

# Wake Up to the True Cost of Printing

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**'Getting to grips with the true "Cost of Ownership" of printers is a problem shared by companies on an international basis. Any business, large or small, that cannot identify exactly how much it is spending on any part of its business has a problem. Given this scenario, it's time every business manager paid sharp attention to printer running costs. However, this is not as easy as it may sound because the problem with printer costs is that they are hidden and what is not hidden is obscured by the lack of any agreed "standards" in the digital imaging industry.**

**While manufacturers postulate about enforcing standards - the only thing that you can rely upon is that the 'new improved standards' will be closer to their marketing ambitions than the buyer's wish list.'**

BERTL surveys have shown that few, if any, businesses know how much it costs them to own and run printers. In fact, few larger companies even know how many printers they actually possess let alone how much it costs to run each of them.

## Out of Control?

In a recent independent study undertaken by BERTL / Digital Times the following was uncovered:

**Case Study 1:** Buyer's Asset Register shows 4 laser printers - all running cost calculations were loosely based around the printers on the asset register. BERTL's independent audit however uncovered a total of 48 printers (the extra 44 each cost less than \$1000 each - none were on the asset register). As a consequence, there was no record of consumable spend for any of the additional 44 printers.

**Case Study 2:** BERTL conducted audit of imaging equipment at a University. Asset Register showed 40 items - Audit uncovered 100 (60 items were unrecorded): all 60 were printers. The 40 copiers each had clear records of page volume / cost / contract end etc. The 60 printer population and related consumable spend; page volume, location etc were totally unrecorded.

**Case Study 3:** BERTL audit uncovered \$1,000,000 plus spent over a 2 year period on printing related equipment and consumables - none of which showed as "printing costs" on the central accounting system nor was there any register of equipment assets.

## Convenience Spend?

It is not only office managers, who have unregistered buying power, secretaries, temps, clerical staff etc., often purchase consumables, drums, low cost printers....all of this expenditure can be lost and usually is within central accounts and asset registers. The money is simply accounted for under faceless nominal ledger entries and not considered part of the overall printing costs. Consider what happens when you print Web Pages, Letters with the Company Logo, Graphics....all of which are now standard in the vast majority of offices.

Some business letters can cost up about 10 cents a page to print. This price isn't based on a page showing a picture of Granny picking flowers, mountains in the background and the dog on the front porch!! No, this is a typical business letter - you know, printed just how you like them to look. Bold for the heading, maybe some underlining. Emphasize a few points by a using larger or different font - maybe include your company logo - nothing madly exciting just you're every day output. This is just black printing (not color - which is another story

entirely)! And these 10 cents is based upon you using a well built cartridge. We are not talking about a "drill and fill" recycled product which could be highly inefficient and increase toner page coverage by 8 % or more per page. What you saved on the cartridge price, you may have lost on the printing!

10 cents a page may look cheap when compared to web pages:

- Do you know what your average page coverage is?
- Do you know your true printer population?
- Do you know if your cheaper alternative cartridge delivers equal page yield? (Forget advertising claims).
- Do you know your real page volume? Printers don't have meters and their electronic counters are very unreliable.
- Do you know that by simply changing your print font from Times Roman to Ariel the document can cost you more to print?

No part of any business should be allowed to run OUT OF CONTROL.

This situation is further aggravated by some promotional campaigns which paint obscure the cost of ownership of a printer by publishing theoretical comparisons of "copying v. printing" costs when such comparisons have no real grounding in like for like analysis. When such campaigns are conducted by three different industries (Fax, Printer and Copier) which operates to no agreed common standard, with some manufacturers using their own mysterious methods, it becomes nonsensical.

Even as they claim that they want a common test standard, one manufacturer is currently running a cost per page advert quoting tests conducted upon a series of cartridges that they withdrew due to manufacturing defects (advert is running October 2000). Yes, that's right they withdrew every cartridge (tens of thousands) because of leaks and quality problems a couple of months after the published date that the test took place. However, these self-confessed faulty cartridge batches are used as the basis of a marketing campaign for toner cartridges.

It is not just large companies who have unchecked page costs. Small companies, schools, charities, law firms, real estate brokers, home offices, sales / marketing departments, advertising agencies, financial advisers.....all share the same problem.

If you would like to know more about tested page yield, industry standards or page coverage software - "Page Check" as used by hundreds of equipment dealers, manufacturers, cartridge recyclers, corporate buyers etc - then please feel free to call Carmel Rowley at BERTL / Digital Times at (1) 212 678 7970 or +44 (0) 1189 844 999 or email [carmel@digital-times.net](mailto:carmel@digital-times.net)

## **Technological demarcation lines diminishing**

Several years ago there was a clear dividing line between technologies with copiers, fax and printers being dedicated single function units. Today, most copier, printer and fax manufacturers offer combined digital systems which print, copy and fax with advanced finishing functions (stapling, sorting, duplex, etc). This development challenges the way that all three industries have traditionally operated and marketed their products.

For the buyer, this poses a dilemma – HOW DO YOU PURCHASE THE UNITS AND CONSUMABLES?

## Unchecked running costs

Of every printer buyer surveyed by BERTL (Digital Test Lab) not one could give a detailed account of the “total cost of ownership” or “cost per page” of the printers they were using. When you buy a printer, there is usually no service contract detailing your anticipated usage linked to cost, no meter counting the number of prints made, no industry agreed standard on toner yield; each printer manufacturer uses a different benchmark to the next and so it goes on. The total cost of running a printer is far wider than the cost of consumables and the printer.

## Marketing rhetoric v. reality

Printer and consumable adverts often show a page yield. Buyers believe that this is an indication of what to expect in terms of product performance. In theory, a buyer should be able to take the purchase price, divide it by the manufacturer’s advertised page yield and arrive at a realistic “cost per page”. This sounds fine in theory but in practice is far from conclusive due to (a) different standards used by manufacturers and (b) a gulf between independent page-yield tests and manufacturers’ advertised yields based on the same test patterns.

## A Manufacturer’s 5% could equate to a buyers 3.28%

Confused - who isn’t? When attempting to calculate costs of toner it is important to check exactly how the calculation of page cover percentage is made. In general, the printer industry quotes 5% page coverage for black toner or ink cartridges but copier companies quote 6% coverage. However, even this can be confusing because the method of working out what is 5% page cover varies and some industry test techniques fall short of a buyer’s expectations. The average buyer is likely to assume that 5% page coverage equates to a black square which covers 5% of an entire page. However, this is not the case. Printer manufacturers are usually referring to 5% of the “printable area” of a page. Even more confusing is the fact that this 5% is often based upon using American size paper (which is smaller than European A4) and this fact is not disclosed to European buyers nor is it made clear to American buyers that it figures are calculated on the printable area and not the entire page (see below).

To get around this (or add more confusion – depending upon your perspective), a number of toner manufacturers do not work to the page at all but instead work to 5% of “8 x 10 inches” (80 square inches) which is usually less than both American and UK paper and equates to about 4% of the “printable area” of an A4 page.

These differences can have the effect of making printer and toner manufacturer page life estimates relatively meaningless. If this judgment sounds too harsh, then at the very least it makes it virtually impossible for a buyer to compare products on a ‘like for like’ basis.

## Consider the following conundrum:

The Hewlett Packard LaserJet 4MP has:

- UK A4 printable area of 7.89 x 11.36 inches (89.63 square inches)
- USA (the same machine) printable area of 8.16 x 10.67 inches (87.06 square inches);

Either figure could be quoted by competing toner manufacturers or recyclers. However, both of these HP 4MP “Printable areas” are bigger than the 8 x 10” inches (80 square inches) quoted by some toner manufacturers in their promotional literature.

## BERTL (Digital Test Lab)

At present there is considerable activity by printer marketing departments to force buyers and independent test labs to accept the manufacturers preferred test methods. An equal amount of manufacturer pressure is seeking to have the cost of testing raised so high (by insisting on very expensive equipment and test chambers) that only the manufacturers marketing claims will prevail.

An example of manufacturer cooperation on marketing claims is NCITS which comprises Lexmark, Hewlett Packard and Xerox. The big three have joined together to promote an agreed method of marketing their toner cartridges. This method involves the use of a test pattern and procedure that the three companies approve. Whether the 'mutual cooperation' of the three dominant toner cartridge manufacturers in this fashion is good for buyers is a question that is outside the scope of this article. However, you only have to visit [WWW.Staples.Com](http://WWW.Staples.Com) to see that these three brands compete with each other at the virtual exclusion of most third party products.

While BERTL (Digital Test Lab) is in favour of common test standards we believe that they must be (1) User Relevant, (2) strictly controlled and (3) repeatable by end users and independent test labs.

At present, BERTL considers the NCITS test pattern to be pretty much the same as existing manufacturer test patterns. It lacks variation, is low coverage and without graphical elements. Tests to date have shown it to be virtually the same page coverage as previous manufacturer endorsed test patterns with some optional variations that could swing the results.

In contrast, for the last 10 years BERTL has used a standard test pattern in all toner tests. BERTL's test pattern has been electronically scanned and tested as producing 7.3% true black image on A4 page coverage on the Hewlett Packard LaserJet 4MP. On machines which produce bigger text, distort extended print characters, have hot drums, etc, the toner % page cover may be higher; similarly a well tuned machine which produces fine resolution may show a lower % page cover.

BERTL (Digital Test Lab) test results may show completely different yields to toner or printer manufacturers stated claims. The important factor is that the BERTL (Digital Test Lab) Test Pattern shows **real life use of toner across standard documents** from an end users perspective. Like all BERTL (Digital Test Lab) test procedures the test pattern highlights the differences between products and allows buyers to calculate the true cost of ownership based upon "User Relevant Tests in a Real World Scenario" rather than having to rely on advertising and promotional claims.

## So what does it cost to run your printer?

Using BERTL's standard test pattern, our Digital Test lab tested 240 cartridges to exhaustion on 52 different printers.

In the following table we show three different results / measurements:

1. **BERTL Test Pattern:** The BERTL test pattern was developed to more closely match the average use of a laser printer. We generate a fixed image (5.34% of an A4 sheet). In reality we expect users to get a lower page yield per cartridge because many offices have more graphical content in their documents.
2. **HP Designed Test Pattern (IDC):** This test pattern was developed by HP who claims that it represents 5% page coverage.
3. **HP Advertised Yield:** These are the page yields advertised by Hewlett Packard; HP claims that these were the results of testing / printing with a 5% coverage page.

As you will notice, the difference between 'Advertised Yields' and 'Tested Yields' differs fairly dramatically; in several instances we could not achieve HP's advertised yield using HP's 'claimed 5%' test pattern.

## SMALL EXAMPLE OF CARTRIDGE TESTS CONDUCTED

by Business Equipment Research & Test Laboratory (BERTL)

AVERAGE YIELD BY PRINTER TYPE, CARTRIDGE MANUFACTURER AND TEST PATTERN, EACH YIELD VALUE REPRESENTS THE AVERAGE OF MULTIPLE CARTRIDGES

	HP Advertised Yield (What they say you get)	HP Designed IDC Test Pattern (HP claim 5% coverage)	BERTL Test Pattern (generated at 5.34% pixels on ISO A4)	Cost Per Page (based on Inmac published UK-£ , Staples US-\$ printed with BERTL test pattern)	16% Page Cover (based on pixels sent to print)  Now Fairly Typical due to Internet and other graphical documents.
<b>LASERJET II / III - 92295A</b>	4,000 pages	3,135 pages	<b>1,843 pages</b>	3.52 cents	<b>10.56 cents</b>
<b>LASERJET IIISi / 4Si - 92291A</b>	10,250 pages	7,936 pages	<b>5,514 pages</b>	2.35 cents	<b>7.05 cents</b>
<b>LASERJET 4 / 4+ / 5 - 92298X</b>	8,800 pages	7,826 pages	<b>5,258 pages</b>	2.04 cents	<b>6.12 cents</b>

**Note:** The above cost per page covers only the cost of the toner cartridge. On top of this price you must add the cost of maintenance kits (fusers, etc) and any service contract.