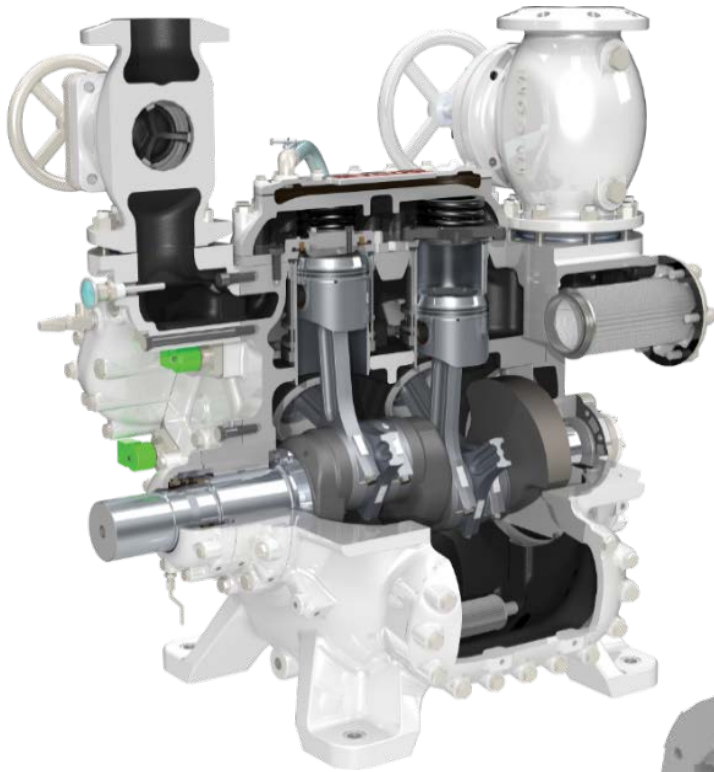
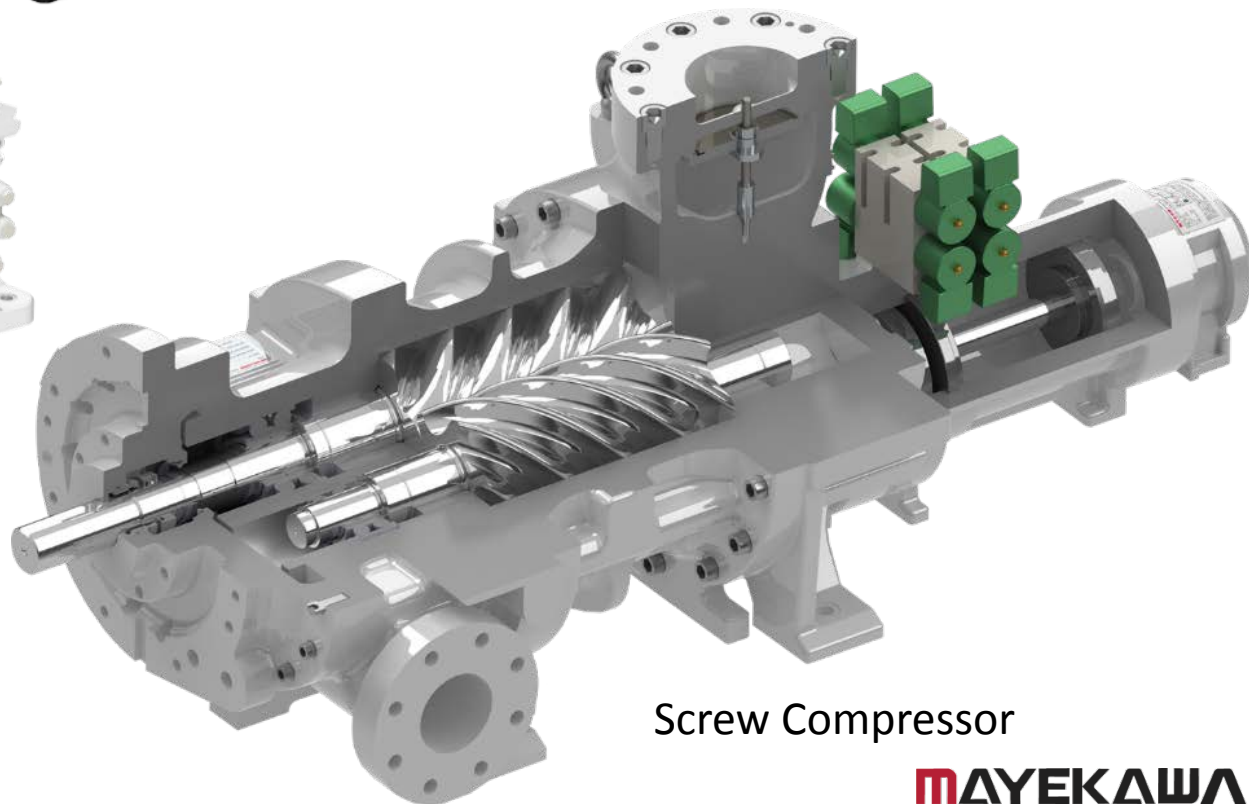


# Compressors



Reciprocating Compressor



Screw Compressor

# Compressor Unit installed at site



Poultry plant in the U.S.



Food processing Co. in the U.S.



Cold storage in India



IQ Freezer in Vietnam

# Cold Logistics Industry (Cold Storage)



Screw compressors  
in the machine room

Inside of cold storage

## Cape Verde / Mindelo Port Facility in 2000



## Cape Verde / Mindelo Port Facility in 2000



## Senegal / Kaolack Fish Handling Facility in 2003



## Gambia / Gunjul in 2003



# Energy Saving approach in Conventional Refrigeration system

## -CASCADE COOLING-



March 17, 2014



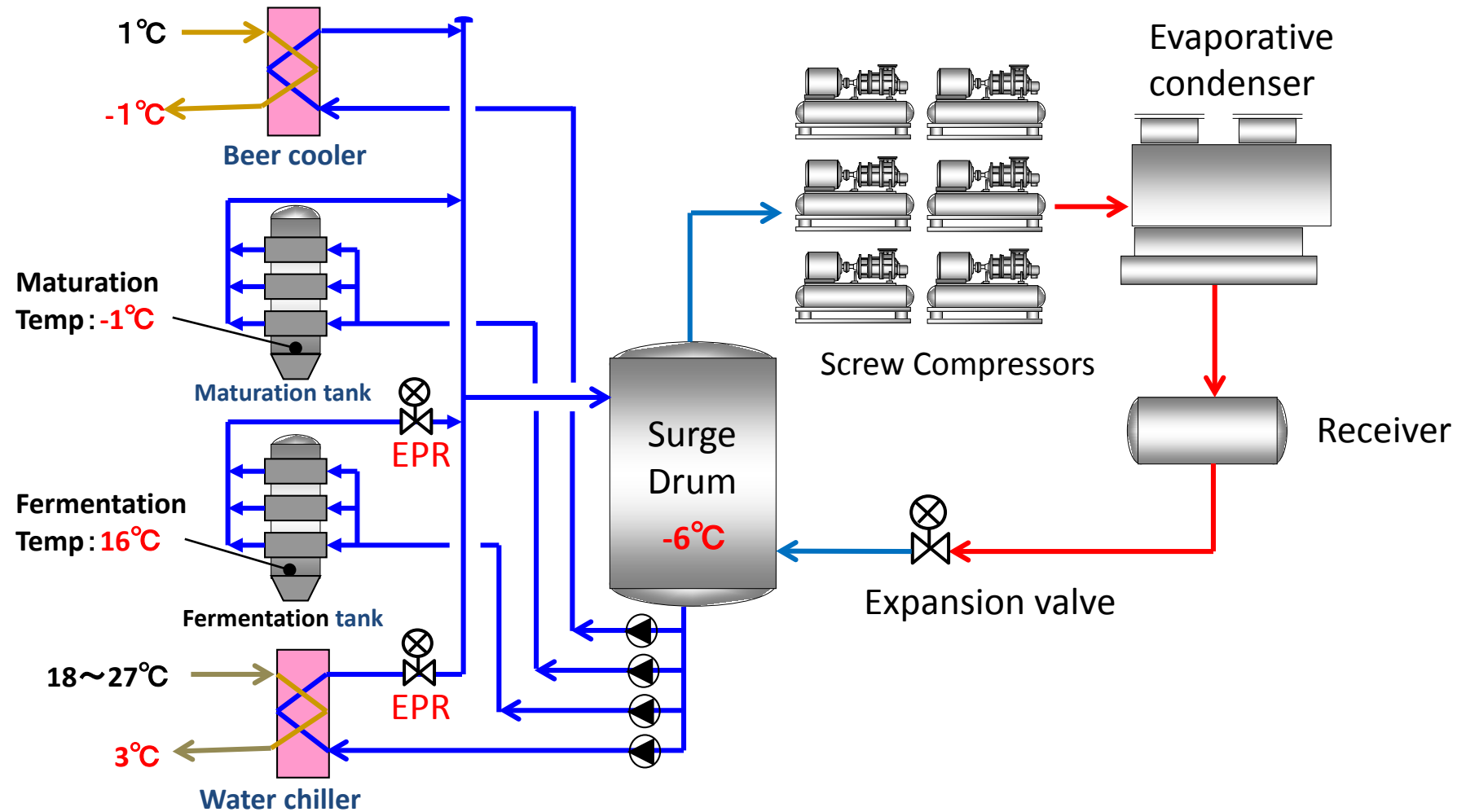




It all comes together  
with a **CASTLE**

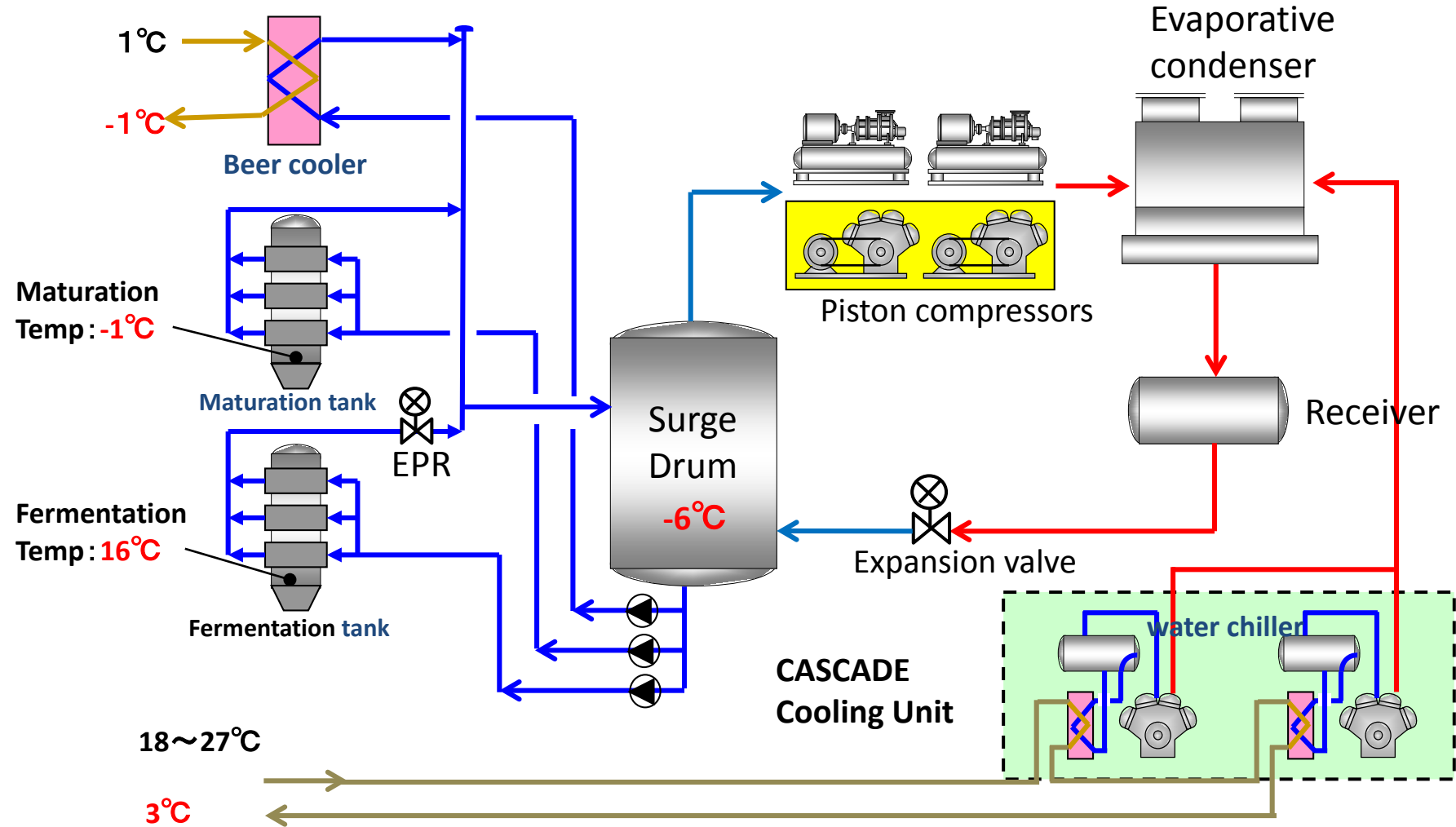
Enjoy Responsibly. Not for Sale to Persons Under the Age of 18.

# Existing System



- Refrigerant liquid temperature has to be matched with the lowest one among the multiple evaporators. → **COP becomes low, if TE is low.**
- Unloader capacity control on large Screw compressors → **COP becomes low at unloaded condition.**

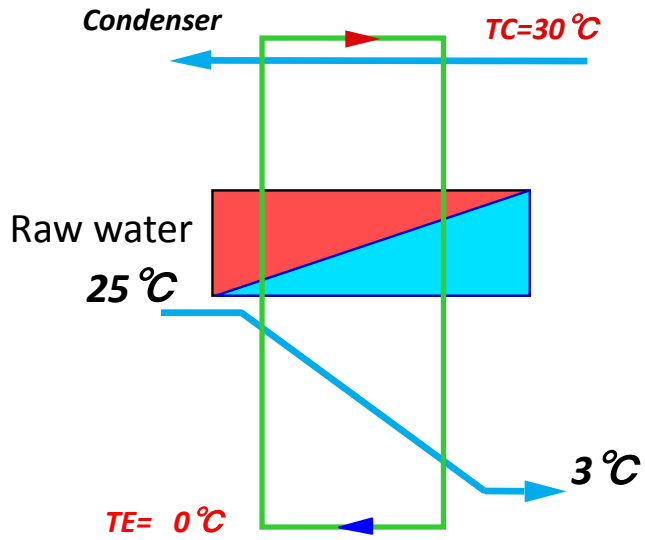
# Proposed System



- Higher Evaporative Temperature to meet the required chilling temperature  
→ COP becomes high, if TE goes high.
- Unloader capacity control by Piston compressors  
→ COP does not drop at unloaded condition.

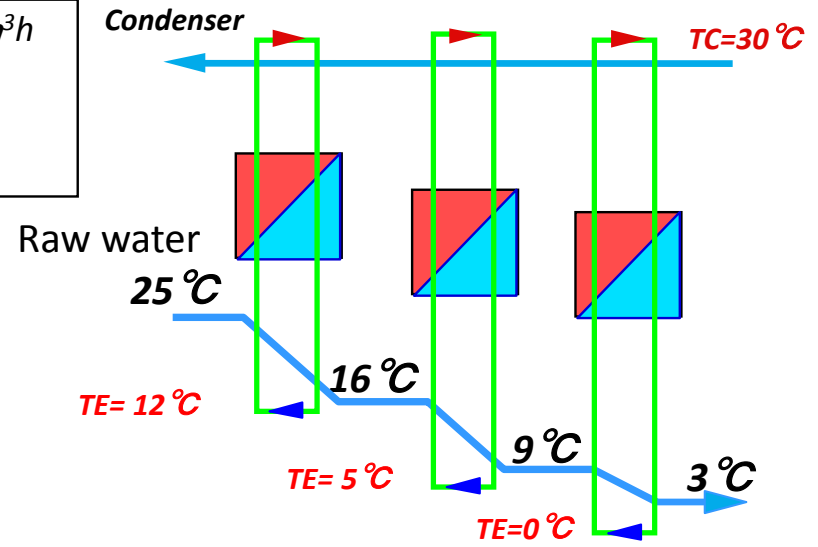
# Advantages of CASCADE COOLING system

*Single stage cooling*



Raw water 120m<sup>3</sup>h  
 25 °C → 3 °C  
 Q = 3073 kW

*3 stage Cascade cooling*



Evap. temps are set lower step by step

|             |      |
|-------------|------|
|             | No1  |
| kW          | 439  |
| Capacity kW | 3073 |
| COP         | 7.0  |

Compressor CFM **3150 m<sup>3</sup>/h**

|             | No1  | No2 | No3 | Total |
|-------------|------|-----|-----|-------|
| kW          | 103  | 116 | 118 | 337   |
| Capacity kW | 1284 | 985 | 805 | 3073  |
| COP         | 14.7 | 9.3 | 7.0 | 9.1   |

Compressor TOTAL CFM **2529 m<sup>3</sup>/h**

**Energy saving .....23% reduction**

**Equipment cost saving.....Compressor SIZE is 80 %**

# Business Field



**Fruits & Vegetable**



**Fish & Food processing**



**Dairy, Beverage & Brewery**



**Meat Processing**



**Cold Logistics**



**Marine application**



**Ice Skate Rink**



**Energy & Environment**



**Oil, Gas & Chemical**









**MAYEKAWA**  
**MYCOM**



Training Center Moriya Plant in JAPAN

株式会社 前川製作所