17.02 - Other sugars, including chemically pure lactose, maltose, glucose and fructose, in solid form; sugar syrups not containing added flavouring or colouring matter; artificial honey, whether or not mixed with natural honey; caramel.

- Lactose and lactose syrup :

1702.11 - - Containing by weight 99 % or more lactose, expressed as anhydrous lactose, calculated on the dry matter

1702.19 - - Other

1702.20 - Maple sugar and maple syrup

1702.30 - Glucose and glucose syrup, not containing fructose or containing in the dry state less than 20 % by weight of fructose

1702.40 - Glucose and glucose syrup, containing in the dry state at least 20 % but less than 50 % by weight of fructose, excluding invert sugar

1702.50 - Chemically pure fructose

1702.60 - Other fructose and fructose syrup, containing in the dry state more than 50 % by weight of fructose, excluding invert sugar

1702.90 - Other, including invert sugar and other sugar and sugar syrup blends containing in the dry state 50 % by weight of fructose

This heading covers other sugars in solid form, sugar syrups and also artificial honey and caramel.

(A) **OTHER SUGARS**

This part covers sugars, **other than** sugars of **heading 17.01** or chemically pure sugars of **heading 29.40**, in solid form (including powders), whether or not containing added flavouring or colouring matter. The principal sugars of this heading are :

(1) **Lactose** (also known as milk sugar) ($C_{12}H_{22}O_{11}$), which occurs in milk and is produced commercially from whey. This heading covers both commercial and chemically pure lactose. Such products must contain by weight more than 95 % lactose, expressed as anhydrous lactose, calculated on the dry matter. For the purposes of calculating the percentage weight of lactose in a product the expression " dry matter " should be taken to exclude both free water and water of crystallisation. Products obtained from whey and containing 95 % or less by weight of lactose, expressed as anhydrous lactose, calculated on the dry matter, are **excluded** (generally **heading 04.04**).

Commercial lactose, when refined, is a white, slightly sweet, crystalline powder. Chemically pure lactose, whether anhydrous or hydrated, occurs as hard colourless crystals, which absorb odours.

Lactose is used extensively, with milk, in the preparation of infant foods; it is also used in confectionery, in jam-making or in pharmacy.

(2) **Invert sugar**, the main constituent of natural honey. It is usually prepared commercially by the hydrolysis of refined sucrose solutions and consists of equal proportions by weight of glucose and fructose. It may be presented in solid form or as a viscous syrup (see Part (B)). It is used in pharmacy, in bread making, in the manufacture of fruit preserves and artificial honey and in the brewing industry.

(3) **Glucose**, which occurs naturally in fruits and honey. Together with an equal part of fructose it constitutes invert sugar.

The heading includes dextrose (chemically pure glucose) and commercial glucose.

Dextrose ($C_6H_{12}O_6$) is a white crystalline powder. It is used in the food and pharmaceutical industries.

Commercial glucose is obtained by hydrolysing starch with acids and/or enzymes. It always contains, in addition to dextrose, a variable proportion of di-, tri- and other polysaccharides (maltose, maltotriose, etc.). It has a reducing sugar content, expressed as dextrose on the dry substance, of not less than 20 %. It is usually in the form of a colourless, more or less viscous liquid (glucose syrup, see Part (B)) or of lumps or cakes (glucose aggregates) or of an amorphous powder. It is used mainly in the food industry, in brewing, in tobacco fermentation and in pharmacy.

(4) **Fructose** ($C_6H_{12}O_6$) which is present in large quantities, with glucose, in sweet fruits and in honey. Commercially it is produced from commercial glucose (e.g., corn syrup), from sucrose or by hydrolysis of inulin, a substance found mainly in the tubers of the dahlia and the Jerusalem artichoke. It occurs in the form of a whitish, crystalline powder or as a viscous syrup (see Part (B)); it is sweeter than ordinary sugar (sucrose) and is especially suitable for use by diabetics. This heading covers both commercial and chemically pure fructose.

(5) **Sucrose sugars**, obtained from sources other than the sugar beet and the sugar cane. The most important is **maple** sugar, obtained from the sap of varieties of the maple tree, chiefly the *Acer saccharum* and the *Acer nigrum* which grow mainly in Canada and the North-Eastern United States. The sap is usually concentrated and crystallised unrefined in order to retain certain non-sugar constituents to which the sugar owes its delicate flavour. It is also marketed in the form of a syrup (see Part (B)). Other sucrose syrups (see Part (B)) are obtained from sweet sorghum (*Sorghum vulgare var. saccharatum*), carob beans, certain palms, etc.

(6) **Malto-dextrins** (or **dextri-maltoses**), obtained by the same process as commercial glucose. They contain maltose and polysaccharides in variable proportions. However, they are less hydrolysed and therefore have a lower reducing sugar content than commercial glucose. The heading covers only such products with a reducing sugar content, expressed as dextrose on the dry substance, exceeding 10 % (but less than 20 %). Those with a reducing sugar content not exceeding 10 % fall in **heading 35.05**. Malto-dextrins are generally in the form of white powders, but they are also marketed in the form of a syrup (see Part (B)). They are used chiefly in the manufacture of baby food and low-calory dietetic foods, as extenders for flavouring substances or food colouring agents, and in the pharmaceutical industry as carriers.

(7) **Maltose** ($C_{12}H_{22}O_{11}$) which is produced industrially from starch by hydrolysis with malt diastase and is produced in the form of a white crystalline powder. It is used in the brewing industry. This heading covers both commercial and chemically pure maltose.

(B) SUGAR SYRUPS

This part covers syrups of all sugars (including lactose syrups and aqueous solutions **other than** aqueous solutions of chemically pure sugars of **heading 29.40**), **provided** they do not contain added flavouring or colouring matter (see Explanatory Note to heading 21.06).

In addition to the syrups referred to in Part (A) above (i.e., glucose (starch) syrup, fructose syrup, syrup of malto-dextrins, inverted sugar syrup as well as sucrose syrup), this heading includes :

(1) **Simple syrups** obtained by dissolving sugars of this Chapter in water.

(2) **Juices and syrups** obtained during the extraction of sugars from sugar beet, sugar cane, etc. These may contain pectin, albuminoidal substances, mineral salts, etc., as impurities.

(3) **Golden syrup**, a table or culinary syrup containing sucrose and invert sugar. Golden syrup is made from the syrup remaining during sugar refining after crystallisation and separation of refined sugar, or from cane or beet sugar, by inverting part of the sucrose or by the addition of invert sugar.

(C) ARTIFICIAL HONEY

The term " artificial honey " applies to mixtures based on sucrose, glucose or invert sugar, generally flavoured or coloured and prepared to imitate natural honey. Mixtures of natural and artificial honey are also included in this heading.

(D) CARAMEL

Caramel is a brown non-crystallisable substance with an aromatic odour. It may be in the form either of a more or less syrupy liquid or of a solid, usually a powder.

It is obtained by more or less prolonged pyrogenation, at a temperature of 120 - 180 °C, from sugars (usually glucose or sucrose) or from molasses.

Depending on the manufacturing process, a whole series of products is obtained ranging from **caramelised sugars** (or molasses) proper with a sugar content, calculated on the dry product, which is usually high (of the order of 90 %), to **" colouring " caramels**, with a very low sugar content.

Caramelised sugars or molasses are used for flavouring, particularly in making sweetened desserts, ice cream or pastry-cooks' products. Colouring caramels, because of a fairly high degree of conversion of the sugars into melanoidin (a colorant), are used as colouring substances in, for example, biscuit-making, brewing and the manufacture of certain non-alcoholic beverages.