

HOW A CHILLER WORKS

KNOWING HOW A CHILLER WORKS CAN BE HELPFUL IN CHOOSING THE BEST SYSTEM TO MEET YOUR NEEDS

Chiller systems transfer heat from
Machinery • Equipment • Food
into the ambient air

Heat is moved and transferred by process fluids typically consisting of a mix of water and glycol

TWO CIRCUITS

Process fluids are moved through two cycles or circuits

REFRIGERATION

MADE UP OF 4 COMPONENTS

Compressor

Evaporator

Condenser

Expansion Valve

FLUID

MADE UP OF 3 COMPONENTS

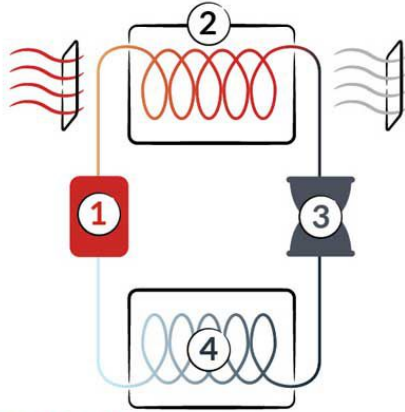
Pump

Heat Exchanger

Process Fluid Reservoir

REFRIGERATION

The refrigeration circuit removes heat from the process fluid into the ambient air



① COMPRESSOR

takes low-pressure, low temperature gas
then compresses refrigerant
into high-pressure, high-temperature gas

② CONDENSER

hot gas flows through coils
air flows over coils and gas condenses
refrigerant into cool liquid

④ EVAPORATOR

heat from process fluids moves into refrigerant and cycle restarts

③ EXPANSION VALVE

refrigerant flow is restricted and pressure rapidly decreases

refrigerant evaporates and interacts with process fluids

FLUID

The fluid circuit carries the process fluid around the object being cooled



① HEAT EXCHANGER

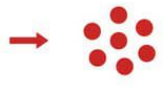
Heat is transferred from:



Equipment that needs cooling



process fluid



gas refrigerant

② PROCESS FLUID RESERVOIR

Holds cool process fluid

③ PUMP

moves cold process fluid from the reservoir into the heat exchanger and moves warm process fluid back into the chiller

DEIONIZED WATER



IONS IN COMMON WATER

^{20}Ca Calcium	^{56}Fe Iron	CO_3 Carbonates
^{28}Si Silicon	^{23}Na Sodium	Cl^- Chlorides
^{24}Mg Magnesium	^{55}Mn Manganese	SO_4 Sulfates
^1H Hydrogen	NO_3 Nitrates	OH^- Hydroxyl

High purity water with no charge in which the ions have been removed

For most industrial processes, these ions act as impurities. Using deionized water protects materials and equipment, produces more accurate lab results, saves energy, and stabilizes temperatures for a range of industrial uses.



Industrial Machinery



Glass Manufacturing



Car Engines



Fire Extinguishers



EDM and lasers



Laboratory Tests



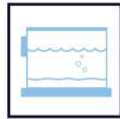
Biotech and Pharmaceutical Industries



Cooling Systems



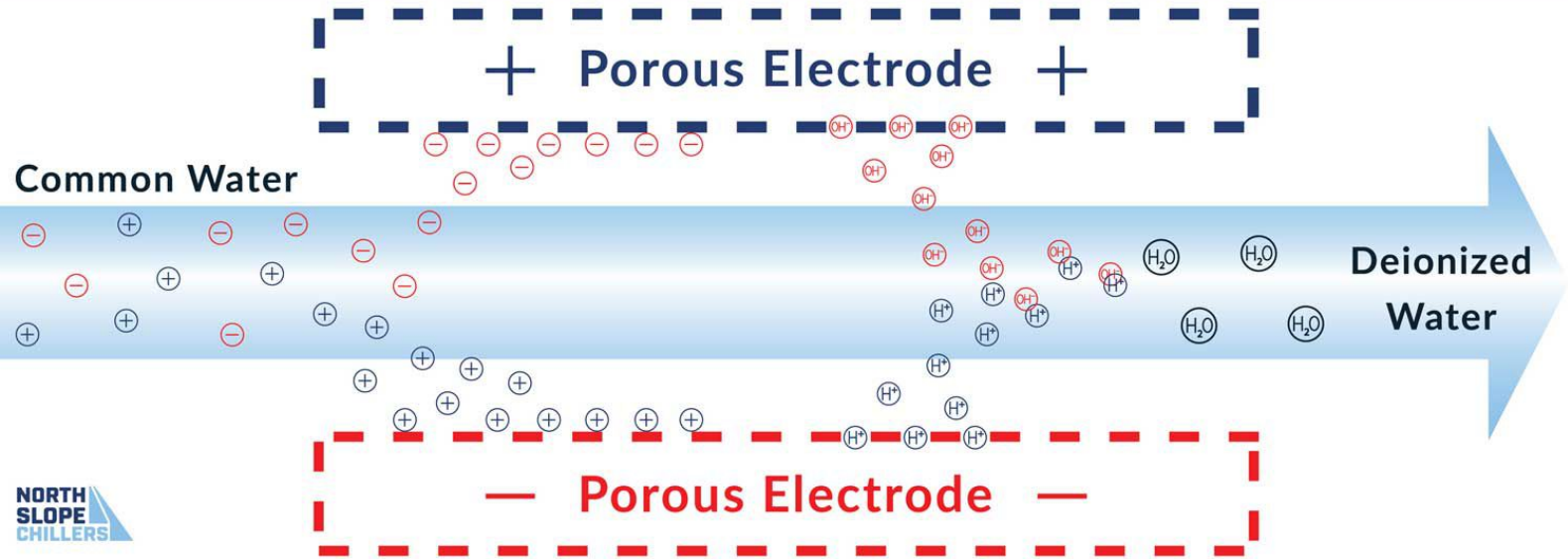
Pressure Cleaners and Steamers



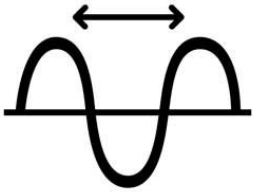
Aquariums

NORTH SLOPE
CHILLERS

ION EXCHANGE



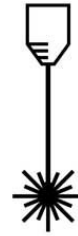
BENEFITS OF KEEPING LASERS COOL



*Maintain precise
wavelengths*



*Reduce
thermal stress*



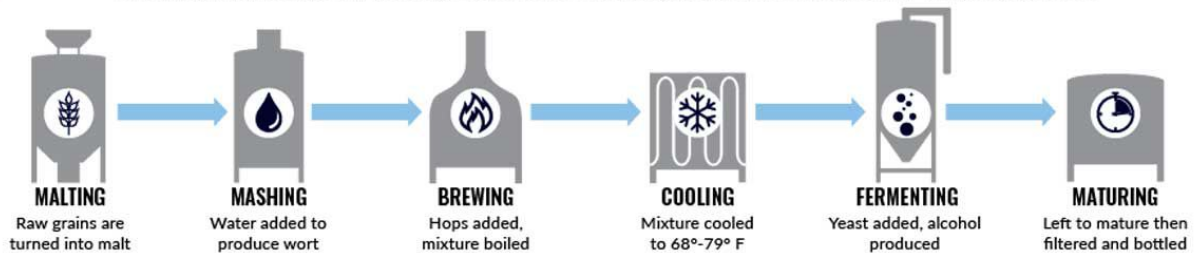
*Maintain
beam quality*



*Higher output
efficiency*

THE BREWING PROCESS → SCIENCE MEETS ART

Temperature, timelines, and ingredients all work together in the creation of the perfect brew

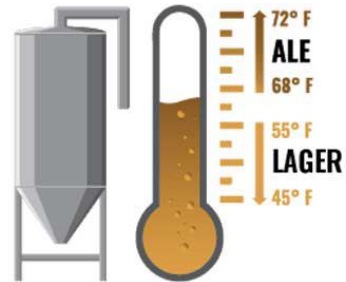


FERMENTATION

Temperature consistency is most important during the fermentation stage. The process of fermenting naturally produces heat.

If the brew becomes too hot, flavors can become compromised, alcohol levels change, and yeast can die completely.

Temperature also affects the type of brew being fermented. Brews need to be kept within certain temperature ranges in order to produce ales or lagers.

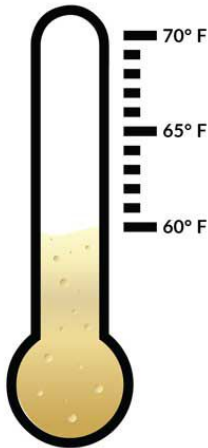


AGING AND STORAGE TEMPERATURES

WHITE WINE

Around 60° F

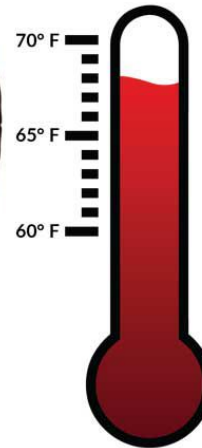
Preserves the acidity, flavors and aromas cultivated during fermentation



RED WINE

Around 68° F

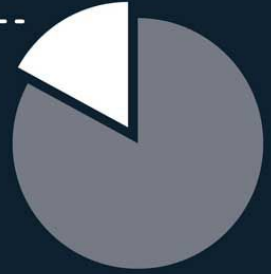
Preserves the color, mouthfeel, flavors and aromas cultivated during fermentation



DAIRY COOLING AND STORAGE

The EPA and USDA estimate that the United States generates over \$161 BILLION of food waste in a year*

Dairy products make up 17% of that waste



TEMPERATURE

Maintaining proper temperatures during dairy production reduces waste



During the pasteurization process**, dairy products are properly heated and cooled to destroy harmful pathogens and extend shelf life during storage and transportation

KEEP YOUR COOL

Maintaining industry standard chill temperatures of below 40° F protects dairy product health during storage and transportation

Chilling equipment is essential in storing and transporting dairy products at the ideal temperature



FOR MORE INFO:

North Slope Chillers line of custom chilling systems and proprietary chilling accessories are tailored to fit your cooling needs and protect your product from farm to table

www.globalindustrial.com | 1-888-978-7759

* www.idfa.org/issues/food-waste

** www.milkfacts.info



FROM HERE TO THERE

Most fresh food produced in North America is transported via highway trailers.

Air freight and cargo ships transport offshore products.

Within all three modes of transport, temperature sensitive products are susceptible to spoilage.



FOOD CHILLERS MAKE IT POSSIBLE



Using a food chiller during transport:

Prevents waste
Controls food maturation

Stops harmful bacteria growth
Extends food shelf life

Preserves taste
Saves money