Frigel
Intelligent Process Cooling

ECODRY SYSTEM

PROCESS-SYNCHRONIZED COOLING

THE PARADIGM SHIFT IN BEVERAGE INDUSTRY

SOFT DRINKS
Juices, Nectars,
Isotonic & Teas

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MAIN ADVANTAGES

Ecodry System is a New Integrated Cooling Solution, based on an innovative engineering concept that truly represents a Paradigm Shift in the Beverage Industry.

From soft drinks to manufacturing to bottling, this “Intelligent Process Cooling” approach, can cover all cooling demands with unbeatable performance improvements and savings when compared to traditional solutions.

PERFORMANCE

INCREASED PRODUCTIVITY

“Process Synchronized Cooling” guarantees that each processing line always runs consistently at the **highest throughput**. In many beverage processes, especially those with a high cooling demand, an **increased productivity of 20 to 30%** can be achieved.

REDUCED OPERATING COSTS

The **“ECODRY SYSTEM”** achieves remarkable **running cost savings** when compared to traditional central systems: **Energy Savings (up to 30%)**, **Water Savings (up to 95%)** and overall **Maintenance & Safety Costs Savings (up to 90%)**.

TOTAL MODULARITY

This **Modular**, **Plug & Play Concept** has many additional advantages compared to traditional systems. It is **easily expandable at any time**, which allows the installation of the **precise capacity needed at every stage of the plant growth**. Thanks to its modularity, it is also extremely easy to gradually implement **even in existing plants**.

SUSTAINABILITY

REDUCED “CARBON FOOTPRINT” UP TO 50% LESS

Thanks to its unbeatable **refrigeration efficiency**, **free-cooling opportunities** and the possibility of reducing natural gas consumption with the **heat recovery option**.

ALMOST NO “WATER FOOTPRINT” UP TO 95% LESS

Thanks to the Ecodry adiabatic cooling heat rejection technology, the beverage industry can achieve **maximum reductions** in water consumption.

LOWEST “RISKS OF EMISSIONS”

The system is **Ammonia free**, utilizes **innocuous refrigeration gas** with the **lowest GWP** available today and is divided into several separated **small circuits**. So the **risk of emissions**, in case of leakage, is **reduced to a minimum**.

THE INNOVATION

Process-Synchronized Refrigeration Units Microgel™ and Multistage™

In this revolutionary approach, one cooling unit (chiller) is dedicated to each main processing line, specifically designed for the application in terms of cooling and pumping capacities. Super-compact, factory built and pretested, each cooling unit may have Single-Stage or Multi-Stage-Cascade refrigeration circuits that operate inverter driven screw compressors with latest generation of “green refrigerant” and inverter driven process pumps. The units are easily installed and connected to each process, digitally-synchronized with the processing lines and automatically operated by them, delivering, with high precision, the set of cooling parameters (coolant temperature and flow rate) pre-programmed by the operator, according to the actual demand and adapting the logics of control to the specific requirements of the process, according to the process status (ON/OFF, RUN/STOP, IDLE or CIP) at any given time.

Optionally, the chillers being water cooled, they may also be operated as “heat-pumps” in order to easily achieve heat recovery, being able to produce hot water (up to 60°C) to be used either for process purposes or room heating (HVAC) during winter.

Central Adiabatic Cooling System ECODRY™

To complete the Ecodry System innovation, the cooling units installed at each process are connected to a Central Adiabatic Cooling System installed outdoors, in order to reject the heat extracted from the processes to ambient (if not recovered). This modular system – an alternative to old-style evaporative cooling towers - is made of closed circuit adiabatic fluid coolers with large copper coils and aluminum fin heat exchangers and inverter driven DC-brushless fans. This system can keep the coolant temperature even lower than the ambient temperature, thanks to the Internationally Patented Adiabatic Chamber which, during high ambient temperature conditions, pre-cools the air before it reaches the heat exchangers. Obviously, this central system can also provide direct cooling to all processes requiring temperatures above ambient, such as air compressors, cooling tunnels, pasteurizers, etc.

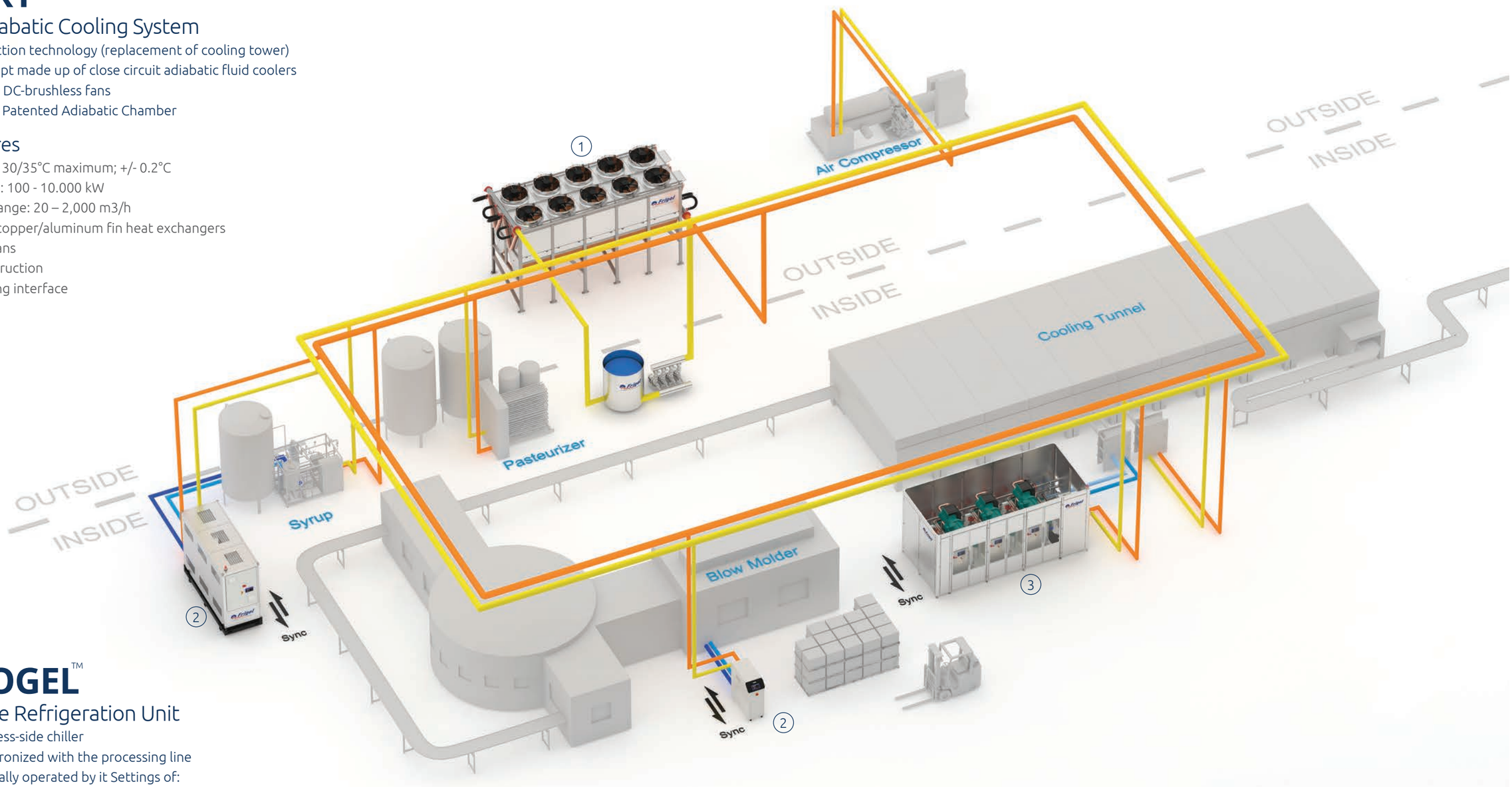
① ECODRY™

Central Adiabatic Cooling System

- New heat rejection technology (replacement of cooling tower)
- Modular concept made up of close circuit adiabatic fluid coolers
- Inverter driven DC-brushless fans
- Internationally Patented Adiabatic Chamber

Main Features

- Cooling range: 30/35°C maximum; +/- 0.2°C
- Capacity range: 100 - 10.000 kW
- Coolant flow range: 20 – 2,000 m3/h
- Large surface copper/aluminum fin heat exchangers
- Brushless EC fans
- Stainless construction
- Web-monitoring interface



② MICROGEL™

Single Stage Refrigeration Unit

- Compact process-side chiller
- Digitally-synchronized with the processing line and automatically operated by it Settings of:
  - Temperature set point and flow rate of coolant
  - System modes: ON, OFF, IDLE, CIP, etc.
- May be operated as a “heat-pump”

Main Features

- Single water-cooled refrigeration circuit (air-cooled option)
- Cooling range: -5 to 90°C; +/- 0.2°C
- Capacity range: 25 – 3000 kW
- Coolant flow range: 1 – 500 m3/h
- Inverter driven rotary compressor
- Inverter driven process pump
- Stainless steel plate evaporator and condenser
- Integrated, stainless steel coolant reservoir
- Web-monitoring / Scada, etc. interfaces
- Touch screen 7” interface, user friendly

③ MULTISTAGE™

Cascade Refrigeration Unit

- Designed for processes characterized by high temperature differentials
- Digitally-synchronized with the processing line and automatically operated by it Settings of:
  - Temperature set point and flow rate of coolant
  - System modes: ON, OFF, IDLE, CIP, etc.
- May be operated as a “heat-pump”

Main Features

- Multiple-cascade water-cooled refrigeration stages (air-cooled option)
- Cooling range: -5 to 30°C / Heating range: +35 to 60°C
- Capacity range: 300 – 3000 kW cooling / heating
- Coolant flow range: 20 – 300 m3/h
- Inverter driven high efficiency screw compressors
- Inverter driven process pumps
- Stainless steel plate evaporator and condenser
- Integrated, stainless steel coolant reservoir
- Web-monitoring / Scada, etc. interfaces
- Touch screen 15” interface, user friendly

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Intelligent Process Cooling

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