Advanced technologies to reduce the environmental burden

Initiatives in the Printing Field

Fully leveraging advanced technologies to reduce environmental burdens associated with expansion of the production, while meeting growing demand for “Computer-to-Plate (CTP)” plates by reinforcing our production system to ensure a stable supply of products.

Reinforcing our operating bases with an eye on the future

Beyond its support for communications such as publishing and newspapers, the printing industry is also vital for economic and day-to-day activities in modern life including areas such as packaging, financing and electronics. Thus, printing is an essential industry for enhancing quality of life, a fundamental commitment of our corporate philosophy.

Fujiﬁlm has positioned its Graphic Systems Business as a priority venture that provides printing equipment, materials, and software for the printing industry. To satisfy the needs of customers for producing a wide variety of printed materials, we are aggressively investing in R&D and production equipment in addition to engaging in M&As. For example, worldwide demand is rising for CTP plates, which are core materials for offset printing. Fujiﬁlm has established four global bases for the production of offset printing plates anchored in Japan, the U.S., Europe, and China, and is implementing global service operations to ensure the stable and eﬃcient supply of high-quality products.

We intend to achieve a 40% share of the world market through an additional investment of approximately ¥15 billion to expand our manufacturing line in Europe, where a new one will begin operating in 2010, and by aggressively increasing supply to the BRICs and “NEXT11,” emerging rapidly growing markets in the “BRICs” and “NEXT11,” emerging economies. And to keep pace with anticipated growth in the digital printing market, we acquired the Sencol Group, which commands the top share of the market for UV ink for industrial inkjet printer heads. We also bolstered our R&D related to cutting-edge inkjet technologies by establishing the Advanced Marking Research Laboratories. We intend to further expand our digital printing business in cooperation with Fuji Xerox.

Evolution of CTP (Computer-to-Plate)

Reducing environmental burden through technological innovation

Fujiﬁlm has been involved for many years in the development, manufacture and sales of a broad array of printing materials and equipment, including graphic arts films, PS and CTP plates for offset printing, plate setters, and various prepress software. We are particularly reinforcing our production and sales system to meet rising demand for CTP plates toward boosting our worldwide market share to 40%.

Vast quantities of lithographic film had previously been consumed in the prepress process for offset printing. The advent of the CTP system enabled the processing of digitized text and images on the computer to produce the completed data, with this system, efficiency was improved, and the only film we needed to develop was the final film. This procedure is called Computer-to-Film (CTF). More recently, the development of CTP technology, which facilitates the direct output of digital data to prepress film, has opened the way for the common application of Computer-to-Plate (CTP) methods for directly outputting data to a printing plate without requiring lithographic film at all. This technological advance reduced CO2 emissions by about two-thirds from a quarter century ago when massive quantities of films and photographic papers were used (refer to diagram below).

Fujiﬁlm took the next step in ﬁlmless CTP with the creation of a CTP plate that does not require development processing at all, eliminating the developer eﬄuent and CO2 emissions associated with this stage of the printing process. Looking ahead, we will focus on improving the quality of processless CTP and encourage its widespread application as part of our eﬀorts to address environmental concerns and reduce the risks and workload associated with handling chemicals. In addition, we will continue to pursue further technological innovation in the ﬁeld of printing to contribute to society by reducing the associated environmental burdens.

This report itself was produced using the state-of-the-art processless CTP systems.

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Examples of printed materials and applications of printing technology

Newspapers, magazines, pamphlets, securities (bonds, cards, business forms), wraps, packaging, paper products for construction (wall paper, metal printing (beverage cans), POP displays, printed-circuit boards, etc.

Note: Refer to diagram above for details.

100 Prior to DTP, process-related lithographic film and photographic paper used an area about four times larger than a single PS plate.

53 With DTP, ﬁlm is used only for ﬁnal outputting.

37 With CTP, ﬁlm becomes unnecessary. CO2 emissions are reduced to about one-third the levels of using lithographic film and up 30% compared to CTP.

0% With processless CTP, environmental burden associated with processing, such as the impact of chemical substances is also reduced. CO2 is reduced by 2% compared to CTP.
**Feature: Enhancing Quality of Life**

**Flow of closed-loop aluminum recycling system**

1. The use of recycled aluminum in the production process reduces CO₂ emissions from metal refining to the production of PS and CTP plates by 74%.

2. Fujifilm expects CO₂ emissions reductions of up to 45,000 tons annually by introducing closed-loop recycling for all waste aluminum from PS and CTP plates generated in the Yoshida-Minami Factory. This level of reduction is equivalent to 3% of CO₂ emitted from the plant in 2006. We reduced CO₂ emissions by 40,000 tons in 2007.

**Comments**

**Establishing basic technologies to realize 99.5% purity—Demonstrating a “We Can!” attitude for overcoming every obstacle**

It took about four years to successfully find partner companies to manufacture recycled bullion, including the preparation time in such areas as technology building. Manufacturing PS and CTP plates involves 13 types of 99.5% pure aluminum that vary slightly in their composition with trace metals. However, toward the goal of obtaining 99.5% high-purity recycled aluminum, an extremely exacting level of control, we had already established our own basic technology, which had transcended the conventional approaches of aluminum manufacturers. This was a great advantage for us as it enabled us to demonstrate full potential for success with this project. Through ongoing discussions, we addressed concerns over quality assurance and prepared a system for overcoming barriers such as ensuring the profitability of alloy manufacturers. Furthermore, col-

**Significantly reducing CO₂**

Closed-loop recycling system for waste aluminum from PS and CTP plates.

Aluminum recycling is generally believed to have reached an advanced stage. However, the substrate of PS and CTP plates for offset printing require high-purity aluminum for sophisticated printability, and as a result recycled aluminum cannot be used. Therefore, the Fujifilm Yoshida-Minami Factory had implemented “cascade recycling” in which several hundred tons of waste aluminum generated every month were used for applications that did not require high purity. However aluminum refining consumes massive amounts of electricity. Fujifilm, believing the cyclic use of aluminum long considered to be impossible—could lead to substantial reductions in CO₂ emissions, conducted years of research into closed-loop recycling technologies, in which waste aluminum is recycled into a level of purity suitable for producing high-quality PS and CTP plates. The technology reached commercial viability in October 2007. The challenge is that once aluminum has been mixed with trace metals into a low-purity alloy, it cannot be restored to high-purity by removing the trace metals. Consequently, continued cascade recycling ultimately leads to a flood of low-purity aluminum that cannot be re-used.

At the same time, aluminum, like other metals, is also becoming the focus of a battle for resources in the wake of rising demand in emerging countries. Therefore, this business is even more important as a means to conserve the limited supply of high-purity aluminum resources for the sustainable development of the printing industry as a vital component of everyday life. Fujifilm will continue to seize the initiative by taking the next steps for protecting the environment and safeguarding the sustainable development of society.

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**Focus: Stakeholder Dialogue**

“*What Fujifilm can do to encourage eco-printing*”

On March 6, 2008, we held a stakeholder dialogue under the theme of encouraging the widespread use of eco-printing. Participants included two external experts (Mr. Jun Okuyama, Executive Director of Eco-hatsumou-Kenkyu-ka, and Mr. Katsumi Kitanou, Chairman of Japan Printing News Co., Ltd.) and 16 employees of the Fujifilm Group (Fujifilm, FUJIFILM Graphic Systems and FUJIFILM Presartec). Participants discussed eco-printing from their respective positions as those who had actually placed and received printing orders; those who developed, produced and sold press-related materials and processing equipment and software; and those who produced printed materials.

**Summary**

Two recommendations were made to FUJIFILM Holdings as a result of this dialogue:

1. Develop a set standard for eco-printing that serves as a model for society
2. Do not just provide environmentally friendly products to printing companies; work to make a difference in the printing industry and society by broadening the use of eco-printing

*Based on these two recommendations, FUJIFILM Holdings has been formulating eco-printing standards for printing orders.*

**TOPIC**

**Print server development project based on the synergy between Fujifilm and Fuji Xerox**

The PX5000 Print Server, launched in February 2007, is highly regarded in the printing industry. This print server controls digital on-demand printing, from color management to output process. Fujifilm and Fuji Xerox had previously independently offered different print servers with distinctive features. The PX5000 Print Server was born by fusing these features from both sides. The PX5000 Print Server realizes the advantages of Group synergy in that the integration of technologies delivers high performance to customers while cutting development costs. In addition, the server is supported by both companies.