Commercial and Industrial Bakeries have various process cooling requirements that include mixers, ice water chillers, retarders, rounding beds, fermentation rooms, etc. Over the past decade there has been a major shift in the baking industry to use secondary refrigerants like glycol when possible in lieu of primary chemical or ammonia based refrigerants to minimize environmental and safety impacts as well as decrease system operational requirements.

Secondary refrigerants commonly used in the baking industry include glycols, which in most cases are propylene (food grade) based where potential food contact may occur. Example of this arrangement is a system is commonly referred to as a chiller where glycol (secondary refrigerant) is cooled by a “primary” refrigerant source and then through circulating pumps distributed to end uses such as a mixer jacket. In this arrangement the impact of a leak at the end use device is of little consequence as far as refrigerant is concerned since the primary charge is contained in the chiller, and as an added benefit in many cases chillers are factory piped further decreasing refrigerant leakage potential even further over field erected systems. In many cases when an existing plant is retrofitted from multiple primary refrigerant systems to a common secondary system the charge is reduced by 75% or more allowing significant environmental liability reductions, better operating efficiencies, as well as maintenance and other operational cost savings. Systems can be designed to serve various levels of operation in respect to temperatures and flow rates so a single system can provide a mixer with 15°F glycol and also serve an ice water system at 33°F. Some instances require subzero temperatures and in these cases glycol is not always the best fit be due to heat transfer properties. In these instance a better choice may be to use Carbon Dioxide (CO2) as a secondary refrigerant, which is commonly referred to as a cascade system. CO2 has been used as a primary refrigerant for over 100-years although its high operating pressures have often been an area of concern. It has only been during the past decade or so that CO2 has reemerged and as a secondary refrigerant doesn’t present the same pressure challenges and offers the opportunity for reduced installation and operating costs in many cases. It is currently being applied in cold storage warehousing, freezers, and even grocery store refrigeration. One of the main drivers for using CO2 has been environmental regulations that are eliminating use of ozone depleting refrigerants and a concern that future regulation involving Global Warming Potential (GWP) may be around the corner, which assigns each refrigerant with an equivalent comparison to CO2 as a greenhouse gas emission. For example one pound of refrigerant R134a has a GWP 1370 times higher than CO2. For this reason use of secondary refrigerants will become more common as industry seeks to keep primary refrigerant inventories as low as possible.

For more information on secondary refrigerant cooling options or to have an audit performed at your existing facility please contact us.