Frigel
Intelligent Process Cooling

THE INNOVATION

ECODRY SYSTEM 4.0

PROCESS-SYNCHRONIZED COOLING

A PARADIGM SHIFT IN THE PLASTICS INDUSTRY

PACKAGING

PERFORMANCE

INCREASED PRODUCTIVITY

up to 50%

Each mold runs with shortest cooling time, consistently producing high quality parts at the highest throughput.

REDUCED OPERATING COSTS

-40%

Energy savings (**up to 30%**), water savings (**up to 95%**) and maintenance costs Savings (**up to 40%**).

TOTAL MODULARITY

100%

Plug & Play Concept, easily expandable at any time, total reliability.

SUSTAINABILITY

REDUCED "CARBON FOOTPRINT"

-40%

Unbeatable overall efficiency: intelligent use of energy and free-cooling opportunities.

MINIMIZED WATER FOOTPRINT

-95%

Adiabatic, closed circuit heat rejection technology with no process water evaporation or blead-off.

REDUCED "RISKS OF EMISSIONS"

-95%

Uses small quantities of innocuous low GWP refrigerant. Minimal disposal of water treatment chemicals.

THE NEW COOLING SOLUTION FOR PACKAGING ECODRY SYSTEM 4.0

The new approach covers all varieties of applications in packaging molding with unbeatable performance improvements: real cooling cycle time reduction and running costs savings together with outstanding reduction of environmental impact.

1 ECODRY

Adiabatic Cooling System

Ecodry is a central closed-circuit Adiabatic Cooling System, designed as a replacement of old cooling tower technology. Ecodry is installed outdoors in order to reject to ambient the heat extracted from processes. This system provides direct cooling to all water consuming devices, such as hydraulic heat exchangers, extruder barrels, resin dryers, as well as water cooled air compressors and chillers, etc.

Main Features

- Maximum cooling water temperature: 30/35°C (85/95°F)
- Cooling capacity: 50 - 10000 kW (15 - 3000 tons)
- Process flow range: 10 - 2000 m³/h (50 - 9000 gpm)
- High Efficiency Adiabatic Chamber for air pre-cooling (internationally patented)
- Antifreezing self-draining configuration
- Large surface heat exchangers, with copper coils and aluminum fins with hydrophilic protection
- Axial fans with built in brushless EC inverter driven motors individually wired
- Modular design with preassembled stainless steel manifolds for interconnection
- Stainless steel structural frame and aluminum access panels
- Web-monitoring interface

Highlights

- Guaranteed operation, with minimum water consumption and maintenance even in extreme weather conditions up to 50°C (120°F) ambient temperature
- Safe winter operation without glycol down to -40°C (-40°F) ambient temperature
- High fan energy savings during partial load operation
- Compact design with minimum footprint required between units
- High reliability with electrical redundancy and 100% rust free materials

2 MICROGEL for Injection Molding

Temperature Control Unit with Chiller & Booster Pumps

Microgel is a super-compact mold cooling unit specifically designed for "cycle cooling time reduction". Combines a water cooled chiller with one or two high flow booster pump temperature controllers with heating elements and a free-cooling valve. Allows for researching and recording the best setting of flow rate and temperature for each zone, optimizing product quality with the minimum cooling time.

Main features

- More than 50 models, MONO or DUO (one or two temperature zones)
- Wide temperature range: -5 to 90°C ± 0.2°C (23 to 194°F ± 0.5°F)
- Chiller capacity: from 16 to 212 kW (4.3 to 60 tons)
- Heating Capacity: from 6 to 48 kW
- Booster pump per zone: from 1 to 140 m³/h (5 to 220 gpm) - inverter (VFD)
- Temperature, flow and pressure digital readings (to and from mold)

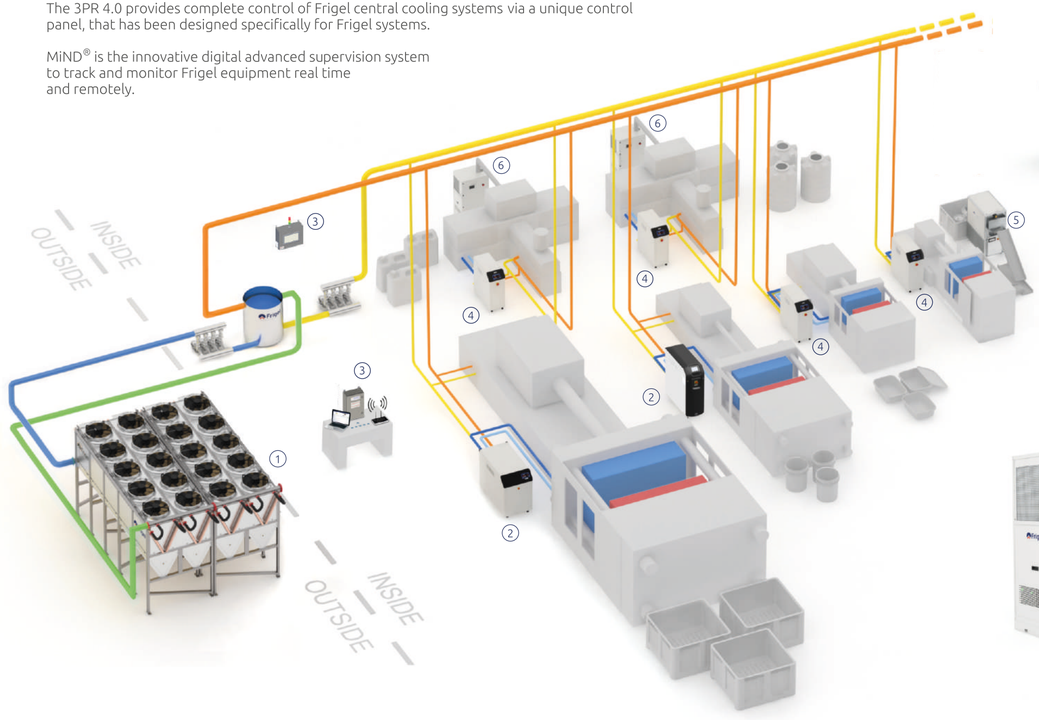
Highlights

- Cycle time reduction up to 25%
- Intelligent use of energy consumption
- High energy savings with automatic free-cooling
- Automatic mold draining
- Web-monitoring interface

3 NETGEL for industry 4.0

The 3PR 4.0 provides complete control of Frigel central cooling systems via a unique control panel, that has been designed specifically for Frigel systems.

MiND® is the innovative digital advanced supervision system to track and monitor Frigel equipment real time and remotely.



4 MICROGEL for Packaging

Microgel for packaging is a super-compact high performance mold cooling unit that combines, in one machine, a water cooled chiller with a high pressure booster pump temperature controller. It is designed specifically for "cycle cooling time reduction" in PET preform, caps and blow molding applications. Allows for researching and recording the best settings of flow rate and temperature that optimize product quality witthe minimum cycle cooling time.

Main features

- Temperature range: -5 to 30°C ± 0.2°C (23 to 86°F ± 0.5°F)
- Chiller capacity: from 20 to 212 kW (7 to 60 tons)
- Booster pumps: from 5 to 160m³/h @ 5 bar (20 to 1100 gpm @ 70 psi)
- Inverter driven pumps available

Highlights

- Cycle time reduction up to 25%
- High energy efficiency (pumps and compressors)
- Perfect repeatability
- Intelligent use of energy consumption
- High energy savings with automatic free-cooling
- Web-monitoring interface

5 CAP COOLER

Cap Coolers are specially designed for cooling caps directly from the molds and before they are discharged into collection boxes, thus reducing mold ing cycle times. The innovative cooling system provides constant quality and drastically reduces cap ovalization and deformation. There are 2 models available for up to 70000 caps per hour.

Main features

- All stainless steel product contact surfaces
- Variable speed drives for the fans and drum tumblers allow for easy adjustment for different product types, sizes and outputs
- Optional H13 HEPA air inlet filters

Highlights

- Easy to install
- Low energy consumption
- Suitable for different cap sizes and outputs
- Small footprint (0.95 m² / 10 ft²)

6 MOLD DRYER

Mold Dryers are designed to prevent moisture condensation on the mold surfaces due to low cooling water temperatures.

Main applications are in packaging fields:
- Extrusion blow molding
- Injection blow molding
- Injection molding

Main features

- 8 Models with air flows from 300 to 4000 m³/h (175 to 2355 cfm)
- Dehumidification system designed with moisture-absorbing desiccants using active metal silicate rotors
- Pre-cooler and post-cooler heat exchangers

Highlights

- Production independent of ambient conditions with constant quality
- Reduced maintenance costs and increased mold life
- Considerable energy savings compared to traditional drying systems

4 MICROGEL for Packaging - High productivities

Microgel RVM for packaging is a super high performance mold cooling unit with a high efficiency Bitzer screw compressor with variable speed drive that combines, in one machine, a water cooled chiller with a super high pressure and flow inveter-driven booster pump. It is designed specifically for "cycle cooling time reduction" in PET preform applications, as well as for other high flow and pressure molding reqirements.

Main features

- Temperature range: 7 to 28°C ± 0.2°C (45 to 82°F ± 0.5°F)
- Chiller capacity: from 146 to 585 kW (42 to 166 tons)
- Booster pumps: from 3 to 130m³/h @ up to 7 bar (130 to 580 gpm @ up to 100 psi)
- Inverter driven pumps and compressors
- Energy efficiency and process KPI (kW/kg) real time monitoring

Highlights

- High energy efficiency (pumps and compressors)
- Standard, cleanable shell-and-tube condensers
- Electromagnetic flow meter
- Intelligent use of energy consumption
- High energy savings with automatic free-cooling (optional)
- Web-monitoring interface

Frigel

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