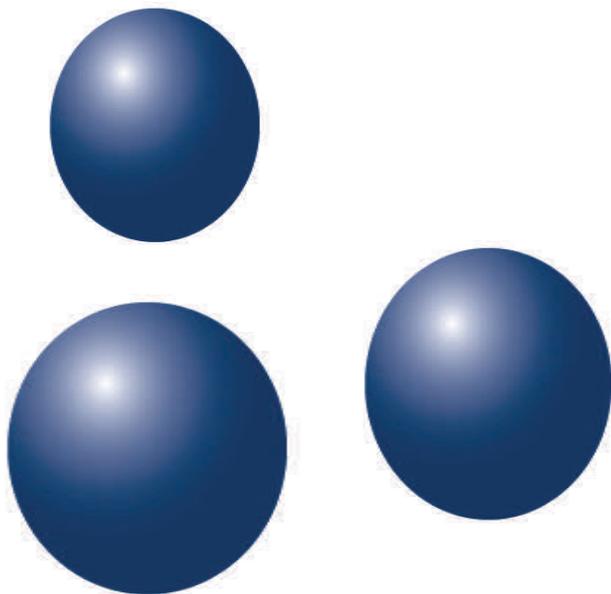


DMP CryoSystems®



www.cryosystems.com
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info@cryosystems.com



DMP CryoSystems has been in the manufacturing business for nearly two decades. We are a family owned and operated business that concentrates on offering quality equipment through meticulous design combined with exceptional customer service. Continuous improvement, largely from customer feedback, ensures the development of the best processing equipment available worldwide. We understand the importance of providing equipment to an industry that works 24/7 and expects nothing less from their equipment. For these reasons, the equipment we build is versatile, dependable, efficient, AMS 2750E compliant, and an irreplaceable asset.

We offer several types of cryogenic processors. The **CryoFurnace™** is the first and only cryogenic processor available with a temperature range of +1200°F to -300°F. The **CryoTemper™** which has a temperature range of +550°F to -300°F, continues to set the standard for which all other systems are judged. It remains the most efficient and versatile cryogenic tempering processor available in today's market. The newest addition to our production line, the **CryoFreezer™**, offers a temperature range of ambient to -300°F. Each temperature range/model can be built as a front load swing, front load guillotine, or top load chest style chamber. We have placed equipment around the world, so various incoming main power preferences are also available.

DMP CryoSystems is known for offering new and innovative ways to improve cryogenic processing. We customize all of our products to meet our client needs and demands. We continually strive to be on the cutting edge of technology in order to offer efficient cryogenic processing systems.

Bill Groschen, President,
Diversified Cryogenics, Burnsville, MN.
"DMP makes the best cryo-processor on the market hands down. We have two of their units".

Ed Minich, Plant Manager,
Specialty Heat Treat, Grand Rapids, Mi.
"I couldn't be more pleased with a piece of equipment. Thank you for the superb performance and dependability.... What an improvement in processing!"

Adam Weitzel, Owner,
Badger Cryogenics, Reedsburg, WI.
"Our CryoFurnace exceeded our expectations in operation and construction" (Badger Cryogenics



One of Two Processors built for the James Webb, Space Telescope Project

64 x 74 x 50, +/- 5 degrees uniformity, 28PT Recorder w/Math Functions, Hydraulic Door Action

The first and only cryogenic tempering chamber to have an upper limit of +1200°F, the **CryoFurnace™** is designed with the heat treat professional in mind. Increasing the LN2 valve size, air flow, and available KW over our **CryoTemper™**, allows this model to have the shorter cycle times required for production shops, and temperature uniformity to meet AMS 2750E. The **CryoFurnace™** is equipped with a purge valve to flush out the chamber's atmosphere at the beginning of a cycle. Inert atmosphere is enriched using a metered gas valve during operation as required to minimize scaling at elevated temperature. The load sensor is standard equipment on all **CryoFurnace™** models and designed to automatically influence the pattern profile, taking process deviation to a higher level of control. A long flexible T/C is inserted into the load or a dummy block and when the load sensor is "ON" it compares the process value to the load sensor value. If this result exceeds the settable limit, the profile is placed in hold and automatically released once the deviation is reduced.

Standard Features for the **CryoFurnace™**

- ⊙ Controls
 - Digital indicating programmable micro-processor based controller
 - Variable circulation drive control
 - SCR heater control with shorted alarm indicators
 - Operation condition lights/alarms
 - Pre-wired for computer communication
 - Integrated load sensor control
 - Inert atmosphere control loop
 - Inert Purge Gas Control
 - Heater element LED indicators
 - Easy access calibration port and T/C's
- ⊙ Safety
 - Pre-wired external alarm relay
 - High and low temperature limit control
 - Mechanical heater contact interrupt
 - Finger safe fusing and wiring
 - Emergency shut off LN2 solenoid
 - LN2 inlet strainer
 - Tower light alarm *
 - Door interlock *
 - Recipe deviation alarm
 - IEC wiring to industrial color and marking standards
- ⊙ Mechanical
 - 12 GA reinforced exterior shell
 - 12 GA 304 Stainless steel interior chamber
 - Back welded flange construction
 - 15 lb. per square inch loading
 - Fully welded interior wall penetrations
 - Anti-air entrainment exhaust system
 - Multi-layer insulation
 - Reinforced 12 gage sealing deck
 - Direct drive blowers with VFD
 - Survey port
 - Larger blower wheels
 - Increased KW heating



30 x 42 x 30 **CryoFurnace™** with I-Beam Hearth

*Some models, Optional

Temperature range of +1200°F to -300°F, with controlled Ramp / Soak heating and cooling.

From its inception, the **CryoTemper™** has set itself apart from the competition. It is designed from the ground up to be used in rigorous environments, delivering efficient and trouble free operation. The all metal construction takes on daily use and wears with ease. The insulation is rated well beyond the temperature range of the **CryoTemper™** and will last indefinitely. Since all cooling is from Liquid Nitrogen (LN2), there is no expensive compressor maintenance, ever. The LN2 turns to vapor inside an air plenum and is re-circulated inside the chamber. Forced internal air circulation ensures temperature uniformity throughout the chamber. The atmosphere in the chamber is displaced with nitrogen gas, usually before the chamber temperature is below Dew Point, hence no condensation. The tubular heaters warm the dry nitrogen atmosphere in the chamber, thus completing a fully controlled cycle to room temperature, eliminating the need for any rust preventive measures, or consequent cleaning. The industrial heat/cool controller is capable of heat cycles, cold cycles or a combination of cycles from start to finish. That's right, any thermal cycling from +550°F to -300°F with one handling in a single piece of equipment.

Standard Features for the **CryoTemper™**

- ◎ Controls
 - Digital indicating programmable micro-processor based controller
 - Variable circulation drive control
 - SCR heater control with shorted alarm indicators
 - Operation condition lights/alarms
 - Pre-wired for computer Communication
 - Heater element LED indicators *
 - Easy access calibration port and T/C's
- ◎ Safety
 - Pre-wired external alarm relay
 - FM approved high low limit
 - Mechanical heater contact interrupt
 - Finger safe fusing and wiring
 - Emergency shut off LN2 solenoid
 - LN2 inlet strainer
 - Tower light alarm *
 - Door interlock *
 - Recipe deviation alarm
 - IEC wiring to industrial color and marking standards
- ◎ Mechanical
 - 12 GA reinforced exterior shell
 - 12 GA 304 Stainless steel interior chamber
 - Back welded flange construction
 - 15 lb. per square inch loading
 - Fully welded interior wall penetrations
 - Anti-air entrainment exhaust system
 - Multi-layer insulation
 - Direct drive blowers with VFD
 - Survey port

*Some models, Optional



Custom built **CryoTemper™** for Gleason Works.

Temperature range of +550°F to -300°F, with controlled Ramp / Soak heating and cooling.

The **CryoFreezer™** is the newest addition to our equipment lineup. It is designed to compete with the freezer market head on, while still offering temperature uniformity using the proven construction materials of the **CryoTemper™** and **CryoFurnace™**. Standard controller settings make sure the temperature profile is followed within a specified process deviation limit, assuring the process value matches the recipe Set Point. Positive recirculation fans ensure temperature uniformity everywhere in the chamber. The use of liquid nitrogen as a cooling source keeps maintenance costs low and reduces the need for rust inhibitors and cleaning.

The Standard features of the **CryoFreezer™** model include:

- ⊙ Controls
 - Digital indicating programmable controller
 - Variable circulation drive control
 - Operation condition lights and alarm
 - Pre-wired for computer communication
- ⊙ Safety
 - IEC finger safe wiring to industrial color and marking standards
 - Circuit breakers
 - Independent low temperature limit control
 - Emergency shut off LN2 solenoid
 - LN2 inlet strainer
- ⊙ Mechanical
 - 12 GA reinforced carbon steel exterior shell
 - 12 GA 304 stainless steel interior chamber
 - Back welded flange construction
 - 15 Lb / square inch loading
 - Gas spring assist on chest doors less than 250lbs w/ manual locks
 - Pneumatic door opening and closing on chest doors over 250lbs
 - Pneumatic door operation on all Guillotine style machines
 - Anti-air entrainment exhaust system
 - 6 inch multi-layer insulation rated to -350F
 - Internal circulation direct drive blower with VFD



30 x 30 x 108 with Pneumatic Door and Strip Recorder



Custom built for a large international heat treater

Temperature range of ambient to -300°F , with controlled cooling only.

Custom Designed Rotary Hearth Immersion Tank



The rotary hearth pictured above is a custom built machine, designed specifically to meet a large aerospace manufacturer's need for efficiency and size. This four position rotary hearth freezer minimizes required floor space, delivers unsurpassed temperature uniformity and product throughput for your most critical components. It has a capacity to handle up to 36"Ø gears, each 24" tall and weighing 400 lbs.

The original design was to submerge product in D-Limonene as cold as -120°F . Exceptional temperature uniformity is achieved by means of a liquid nitrogen heat exchanger with a variable speed circulation pump and continuous part rotation. A modified version of this system uses only liquid nitrogen sprayed through jets along the inner chamber walls. Touch screen HMI is set up to offer "Full Automatic" operation in a Robot Cell, or manual control operation.



**Fully Automated
Immersion Quench
(as Low as -120°F)**



**Maximized production
in a small footprint**



**Could be used as a dry
chamber for colder tem-
peratures.**

Designed by request from an aerospace manufacturer. What can we design for you?



Automatic Switch-Over Manifold for Liquid Cylinders 2, 3, or 4 Positions

The **CryoSwitch™** is an invaluable automation device for companies that operate equipment using multiple cylinders instead of bulk cryogenic liquid systems. The **CryoSwitch™** manifold system automatically switches from an empty cylinder to a full cylinder, eliminating disruptions in the liquid supply for a wide range of applications including pharmaceutical and biological research. This control device maximizes product usage by completely drawing down a single cylinder before switching over to the next available cylinder in sequence. The **CryoSwitch™** is available for high and low pressure operations and can be configured to run with systems that are sensitive to pressure, temperature or liquid level.

Each factory-programmed **CryoSwitch™** has its own easy-to-use touch screen, and is capable of handling up to 4 liquid cylinders. The 2012 model has an upgraded and slightly larger touch screen, making it easier to operate. Custom systems are also available. **CryoSwitch™** systems can be adapted to any use wherever liquid cylinders are used.

Standard Features for the **CryoSwitch™**

- Requires standard 120V power source
- Easy to use front panel LCD Display
- Alarm system signals activation and depletion of last cylinder
- User adjustable set-point for Temperature and Pressure
- Industrial, all-steel construction
- Pre-Wired for external alarm or paging system



Older model **CryoSwitch™** on Floor Stand with Shroud Cover

2012 Model, 2 Position, wall mount **CryoSwitch™**

Common Machine Details

Chamber Size Models	Work Zone Basket	Vol. Cu. Feet	Exterior Dim. Door closed (W x D x H)	Door Style	CryoTemper/ CryoFurnace 460 Volt	Temperature Uniformity	Approx. Ship Weight
181224-15C/08C	14w x 10d x 20L	3	48 x 45 x 41	Chest	9/15	± 3/10	900 lbs
242436-15C/08C	20w x 22d x 32L	12	66 x 45 x 45	Chest	18/24	± 3/10	1200 lbs
242448-15C/08C	20w x 22d x 44L	16	78 x 45 x 45	Chest	18/30	±3/10	1400 lbs
303048-15C/08C	26w x 28d x 42L	25	78 x 51 x 51	Chest	21/30	±3/10	1900 lbs
303060-15C/08C	26w x 28d x 54L	31	90 x 51 x 51	Chest	24/42	±3/10	2100 lbs
304230-15S/08S	24w x 36d x 24h	21	74 x 68 x 75*	Front Swing	45/60	±3/10	2600 lbs
425442-15S/08S	36w x 48d x 36h	55	86 x 80 x 87*	Front Swing	60/90	±5/10	3400 lbs
304230-15G/08G	24w x 36d x 24h	21	74 x 69 x 120*	Guillotine	45/60	±3/10	2800 lbs
425442-15G/08G	36w x 48d x 36h	55	86 x 81 x 144*	Guillotine	60/90	±5/10	3700 lbs

* Height may change due to specified deck height dimensions



Front Swing Door, Chest Style Door, Guillotine Style Door

Popular Options and Customized Accessories

- ⊙ **Special Color**
- ⊙ **Modified Split Airflow:** 2nd Air Plenum in ceiling with heaters and adjustable air louvers.
- ⊙ **Roller Rails with Chain Guides or Moving Bridge:** Designed to match existing load cars.
- ⊙ **Atmosphere and Purge Valves:** Special purpose requirements.
- ⊙ **Load Sensor:** Integrated secondary temperature control loop. This feature, when used during a soak, guarantees that the core temperature (not just the surface) sees the minimum time at temperature specified by the customer. The load sensor can also be used during ramps to protect parts with extreme thickness variations or critical geometry.
- ⊙ **Door Interlock:** Temperature driven safety device that only allows access to the interior chamber after the temperature is within a safe operating range. This device can also be set to lock while Processing.
- ⊙ **Heater Element LED's:** Current sensors on each heater light when the heater is working properly. Heaters are like light bulbs and do burnout eventually. When they do, the LED indicators light the way.
- ⊙ **Shelving/Racking:** Adjustable shelves suitable for general product tempering or custom fixturing units can be designed for special purposes.
- ⊙ **Print Recorder:** Various recorders are available for operations that require paper recording.
- ⊙ **Monitoring/Programming Software:** We utilize Spec View™ SCADA software capable of communicating with up to 32 instruments per serial port. This software is auto configuring and through the use of standard windows drawing tools you are able to create graphical interface screens, trend charts, bar charts, recipe systems, etc. In addition, you can monitor and record operations, including historical replay, and operate/monitor equipment remotely.

- ⊙ **Swing Door Style Standards**

- Heavy duty door hinges and locks
- Tower light
- I-Beam hearth
- Custom deck height
- Charge car guide rails



Custom color, Swing Door CryoFurnace™



Custom color, Guillotine Door CryoFurnace™ with Roller Rails and Stationary Bridge

- ⊙ **Guillotine Door Style Standards**

- Tower light
- Custom deck height
- Charge car guide rails
- I-Beam hearth
- Pneumatic door lift
- Full open mechanical lock
- Horizontal door action for longer seal life



Simplifying operation and process control has always been one of our goals. Our new Level II Control Package offers just that. With on screen guides and automated batch entry much of the guess work is removed. View all settable pattern events, time and temperature at one time making pattern creation and editing almost fool proof. Our true PLC allows for full integration to existing demands and is upgradable for future requirements.

Some Custom Screens include:

- Maintenance screens allow the user to view the Machine Status and adjust PID settings.
- Program Overview screens allow the user to view and easily modify recipes.
- Alarm History screen shows all past and present alarms.
- Trend Charts screen shows the process value, recipe set point, load sensor temperature, and heat/cool outputs.

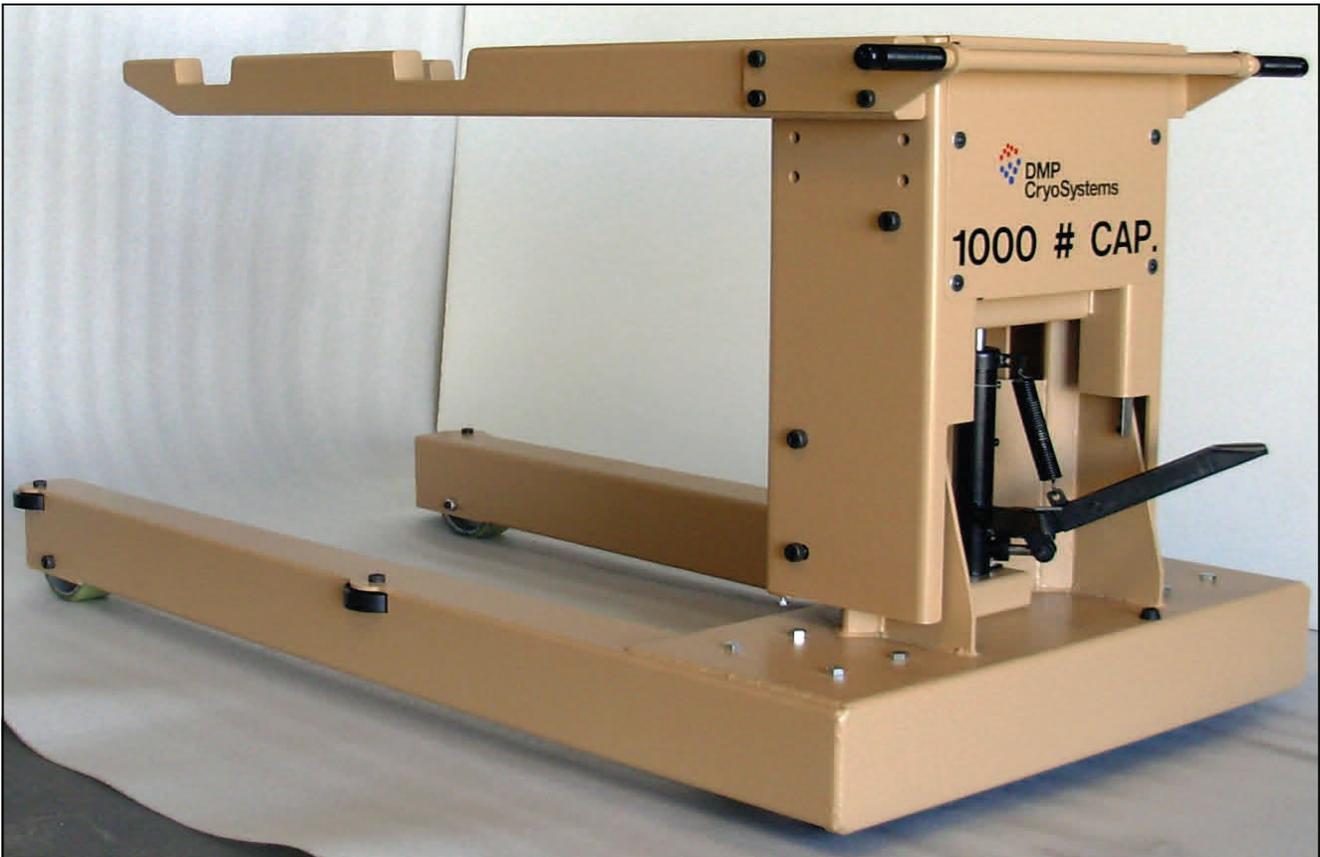
Key Features and Benefits:

- 8.5" touch screen (Standard)
- Customizable screens
- Historical replay
- Tamper-proof data storage
- Ease of programming
- Password security protection
- Program editing
- Ease of pattern selection
- Barcode entry
- Batch data reporting
- Remote monitoring and control
- Full network capabilities
- Tuning Graphs
- Alarm logging and time stamping
- Process and machine condition indicators providing easily understood feedback
- NADCAP Data Logging



Manual Loaders Built for the Operator. Designed for the Furnace.

After receiving several request for loaders and witnessing operators struggle with charging carts in the field, we decided to offer a manual loader that makes sense. We oversized the wheels for ease of movement on rough or dirty floors. The bumper guides are fully encased solid steel rollers making it impossible to "realign them". And each comes with a furnace saving height gauge giving your fixtures and furnace a chance.

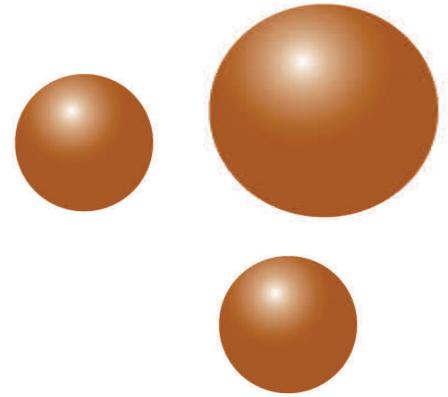


- Available in 1000, 1500 and 3500 Lb. capacities
- Oversized Floor Saving Phenolic Wheels
- Adjustable Fork Height- 3 positions
- Height Indicator Scale
- Fork Leveling Screws
- Heavy Wall Tubular Forks
- Fully Encased Bumpers and Axles
- Shin Saving Fold Away Pump Pedal
- Tapered Nose Section
- Custom Configurations and Sizes





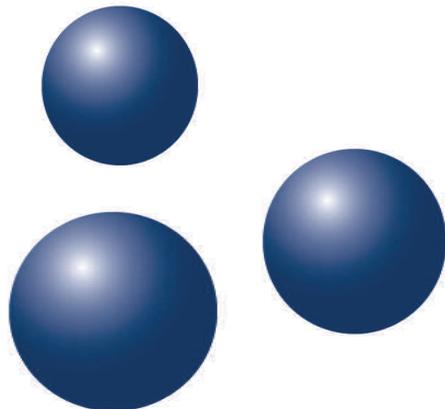
DMP CryoSystems®



Just a few of our satisfied customers



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