Toner Cartridge Report
Evaluation Report #06-130b
Cartridge Type: 12A7465

April 25, 2006

122-ELT-12A7465

Cartridges submitted for evaluation by:

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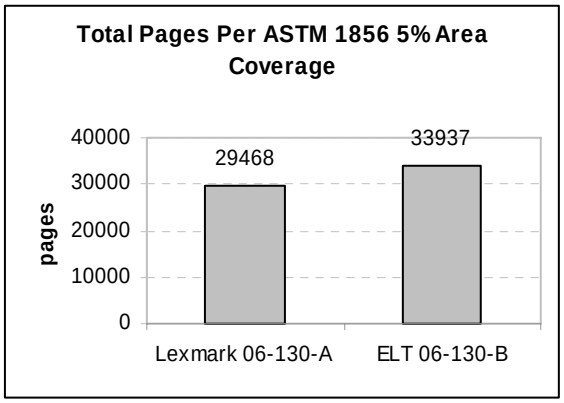
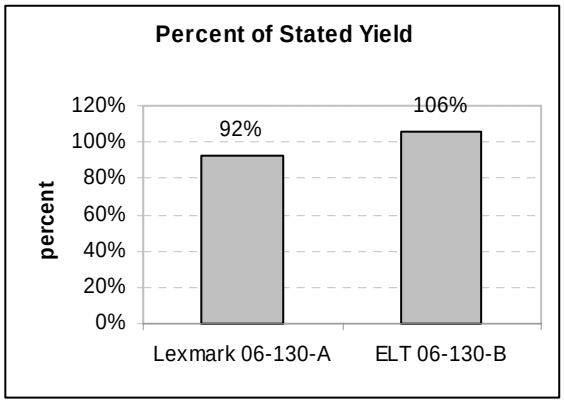
SUMMARY RESULTS

The page yield of the ELT sample cartridge (ELT 06-130-B) of 33937 was 106% of the OEM stated yield of 32000 pages. It consistently exhibited a maximum density performance above 1.35 throughout the life of the cartridge. No toner leakage was observed in the cartridge packaging materials or during operation of the cartridges in the printer. The ELT sample cartridges produced no detrimental effects on the test printer.
The page yield of the OEM sample cartridge (Lexmark 06-130-A) of 29468 was 92% of the OEM stated yield of 32000 pages. It consistently exhibited a maximum density performance above 1.28 throughout the life of the cartridge. No toner leakage was observed in the cartridge packaging materials or during operation of the cartridges in the printer.

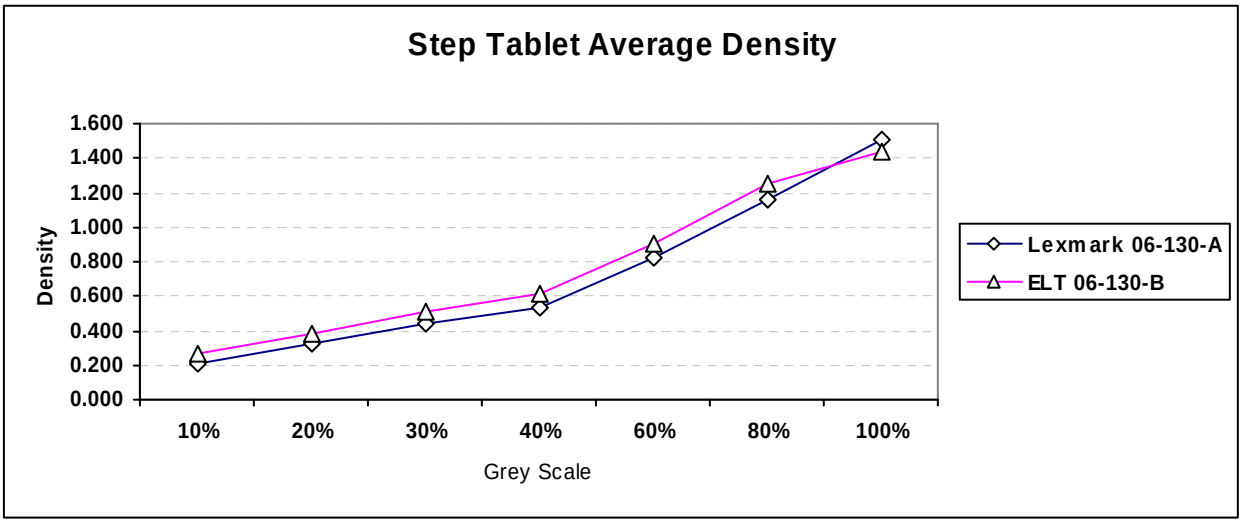




A major portion of the total cost of ownership for a remanufactured cartridge can be measured as the cost per print. In the shaded areas below, fill in your current selling price and then divide it by the yield. Fill in the resulting cost per print in the space provided.

ELT can complete the calculation of cost per page based on the negotiated purchase price of the cartridges.

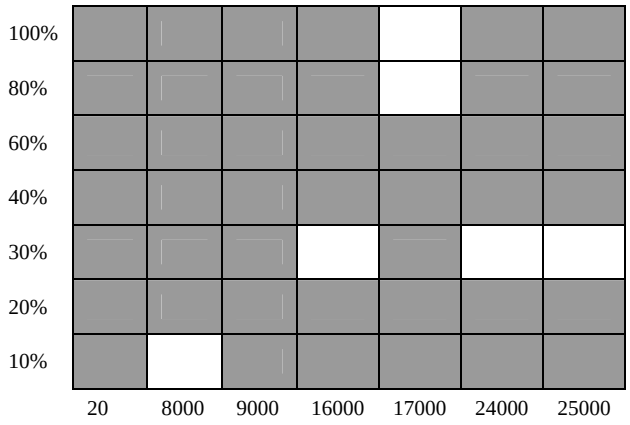
Lexmark 06-130-A		ELT 06-130-B	
OEM Cartridge Cost:	**$355.00**	**Selling Price:**	
Print Yield:	**29468**	**Print Yield:**	**33937**
Cost/Print:	**$0.012**	**Cost/Print:**	



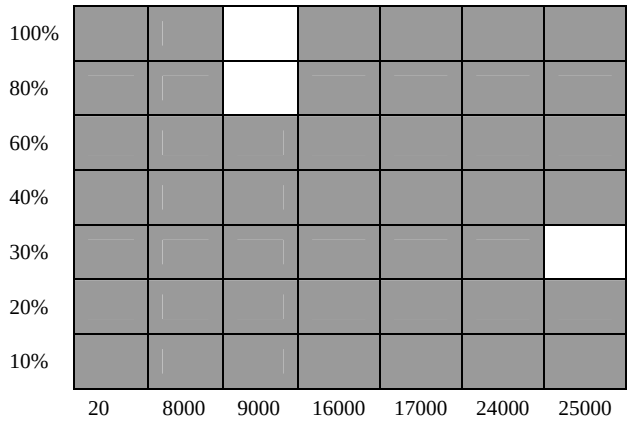
The 1423 IQ Test Target page includes two columns having a series of seven patches with the following levels of halftones: 10%, 20%, 30%, 40%, 60%, 80%, and 100%. These step tablets demonstrate how accurately the printer can produce each level. This is an important consideration in applications with graphical and photographic output.

Differentiating results are achieved when a proportional change is maintained between levels throughout the life of the cartridge. Various shades of gray are resolved between each increment. Poor image quality is experienced when little change between levels occurs such as when the 80% halftone is approximately the same density as the 100% step or when there is little discernable difference between a 10% and 20% halftone. In photographic output the first condition results in loss of detail in shadow areas (blocking) while the latter condition lead to loss of detail in the highlights (wash out). The patches are considered resolved when the difference between the 2 adjacent patches is greater than 4 times the standard deviation of the measurements taken within each patch. The box chart will be completely filled if the adjacent patches were adequately resolved throughout the evaluation. Any voids in the box chart indicate that there was not a discernable difference between the boxes at that point.

Lexmark 06-130-A

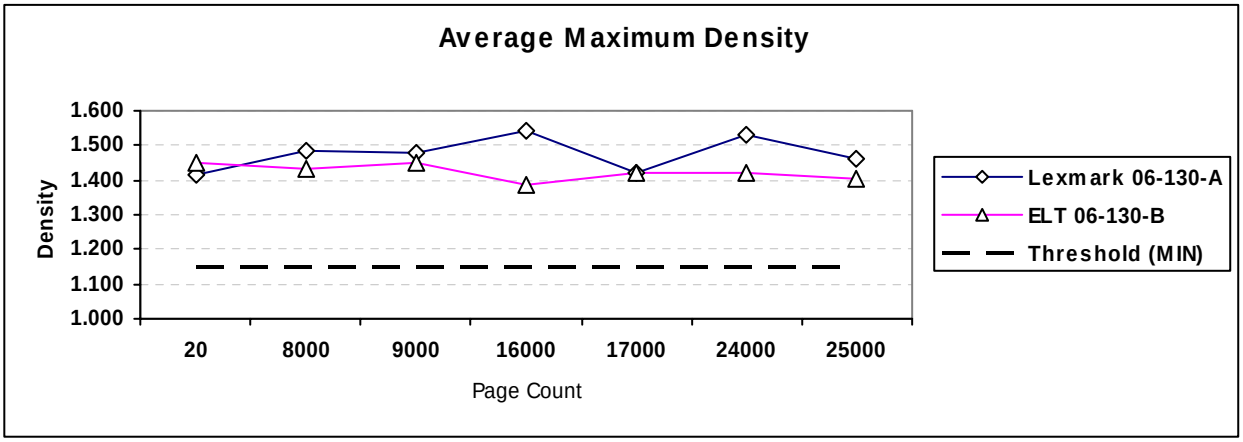


ELT 06-130-B



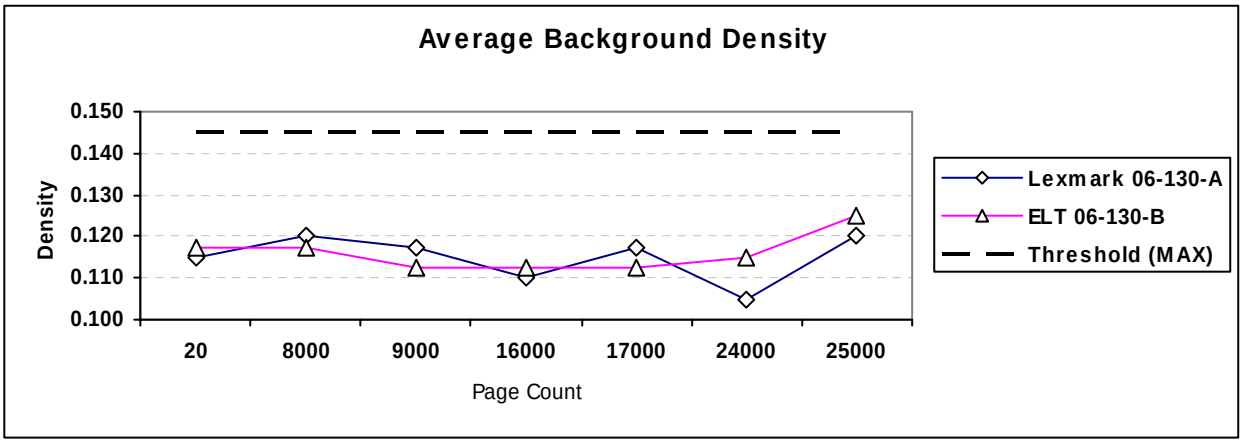
Average Maximum Density

The maximum density for a print may be simply described as a measure of "blackness". An image quality test target was run at the start of testing and at every 1,000 pages. Density measurements were made on the one inch square solid area blocks located at the center of the page and in the four corners. The threshold limit is the minimum density value the block could have and maintain an acceptable appearance. Maximum density values below this threshold would appear as voids within the block and would be considered unacceptable by the average customer.

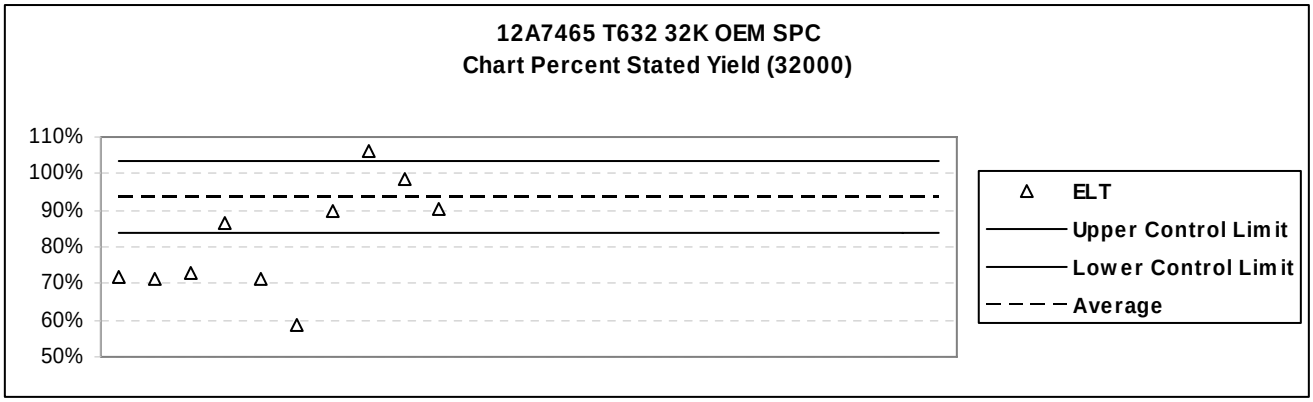


Average Background Density

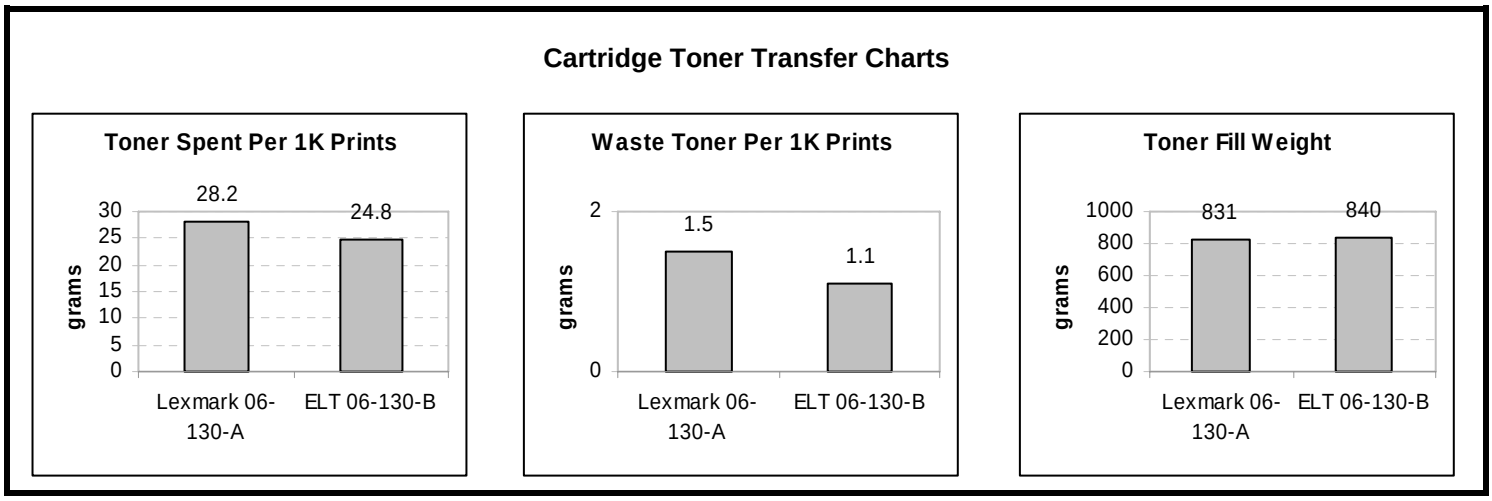
Background can be characterized as small, randomly distributed spots in non-imaged background areas on a print. An image quality test target was run at the start of testing and at every 1,000 pages. Background density measurements were made in the open areas of the one inch square hollow blocks located near the center of the page. The threshold limit is the maximum density value the block could have and maintain an acceptable appearance. Background density values that exceed this threshold would be considered visible and unacceptable to the average customer.



The Statistical Process Control Chart represents the OEM cartridges that have been evaluated to date at NCR[3] Using the ASTM F1856 process for the specific cartridge model submitted for analysis. If the cartridge did not fall within these control limits NCR[3] can help determine the root cause of the shortfall. Whether the cartridge was under the lower control limit (LCL) or above the upper control limit (UCL), there is a cost of non-conformance associated with each. If the UCL is exceeded there may be an opportunity to maximize profits. If the LCL is exceeded there is the cost of possible customer dissatisfaction. The toner transfer charts (below) indicate how much toner is transferring to the print media. NCR[3]'s Imaging Products Laboratory is equipped with the latest equipment to analyze toner, OPC's, magnetic rollers and PCR's.



The Cartridge Toner Transfer Charts illustrate the efficiency of the cartridge. The compatibility of the toner and the charging components within the cartridge is critical to function. It is common for remanufactures to add more toner to the cartridge to compensate for inefficient toner transfer. The toner particle size distribution and OPC charging characteristics should be matches for optimum transfer efficiency.



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The Evaluation of All-In-One Laser Printer Toner Cartridges

Summary – The NC3R evaluation process is based upon a series of integrated standardized tests (primarily ASTM F1856 and the STMC Guide for Toner Cartridge Evaluation) to provide an evaluation of all-in-one laser printer toner cartridges for cartridge yield, image quality, and cartridge integrity.

Overall Approach – The initial step is to establish a baseline performance by using a series of integrated standardized tests to evaluate the performance of a selected control toner cartridge designated Cartridge A. Then, Identical tests are performed on the cartridges of interest (Cartridge B) using the same printer. The performance of the Cartridge B is compared to that of Control Cartridge A.

Image Quality – A suite of 5 IQ test are run at the beginning of testing and at approximately 1000 page intervals thereafter. Density and background measurements for images produced by Cartridge B are compared to those produced by the Control Cartridge A. The image quality evaluation focuses on text sharpness, maximum density solid area performance, background, and image artifacts. It is not inclusive of all image quality attributes.

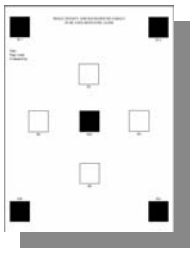
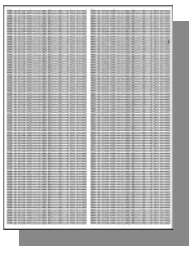
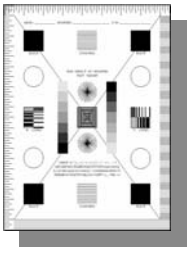


Image Density and Background Target

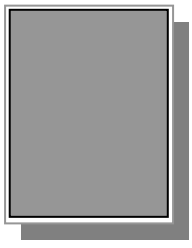


Text Target

15% Gray Page Uniformity

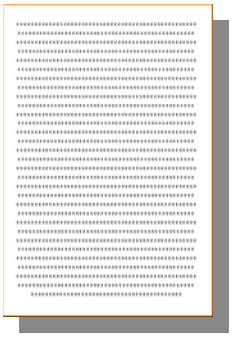


1423 IQ Target



40% Gray Page Uniformity

Cartridge Yield – Depending on cartridge size, one to three 1000-print runs are made using a specified 5% output test target. By weighing the supply hopper before and after each run, the toner consumption per page is determined for each 1000-print test interval. At the outset of evaluating the cartridge, the toner supply hopper assembly is separated from the cartridge and weighed. When a cartridge has printed approximately 80% of its advertised yield, printing is stopped. The cartridge is disassembled, any toner in the supply hopper is removed and the empty hopper is weighed. By subtracting the empty hopper weight from the full hopper weight, the initial toner load is determined. By dividing the initial toner load by the average consumption rate of the yield runs, the cartridge print yield is calculated. This approach eliminates the subjective judgment of print fade and the variation procedures employ to establish the end of life print count (cartridge yield). Yield comparisons are made between Cartridge B and the control Cartridge A.



Cartridge Integrity – Upon receipt, the cartridge packing materials are examined for signs of any toner leakage. At the conclusion of the test runs for a given cartridge, the host printer is inspected for any signs of cartridge toner leakage and detrimental effects to printer components.