

**TRACEABILITY APPLIED IN THE REGENERATED  
CELLULOSE FILM (CELLOPHANE) SECTOR  
(Practical Guidelines)**

## **I. SCOPE**

This document describes the traceability procedures in place within the cellophane manufacturing industry.

It refers to the primary manufacture of plain and coated cellophane, but not the possible subsequent operations performed by conversion industry customers e.g. printing and laminating.

## **II. GENERAL INFORMATION**

Cellophane is a natural product derived from wood pulp. Trees from managed plantations provide the raw material from which wood pulp is obtained. A pure grade of dissolving pulp is supplied to the cellophane industry in the form of compressed wood pulp sheets or reels.

The cellophane manufacturing process starts with bales or reels of wood pulp being agitated with caustic soda solution and a catalyst to form slurry. The slurry is fed through a press where it is compressed to produce alkali cellulose crumb. The alkali cellulose is reacted with carbon disulphide under vacuum to make sodium cellulose xanthate. This is then mixed with a weak caustic soda solution to produce viscose.

The cellulose in the viscose is regenerated by extruding the liquid viscose through a jet into a bath of dilute sulphuric acid to form a sheet of film. This is known as the casting operation. The film then passes through a series of wash baths, which treat the film and remove all impurities. Carbon disulphide is recovered during part of this process. Along its path through the casting machine the film is treated with softeners to make the film more flexible, and anchoring agents to provide a chemical bond between the film and subsequent application of a coating.

At the end of the casting machine the dried base cellulose film is wound up into “mill rolls” and given a unique number, which then stays with that film through all further operations. These “mill roll” numbers are the main identity of all cellophane. All production records can be related to the “mill roll” numbers and samples of daily production are kept for reference. These records include (a) up-stream data of pulp and other chemical use, (b) results of quality control tests, (c) time and date of manufacture and (d) down-stream details of any coating application and conversion to smaller reels and sheets.

In the context of traceability, it is the down-stream area which is most important as it is only here that the product first becomes recognisable as being for food contact use and thus available for recall in the event of an incident. The “mill rolls” can be coated with a PVdC, nitrocellulose or other coating to give the final film properties of heat sealability, moisture permeability etc. The coatings are applied from solvent or aqueous dispersions. The coated and uncoated film “mill rolls” are then transferred to slitting equipment where “slit reels” of smaller diameter and widths are produced.

## **III. TRACEABILITY INFORMATION AND PROPAGATION**

### **III.1 Up-stream Information**

Up-stream traceability is important for internal purposes for monitoring what raw materials are used during the production of cellophane. All manufacturers of cellophane that have implemented the ISO9001 (or equivalent) quality management systems maintain details of all raw materials that are used in the production of the “mill rolls”. All raw materials are purchased against agreed specifications, preferably from suppliers who employ accredited quality management systems.

Therefore the raw materials used can be traced to “mill rolls”, either directly (where batches of raw materials are used e.g. wood pulp) or by reference to a time period (where raw materials are delivered in bulk and continuous feed is operated e.g. softeners). This process will facilitate the identification of “mill rolls” (in addition to those notified by a customer) if considered defective due to faulty raw materials.

### **III.2 Internal Information**

Within the cellophane production environment, departmental logs record the time of manufacture of the “mill rolls”, related processing conditions and quality control information. Other logs record the details of raw materials used and the details of any in-process testing. All rolls of cellophane being processed internally are labelled with the “mill roll” numbers. These logs are either in paper or electronic format and are stored for various lengths of time as defined in departmental ISO9001 procedures.

Information stored against the customer’s order number identifies all “slit reels” supplied to that order. Labels attached to the outside of the reels carry such information as the type of film, “slit reel” number, customer order number, date and shift of production etc.

### **III.3 Downstream Information**

The primary purposes of traceability within the cellophane industry are (a) internal control of quality, (b) the ability to trace back to identify possible corrective action following internal or external complaints and non conformances and (c) the facilitation of product recall.

Traceability is especially important when a product is placed on the market as suitable for contact with food. In the case of cellophane, the product will almost always be supplied to the customer as “slit reels”. Several “slit reels” would make up a customer order. All “slit reels” of cellophane are labelled with identification numbers, which can be directly traced back to the parent “mill roll”.

Therefore, the requirements for full traceability are in place. A customer, next along the food packaging chain, will receive “slit reels” labelled with these identification numbers.

## **IV. RECALL**

If notified of a defect, the cellophane manufacturer can directly trace back to the “mill roll” and to all other possibly affected “slit reels” from the same “mill roll”. Most manufacturers, who have implemented ISO9001 (or similar) quality management systems, would have implemented procedures in their system for tracking and recall of product.