

Actionable Intelligence Report



# Premium Compatibles Poised to Fundamentally Change Third-Party Printer Supplies Market



THE PRINTER AND SUPPLIES INDUSTRY'S LEADER FOR NEWS AND ANALYSIS

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## Executive Summary

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- Demand for consumables used in home and office imaging devices is declining; however, ink and toner cartridge sales worldwide generate almost \$45 billion annually for manufacturers.
- The majority of new compatibles infringe OEM intellectual property (IP) or perform poorly, but a sub-category of non-infringing new-builds has emerged with enhanced performance that has the potential to be market disruptive.
- Marketing to remanufacturers in Europe and North America along with regional distributors, resellers, and other channel partners since the 1990s, today's new-build cartridge industry is well-established and based almost exclusively in China.
- In 1987, a group of 18 independent service organizations (ISOs) maintaining Kodak analog devices filed an antitrust suit against Eastman Kodak in the U.S. District Court alleging the OEM illegally tied its hardware to aftermarket supplies and service.
- The case was heard by the U.S. Supreme Court, which rendered a verdict in the plaintiff's favor and ensured third-party vendors can market replacement parts and service, and Kodak paid the ISOs \$72 million in treble damages for violating the Sherman Act.
- The Kodak case restricted OEMs from tying aftermarket products and services to hardware, but the courts have since made clear that while it is permissible to market third-party consumables, IP must be respected on non-OEM products.
- The 1990s saw the beginning of decades of IP suits filed by Canon, Epson, HP, Lexmark, and others and those filings have lasted up to the present day.
- With the release of its 86T product line in 2002, Print-Rite is the first third-party supplies vendor that we are aware of to release a branded line of consumables based solely on its own proprietary technology.
- For years, third-party supplies vendors fought long legal battles over the IP violations, but in 2005 Print-Rite embraced a new strategy and began settling with OEMs so it could swiftly bring non-infringing products to market. Today, the strategy is employed by many large firms, including Aster Graphics, Ninestar, and others.

- Over the past 10 years, Canon has become one of the most aggressive OEMs in the protection of its IP and has sued dozens of firms in Europe and the United States. Certain major third-party supplies vendors have quickly settled with Canon and reentered the market with non-infringing products.
- In 2018, Canon sued 49 companies in the United States for violating a set of newer patents awarded to Canon after 2016. Some of the larger companies, including Aster Graphics, LD Products, Ninestar, Print-Rite, and The Supplies Guys challenged Canon over the patent validity.
- The third-party supplies vendors prevailed in their arguments before the U.S. International Trade Commission, which found they had not violated the patents, but Canon has appealed that ruling and no further ruling has been issued yet on the matter.
- The final decision in this case is very important because it could limit OEM patentholder protections and allow third-parties to develop more non-infringing new-build compatibles.
- Although lawsuits will continue, we believe that manufacturers will react swiftly to bring to market non-infringing products.
- Patent and antitrust laws protect the market for non-infringing new builds, and this market will continue to grow and take share as it has for the past 10 years.

## Introduction

For more than a decade, we have heard that demand for consumables used in home and office imaging devices is declining. Nevertheless, the worldwide sale of ink and toner cartridges remains big business, generating almost \$45 billion annually for manufacturers.

While the global demand for ink and toner consumables is declining, one cartridge category, new compatibles, has been growing as these products take market share from hardware manufacturers and companies that remanufacture empty cartridges. Because the majority of new compatibles infringe proprietary intellectual property (IP) or perform poorly—or both—they have acquired a deservedly bad reputation. Over the past five years, however, a sub-category of non-infringing new builds with enhanced performance has emerged. This new category of new-build cartridges, which are currently available from only a few manufacturers, has the potential to disrupt the market and we expect it to grow quickly over the next five years.

## Cartridge Types

Consumables sales are arguably the most important source of revenue within the digital imaging industry. The companies that design and manufacture the hardware—the so-called original equipment manufacturers (OEMs)—rely on aftermarket sales of high-margin cartridges to stay profitable. And thousands of third-party supplies vendors worldwide have built businesses exclusively around marketing ink and toner cartridges for home and office printers and MFPs.

In general, consumables come in three different categories. The first is cartridges produced by OEMs. Because hardware manufacturers develop their imaging platforms around their own specific ink and toner formulations, OEM products offer the highest-quality performance as well as other competitive advantages such as being first to market and (usually) a rock-solid supply chain. Historically, OEMs have dominated the aftermarket, controlling 70 percent or more of the global market. OEM ink and toner cartridges typically sell at a premium, however, and carry the largest price tag of any consumable.

The second supplies category is remanufactured or refurbished products. These cartridges are made from spent OEM consumables, which are refilled with ink or toner and remanufactured with new parts. Remanufactured supplies usually sell at a discount of between 15 and 25 percent compared to the equivalent OEM SKUs and can offer performance close to that of OEM products, depending on the raw materials and processes used on the production lines. Remanufacturing techniques and quality controls also play a large role in the performance of the finished product, and such processes can vary significantly from one remanufacturer to the next. Empty cores are the remanufacturer's most essential material and they degrade if broken down and reassembled multiple times. Likewise, all of the components inside a cartridge must work together flawlessly or the finished product will not operate correctly.

The third group of consumables, which this white paper explores, consists of brand-new third-party cartridges, also known as new-build compatibles. Like remanufactured products, the performance and reliability of new-build compatibles vary widely.



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**A select group of third-party cartridge manufacturers is investing heavily in research and development (R&D) programs to ensure the companies do not violate OEM IP protections**

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Basically, there are two types of new builds. Perhaps the most famous—or infamous—is the “clone,” which represents the bulk of the new-build cartridges available on today’s market. These products are cheap copies of OEM supplies that are reverse-engineered with little or no regard for IP. Clones are sometimes marketed as remanufactured cartridges, which means that in addition to infringing OEM patents they are sold using false or misleading marketing claims. To keep production costs as low as possible, clones typically feature low-grade inks and toners and other components that were made using slipshod manufacturing practices with no quality testing. Clones are notorious for having high failure rates and rendering poor image quality. Because they sell at low price points, however, customers are willing to gamble that at least some percentage of the clones they purchase will perform adequately.

A small group of third-party cartridge manufacturers produces a higher-quality subset of compatible products that are not infringing. These higher-end, new-build compatible products include new ink and toner cartridges and are marketed as “patent-safe.” While premium non-infringing cartridges have been taking market share since 2015, their availability remains low.

Today, there is a range of non-infringing ink and toner cartridges. Certain cartridges are less technically advanced than others and feature patents that third-party supplies manufacturers can easily work around. In other cases, the patent-safe products are third-party versions of older SKUs based on patents that have expired altogether, which allows third parties to manufacture them without any risk of infringement.

Of course, the most popular cartridges are based on enforceable OEM patents. A select group of third-party cartridge manufacturers is investing heavily in research and development (R&D) programs to ensure they do not violate OEM IP protections. To stay on the right side of patent laws, some manufacturers have developed products based largely on their own patented technologies. These higher-end compatibles are often produced with the same high-grade third-party inks, toners, and other cartridge components used by leading remanufacturers but sell at price points well below those associated with remanufactured and OEM products. We see high-quality compatibles free of IP issues as being among the third-party supplies industry’s fastest-growing categories, and they are taking market share from remanufacturers and, in some cases, even OEMs.

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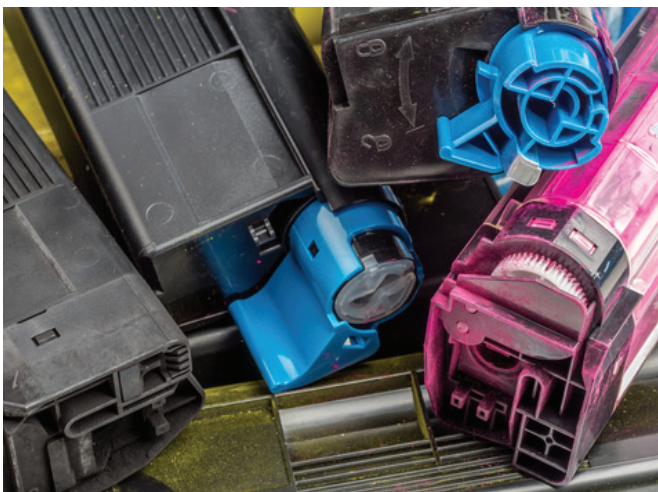
## Part 1: Today's Competitive Landscape Emerges

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**The industry was growing robustly when the global recession hit at the end of 2007, but various signs that things were slowing had been noted in the years prior**

While print volumes in certain regions such as China continue to grow, printing in the home and office in Europe and the United States, the world's two largest markets, has been slowing for almost 15 years. The industry was growing robustly when the global recession hit at the end of 2007, but various signs that things were slowing, such as lower office paper consumption and decreases in ink and toner production, had been noted in the years prior. Technologies like cheaper memory and lower-priced computer displays were eliminating the need for many end users to print at the levels they once had. Gadgets like smartphones and tablets have also reduced the need for hardcopy, especially in the home, and new software-based business processes have allowed corporate users to manage documents electronically, which further lowered print volumes.

As the dominant market leader, HP Inc.'s Printing business can be viewed as a bellwether for the industry. While we estimate that overall printing was already declining in established markets, during the three years prior to the recession HP's supplies business experienced healthy growth. From 2006 to 2008, the company's consumables revenue grew by approximately \$1.5 billion annually, which was an increase of roughly 10 percent each year. As a result of the recession, supplies sales fell by almost \$2 billion to \$16.5 billion in 2009. Since then, HP's supplies sales have experienced some gains but the results have been uneven and the overall trend has been downward. In fiscal 2016, total revenue for HP Printing was only \$18.3 billion, which was a low the firm had not experienced since 1999, and supplies sales totaled only \$11.9 billion. With supplies sales surging over 8 percent in 2018 to \$13.6 billion and total printing revenue at \$20.8 billion in 2018, it appeared that 2016 was HP's post-recession nadir. Fiscal 2019 was off to a rocky start, however, with total Printing and supplies numbers trending downward again during the first half, albeit not as steeply as in the past. HP forecasted its supplies sales would be down 3 percent in 2019, which would put them at just over \$13 billion.



As its Printing unit struggled to find its footing, HP underwent a massive restructuring that resulted in the firm being split in two in order to compete better in today's market. The creation of HP Inc. is only one of the industry's many well-chronicled changes. Today's Kodak bears little resemblance to what it looked like in 2007. Although it has emerged from Chapter 11 bankruptcy protections it filed for in 2012, it has been forced out of markets for home and office equipment. Sharp suffered its first-ever operating loss in 2009, which led to a couple of bailouts from the Japanese government, and its future remained cloudy until the Taiwanese firm Foxconn acquired a 66 percent stake in Sharp for \$3.8 billion. The money allowed Sharp to invest ¥40.0 billion (\$355.5 million) in its MFP division, Business Solutions Company, which the firm acknowledged faced a mature market that was moving



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**Today, the new-build industry is well-established and based almost exclusively in China, where companies have been making brand-new compatible cartridges since the 1990s**

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away from hardcopy. After years of tumbling revenue and being forced out of the inkjet market in 2012, Lexmark International was ultimately purchased by a group of Chinese investors and folded into Ninestar Corporation, a publicly traded third-party consumables firm based in Zhuhai, China.

While they are perhaps the most dramatic, these are only a few examples of how the OEMs have changed since the recession. Although a couple have managed to regain some or all of the revenue they had a decade ago, most companies that manufacture hardware and original supplies are now experiencing sagging sales.

The third-party supplies industry has also changed dramatically in the past decade. The world's largest remanufacturer, Clover Imaging Group (CIG), grew rapidly after Golden Gate Capital, a private-equity group that owns such brands as California Pizza Kitchen, Eddie Bauer, and J.Jill, made a significant investment in the company for an undisclosed amount in 2010. CIG would go on to make a number of acquisitions and fueled the consolidation of the remanufacturing industry in the West. We estimate that by 2015, the firm's revenue swelled to nearly \$1.2 billion largely as a result of acquisitions. Since that time, however, CIG's sales have declined and we estimate that its total revenue will be under \$800 million in 2019. Similarly, Germany's Turbon Group, one of Europe's largest remanufacturers, enjoyed strong growth through 2015 in part due to certain U.S. acquisitions, including the 2014 purchase of Clarity Imaging Technologies and International Laser Group (ILG). Turbon's top-line growth sputtered in 2015 after the company racked up consolidated sales of €107.9 million (\$117.2 million) in 2014. Since then, revenue has fallen sharply and totaled only €65.2 million (\$74.7 million) in 2018, with further declines expected in the short term.



### **The Birth of the Western New-Build Market**

Although the supplies businesses at most OEMs and remanufacturers have declined, as noted, companies marketing new-build compatible cartridges have grown. Today, the new-build industry is well-established and based almost exclusively in China, where companies have been making brand-new compatible cartridges since the 1990s, as we will discuss later in the report.

While new third-party cartridges have been produced in regions throughout the world, the domestic third-party supplies industries established in North America and Europe have consisted mainly of remanufacturing companies. Initially, western remanufacturers had ample

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originated in China**

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reserves of their most critical raw material, empty cores, and could produce sufficient quantities of the cartridges needed to cover most of the market. As printer populations grew and became more diverse in the late 1990s, however, it became more difficult for remans to collect the wide assortment of empties in the quantities required to meet market demands. To augment what they produced internally, western remanufacturers began importing finished cartridges from China.

Sensing the enormous opportunities in the West at the turn of the new century, firms in China began actively wooing remanufacturers in Europe and North America along with regional distributors, resellers, and other channel partners. China's vast pool of cheap labor allowed the Chinese industry to keep production costs dramatically lower than they were in the West. To gain an even greater cost advantage, larger Chinese manufacturers invested in assets such as injection molding machines and mold-making equipment to make their factories vertically integrated. These firms also set up internal laboratories and worked with local universities to implement sophisticated R&D programs. While Chinese companies often used their advanced internal infrastructure to remanufacture cartridges, many also leveraged their assets to bring to market freshly minted compatibles.

During the first years of the twenty-first century, the markets for third-party supplies in Europe and North America grew to be the world's largest. As the markets matured, new customers were increasingly hard to win and a price war broke out among third-party supplies vendors as they increasingly relied on price to grow their business. Between 2000 and 2005, the wholesale price of certain remanufactured cartridges plunged more than 50 percent. Imports grew as companies in the West found it more economical to acquire ink and toner cartridges from China than to remanufacture the cartridges themselves. By 2005, many western remanufacturers switched their business models to become distributors, and soon more than half of the third-party supplies being sold in Europe and the United States had originated in

China. While many of these products were remanufactured ink and toner cartridges, a growing number were new-build compatibles—and that number has continued to grow up to the present.

### **China's Supplies Industry Flourishes**

Established in the early 1990s, China's third-party supplies industry flourished as it attracted more customers from the West. From the beginning, most Chinese companies remanufactured cartridges and produced new builds, and often manufactured other supplies such as impact ribbons. What is today Print-Rite Holdings first established itself as a ribbon vendor in Hong Kong in the 1980s. In the early 1990s, Print-Rite set up one of the first ink cartridge plants in Zhuhai, China, a small port city in the Southern China province of



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**The industry grew quickly across China in the opening days of the twenty-first century, and today some of the industry's early firms are among the world's largest third-party cartridge producers**

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Guangdong that was destined to be the center of China's third-party supplies industry. Other firms in the city, such as Gree Meida Technology, a joint venture established to produce floppy disks in Zhuhai in 1986 with the support of the giant state-owned enterprise Gree Group Company, also began manufacturing digital imaging consumables. Gree Meida began producing ink cartridges in 1998, and exports of its MMC-branded new-build compatibles were among the first to become popular in North America and Europe.

The industry grew quickly across China in the opening days of the twenty-first century, and today some of the industry's early firms are among the world's largest third-party cartridge producers. Hong Kong-based Sinobase Network Technology opened its new-build toner cartridge plant in 2001 in Shenzhen, as did Retech Technology International. Top-Print Technology was established in Shenzhen in 2000 and moved its campus to Zhuhai in 2008. The toner cartridge producer Baiyingmei Printer Consumables Co., which also does business as Zhuotai Printer Consumables Co., was founded in Shanghai in 1998 and continues to market its PrinterMayan-branded products. Huatai Computer Consumable Co., which is also known as Menston Limited, was established in Shanghai in 2000. It started out selling new-build ink cartridges exclusively before shifting to remanufacturing in 2004. The compatible ink cartridge manufacturer and refiller Speed Infotech Holdings Limited was established in Shanghai 2001 and opened a new factory in 2014 in the port city of Beihai in the southern province of Guangxi after expanding its Shanghai plant in 2009.

Zhuhai, now the hub for China's cartridge industry, is home to hundreds of companies, many of which started in the opening days of the industry. Jialianxin Imaging Products Co. began as a trading company in 1999 and set up its factory in 2001 in Zhuhai. The new-build toner and ink cartridge manufacturer Polytoner was founded in Zhuhai in 2004 and expanded into ink-cartridge production in 2011. Established in Zhuhai in 2005, Topjet started out as a compatible ink cartridge manufacturer and expanded into new-build toner cartridges in 2010. The firm was acquired by Ninestar Corporation in 2017.

Ninestar Corporation was started in 2000 by a group of executives who defected from Zhuhai



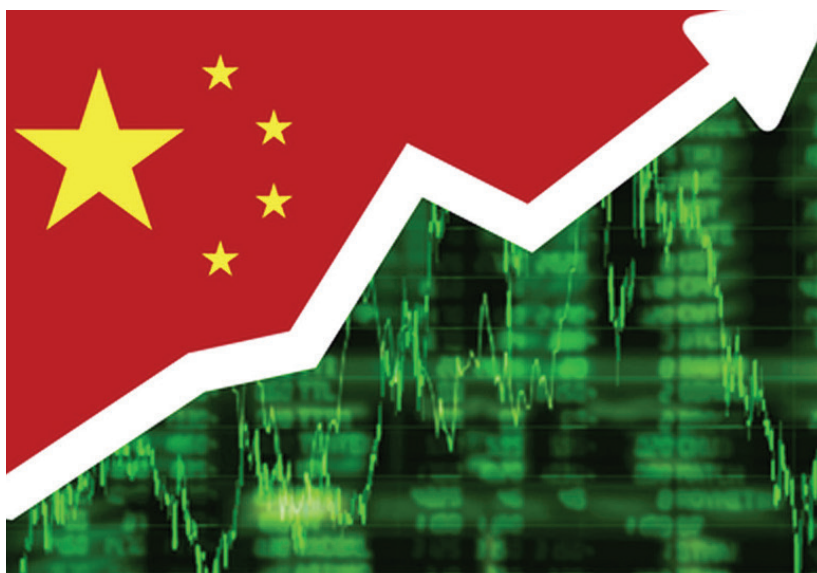
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**With its own internal production assets for toner, ink, OPC drums, chips, and components, Print-Rite is the third-party supplies industry's only fully vertically integrated manufacturer**

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Gree Meida. Although it has been at the center of many lawsuits, the firm has experienced nearly two decades of strong organic growth and has also grown through acquisition. A publicly traded company formerly listed as Apex Microelectronics, Ninestar's total revenue with the inclusion of its Lexmark business has grown from almost CNY 1.7 billion (\$245.6 million) in 2014 to CNY 21.9 billion (\$3.2 billion) in 2018. In a move similar to those made by rival remanufacturers in the West, in 2017 Ninestar acquired several of the larger second-tier new-build manufacturers in China. The companies include Zhongrun Jingjie Printing Technology Co., which trades its products under the Ink-Tank name; Xinwei Technology Co., Ltd., also known as Kingway; and Tuoja Technology Co., better known as Topjet. In fiscal 2018, Ninestar's various third-party cartridge businesses had CNY 2.16 billion (\$313.9 million) in sales, up 17.6 percent year-over-year.

Print-Rite Unicorn Image Products, the finished-cartridge manufacturing arm of Print-Rite Holdings, is another major third-party supplies manufacturer based in China. With its own internal production assets for toner, ink, OPC drums, chips, and components, Print-Rite is the third-party supplies industry's only fully vertically integrated manufacturer. In 2017, Print-Rite announced a licensing agreement with one of Europe's largest third-party supplies vendors, Pelikan Hardcopy, which gave the Chinese firm exclusive rights to manufacture inkjet and toner cartridges using the Pelikan brand. At the time of the deal, we estimate that the Pelikan business was worth between \$25 million to \$30 million. While Print-Rite Holdings is a private firm and does not report its financial results, we put its 2018 annual revenue at approximately CNY 1.7 billion (\$245 million).



Recent research by Actionable Intelligence indicates that, like Ninestar and Print-Rite, revenue has been up at many of China's leading cartridge producers over the past five years. The growth has come primarily from the Chinese industry's ability to take share from remanufacturers in foreign markets as well as through growth in the domestic market. Although China's gross domestic product has cooled, it remains above 6 percent. Many of the country's secondary and tertiary cities enjoy strong growth, as do the many small businesses located in these cities. While revenue is up at many of China's third-party cartridge manufacturers, profits are being squeezed. Over the past few years, several large third-party supplies vendors have been forced out of business, such as Kolion Technology and Rich Imaging Technology.



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**New-build  
compatibles cost  
significantly less to  
manufacture and  
often sell at price  
points significantly  
lower than OEM and  
remanufactured  
SKUs**

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### **The New-Build Advantage**

The strong growth experienced by the Chinese third-party supplies industry has been fueled largely by the growing popularity of new-build compatibles worldwide. New-build compatibles have a number of distinct competitive advantages. Lacking many of the fixed costs associated with remanufacturing, such as collecting, sorting, and storing empty cartridges, new-build compatibles cost significantly less to manufacture and often sell at price points significantly lower than OEM and remanufactured SKUs. Most compatible ink and toner cartridges are exported from China and thus gain further cost advantages. In addition to having access to a large and highly trained pool of cheap labor, the Chinese compatibles industry can leverage valuable regional assets that help further reduce production costs. For example, the southern province of Guangdong, which is home to many compatible manufacturers, has advanced technical expertise at its many universities and laboratories that buttress the industry's R&D efforts.

New compatibles also gain a competitive leg up on remanufactured products because the compatibles can be brought to market quickly. Remanufacturers must wait until they have a reliable supply of empties before they can set up lines to produce new SKUs. Compatible makers, on the other hand, can begin manufacturing once they have reverse-engineered the OEMs' products and retooled production lines for the new SKUs. Because their cartridges use only new parts, compatible cartridge manufacturers also claim their products have a performance advantage over products from remanufacturers, which may be made from cores that have been taken apart and reassembled multiple times.



There is a significant downside to many new-build compatible cartridges, however. As noted above, the list of companies producing high-quality, non-infringing compatibles is tiny relative to the size of the entire third-party supplies industry. The majority of the industry produces clones. Clone makers are focused on driving their costs down and their profit margins up. As a result, they keep R&D expenses to a minimum by ignoring OEM IP. To further lower production costs, clones are often made from inferior raw materials such that the finished cartridge performs poorly or may fail altogether. In some cases, the inferior materials found in new builds may even pose health risks to the end users.

Despite the industry's propensity to bring cheap clones to market, a small but growing cadre of compatibles manufacturers has begun producing high-quality, new-build cartridges that



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**The availability of non-infringing new-build compatibles has grown over the past five years and these products are gaining acceptance, especially within office-equipment channels**

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they promote as being free of any OEM-patented technologies. Though they are few, the companies tend to be large, multinational firms with global distribution. They have high-tech R&D facilities and the expertise to develop home-grown proprietary technologies that do not violate OEM IP. The factories these firms operate are ISO-certified and their products often carry environmental labels, such as Germany's Blue Angel designator.

The availability of non-infringing new-build compatibles has grown over the past five years and these products are gaining acceptance, especially within office-equipment channels.

Through leases or managed print services, the channels for office devices, which are comprised mainly of copier dealers and value-added resellers, often support diverse fleets of machines from a variety of vendors. Rather than employ OEM



consumables, which command a premium, firms in the office-equipment channels are attracted to lower-priced third-party supplies. While some dealers have experimented with clones in the past, the unreliability and legal risks associated with these new builds have tended to make dealers rely on high-quality remanufactured cartridges. As more premium, non-infringing new compatibles have become available, we have witnessed a growing willingness in the office-equipment channel to give the premium new builds a try.

Although these third-party compatibles makers invest in developing and marketing non-infringing products, OEMs have successfully challenged their designs in court. As we will discuss later in this report, most of the suits involving premium compatibles are settled quickly and the third-party supplies vendors are able to return to market with new non-infringing compatibles, which are usually available shortly after the settlements are reached.

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## Part 2: Legal Legitimacy of New Compatibles

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**The legal foundations supporting a third party's right to sell aftermarket products and services for another firm's equipment are well-established and have been upheld in various courts**

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Because so many new builds marketed by Chinese firms since the 1990s have been found to violate IP, it is now assumed that it is against IP law to manufacture, distribute, or sell new compatible ink and toner cartridges. This assumption is incorrect. The legal foundations supporting a third party's right to sell aftermarket products and services for another firm's equipment are well-established and have been upheld in various courts. Companies have been selling non-infringing new compatible third-party consumables for office equipment since the first typewriters and adding machines entered offices more than a century ago, and that tradition continues today.

Perhaps the most famous case regarding a third party's right to sell consumables for imaging devices was filed in the United States. In 1987, a group of 18 independent service organizations (ISOs) that maintained Kodak analog copiers and other Kodak equipment filed suit against Eastman Kodak in the U.S. District Court for the Northern District of California. The plaintiffs accused Kodak of violating antitrust laws in the Sherman Act, which was established in the nineteenth century to preserve "free and unfettered competition." The ISOs claimed that the OEM was "tying" hardware sales to equipment maintenance and attempting to monopolize aftermarket services and repairs. Kodak failed to get the case dismissed in federal court, and on appeal the matter went all the way to the U.S. Supreme Court. In 1992, the high court issued its *Kodak v. Image Technical Services* ruling, which found in favor of the ISOs.

In their suit, the ISOs explained that after a device's warranty expired, customers could purchase parts and service from Kodak or use an ISO. They argued that many customers preferred working with ISOs because they were less expensive than the OEM, and some customers felt their service was as good—if not better than—Kodak's. Initially, ISOs were able to get replacement parts from Kodak and service the machines. Around 1985, however, Kodak began to restrict access to its parts to those customers using Kodak aftermarket services or doing the work themselves. Kodak refused to sell parts to ISOs and tried to tie the sale of its parts to services, which required the ISOs to purchase Kodak parts and compatibles from third parties. As a result, the ISOs sued, accusing Kodak of unlawful tying and of monopolizing aftermarket sales and services.



Although the high court did not rule on the ISOs' actual allegations, it indicated that the plaintiffs had a case against Kodak, suggesting that the OEM was violating antitrust laws.

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When reporting the high court's decision in 1992, *The New York Times* explained that if Kodak had prevailed, OEMs "in Kodak's position would have been effectively immunized from antitrust liability for driving competitors out of the markets for replacement parts and service." By allowing the case to move forward, the ruling upheld the right for third-party firms to offer non-OEM aftermarket services and consumables. As one might expect, companies selling third-party supplies at the time, such as Katun, applauded the move.

In its final ruling on the matter, the U.S. Supreme Court remanded the case back to the lower court for the district of northern California where it originated. Ultimately, a jury heard the case and a unanimous verdict in favor of the ISOs was returned. Kodak was ordered to pay the plaintiffs \$72 million in treble damages for violating the Sherman Act.

#### **Patents Must Be Respected**

While the Kodak v. Image Technical Services ruling sorted out any ambiguities regarding a third-party's legal right to sell aftermarket products and services, it was understood over time that the case did not exempt companies from honoring a patent holder's other protections. That third-party supplies vendors had to stay on the right side of intellectual-property laws was made abundantly clear in the 1990s as issues of IP began swirling around third-party supplies. Since then, disputes over IP have been a hallmark of the consumables industry and lawsuits, as noted earlier, have been one of the key forces that have shaped today's competitive landscape.

Over the years, certain third-party consumables vendors have tried to make the case that new cartridges are replacement parts; therefore, because of the Kodak v. Image Technical Services, to bar the sale of these products is anticompetitive, regardless of whether or not the cartridges in questions infringe IP. The argument has been repeatedly rendered

moot, however. Kodak's case had focused on the OEM's right to control the sales of aftermarket products and services but did not raise the issue of IP. There was no claim that the ISOs' replacements parts infringed Kodak's patents. Other OEMs appeared to have learned a lesson from the Kodak case, and in most subsequent ink and toner cartridge cases IP infringement was placed front and center.

In 1993, one of the first suits was filed involving new-build toner cartridges after the Kodak v. Image Technical Services ruling. Canon filed suit in Hong Kong against the Green Cartridge Company, which would later become known as GCC International. Green



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**Because cartridges are replaced when nothing else is wrong with a device, the high court in England did not consider cartridges to be replacement parts**

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Cartridge sold new-build toner cartridges along with cartridge components and refilling equipment. The company maintained that, based on British IP law (Hong Kong was a British territory at the time), it had the right to sell new repair parts for machines based on Canon print engines. Although Green Cartridge was only a fraction of the size of Canon in terms of revenue, the company embarked in a quixotic legal battle against the OEM, which cost the company dearly.

Canon's case against Green Cartridge was ultimately decided by England's Privy Council, which is the equivalent to the U.S. Supreme Court. England's high court made clear that patent rights on cartridges must be respected. It was determined in the lower courts hearing the case that the five Canon patents asserted in the suit were valid and enforceable and had been infringed by Green Cartridge. Green Cartridge maintained, however, that cartridges were replacement parts and as such it would be anticompetitive to deny the company the right to market its new-build cartridges. Like U.S. antitrust law, British law allows third-party firms to manufacture replacement parts for another company's products. Unlike in the United States, British antitrust laws also made allowances for replacement-part manufacturers in respect to IP, and Green Cartridge sought to leverage these allowances in its case.

In its detailed and complex decision on the matter rendered in April 1997, which referenced the U.S.

Supreme Court's Kodak v. Image Technical Services ruling, the Privy Council disagreed with Green Cartridge's contentions. Because cartridges are replaced when nothing else is wrong with a device, the high court in England did not consider cartridges to be replacement parts. Green Cartridge's anticompetitive claims were further undermined by Canon's argument that remanufacturers were robust and growing competitors, with which the Privy Council agreed. Canon indicated that in Hong Kong, remanufacturers commanded 40 percent of the market. Because of the market power remanufacturers exercised, the high court noted that Canon's cartridge prices were not excessive and they did not reflect an anticompetitive monopoly.





**The case made it clear that while OEMs cannot legally restrict third parties from selling aftermarket goods and services, OEMs are entitled to being granted valid and enforceable patents on their cartridges**

### **GCC's Costly Lesson**

Today's third-party supplies vendors should recall the Green Cartridge case for several important reasons. First, the case made it clear that while OEMs cannot legally restrict third parties from selling aftermarket goods and services, OEMs are entitled to being granted valid and enforceable patents on their cartridges. It also demonstrated that third parties cannot violate an OEM's patent on the basis that a patent is anticompetitive. Finally, the case showed that ignoring an OEM's patent can have a material impact on a third-party supplies vendor's business.

Unfortunately, it appears that Green Cartridge learned nothing from its first costly legal encounter with Canon and it was fated to relive the experience. In less than 10 years, the two combatants would lock horns again, and this time the legal battle would mark the end of the Chinese firm. In the years following Canon's first case, Green Cartridge recovered and restructured as GCC International. Over time, the company once again became a major vendor of premium new-build toner and ink cartridges in western markets. The company successfully wooed the printer OEM Genicom (which later became TallyGenicom) as a channel partner and it became a supplier of new-build compatibles to Staples, which was on its way to becoming one of the largest supplies retailers in the world.

In 2006, Canon sued the firm again along with several of its affiliates and TallyGenicom in the United States. Things were not good at GCC when Canon filed its suit. GCC's vendor was in the process of losing Staples, which was GCC's largest customer, and the company's cash flow was strained. Despite its precarious position, GCC opted to fight rather than seek a settlement with Canon, and it would be a fight to the death. After the court decided in favor of Canon, GCC and the other defendants appealed the ruling but lost again. Not long after the ruling from the appellate court, GCC was out of business.



### **Rushing into the Breach**

GCC is only one of a number of firms that chose to tussle with an OEM over IP issues and suffered as a result. In the more than two and a half decades that have followed Canon's initial Green Cartridge suit, scores of other vendors marketing third-party supplies, including both remanufactured cartridges and new builds, have engaged in protracted legal battles. In most cases, OEMs have come out on top and many of the firms caught selling infringing products have paid dearly for violating IP laws. Like GCC, more than one firm has curtailed its operations as a result of an OEM lawsuit.

One of the biggest cases involving supplies in the 1990s pitted the third-party supplies industry's then largest player, Nukote International, against three of the industry's largest OEMs. In 1994, Nukote was sued by HP, followed by Canon and Epson in 1995. Nukote appears to have never considered settling the



matter with the OEMs, even as the cases dragged on. Apparently, Nukote felt it was big enough to stand up to not one but three OEMs in court. The company faltered, however, as it amassed a huge debt—some from its legal battles and some from business missteps—and filed for Chapter 11 protection late in 1998.

In the end, the OEMs' suits cost Nukote millions in damages along with attorneys' fees and other legal expenses. Despite siding with the defendant on several of its counterclaims and dismissing 10 of HP's patent claims, a jury eventually found that Nukote had infringed three HP patents and awarded the OEM \$2 million. Similarly, after emerging from bankruptcy, Nukote and its subsidiary Pelikan Hardcopy were ordered to pay Epson more than \$14 million. Nukote reached a mediated settlement with Canon, the details of which were not disclosed.

Although Nukote would eventually emerge from bankruptcy, it would never regain its past glories and the company slipped back into bankruptcy in 2009, never to emerge. When it entered into the lawsuits, Nukote was the world's largest third-party printer supplies vendor with more than \$500 million in annual revenue, which was the firm's high-water mark.

Of course, Nukote and GCC are only two examples of firms that fought long and damaging legal battles with OEMs. During the 1990s, the ink cartridge refiller Repeat-O-Type fought a pitched legal battle with HP that affirmed the remanufacturing industry's right to repair spent OEM cores. Nevertheless, Repeat-O-Type was forced to declare bankruptcy after an appellate court ruled that Repeat-O-Type was required to pay HP damages and attorneys' fees for violating the OEM's IP. Similarly, Nashua Corporation, which sold toner cartridges as well as specialty media and adhesive-backed papers and tapes, was forced out of the toner cartridge business after losing a couple of punishing lawsuits to Ricoh.



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## Part 3: Lawsuits Shape the Industry

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**Even in regions where state agencies aggressively defend patent-holder protections, the courts have ruled that it is not illegal to market non-infringing third-party consumables**

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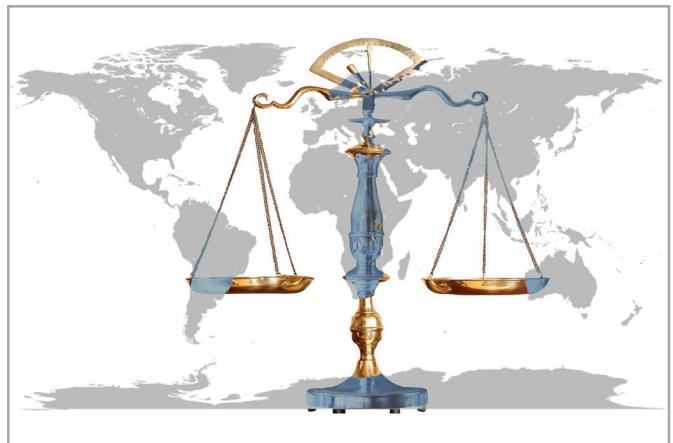
Consumables often contain much of the gear that actually puts an image on a page. Many OEMs design their machines to ensure that each time cartridges are replaced, much of the imaging technology is refreshed, which means image quality won't deteriorate as a machine ages. In order to better meet new and evolving end-user demands, OEMs spend billions to develop the technologies contained within many of their consumables. Of course, aftermarket sales are a critical part of any OEM's business. Consumables are the "blade" in the OEMs' "razor-and-blade" business model and any potential disruption to that model is a cause for concern. So, OEMs make sure to safeguard both their R&D investments and their aftermarket business with lots of patents.

To ensure that inventors keep investing in new inventions, courts tend to side with patent holders like OEMs and allow them to maintain monopolies and reap the monetary rewards that new inventions deserve. Patents, however, are supposed to act as shields for the OEMs' investments and not swords to attack the competition. Over the past 10 years, we have seen courts rein in patent-holder rights in various regions, especially the United States. As we have noted, even in regions where state agencies aggressively defend patent-holder protections, the courts have ruled that it is not illegal to market non-infringing third-party consumables. To prevent the industry from competing unfairly, courts have sought to restrict anticompetitive behaviors as well as protect patent holders.

The primary goal of the courts and other governmental agencies is to balance the needs of OEMs, third-party supplies vendors, and end users and protect free markets so consumers can choose between a range of safe, non-infringing products. In much the same way that new technologies or changing end-user behaviors have shaped today's consumables industry, the courts have played a major role in its

development. As one might expect, the OEMs' imaging technologies contained in their consumables are heavily patented, and companies that remanufacture or reverse-engineer any OEM cartridge run the risk of violating OEM IP. The competitive landscape is littered with the hulks of large third-party vendors that have been destroyed because they asserted their rights to market infringing products, especially new-build compatibles.

As a result of lost litigation, legitimate third-party supplies vendors—remanufacturers and compatibles makers—have been investing heavily in bringing to market non-infringing



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**Although there were plenty of smaller cases during the first few years of the new century, Epson's 2006 case in the United States was truly disruptive**

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products. Many of the industry's larger players have invested in the development of their own internal proprietary designs, which are often patented. The leading third-party firms that manufacture finished cartridges, along with the manufacturers that make the cartridge components now have sizable patent portfolios. These IP assets continue to grow as the third-party supplies industry is slapped with round after round of OEM litigation. We have witnessed a number of new, non-infringing products coming to market in the wake of each large OEM lawsuit.

### **Epson Breaks New Ground**

Although there were plenty of smaller cases during the first few years of the new century, Epson's 2006 case in the United States was truly disruptive. Prior to this case, lawsuits in the United States usually involved a lone manufacturer and perhaps a couple of channel partners. Under U.S. patent law, however, distributors and resellers can be held responsible for IP violations, and Epson's suit included various channel organizations. Alleging that 24 companies—12 manufacturers and 12 distributors—from around the globe had violated a broad assortment of its desktop ink cartridge patents, Epson filed related patent-infringement complaints before the U.S. International Trade Commission (ITC) and in U.S. federal district court. The ITC complaint was aimed at stopping the importation and sale of clones coming into the United States from outside of the country.

Among the manufacturers, Epson sued some of the largest third-party consumables suppliers to the United States. China's Ninestar, for example, was named in the suit along with its wholly owned North American distributor, Town Sky. The French firm Armor, which supplied the office superstore Staples with Epson compatibles, was also a defendant in the case, along with Armor's German manufacturing subsidiary, Artech. In addition, Epson sued several large U.S. distributors, including Nectron International and Rhinotek Computer Products, as well as Dataproducts, which had been acquired in 2005 by the growing U.S. remanufacturer Clover. The inclusion of inkjetwarehouse.com is notable because, although the firm is small, it marked the beginning of Epson's pursuit of online vendors.

Many companies sought settlements or defaulted and exited the U.S. market. Some, like Ninestar, decided to fight, however, and it cost them dearly. For nearly six years, the Chinese company battled before settling in January 2012. During that period, the ITC slapped Ninestar with a \$11.1 million fine because the firm continued selling infringing products despite the commission's order to the contrary. Ninestar's wholly owned U.S. distributor,



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**Canon, HP, Lexmark, and Samsung have filed suit in Europe and the United States against companies manufacturing and marketing third-party supplies, including new builds and remanufactured cartridges**

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Town Sky, was forced to file for bankruptcy protection, from which it never reemerged. Likewise, MMC Consumables went out of business after filing for bankruptcy protection. Other firms, such as Glory South Software Manufacturing, Rhinotek Computer Products, Ribbon Tree (USA) Trading Co., Tully Imaging Supplies, and Wellink Trading, have also folded since losing to Epson. After being dropped by Staples, Armor dramatically scaled back operations in the United States and is not a player in the North American ink cartridge market.

**Following Epson's Lead**

Epson virtually rid clones for its desktop inkjet units from much of the North American channel. Office superstores were one of the most important channels for ink cartridges at the time, and they all pulled their Epson compatible SKUs from their retail shelves. After regaining a significant share of the U.S. market, the OEM continued to aggressively monitor channels for products that infringe its patents. Epson expanded into other regions, including Europe and South America. Over the past few years, it has succeeded in having a number of compatible new builds removed from large websites, including the Amazon online marketplace.

Other OEMs appear to have followed Epson's example. Canon, HP, Lexmark, and Samsung have filed suit in Europe and the United States against companies manufacturing and marketing third-party supplies, including new builds and remanufactured cartridges. Often these cases involved a number of manufacturers and their channel partners. The first suits were filed in 2009, just as the world markets emerged from the recession, and OEMs have continued to file more up through 2019.



HP filed complaints before the ITC in 2009 and 2010, looking to protect its inkjet business in the United States from infringing compatibles. The OEM's machines were becoming more vulnerable to cheap knock-offs as it deployed more devices with permanent print heads rather than building print heads into each ink cartridge. HP filed multiple lawsuits in the years following the recession, and after prevailing in its legal battles the OEM was awarded not one but three exclusion orders from the ITC in 2011, preventing vendors from importing and marketing infringing ink tanks in the United States.

In 2010, Lexmark International filed suit in federal court and with the ITC alleged that various Chinese third-party cartridge manufacturers along with their U.S. distributors

violated a laundry list of the firm's toner patents. The OEM claimed that 24 companies were marketing new-build compatibles or remanufactured cartridges that violated one or more of over a dozen patents. Understanding the need to resolve the matter quickly, most of the defendants, including Ninestar and Print-Rite, settled with Lexmark within six months, while



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**Since the end of the recession, no company has been more aggressive about finding and removing infringing toner cartridges from western markets than Canon**

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others were ruled to be in default. The ITC issued orders that went into effect in the second half of 2011 barring the importation of cloned Lexmark compatible toner cartridges.

Lexmark expanded its suit in 2012 and leveraged it to settle with an undisclosed number of companies not actually named in the suit. Although the OEM was able to gain back a significant share of the U.S. market with its suit, the case was ultimately challenged. A small remanufacturer, Impression Products, appealed the case to the U.S. Supreme Court. In a landmark ruling issued in May 2017, the high court sided with the remanufacturer against Lexmark and issued a decision that placed new restrictions on patent-holder rights. Thanks to the Impression Products ruling, remanufacturers are allowed refurbish cartridges from around the world. Before the verdict, these cartridges would have been infringing products. The price of empties has fallen as a result of the ruling and the core supply in the U.S. has been more stable.

#### **Canon Comes Alive**

Since the end of the recession, no company has been more aggressive about finding and removing infringing toner cartridges from western markets than Canon. As the supplier of toner cartridges to the largest population of printers and MFPs in the world—HP's LaserJet installed base—Canon has been exposed to tremendous pressure as cloned toner cartridges have continued to gain market share. Beginning a decade ago, the company began pursuing third-party supplies vendors that encroached on its toner cartridge IP.

In 2010, the company filed patent-infringement complaints in U.S. federal court and with the ITC against 10 Ninestar companies, their wholly owned subsidiaries, and 10 of their distributors doing business in the United States.

The OEM alleged the defendants violated two patents on the gear mechanism that would become known as a "twisted prism gear." It is the same coupling involved in the GCC case noted earlier, although neither of the patents in the 2010 suits were asserted in the 2006 case. Ninestar settled quickly and within a year Canon announced it had resolved its complaints against all the defendants in U.S. federal court and with the ITC.



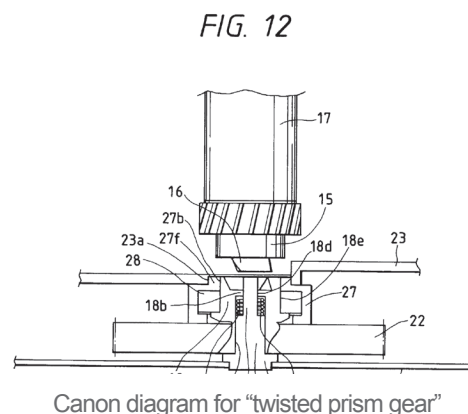
At the time of the settlement, Canon had been deploying its twisted prism gear for years and it was used on most Canon and HP toner cartridges. The Ninestar settlement stipulated that the defendants had to stop selling more than 100 SKUs in the United States, which was a blow to Ninestar given that it was similarly enjoined from marketing Lexmark toner cartridges. Shortly after settling with Canon, however, Ninestar was able to launch products in the United States featuring a home-grown alternative to the OEM's twisted prism gear. The company applied for



**Unlike the many patents involved in the Epson case, Canon only had a couple of patents, which third-party cartridge manufacturers like Ninestar were able to successfully work around**

U.S. patents on the designs it developed for its gear, which were granted in 2014.

At the start of 2012, Canon filed another twisted prism gear suit in the federal court and with the ITC involving the same two patents in the 2010 Ninestar case. In this second case, the OEM named 34 defendants, including several remanufacturers such as Clover and Nukote. Although some companies including Clover vowed to fight, the OEM was victorious in federal court as well as with the ITC, and most defendants settled and agreed to consent judgments with permanent injunctions. A few firms did not settle, however, and the court sided with the OEM and issued default judgments and injunctive relief. The ITC also sided with Canon and issued a GEO restricting the importation of infringing cartridges.



Initially, industry watchers believed that Canon's twisted prism gear cases would be as impactful as Epson's 2006 cases and would result in Canon taking back a significant share of the U.S. market. The suits were numerous and many companies were found to be marketing infringing products and forced to pull their products off the market. The GEO also resulted in a number of seizures that restricted the importation of clones and other infringing products into the United States.

Ultimately, however, Canon did not win back as much market share as Epson had. Unlike the many patents involved in the Epson case, Canon only had a couple of patents, which third-party cartridge manufacturers like Ninestar were quickly and successfully able to work around. Cartridges—including both remans and new-builds—sporting gears that didn't violate Canon's two patents were available even before all the settlements were signed. The ITC's order banning infringing imports ended with little fanfare on March 26, 2016, the date the patents expired. At that time, many non-OEM supplies vendors, including remanufacturers and new compatible manufacturers, were marketing products with non-infringing alternatives to Canon's twisted prism gears.

### **Lessons Learned**

After years of OEM lawsuits, many third-party supplies vendors have demonstrated a willingness to settle with OEMs and move on rather than fight a protracted battle. Lawsuits are bad for business. Not only do legal battles cost a lot to sustain, they damage a company's reputation. Uncertainty may arise about a vendor's ability to continue to supply its channel partners with non-infringing products. As their concerns grow, customers may seek new suppliers, and many third-party supplies vendors have lost market share as a result of an OEM suit. Because OEMs' usually win their cases, settling is often much smarter than

**Print-Rite, one of China's original third-party supplies vendors, was among the first companies in the industry to begin settling its legal quarrels rather than fight them through to the bitter—and very costly—end**

fighting. After settling, technically savvy companies have been able to quickly return to the market with non-infringing versions of the products that landed them in legal hot water.

Print-Rite, one of China's original third-party supplies vendors, was among the first companies in the industry to begin settling its legal quarrels rather than fight them through to the bitter—and very

costly—end. The firm has worked out agreements with various OEMs, including Canon, Epson, and Lexmark. As a result, Print-Rite has quickly brought to market new products free of potential problems, while other companies engaged in protracted legal battles. Today, a growing number of non-OEM supplies vendors have embraced similar tactics, which not only save the defendants time and money but also eliminate some of the customer uncertainty stemming from lengthy legal battles.

While Print-Rite has settled a number of cases amicably over the years, it did not always seek to end its differences quickly. In 2001, Print-Rite Holdings and its wholly owned distributor, Multi-Union Trading Company, along with several other subsidiaries were sued by Seiko Epson Corporation and a couple of its North American subsidiaries in the U.S. District Court in Portland, OR. After the matter dragged on for more than four years, Print-Rite sought a mediated settlement rather than continue on the lengthy path to a full-blown trial. The settlement allowed Print-Rite to avoid being named in Epson's 2006 suit and since that time, in most instances, the company has sought to resolve issues as they arise.

### **Print-Rite's 86T Strategy**

Print-Rite has a history of using its technical expertise to avoid violating OEM patents and other IP issues. The firm became the first third-party supplies vendor that we are aware of to release a branded line of consumables based solely on its own proprietary technology. Over the years, other third-party supplies vendors and their component suppliers have also released non-infringing workarounds to various OEM-patented technologies.

In 1999, Print-Rite began developing its 86T line of high-end new-build products. The first 86T-branded product, a non-infringing Epson ink tank, was released in 2002. The company invested over CNY 1 million to develop the product, which resulted in Print-Rite's first U.S. patent. In time, Print-Rite received over 50 patents worldwide for the design. The 86T tank featured technologies for controlling ink flow that were radically different than those found in the equivalent Epson tanks. The company later leveraged the design of its 86T Epson compatibles to produce similar patent-safe ink tanks for use in Canon inkjet machines.

Unveiled at Recharger magazine's World Expo trade show in 2002, the 86T line received a lot of attention and the Epson-compatible SKU quickly



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**It did not take long for other Chinese third-party vendors to begin releasing new products based on internally developed designs**

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became popular with Print-Rite's dealers. In 2005, the company was awarded the prestigious China Patent Award of Excellence from the State Intellectual Property Office (SIPO) of China and World Intellectual Property Organization (WIPO) for the design of its 86T-branded ink tanks. According to the Print-Rite website, it is SIPO's highest award.

It did not take long for other Chinese third-party vendors to begin releasing new products based on internally developed designs. Ninestar began releasing Epson-compatible cartridges in 2003 based on its own proprietary technology. The company developed a micro-pressure valve that eliminated the problem of wasted residual ink and was awarded a patent in the European Union. Thanks to its design, Ninestar was able to bring to market a line of Epson-compatible ink tanks under its G&G brand with higher page yields and lower costs than Epson's equivalent SKUs.

Although the technologies in toner cartridges had initially proven difficult for third-party supplies vendors to work around, by 2005 new ground was being broken. Ninestar released a new compatible version of the Brother TN-350 SKU in 2006 based on its own technologies, which would be awarded patents in China, Europe, Japan, Korea, and the United States. In 2007, Print-Rite expanded its 86T line to include a range of non-infringing toner cartridges for Brother and Samsung machines based on its own technology, which yielded the firm a second SIPO award.

### **Strategy Gets Results**

One reason why the twisted prism cases were not as impactful as Epson's cases is that firms had begun to invest in developing workarounds to the patents that Canon asserted rather than wage protracted legal battles. As noted, Ninestar settled the twisted prism gear case quickly. The company then marshalled its resources, retrenched, and developed an alterna-

tive non-infringing version based on its own design, which it quickly brought to market.

Understanding the risks that Canon's twisted prism gears represented, some companies proactively developed non-infringing solutions and avoided Canon's lawsuits altogether. Years before the OEM's filings, for example, Print-Rite was investing in new technologies, including non-infringing gears, for use in its Canon and HP compatible toner cartridges. The firm was the first to market with an alternative to Canon's twisted prism coupling, which allowed Print-Rite to avoid any legal difficulties related to Canon's 2010 and 2012 gear suits. The company was granted its first patent on the designs in China in July 2007 and introduced its Non-Twisted gear in 2008. Aster Graphics announced its GearTek solution to the twisted prism coupling late in 2013. Similarly, by

2013, suppliers to the third-party supplies industry, including Future Graphics and Static Control Components, began marketing OPC drums with non-infringing gears.



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**In January 2014, Canon accused 18 companies in the U.S. District Court for the Southern District of New York of violating nine patents related to the dongle gear found on certain cartridges**

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### **More Gear Suits**

In addition to its twisted prism gear, Canon marketed a limited number of toner cartridges for its machines and LaserJet units with a different but equally novel gear—the so-called dongle gear. In January 2014, Canon accused 18 companies in the U.S. District Court for the Southern District of New York of violating nine patents related to the dongle gears found on certain cartridges used in monochrome Canon machines and monochrome and color LaserJet devices. Because it had four patents that were about to be issued, Canon waited until May to request that the ITC investigate the matter. In addition to including new patents in the matter before the commission, the list of ITC respondents grew to 33 from the original 18 defendants named in federal court.

As it did in its twisted prism gear case, the expanded number of companies named by Canon in the ITC matter included new-build manufacturers, remanufacturers, and various channel organizations. Three of China's largest toner cartridge producers, Aster Graphics, Ninestar, and Print-Rite, were named as ITC respondents. The list of companies also included the U.S.-based remanufacturers International Laser Group and Micro Solutions Enterprises (MSE) and some of the most well-known third-party supplies vendors in the United States such as Katun and LD Products.

The patents involved in the 2014 case were totally different from the twisted prism gear patents. Instead of covering the design of the twisted protrusion found on the older gear, the new patented mechanism was similar to a universal joint (a.k.a., U-joint) commonly found in an automotive drivetrain. Like the older coupling, the new gear is used to connect the OPC drum (or developer roll in a color printer) to the printer. It features a movable joint that allows for easy cartridge insertion and removal while providing a smooth driving force to rotate the drum or roll. The new coupling became known as the “dongle gear,” presumably, because the coupling is free to move around within the cartridge.

Canon prevailed in its suits against the firms alleged to have infringed the dongle gear patents just as it did in its twisted prism gear lawsuits. None of the manufacturers put up much of a fight. Within weeks of the initial filings, Print-Rite's wholly owned global distributor Union Technology International (M.C.O.) Co. (UTec) issued a statement signaling that it was working

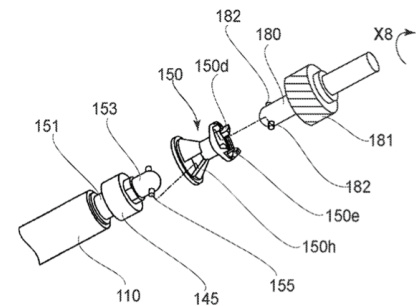


**Although the legal action slowed the importation of products that infringed Canon's dongle gear patents and resulted in container seizures, including several bound for Amazon, the impact of the first dongle gear suit on the market was limited**

to resolve the issue with Canon. As is its custom, Print-Rite settled the matter with Canon within a matter of months. In just under a year, Aster Graphic and several of its subsidiaries, which had been sued in France and Holland, worked out a comprehensive deal with Canon. Initially, Ninestar challenged the validity of the patents Canon had asserted, but it too settled. The ITC issued orders restricting the importation of infringing cartridges in August 2015 and Canon settled the last case in federal court with Katun Corporation in February 2016.

#### The Aftermath

Although the legal action slowed the importation of products that infringed Canon's dongle gear patents and resulted in container seizures, including several bound for Amazon, the impact of the first dongle gear suit on the market was limited. Despite Canon's success and its enforcement measures, cheap SKUs that should have been restricted from the United States after the 2014 case remained readily available at prices that were just a fraction of what Canon- and HP-branded SKUs cost.



Canon diagram for "dongle gear"

Smaller clone manufacturers were hardly affected by Canon's 2014 suits and simply continued to market infringing products. Many of the large third-party supplies companies reacted swiftly, however, and released non-infringing solutions. Despite every indication that it planned to challenge the OEM's patents, Ninestar released an alternative to the dongle gear based on its internal designs within weeks of Canon filing the suit. Before the end of 2014, Print-Rite released its PR-2 coupling, an enhancement to the non-infringing PR-1 dongle gear solution that the firm patented in the United States in 2013 and that had not been named in Canon's suit against Print-Rite. In 2015, prior to the ITC's order barring the importation of products that infringe the patents in Canon's dongle gear suits, Aster Graphics announced the release of its non-infringing gear solution called Smart Coupling, which was also patented in the United States.

As they did with the twisted prism alternative couplings, drum suppliers to the third-party consumables industry brought to market non-infringing workarounds to Canon's dongle gear patents for drums to be used in remanufactured and new-build toner cartridges. Within weeks of Canon filing its suits, the Japanese toner and drum manufacturer Mitsubishi Kagaku Imaging Corporation, which was doing business as Future Graphics, sent a letter to its customers saying it would soon have a gear solution based on its own technology and reassuring them that none of its products have been accused of infringement by Canon. In October 2014, China's largest drum manufacturer, Suzhou Goldengreen Technologies, announced it had a patent-pending solution.



**Unlike its past gear cases, which accused certain remanufacturers based in the United States of infringement, the only U.S.-based firms named in the 2018 complaint were distributors marketing new-build and remanufactured toner cartridges sourced from China**

Because of the way the dongle gear was constructed, there were some legal issues surrounding the reuse of the gear by remanufacturers. It was unclear if removing the OEM gear from a spent drum and reattaching it to a drum in a refurbished cartridge was permissible under patent laws in certain European countries and in the United States. Print-Rite began targeting remanufacturers with its patented PR-2 solution, which the company said would “leave a door open for the remanufacturers to invigorate the manufacturing business.” In addition to offering the gear for sale to remanufacturers, we assume the company deployed the PR-2 on the OPC drums it makes.

### **2018 Dongle Gear Case**

Just as it did in 2014, Canon started 2018 by initiating legal action in the United States over alleged infringement of its toner cartridge patents. The OEM filed patent-infringement lawsuits in federal courts throughout the United States against 49 aftermarket supplies manufacturers and distributors. It also filed a complaint with the ITC about the activity of the same 49 companies and requested that the ITC commence a Section 337 investigation. Initially, Canon alleged infringement of nine of its patents on the gears in certain mono-chrome toner cartridges, but the firm later amended its ITC complaint and walked that back to seven patents.

Unlike its past gear cases, which accused certain remanufacturers based in the United States of infringement, the only U.S.-based firms named in the 2018 complaint were distributors marketing new-build and remanufactured toner cartridges sourced from China. The cartridges were either being sold on the distributors’ websites or on Amazon or other online marketplaces. Canon

targeted four Chinese manufacturers in the case: Aster Graphics and Print-Rite along with Ninestar and its Kingway (Ourway) subsidiary. Many of the defendants named in the 2018 litigation were also named in Canon’s first dongle gear case, and some of the companies had the dubious distinction of being named in both the twisted prism gear suit and the first dongle gear suit.

While the first and second dongle gear cases were similar, they differed in one key respect—the 2018 suit involved patents that had all been issued since 2017. Although third-party



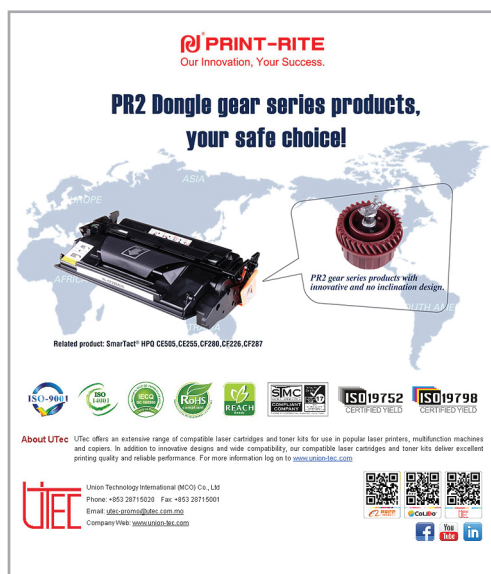
**With a reputation for quickly resolving OEM patent infringement and returning to market with non-infringing products, Print-Rite's move to challenge Canon's claims was especially interesting**

cartridge manufacturers had developed non-infringing workarounds to avoid violating the patents Canon asserted in its 2014 case, in its 2018 case the OEM alleged that these previously non-infringing workaround gears were rendered infringing by its new patents. Another key difference between the 2014 and 2018 lawsuits is that some of the large manufacturers named as defendants in the case, including Aster, Ninestar, and Print-Rite, challenged Canon claims and opted not to settle.

The decision to lock horns with Canon over the patents in question was a departure from the growing trend among third-party supplies manufacturers to settle with OEMs. With a reputation for quickly resolving OEM patent infringement and returning to market with non-infringing products, Print-Rite's move to challenge Canon's claims was especially interesting.

After the ITC announced in March 2018 that it would investigate the matter, the cases filed in federal court were stayed pending the conclusion of the commission's investigation. In April 2018, a number of respondents submitted answers to Canon's complaint before the ITC. While certain distributors answered Canon's claims, it was the attorneys for the manufacturers and their subsidiaries that took the lead in the case. Presumably, some of the answers filed on behalf of distributors were part of manufacturers' agreements to indemnify customers.

While the number of firms defending themselves from Canon's patent-infringement allegations grew ever smaller as the investigation proceeded and many respondents settled or defaulted, in the end, Aster, Ninestar, Print-Rite, LD Products, and The Supplies Guys were left to fight back. These firms argued that they hadn't infringed Canon's patents, that the Canon patents were invalid, and that Canon had broadened the scope of its patents and, thus, abused its patent-holder rights.



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**The Markman hearing was crucial to those on both sides of the case because it determined how the ITC would interpret key areas of Canon's patents**

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### Markman Hearing

After the aftermarket manufacturers made it clear that they would not settle with Canon, the ITC administrative law judge (ALJ) overseeing the investigation conducted a Markman hearing in August 2018. This pretrial hearing allowed the ALJ to hear evidence and decide on the meanings of certain important words or phrases in Canon's patent claims. Markman hearings are not held in every lawsuit, but they are important if a case hinges on a thorough understanding of technical terms. In this particular case, the Markman hearing was crucial to those on both sides of the case because it determined how the ITC would interpret key areas of Canon's patents.

As previously noted, all of the patents in Canon's 2018 investigation were new and had been issued after the OEM had reviewed the various manufacturers' workaround designs. The OEM then attempted something we hadn't seen from the company. After studying the various third-party solutions specifically designed to avoid infringing the first set of dongle gear patents, Canon applied for and was granted new patents that were continuations of some of the patents asserted in its first dongle gear case. The original patents covered, among other things, a gear that employed an inclination-type motion to engage with the OPC drum. Most of the third-party workarounds Canon reviewed and verified as non-infringing during the first dongle gear case featured a gear that plunged in and out of the OPC drum coaxially—or, in other words, moved in a straight line—rather than use the inclination-type motion described in Canon's patents.



Essentially, what Canon argued in the Markman hearing was that its patents claim not only a type of movement in which the coupling member or gear inclines or pivots, but also other kinds of movement, such as the coaxial movement employed by the gears in the respondents' accused cartridges. Aster, LD Products, Ninestar, Print-Rite, and The Supplies Guys argued in the Markman hearing that "the claims must be construed to require the capability of pivoting, regardless of whether they can cover pivotal movement in combination with some other type of movement." This construction would mean the workarounds the respondents developed to avoid the pivoting-type motion employed in the original dongle gear patents would not infringe Canon's newer patents.

Right from the beginning, it appeared that the respondents had a solid case to challenge Canon. As part of the Markman hearing, the Office of Unfair Import Investigations (OUII), which assists the ALJ in conducting ITC investigations, indicated that its position and that of the respondents regarding claim construction were "substantially similar."

After months of legal jockeying, ALJ Dee Lord issued her Markman order in February 2019. While she came down on the side of Canon on some matters, she sided with the respondents and the OUII on one crucial issue--that the gear described in the asserted Canon patents must connect in an angular position and not coaxially. A few weeks after issuing her Markman order,

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**ALJ Lord's decision is remarkable in that it is the first time that the ITC has decided in favor of third-party supplies vendors named as respondents in a case rather than the OEM complainants**

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ALJ Lord issued a summary determination declaring that Aster, Ninestar, and Print-Rite had not infringed the Canon patents. The ITC later reviewed this determination, upheld it, and terminated the investigation in its entirety. In May, Canon, as expected, appealed the matter to the U.S. Court of Appeal for the Federal Circuit. As of this writing, the appeal was still underway.

**Respondents Respond**

While the ultimate outcome of this case has yet to be decided, ALJ Lord's decision is remarkable in that it is the first time that the ITC has decided in favor of third-party supplies vendors named as respondents in a case rather than the OEM complainants. The ruling in and of itself has had little impact on the market because many manufacturers had already developed workarounds to the new Canon patents asserted in the 2018 case. However, in the longer term, the decision may end up being quite impactful because it may limit an OEM's patent protections.

Various companies named as defendants in the suit replied to ALJ Lord's Markman order just days after the news broke. Static Control Components, a wholly owned Ninestar subsidiary based in the United States, was one of the first respondents to comment after the order was handed down. In a prepared statement, Static Control's General Counsel Skip London said, "This ruling proves what we've known all along. Our design was a unique, non-infringing solution." Aster Graphics also made a similar statement a few days after the Markman order was released, saying its gears did not pivot and thus did not infringe. Aster went on to say that a few months after the suit was filed in 2018 it released a newly designed dongle gear solution that did not infringe Canon's newer patents and "that the new design would not be subject to any exclusion order the ITC may issue."

Print-Rite, which was marketing its PR2 gear prior to Canon's 2018 lawsuit, released its PR3 dongle gear solution within a couple of months of being named in the suit. The firm announced that while ALJ Lord's Markman order



made it clear that its PR2 solution was non-infringing, it advised customers to use the PR3 solution. Such a cautious approach was prudent given that Canon was challenging the ITC ruling, although it had verified the PR3 solution did not infringe. Even if the appeals court overturned the ITC's finding, Print-Rite customers would still have a non-infringing solution.



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## Part 4: Today's Market

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**Offshore finished-cartridge manufacturers have a long track record of supplying remanufacturers in the West with products**

Non-infringing new-build toner cartridges are not a recent phenomenon in the industry. OEMs have offered these products for decades. In 1995, Lexmark began manufacturing new compatible integrated toner cartridges for use in Canon and HP devices. These new builds featured Lexmark toner and drums and sold for approximately 40 percent less than the OEM cartridges. Although it would eventually exit the market, the firm expanded its selection of new builds to include the most popular Canon and HP models throughout the late 1990s. In 1997, Lexmark also rolled out an extensive line of remanufactured cartridges for Canon and HP units along with a line of remanufactured SKUs for its own machines.

While Lexmark may have been the first it was not the only OEM to market a line of new-build compatibles. In 1999, HP released its Eliptica line of new compatible toner bottles for use in Xerox copiers. In 2001, Samsung released a line of six HP new-build integrated cartridges that it sold under the Samsung brand in the United States and Europe. Genicom was another printer OEM that marketed a comprehensive line of new HP compatibles, which continued to be offered under the TallyGenicom brand after Tally acquired Genicom. Toshiba released its Encompass line of cartridges in 2004 and continues to offer a range of Encompass SKUs. For approximately 20 years, Xerox has marketed its own line of new-build and remanufactured cartridges for use in machines from a range of OEMs.

As noted earlier, companies like Ninestar and Print-Rite have been marketing toner cartridges based on their own respective proprietary technologies for almost 15 years. Today, these firms offer a range of premium, non-infringing new builds and have massive patent portfolios that include thousands of international patents. They also have developed the expertise to match toners and drums with other non-infringing components to ensure the cartridges print

properly and deliver the appropriate page yields. Both Ninestar and Print-Rite operate assembly lines that are either partially or fully automated and staffed with well-trained technicians to ensure the performance of their finished cartridges is optimized. More recently, large firms like Aster Graphics, Mito Color, and others have developed their own respective technologies and have brought to market premium new-build compatibles based on their own designs.

Offshore finished-cartridge manufacturers have a long track record of supplying remanufacturers in the West with products. Over the past decade, the remans have become a good channel for firms that produce high-quality new builds as well as remanufactured products. The list of remanufacturers currently marketing premium new builds includes some of the North American industry's largest players. InkCycle, for

example, introduced its Value Line of products in 2007. Produced in Asia, initially all Value Line cartridges were remanufactured, but InkCycle has expanded the assortment of SKUs to include new-build compatibles as well as remanufactured cartridges. International Laser





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**Today, certain large compatible manufacturers offer an assortment of high-performance, non-infringing new-build SKUs for Brother, Canon, Dell, HP, OKI, Samsung, and other printers**

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Products (ILP) also imports new builds and remans and markets the products that it remanufactures in-house.

As the performance of new-build, non-infringing toner cartridges improved, Chinese manufacturers attracted a loyal following among a growing number of distributors in the United States. Court filings and import records indicate that many of the region's major distributors are now marketing new builds. The list of firms includes ACM Technologies, Arlington Industries, Frontier Imaging, FTrade (dba ValueToner), Kuhlmann Enterprises (dba Precision Roller), LD Products, Online Tech Stores (OTS) (dba SuppliesOutlet.com, SuppliesWholesalers.com, and OnlineTechStores.com), Static Control Components, The Supplies Guys, V4INK, and many others.

#### **Premium New Builds for MPS**

The range of new-build SKUs has grown over the past couple of years as the quality and performance of the cartridges have improved, making new compatibles more appropriate for diverse printer fleets. Today, certain large compatible manufacturers offer an assortment of high-performance, non-infringing new-build SKUs for Brother, Canon, Dell, HP, OKI, Samsung, and other printers. In addition to the various cartridges for A4 devices, a few companies also offer a range of toner containers for higher-end A3 copiers.

Currently, LD Products, OTS, and Static Control Components are among the largest distributors with programs specifically targeting premium new builds at large office-equipment dealers and other companies that have substantial managed print services (MPS) and contractual offerings. Each of the three distributors has a broad product portfolio of premium compatibles. Import records indicate that LD Products

sources its toner cartridges from Mito Color, Ninestar, Print-Rite, and other manufacturers, while our research finds that Online Tech Stores sources its new builds from Aster Graphics, Ninestar, Print-Rite, and others. Because it is a wholly owned Ninestar subsidiary, we suspect that Static Control sources its new builds from Ninestar.

While Static Control continues to offer new builds, it appears to have shifted more of its attention to selling cartridge components rather than finished cartridges. LD Products and Online Tech Stores, however, seem to be devoting more and more resources to their respective



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**LD Products says its Gold Line cartridges have return rates of under 1 percent and have experienced robust month-on-month sales volume growth**

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premium compatibles. It appears that each firm is beginning to penetrate certain larger dealers.

LD Products first announced it was targeting the dealer and reseller markets with its Gold Line of compatibles in December 2017, when it launched its Channel Partner Division. The company said the aim of the new division is to offer low-cost, reliable, newly manufactured compatible cartridges designed specifically to support MPS and other contractual offerings from equipment dealers and resellers. LD Products has made some bold claims about its Gold Line products, which include new compatible toner cartridges for HP, Lexmark, and Xerox machines as well as ink cartridges for HP's Officejet Pro X devices. The firm says its Gold Line cartridges have return rates of under 1 percent and have experienced robust month-on-month sales volume growth.

In 2019, LD Products released impressive results from product testing performed by Buyers Laboratory, LLC (BLI), an independent, third-party testing firm that evaluates the performance of printers, copiers, scanners, and wide-format and production devices from all of the major manufacturers. A sample of the testing reveals that the 9,000-page LD Gold CF226X new-build compatible cartridge, compared with the original HP CF226X, produced good overall quality, operated reliably with no malfunctions, and surpassed stated yields. BLI's testing also concluded that LD's Gold 40,000-page CF281X, compared with HP's 25,000-page CF281X cartridge, exceeded its stated yield by 16 percent and cost about one-third of the OEM cartridge over a five-year period.



Online Tech Stores is the latest firm to release a line of cartridges specifically to support MPS and other contractual programs. In October 2018, the firm's Supplies Wholesalers group released its Platinum MPS Toner Line of high-quality, new-build toner cartridges. At the time of the product launch, representatives for the company said SKUs in the Platinum MPS Toner Line are designed to deliver the same or better performance than OEM or remanufactured cartridges but at lower price points. On average, cartridges in the line, which total 45 different SKUs, yield approximately 5 percent or more than the equivalent OEM SKU but cost 50 to 75 percent less than remanufactured toner cartridges.

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**Canon's 2018  
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compatible  
toner cartridges,  
especially those  
looking to penetrate  
the dealer channel**

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### **Timing Is Everything**

In many ways, Canon's 2018 dongle gear lawsuit could not have come at a more awkward time for companies manufacturing and distributing premium, non-infringing compatible toner cartridges, especially those looking to penetrate the dealer channel with new builds. Just prior to the suit, new-build vendors were building up a head of steam. LD Products launched the Gold Line at the end of 2017. In the days just prior to the lawsuit, the Grand Rapids, MI-based private-equity firm Blackford Capital announced it would take a major position in OTS specifically because OTS is one of the largest importers of toner products in the United States.

The second dongle gear lawsuit quickly cooled the industry's growing ardor for new builds, as remanufacturers and OEMs and their channel partners spread the word that selling new builds can be risky business. At the time, we heard from various distributors that customers were cancelling orders for new builds as a result of the lawsuits.

Various groups warned the channels to stay away from new builds. TriMega Purchasing Association, a nonprofit buying group serving about 485 independent office-product dealers and technology retailers in the United States, warned its members that they could be sued if they marketed new-build compatible toner cartridges. Likewise, HP applauded Canon's filings and worked behind the scenes to spread awareness in the channel about the Canon litigation and the need to respect the intellectual property associated with HP toner cartridges.

One of the more interesting warnings to the channel came from Clover Imaging Group (CIG). The remanufacturing firm asserted that "Canon's patents make all aftermarket dongle gear designs infringing and illegal" and that "the only safe non-OEM dongle gear cartridges are remans that use the original dongle gear." This claim would be proven untrue when Canon later verified various third-party dongle gear solutions did not infringe the OEM's patents.

CIG explained that dealers selling products that infringe Canon's patents run the risk of being sued by Canon if they keep selling clones. The remanufacturer went on to say that dealers would be de-authorized by HP to sell the OEM's consumables if they continued selling infringing products. They would also find themselves stuck with infringing inventory once the case had been resolved in Canon's favor. CIG told dealers that their customers could be sued for using infringing products and that many end users received cease-and-desist letters. We found CIG's warning rather ironic given that the firm had been named as a defendant in Canon's twisted prism gear case and Wazana Brothers International, which did business as Micro Solutions Enterprises (MSE), was named in the original dongle gear matter. CIG had acquired MSE in 2014 after the suit had been filed.

### **Market Quick to Recover**

While Canon's lawsuits caused a lot of initial handwringing, and firms like HP and CIG stoked fear in the channel, the ability of new-build manufacturers to come up with additional work-arounds, which Canon verified didn't infringe, allowed things to settle down fairly quickly. Our research indicates that unit shipments of new builds out of China didn't slow but actually grew in 2018 and continued to grow in 2019.

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**The ability of new-build manufacturers to come up with additional workarounds, which Canon verified didn't infringe, allowed things to settle down fairly quickly**

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It appears that business returned to normal for many vendors selling new builds within a few months of the cases being filed. In October 2018, OTS's Supplies Wholesalers introduced the Platinum MPS Toner Line of toner cartridges for MPS environments. At the time, we asked about the risks associated with marketing new builds and a representative for Supplies Wholesalers told us, "We have never experienced a supply interruption or had to pay damages as a result of the previous Canon litigation, and we have always protected the customer."

Business also seemed to quickly return to normal for LD Products as well. The company acknowledged in 2019 that various dealers were using its Gold Line products, including Applied Imaging, Copiers Northwest, Fisher's Technology, and JD Young. In a promotional piece for the Gold Line, customers sang the praises of LD Products' premium new builds. In some cases, the customers said they had been purchasing the Gold Line products for over a year, suggesting they had not been impacted by Canon's suit. Indeed, customers seemed pleased. An executive for Fisher's Technology said the return rate was 0.076 percent and the cartridges delivered consistent yields. Various executives recommended Gold Line cartridges and commented on how the cartridges made their respective MPS programs more profitable.

#### **Not Without Risk**

While we see premium new-build cartridges as the fastest growing category in the digital imaging industry, these products are not without risk. As the dongle gear matter before the ITC was being settled in 2019, Canon filed suit against LD Products for infringing a patent that was not asserted in its 2018 case. A few weeks later, Canon amended its complaint to include six additional patents for a total of seven Canon patents that LD was accused of violating. Shortly after that, Canon sued another online vendor, V4INK, for violating the same seven patents. As of this writing, Canon has not added any more defendants, but we suspect it will.



The infringement cases against LD Products and V4INK underscore the fact that OEMs have patented many of the parts and subassemblies in their cartridges, and lawsuits can and will be filed with little to no warning. As we wrote earlier, this has happened many times in the history of the third-party supplies industry and the lawsuits have involved new-build compat-

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**Patent and antitrust laws protect the market for non-infringing new builds, and this market will continue to grow and take share from OEMs and remanufacturers alike as it has been for the past 10 years**

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ible manufacturers and remanufacturers along with their channel partners. If the past is any indicator of what the future will hold, we expect to see more lawsuits. Moreover, the continued proliferation of cheap, infringing compatibles on the web, especially on Amazon, all but ensures that OEMs will file more lawsuits as they try to control the availability of clones.

Although lawsuits will continue, we do not think legal issues will kill the new-build category. Instead, we believe that manufacturers will work hard to avoid suits, and when they come manufacturers will react swiftly to bring to market non-infringing products. When appropriate, new-build manufacturers will also challenge OEMs to ensure that the OEMs don't take unfair advantage of the patent protections the law provides.

We conclude that there is a market for legitimate and legal new builds that will be further developed over the next three to five years. Patent and antitrust laws protect the market for non-infringing new builds, and this market will continue to grow and take share from OEMs and remanufacturers alike as it has been for the past 10 years.



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## About Actionable Intelligence

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Actionable Intelligence is the leading source for news, analysis, and research on the digital printer and MFP industry and the original and third-party consumables business. Actionable Intelligence provides clients with customized research and consulting, as well as up-to-date news and strategic analysis on Action-Intell.com, the industry's leading destination site visited by tens of thousands of printer and supplies executives worldwide. Global printer OEMs, third-party supplies vendors, distributors, resellers, and a diverse mix of other companies rely on Actionable Intelligence to deliver timely and accurate information about the trends shaping the printer hardware and supplies markets. To learn more about Actionable Intelligence, visit [www.action-intell.com](http://www.action-intell.com).