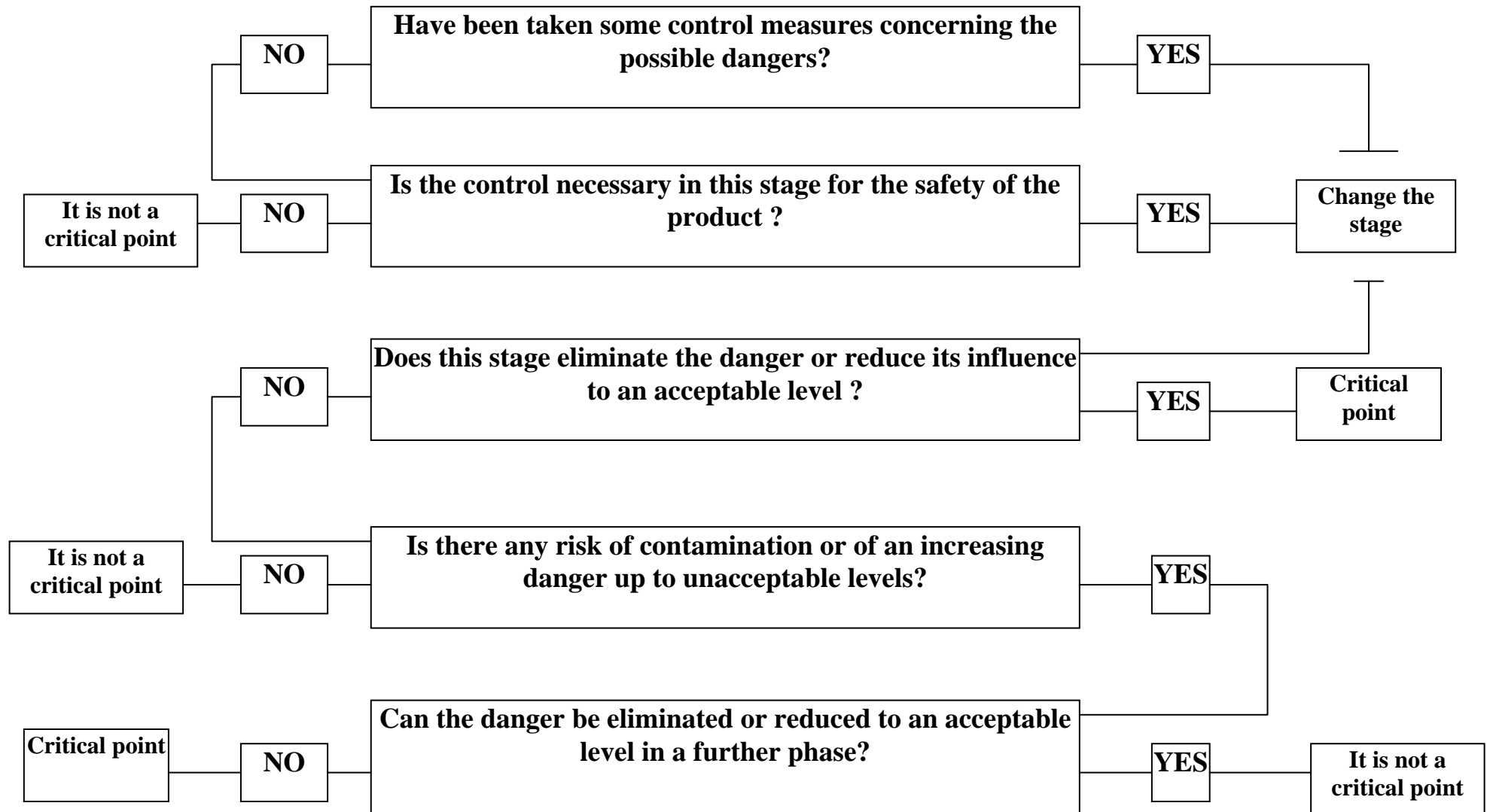


H.A.C.C.P. Decision layout



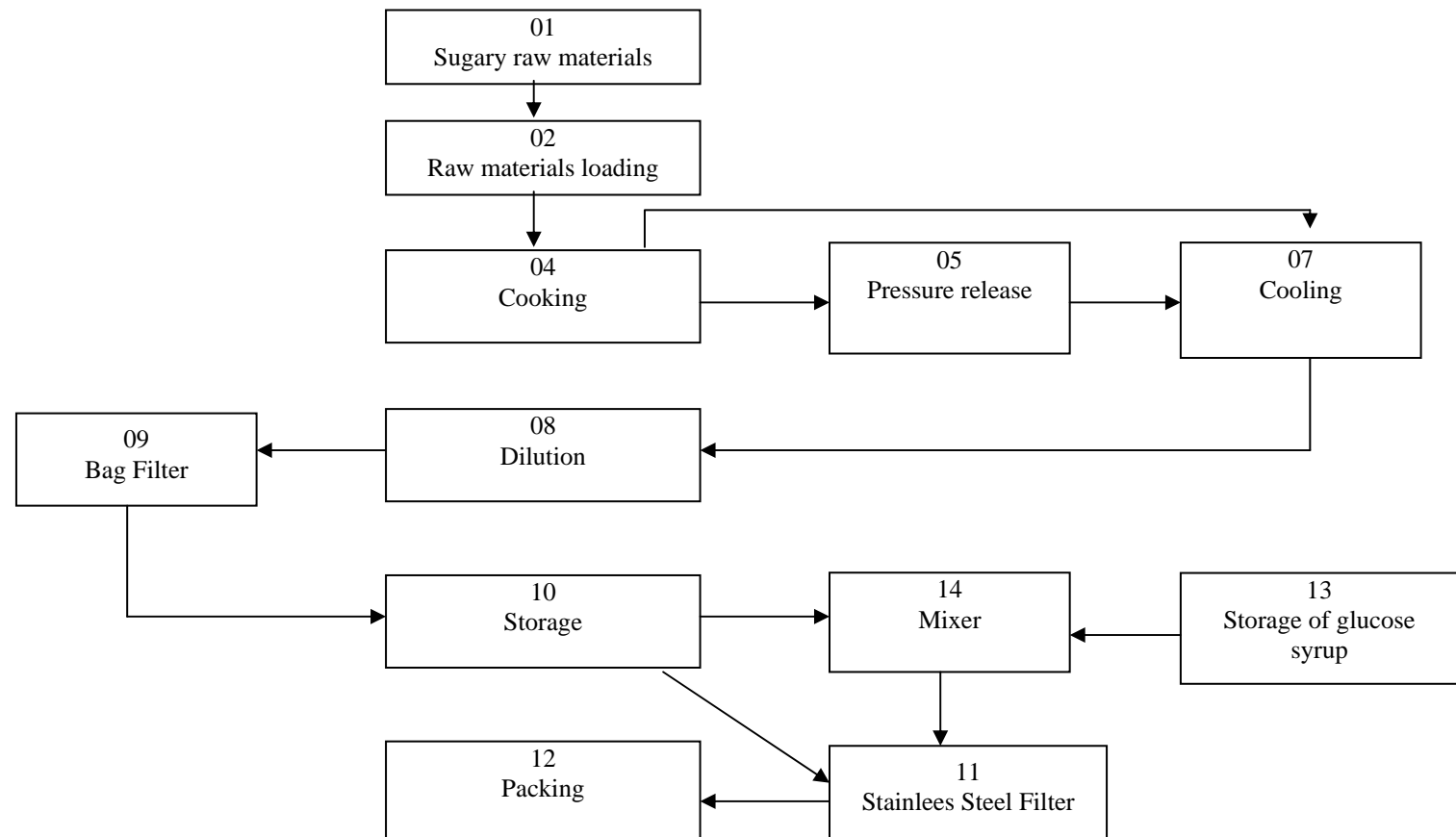
SICNA S.r.L.

HACCP study :
Production of aromatic caramel

Document :
Flowchart

Approved :
S. Selmi

Rev. : 03 01
Date : 22/09/2003
Sheet : 2



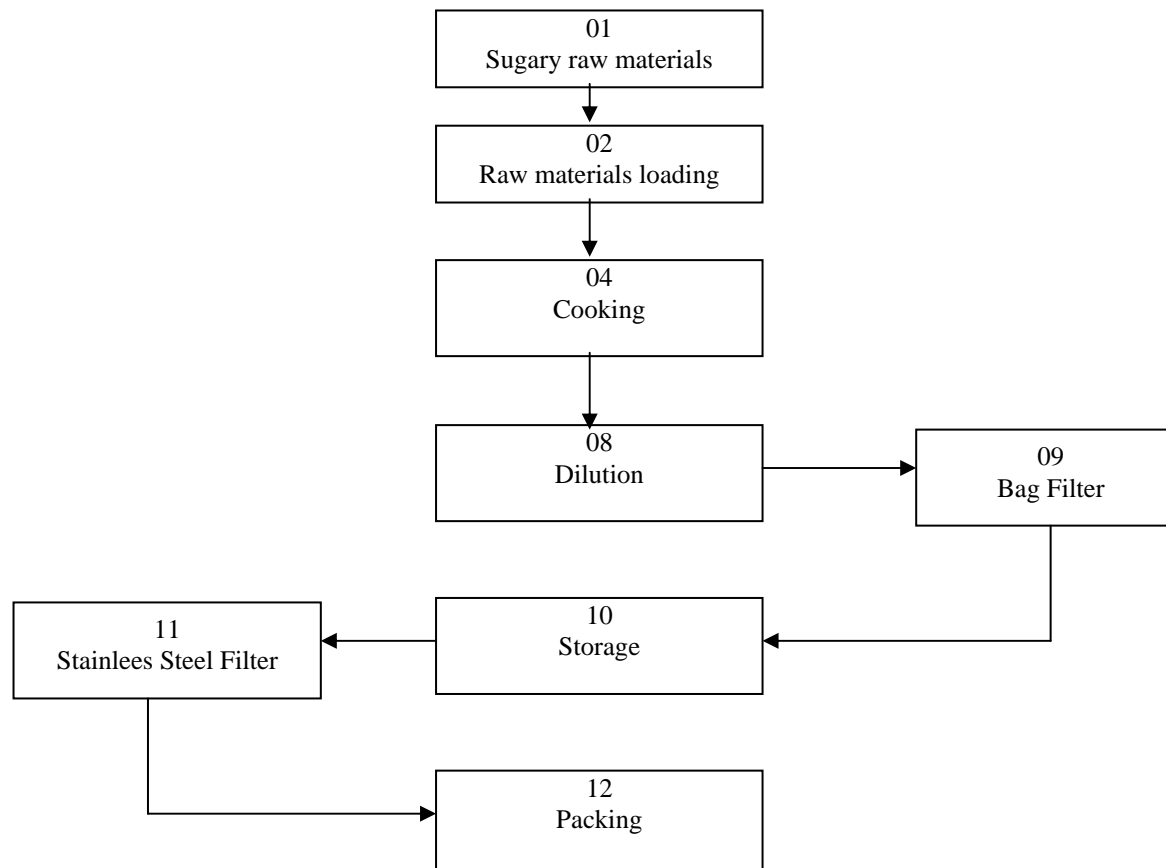
SICNA S.r.L.

HACCP study:
Production of burned sugar

Document :
Flowchart

Approved :
S. Selmi

Rev. : 03 01
Date : 22/09/2003
Sheet : 3



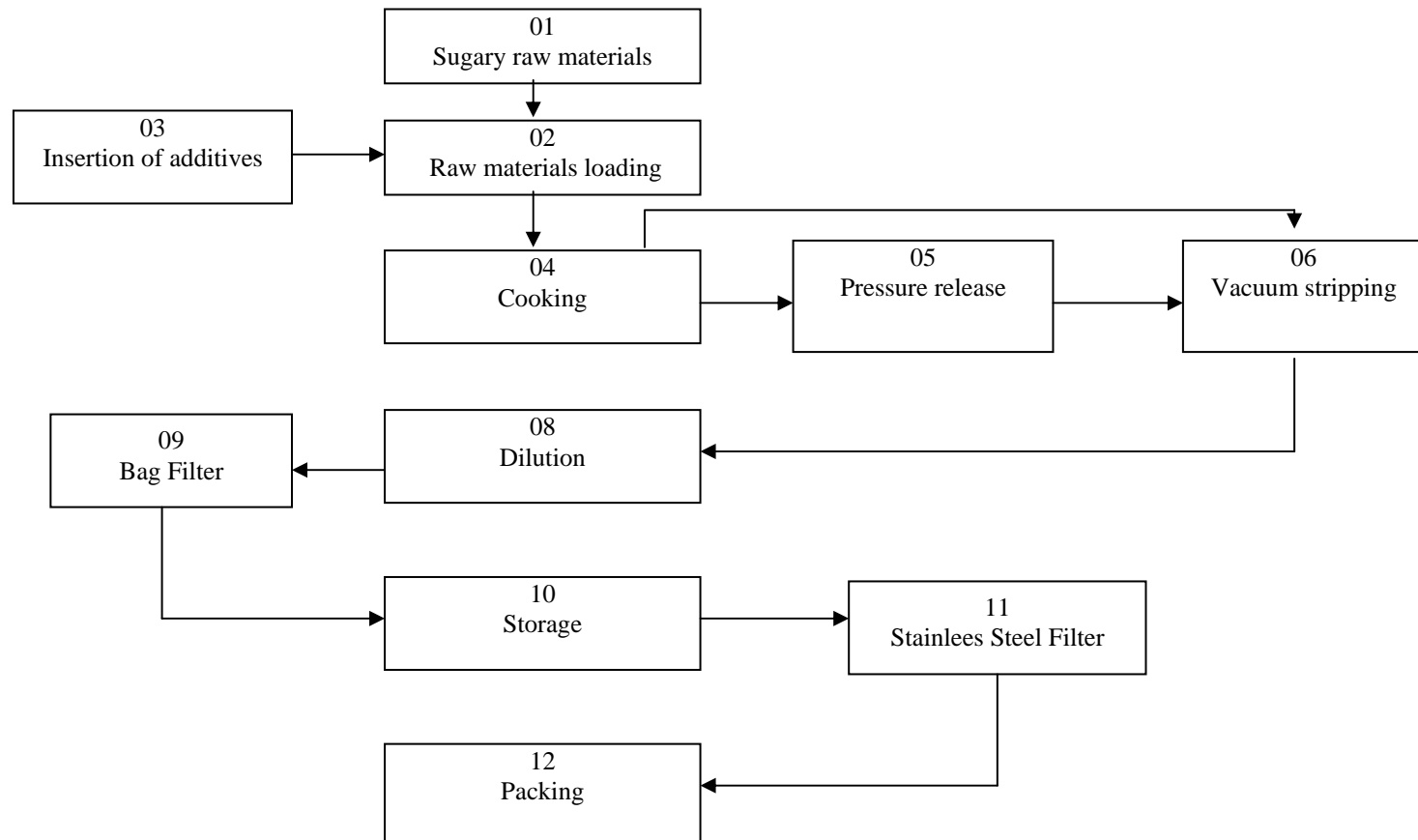
SICNA S.r.L.

HACCP study
Production of Caramel Colour Class a,b,c,d

Document :
Flowchart

Approved :
S. Selmi

Rev. : 03 01
Date : 22/09/2003
Sheet : 4



SICNA S.r.L.

HACCP study Caramel colour, Aromatic caramel, Burned Sugar	Document : HACCP analysis	Approved : S. Selmi	Rev. : 03 01 Date : 22/09/2003 Sheet : 5
--	------------------------------	------------------------	--

Process stages	Risks	Control measures	Critical limits	Monitoring procedures	Corrective actions
----------------	-------	------------------	-----------------	-----------------------	--------------------

01 Sugary raw materials	Possible Crystallisation	Temperature higher than 50°C			
02 Load of raw materials	Load error	Visual and instrumental			
03 Addition of additives	Wrong insertion of additives				
CCP	Production of unsuitable caramel colour	Computer-aided control Insertion of additives	Integrity of magnetic meter	Visual control during the insertion Diagnosis of the meter integrity by the P.C.	Replacement of meter in case it is damaged.
04 Cooking	Excessive Temperature				
CCP	Production of unsuitable caramel colour	Visual control with digital thermometer Control of colour intensity during the cooking	Integrity of thermometer with maximum delta 5°C Colour intensity out of standards	Periodical control with certified thermometer Periodical control colorimeter	Replacement of thermometer in case of wrong reading Setting of colorimeter

SICNA S.r.L.

HACCP study: Caramel Colour, Aromatic Caramel, Burned Sugar	Document : HACCP analysis	Approved : S. Selmi	Rev. : 03 01 Date : 22/09/2003 Sheet : 6
---	------------------------------	------------------------	--

Process stages	Risks	Control measures	Critical limits	Monitoring procedures	Corrective actions
----------------	-------	------------------	-----------------	-----------------------	--------------------

05 Pressure release	Possible forming of foam	Visual control by adding eventually antifoam			
06 Vacuum stripping	None				
07 Cooling	None				
08 Dilution	Wrong dilution	Visual			
09 Bag Filter	Possible breakage of the bag				
CCP	Possible breakage of the bag	Visual	Insolubles >20 mg./100gr.	Opening of the filter and visual check of the bag	Replacement of the bag Re-filtration of the product
10 Storage	Microbial contamination	Sterilisation with steam of tanks before unloading Homogenisation of batch with nitrogen insufflation			
11 Stainless Steel Filter	Dirty in the filter	Visual			Washing with water and steam
12 Loose packing	Microbial contamination	Sterilisation with steam of tanks before loading			
Packing of cans and drums	Microbial contamination	Sterilisation with steam from the semiautomatic filling plant			
Packing of bags					
CCP Bags	Microbial contamination	Bacteriological analysis concerning the bag contents	Limits of specifications	Bacteriological analysis	Sterilisation or reutilization of product

SICNA S.r.L.

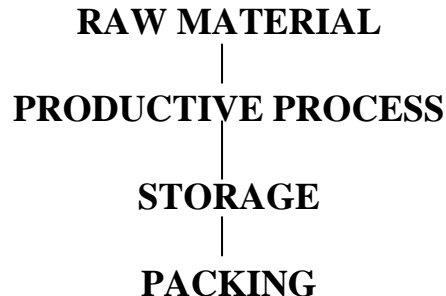
HACCP study: Caramel Colour, Aromatic Caramel, Burned Sugar	Document : HACCP analysis	Approved : S. Selmi	Rev. : 03 01 Date : 22/09/2003 Sheet : 7
---	------------------------------	------------------------	--

Process stages	Risks	Control measures	Critical limits	Monitoring procedures	Corrective actions
----------------	-------	------------------	-----------------	-----------------------	--------------------

13 Storage Glucose syrup	Microbial contamination	Temperature higher than 60°C Concentration higher than 80% with relative high osmotic pressure Sterilisation with steam of tank before unloading the glucose			
14 Mixer	Microbial contamination	Sterilisation with steam of mixer before using it			

H.A.C.C.P. STUDY

It has been considered the extended productive process, in order to take into account the **Chemical, Physical and Microbiological risks**.



The a **H.A.C.C.P. TEAM** has been created to take into account the risks.
The Team is composed by :

- ◆ Selmi Sergio - Quality Assurance
- ◆ Ghioni Mauro - Production
- ◆ Lecchi Margherita - Quality Control
- ◆ Malachin Donatella - Packing

H.A.C.C.P. DEVELOPMENT

In order to have a better assessment of the risks, three **flowcharts** have been created, one for each line of production. After this we have passed to the assessment of the risks for each stage of the Productive Process.

- 1) **SUGARY RAW MATERIALS**: For this stage the risk of chemical pollution is excluded because of the use of storage tank of stainless steel. The physical risk has been eliminated thanks to the filters on the airholes of the tanks. The biological risk has not been taken into consideration, since in the following phase the cooking which is carried out at temperatures higher than 150 °C, excludes any biological risk.
- 2) **INSERTION OF RAW MATERIALS** : No risks have been detected, since the raw material is under vacuum and the lines are insulated against any possible external contact.
- 3) **ADDITION OF ADDITIVES** : During this stage there have been found some risks, which have been solved by arranging a computer-aided control of this addition to avoid the human error and arranging visual and instrumental controls to avoid the mechanical mistake.
- 4) **COOKING** : Also in this stage a possible risk has been found, due to an excessive cooking temperature which could cause physical and organoleptic damages to the finished product. This risk can be eliminated with a periodical control of thermometer and with the control of the colour intensity of the product during the cooking.
- 5) **PRESSURE RELEASE** : There are no risks in this phase, where there is only a possible forming of foam, which can be eliminated by adding an alimentary anti-foam product
- 6) **UNDER VACUUM STRIPPING** : No risks because of the simplicity of this stage.
- 7) **COOLING** : As above.

- 8) **DILUTION:** In this phase a wrong dilution is not a risk, since the analytical controls carried out before unloading the finished products, enable the correction.
- 9) **FILTRATION WITH BAG FILTER :** Also in this stage a possible risk has been found, due to the breakage of the bag and as consequence an inadequate filtration. This risk can be eliminated with a daily control and re-filtration of all products produced in the day if the bag is found broken.
- 10) **STORAGE:** The possible risk of biological contamination has been avoided by sterilising the tank before its filling with the finished product and also because this has a very high osmotic pressure. The homogenisation of a possible batch composed by more batches is made with nitrogen to avoid pollution.
- 11) **FILTRATION WITH STAINLEES STEEL FILTER :** There are no risks in this phase, where there is only a possible forming of dirty, which can be eliminated by washing with water and steam.
- 12) **PACKING:** For the loose packing and that of containers, risks have been eliminated by sterilising the semi-automatic filling plant and thanks to the presence of filters. About the packing of bags a possible risk of biological pollution has been detected due to the process of the machine and to the package as well. In order to avoid this risk, a microbiological analysis has been carried out on the bag contents, which are withdrawn in time before the forwarding of the goods.
- 13) **STORAGE OF GLUCOSE SYRUP :** In this phase no risk has been detected, because of the high storing temperature and the high osmotic pressure of the product. Other factors which exclude the risk are the analytical controls on the final product before the packing.
- 14) **MIXER :** As per point 10.