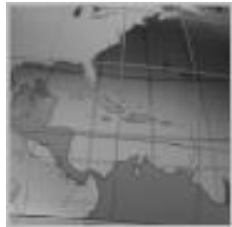


Primary Research



January 2016

LA Cartridge Collection and Recycling Report

Executive Summary

This report presents the results of a research program by InfoTrends to investigate cartridge collections, usage and disposal practices for reman and newly build compatible ink and toner cartridges. InfoTrends interviewed 29 remanufacturers in Mexico, Brazil, Panama and Colombia. The following is a glossary of terms used in this report.

Glossary

- **Bad Non-Virgin Empty:** A non-virgin empty that cannot be successfully remanufactured or one for which there is no market.
- **Bad Virgin Empty:** A virgin empty that cannot be remanufactured or one for which there is no market.
- **Bad Wrong Vender:** A cartridge originally produced by an OEM which is typically not remanufactured. Or a cartridge model that is not remanufactured
- **Clone:** NBC that violated patents
- **Empties collector:** A company that buys and sells empty cartridges.
 - A captive empties collector is owned by a remanufacturer. They are a profit center to the parent company and will supply primarily to the parent company as well as the aftermarket when excess empties are on hand.
 - Independent empties collectors are an independent business and serve the remanufacturing industry overall.
- **Empty:** A used cartridge that might be suitable for re-use or recycling.
- **Extra - Wrong Vendor:** Cartridges from vendors that the remanufacturers do not accept
- **Final Disposition:** What happens to a cartridge at the end of its life (sent to landfill, recycled, waste to energy (W2E))
- **Good non-Virgin Empty:** A non-virgin empty that can successfully be remanufactured.
- **Good Virgin Empty:** A virgin empty that can successfully be remanufactured.
- **Landfill:** Use of municipal waste. Municipal solid waste is commonly known as trash or garbage (US), refuse or rubbish (UK) is a type of waste consisting of everyday items that are discarded by the public. Depending on local laws, trash or rubbish may be buried untreated or may first be incinerated before the ashes are

disposed of based on local laws. Some municipal waste incineration may also be W2E. However measuring that mix is beyond the scope of this study.

- **New Build Compatible (NBC):** A 3rd party replacement cartridge that does not use an empty cartridge from an OEM, but rather uses a newly moulded cartridge shell and internal parts.
- **Non-Virgin Empty:** An OEM empty cartridge that has previously been remanufactured
- **OEM:** Original Equipment Manufacturer.
- **Recycling:** Crushing or melting components for use in other products or industries.
- **Remanufacturing:** The practice of cleaning, servicing, refilling, and re-using cartridges.
- **Remanufacturing Recycling Ratio:** Share of remanufactured cartridge waste that is recycled rather than sent to a landfill or incinerator.
- **Virgin Empty:** An OEM empty cartridge that has not been remanufactured.
- **W2E – Waste to Energy.** Burning of waste to produce electricity

Key Findings

- Domestic remanufacturers are under severe pressure from Chinese remanufacturers and NBCs.
- Domestic remanufacturers have lost very significant share of the market and ink remans have almost been wiped out.
- Remaining remanufacturers focus either on high quality to compete against OEM or cheap to compete with Chinese. The majority is the later.
- In either case above this causes a shift to virgin
- Virgins are more likely to maintain quality than non-virgins
- Virgins are less expensive to reman than non-virgins
- Essentially no effort to divert waste away from landfill. Too expensive
- OEM collections do not impact remanufacturer collections

Newly Build Compatible Findings

In speaking with the industry it is clear that almost all newly build compatible cartridges end up being thrown out by the users. With one small exception there is no effort by the manufacturers of NBCs to collect and recycle these cartridges at end of life. Other than the one exception, any collections of NBCs are unintended and accidental collections by the remanufacturing industry. Remanufacturers will not remanufacture an NBC due to concerns about the quality and reliability of such a product. Unlike other areas of the world, the patent issues related to some NBCs are not an issue.

Remanufacturers attempt to minimize this unintended collection but when it does happen the waste materials are recycled, sent to waste to energy or landfilled through the same process that the remanufacturer has for all of its waste and so the ratios for landfill, W2E and recycle below mirror what remanufacturers do with all of their waste materials.

Remanufacturer findings

What happens to cartridges that remanufacturers collect but can't use or sell?

Remanufacturers need to collect empty cartridges to remanufacture them and not all collected cartridges are suitable for use. The table above provides our estimates on what the remanufacturing industry does with cartridges and components that they cannot use or sell.

- Under price pressure from Chinese, the use of landfill has increased to reduce cost
- There is no significant investment or capacity for recycling available to remanufacturers
- What exists is too expensive to use due to the need to compete with NBCs and refill

Table 1: What happens to cartridges that remanufacturers collect but can't use or sell?

	2016
Laser	
Landfill	98%
Waste-to-Energy/ Incineration	0%
Recycled	2%
Total	100%
Inkjet	
Landfill	100%
Waste-to-Energy/ Incineration	0%
Recycled	0%
Total	100

Unusable Remanufacturer cartridge collections

Remanufacturers need to collect more cartridges than they can actually use because some collections are damaged or unusable because they were previously remanufactured by a different remanufacturer, an NBC that remanufacturers will not purposely collect, or of a type of cartridge that simply is not remanufactured.

Virgin empties have a lower defect rate than non-virgins but remanufacturers primarily remanufacture virgin cartridges as opposed to non-virgins so virgin represent a higher share of total bad collections than non-virgins.

Remanufacturers also accidentally collect cartridges that are simply not usable because they may be NBCs, simple toner cassettes and even toner bottles that they typically do not remanufacture.

On the inkjet side a significant volume of collections are bad-wrong vendor because many are ink tanks from vendors where the cartridges are not remanufactured. However those numbers had been higher as there is more remanufacturing on ink tanks now than in the past.

- Remanufacturers focus on virgins so despite a somewhat lower defect rate on virgins vs non-virgins, virgins represent a larger share of their unusable returns
- Bad wrong vendor is largely separates where remanufacturers could never compete with NBCs as well as collections of NBCs as China infiltrates LA.

The table below shows the percentage of all collections that are bad /unusable for the three types described above.

Table 2: Unusable Remanufacturer cartridge collections

	2016
Laser	
Bad Virgins	8%
Bad Non-Virgins	2%
Subtotal	10%
Bad–Wrong Vendor	35%
Total	45%
Inkjet	
Bad Virgins	7%
Bad Non-Virgins	3%
Subtotal	10%
Bad–Wrong Vendor	30%
Total	40%

Trend from 2012 and 2016

The following table show the values for both Toner and Ink for the years the report has been commissioned by HP for LA.

Table 3: Toner Reman Trend Summary from past studies

Toner		
2012	2016	
98%	~100%	% of remanufactured cartridges sold which will ultimately be thrown away due to remanufacturer preference to work with cartridges that have never been remanufactured and lack of recycling for unusable cartridges and replaced parts
73%	80%	% of toner cartridges that are remanufactured only one time
27%	20%	% of toner cartridges that are remanufactured from non-virgin cores

23%	45%	% of toner cartridges that remanufacturers collect (are not suitable for remanufacturing) that cannot be profitably remanufactured.
90%	98%	% of unusable cartridges and components that go to the landfill

Table 4: Ink Reman Trend Summary from past studies

Toner		
2012	2016	
98%	~100%	% of remanufactured cartridges sold which will ultimately be thrown away due to remanufacturer preference to work with cartridges that have never been remanufactured and lack of recycling for unusable cartridges and replaced parts
70%	70%	% of ink cartridges that are remanufactured only one time
30%	30%	% of ink cartridges that are remanufactured from non-virgin cores
40%	40%	% of ink cartridges that remanufacturers collect (are not suitable for remanufacturing) that cannot be profitably remanufactured.
95%	~100%	% of unusable cartridges and components that go to the landfill

About InfoTrends

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