Test Your Printing Knowledge

Yellow Printing Co., Ltd
Guangzhou, China
Tel : +86-20-2986 6018
Fax: +86-20-2222 6980
Skype: helloprinting
Email: contact@YellowPrinting.com
URL: YellowPrinting.com

Inside

At the close of the millennium, many groups viewed the accomplishments of the previous one thousand years and developed listings of the “most influential.” Our vote went to the A&E television channel's choice for the #1 most influential person of the millennium – the inventor of movable type, Johannes Gutenberg.

Gutenberg's invention of the printing press is often credited as being the origin of mass communication – Western culture's first instance of being able to disseminate ideas and information from one source to a larger and more diverse audience. In the early 1450s, fast-occurring cultural change in Europe mandated the need for written documents, rapidly and cheaply produced. Gutenberg developed his press by combining features of existing technologies: textile, papermaking, and wine presses. But his most significant innovation was the efficient molding and casting of movable metal type.

Curiously, Gutenberg's print technology did not change substantially until the 19th century. In the early 1800s, the efficiency of printing was advanced by the development of continuous rolls of paper, a steam-powered press, and a way to use iron instead of wood for building presses. In 1884 the introduction of Linotype, a method of creating movable type by machine, resulted in a significant increase in production speed. Other typesetting technologies – photomechanical

composition, cathode ray tubes (CRTs), and laser technology – furthered production efficiencies.

New printing technologies, including xerography, dot matrix impact printing, and non-impact printers (inkjet, laser, and thermal transfer) have provided a way to make printed documents available to audiences as large as millions or as small as one.

Given the importance of printing to human communication, it seems logical that we should all have a basic familiarity with the printing process.

So get out your past issues of Printips and get ready for our printing quiz. Good luck - the answers appear on page 2.

1. From what material was the earliest paper made?
   A. Bark
   B. Bamboo
   C. Silk
   D. Cloth scraps and plant fiber

"The invention of the printing press depended on the invention and refinement of paper."

"It was developed from writing ink used by the ancient Egyptians and Chinese."

2. What materials were used for type before Gutenberg's invention?
   A. Clay
   B. Bronze
   C. Wood
   D. All of the above

3. Where was the first ink factory established?
   A. England
   B. France
   C. Colonial America
   D. Spain

4. As used on a printing press, what is a blanket?
   A. The large sheet used to cover it at night to keep it clean.
   B. A full coating of ink.
   C. A rubber sheet that transfers ink to the paper.
   D. The mat beneath the press to reduce static discharges.

5. What is process color printing?
   A. Printing with inks that are machine processed.
   B. Printing with more than one ink.
   C. Printing that uses four inks to produce a full spectrum of color.
   D. Printing with a special procedure in which each color is processed before the next is applied.

6. In printing, the term trapping refers to:
   A. Catching rats that would otherwise chew on the press blankets.
   B. Catching paper in a small cage as it comes out of the press.
   C. The slight overlapping of colored printing areas.
   D. A new term for choking and spreading.

The Answers

1. From what material was the earliest paper made?

   D. Cloth scraps and plant fiber.
   The invention of the printing press depended on the invention and refinement of paper. The Chinese developed "rag" paper, a cheap cloth-scrap and plant-fiber substitute for cumbersome bark and bamboo strips and for precious silk paper. In the 8th century, Chinese prisoners passed a mature technology on to their Arab captors; Europeans learned the secrets of papermaking in the 12th and 13th centuries.

2. What materials were used for type before Gutenberg's invention?

   D. All of the above. Wood, hardened clay, and bronze, though an improvement over hand scribing, were not durable enough to result in the production improvements of Gutenberg's movable type. In Gutenberg's method, each letter was carved into the end of a steel punch that was then hammered into a copper blank; the copper impression was inserted into a mold and the mold filled with a liquid alloy of lead, antimony, and bismuth. The alloy cooled quickly, and the resulting reverse image of the letter attached to a lead base could be handled in minutes.

3. Where was the first ink factory established?

   C. Colonial America. Ink making become a commercial process in the 18th century when the first ink factory was established in Colonial American in 1742. Prior to that time, the printer made his own inks with lampblack and boiled linseed oil. Each printer had his own secret formula for cooking the materials. Little color was used until the discovery of coal tar dyes in the middle of the 19th century.

4. As used on a printing press, what is a blanket?

   C. The rubber sheet that transfers the ink to the paper. In an offset press, the blanket is wrapped around the blanket cylinder and receives the inked impression from the plate cylinder. In turn, the blanket transfers the image to the paper, which passes between the blanket cylinder and impression cylinder.

5. What is process color printing?

   C. Printing that uses four inks to produce a full spectrum of color. The process ink colors are cyan (C), magenta (M) and yellow (Y). As each ink color is laid down on the sheet,

Test Your Printing Knowledge (Continued)

about one-third of the visible spectrum of color being reflected off the white paper is subtracted. The primary process colors also create secondary colors and overprints. Black ink (abbreviated K) represents the total lack of colors; it is used to create contrast.

6. In printing, the term trapping refers to:

C. The slight overlapping of colored printing areas. Trapping prevents white lines from appearing along the edges of the different colored areas by allowing for possible minute shifts in ink laydown.

The Principle of Offset Printing

Q. *What exactly is offset printing?*

A. Offset printing is a technological improvement in lithographic printing. The offset process was invented in 1798 by an Austrian printer, Alois Senefelder.

Lithography literally means writing on stone and it is based on the principle that grease or oil and water do not mix. Working on a very porous stone, Senefelder sketched a design with a greasy substance that adhered to the stone. He then wet the stone's surface with a mixture of gum arabic and water. The mixture wet the blank (non-image) areas but was repelled by the greasy (imaged) areas.

Finally, Senefelder rolled an ink made of soap, wax, oil, and lamp black onto the stone's wet surface. The ink mixture adhered to the greasy, imaged area of the stone but did not spread to the wet, non-imaged area. When he pressed a sheet of paper to the stone, the image was transferred to the paper. This is the principle of offset printing that is the basis for today's printing presses.

Q & A
questions and answers

"...it is based on the principle that grease or oil and water do not mix."

A Computer is not a Typewriter

Do you still use a typewriter? Or have you made the switch to computers? If you have, we ask you to remember one important thing –a computer is not a typewriter.

If you learned to type before 1980, you were probably taught to double space after a period. There is a very good reason for this. Most typewriters use monospaced fonts –fonts formed by characters, each of which fit into an invisible box of white space that is exactly the same size for each character. Thus, the letter l or t or i occupies the same amount of space as the letter w or m. This means there is much more white space around the narrower letters, causing the eye to keep adjusting to the differences in white space.

Computer fonts, on the other hand, are proportionally spaced. The amount of white space around each character has been adjusted so that each letter occupies enough space for itself and a pleasing area of white space around it. The pleasing area surrounding each letter is relatively the same, regardless of the width of the letter, creating an even look. The eye does not have to pause to adjust to differences in white space.

That brings us back to the statement that computers are not typewriters. The monospaced fonts of typewriters require a double space to create extra white space after a period. Double spacing after a period with the proportional spacing of computer fonts creates unnecessary and visually disturbing extra white space.

So stifle that habit of double spacing after a period when using proportional fonts. Your words will be much easier on the eye.

TRICKS & tips

"If you learned to type before 1980, you were probably taught to double space after a period."

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URL: YellowPrinting.com

Words

"The tones are no tone, quarter-tone, halftone, three-quarter tone, and total density."

A Vocabulary of the Graphic Arts

Continuous tone: A range or gradation of tones in black and white or color in a photograph or illustration. The tones are no tone, quarter-tone, halftone, three-quarter tone, and total density.

C-T-P: Abbreviation for computer-to-plate, a method of imaging press plate material using lasers.

Dot: A single area of a printing surface necessary to reproduce a continuous tone image on a printing press. Needed because printing presses have the ability to print only one color and one color density at a time. The traditional dot shape is square; other shapes are elliptical or round.

Dot gain: An irregularity in halftones that causes dots to print larger than the actual size of the half tone dots. Dot gain results in stronger (darker) colors.

Dummy: A folded sample used to show finished size, shape, and binding requirements.

Fountain solution: A water, natural or synthetic gum and chemical solution used to dampen press plates so non-printing area will not accept ink.

Halftone screening: A geometric dot pattern of varying size that creates an optical illusion of tone gradation.

Hard copy: A printed copy of text or a page layout. Used to check for accurate transmission of electronic files or to proof read against.

K: In process color printing, the abbreviation for black ink. The K stands for key printer, the printing plate that carries the text copy or keyline information.

Key plate: In multi color printing, the plate used as a guide for registering other plates.