

Guide to Printing



Paper and Paper Recycling

In the UK we use 12.5 million tons of paper every year. Paper production is a energy, water, resource and chemical intensive process. With rumours that recycled paper production is more environmentally damaging than paper produced from virgin material we were confused about the best type of paper to buy. What we wanted to know was which paper type used the least energy and chemicals and which was the best environmentally.

Which paper should I use?

Recycled Paper

Recycled paper is the greenest option. Each tonne of recycled paper saves 6 mature trees and saves 2.5 m³ of waste being sent to landfill⁴. Also paper is a biodegradable material, this means that if it goes to landfill it rots down and produces methane, a very potent greenhouse gas⁵, so recycling paper reduces your carbon footprint too. In the UK we currently recycle approximately 42% of our paper waste¹.

It is sometimes claimed that it requires more energy to make recycled paper compared to new paper. This is partially true, looking just at the papermaking

Benefits of recycling paper:

- Less energy consumed
- No harm to forests
- Less paper waste going to landfill
- Fewer emissions of gasses like methane into the atmosphere
- Less water consumed
- Less chemicals used
- Less air pollution²

process - from waste paper or pulp to new paper - making recycled paper does require more energy because of the extra cleaning needed. However, this doesn't take into account the energy to turn trees into wood chips and wood chips into pulp. If we consider the full process, recycled paper does use less energy in its production³.

With regard to cleaning recycled paper, this does account for not only additional energy but also chemicals not used in new paper production but these chemicals are not as harmful as you might imagine. To de-ink recycled paper, manufacturers use sodium hydroxide, this is the same detergent that is used in soap and for washing fruit and vegetables commercially. Air bubbles are also used to help bring the ink to the surface where it is then scooped off and either burned or used a fertiliser. To achieve very white paper bleaching is also used, although this is also required when making new paper too. Bleaching is not done with chlorine as is often thought but hydrogen peroxide, which is relatively harmless and also used in hair dyes.

This doesn't mean that the bleaching processes is completely without pollutants and so the greenest option is to use unbleached recycled paper.

When buying recycled paper it is important to consider the vast array of products that covers. As well as looking at the percentage of recycled material in the paper you are buying (obviously the higher the better) its worth looking at the source of the recycled material.

There are three main types mill broke, pre- and post-consumer waste and there is a big difference between each. Post-consumer waste is the important one to look out for; this means the paper had reached the consumer, been used, returned and recycled. Pre-consumer waste never made it to the end-user and is printers' waste such as off-cuts and unused materials. Mill broke never makes it out of the paper mill and is the trimmings or faulty paper which is returned straight back in to the production process. As this has never been used it does not count as recycled fibre but recovered fibre⁶.

FSC Principles

1. Compliance with all applicable laws and international treaties
2. Demonstrated and uncontested, clearly defined, long-term land tenure and use rights
3. Recognition and respect of indigenous peoples' rights
4. Maintenance or enhancement of long-term social and economic well-being of forest workers and local communities and respect of worker's rights in compliance with International Labour Organisation (ILO) conventions
5. Equitable use and sharing of benefits derived from the forest
6. Reduction of environmental impact of logging activities and maintenance of the ecological functions and integrity of the forest
7. Appropriate and continuously updated management plan
8. Appropriate monitoring and assessment activities to assess the condition of the forest, management activities and their social and environmental impacts
9. Maintenance of High Conservation Value Forests (HCVFs) defined as environmental and social values that are considered to be of outstanding significance or critical importance
10. In addition to compliance with all of the above, plantations must contribute to reduce the pressures on and promote the restoration and conservation of natural forests.⁷

Sustainably sourced paper

Sustainably sourced paper is really a by-word for FSC certified paper, other certification schemes are not as well-known or always as well-managed. Illegal or badly managed logging has an impact on the social, economic, ecological and cultural environment and can devastate ancient forests. The FSC certification tries to balance all these aspects with their principles and criteria for responsible forest management (see box).

Currently FSC manage about 10% of the world's forest production⁴ but it's reach goes much further. With its chain of custody, each step of the process has to be FSC certified tracking the timber from forest to paper mill and on to the printer.

There are 3 FSC labels; "FSC 100%" which indicates that 100% of the fibres come from FSC certified forests; "FSC Mixed sources" means the paper contains fibres from a mixture of sources: material may come from FSC certified, post-consumer recycled and controlled sources⁷; and "FSC Recycled" means that all the material comes from recycled post consumer waste.



Useful links and sources:

- ¹ Independent
- ² Recycle-now
- ³ Paper Back

- ⁴ Lovely as a Tree
- ⁵ Waste Online
- ⁶ A Local Printer
- ⁷ FSC UK
- ⁸ Big Sky Print
- ⁹ Waterless

Printing, Inks and Finishes

The print process can use a significant amount of water and energy, from running presses to delivering the product. There is also a large amount of associated waste, much of which can be recycled but which often isn't. Using a printer that is ISO14001 certified or has the Greenmark standard means they are environmentally accredited, aware and working towards continuous improvement.⁴⁸ Other aspects to consider:

Ink

There are a number of issues associated with the inks used in printing. VOCs (volatile organic compounds) are emitted as the ink dries; these are a hazard to human health and contribute to climate change. Heavy metals in the inks are also a hazard to press room workers health & the environment and inks containing heavy metals don't break down as easily. Inks are oil based, and the main oils in non-vegetable based inks are petroleum-based. Fortunately vegetable based inks have now become far more common. Vegetable based inks use vegetable oil instead of petroleum, replacing a non-renewable oil with a renewable one, although it is worth remembering that a vegetable based ink is not necessarily 100% vegetable oil. Vegetable based inks also have much lower VOC emissions and are easier to remove in the recycling process. It is worth trying to avoid fluorescent and metallic inks as these tend to only be available as petroleum-based inks.⁴⁸

Alcohol- and Waterless printing

In addition to high water usage the print process also uses alcohol as a dampening solution, resulting in more VOC emissions. It is possible to print without the need for water or alcohol. Waterless printing uses a special kind of silicone coated press, special inks and temperature control which also removes the need for alcohol⁹.

Considering recycling and waste reduction in your design

Other than the type of paper you use, there are a few things you can do to ensure that your printed work produces minimum waste before it is used and can be recycled after it's useful life;

- Make sure you only print as much as you need.
- Use the lightest paper type you can, 200gsm uses double the amount of fibre as 100gsm paper.
- Check your print size with your printer, as many materials are only available in limited sizes a few millimetres can make all the difference between a lot of waste and zero waste. Designing without bleeds can also mean that more pages can be fit on the printer's sheet, thereby reducing the print run, waste and the cost
- High levels of ink coverage can reduce recyclability as it is difficult to de-ink.
- Laminated, Foil blocking, UV Varnished and some glues will render your paper unrecyclable so try to avoid these.
- Window envelopes can't be recycled unless the window has been removed so avoid where possible
- Avoid perfect binding where possible as it is not easy to recycle such products; consider other options such as wire stitching which is easily removed and recycled.

Binding

The most environmentally sound choice for binding is wire stitching (staples) as these are easy to remove and recycle. The glue used in perfect binding can affect the recyclability of the document, is pretty toxic and often contains VOC-releasing solvents. Other bindings, such as singer sewing can be difficult to remove⁴.