

## **Modern systems to control the quality of print produced by digital printing techniques**

**Prof. Mona Mostafa Abo Tabl**

Professor of control systems and quality control – Printing and Publishing Department –  
Faculty of Applied Arts – Helwan University.

[monaabutabl@yahoo.com](mailto:monaabutabl@yahoo.com)

**Dr. Hanaa Abdel Fadel Sarhan**

Director of Commercial Printing Management in the News Today institution – Lecturer  
at the news today Academy

[hanaa.sarhan@yahoo.com](mailto:hanaa.sarhan@yahoo.com)

**Assist. Dr. Sara Ibrahim Abdel Rahman Ramadan**

Assistant Lecturer – Advertising, Printing and Publishing Department - Faculty of  
Applied Arts – Helwan University.

[sara.printing@yahoo.com](mailto:sara.printing@yahoo.com)

### **Research Abstract**

The aim of the research is improving the quality of publications by applying the latest quality techniques to the digital print production lines. The digital printing machines include advanced means of controlling the quality of the printed material. They can be used to perform the time correction on the operating line, the study included a description of the latest systems that have proven successful in achieving the high quality in the typography. This paper includes a description and application of one of the systems used. To measure and control the quality of printed on digital printing machines.

#### **The research problem:**

- High percentage of paper waste due to the long time it takes to determine the the printing fault by means of measuring devices separate from the machine,  
And correct it on the machine controller to translate it into signals sent to the devices and units of the machine responsible for correcting the deviation.
- The special nature of some types of printing inks used in Modern printing techniques, which Imposed on owners of these presses to operate a very limited range of paper types.

#### **The research aim:**

- Reducing the percentage of materials waste by applying the newly developed quality techniques designed to quickly detect and determine the deviation and modify it quickly.
- use a wide range of paper in the market even non-processed paper, which can be operated on the developed printing machines with the same quality of high-quality paper.

#### **The research methodology:**

the research conducted the descriptive analytical method; Through the review of The main quality measuring devices are integrated into digital printing machines and The developed techniques to achieve the quality printing as well as the materials used to treat paper before printing it as follows:

- 1- Quality measuring devices integrated into the digital printing machine:

The built-in spectrophotometer **-Inline Spectrophotometer (ILS)** - is one of the automatic color controls this gives a higher characteristic of color management. Where the presence of the spectrophotometer on the operating line to calibrate and correct the color in accordance with the properties of raw material used of the most important necessities.

2- Materials used to process paper on the production line before printing inside the machine . As Use the Bonding Agent (HP), a colorless liquid that is printed on the surface of the paper before printing with print inks (CMYK)

(In which the paper will be received . its function that Maintain the strength of the color appearance of inks, It makes hardening of the colored material near the surface of the paper to control the speed of drying and penetration of ink inside the paper. Improve the properties of color saturation and optical density of black color And reduce the occurrence of Slur and through vision

Problems. its Features that Improving print quality, Printing on a wide range of materials, Reduce ink consumption, Flexibility of printing and saving time.

3- The developed techniques developed in the digital printing machine such as

- One-Shot technology It is summarized in assemble all the colors of the image on the blanket and transfer them all to the printing material in one shot.

- Dynamic Print Head Positioning , It is an advanced technique for continuous ink, which includes precise positioning of the ink Drop to obtain a high resolution image with minimal dot gain and therefore the ability to print on the coated paper.

- Bi-pitch Laminated Piezo Actuator, Advanced technique in the head of the Piezo printing . that extends the operational life and makes it suitable with a wide range of inks to obtain accurate and equal ink.

### **The research results:**

Through reviewing the above, it is possible to achieve the following results:

1 - Provide a large percentage of paper waste as well as reduce the time required in the process of correction and adjustment of deviations in external measuring devices (outside the printing machine) as in the traditional printing techniques.

The measuring devices are integrated into the operating line inside the machine and after the printing unit directly to survey and measure the quality elements on the total sheet area and diagnosis, and then perform the automatic and immediate correction to To correct any deviation in the printing of the next sheet directly.

2 - improve and polish the surface of printed sheet and improve the efficiency of surface properties by adding some material to the sheet to be printed before printing so that the color remains full strength on the surface fibers. This is done in the inkjet machines where they are used as liquid ink; may penetrate the fibers of paper causing printing problems is not desirable ; Achieve high quality and give glossy appearance to the printed; efficient dry printing.

### **The study recommends:**

The researcher recommends the following:

1 - The trend towards expanding the spread and application of the latest quality systems provided by digital printing machines and exploitation of the best and most effective in considering the development plan in the printing institutions because of the advanced systems in achieving high print quality, which in turn reduced the incidence of many of the printing

problems existing In addition to reducing the amount of the waste of materials and providing the time needed to correct any deviation, making it the most productive.

2- To provide scientific programs and seminars to sensitize and train the printing staff on the importance of controlling the quality of the printed and the methods and mechanisms developed in this field, thus spreading the culture of improvement in the long-term development plans developed by the printing institutions for themselves.

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