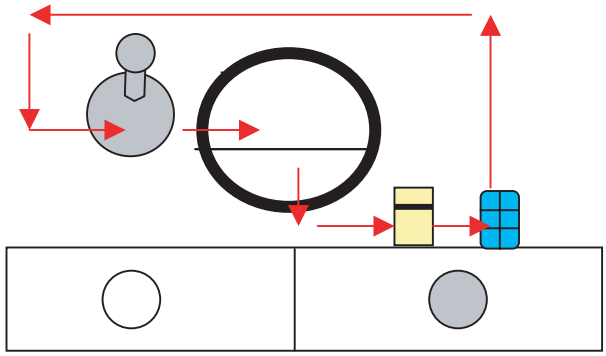
A. Distilled Tank
B. Working Tank
C. Separator
D. Distillation Unit (Still)
E. Motor
F. Button Trap
G. Pump
H. Condenser
I. Filter
J. Cage (Illustrates Lifter)
K. Fan

Figure 3.3: By pass wash for typical dry cleaning operation



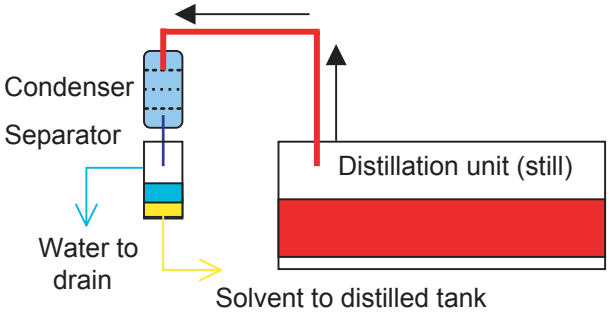
The Bye- pass wash.
Solvent is pumped into the cage from either tank, once the correct level is reached; the solvent is circulated between the cage, button trap, and pump.

Figure 3.4: Filtered wash for a typical dry cleaning operation



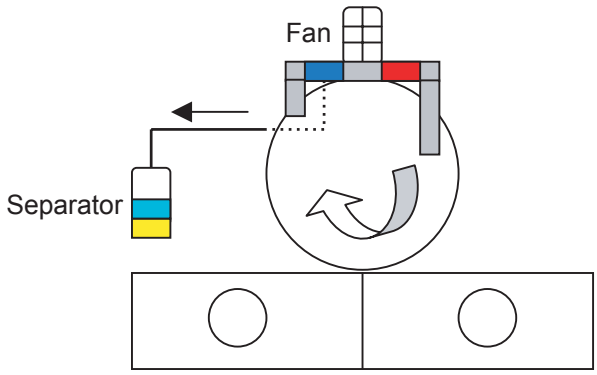
The Filter wash.
Solvent is pumped into the cage from either tank, once the correct level is reached; the solvent is circulated between the cage, button trap, pump and filter.

Figure 3.5: Distillation cycle for a typical dry cleaning operation



The Distillation Cycle.
Contaminated solvent is pumped to the still. The solvent is heated to 121 C; the vapour is cooled in the condenser and passed on as solvent and water to the separator. The lighter water goes to drain the heavier solvent flows back to the clean tank.

Figure 3.6: Drying cycle for a typical dry cleaning operation



The Drying Cycle;
Air is driven by the fan through the heating battery The hot air is then circulated around the cage absorbing the solvent in the garments. The air is then sucked into the cooling battery and condensed back into a liquid.

The solvent and water then flow back into the separator.

4 Emission limits, monitoring and other provisions

Compliance overview

4.1 New and substantially changed SED installations, and by the 31 October 2007 existing SED installations must comply with:
- Total Emission Limit Value (SED Box 1).

4.2 The provisions described in this Section are achievable using best available techniques described in **Appendix 3**.

- The reference conditions for limits in **Section 4** are: 273.15K, 101.3kPa, without correction for water vapour content, unless stated otherwise.

VOC Total Emission Limit Values

SED Box 1 New or substantially changed SED installations, and by the 31 October 2007, existing SED installations			
Row	**Total Emission Limit**	**Monitoring**	**Monitoring Frequency**
1	20 grams of solvent released per kilogram of product cleaned and dried* * Equal to: For PER 1 litre/ 80 kilograms of product cleaned and dried For HCS 1 litre/ 48.5 kilograms of product cleaned and dried For Siloxane 1 litre/ 48.5 kilograms of product cleaned and dried	• Monitoring of solvent input • Monitoring of solvent losses • Monitoring of mass of garments etc.cleaned	Weekly checks and annual mass balance to demonstrate compliance.

Compliance with Total Emission Limit Value PER Dry Cleaning only

4.3 For dry cleaning installations using only PER the solvent input (I_1) into the dry cleaning operation can be determined using the method below:

Solvent input (I_1)	=	Initial solvent stock at start of accounting period	+	Solvent purchased during the accounting period	_	Final solvent stock at the end of the accounting period	_	Solvent in waste sent for recovery, or disposal
Example								
Solvent input (I_1)	=	100 litres on stock 01/01/04	+	520 litres purchased between 01/01/04 and 01/01/05	_	110 litres on stock 01/01/05	_	10 litres of solvent contained in still bottoms sent for recovery, or disposal*
	=	100	+	500	-	110	-	10
Solvent input (I_1)	=	500 litres						

* The solvent content of still bottoms is determined by the :

volume of still residue X (Factor)

Factor= 0.15 for still residues which are raked out

Factor= 0.6 for still residues which are pumped out

For PER Compliance the weight of products cleaned and dried in kgs should be at least :

{Solvent input (I_1) + correction factor for spot cleaning solvents** (litres)} X 80 kgs

****Note:**
The spot cleaning correction factor is 6.25 (litres) if 10 litres or less are used per annum of:

- proprietary solvent borne purchased spot cleaning solutions, and/or
- solvent borne spot cleaning solutions made up from solvent other than the main dry cleaning fluid (PER).

The spot cleaning correction factor should be calculated in all other circumstances using the method is given in **Appendix 4**.

4.4 The mass of products cleaned should be determined weekly in kilograms. The sum of weekly figures over the annual accounting period should be used to show compliance with the above requirement.

Compliance with Total Emission Limit Value all other solvent and mixed solvents

4.5 Where solvents other than Per are used or a mixture of solvents are used (including PER). The solvent input (I_1) will be made up of the solvent usage of each individual solvent

Solvent "A" usage	=	Initial solvent "A" stock at start of accounting period (litres)	+	Solvent "A" purchased during the account-ing period (litres)	_	Final sol-vent "A" stock at the end of the accounting period (litres)	_	Solvent "A" in waste sent for recovery or disposal (litres)*
Solvent "B" usage	=	Initial solvent "B" stock at start of accounting period (litres)	+	Solvent "B" purchased during the account-ing period (litres)	_	Final sol-vent "B" stock at the end of the accounting period (litres)	_	Solvent "B" in waste sent for recovery or disposal (litres)*

Solvent input (I_1) is equal to the sum of the mass of the individual solvents used

Solvent input (I_1) (grams)	=	Solvent "A" usage	X	SG** of Solvent "A"	+	Solvent "B" usage	X	SG** of Solvent "B"

* The solvent content of still bottoms is determined by the :

volume of still residue X (Factor)

Factor= 0.15 for still residues which are raked out

Factor= 0.6 for still residues which are pumped out

**Specific Gravities of common dry cleaning solvents

- PER 1600 grams/litre
- HCS 970 grams/litre
- Siloxane 970 grams/litre

For compliance the weight of products cleaned and dried in kgs should be at least :

Solvent input (I_1)+ correction factor for spot cleaning solvents** (grams)/20 kgs

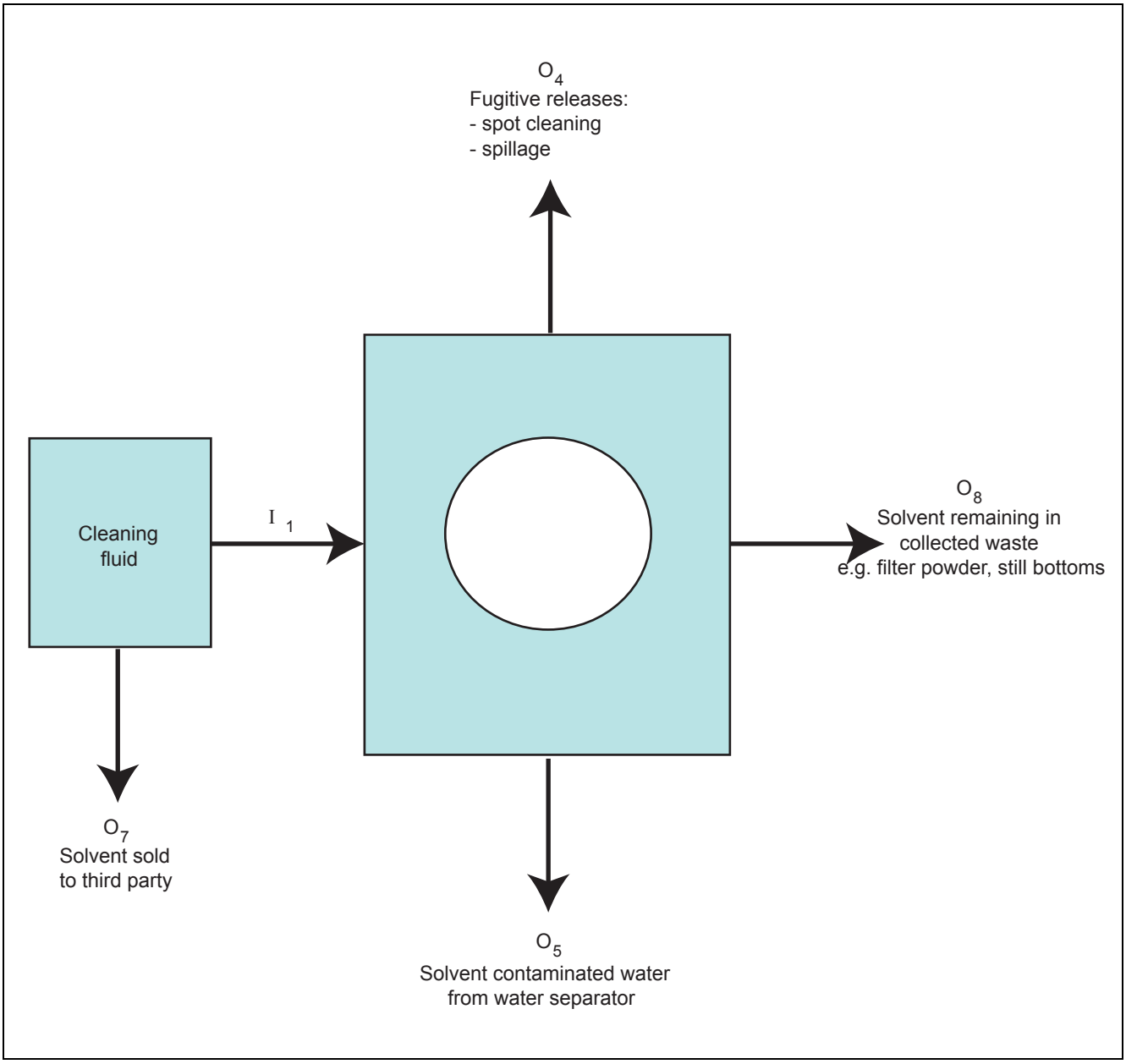
****Note:**
The spot cleaning correction factor is 10,000 (grams) if 10 litres or less are used per annum of:

- proprietary solvent borne purchased spot cleaning solutions, and/or
- solvent borne spot cleaning solutions made up from solvent other than the main dry cleaning fluid (PER, HCS or Siloxane).

The spot cleaning correction factor should be calculated in all other circumstances using the method is given in **Appendix 4**.

4.6 The mass of products cleaned should be determined weekly in kilograms. The sum of weekly figures over the annual accounting period should be used to show compliance with the above requirement.

Figure 4.1: Solvent Management Plan Inputs and Outputs



5 Definitions and further information

In this section, definitions are arranged alphabetically in this list and within the SED Box.

Activity	see “Process”
BAT	explained in Defra General Guidance Manual on policy and procedures for A2 and B installations
Input	means the quantity of organic solvents and their quantity in preparations used when carrying out an activity, including the solvents recycled inside and outside the installation, and which are counted every time they are used to carry out the activity
Installation	shall have the same meaning as in Appendix 3 of the Manual. generally for the purposes of this note the term installation should be taken to have the same meaning as “process” for the purposes of LAPC
Installation in relation to SED	means the same as LAPPC except that it refers only to the parts of the installation which have an effect on emissions of VOC
LAPPC	explained in the Introduction section of this guidance
Local enforcing authority	is replaced by the word ‘regulator’ in LAPPC
Organic solvent	means any VOC which is used alone or in combination with other agents, and without undergoing a chemical change, to dissolve raw materials, products or waste materials, or is used as a cleaning agent to dissolve contaminants, or as a dissolver, or as a dispersion medium, or as a viscosity adjuster, or as a surface tension adjuster, or a plasticiser, or as a preservative
Organic compound	means any compound containing at least the element carbon and one or more of hydrogen, halogens, oxygen, sulphur, phosphorus, silicon or nitrogen, with the exception of carbon oxides and inorganic carbonates and bicarbonates
Permit	the written permission to operate an installation prescribed for LAPPC – (the replacement for authorisation under LAPC)
Process	the term “process(es)” means both “processes” under the Environmental Protection Act 1990 and “installations” and “activities” under the Pollution Prevention and Control Act 1999 and the Solvent Emissions Directive 1999/13/EC
Process/activity under LAPPC	means activity
Process/activity under SED	means the same as under LAPPC except that it refers only to the parts of the activity which have an effect on emissions of VOC
Regulator	replaces the phrase ‘local enforcing authority’ from LAPC
Reuse of organic solvents	means the use of organic solvents recovered from an installation for any technical or commercial purpose and including use as a fuel but excluding the final disposal of such recovered organic solvent as waste

Risk Phrase	means the same as in Directive 67/548/EEC R40 - limited evidence of a carcinogenic effect R45 - may cause cancer R46 - may cause heritable genetic damage R49 - may cause cancer by inhalation R60 - may impair fertility R61 - may cause harm to the unborn child
SED	Solvent Emission Directive
Shortest possible time	shall have the same meaning as in DEFRA Guidance on the Implementation of Solvent Emissions Directive (1999/13/EC) March 2002
Start-up and shutdown operations	means operations whilst bringing an activity, an equipment item or a tank into or out of service or into or out of an idling state. Regularly oscillating activity phases are not to be considered as start-ups and shut-downs
Site boundary	shall have the same meaning as GG4
Substantial change	See Substantial Change Box below.
Technically connected	shall have the same meaning as in Integrated Pollution Prevention and Control, A Practical Guide (Pages 69-71)
This guidance	Process Guidance Note 6/46(04)
VOC	Volatile Organic Compounds
Volatile Organic Compound (VOC)	shall mean any organic compound having at 293,15 K a vapour pressure of 0,01 kPa or more, or having a corresponding volatility under the particular conditions of use. For the purpose of the Solvents Directive, the fraction of creosote which exceeds this value of vapour pressure at 293,15 K shall be considered as a VOC

Substantial change SED Box 2

Substantially changed installations: that part of the installation which undergoes the substantial change shall be treated as new installation and the permit must have regard to the full standards of the Directive as from the first day of April 2001

Substantial change means:

A change which results in

- an increase of more than 10% in VOC emissions and
- that increase in VOC emissions must have resulted from a change in nominal capacity of the installation.

Or in the opinion of the competent authority, any change which may have significant negative effects on human health or the environment .

However, if the following condition is met, then the change should not be considered substantial and an application for a non-substantial variation should be made.

The total mass emission of VOC from the SED installation after the substantial change is less than:

- the total mass emission of the installation prior to the change (which would have been described as substantial); PLUS
- the calculated additional mass emission of the change part (which would have been described as substantial) of the installation if it had complied with the 31 October 2007 VOC total emission limits requirements.

Note: *under the above condition the following would not normally be considered a substantial change:*

- *the replacement of an existing dry cleaning machine with a new closed circuit machine (even if the new machine was of a larger capacity);*
- *the addition of one or more new closed circuit machine to an existing installation.*

and an application for a non-substantial variation should be made.

Following a substantial change, compliance must be re-verified.

SED Box 3 Definitions SED Activities

(article 2) All Activities

Competent Authority	shall mean the authority or authorities or bodies responsible under the legal provisions of the Member States for carrying out the obligations arising from this Directive;
Emission limit value	shall mean the mass of VOCs, expressed in terms of certain specific parameters, concentration, percentage and/or level of an emission, calculated at standard conditions, which may not be exceeded during one or more periods of time;
Emission	shall mean any discharge of VOCs from an installation into the environment;
Existing installation	shall mean an installation in operation or, in accordance with legislation existing before1 April 2001, an installation which is authorised or registered or, in the view of the regulator, the subject of a full request for authorisation, provided that the installation is put into operation no later than one year after 1 April 2001
Halogenated organic solvent	shall mean an organic solvent which contains at least one atom of bromine, chlorine, fluorine or iodine. per molecule;

SED Box 3 Definitions SED Activities

(article 2) All Activities

Installation	shall mean a stationary technical unit where one or more activities falling within the scope defined in Article 1 of the Solvents Directive are carried out, and any other directly associated activities which have a technical connection with the activities carried out on that site and which could have an effect on emissions;
New installation	shall mean an installation which is not existing;
Nominal capacity	shall mean the maximum mass input of organic solvents by an installation averaged over one day, if the installation is operated under conditions of normal operation at its design output;
Normal operation	shall mean all periods of operation of an installation or activity except start-up and shut-down operations and maintenance of equipment;
Operator	shall mean any natural or legal person who operates or controls the installation or, where this is provided for in national legislation, to whom decisive economic power over the technical functioning of the installation has been delegated;
Preparation	shall mean mixtures or solutions composed of two or more substances;
Standard conditions (N)	shall mean a temperature of 273,15 K and a pressure of 101,3 kPa;
Substances	shall mean any chemical element and its compounds, as they occur in the natural state or as produced by industry, whether in solid or liquid or gaseous form;
Total emissions	shall mean the sum of fugitive emissions and emissions in waste gases;

Health and safety

Operators of processes and installations must protect people at work as well as the environment:

- requirements of a permit or authorisation should not put at risk the health, safety or welfare of people at work
- equally, the permit must not contain conditions whose only purpose is to secure the health of people at work. That is the job of the health and safety enforcing authorities

Where emission limits quoted in this guidance conflict with health and safety limits, the tighter limit should prevail because:

- emission limits under the Pollution Prevention and Control Act 1999 relate to the concentration of pollutant released into the air from prescribed activities
- exposure limits under health and safety legislation relate to the concentration of pollutant in the air breathed by workers

- these limits may differ since they are set according to different criteria. It will normally be quite appropriate to have different standards for the same pollutant, but in some cases they may be in conflict (for example, where air discharged from a process is breathed by workers). In such cases, the tighter limit should be applied to prevent a relaxation of control

Additional information

Some of the **High Street banks**, such as NatWest and the Coop, now offer preferential loan rates to organisations that can demonstrate they are committed to improving their environmental performance. The NatWest also produce a self help guide for SMEs, 'The Better Business Pack', focusing on waste, utilities, transport and supply chain issues. It gives tools, guidance and examples. Contact: WWF-UK on 01483 426444.

References

(a) General Guidance Note 1 (GG1). "Introduction to Part I of the Act" (The Stationery Office, ISBN 0 11 752423) includes general guidance on the interpretation of "best available techniques not entailing excessive cost", and the requirements of Articles 4, 12 and 13 of EC Directive 84/360/EEC

(b) General Guidance Note 4 (GG4). "Secretary of State's Guidance – Interpretation of terms used in Process Guidance Notes" April 1991

(c) Envirowise (formerly known as ETBP publications)
- GG87 Solvent Consumption in Dry- Cleaning
- ETBPP GG28: Good Housekeeping Measures for Solvents

Web addresses

The final consultation drafts and final published versions of all guidance notes in this series can be found on **www.defra.gov.uk/environment/index.htm**.

Welsh Assembly Government web-site **www.wales.gov.uk**.

Local Authority Unit of the Environment Agency for England and Wales. **www.environment-agency.gov.uk**.

Scottish Environment Protection Agency (SEPA) **www.sepa.org.uk**.

Energy saving and environmental management measures can increase industry profits. Envirowise (formerly ETBPP) show how at **www.envirowise.gov.uk** (or freephone 0800 585794).

Appendix 1: Extract from LAPPC Regulations[7]

DEFINITION OF DRY CLEANING ACTIVITY IN SCHEDULE 1 TO THE SOLVENT EMISSIONS (ENGLAND AND WALES) REGULATIONS 2004, SI 107

"dry cleaning" means any industrial or commercial activity using volatile organic compounds to clean garments, furnishing and similar consumer goods excluding the manual removal of stains and spots in the textile and clothing industry.

7. Every effort has been taken to ensure that this Appendix is correct at the date of publication, but readers should note that the Regulations are likely to be subject to periodic amendment, and this Appendix should not therefore be relied upon as representing the up-to-date position after the publication date.

Appendix 2: Outline Application Form

Local Authority Pollution Prevention and Control

Pollution Prevention and Control Act, 1999

Pollution Prevention and Control (England and Wales) Regulations 2000 (as amended)

When to use this form

Use this form if you are applying for a permit to a Local Authority to operate a dry cleaning installation as defined in Schedule 1 of The Solvent Emissions (England and Wales) Regulations, 2004 SI 107.

The appropriate fee must be enclosed with the application to enable it to be processed further. When complete send the form and fee and any additional information to:

Insert local authority address

A1.1. **Name of the premises**

……

A1.2. Please give the **address of the premises**

……
……
……

Postcode .....Telephone.....

Ordnance Survey national grid reference 8 characters,

(for example, SJ 123 456)..... *there are a number of internet mapping sites which will convert a Post Code to a grid references*

A1.3. Do you have an existing permit for a dry cleaning installation?.....

A2.1. **The Applicant** - Please provide the full name of company or corporate body or the name of the sole trader or the names of the partners

……

Trading/business name (if different)

……

Registered Office address

……
……
……

Postcode .....Telephone.....

A2.2. Holding Companies

Is the operator a subsidiary of a holding company within the meaning of Section 736 of the Companies Act 1985?

No?

Yes? Name of ultimate holding company.....

Ultimate holding company Registered office address

……
……
……

Postcode .....Telephone.....

B**. About the installation**

B1.2. A plan of the premises showing the location of:
(a) the premises
(b) where the dry cleaning machine(s) will be installed
(c) where the dry cleaning solvents will be stored
(d) where the dry cleaning residue will be stored
(e) any drains within the installation and in the immediate area of the installation which may be affected as a result of any potential Volatile Organic Compound (VOC) release from the dry cleaning operations

must be attached.

B1.3. A description of the location and methods of storage of:
(a) dry cleaning solvents
(b) dry cleaning residue

must be supplied.

B1.4. Make, model name/number, serial number, load capacity, date of installation and type of dry cleaning solvent used.

Make	Model	Serial Number	Load Capacity	Date of Installation	Dry Clean-ing Solvent

B1.5. Provide details, including a schedule, of checking and maintenance procedures for each machine. This should include the machine manufacturers' recommended operating procedures, checking and maintenance requirements and any other additional procedures undertaken by the operator. (This should be submitted in a form of a list of the activities carried out and there frequencies, for additional guidance see **Section 3**, paragraph **3.14**)

B1.6. Provide details of any other activities carried out within the dry cleaning installation which involve the use of organic solvents in particular spot clean solutions, water-proofing solutions and any other solvents or solvent bourne preparations

B1.7. Provide details on the training and relevant qualifications regarding operating and maintaining the dry cleaning machine inaccordance with this guidance.

B1.8. Specify how the product will be weighed and recorded weekly and annually.

B1.9. Provide details how the mass or volume of solvent used will be determined and recorded weekly and annually (due to the low use spot cleaning solvents they need only to be determined annually).

B2.0. **Risk Phrase Solvents** At the time of writing and in the future it is believed unlikely that these materials will be used within the dry cleaning industry. (*Details of the risk phrases of the materials used can be found on the orginal suppliers packaging and in the Materials Safety Data Sheet (MSDS) for the product)*

Are any substances or preparations which because of their VOC content are required carry one or more of the following risk phrases used within the installation:

- R45 - May cause cancer
- R46 - May cause heritable genetic damage
- R49 - May cause cancer by inhalation
- R60 - May impair fertility
- R49 - May cause harm to the unborn child.

Yes	No

If **Yes,** provide full details of how and why these risk phrase materials are used and how the requirements of the amendment 1C of Schedule 1 of The Solvent Emissions (England and Wales) Regulations, 2004 SI 107, substitution, control and limiting of emissions of risk phrase materials will be met.

C1. **Fees and Charges**

The enclosed charging scheme leaflet gives details of how to calculate the application fee. Your application cannot be processed unless the application fee is correct and enclosed.

C1.1. Please state the amount enclosed as an application fee for this installation.

£.....

Cheques should be made payable to:

We will confirm receipt of this fee when we write to you acknowledging your application.

C1.2. Please give any company purchase order number or other reference you wish to be used in relation to this fee.

C2. Annual charges

If we grant you a permit, you will be required to pay an annual subsistence charge. If you don't pay, your permit can be revoked and you will not be able to operate your installation.

C2.1. Please provide details of the address you wish invoices to be sent to and details of someone we may contact about fees and charges.

……
……
……

Postcode.....Telephone.....

C3. **Commercial confidentiality**

C3.1. Is there any information in the application that you wish to justify being kept from the public register on the grounds of commercial confidentiality?

Yes	No

If **Yes**, please provide full justification, considering the definition of commercial confidentiality within the PPC regulations (See the general guidance manual).

C4. **Data Protection**

The information you give will be used by the Local Authority to process your application. It will be placed on the relevant public register and used to monitor compliance with the permit conditions. We may also use and/or disclose any of the information you give us in order to:

- consult with the public, public bodies and other organisations,
- carry out statistical analysis, research and development on environmental issues,
- provide public register information to enquirers,
- investigate possible breaches of environmental law and take any resulting action,
- prevent breaches of environmental law,
- assess customer service satisfaction and improve our service.

We may pass on the information to agents/ representatives who we ask to do any of these things on our behalf.

It is an offence under Regulation 32 of the PPC regulations, for the purpose of obtaining a permit (for yourself or anyone else) to:

- make a false statement which you know to be false or misleading in a material particular,
- recklessly make a statement which is false or misleading in a material particular.

If you make a false statement
we may prosecute you, and
if you are convicted, you are liable to a fine or imprisonment (or both).

C5. **Declaration**

C5.1. Signature of current applicant(s)*

I / We certify that the information in this application is correct. I / We apply for a permit in respect of the particulars described in this application (including supporting documentation) I / We have supplied.

Please note that each individual applicant must sign the declaration themselves, even if an agent is acting on their behalf.

For the application from:

Premises
name:.....

Signature:
.....

Name:.....
.....

Position:.....
.....

Date:.....

Signature:
.....

Name:.....
.....

Position:.....
.....

Date:.....

* Where more than one person is defined as the applicant, all should sign. Where a company or other body corporate - an authorised person should sign and provide evidence of authority from the board of the company or body corporate.

Appendix 3: Outline Permit

ANY PLACE DISTRICT COUNCIL

POLLUTION PREVENTION AND CONTROL ACT 1999

POLLUTION PREVENTION AND CONTROL REGULATIONS 2000, SI 1973 (AS AMENDED)

Permit ref. no.

Installation Details

(i) **Name and address of operation:** + (if appropriate) registered number and office of company.

(ii) **Address of permitted installation**: [outlined on attached plan; + include location of dry cleaning machince(s), storage dry cleaning solvents, residues and drains -see condition].

The above named company is permitted to operate a dry cleaning installation containing the dry cleaning machine(s) [insert details from application],

Make	Model	Serial Number	Load Capacity	Date of Installation	Dry Clean-ing Solvent

subject to compliance with the following conditions:

Permit Conditions

(1) Operations must be carried out in such a manner that no more than 20 grams of solvent per kilogram of product cleaned and dried shall be emitted as measured and reported annually. The 20 grams includes all organic solvents used within the installation e.g. dry cleaning solvent, water-proofing solutions and spot cleaning solutions.

(2) A weekly inventory of solvent usage, product cleaned and solvent waste sent for recovery or disposal shall be maintained and held on site for inspection by the regulator for at least 12 months

– Note: The solvent management balance sheet for dry cleaning installations in **Appendix 4** can be used to demonstrate compliance with conditions (1) and (2) (above).

(3) The operator shall implement the schedule of procedures, checks and maintenance requirements to each dry cleaning machine as listed in [B1.5 of the permit application dated [**date**]].

(4) The regulator shall be advised in writing 14 days prior to any proposed significant alteration to the operation, or modification of the installation which may have an effect on emissions of VOC from the installation, in particular changes to the matters listed in condition (3).

(5) All operating staff must know where the operating manual for each dry cleaning machine can be found and have ready access to it.

(6) All operating staff must been trained in the operation of each dry cleaning machine and the control and use of dry cleaning solvents. The training received must be recorded.

(7) The machine shall be installed and operated in accordance with supplier recommendations, so as to minimise the release of VOC to air, land and water.
(8) In the case of abnormal emissions, malfunction or breakdown leading to abnormal emissions the operator must:
- investigate immediately and undertake corrective action; adjust the process or activity to minimise those emissions; and
- adjust the process or activity to minimise those emissions; and
- promptly record the events and actions taken.
- In this condition abnormal emission will include any detectable solvent smell other than in the area of the dry cleaning machine.

(9) In cases of non-compliance causing immediate danger to human health, operation of the activity must be suspended; and the regulator informed within 24 hours.
(10) Dry cleaning machines shall be operated as full as the type of materials to be cleaned will allow. (e.g. Full loads for light non delicates materials such as suits. Delicates and heavy materials, such as, wedding dresses and blankets may need to be cleaned in part loads).
(11) Where cleaning solvents containing VOC are not received in bulk they shall be stored:
- in the containers they where supplied in with the lid securely fastened at all times other than when in use; and
- within spillage collectors, of suitable impervious and corrosion-proof materials and capable of containing 110% of the largest container; and
- away from sources of heat and bright light; and
- with access restricted to only appropriately trained staff.
- Note: from a health and safety point of view: a well ventilated area should be used.

(12) Where cleaning solvents containing VOC are not received in bulk, the lids of the containers shall only be removed when the container is next to the cleaning machine readily for filling. Cleaning solvents shall be obtained in containers of a size which allows the entire container to be emptied into the machine at each topping up. Once emptied the lid of the container shall be replaced securely.
(13) Spot cleaning with organic solvents or organic solvent borne preparations shall not be carried unless they are the only method of treating a particular stain on a the material to be cleaned.
(14) The dry cleaning machine loading door shall be kept closed when not in use.
(15) The dry cleaning machine loading door shall be closed before the start-up of the machine, and kept closed at all times through the drying and cleaning cycle.
- All machines installed after 19 May 2005 shall have interlocks to prevent start-up of the machine until the loading door is closed and to prevent opening of the loading door until the machine cycle has finished and the cage has stopped rotating.
- All machines installed after 19 May 2005 shall have interlocks to automatically shut down the machine under any of the following conditions: cooling water shortage, failure of the cooling ability of the still condenser, failure of the cooling ability of the refrigeration system or failure in the machine heating system resulting in the inability to dry the load.

(16) The still, button trap and lint filter doors shall be closed before the start-up of the machine and kept closed at all times through the drying and cleaning cycle.
- All machines installed after 19 May 2005 shall have interlocks to automatically shut down the machine if the still, button trap and lint filter doors are not properly closed.

(17) The still shall have a thermostatic control device or equalvent with which to set a maximum temperature, in accordance with manufacturers' recommendations for the solvent used.
(18) The heat source shall automatically switch off at the end of the distillation process.

(19) The machine shall have a spillage tray with a volume greater than 110% of the volume of the largest single tank within the machine.
(20) All machines installed after 19 May 2005 shall have a secondary water separator to minimise potential solvent losses.
(21) Prior to disposal, containers contaminated with solvent shall be store with the lids securely fastened to minimise emissions from residues during storage prior to disposal, and labelled so that all that handle them are aware of their contents.
(22) Solvent contaminated waste, for example still residues, shall be stored:
- in suitable sealed containers with the lid securely fastened at all times other than when in use; and
- on a suitable impervious floor; and
- away from any drains which may become contaminated with residues as a result of spillage,
- away from sources of heat and bright light; and
- with access restricted to only appropriately trained staff.
- Note: from a health and safety point of view: a well ventilated area should be used.

(23) Equipment to clean up spillages must be quickly accessible in all solvent handling and storage areas.
(24) The operator shall maintain a records incorporating details of all maintenance, testing, repair work carried out on each dry cleaning machine and the scales used to weigh the loads, along with details of training required under condition 6. The records shall be available within 7 days upon request by the regulator
(25) Spares and consumables in particular, those subject to continual wear shall be held on site, or should be available at short notice from guaranteed suppliers, so that plant breakdowns can be rectified rapidly.

New and Substantially Changed Installations Using PER Only

The following requirements only apply to new or substantially changed installations using PER.

(26) Where PER is used within the installation a suitable continuous monitoring device for PER shall be installed within the operating area of dry cleaning machine to monitor for leaks and any other malfunctions which may lead to the release of PER.
(27) The continuous PER monitoring device shall be maintained and calibrated in accordance with the manufacturers recommendations.
(28)All PER machines shall have a secondary water separator followed by an activated carbon adsorption bed to minimise potential solvent losses.

Bulk Storage of Dry Cleaning Solvents

The following requirements only apply where bulk storage of dry cleaning solvents is carried out.

(29)Where delivery vehicles are equiped with back-vent facilities, bulk storage tanks for dry cleaning solvents shall be back-vented to the delivery tank during filling.
(30)When connecting hoses prior to delivery, the vapour return hose shall be connected before any delivery hose. The vapour return hose shall be connected at the road tanker end first, and then at the storage tank end.
(31)Bulk storage tanks for solvent storage shall be light coloured to reduce potential breathing losses from storage tanks and located away from potential source of heat [where practicable bulk storage tanks should be located outside].
(32)Delivery connections to bulk storage tanks shall be located within a bunded area, fixed, clearly labelled and locked when not in use.
(33)Bulk storage tanks shall be fitted with a reliable means of measuring their contents. { *For example a dial gauge; dipsticks are not recommended as they act as potential source of release; if they are used a screw cap must be fitted to prevent release of solvent when not in use*.}
- All bulk storage installed after 19 May 2005 shall be fitted with high-level (visual and audible alarms or volume indicators to warn of overfilling.

(34)Prior to receipt of a bulk delivery of cleaning solvent the receiving tank shall be checked to ensure that it has sufficient capacity.

(35)Bunding and containment of bulk tanks shall:

- completely surround the bulk liquid storage tanks; and
- be impervious and resistant to the liquids in storage; and
- be capable of holding 110% of the capacity of the largest storage tank.

(36)Emissions from the filling and topping up of the dry cleaning machine from bulk storage shall be minimised, by the use of closed transfer systems between the bulk storage tank and the machine.

(37)Where solvent is hard piped from bulk storage tanks to machines, appropriate measures shall be in place to prevent storage tanks from draining into machines for example: prevention of gravity flow, or syphoning of solvent from the storage tank into the dry cleaning machine.

(38) A competent person shall remain near the tanker and keep a constant watch on hoses and connections during unloading.

Dry cleaning installations using risk phrase materials.

At the time of writing and in the future there is little or, no likelihood of theses materials being used in the dry cleaning sector. In the unlikely event that an operator is using a substance or preparation which contains VOC and the nature or amount of VOC means that the substance or preparation is assigned one, or more, of the risk phrases R45, R46, R49, R60, R61, the mandatory requirements for their control can be found in PG 6/45 (04) Surface Cleaning (SED Box 6), should be included in the permit.

Appendix 4: Solvent and Product Cleaned Inventory

Weekly Inventory Sheet: installations using PER machines only

Name of the premises

……

Permit ref number.....

Start date of week.....

Week Number (1-52).....

Serial Number of machines	Weight of products cleaned (kg)	Initial stock of solvent in machine at start date (litres)	Solvent added to machine over week (litres)	Final stock of solvent in machine at end of week (litres)
Totals	kg(A)	litres(B)	litres(C)	litres(D)

Still residues raked out (litres) and sent for recovery or disposal during week	Still residues pumped out (litres)and sent for recovery or disposal during week
Litres X 0.15	Litres X 0.6
litres(E)	litres(F)

Solvent Input(I_1)

Solvent input for week (I_1)	=	Initial solvent stock at start of accounting period(B)	+	Solvent purchased during the accounting period(C)	–	Final solvent stock at the end of the accounting period(D)	–	Solvent in waste sent for recovery, or disposal(E+F)
(I_{1week})	=	B	+	C	-	D	-	(E+F)

Annual Inventory Sheet: installations using PER machines only

Name of the premises

……

Permit ref number.....

Date.....

Week number (1-52)	Weight of products cleaned for week (kg) (A)	Solvent Input for week (I_{1week}) (litres)
1		
2		
3 etc		
52		
Totals	A_{total} kg	litres(G)

Spot Cleaning Correction Factor

Spot Cleaning 10 litres or less

Where 10 litres or less per annum are used of:

- **proprietary solvent borne purchased spot cleaning solutions, and/or**
- **solvent borne spot cleaning solutions made up from solvent other than the main dry cleaning fluid (PER).**

The spot cleaning correction factor is 6.25 (litres) and is already entred into the table below.

Spot Cleaning more than 10 litres

***Where more than 10 litres per annum are used of:**

- **proprietary solvent borne purchased spot cleaning solutions, and/or**
- **solvent borne spot cleaning solutions made up from solvent other than the main dry cleaning fluid (PER).**

Then the method at the end of the Appendix should be used to calculate the correction factor to replace 6.25 in the table below.

Corrected solvent Input for year including solvent borne spot cleaners (I_1) (litres)	Corrected solvent Input X Compliance Factor for PER 80kg/litre	Weight of product cleaned for compliance (J) (kg)	Actual weight of product cleaned and dried (A_{total}) (kg)
6.25*+G litres	(6.25*+G) X 80	=J kg	A_{total} kg

For PER Compliance the weight of products cleaned and dried in kgs should be at least : J kg

Weekly Inventory Sheet: installations using all other solvents and mixed solvents

Name of the premises

.....

Permit ref number.....
Start date of week.....
Week Number (1-52).....

Serial Number of machines using Siloxane/ HCS	Weight of products cleaned (kg)	Initial stock of solvent in machine at start date (litres)	Solvent added to machine over week (litres)	Final stock of solvent in machine at end of week (litres)
Totals	kg(A)	litres(B)	litres(C)	litres(D)

Still residues raked out (litres) and sent for recovery or disposal during week from machines using Siloxane/HCS	Still residues pumped out (litres)and sent for recovery or disposal during week from machines using Siloxane/HCS
Litres X 0.15	Litres X 0.6
litres(E)	litres(F)

Solvent Input(I_1) volume Siloxane/HCS machines (litres)

Solvent input for week (I_{1week}) Siloxane/ HCS machines (G) (litres)	=	Initial solvent stock at start of accounting period(B)	+	Solvent purchased during the accounting period(C)	_	Final solvent stock at the end of the accounting period(D)	_	Solvent in waste sent for recovery, or disposal(E+F)
G (I_{1week}) (litres)	=	B	+	C	-	D	-	(E+F)

Solvent Input(I_1) mass Siloxane/HCS machines (grams)

Solvent input for week (I_{1week}) mass Siloxane/HCS machines	=	Solvent input for week volume (I_{1week}) Siloxane/HCS machines (G) (litres)	X	Specific gravity = 970 grams/litre*
$H_{silox/HCS}(I_{1week})$ (grams)	=	G	X	970

* Note if solvents other than Siloxane or HCS are used the specific gravity of the solvent used should be used to convert the volume of solvent to mass.

Start date of week.....

Week Number (1-52).....

Serial Number of machines using PER	Weight of products cleaned (kg)	Initial stock of solvent in machine at start date (litres)	Solvent added to machine over week (litres)	Final stock of solvent in machine at end of week (litres)
Totals	kg(A)	litres(B)	litres(C)	litres(D)

Still residues raked out (litres) and sent for recovery or disposal during week from machines using PER	Still residues pumped out (litres)and sent for recovery or disposal during week from machines using PER
Litres X 0.15	Litres X 0.6
litres(E)	litres(F)

Solvent Input(I_1) volume PER machines (litres)

Solvent input for week (I_1) PER machines (G) (litres)	=	Initial solvent stock at start of accounting period(B)	+	Solvent purchased during the accounting period(C)	–	Final solvent stock at the end of the accounting period(D)	–	Solvent in waste sent for recovery, or disposal(E+F)
G (I_{1week}) (litres)	=	B	+	C	-	D	-	(E+F)

Solvent Input(I_1) mass PER machines (grams)

Solvent input for week (I_1) mass PER machines	=	Solvent input for week volume (I_{1week}) PER machines (G) (litres)	X	Specific gravity = 1600 grams/litre
$H_{PER}(I_{1week})$ (grams)	=	G	X	1600

Total Solvent Input(I_1) mass Siloxane/HCS and PER machines (grams)

Total solvent input for week (I_{1week}) mass Siloxane/HCS and PER machines	=	Solvent input for week (I_{1week}) mass Siloxane/HCS machines	+	Solvent input for week (I_1week) mass PER machines
Total solvent input for week (I_{1week}) (grams)(J)	=	$H_{silox/HCS}(I_{1week})$ (grams)	+	$H_{PER}(I_{1week})$ (grams)

Annual Inventory Sheet: installations using using all other solvents and mixed solvents

Name of the premises

……

Permit ref number.....

Date.....

Week number (1-52)	Weight of products cleaned for week (kg) (A)	Total solvent Input for week (I_{1week}) (grams) (J)
1		
2		
3 etc		
52		
Totals	A_{total} kg	J grams

Spot Cleaning Correction Factor

Spot Cleaning 10 litres or less

Where 10 litres or less per annum are used of:

- **proprietary solvent borne purchased spot cleaning solutions, and/or**
- **solvent borne spot cleaning solutions made up from solvent other than the main dry cleaning fluid (PER, HCS or Siloxane).**

The spot cleaning correction factor is 10,000 (grams) and is already entred into the table below.

Spot Cleaning more than 10 litres

***Where more than 10 litres per annum are used of:**

- **proprietary solvent borne purchased spot cleaning solutions, and/or**
- **solvent borne spot cleaning solutions made up from solvent other than the main dry cleaning fluid (PER, HCS or Siloxane).**

Then the method at the end of the Appendix should be used to calculate the correction factor to replace 10,000 in the table below.

Total corrected solvent Input for year including solvent borne spot cleaners (I_1) (grams)	Corrected solvent Input X Compliance Factor 20g/kg	Weight of product cleaned for compliance (M) (kg)	Actual weight of product cleaned and dried (A_{total}) (kg)
J+10,000*	[J+(10,000*)] X 80	=M kg	A kg

For PER Compliance the weight of products cleaned and dried in kgs should be at least : M kg

Calculation of Spot Cleaning Correction Factor

Calculation of Spot Cleaning Correction Factor

Where more than 10 litres of proprietary solvent borne spot cleaning solutions and/or solvent borne spot cleaning solutions made up from solvent other than the main dry cleaning fluid are used, the actual solvent content of each solvent borne spot cleaning solution has to be determined. For purchased spot solvent borne spot cleaners this information can be obtained from the supplier. For spot cleaners made up within the dry cleaning installation the recipe used should be used to determine the actual solvent content .

Spot Cleaner	Amount used (litres) (P)	Solvent content %(Q)	Specfic Gravity of solvent within spot cleaner (grams/litre) (R)	Mass of solvent in spot cleaner used S=(PxQ/100)xR
Totals	(P_{total}) litres			(S_{total}) grams

Installations using PER machines only solvent borne spot cleaning correction factor =(S_{total}) grams x 0.00625

Installations using all other solvents and mixed solvents only solvent borne spot cleaning correction factor =(S_{total}) grams