

The Sugar Production Process



Introduction

The raw material from which sugar is obtained is either sugar beet or sugarcane. In Europe, it is generally obtained from sugar beet, while sugarcane is more frequent in tropical climates (such as South America and Asia).

In the conveying processes involved in production, the conveyor belts used vary between those in the reception and washing zone, where rubber belts are still used, and those in the drying and storage area, where our white, non-toxic, food quality belts are used, as this is refined sugar (or sugar undergoing the refining process), destined for human consumption.

esbelt provides a full range of belts for conveying sugar, which fully meet the demands of the sector.

These belts are the **FEBOR 21CC, 31CC, 32CC, and 41CC**.

In some lines requiring a greater working tension (e.g. bucket elevators), our **ESPOT 81CC** is also used, with notable success.

PRODUCTION PROCESS

A) RECEIVING THE SUGAR BEET

- Unloading (**photos 1 and 2**).
- Extraction conveyors (2 rubber belts, 1,200 mm x 40 m full unrolled length) -**photo 3**-.
- Inclined conveyor extending to the washing machine (1 troughed rubber belt, 1,600 mm x 200 m) - **photos 4, 5 and 6** -.



B) WASHING:

- Washing machine ("Trommel") (**photo 7**).
- Stone-removing machine: removes stones and other solid elements by gravity (**photos 8 and 9**).
- Leaf removing machine: (**photo 10**) removes the leaves, which are extracted by means of a troughed rubber belt (**photo 11**).

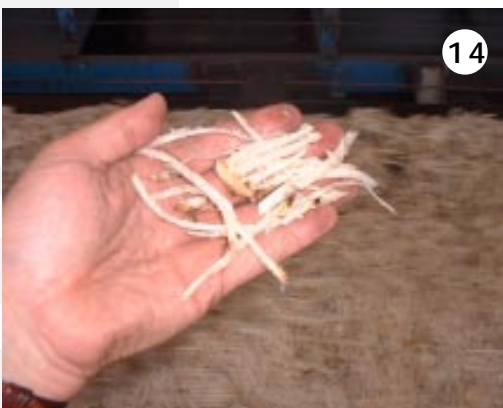
From this point on, only the clean beets and "stalks" (small pieces of beet and the actual stalks) are left and are taken to the factory (the beet chutes) on another troughed herring-bone belt (approx. 1400 mm x 90 m).





C) CUTTING

- Beet chutes (**photo 12**).
- Mills (**photo 13**): this is where the beets are cut into pieces or sheets (see detail in **photo 14**).
- Mill outlet (**photo 15**): from here, the pieces of beet move onto two parallel rubber belts (1,200 mm x 120 m), operating on an inclined plane of approximately 25° (**photo 16**), which take the pieces to the next process.



D) DIFFUSION

- This is the process in which the saccharose is extracted from the sugar beet (**photo 17**).



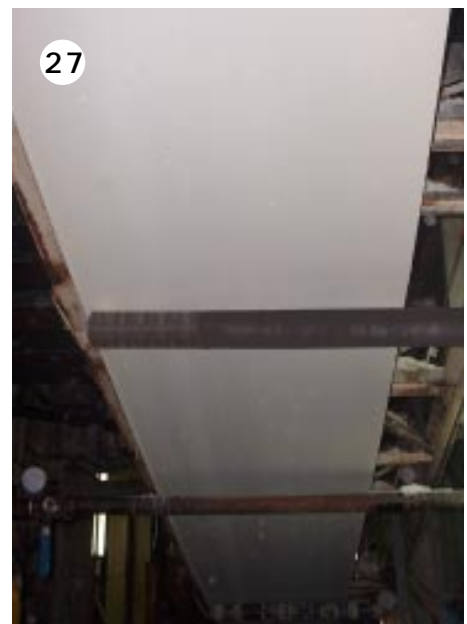
E) PRESSING THE PULP

- Pressing and drying the pulp (**photo 18**).
- Pellets - **photo 19** - This is used as animal fodder.



F) PURIFYING THE JUICE

The juice obtained in the presses flows to these purifying tanks (**photo 20**).



G) VAPORISATION

H) FILTRATION

- Filtering the syrup (photo 21)

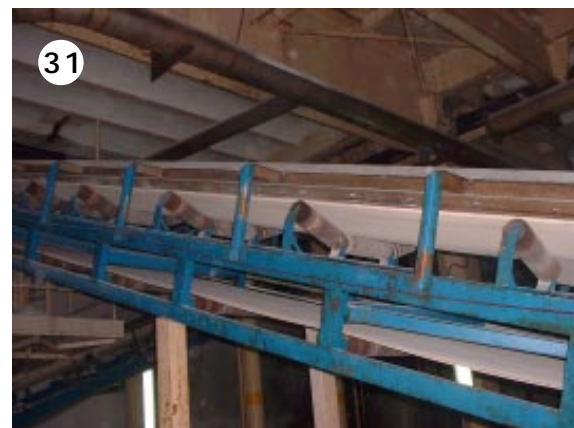
I) CRYSTALLISATION

- The syrup flows into the tanks which are connected to the centrifuges (photo 22), where the granule size and quality of the moist sugar is obtained using velocity and temperature (the sugar is divided into 1st, 2nd, and 3rd class).
- Treacle is obtained as a by-product, from which alcohol is extracted.

J) DRYING PROCESS

- A 1,400 mm x 42 metre endless belt under turbine.
From this point on our belts are installed. In this case, the belt used is a FEBOR 41CC (photos 23, 24 and 25). This delivers:
- the moist sugar belt to the dryer (photo 26). The same type as above with measurements of 800 mm x 100 m. This is a troughed belt that raises the sugar along an inclined plane of 20° (detail of return side, photo 27).

- Sugar dryer (**photo 28**). Once the sugar is dry, it is unloaded through chutes (**detail, photo 29**) onto a series of conveyors fitted with:
 - **FEBOR 31CC or FEBOR 32 CC** type belts, 500 mm x 40 m approx. (**photos 30 and 31**), which unload onto a
 - crosswise collector belt: in this case a **FEBOR 41CC**, 800 mm x 70 m approx. (**photo 32**), which conveys the sugar to the upper level, where, after first being sieved, it is sent to the first packaging warehouse deposit, by means of a chain elevator.



K) STORAGE

- Unloading silo:

The chain elevator transfers the sugar to a **FEBOR 41CC** belt, 800 mm x 80 m, that unloads into the first storage silo (**photo 33**). This silo has two large chutes that can be used to load the loose sugar into lorries or on to the packaging process into the large storage silo. The transfer to the packaging area and large silo uses two parallel **FEBOR 41CC** belts, 650 mm x 200 m («silo filling» and «silo emptying»). - **photo 34** –

- Storage silo: (**photo 35**)

This uses two vertical elevators for loading and unloading, fitted with **ESPOT 81CC** belts, 380 mm x 80 m, –loading- and 320 x 70 m –unloading- (**photo 36**).

The loading/silo filling elevator transfers the sugar to a **FEBOR 41CC** belt, 650 mm x 66 m (**photo 37**), which fills the silo with the sugar.



Finally, at the bottom of the silo, there is another **FEBOR 41CC** belt, 650 mm x 120 m (**photo 37**) that is used to empty/unload the silo.

L) PACKAGING

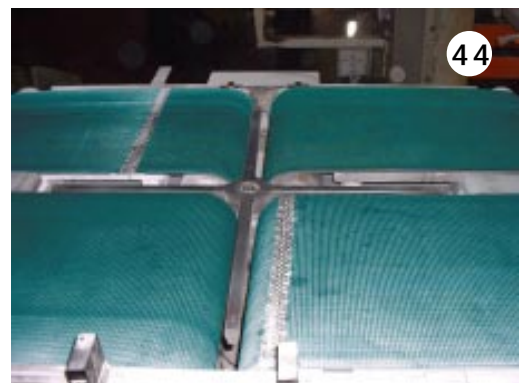
- Packing in sacks: in this line, 50 kg sacks (**photo 38**) and 1,200 kg big bags (**photo 39**) are filled. The attached photos show a number of details of the process:

Sack sewing machine (**photo 40**), with a **BREDA 20CF**.

Turning machine (**photo 41**).



Inclined belt to the palletiser (**photo 42**), **ASTER 20GF** belt.

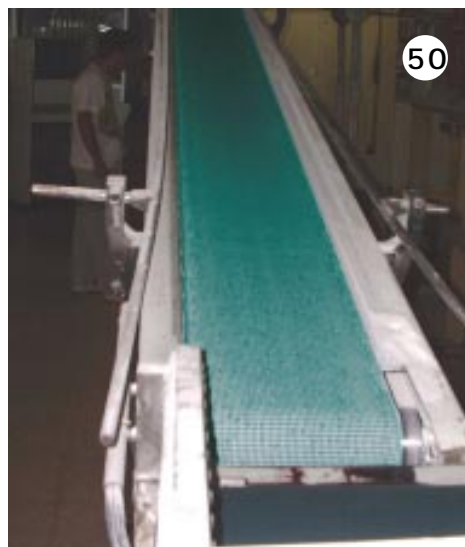


Palletiser (photos 43 and 44): a set of 4 **ASTER 20GF** belts and one **BREDA 20CF** belt, 1,200 mm wide.

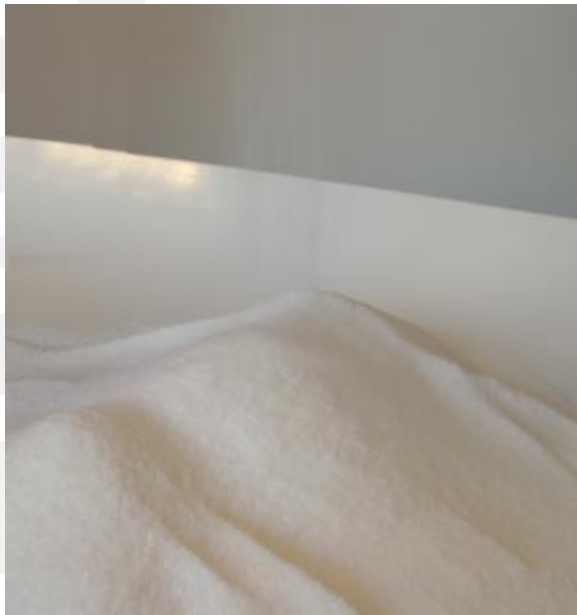


- Packing bags (normally 1 kg).

The process starts in the dispensing chutes and continues to the fillers, closers (**CLINA 20CF**, 130 mm x 6 m, **photos 45 and 46**), the closer outlet (**photo 47**) and the wrapping tunnel (**photo 48**). From the tunnel outlet to the palletiser, **BREDA 12CF** (**photo 49**) and **ASTER 12GF** (inclined plane, **photo 50**) belts are fitted. **Photos 51 and 52** show details of the palletiser.



Belts for conveying SUGAR



- **ABRASION RESISTANT**
- **FOOD QUALITY (FDA)**
- **ANTISTATIC**
- **FLAME RESISTANT**
- **EXCELLENT ADAPTABILITY TO TROUGHS (FLEXIBLE WEFT)**

TYPES:

FEBOR 21CC

- 2 Plies
- Top cover: 2 mm thick
- Bottom cover: 1 mm thick
- Belt: 5 mm thick

FEBOR 31CC

- 3 Plies
- Top cover: 2 mm thick
- Bottom cover: 1 mm thick
- Belt: 6,10 mm thick

FEBOR 32CC

- 3 Plies
- Top cover: 2,75 mm thick
- Bottom cover: 1,5 mm thick
- Belt: 7,4 mm thick

FEBOR 41CC

- 4 Plies
- Top cover: 2 mm thick
- Bottom cover: 1 mm thick
- Belt: 7,4 mm thick

