I. INTRODUCTION

1. INTRODUCTION ABOUT APPLICATION OF REFRIGERATION SYSTEMS IN THE BEVERAGE INDUSTRY

1.1 Used to quickly cool sugar solution after cooking.
Sugar solution after hublon process have temperature about 80° C need have to down temperature quickly to fermentation temperature from 6 to 8° C. The cooling speed from 30 to 45 minute. If it make cooling slow, some bacterial strain will develop to make fermentation process be reduce quality. To make cooling sugar solution have use some equipment to make cooling speed. The Process be make by two phase:

- Use water at 1° C to lower temperature sugar solution from 80° C to 20° C
- Use Glycol solution ( or brine ) has temperature about −8° C to lower temperature sugar solution from 20° C to 8° C. The modern Refrigeration engineering use glycol solution to make cooling, because Brine cause corrosive electrical equipment

Summary, In the process make lower temperature requires use a large amount of cold. The average for a beverage factory have capacity 50 millions litter / year need have use 180 m³ sugar solution in proceed, the amount of cold used to lower the temperature.

1.2 Cooling by Co2
- In fermentation process, thanks to the hydrolysis process that fermentation box produce a lot of Co2. In the process of generating Co2 show reaction below.

The final result of the conversion (fermentation) from hexoza to ethylic alcohol and carbon dioxide can be expressed by the following reaction equation:

\[ C_6H_{12}O_6 = 2C_2H_5OH + 2CO_2 \]

Gas Co2 is very near for the process of the artist in the pouring phase and technology processing in the fermentation box. Gas Co2, exit from fermentation box in the biochemical process to be withdraw, security to use in the boot line. To preserve Co2 can only be only in the liquid, at the condensing pressure and normal temperature of Co2 can near 100 at. So, to reduce the preserve pressure Co2 under 20KG/cm² requires lower preserve pressure very low, beween -30 - -35 độ C.

1.3 Cooling water 1°C
- Cold water used in the product of the beverage with multiple purposes, especially used to make fast cooling sugar solution after hublon to near 20° C. The use of 1 ° C water is a very effective and economical solution in modern breweries. The heat load of batches during the day was uneven and continuous with the pulse shape. When complete batches are required, refrigeration is required. Obviously, if you use direct cooling, the capacity will be very large.
- Using cold water use at temperature 1°C to down the fast lines for an archive to be clean to take a line of fast pipeline. This is not allowed to be large system but anrecirming request. Cold Water made by glycol solution with temperature near 1°C through the Plate heater exchanger

2. INTRODUCTION OVERVIEW
The Contructionat SAN MIGUEL VIETNAM CORP FACTORY (SUNTORY PEPSICO VIET NAM) Actual works at the beverage factory SAN MIGUEL VIETNAM CORP (belong to SUNTORY PEPSICO VIET NAM)

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