



Paper Round

Recycling – where does it all go?

The trade in recyclables is international, but by collecting all of your recyclable materials separately we are able to send them all to recycling centres within Western Europe, and largely within the United Kingdom. Each material has a different destination depending on markets and prices. We have listed below the most common routes that the materials we collect follow.

The journey starts when our drivers take everything we collect back to our warehouse in Rainham, Essex. There the trucks are offloaded and materials stored and bulked up before onward transport.

To see our video on YouTube showing our yard and how we collect and sort your recyclables click [here](#).

Paper

Our drivers hand sort the paper into 4 grades:

- ❖ **White paper.** Contaminants in the paper such as envelopes or photocopier ream wrappers have to be removed. Our white paper's excellent quality means that it is in high demand on the Continent, and most of it is sold to Germany or Holland. White paper has the highest environmental value because it can be used by mills as a virgin pulp substitute, reducing demand for trees throughout the world.
- ❖ **Sorted office waste.** This is a mixture of white envelopes, magazines, coloured paper & white paper too badly mixed to be worth sorting. It is taken down to M-Real's site in Kent. They have invested heavily in state-of-the-art recycling technology. This enables the paper to be recycled back into high grade copier paper, which Paper Round sells back to its customers under the Evolve brand.
- ❖ **Newspaper & magazines.** Aylesford Newsprint in Kent convert this back into newsprint reels which is then sold to printing works.
- ❖ **Cardboard.** This is baled and then made back into packaging materials and cardboard at a number of mills in the UK, often in the North West and North East of England.

Paper Recycling process

The recycling process is broadly similar for all types of paper. At the mill the paper is mixed with large quantities of water to form a slurry of fibres. It is sieved to remove contaminants such as staples and any fibres that are too short. Inks are removed by bubbling air through the mixture and through the use of various brighteners and bleaches.

The clean usable fibre is piped to the pulper, where further water is added to produce a very thin slurry. This is then pumped onto a mesh screen (the wire) above a trough. Much of the water drains off here and is recirculated. As the fibre goes over the wire it begins to take the form of a wet sheet-like form.



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Next the fibres go through a series of dryers and rollers before ending up on a long reel. This reel is cut into smaller rolls for printers to use or for converting into sheets of paper or envelopes.

The unusable residues of paper recycling, mainly fibres that are too short, old inks, clays and other fillers, are known as 'sludge'. This is typically burnt by the recycling plant to generate heat and power for the recycling process, or is used as a soil conditioner by farmers.

Cans

Paper Round collects mixed cans, aluminium and steel. We take them to a Local Authority facility in South East London. There they are separated using magnets and then baled. Steel cans are taken to AMG in South Wales where they are de-tinned before the steel is melted down in the blast furnaces. Aluminium cans are taken to Novelis in Warrington where they are melted down into ingots which are then used to make new drinks cans, and in the production of cars, aircraft, etc.

Glass

Paper Round delivers mixed glass to Berryman's in East London. Their processing plant is close to our yard, minimising transport costs. Berryman's crush the bottles into a consistent glass cullet, removing paper and metal contaminants. This cullet is then used in the manufacture of new green glass bottles. After accounting for the transport and processing needed, 315kg of CO₂ is saved per tonne of glass melted.

IT Equipment

Paper Round carefully examines all equipment at our warehouse. Working, reasonably modern equipment is reused, normally in Eastern Europe or developing countries. Very old or non-working equipment is disassembled and the various components are recycled or reused in new machines.

New legislation, including the WEEE Directive, places much tighter restrictions on the disposal of electronic items. Paper Round is a registered waste carrier and fully complies with all relevant regulations.

Appliances (not fridges) & sundry ferrous

Paper Round can collect broken or unwanted appliances, such as dishwashers, kettles and other sundry metal items. These are stored before being taken to a metal recycling facility in east London. There they are fed into a fragmentiser. This breaks them down into small chunks which can then be easily separated by magnets and other means into materials for recycling.

Toner cartridges

Cartridges are individually checked to see if they are suitable for remanufacturing. All intact OEM cartridges, such as HP, Brother and Canon can be remanufactured to be used a second time. However broken cartridges have to be thrown away. Cartridges that have already been remanufactured can in some cases be used again or broken down for parts. Photocopier toner



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refill bottles have to be thrown away.

OEM cartridges are sold to re-manufacturers in the UK and Europe. These companies refurbish the cartridges, refill them with toner and sell them to end-users as 'compatibles'. These cartridges as well as being very environmentally friendly are generally significantly cheaper than OEM's.

Most manufacturers, including HP, run cartridge recycling programs. However customers should be aware that these cartridges are simply crushed before the plastic and metal are recycled. One of the main motivations for these programs is to stop the remanufacture of cartridges, which despite being a far better environmental option competes with the sale of more new cartridges.

Wood

Paper Round collects waste wood, principally in the form of redundant or broken wood pallets. We sort out any pallets that can be reused and pass them onto a pallet dealer. Most however cannot be reused and are sent to the wood recycling facility at Edmonton, off the North Circular.

The wood is chipped and contaminants, such as metal nails, removed. Wood chips are then used in a variety of applications, including horticultural mulches and animal bedding. The manufacture of MDF board also consumes large quantities of wood chip in the UK.

Batteries

Paper Round uses Lampcare for the recycling of batteries. The company is fully licensed to handle all types of non lead acid batteries, both rechargeable and single-use including;

Nickel Cadmium	Alkaline Manganese
Nickel Metal Hydride	Silver Oxide
Lithium	Zinc Carbon
Lithium Ion	Mercury Oxide

We also recycle lead acid batteries in the form of Uninterruptible Power Supplies (UPS). We try to reuse these wherever possible. UPS that fail testing are recycled through the well established recycling infrastructure that exists for lead acid batteries, principally found as car batteries.

Each battery chemistry requires a different recycling process to achieve the most effective recovery of material. Recycling processes fall into two basic categories, pyrometallurgical, where a furnace is used to recover the metals and hydrometallurgical, where the metals are recovered via chemical methods.

- ❖ Lead can be recovered by either separating the different materials that make up the battery (lead, plastics, acid, etc.) prior to metallurgical processing. Alternatively, batteries can be processed as a whole through heat treatment in a particular type of furnace with metals being recovered



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at the end of his process.

- ❖ NiCd batteries can be reprocessed through a similar thermal technique, which recovers cadmium and iron-nickel for steel production.
- ❖ Batteries containing mercury (button cells) are most commonly processed using a vacuum-thermal treatment, in which the mercury vaporises. It condenses and eventually solidifies when temperatures are reduced and can then be reintroduced into the material cycle.
- ❖ NiMH batteries are reprocessed by mechanically separating the individual materials (plastic, hydrogen and nickel) within a vacuum chamber to prevent the escape of hydrogen. The output of this process is a product with high nickel content which can be used in the manufacture of stainless steel.
- ❖ Li-Ion batteries are currently reprocessed through pyrolysis (heat treatment) with the primary recovery the metal content.
- ❖ Zinc-carbon/air and alkaline-manganese batteries can be reprocessed using a number of different methods, which include smelting and other thermal-metallurgical processes to recover the metal content (particularly zinc).

PLASTIC RECYCLING

There are many different types of plastics, all with very different chemical and physical properties. The 7 broad categories of plastics can be further modified by numerous additives, such as plasticisers, flame retardants and blowing agents, to tailor the plastic to specific applications. This variety can make plastics hard to recycle into a consistent end product.

All plastics tend to be recycled in similar ways. The cleaner the plastic grade is the more valuable it is in environmental and financial terms. Sophisticated machinery is now available to automatically sort plastic polymers, but hand sorting will still often be used as a lower cost option. Once sorted, the plastic will be washed and normally flaked before being sold by the recycling facility to a plastic manufacturer.

Recycled flake will be used in a wide variety of applications, depending on its quality. High quality, consistent flake will be able to be used instead of virgin material to make items such as plastic bottles. Each tonne of plastic used in this way will save two tonnes of CO₂. Increasingly household names like Coca Cola, M&S, Boots, The Body Shop, Innocent drinks and Halfords are using recycled plastic in selected product lines.

Lower quality flake will not replace virgin material, but will be made into items such as drainage pipes and 'plaswood' – a wood substitute used to make outdoor furniture and decking.



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Plastic bottles

Paper Round collects both PET and HDPE plastic bottles. These are taken to Closed Loop Recycling in South East London.

PET plastic bottles are washed and flaked and then made back into food-grade pellets, suitable for making new bottles, and closing the recycling loop. Those PET flakes that can't be used to make food grade product have a variety of other applications. Some are spun into fibres which are used in clothing or carpets. Patagonia for instance market high quality fleece jackets made from recycled bottles.

The HDPE plastic is heated to molten form to eliminate contamination, then made into pellets, which are used to make new milk bottles.

Other remaining sundry plastics tend to go into a mixed plastic grade. This is converted into things like drainage pipes and 'Plaswood', a wood substitute used to make outdoor furniture and pallets

Plastic film

Plastic bags are typically made from low density polyethylene (LDPE). Film is difficult to recycle economically because it is so light and bulky. Small quantities of film can be mixed in with plastic bottles. It is separated in the recycling plant and baled. This allows it to be easily and cost effectively transported to specialist recycling plants, where it is washed and extruded back into plastic film.

VHS Tapes

In some cases these can be reused. The polystyrene hard case is difficult to recycle as it contains a number of additives. Sony has devised an experimental procedure to reuse these polystyrenes in the form of a water-soluble polymer that can be used to condense pollutants contained in industrial wastewater.

Vending Cup Recycling

Paper Round collects hard-walled polystyrene (PS6) vending cups. These are collected by the Save-a-Cup recycling scheme. The cups are washed and flaked. Polystyrene PS6 is a versatile plastic that can be recycled back into office stationery such as rulers, pens & pencils and drinks coasters.

Polystyrene

This plastic is found as either hard or as foamed polystyrene. Hard polystyrene is used in the manufacture of vending cups (for cold drinks), plastic cutlery and food containers. Paper Round recycles polystyrene vending cups, identified through the PS6 recycling symbol, through the Save-a-Cup scheme.

Foamed polystyrene is used as a lightweight packaging material and because of its heat resistance in cups for hot drinks. It is 95% air and only 5% plastic! Paper Round does not recycle it as it is so light and so voluminous that it takes up too much space on our trucks. We would be using lots of diesel to transport essentially air and this would far outweigh the environmental benefit



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of recycling the polystyrene.

CD Recycling

Paper Round sends CD's to a specialist recycling centre near Liverpool where the constituent parts (CD / jewel case / paper inserts) are separated and the CDs are rendered unplayable.

Paper is baled and pulped and used in the production of cardboard.

The jewel case is granulated and then fed into an extrusion system which produces a high quality Crystal **Polystyrene** pellet which is reused in a number of applications, including the manufacture of new CD jewel cases, artificial wood and insulating foam.

The discs themselves are processed in CD recycling machines which remove the paint, aluminium and data layer from the surface of the disc, to be used as insulation in electric cables.

The cleaned disc is then granulated, blended and compounded into a high quality injection moulding grade **polycarbonate** for use in a multitude of applications (e.g. burglar alarm boxes / street lighting / lenses etc).

This CD recycling process has a very low environmental impact, using a non-chemical procedure and allowing the various component plastics to be recycled efficiently. 100% of the product is recycled, ensuring that natural, finite resources can be re-used rather than sent to landfill. Neither do they use corrosive chemicals that might contaminate water.

Food Composting

Unpackaged food waste is taken to Countrystyle Group in Kent, where it is fed into a large scale in-vessel composting unit. The facility is Animal By-product regulations (ABPR) compliant, and is therefore capable of processing all grades of food waste, including cooked and uncooked meats, bones, and all other organic waste.

Inside the vessels, the organic material reaches temperatures of 70°C through microbial activity, which destroys all of the harmful bacteria present in the waste.

The pasteurised material is then uplifted from the vessels to the maturation cycle, where further aeration continues for a period of 6 to 8 weeks. Comprehensive laboratory testing ensures that all the compost produced is suitable for dispatch from the composting operation. A range of peat free, sustainable, green compost products are produced, which are suitable for agriculture, landscaping, parks, gardens and orchards.



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Appendix – Licence & Duty of Care information

Material	Recycling Facility	Waste Management Licence	Address
Batteries	Lampcare (UK) Recycling Ltd	WML 80611	Unit C River Way, Mead Park Industrial Estate, Harlow, Essex, CM20 2SE
Cans & plastics	Cleanaway Ltd	WML 83498	Materials Recycling Facility, Nathan Way, Plumstead Marsh, Thamesmead, SE28 0AN
CD's	Polymer Recycling Ltd	Exempt from holding Waste Management Licence	Peninsula Business Park, Reeds Lane, Wirral, CH46 1DW
Ferrous scrap	European Metal Recycling Ltd	T/NE/MAY043	29 Bidder Street, Canning Town, E16 4SZ
Fluorescent tubes	Lampcare (UK) Recycling Ltd	WML 80611	Unit C River Way, Mead Park Industrial Estate, Harlow, Essex, CM20 2SE
Food waste	CountryStyle Recycling	EAWML 10367	Ridham Dock Road, Iwade, Sittingbourne, Kent, ME9 8SR
Fridges	European Metal Recycling Ltd	WML 80371	106 Scrubs Lane, Willesden, London, NW10 6GY
Furniture	Given to charity / Recycled	N/A	
Glass	Berryman	TE1/E/L/BER041	Dagenham Dock Complex Chequers Lane DAGENHAM, Essex RM9 6QD
IT scrap	Computer Salvage Specialists	WML 86256	5 Abex Road, Bone Lane Industrial Estate, Newbury, Berkshire, RG14 5EY
Paper - Newspapers	Holmen Paper	RE/04/102-103	Chatham Docks, Kent
Paper - Sorted office waste	M-Real New Thames Ltd	N/A	Kemsley, Sittingbourne, Kent, ME10 2SG
Paper - Various grades	London Recycling	TE1/E/LRL001/EL17	Unit 4D, North Crescent, Cody Road, Canning Town, E16 4TG
Paper - White	Chas Storer	TE1/E/L/CHA002	Coopers Lane, Northaw, Potters Bar, Herts, EN6 4NE
Toner cartridges	Reclaim IT	Exempt from holding Waste Management Licence	Colthrop Lane, Thatcham, Berkshire, RG19 4NP
Vending cups	Save A Cup	N/A	Suite 2, Bridge House, Bridge Street, High Wycombe, HP11 2EL
Wood	London Waste Ltd	WML 80689	Ecopark, Advent Way, Edmonton, London, N18 3AG

Special Note: IT Equipment

CRT Monitors are now classified as hazardous waste. Paper Round normally collects these on the basis that they are still working (or can be repaired) and that they therefore have a value and are not waste. We make a transport charge for their collection and then arrange for monitors to be reused. The hazardous waste regulations do not therefore apply.



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