

De-Inking

Before printed paper, such as office waste and newspapers, can be recycled the ink needs to be removed, otherwise it will be dispersed into the pulp and a dull grey paper will result.

There are two main processes for de-inking waste paper known as washing and flotation.

1 Washing

The waste paper is put into a pulper with a large quantity of water and broken down into a slurry. Contaminates or 'contraries' such as staples and plastic are removed by wire mesh machines and a mechanical action. Most of the water containing dispersed ink is drained off from the pulp through slots or screens that allow small particles through, but not the pulp. Water can be added to rinse the fibres and drained to remove more of the ink. Adhesive particles known as 'stickies' are removed by fine screening.

About 80% of the original fibre is recovered by this process (though it will depend on the type of washing equipment being used) with the remaining 20% of ink, clay, filler, plastics etc left behind.

De-inking by washing has been used with great success on old newspapers to produce stock for newsprint manufacture. It is more effective than the flotation process at removing smaller ink particles.

2 Flotation

Again, the waste paper is made into a slurry and the contaminants are removed. Then special surfactant chemicals are added which makes a sticky froth on the top of the pulp. Air bubbles are blown through the pulp and these carry the ink to the surface. As the bubbles reach the top a foam layer is formed that traps the ink. The foam must be removed before the bubbles break or the ink will go back into the pulp. Because the ink is removed from the flotation machine in a concentrated form, the flotation system does not require a larger water treatment plant.

When the flotation method is used to de-ink old newspapers, around 30% used magazines are usually added for strength. The clay present in coated papers can improve de-inking efficiency as the ink attaches itself to the clay particles before floating to the surface. The flotation method is more able, than the washing method, to remove large ink particles.

Yields from flotation de-inking are quoted as 90-95% but filler is not removed to the same extent as in the washing process.