Environment

INFORMATION FROM KODAK

Silver management series

SILVER MANAGEMENT >>

AgX

[silver halide]

Kodak
Environmental Information

Introducing the.....
"Silver Management" Series

Does your business process photographic products? If so, you are among the nearly 400,000 facilities in the United States that process photographic films and papers containing silver. These businesses come in all sizes and types—from minilabs to dentists' offices to commercial printers to hospitals.

Are you comfortable with the way you manage silver in your processing operations? Or do you suspect that with some improvements, your operations could run more efficiently?

Silver management is more than just silver recovery. It's a systematic way to control your operations from the mixing room to the drain. But its benefits far outweigh the effort that you put into it. Proper silver management ensures that your operations will achieve peak efficiency and meet or exceed all environmental requirements.

That's why Kodak has designed this series of publications—to help you save three of your most valuable resources: silver, time, and money. The "Silver Management" series offers you the opportunity to learn the tips, share the techniques, and get answers to questions that affect *your* business.

The bottom line is putting less silver down the drain and more silver into your pocket, while giving your business a competitive edge over others that aren't taking advantage of this information. If you want to conserve resources, prevent pollution, and save money, it simply makes good business and environmental sense to adopt a plan for silver management and recovery.

HOW CAN THE SERIES HELP YOU?

Even a very small business will benefit from simple and inexpensive recovery methods, all clearly explained in this series of publications. And for those already familiar with silver recovery, the information will help to optimize existing silver-recovery equipment and methods, and help to predict and monitor recovery efficiency.

J-210
How do I identify sources of silver in my processing operation?

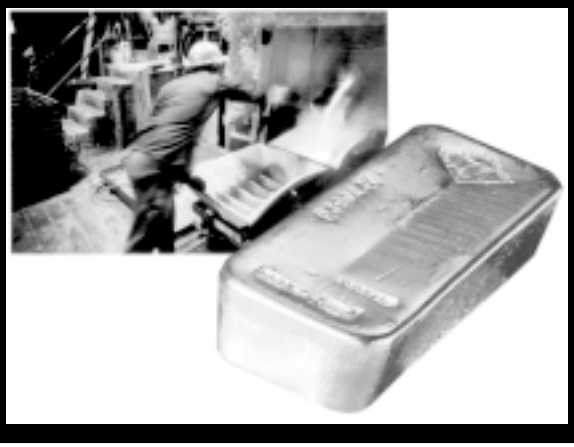
Learn how to increase your revenues by recovering silver from scrap films and papers. This publication describes the potential sources of silver in your processing operation, including unprocessed materials and processed black-and-white materials. It will help you to evaluate each source to determine if recovering the available silver is worthwhile for your facility. J-210 includes step-by-step examples of calculating potential silver yields from minilabs, graphic arts facilities, and medical photographic facilities as guides to help you maximize your silver recovery. Understanding potential yields will also assist you in selecting the right silver-recovery equipment and ensure that you get the maximum return.

J-211
How do I measure silver?

Discover how you can use economical and simple tests to make your processes more efficient. Measuring the silver concentration at various points in your operation provides you with important and extremely useful information. An accurate knowledge of silver concentration helps you to optimize your silver-recovery system, manage the disposal of photoprocessing solutions, and maintain control of silver in processing machines. Learn techniques for determining silver content in processing solutions, wash waters, overflows, effluents, processor filters, and photographic films and papers. Other valuable information includes methods of solution sampling; off-site and on-site measurements; purposes of testing, such as compliance with EPA regulations; and choosing an analytical laboratory. A table presents a comparison of measurement techniques, including cost, accuracy, advantages, disadvantages, and expertise required.

J-212
What are the most efficient and economical methods for recovering silver in my lab?

Learn which type of silver recovery is the right one for your facility. This publication describes the most appropriate methods for recovering silver from silver-rich processing solutions and wash waters in different sizes and types of operations. It will help you choose between electrolysis (terminal and in-line), metallic replacement, precipitation,



and ion exchange, and includes a helpful table that presents a comparison of costs, efficiency, advantages, and disadvantages. J-212 also describes methods for concentration of solutions: reverse osmosis, distillation, and evaporation.

J-213

What are my options for handling and refining recovered silver?

This publication will help you to capitalize on your silver-recovery system by explaining the final step in the process. It describes the forms of silver produced by the three most common types of on-site silver recovery: flake silver from electrolysis, sludge from metallic replacement cartridges, precipitate from TMT (tri-mercapto-s-triazine)—as well as silver in ion-exchange resins. It then explains the procedures used by refiners to remove silver from silver-bearing materials. Learn how your lab can efficiently collect silver-bearing materials and ship or transport them to a refiner. J-213 also offers advice on choosing a refiner.

J-214

How is silver regulated?

If you're not sure how and why your municipality regulates the disposal of silver-bearing materials, this publication will help you understand how silver is regulated and how the regulations affect you. It provides a simplified review of EPA regulations that apply to silver and silver-bearing materials, i.e., regulations of the Resource Conservation and Recovery Act, the Clean Water Act, the Safe Drinking Water Act, the Comprehensive Environmental Response Compensation and Liability Act, and the Emergency Planning and Community Right-to-Know Act. A comprehensive table helps you to identify "hazardous" wastes, and helps you see where your facility fits into compliance requirements.

J-215

Which type of silver recovery system is best for me?

This publication takes a look at the different methods of recovering silver from photographic processing solutions and offers important tips on selecting, operating and troubleshooting silver-recovery equipment and systems. While J-212 explains the details of technology behind the equipment, this publication is best characterized as a practical how-to reference guide.

J-216

How does silver affect the environment?

Silver management makes more sense when you can see how the different forms of silver fit into the big environmental picture. This publication explains the environmental properties of silver, and how and why discharges of silver are regulated. It also describes the series of changes in chemical and physical properties that determine the final disposition of silver in the environment—from the silver metal used in manufacturing photographic products to the recovered silver purified by a refiner. J-216 will help you to understand the different forms of silver, how concentrations in the environment are measured, and their potential effects on the environment.

J-217

How does the Code of Management Practice help me manage silver?

Many municipalities are adopting a version of the Code of Management Practice (CMP) for controlling silver discharges in a cost-effective and environmentally sound manner. If your city has adopted the CMP or is considering adopting the CMP, this publication will help you to understand the issues involved and how it will affect your facility.

This publication provides background information on the development of the CMP for the management of silver from all facilities that generate silver-rich solutions and outlines the benefits of using this approach, from the perspective of both the facility and of the municipality. In addition, the publication takes you step-by-step through the process of determining where your facility would fit into the regulatory scheme of the CMP, based on the quantity of silver-rich solutions you generate and how you manage your silver-recovery process. It describes various technologies available for recovering silver from silver-rich solutions as well as various methods of measuring the amount of silver in your facility's effluent. Finally, J-217 provides suggestions for incorporating a pollution prevention program at your facility.

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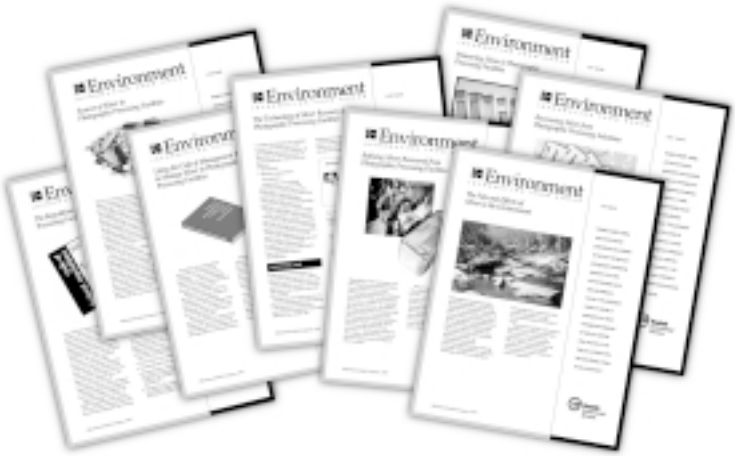
Silver management series



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CAT No.	
189 0896	J-210, *Sources of Silver in Photographic Processing Facilities*
840 0715	J-211, *Measuring Silver in Photographic Processing Facilities*
810 2436	J-212, *The Technology of Silver Recovery for Photographic Processing Facilities*
816 0418	J-213, *Refining Silver Recovered from Photographic Processing Facilities*
123 4004	J-214, *The Regulation of Silver in Photographic Processing Facilities*
804 1576	J-215, *Recovering Silver from Photographic Processing Solutions*
844 1784	J-216, *The Fate and Effects of Silver in the Environment*
875 9839	J-217, *Using the Code of Management Practice to Manage Silver in Photographic Processing Facilities*

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