

Abstract

Recently, people often use tablets to read files, newspapers, or other papers, printing some documents is still necessary and convenient for most people. As a result, printer is one of the basic machines that many people use for working or learning. Toner cartridges are the main components that print high-quality images or text on paper and are therefore of research value. Existing literature lacks research on performance of different printers and toners. Therefore, this study investigated and analysed different types and brands of toners. In the toner, the colorant is an important ingredient to provide colour of the prints. In the study, colorant content of toner cartridges of major suppliers were compared with data provided in material safety data sheets (MSDS). Based on MSDS, the impact of the colorant of the toner cartridges was discussed in this study.

Keywords: colorant, toner, cartridges, Material Safety Data Sheet, impact

Content:

The toner cartridge is a part of a laser printer and it contains a complex powder used for printing images and text on paper. Besides laser printers it is also used in compound printers and fax machines based on electronic photography technology. The chemicals in a toner are a mixture of coloured pigments, plastic resins and other ingredients.

Empty toner cartridges are a waste and their reuse and recycling have attracted much attention in recent years. Printers and toner cartridges have serious problems, from the manufacturing process to the eventual throw away and recycling of materials. Most chemicals in toner cartridges have the potential to cause damage to the environment and humans. Discarded toner cartridges may cause damage to the environment as they can contaminate soil and water when sent to landfills. In fact, carbon black in toner is classified as a potential carcinogen because the devastating effects of toner cannot be properly addressed.

In order to compare and analyse different contents of toner cartridges, this study selected four well-known brands which are sharing key markets, based on the global printer market share of suppliers from 2015 to 2018. The main objectives of the study are:

- (1) To analyse components of toners and compare the toner cartridges of the four brands based on the Material Safety Sheet (MSDS).
- (2) To study the hazardous impacts to the environment and human health caused by waste toner cartridges.

This study assembles, integrates, compares and analyses data of 1473 toner cartridges of the four target brands. Most of the components in the target model are similar to search information. At the same time, the relationship between the percentage and function of major chemicals was studied. Finally, the health and environmental effects are discussed on the basis of safety measures suggested in MSDS.

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