39.12 - Cellulose and its chemical derivatives, not elsewhere specified or included, in primary forms.

- Cellulose acetates :

3912.11 - - Non-plasticised

3912.12 - - Plasticised

3912.20 - Cellulose nitrates (including collodions)

- Cellulose ethers :

3912.31 - - Carboxymethylcellulose and its salts

3912.39 - - Other

3912.90 - Other

(A) CELLULOSE

Cellulose is a carbohydrate of high molecular weight, forming the solid structure of vegetable matter. It is contained in cotton in almost a pure state. Cellulose not elsewhere specified or included, in primary forms, falls in this heading.

Regenerated cellulose is a glossy, transparent material usually obtained by precipitation and coagulation when an alkaline solution of cellulose xanthate is extruded into an acid bath. It is usually in the form of thin, transparent sheets which are classified in **heading 39.20** or **39.21**, or of textile filaments of **Chapter 54** or **55**.

Vulcanised fibre, which is produced by treating paper or sheets of cellulose pulp with zinc chloride, is generally in the form of rods, tubes, sheets, plates or strip and is therefore also **excluded** (generally **heading 39.16**, **39.17**, **39.20** or **39.21**).

(B) CHEMICAL DERIVATIVES OF CELLULOSE

This group includes chemical derivatives of cellulose which serve as a basis in the manufacture of plastics as well as for other purposes.

The principal chemical derivatives of cellulose, whether or not plasticised, are :

(1) **Cellulose acetates**. These are prepared by treating cellulose (usually cotton linters or dissolving grades of chemical wood pulp) with acetic anhydride and acetic acid in the presence of a catalyst (e.g., sulphuric acid). With the addition of plasticisers they can form plastics which are non-inflammable and suitable for injection moulding. They are commonly presented in the form of powders, granules or solutions. Cellulose acetates presented in the form of sheets, film, rods, tubes, etc., are **excluded** (generally **heading 39.16**, **39.17**, **39.20** or **39.21**).

(2) **Cellulose nitrates (nitrocellulose)**. These products are prepared by treating cellulose (usually cotton linters) with a mixture of nitric and sulphuric acids. They are highly inflammable and the more highly nitrated varieties (gun-cottons) are used in explosives; for safety reasons they must be transported damped with alcohol, generally ethyl, isopropyl or butyl alcohol, or dampened or plasticised with phthalate esters. Cellulose nitrate plasticised with camphor in the presence of alcohol forms **celluloid**. Celluloid is usually in the form of sheets, film, rods or tubes, or other extruded forms, and is then **excluded** from this heading (generally **heading 39.16**, **39.17**, **39.20** or **39.21**); it is not suitable for injection moulding and is therefore not put up as a moulding powder.

Cellulose nitrate mixed with other kinds of plasticisers is widely used as the basis for varnishes, and for this purpose may be presented in the form of dry or pasty extracts. Solutions consisting of nitrocellulose in a mixture of ether (diethyl ether) and alcohol (ethanol) are **collodions** which are also included here. If the solution is partly evaporated celloidin is obtained in a solid form.

(3) **Cellulose acetate butyrate and cellulose propionate**. These are cellulose esters forming plastics of the same general character as those formed with cellulose acetate.

(4) **Cellulose ethers**. The most important are carboxymethylcellulose, methylcellulose, and hydroxyethylcellulose. These are water-soluble and are used as thickeners or as glues (see the General Explanatory Note to this Chapter, exclusion (b), for the classification of glues). Other cellulose ethers of commercial importance include ethyl cellulose which is a lightweight plastics.

Plastics chemically derived from cellulose generally need the addition of plasticisers.

For the classification of polymers (including copolymers), chemically modified polymers and polymer blends, see the General Explanatory Note to this Chapter.