HP Indigo 7000 Innovation

New charge roller initiated at HP Labs yields impressive benefits

The new HP Indigo 7000 digital commercial printing press unveiled this spring incorporates a different method for charging the photoconductor, a key step for creating the print image.

HP Labs, the company's central research facility, and HP's Imaging and Printing Group have collaborated to invent new technology based on roller charging for the new higher speed HP Indigo 6000 and 7000 series digital presses. Roller charging has been commonly used in desktop laser printers, but now the HP Indigo 7000 press is the first production digital press to use this charging technique. Like other production digital presses, previous HP Indigo products use Scorotrons containing corona wires and a reference-voltage grid to apply electrical charge to the surface of their photoconductor. The new charge roller replaces the Scorotrons.

The following impressive benefits have been achieved:

- Uniform and consistent charging at a process speed 76 percent higher than the HP 5500, 2.15 meters/sec compared to 1.22 meters/sec – by far the highest process speed of any offset-quality electrophotographic press.
- Only one charge roller is needed, and even including its mounting assembly it is markedly smaller than the three Scorotrons in the HP Indigo press 5500.
- The charge roller assembly is significantly less expensive to manufacture than the multiple Scorotrons.
- Cost per page is improved.
- Maintenance is lower, increasing ease of use.
- Ozone generation is lower, reducing requirements for ozone filtration.
- The charge roller life exceeds the initial design objectives and has a useful life of over half a million impressions, a lifetime far longer than other charge rollers.

This high-speed roller charging technology originated as an HP Labs research investigation. In the course of this investigation, HP labs researchers developed several significant advances. Improved conductive roller materials were developed to uniformly and reliably deliver the required high charge at high press speed. Long roller life was achieved by radially balancing the flow of electrical current. In addition, mechanical and electrical compensation systems were created to properly charge the seam area on the photoconductor drum and also to keep the roller clean to ensure high image quality. Patents have now been issued on these inventions.

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Building on this success, IPG research and development teams then engineered the charge roller into a product configuration, substantially refining it and qualifying it for use in the new HP Indigo 7000 press. The additional HP Indigo 6000 and 7000 series presses (the HP Indigo WS6000 Digital Press and the HP Indigo W7200 Digital Press) being announced on March 10 also use the charge roller to achieve industry-leading image quality at speeds up to 100 ft./min. (30 meters/min.) for industrial label and packaging applications, or up to 240 pages per minute (A4 4/0) for commercial print applications.

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