

DIGITAL PRINTING  
GOOD PRACTICE GUIDE







# **DIGITAL PRINTING GOOD PRACTICE GUIDE**

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# FOREWORD

**Addressing the issues of climate change and our environmental responsibilities are two of the key challenges facing those in our industry. Sustainability has an impact on all our lives and for participants in digital printing there are a variety of issues. In addition to these wider responsibilities, business owners have to comply with the demands of customers, more and more of whom are insisting, as part of their procurement process, that suppliers have 'green credentials'.**

This guide is the direct result of cooperation and input from many facets of the digital printing industry including manufacturers, printers, trade associations, consultants and magazine publishers. All of them gave of their time freely with an earnest desire that those at the coalface can with some desire and effort make their own businesses more responsible insofar as sustainability is concerned. However, the guide would not be possible if there was not a driving force and the graphic arts sector owes a great deal of thanks and appreciation to the catalyst for the activity – Envirowise, whose expertise, understanding and desire to gather and disseminate relevant information ensures that this first guide is a practical working document.

It is hoped that you find the guide to be a useful reference tool, going some way to remove the mystique of environmental responsibility. However, in the likely event that you do need further guidance have no hesitation in contacting any of the organisations mentioned in the publication.

**Sidney Bobb**

**British Association for Print and Communication**

## SUMMARY

**This Good Practice Guide will help digital printing companies to save money, comply with environmental legislation and improve their environmental performance.**

The Guide provides advice on how to implement practical and cost-effective measures for resource efficiency. For printers this means reducing paper waste, reducing energy consumption, recycling paper and toner cartridges, and promoting the use of recycled paper. It also provides advice on reducing energy and water use throughout the shop floor.

Industry examples highlight exemplar companies and the measures that they have taken and the cost savings that have resulted.

The Guide also shows what the manufacturers of digital printing equipment are doing to play their part. It profiles how several manufacturers are implementing best practice in the provision of energy and resource efficient machines, longer life machines that are made of more recycled material and are recyclable at the end of their life, and are taking their 'producer responsibility' for the packaging and consumables at the end of the products' life.

Raw materials, waste, water and energy costs are rising, but are not uncontrollable overheads. Implementation of the recommendations in the Guide will reduce costs and thus increase profits and/or minimise the need to pass on rising costs to customers.

Customers, particularly local, regional and national government, as well as the larger commercial providers such as supermarkets, are requiring increasingly higher environmental performance from their supply chains. The Guide will show you how to implement an environmental policy, how to promote this to your customers, and thus secure competitive advantage.

**Please note that the legislation mentioned within this publication was checked for accuracy before going to press. However, legislation is constantly changing and being updated. For information on current environmental legislation, please contact the Envirowise Advice Line free on 0800 585794.**



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# INTRODUCTION

## 1.1 WHAT IS THIS GUIDE ABOUT?

**This Good Practice Guide can help companies in the digital printing sector to save money, comply with environmental legislation and improve their environmental performance.**

The Guide is aimed at companies of all sizes involved in digital toner-based printing, inkjet printing and direct imaging. Digital printing is defined as all forms of printing directly from electronic data sources. The Guide is aimed at commercial printers rather than office-type printers (including digital photocopiers). A large number of companies also do lithographic printing, which is covered in other Envirowise publications, such as:

- **GG391** *How to convert to waterless printing;*
- **GG283** *Reducing IPA use: Industry examples;*
- **EN434** *EMS in printing: manage your significant environmental aspects and save money;*
- **EN281** *How to become a green printer.*

A unique feature of digital printing is that it is possible and economic to change the image or part of the image on each copy, so personalising the message and the print. This allows for considerable flexibility for short runs (<2,000 copies) with rapid changes, with a shortest run of just one copy. Digital printing is also used for printing very large circulation products such as spare part catalogues, where a very quick updating of data is needed. For these reasons, digital printing is seen as a better environmental option and produces far less waste than traditional forms of printing, but there are still environmental and financial improvements that can be gained.

Inkjet digital printing machines can range from 1 to 10 metres wide. They can provide four-colour quality prints in runs from one to very high volumes. The length of print can vary from 1 - 30 metres. Inkjet printers are also used to produce 'mock-ups' prior to long runs in other forms of printing. They are capable of printing onto paper, board, plastics, textiles and metal – including complete vehicles such as buses for advertising.

The Guide provides advice on how to implement practical and cost-effective measures to reduce paper consumption and that of other substrates, reduce energy, recycle paper and toner cartridges, and promote the use of recycled paper. It also provides advice on reducing energy and water use throughout the shop floor.

## 1.2 WASTE AND ITS TRUE COST

There is a variety of wastes from digital printing:

Direct printing wastes (hazardous or difficult wastes)*	Printing wastes (dry wastes)	Incoming packaging	Other wastes
Waste toner cartridges Compact discs Ink Oils	Waste paper Waste card Other substrates	Copier paper boxes Spare parts boxes Packing cartons Paper wrappers Wooden pallets Air-filled plastic bags Plastic shrink wrap Plastic straps	Fluorescent tubes (hazardous waste) Computer and other electronic equipment General waste: floor sweepings, contaminated food wrappers Office paper Food and drink containers – glass, metal, plastic Electricity Gas Water

\*See Appendix 1 for the European Waste Catalogue codes that could apply.

Lithographic printers might also create waste in the form of chemicals, metal plates, silvermaster plates, developer, fixer, foils, stabilisers, solvents, founts, polyester plates and film.

The true cost of waste can be as much as 25 times the cost of disposal and potentially as much as 4% of a company's turnover (for more information see Envirowise Guide GG367 *Waste minimisation for managers*).

## 1.3 THE BENEFITS OF WASTE ELIMINATION, RESOURCE EFFICIENCY AND RECYCLING

Implementing waste minimisation and recycling has several benefits:

- cost savings;
- improved process performance;
- improved marketing to clients leading to more business (especially local authorities, Government departments and major commercial companies);
- compliance with legislation;
- motivation and team working;
- improved recruitment and retention of staff;
- improved environmental performance.

# PAPER AND OTHER SUBSTRATES

## 2.1 INTRODUCTION

Paper wastage in digital printing compares favourably with the 15-40% substrate waste for litho printers. Formara, a mixed digital and litho printer, has 13% waste, for example (see page 11). Paper is a natural material that is readily managed and is easily recycled. However, its use is rarely fully controlled.

## 2.2 PAPER STORAGE

There is a belief within the industry that the paper used in the machine must be kept at a certain temperature to avoid humidity problems and paper jams on start-up. This has resulted in either thermostatically controlled heating or air-conditioning being installed to control air temperatures. Over time heat controls are not maintained leading to excessive and unnecessary energy use.

Most papers can be stored at 12°C, saving energy on heated store rooms, and, as they come in waxed packaging, damp paper is generally not an issue.

Where some form of heating or environmental control is required, then the Carbon Trust<sup>1</sup> can provide free advice on energy efficiency, and, depending on the type of company and project, may be able to provide support ranging from consultancy and advice to interest-free loans.

## 2.3 PAPER SUBSTRATE CHOICES

### 2.3.1 Introduction

The UK currently consumes approximately 12.5 million tonnes of paper and board per annum of which over 4.7 million tonnes ends up in the waste stream. From an environmental perspective this is a waste of a valuable resource and, where landfilled, produces methane gas, a major contributor to global warming, and uses up declining landfill space.

Paper from non-sustainable sources can result in the permanent destruction of forests and the communities and wildlife they support.

### 2.3.2 Recycled papers

Recycled paper has been produced to the same standards as virgin pulp paper for several years but still suffers from a perception of poor quality.

The Waste & Resources Action Programme (WRAP)<sup>2</sup> advocates recycled paper:

- it is equal in quality to paper from virgin forest sources;



<sup>1</sup> [www.carbontrust.co.uk](http://www.carbontrust.co.uk), Tel 0800 085 2005.

<sup>2</sup> [www.wrap.org.uk/businesses/using\\_recycled\\_paper/index.html](http://www.wrap.org.uk/businesses/using_recycled_paper/index.html)

- it is readily available;
- it supports your Corporate Responsibility Agenda, demonstrating that your organisation is committed to sustainable procurement;
- it diverts waste paper from landfill - recognised as one of the least desirable disposal options;
- it need not cost more.

WRAP conducted a life-cycle analysis (LCA) to compare 100% recycled paper to that from a virgin source. It found that:

- one tonne of recycled paper can save 1.32 tonnes of CO<sub>2</sub> equivalent;
- an average of 50% less energy is consumed when recycling instead of incinerating paper and cardboard over the entire life-cycle;
- it is the best environmental option in comparison to landfill and incineration.

Waste Online<sup>3</sup> quotes that for every tonne of paper used for recycling the savings are:

- at least 30,000 litres of water;
- 3,000 – 4,000 kWh electricity (enough for an average three-bedroom house for one year) and 28 - 70% less energy consumption than virgin paper;
- 95% reduction in pollution emissions to the air.

**Defra's Waste Strategy 2007 for England and Wales identifies the purchase of recycled products (or products with a recycled content) as a key driver for increasing the proportion of the nation's waste that is recycled. Government departments are currently required to purchase paper containing 80% post-consumer waste for all non-specialist printing.**

Recycled products can have a variety of labels on them to show their recyclability and/or their recycled content. The main ones are:



When you have finished with this leaflet please recycle it

**75% recycled**

This leaflet is printed on 75% recycled paper

**WRAP's Recycle Now campaign encourages and motivates consumers to recycle now and often. It promotes the 'curved arrow' recycle mark on all recycled and recyclable products. To find out more, visit [www.recyclenowpartners.org.uk](http://www.recyclenowpartners.org.uk)**



The mobius loop is used to indicate that an object is capable of being recycled. Please note that it does not necessarily mean that an object has been recycled, and can sometimes be misleading. The 'curved arrow' is being promoted to replace this.



This denotes that an object contains x% of recycled material. Use of this symbol is voluntary. This is more meaningful than the mobius loop, as it shows how much recycle has been used.

Paper, Print, Environment (PPE)<sup>4</sup>, which was established to promote environmental improvements in the printing industry, provides a Paper Finder List. All materials featured on PPE contain recycled fibre and/or are FSC certified. Any material without a percentage figure in the post-consumer waste or not stated as FSC certified will contain pre-consumer waste.

### 2.3.3 Eco labels

Eco labels usually cover a wide range of environmental impacts, across the lifetime of a product, from production and use through to disposal.

#### European Eco-Label

This is an official Europe-wide award for non-food products that minimise impacts on the environment<sup>5</sup>. Products must be independently certified, and have to meet strict criteria for all the main environmental impacts across their whole life-cycle. The Eco-Label for paper products means that the products must:



- have reduced greenhouse gases during production;
- have decreased emissions to water of chlorine compounds and organic wastes during production;
- have a limitation on energy consumption during production;
- use only recycled fibres or virgin fibres from sustainably managed forests.

Defra runs the scheme in the UK<sup>6</sup>, where products with the flower logo include copying and graphic paper, with printed paper under development. It does not cover printed paper products used for packaging and wrapping, printed tissue papers or printed paper products produced by using metal-complex inks based on lead, chromium (VI), nickel, cadmium, copper (excluding copper-phthalocyanine), cobalt of greater than 0.1% (w/w), and mercury.

Some countries or areas also have national schemes, such as the **Nordic Swan** in Scandinavia and the **Blue Angel** in Germany. For more about eco labels, visit the website of the Global Ecolabelling Network<sup>7</sup>.



**Paper Profile** is a standardised product declaration system developed by paper suppliers, manufacturers, distributors and industry associations that provides product-specific environmental data. Data are provided on a standardised one-page declaration so product information is comparable. A Paper Profile gives essential information regarding product composition and key environmental parameters (eg chemical oxygen demand (COD) of wastewater discharges, sulphur and CO<sub>2</sub> emissions, solid waste). Additional topics include environmental management systems adopted by the producing mills and details about wood procurement.

<sup>4</sup> [www.ppe.uk.net/pages/paper/paperfinderlist.php](http://www.ppe.uk.net/pages/paper/paperfinderlist.php)

<sup>5</sup> <http://europa.eu.int/ecolabel>

<sup>6</sup> [www.defra.gov.uk/environment/consumerprod/ecolabel](http://www.defra.gov.uk/environment/consumerprod/ecolabel)

<sup>7</sup> [www.gen.gr.jp](http://www.gen.gr.jp)

### 2.3.4 Paper from sustainable forests

Sustainable forests are managed to ensure long-term timber supplies while protecting the environment and the lives of forest-dependent peoples. A system of Chain of Custody certification traces forest products through the supply chain to the end-consumer. In the UK there are two accreditation bodies:

#### Forest Stewardship Council (FSC)

FSC is an independent, non-profit, non-governmental organisation. It was founded in 1993 with the aim of establishing a single global forest certification body. It has the support of the 1995+ Group, a number of environmental organisations (most prominent was the World Wildlife Fund) and social non-governmental organisations (NGOs). FSC has now accredited 16 organisations to certify forests that are managed in accordance with its principles and criteria in Canada, France, Germany, Italy, South Africa, Switzerland, the Netherlands, UK, and USA. Over 70 million hectares of forest have been certified by FSC accredited auditors.



#### Programme for the Endorsement of Forest Certification (PEFC) schemes

PEFC was launched in June 1999 as a forest industry initiative supported primarily by owners of small European forests. It provides a Programme for the Endorsement of Forest Certification schemes to facilitate the mutual recognition of national forest certification initiatives that deliver a similar level of assurance. It enables countries, or regions, to develop schemes that cater for their own particular forest types, conditions and ownership structures. The PEFC scheme is based on independent third-party auditing and on regional certification levels. All member countries and their stakeholders can participate in voting on whether or not they will mutually recognise the applicant scheme. Thirty-two independent international schemes have signed up to PEFC. These include 17 European countries, and Australia, Brazil, Canada, Chile and the USA. Over 186 million hectares have been audited in 23 countries.



## 2.4 OTHER SUBSTRATES

There is a wider number of other substrates available, and there has been an increase in the use of wide-format printing, especially for advertising on buildings and hoardings. Other substrates can include:

- plastics - polystyrene, ABS, PVC;
- glass;
- ceramics;
- metal;
- wood;
- textiles - particularly organic and biodegradable products such as cotton, hemp and jute.

Each material has its own unique properties in regards to printing techniques, quality and limitation. Apart from PVC, generally all the materials are easily recycled.

## 2.5 SUBSTRATE MANAGEMENT

Waste can be attributed to a series of contributing factors that include:

- poor printing;
- printing head blockage;
- poor set-up;
- operator error;
- customers changing their requirements;
- producing overs;
- file copies;
- a mismatch between the paper requested and the printing process being used.

Digital printing can offer much lower waste levels than traditional litho printing, with potential for no set-up waste and a minimum print run of 1. However, digital print is often overprinted or produced in conjunction with other types of print, and may be trimmed and finished on conventional finishing equipment.

Avoiding waste by good substrate management can be an opportunity for digital printing and this section gives some tips on how to understand, manage and minimise digital print substrate waste.

### Understanding your substrate loss

The first step is to understand the amount of waste and what it is costing. You could be in for a surprise!

- **Check what is in paper skips/bins.** Make regular visual checks to ensure that mixed waste is not placed in the paper skip as this can cause the load to be rejected and loss of revenue from waste sales.
- **Check what is in the mixed waste bins.** If recyclable substrate waste is in the mixed waste bins, then revenue from sales of waste is lost and so is data about substrate waste levels.
- **Monitor the amount of substrate purchased and the average cost per tonne.** Keep track of the amount of substrate purchased as well as the value. Calculate an average cost per kilo, sheet or tonne and communicate this information so everyone is aware what substrate costs.
- **Monitor the amount of waste substrate.** Calculate the amount of waste substrate using data from sales invoices. Calculate the raw material cost of the waste using average purchasing cost per tonne. Waste is caused by area loss (due to trim, finishing and die cutting) which is part of the job design, and process waste, sheets lost in the process.
- **Monitor amount of substrate area loss.** Some of the waste will be area loss from trim and die cutting at the finishing stage. Take a sample of 'typical' jobs (perhaps 10-20 jobs) and calculate an average area loss percentage for your mix of work. This can be reduced by optimising sheet size and nesting (see below).



- **Estimate the process loss.** Deduct the trim waste from the total waste to estimate the sheets lost. This can be reduced by good stock management, by process improvement and by overs reduction.
- **Set up Key Performance Indicators (KPIs).**

KPIs are metrics used to help an organisation define and measure progress towards its goals. For further information on KPIs, see the Envirowise publication EN465 *Key environmental performance indicators in the printing sector*. Some suggested KPIs are:

- **KPI of clicks wasted = clicks paid for – clicks invoiced.** If your machine is leased then there will typically be a click charge for each sheet printed. Calculate the clicks paid minus the clicks invoiced to estimate the clicks wasted. How much is this costing?
- **KPI of percentage of waste =  $\frac{\text{waste}}{\text{purchases}}$**  . This is a key performance indicator for the production process, and a target can be set to reduce this progressively over time.
- **KPI of cost of substrate waste** = amount of substrate waste x average cost per tonne – revenue from sales of waste + cost of waste clicks.

#### Planning and estimating

Substrate waste can be unnecessarily built into a job at the planning and estimating stage through choice of paper size, layout and overs allowance. This is where a lot of waste is created.

- **Review the policy on overs.** How much waste is planned into the job, are office copies really necessary? What is the policy on good overs? Are they scrapped, stocked or given away? There is a balance to be struck between the cost of building in overs and the risk of a reprint if the job is short – is that balance right?
- **Choosing the right paper size.** Choose the right paper size to minimise trim and area loss. Different sizes are optimum for digital only, litho/digital and bleed/no bleed. For example for an A4 booklet:

Name	Paper size (mm)	Suitable for	Trim
SRA3	450 x 320	Litho with bleed	15%
RA3	430 x 305	Litho no bleed	5%
A3+	427 x 305	Digital with bleed	4%
A3	420 x 297	Digital no bleed	0%

- **High waste paper production** can occur when a customer has a catalogue or flyer that has a bleed on one or more edges as this will need a larger sheet of paper for printing and then trimming. For example, a sheet size SRA3 (450 x 320 mm) is often used to print A3 pages. Some manufacturers offer a sheet 427 x 305 which reduces trim.

Clients should be encouraged to avoid designs that require a bleed.



- **Shape nesting.** When planning die cutting or laser cutting take care to nest shapes to minimise the area loss. Automatic nesting software is available as an option on many design packages and is worth investigating.

### Purchasing and stocking

Good stock management and control are key to reducing substrate losses. Losses due to obsolescence and damage can be significant, so take some sensible steps to control them.

- **Keep a stock list and do a regular stocktake.** This is invaluable for avoiding over-ordering and highlighting slow-moving stock.
- **Avoid over-ordering.** Many paper merchants will deliver the next day so there is little need to keep large stocks. Ensure order quantity takes current stocks into account. Ordering special sizes or paper types for a one-off job can be a problem when there is a minimum order quantity. Think about what to do with any leftovers. Can they be used on future jobs?
- **Goods-in inspection procedure.** There should be a clear procedure for goods-in inspection and a policy on what to do if damage or shortages are noticed. This can be part of the quality system.
- **Stocking area.** This needs to be dry and clean, but in the UK climate does not generally need to be heated or air-conditioned. Paper can be kept at a wide range of temperatures and humidity providing extremes and sudden changes are avoided.
- **Rotate stock.** Mark incoming stock with the date of delivery. Ensure stock is rotated so that the oldest stock gets used first (FIFO = First In First Out).
- **Damage.** How much is it costing? Record write-offs due to damage and ensure a reporting and corrective action procedure is in place as part of the quality system.
- **Slow-moving stock.** Review what to do with slow-moving stock on the stock list. It could be used on selected jobs, offered to selected customers at a discount, or made into notepads.

### Production and packing

- **Handling and unwrapping paper.** Train operators to take care in handling and unwrapping paper to avoid damage and creasing which can cause paper jams and rejects. Are they clear what to do with any leftover paper at the end of a job?
- **Digital overprint.** When overprinting digital on litho print you may need to adjust the position to fit. Reduce waste by using litho make-ready sheets (with correct position) to set up the job.
- **Packing.** Re-use raw materials' pallets and boxes for packaging the finished product. A positive image can be created this way!

### Personalised and numbered work

Digital print is often used for personalised and numbered work. Paper jams or waste in subsequent operations such as finishing or enveloping can mean time-consuming make-ups and expensive confidential destruction of the waste. Delays caused by make-ups can have an impact on customer service.

- **Cost of make-ups.** Calculate the cost of make-ups including time, materials and waste costs. The answer could spur you to investigate the causes of the waste more deeply. Minimising make-ups could be a cost-saving opportunity.
- **Make-ups KPI.** Where cost is an issue, set up a KPI of make-ups as a percentage of output. Use this to set targets for an improvement project.

#### Finishing/enveloping

Finishing operations can be very reliable, allowing overs to be pared to the minimum, or they may be variable, increasing reprint risks and leading to high overs as an insurance policy.

- **Investigate finishing waste** - how variable is it? If most jobs go through without a problem and then there is an occasional disaster then high overs allowances are not the right solution - they will increase waste without preventing the disaster. Investigate and fix the cause of the disaster and set a lower overs allowance for the routine jobs.
- **Improving the finishing process.** If finishing waste is routinely high then set up a process improvement project to understand and tackle the root causes.

## 2.6 RECYCLING OF PAPER



The majority of papers can be recycled.

The Environment Agency's website at [www.wastedirectory.org.uk](http://www.wastedirectory.org.uk) allows you to enter your postcode and select the type of waste you wish to dispose of, and provides a list of up to ten waste/recycling contractors dealing with that waste in your area.

Some may charge a fee to cover the collection and treatment costs, though this will always be less than the cost of disposing to landfill.

## Formara makes savings by reducing paper waste

Formara is a commercial printing company based in Essex, with a large digital production unit. As one of the first printing companies to achieve ISO 14001 certification, in 2002, it is now recognised by peers in the industry for its environmental focus.

Paper waste is collected from the offices, presses and finishing area. Office paper waste is estimated at 3 tonnes, leaving the balance of 39 tonnes of paper waste from production. This represents 13% of paper usage and compares favourably with Envirowise observations of 15-40% substrate waste for litho printers. At average paper cost, the raw material value is calculated at over £32,000 per year.

- **Digital.** Approximately three 250-litre bins of paper waste are collected from the digital department per month, estimated at 3 tonnes per year (£2,500). Digital print waste includes setting up register when overprinting litho, unused litho overs, paper jams and dirty sheets (top/bottom of stack from litho).
- **Waste from litho printing** includes reject print, make-ready sheets and overproduction and is estimated at 18 tonnes per year (£15,000). Make-ready varies from a few sheets up to 200 sheets per job depending on coverage and the number of colours. The backs of waste sheets are used for make-ready where available.
- **Finishing** accounts for the remainder of the paper waste, including trim from finishing and booklet making, estimated at 18 tonnes (£15,000). The amount of trim depends on factors such as digital/litho and bleed/no bleed. Litho needs a larger margin for the paper grippers and a design where the print goes up to the edge of the paper (a bleed) requires more margin. The ideal paper size is sometimes not available depending on the type of paper chosen for the job.

## WASTE

### 3.1 INTRODUCTION

Waste can represent as much as 4% of turnover and disposal to landfill is becoming more expensive year on year. Where wastes cannot be eliminated, reduced or re-used, then recycling and recovery offers the next best environmental option.

### 3.2 TONER CARTRIDGES

Some producers offer a reverse logistics to their customers. Examples include:

“Konica Minolta can help its customers play a valuable role in preserving the environment by recycling printer cartridges through its Clean Planet Program. The cartridges are recycled efficiently and cleanly thus reusing precious resources. What is more, returning Konica Minolta cartridges is quick, easy and completely free. Customers can download a return label from [www.konicaminolta.co.uk/clean-planet.html](http://www.konicaminolta.co.uk/clean-planet.html)”

“Ricoh has gathered almost 60,000 cartridges in the last three years, representing over 30% of total cartridge sales” see <http://www.ricoh.co.uk/environment/index.cfm>. Ricoh customers can now download labels from the website and send back toner cartridges to the company.

Canon’s toner cartridge recycling programme is a zero landfill programme in which every component of a used toner cartridge is re-used or recycled. [http://www.canon-europe.com/recycling/canon\\_toner\\_cartridge\\_recycling.asp](http://www.canon-europe.com/recycling/canon_toner_cartridge_recycling.asp)

Some toners contain dangerous substances and must be treated as hazardous waste at the end of their life. This may not prevent it being collected for recycling, but there are legal requirements to ensure that the waste is transferred correctly and safely. See Appendices 1 and 2 for further information on this and on the European Waste Catalogue codes.



### 3.3 TONER BOTTLES

Toner bottles are problematic to recycle, in that the toner, though usually non-hazardous (it is styrene based), is a dust and this contaminates the plastic causing a handling problem. The plastic bottle is also very bulky and lightweight and thus has a low recycling value to plastic reprocessors. A collection scheme solely for toner bottles could have a negative environmental effect owing to the transportation requirements caused by the bulkiness of the product.



Ricoh has established a recycling system for its product, in the form of a UK Green Centre to recycle Ricoh toner bottles, toner cartridges from fax and printer products, used spare parts from its direct and dealer engineers and end-of-life products in readiness for compliance with the WEEE Directive.

The toner bottles have to be posted to Ricoh at the producer's expense (at 2007 prices the cost to return empty bottles in their box should not exceed £1.50). Ricoh pays the costs for recycling.

When toner bottles are received at the UK Green Centre they are initially purged of any toner residue through dust extraction facilities. The empty bottles are subsequently transferred to the waste resource area where they are crushed in layers together with other hard/soft plastic material and compacted into mill size bales.

If you would like to recycle your empty Ricoh toner bottles, full details of the scheme are available at [www.ricoh.co.uk/environment/wrapper.cfm?ricpage=bottlerecycle](http://www.ricoh.co.uk/environment/wrapper.cfm?ricpage=bottlerecycle)

Konica Minolta toner bottles are made using in excess of 25% recycled plastic and can be returned either using the A World on Loan programme or via your local recycler who is able to recycle them within the mixed plastic stream.

A World on Loan is designed to help Konica Minolta's customers meet and exceed their environmental targets for recycling and to protect the environment. The scheme provides customers with a process to return and recycle used consumables.

For more information, visit [www.konicaminolta.co.uk/world-on-loan.html](http://www.konicaminolta.co.uk/world-on-loan.html)

Canon UK has entered into a referral partnership with eReco for the provision of a toner bottle recycling service, where eReco manages the complete process on the customers' behalf. [http://www.canon.co.uk/About\\_Us/About\\_Canon/Environmental\\_Activities/Canon\\_eReco\\_tonerbottlerecycling.asp](http://www.canon.co.uk/About_Us/About_Canon/Environmental_Activities/Canon_eReco_tonerbottlerecycling.asp)

### 3.4 OTHER LIQUID OR HAZARDOUS WASTES

Other liquid or hazardous wastes must be disposed of correctly. Liquids are banned from landfill and must be stored in secure containers.

There are a number of waste management companies that specialise in the disposal of printing waste. Envirowise is currently aware of the following companies, though others exist:

J&G Environmental	01258 453445	<a href="http://www.jg-environmental.com">www.jg-environmental.com</a>
Hydro Dynamic Products	01273 464881	<a href="http://www.hdp.co.uk">www.hdp.co.uk</a>
WasteCare	01133 854321	<a href="http://www.wastecare.co.uk">www.wastecare.co.uk</a>

### 3.5 COMPACT DISCS

Compact discs are collected and placed into batches before being granulated. Granulated plastic is then washed in caustic solution to remove aluminium foil and inks. The clean plastic is then sold to injection moulding companies etc for re-use.

Envirowise is currently aware of the following company that provides CD recycling services, though others exist:

J&G Environmental	01258 453445	<a href="http://www.jg-environmental.com">www.jg-environmental.com</a>
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### 3.6 PACKAGING

Companies with an annual turnover of more than £2 million and that handle greater than 50 tonnes of packaging per year must comply with The Producer Responsibility Obligations (Packaging Waste) Regulations 2007 (as amended). To meet the set targets for each year most companies use a compliance scheme. Details of compliance schemes can be obtained from the following website:  
[www.defra.gov.uk/environment/waste/topics/packaging](http://www.defra.gov.uk/environment/waste/topics/packaging)

### 3.7 INCOMING PACKAGING

The majority of manufacturers take back the packaging on equipment for re-use and recycling. However, significant quantities of packaging materials can be received from suppliers:

- copier paper boxes;
- spare parts boxes;
- packing cartons;
- paper wrappers;
- pallets;
- air-filled plastic bags.



There are a number of options for dealing with packaging waste:

- Where you receive excessively packaged products, then contact the supplier to discuss your concerns.
- For large volume printers, talk to your supplier about returnable packaging.
- Re-use the packaging for your outgoing printed products. Communicate to your client your environmental objectives and the fact that this is reducing their costs.
- In certain areas packaging suppliers take in re-usable packaging for resale.
- While you may not be able to re-use waste in your business, it may be useful to others. Make use of a waste exchange scheme to advertise your waste and make it available for use by others, either for sale or free collection. The exchange schemes cater for a wide range of materials and include difficult wastes that may not have recognised markets, brokers or dealers.
- Cardboard boxes can be recycled, and can usually be collected by the paper recycler. They may specify that the cardboard is separated from the paper. To receive an income for cardboard it is likely that the cardboard will have to be baled in 0.5 tonne bales and usually a truckload will have to be stored (20 to 40 bales) before a collection will be made. This makes baling unviable for most printers.
- Waste contractors may not be interested in collecting small volumes of waste, but there are a large number of sites that will accept deliveries. The Environment Agency's website at [www.wastedirectory.org.uk](http://www.wastedirectory.org.uk) and the Waste & Resources Action Programme at [www.wrap.org.uk](http://www.wrap.org.uk) allow you to enter your postcode and select the type of waste you wish to recycle, and provide a list of waste/recycling contractors dealing with that waste in your area.

## 3.8 OUTGOING PACKAGING

Remember that your clients will be facing the same problems as you when dealing with waste. Consider:

- For key clients with frequent orders, offering returnable packaging or take-back of used packaging (only if it is your own).
- Packaging levels - ensure that it is minimised and not excessive.
- Avoiding using polystyrene chips. Use cardboard inserts or balled paper rather than plastic protection as this is readily recycled.
- Using a paper-based wrapping tape rather than a plastic tape.
- For labels and tapes, use water-soluble adhesives.

For further advice see the following Envirowise Guides:

**GG482** *Cutting costs and waste by optimising packaging use;*

**GG411** *Packaging reduction saves money: industry examples;*

**GG360** *Packaging design for the environment: reducing costs and quantities.*

## CHEMICALS MANAGEMENT

### 4.1 INTRODUCTION

There are still a number of chemicals used in the process that can be hazardous, particularly solvents within inks and cleaning products. Using chemicals or other hazardous substances at work can put people's health at risk and harm the environment, so the law requires employers to control exposure to hazardous substances to prevent ill health.



Employers should use '**COSHH essentials for printers**'<sup>8</sup> produced by the HSE and select the appropriate P series Guidance Sheets (eg P39 *Wide-format printing with solvent-borne inks: Digital (ink-jet) printing*) and follow the guidance provided. All the Guidance Sheets can be downloaded free of charge.

Of over 30,000 chemicals on the market, only products on the market after 1981 (c 2,700) have been tested properly.

**The REACH Regulations - Registration, Evaluation, Authorisation and Restriction of Chemical Substances Regulations 2007** shift the responsibility for carrying out the tests from public authorities to industry. All chemicals on the market have to be registered by 2018. REACH may result in certain very hazardous substances or substances that are in very low volumes being removed from the market.

Pre-registration must be undertaken prior to 1 December 2008. The registration must include every use of the chemical as well as preparations containing that chemical. Normally articles (objects with a defined shape) will not require registration. There are certain exceptions. If the article contains greater than 0.1% of a carcinogenic, mutagenic, repro-toxic and bio-accumulating chemical it will need to be registered. Similarly, if the article releases any chemical during its entire life-cycle, and this will include disposal, it will require registration. For example, digital printing cartridges containing ink used for office or commercial printers are not considered as being articles and must be registered.

### 4.2 SOLVENTS

Inks (liquid and dry), thinners and cleaning agents contain solvents to transfer the material onto the substrate and accelerate evaporation as well as aiding adhesion.

Solvents contain substances called 'volatile organic compounds' (VOCs) that mix in the air with vehicle exhausts (nitrous oxides) and sunlight and can create low-level ozone, causing smog and air pollution that are linked to lung cancer and worsening of respiratory illnesses. They can also cause damage to buildings, wildlife and crops. The yellow smog you may see hanging over cities on hot days is caused by this. Some solvents are highly flammable and are pollutants to soils and groundwater.

<sup>8</sup> [www.hse.gov.uk/pubns/guidance/pseries.htm](http://www.hse.gov.uk/pubns/guidance/pseries.htm)



Substances or mixtures of substances classified as explosive, oxidising, extremely flammable, highly flammable, or flammable under the current **Chemicals (Hazard Information and Packaging for Supply) Regulations 2002**<sup>9</sup> (CHIP) must be controlled.

**The Dangerous Substances and Explosive Atmospheres Regulations 2002 (DSEAR)** put duties on employers and the self-employed to protect people from risks to their safety from fires, explosions and similar events in the workplace. This includes members of the public who may be put at risk by work activity. Dangerous substances are any substances used or present at work that could, if not properly controlled, cause harm to people as a result of a fire or explosion. They can be found in nearly all workplaces and include such things as solvents, paints, varnishes, flammable gases, such as liquid petroleum gas (LPG), and dusts from machining and sanding operations.

For large processes (using more than 5 tonnes of solvent per year) the company has to register the process with the local authority under the **Environmental Permitting (England and Wales) Regulations 2007**. Advice on compliance is given in the Secretary of State's Guidance for Printing Note PG 6/16(04).

However, for smaller processes the following simple guidance should be followed.

- Where possible use solvent-free cleaning products and inks.
- Always keep the lids tightly shut on solvent containers, even when they are empty.
- Avoid soaking rags in solvents. Use sparingly. Use pre-treated solvent wipes ('wet wipes').
- Where solvents are used, ensure adequate ventilation.
- Always use gloves, and if required, respiratory protection when handling solvents as they can cause skin irritation and possibly dermatitis.
- Always keep the Material Safety Data Sheet (MSDS) supplied by the manufacturer close to the point of use.

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<sup>9</sup> [www.hse.gov.uk/chip/index.htm](http://www.hse.gov.uk/chip/index.htm)

## DIRECT MAIL

### 5.1 INTRODUCTION

Digital printing provides a number of advantages over traditional printing in that the minimum print run is one, and that the mailings can be personalised.

Direct mail can, however, have environmental consequences with regards to the procurement and marketing choices.

### 5.2 DIRECT MARKETING PLEDGE

In July 2003, to help influence long-term economic and environmental sustainability for the Direct Marketing industry, the Direct Marketing Association (DMA) signed an agreement with the Department for the Environment, Food and Rural Affairs (Defra) to develop a Direct Mail and Promotions Producer Responsibility Scheme.

This agreement aims to increase the collection and recycling of direct mail and promotions material, to publicise the services available to those who do not wish to receive direct mail, and to improve the targeting of direct mail and promotions material. The first report on progress to the end of 2005 was published at the beginning of 2007 and a further progress report is due in 2009.

The Producer Responsibility Scheme can be downloaded from [www.dma.org.uk/content/Env-Introduction.asp](http://www.dma.org.uk/content/Env-Introduction.asp).

Shown below is an extract of the DMA Code of Practice, outlining best practice for DMA members on achieving industry commitment to increased recovery and recycling from direct mail promotions and waste.

If you are printing material for your customer for use in direct mail campaigns, then you should be aware of the requirements of the scheme.

#### **Direct Mail and Promotions Producer Responsibility Scheme Appendix I - Code of Practice**

##### Introduction

This Code of Practice is the result of a voluntary agreement with Government. It deals with new regulatory demands on all industry to recover and recycle products after they have served their intended purpose. The Government's intention to make producers of direct mail responsible for diverting 'end of life' direct mail from landfill to recycling was set out in Waste Strategy 2000 presented to Parliament in May 2000. Government has the option of introducing regulation where industries fail to produce and deliver a voluntary scheme.

##### Aims and Objectives

This Code of Practice seeks to reduce the amount of direct mail waste in landfill.

The waste will be reduced by a combination of ease of recovery initiatives, recovery friendly materials and an omission of certain contaminants from the waste stream. Ease of recovery should facilitate increased recycling such as recycled paper mills, composting, and energy recovery.

#### Responsibility

1. Members have a duty to implement a waste strategy policy within their organisation.
2. Members must adhere to this Code of Practice.
3. Members have a duty to communicate this Code and policy to their clients.

#### Materials

1. Members should seek to aim to maximise their use of recycled paper where practical.
2. Members must ensure direct mail packs and inserts are primarily paper-based.
3. The use of laminates should be kept to a minimum and biodegradable alternatives pursued.
4. Non-paper products can be used but only if they are easily separable at the point of recovery or papermaker fibre plant.
5. Alternative envelope should be used (subject to alternative adhesive availability).
6. Substitute products for latex adhesive (subject to alternative adhesive availability).
7. Members should use lightweight recyclable or environmentally friendly paper.

#### Chemicals

1. Inks, varnishes, photographic developers and fixes should be reclaimed or recycled where possible.

#### Contaminants

The DMA have agreed a schedule of banned materials. Members should seek to avoid the use of such contaminants using recoverable alternatives where possible.

#### Data

Well-targeted, appropriate direct mail will reduce direct mail waste.

1. Members must adhere to the DMA Code of Practice on the use of data.
2. Members using, buying or selling data must follow industry best practice guidelines.
3. Members must use relevant suppression files, in particular Mailing Preference Service, National Suppression File and deceased suppression files.

#### Publicity

1. Members must promote to their customers what they are doing re this policy.
2. Members must direct consumers/customers to 'how and where' re recovery.

## 5.3 ENVELOPES: LAMINATES AND WINDOWS

Envelope windows and laminates cannot be recycled, and some paper mills will reject them.

Clients should be encouraged to avoid plastic laminates and windows, and may need to be informed of alternatives. A recyclable laminate 'Cellogreen' and cellulose labels are now available.

## MACHINES AND ENERGY MANAGEMENT



### 6.1 MANAGING ENERGY USE

**Many machines enter into a standby mode when not used for a pre-set period of time selected by the user. This mode can save a considerable amount of energy and cost, and it is good practice to ensure it is activated. Manufacturers can advise on the energy use of their machines in different modes and the most energy efficient settings to use. The restart time should not be a barrier to use of standby.**

Manufacturers have considerably reduced standby energy use, but standby still uses energy and it is good practice, where possible, to switch off machines completely when they are not in use for long periods, overnight or at weekends.

Energy use varies considerably from one machine to another. Larger machines may be more energy efficient per copy than smaller machines, and it is good practice to factor energy costs into purchasing decisions.

Consider the following:

- When purchasing a machine choose the most energy efficient model that meets your production requirements. Compare the production, idle and sleep mode electrical consumption levels.
- Ensure the machine is set up and operated according to the manufacturer's recommendations on energy efficiency and ensure the correct settings are communicated to all users.
- Determine if the machine can be turned off at night, and whether it needs a manual shutdown or can be put on a plug-in timer.
- Estimate the energy cost per copy and per week given your operating hours and projected copy volumes. Consider this as a factor in the purchasing decision. You may find the table opposite useful.

Enter your data

Mode	Energy consumption (W)	Hours per week	Energy use (kWh)*
Off			
Standby			
Printing			
Total			
Energy cost per kWh (including CCL) pence (from bills)			
Energy cost per week			
Expected weekly copy volume 000			
Estimated cost per 000 copies pence			

\* Energy use (kWh) = Energy use (W) x Hours/1,000

Example

Mode	Energy consumption (W)	Hours per week	Energy use (kWh)*
Off	0	128	0
Standby	20	20	0.4
Printing	3,000	20	60
Total		168	60.4
Energy cost per kWh (including CCL) pence (from bills)			10p
Energy cost per week			£6.04
Expected weekly copy volume 000			120
Estimated cost per 000 copies pence			5p

\* Energy use (kWh) = Energy use (W) x Hours/1,000

## 6.2 ENERGY STAR

The ENERGY STAR® logo means that the energy consumption of an appliance is below an agreed level in 'standby' mode.

The logo appears on some types of office equipment, such as computers, monitors, printers, fax machines and imaging equipment.

Within the EU, the ENERGY STAR is a voluntary labelling scheme and its use is controlled by an agreement between the USA and the European Union.



ENERGY STAR qualified office and imaging products use as much as 60% less electricity than standard equipment, and using less energy keeps utility costs down.

Organisations such as local authorities are required by law from 2008 to purchase equipment to ENERGY STAR standards.

## 6.3 USE OF EQUIPMENT IN AIR-CONDITIONED ENVIRONMENTS

In section 2.2: Paper Storage it was highlighted that the majority of papers needed no environmental controls to assure the storage conditions where the air temperature was above 12°C.

Some form of ventilation may be required to remove excessive heat from machines that are being operated in enclosed or poorly ventilated areas. Alternatives to air-conditioning should be examined such as natural ventilation, extraction fans and adiabatic cooling systems.

Where air-conditioning is being installed, planning permission is required, and the applicant will be required to take measures to improve the energy efficiency of the entire building.

## 6.4 OTHER ENERGY SAVING TIPS

- Turn off computer monitors when not in use, as well as the computers themselves, if they are not going to be used for at least three hours. If your system is controlled by a central server then software is available that will automatically shut down computers at predetermined times.
- Turn off lights when not required due to rooms being unoccupied or having sufficient natural daylight. It is an urban myth that it takes more energy to power on a fluorescent tube than leave it on.
- Reduce lighting to suit the layout of the area, eg remove lamps above filing cabinets, reduce the number of lamps above corridors.
- Unplug or switch off chargers for mobile telephones and cameras when not in use. Chargers use £15 worth of electricity per annum when not charging.
- Use master/slave plug sockets to turn off multiple items with only one switch.
- Install localised lighting controls such as pull-switches above workstations and push-timer switches/movement detectors (PIRs) in infrequently occupied areas.
- Ensure that heaters are energy efficient and are serviced at least annually.
- Ensure that heaters can be controlled locally.
- Where practical, install insulation to doors, windows, roofs and walls.

The Carbon Trust can provide free advice on energy efficiency, and, depending on the type of company and project, may be able to provide support ranging from consultancy and advice to interest-free loans. Visit the Carbon Trust at [www.thecarbontrust.co.uk](http://www.thecarbontrust.co.uk)

# TRANSPORT AND LOGISTICS

## 7.1 INTRODUCTION

The use of vehicles has an impact on the environment.

- Petrol and diesel are from non-renewable resources.
- When burnt they release carbon dioxide (associated with global warming), sulphur dioxides (associated with acid rain) and nitrous oxides (associated with poor air quality).
- Traffic congestion increases noise and affects communities.

Many copy shops and digital printers only deliver locally. Potential problems include the possibility of delivering very small runs and one-off jobs as they complete them to customers who say they require their work quickly.

## 7.2 FLEET MANAGEMENT

Where you operate your own fleet, consider:

- Effective journey planning to optimise delivery routes and so lower mileage.
- LPG conversions to vehicles and/or opting for dual-fuel vehicles, which also saves on the London congestion charge. Electric vehicles may be appropriate for deliveries in urban areas.
- Re-jigging the sales areas so that the sales team is operating in a geographically set area and not on a 'customer account' basis.
- Using company vans to pick up staff for work.
- Using couriers to deliver one-off jobs in areas where the use of your own transport is not economical.

SAFED is a driver development course, consisting of assessment and training. It can improve the safe and fuel efficient driving skills of LCV (light commercial vehicle) drivers and should complement a broader programme of commercial vehicle fleet efficiency management. For more information on SAFED visit [www.safed.org.uk](http://www.safed.org.uk)

Freight Best Practice offers free information for the freight industry covering topics such as saving fuel, developing skills, equipment and systems, operational efficiency and performance management. All free materials are available to download from its website or can be ordered through the Hotline on 0845 877 0 877. Further details are available at [www.freightbestpractice.org.uk](http://www.freightbestpractice.org.uk)

# MANUFACTURERS' PRODUCER RESPONSIBILITY

## 8.1 INTRODUCTION

The majority of manufacturers of printing equipment and supplies have adopted environmental and sustainability strategies as part of their Corporate Responsibility Agenda. They have recognised the effects that their products have on the environment, and on the end-user, and are implementing strategies to reduce these potential effects.

The following have already been discussed:

- toner/ink cartridges and bottles: section 3;
- energy efficiency: section 7.

The examples below illustrate the action that major manufacturers have taken in adopting environmentally sustainable strategies.

### Corporate social responsibility at the Konica Minolta Group

Konica Minolta strives to continually improve its CSR and environmental protection and has been ISO 14001 certified since 1997 and ISO 9001:2000 since 1996. The following is an extract from its CSR policy.

“The Konica Minolta Group sees CSR as the essence of management pursuit of the management philosophy, ‘the creation of new value’ and the implementation of the Konica Minolta Group Charter of Corporate Behavior\* form the basis of Konica Minolta’s CSR.”

Seven target areas in the Konica Minolta Group Charter of Corporate Behavior:

1. Beneficial and safe products
2. Fair and transparent corporate activities
3. Communications with society and information disclosure
4. Environmental protection
5. Contribution to society
6. Respect for employees
7. Responsible actions

\*The full Charter of Corporate Behavior can be viewed on the Konica Minolta website at [www.konicaminolta.com](http://www.konicaminolta.com)



### Ricoh Group and sustainability

“To fulfil its mission as a global citizen, the Ricoh Group will enhance its environmental management, and contribute to the development of a sustainable society.

For Ricoh the drivers are Corporate Responsibility, with sustainability targets that set up action plans under its Extra Long Term Environmental Vision - recognising that advanced nations need to reduce their environmental impact to one eighth of the fiscal 2000 levels by 2050.

Ricoh uses its Green Procurement policy to influence its supply chain and requires suppliers to have an EMS, such as ISO or EMAS, or its own Green Standard. In 2003 Ricoh identified 16 hazardous substances it wanted to eliminate from its products and it was ready before RoHS came along on 1 July 2006. All new products have been RoHS compliant since January 2005 (six months before the deadline).”

### Canon, a greener culture

“At Canon, environmental commitment has been part of the culture for years. It is reflected in the company philosophy of Kyosei ‘Living and working together for the common good’ and the pro-active commitment to continuous environmental improvement.

There are many initiatives to reduce the environmental impact of activities, all of which contribute to our overriding goal called Factor 2\*. This aims to double our resource efficiency through an increase of the ratio of net sales to lifecycle CO<sub>2</sub> emissions. (\*Canon aims to achieve Factor 2 by 2010 using 2000 as benchmark data.)

Canon (UK) Ltd received ISO 14001 certification in 2006, scored top of the electronics category in Climate Counts’ independent survey 2007 ([www.climatecounts.org](http://www.climatecounts.org)) and in 1998 became WWF’s first Conservation Partner.

Canon was the first company in the industry to release a RoHS compliant product (2004), and is also eliminating the use of seven additional substances currently outside the scope of RoHS legislation. Canon refers to this as RoHS+7.”

For more on Canon’s commitment see:

[http://www.canon.co.uk/About\\_Us/About\\_Canon/CSR/Index.asp](http://www.canon.co.uk/About_Us/About_Canon/CSR/Index.asp)

## 8.2 ELECTRONIC AND ELECTRICAL EQUIPMENT

**All manufacturers and distributors of electrical and electronic equipment that are dependent on 1,000 volt AC/1,500 volt DC electrical supplies have certain legal obligations under the Waste Electrical and Electronic Equipment Regulations 2006 (known as the WEEE Regulations) and Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment Regulations 2005 (RoHS).**

These responsibilities are for the financing of the recovery and recycling of WEEE and for placing new products on the market that are free from hazardous substances (such as lead, mercury, hexavalent chromium, cadmium and certain fire retardants). For business-to-business sales, retailers may still make a charge for the collection of WEEE from your premises.

## ENVIRONMENTAL POLICIES AND MANAGEMENT SYSTEMS

**An environmental policy is a statement which summarises how your company intends to manage its environmental responsibilities. An effective environmental policy can help you with:**

- **cost and efficiency benefits;**
- **regulatory compliance;**
- **customer assurance.**

An environmental policy should be short, clear and concise. Implementing it does not need to involve a lot of paperwork, only what is necessary to make it effective.

An environmental management system (EMS) is how you implement your Environmental Policy. It can be certified to a standard such as ISO 14001, BS8555 or EMAS. External certification gives an assurance that the system has been checked by a third party and meets the standard. The environmental management system ISO 14001 is similar to ISO 9001 for Quality Management Systems and is based on the 'Plan, Do, Check, Act' cycle of continually improving performance.

Visit the Envirowise website or contact the Advice Line on 0800 585794 for further advice on implementing environmental management systems.

“Over the past four years, the environmental performance of Seacourt Press has become something of a crusade. We all have to take responsibility for our actions - not only manufacturing business but also large organisations. There may well be an initial cost involved but the results far outweigh this in the longer term.”

*Mr Roy Williams, Managing Director, Seacourt Press Ltd, Oxford*

## CARBON FOOTPRINTS

A carbon footprint is a measure of the amount of carbon dioxide produced by an organisation through its use of raw materials, energy, transport and the creation of waste. When done properly and consistently carbon footprints can be an effective way of comparing one company's performance against another's.



The Carbon Trust produces a series of guides on Carbon footprinting:

**CTV033** *Carbon footprinting – introduction*

**CTC616** *Carbon footprints in the supply chain:*

*The next step for business*

Specific to the paper industry, Responsible Print (see Appendix 3) provides the following advice:

“Unless otherwise specified, for offset purposes we use the following calculation for the amount of CO<sub>2</sub> associated with the production of a tonne of paper or board, including delivery to the print room:

- Uncoated paper with 100% recycled fibre content: 1.5 tonnes of CO<sub>2</sub>
- Uncoated paper with 50% - 99% recycled fibre content: 1.75 tonnes of CO<sub>2</sub>
- Coated paper with 50% - 100% recycled fibre content: 2.0 tonnes of CO<sub>2</sub>
- Uncoated paper with 100% virgin fibre, sustainably farmed wood: 2.5 tonnes of CO<sub>2</sub>
- Coated paper with 100% virgin fibre, sustainable farmed wood: 3.5 tonnes of CO<sub>2</sub>

The paper used for the finished item is responsible for a significant part of the carbon footprint, but we also include the following in the calculations for our final figure to achieve a true representation of the impact of your project:

- Waste paper involved in the print and finishing process;
- Print process and consumables;
- Delivery to end destination;
- Projected landfill emissions after disposal.”

# WASTE REGULATIONS AND EUROPEAN WASTE CATALOGUE CODES

## Waste regulations

In England and Wales shipments of waste are regulated by the Environmental Protection Act 1990, the Environmental Protection (Duty of Care) Regulations 1991, 2003, the Controlled Waste Regulations 1991, 1993, the Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations 1991, 1998, the Hazardous Wastes (England and Wales) Regulations 2005, and the List of Waste (England) Regulations 2005 as amended. In Wales the List of Waste (Wales) Regulations 2005 apply. Treatment and storage of waste is regulated by the Environmental Permitting (England and Wales) 2007 regulations.

In Scotland and Northern Ireland different regulations apply, see your local regulator.

Guidance on these regulations is available at the Environment Agencies' Netregs website at [www.netregs.gov.uk](http://www.netregs.gov.uk)

## European Waste Catalogue codes

The table below gives some common European Waste Catalogue codes for wastes from printing. This list may not be complete, and other sections of the catalogue should be considered. MFSU means 'Manufacturing, supply and use'.

<b>08 03</b>	<b>Wastes from MFSU of printing inks</b>
08 03 07	aqueous sludges containing ink
08 03 08	aqueous liquid waste containing ink
08 03 12*	waste ink containing dangerous substances M
08 03 13	waste ink other than those mentioned in 08 03 12
08 03 14*	ink sludges containing dangerous substances M
08 03 15	ink sludges other than those mentioned in 08 03 14
08 03 16*	waste etching solutions A
08 03 17*	waste printing toner containing dangerous substances M
08 03 18	waste printing toner other than those mentioned in 08 03 17
08 03 19*	dispersed oil A
08 03 99	wastes not otherwise specified
<b>15 01</b>	<b>Packaging</b>
15 01 01	paper and cardboard packaging
15 01 02	plastic packaging (including films)
15 01 03	wooden packaging (pallets/crates)
15 01 04	metallic packaging
15 01 05	composite packaging
<b>16 06</b>	<b>Batteries and accumulators</b>
16 06 01*	lead batteries A
16 06 02*	Ni-Cd batteries A
16 06 03*	mercury-containing batteries A
16 06 04	alkaline batteries (except 16 06 03)

- 16 06 05 other batteries and accumulators
- 16 06 06\* separately collected electrolyte from batteries and accumulators A

**20 01 Separately collected fractions (except 15 01)**

- 20 01 01 paper and cardboard
- 20 01 02 glass
- 20 01 08 biodegradable kitchen and canteen waste
- 20 01 10 clothes
- 20 01 11 textiles
- 20 01 21\* fluorescent tubes and other mercury-containing waste A
- 20 01 23\* discarded equipment containing chlorofluorocarbons M
- 20 01 33\* batteries and accumulators included in 16 06 01, 16 06 02 or 16 06 03 and unsorted batteries and accumulators containing these batteries A
- 20 01 34 batteries and accumulators other than those mentioned in 20 01 33
- 20 01 35\* discarded electrical and electronic equipment other than those mentioned in 20 01 21 and 20 01 23 containing hazardous components M
- 20 01 36 discarded electrical and electronic equipment other than those mentioned in 20 01 21, 20 01 23 and 20 01 35
- 20 01 37\* wood containing dangerous substances M
- 20 01 38 wood other than that mentioned in 20 01 37
- 20 01 39 plastics
- 20 01 40 metals

**20 03 Other municipal wastes**

- 20 03 01 mixed municipal waste

## Non-hazardous wastes

EWC codes with no asterisk are non-hazardous wastes. The owner or holder of such waste is subject to the Duty of Care for waste (which also applies to hazardous wastes) which includes regulations on control, storage, labelling, transfer and documentation. Waste should only be transferred to an authorised person, such as a local authority waste collector, or the holder of a Waste Carrier's licence, a Waste Management licence or Waste Broker's licence, or the holder of a registered exemption. This includes waste for recycling.

## Hazardous wastes

Hazardous (or in Scotland 'special') wastes should not be mixed with non-hazardous wastes, and should be consigned to a specialist contractor.

An asterisk after the EWC code indicates a waste that may be hazardous. An 'A' after the description indicates an 'absolute' entry that is always considered hazardous while an 'M' indicates a 'mirror' entry that requires assessment. Guidance WMR01 and WM2 on Hazardous Wastes are available on Netregs ([www.netregs.gov.uk](http://www.netregs.gov.uk)).

The regulations cover premises, registration, storage, shipment, documentation and mixing of wastes. Fixed penalty notices can be issued for breaches of the regulations.

For guidance on reducing hazardous waste in printing see the Hazred project website at [www.hazred.org.uk](http://www.hazred.org.uk)

## DISPOSAL OF WASTE PRINTING TONERS

**Some toners may be hazardous wastes. There are two EWC codes for waste printing toners:**

- 08 03 17\* waste printing toner containing dangerous substances M
- 08 03 18 waste printing toner other than those mentioned in 08 03 17

The 'M' after 08 03 17\* means it may be hazardous waste depending on the concentration of hazardous substances it contains.

Environment Agency guidance WM2 relating to 08 03 17\* states:

“As with paints and varnishes, formulations have changed significantly over the past few years with elimination/reduction in the heavy metals used. Therefore the potential hazards will depend on the age of ink being considered. The main hazards arising from older inks fall into three main categories: namely (1) the presence of a range of flammable and/or toxic organic solvents; (2) potentially hazardous metals in the pigments; and (3) the irritant nature of some waste inks. If any of these is present above the relevant threshold concentrations, the hazards H3A, H3B to H7, H10; H11 and H14 may apply. Many modern inks use pigments that are non-toxic; however, the formulation of the ink will need to be considered and the hazardous properties may be limited to H3A, H3B to H5.”

## RESPONSIBLE PRINT®

**Responsible Print® is a new standard for printed materials that has been launched in an attempt to address the damaging impact that commercially printed materials can have on the environment.**

The initiative guarantees that printed marketing material and promotional literature have been produced only by suppliers who have voluntarily exceeded the legal requirements for environmental best practice and who are truly motivated by sustainability.

An item that bears the 'Responsible Print'® logo has been produced in a supply chain where the following standards apply as a minimum requirement:

- ISO 14001 certified printer.
- Using paper with at least 50% recycled fibre content.
- Papers with virgin fibre content must be FSC or PEFC certified.
- All process inks used are vegetable oil based.
- Any gloss, semitone or matt laminates used must be biodegradable and home compostable.
- If lamination is used it must be applied to on one side of the sheet only, unless clear printed instructions encourage customers to compost instead of recycle them after use.
- Polywraps for mailing outers can be biodegradable if appropriate.
- The entire life-cycle of the printed item has undergone carbon footprint analysis and a payment has been made to offset the associated CO<sub>2</sub> emissions.
- Rigorous, innovative and genuine environmental protection schemes are in place within the supply chain. Further details about what kind of measures have been implemented by the approved Responsible Print® printers are available on the website<sup>10</sup>.
- Every quote and invoice carries details of the CO<sub>2</sub> emissions associated with the project, giving customers unparalleled accountability and ability to assess the impact of their print.

See Responsible Print® at [www.responsibleprint.info](http://www.responsibleprint.info) for details.



## OTHER ORGANISATIONS

British Association for Print and Communication ([www.bapc.co.uk](http://www.bapc.co.uk)).  
Tel: 020 8736 5862.

British Printing Industries Federation ([www.britishprint.com](http://www.britishprint.com)). Tel: 0870 240 4085.

Lovely as a Tree - Guide to Green Printing ([www.lovelyasatree.com/](http://www.lovelyasatree.com/))

Paper. Print. Environment (PPE) ([www.ppe.uk.net/](http://www.ppe.uk.net/)): Supported by the British Printing Industries Federation, Greenpeace, Friends of the Earth, WWF and the Soil Association, PPE was established to make informed choices to reduce the environmental impact of your printed materials.

The Waste Book Chapter 310 ([www.wastebook.org/greprin.htm](http://www.wastebook.org/greprin.htm)) provides a list of Green Printers.

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<sup>10</sup> [www.responsibleprint.info/the-difference.php](http://www.responsibleprint.info/the-difference.php)





Envirowise - sustainable practices, sustainable profits. Envirowise is a Government-funded programme dedicated to putting the sustainable use of resources at the heart of business practice. It is managed by AEA Technology plc and Serco Ltd. Envirowise is funded by Defra, the Scottish Government, the Welsh Assembly Government and Invest Northern Ireland.

**Envirowise offers a range of free services including:**

- **Free advice from Envirowise experts through the Envirowise Advice Line.**
- **A variety of publications that provide up-to-date information on resource efficiency issues, methods and successes.**
- **Best practice seminars and practical workshops that offer an ideal way to examine resource efficiency issues and discuss opportunities and methodologies.**

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