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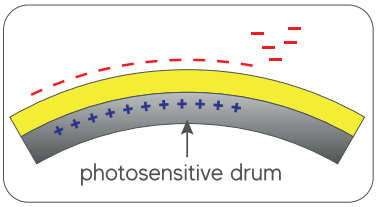
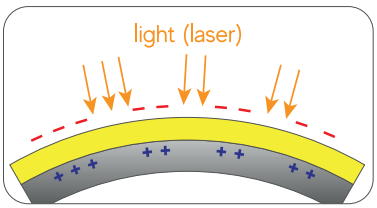
THE TECH CORNER

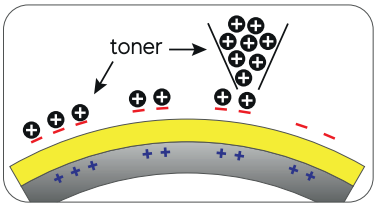
How toner printers work

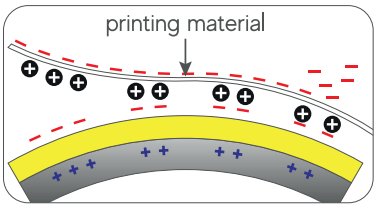
The interaction between the printer and the material

A laser printer works in a simple and intuitive way, just like a traditional printer. The difference lies in the print speed and quality, and the internal operating mechanism. Laser printers consist of three elements: the toner, the laser, and the photosensitive drum.









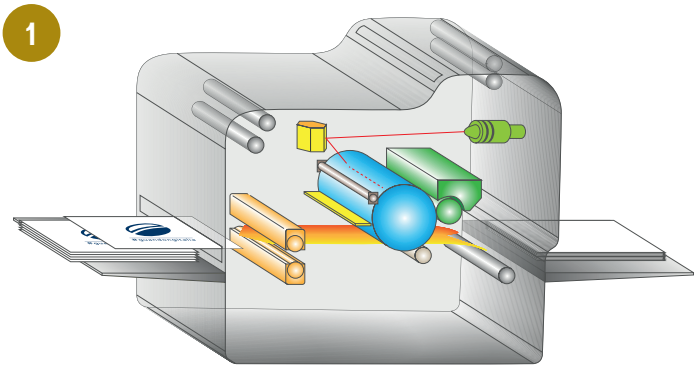
- The photosensitive drum is electrostatically charged (with a positive charge). The image is imprinted on the drum based on positive or negative charges.
- The laser removes the image or document, imprinted with positive charges, from the drum and processes it dot by dot, for printing.
- The drum passes over the toner, which is attracted by the negative charge previously processed by the laser.
- The print is reproduced in reverse on the drum.
- Because the material is more negatively loaded, it attracts the toner to itself.
- Extremely hot air from the fuser fixes the toner to the material.

On these systems, the printing process is based mainly on two elements: **electrostatic charges and temperature**. They both interact with materials in an extremely significant way, especially on plastics.

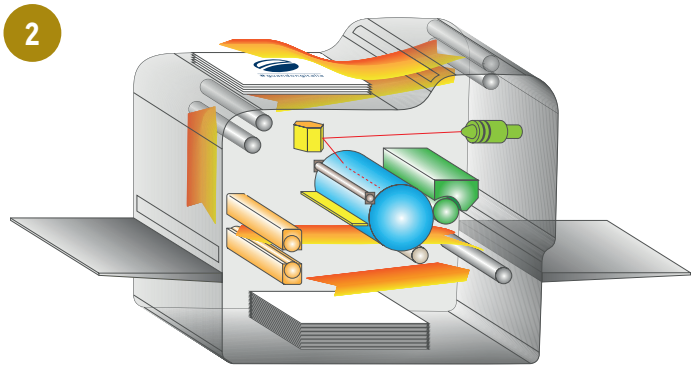
For that reason, close attention must be paid to the print settings, the temperature of the fuser, and the adjustment of the "transfer voltage" that affects the amount of charge given to the material. This adjustment enables the toner to adhere perfectly to the printing surface.
The adjustment methods described above vary depending on the printer brand and model.

From the illustrations below we can understand why, particularly for a plastic material, bypass/multifunction drawer loading (image 1) is recommended as compared to traditional drawers (image 2). The bypass path decreases both the physical stress (because it is linear) and the thermal stress (because it needs to remain in the machine for a shorter time).

1



2



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