

## THE RE-USE OF WASTE PAPER

(Formerly entitled "The De-inking of Newspapers")

Of the materials composing the approximately 13,510,000 tons of paper and paperboard manufactured in the United States in 1939, about 3,821,000 tons, or 28.2 percent, consisted of fiber derived from waste paper. The total amount of waste paper consumed was 4,366,000 tons, of which 12.5 percent was lost in remanufacture. The largest proportion of waste paper used, about 79 percent, was manufactured into paperboards and wrapping papers. About 36.6 percent was used to manufacture book and writing papers, and the remainder was converted into various miscellaneous paper products. Most of the waste paper required very little processing except defibering. About 500,000 tons, or 11.5 percent, had to be de-inked and bleached as well as defibered.

Dealers sort the waste paper into 35 or more grades ranging from clean white trimmings to mixed paper scrap and old corrugated containers. Even so, the quality of paper received by paper makers is very irregular, and much sorting must be done at the mill in order to control the processing of the material.

*Mechanical Processing*

After sorting, the paper is shredded or cut, dusted, and defibered. Waste paper shredders reduce the material to irregularly shaped pieces from 4 to 8 inches square. Cutters are used to reduce solid material like ledgers, books, and heavy magazines. After shredding or cutting, the waste is passed through dusting machines, which remove fine dust and dirt. When used for grades of paper such as in shipping container board and some wrapping paper, for which de-inking is unnecessary, the waste paper is defibered in the presence of water in specially designed breaker beaters or some other type of pulper, and the resulting pulp used directly in the paper or board furnish.

*De-inking of Waste Paper.*

For use in printing and other light-colored papers, the waste paper must be chemically treated and washed to remove ink,

dyes, and other ingredients that might be troublesome later when added to the paper furnish. Since, for this purpose, waste paper of fairly high quality must be employed, the waste used consists principally of new white cuttings, books and magazines free from groundwood, old ledgers, sorted scrap, and similar materials.

Ink bases may be composed of saponifiable varnishes, unsaponifiable mineral oils, or synthetic-resin varnishes. The principles involved in the de-inking process are the dissolving or softening of the varnish or resin and the washing of the loosened ink particles from the pulp. Various types of cookers are used, in some of which defibering and digestion takes place simultaneously.

The most common method of chemical treatment is a digestion with caustic soda, soda ash, or mixtures of the two. This process is applicable especially to inks of the first type. It can also be used to remove inks of the other types, but only with more difficulty and special modification of procedure. As mentioned above, control can be achieved by carefully blending the various kinds of printed stock to maintain a uniform product. After digestion, the waste paper is washed and bleached. Although special techniques and equipment are used, the washing and bleaching procedures conform for the most part to ordinary paper mill practice.

Numerous patented procedures, used either in conjunction with the caustic soda-soda ash process or alone, advocate the use of various materials, such as soaps, detergents, oils, wetting agents, colloidal clay. Processes involving the use of special inks which are readily decolorized by oxidation or other treatment are also patented. The alkaline solutions and bleaching liquor ordinarily used in de-inking cannot be employed for the de-inking of newspapers and other paper containing groundwood pulp, since this type of pulp is turned yellow by such treatment. Some of the patented processes are said to be applicable to the de-inking of newsprint, but thus far none has been extensively used.