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SERVICE AREAS:

PRIMARY RESEARCH

US CARTRIDGE COLLECTION AND RECYCLING REPORT 2018

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Executive Summary

This report presents the results of a research program by InfoTrends to investigate cartridge collections, usage and disposal practices for remanufactured and newly built compatible ink and toner cartridges. InfoTrends interviewed 15 industry participants including remanufacturers, newly built compatible suppliers, cartridge empties collectors and channel members to understand the current situation. The following is a glossary of terms used in this report.

Glossary

- **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.
- **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.
- **Clone:** NBC that violated patents
- **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))
- **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.
- **Non-Virgin Empty:** An empty cartridge that has previously been remanufactured
- **Bad Non-Virgin Empty:** A non-virgin empty that cannot be successfully remanufactured or one for which there is no market.
- **Good non-Virgin Empty:** A non-virgin empty that can successfully be remanufactured.

- **Recycling:** Crushing or melting components for use in other products or industries.
- **Remanufacturing Recycling Ratio:** Share of remanufactured cartridge waste that is recycled rather than sent to a landfill or incinerator.
- **Remanufacturing:** The practice of cleaning, servicing, refilling, and re-using cartridges.
- **Virgin Empty:** An empty cartridge that has not been remanufactured.
- **Bad Virgin Empty:** A virgin empty that cannot be remanufactured or one for which there is no market.
- **Good Virgin Empty:** A virgin empty that can successfully be remanufactured.

Key Findings

- US Supreme Court ruling overturning Jazz Photo has had limited impact on collections and cartridge availability
  - Remanufactures who tracked collections to comply with Jazz photo need not incur that cost any more
  - In the past 2 year Canon was not seen as enforcing Jazz photo so Chinese producers stopped worrying about using US collected empties even before the Supreme Court ruling
  - Chinese remans might have increased share but it is difficult to gauge as many NBC cartridges from china are mislabeled as reman
  - Most Chinese product for use in HP are said to be NBCs
  - Availability of virgin empties may have loosened but they were already largely plentiful
- Domestic remans remanufacturing of their own cartridges has slightly declined
  - Empty OEM cartridges are plentiful and inexpensive
  - Remanufacturing a non-virgin is focused on very old model cartridges, newest models and some high volume models
- Domestic remanufacturers own internal waste recycling ratio has increased due to consolidation
- Domestic remanufacturers (Including those who manufacture in Mexico) continue to consolidate.
  - Clover has gained additional share.
  - LMI has not recovered from plant fire

- Domestic remanufacturers believe that they are losing share to NBCs
    - However B to B channels and especially those that provide service/contract sales/MPS are still largely avoiding NBCs
- At this time the research found no significant NBC supplier that provides an end of life program for customers
    - NBC manufactures do not take back their empties
    - Remans do not want NBCs and attempt to avoid collecting them
- Respondents are very unsure the mix of Reman vs NBC coming rom China (for use in HP) but most think that at least 65% are NBC
    - Respondents believe that a large volume of those remans do not use US collected empties

Newly Built Compatible Findings

In speaking with the industry it is clear that almost all newly built 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 patents as well as concerns about the quality and reliability of such a product.

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.,

- NBC suppliers do not take back their empties
- All of the data in the table above is for what happens to NBCs when remanufacturers accidently collect them
- Collection of NBCs by remans (and OEMs) is unintended and accidental
- Remans will not reman a NBC because of IP fears as well as quality/reliability issues.
- Remans/Collectors state that empty NBCs are not a huge problem for collections because most are purchased on the internet and those users are not typically where they focus their collections efforts. Their collections are primarily done in cooperation with their own channel partners.
- Recycling of NBCs is only by remans (and OEMs) who accidently collect and send waste through their usual process

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.

- Huge improvements have been made across the domestic reman industry to reduce the amount of product that is disposed in a landfill
  - Large domestic remans already largely avoid landfill and the large domestics are consolidating the market
  - Chinese remans still largely do not collect their own remans at all
  - Collected waste is still a small proportion of all cartridges that go to landfill. Mot landfilled cartridges are those that are never recollected
- Recent increase in recycling ratio is due to ongoing consolidation in the domestic reman industry under only a few very large remanufacturers who do recycle their waste
- Ink Cartridges have more share of mass that is not easily recycled. (residual ink, sponges)
- Sustainability is also a selling point in both regions, but more so in WE

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

	2018
Laser	
Landfill	40%
Waste-to-Energy/ Incineration	12%
Recycled	48%
Total	**100%**
Inkjet	
Landfill	25%
Waste-to-Energy/ Incineration	15%

Recycled	60%
Total	**100%**

For notes below charts/images use the Comments style

Unusable Remanufactured cartridge collections

Remanufacturers need to collect more cartridges than they can actually use because some collections are damaged or unusable because they are previously remanufactured cartridge from a different remanufacturer, an NBC that will not 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 number had been higher as there is more remanufacturing on ink tanks now than in the past.

NBC's have been gaining share among 3rd party product however they are largely confined to the internet and users who buy that way. Remanufacturers do not collect empty cartridges backwards through the traditional sales channels such as contract stationers and MPS providers. As such the impact of empty NBCs in the market has been limited.

- There has been little change since 2016 of the probability that a collected virgin or non-virgin will be "Bad"
- Changes above mainly reflect the changing use of non-virgins overall
- Mix of bad Virgin vs Bad Non-Virgin driven by result of mix of overall use of virgin vs non-virgin + the success rate for each.

Table 2: Unusable remanufactured cartridge collections

	2018
Laser	
Bad Virgins	8%

Bad Non-Virgins	4%
Subtotal	12%
Bad–Wrong Vendor	9%
Total	**21%**
Inkjet	
Bad Virgins	9%
Bad Non-Virgins	3%
Subtotal	12%
Bad–Wrong Vendor	23%
Total	**35%**

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