



# Process Chiller Buyer's Guide

We are Challenging the Status Quo

Section Subject

**What Chiller Manufacturer's Don't Tell You**

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# The DARK SIDE of Chiller Manufacturing - What Chiller Manufacturers Don't Tell You



Our recent research has uncovered some concerning trends in the world of chiller manufacturing. On the following pages we will outline some of these trends and their impact on your chiller buying decision. As you review this information, please keep in mind that our intention is not to beat up on the competition. Our intention is to highlight key design items that, in our view, can have a moderate to significant impact on the value and overall performance of a chiller. When doing our research for this section of the Buyer's Guide, we specifically focused on items that competing manufacturers are not disclosing to prospective buyers.



**1. The ETL Listed Mark:** Similar to the UL mark that is found on many consumer electronic items, the ETL mark is used by many refrigeration equipment manufacturers. The ETL mark is a critical certification that the prospective chiller buyer must look for assuring that every electrical component used in the subject equipment meets UL or ETL standards of performance and reliability. Unfortunately, there is a growing number of US and foreign chiller manufacturers that either do not bear the ETL mark, or in some extreme cases, display the mark and make claims such as "ETL / UL Listed" or "ETL / UL Certified" with no real listing. The process to

legitimately bear the ETL mark requires extensive qualification and testing. Once a chiller line has been assigned the ETL mark, the manufacturer is required to maintain and submit to regular recertifications to maintain the ETL mark. If a process chiller project is to be permitted, many municipalities will require the ETL mark in order to approve the project. In some cases where electrical equipment is responsible for personal injury or property damage, insurance companies have been known to reject claims on the basis of non-ETL or UL listings.



**2. The MIXED DESIGN System:** In recent years, mixed design chillers have entered the market and they appear to be on the rise. These chillers are generally less expensive; however there are some tradeoffs that some manufacturers are reluctant to openly disclose.

The image to the left illustrates a mixed design chiller system. In this case, the chiller manufacturer has purchased a residential air conditioning duty condensing unit, mounted it on a simple steel frame, installed a chiller barrel and a pump. Although mixed design chiller systems do have their place on the market there are some things that an informed chiller buyer should know.

1. Although the condensing unit (top section) may openly display the ETL/UL mark, in most cases the entire chiller unit has not been ETL/UL listed.
2. Manufacturers of mixed design chillers will openly market these systems as process duty chillers; however a residential condensing unit is not engineered for a process duty workload. As a result, even with regular maintenance, air conditioning duty equipment has a life expectancy of about half compared to a process duty designed chiller.
3. Since mixed design chillers tend to be positioned in the market as a low cost alternative, manufacturers tend to use lower cost components and change vendors often. This can lead to more frequent breakdowns as well as longer lead times on replacement parts. Here are a few items to look out for:
  - ⇒ **Pump Impellers:** Tend to be plastic or nylon. Over a relatively short period of time these tend to lose pumping capacity or break down.

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- ⇒ **Pump seals:** Tend to be constructed of materials that can overheat or be susceptible to damage from some types of glycol or system cleaning chemicals.
- ⇒ **Evaporators:** The chiller evaporator is one of the most important components in the entire chiller system. Its job is to remove heat energy from the process fluid. On mixed design systems, evaporators tend to be constructed of substandard materials such as all copper, brass or even steel in some cases. These materials tend to be susceptible to premature failures. In some cases a damaged evaporator can also damage the chiller's compressor requiring replacement of the entire chiller.
- ⇒ **Indoor rated:** Although the condensing unit (top section) may be outdoor rated, the lower section is commonly not. Since many of these lower sections are not cleared by way of the ETL/UL listing process, owners may not be aware that these mixed design machines are indoor rated only. Installing mixed design chillers outdoors can result in failure of the system. In some extreme cases, these systems can be considered unsafe for outdoor use.
- ⇒ **Replacement parts:** Loyalty between the chiller manufacturer and component vendors is critical. Unfortunately, it is common for manufacturers of mixed design chillers to change component vendors regularly to maintain the best possible price point. Customers who choose to purchase mixed design chillers can run into difficulties getting the parts they need quickly, leading to extending downtime. It is also common to have manufacturer provided replacement parts show up that do not match the original part. This can also lead to extended downtime and increased repair costs.



**3. Made in the USA?:** Over the last two decades, some USA based chiller manufacturers have moved some or all of their production offshore to gain a competitive edge here at home. It has been argued that finding ways to make more profit, by way of getting workers to build things at a lower cost, is good for business. When it comes to process chillers, and the end users that depend on fluid cooling for their business operations, there is a growing argument that lower initial investments costs may not equal the best overall value. Here are a few things to consider:

- ⇒ **Design flexibility:** Producing products offshore naturally results in communication challenges. A customer's design request needs to travel long distances, time zones and in some case language barriers to get addressed. To offset these challenges, many companies who produce offshore dramatically limit their offering to a very narrow set of designs. These limitations may not be known until the end of a purchase and can add to the overall cost of the equipment.
- ⇒ **Security:** In the case of Mission Critical process systems that are highly dependent on the application and overall reliability of a process chiller, customers may need to share sensitive information with a chiller manufacturer. Chiller buyers who share such information, regardless of a Non-Disclosure Agreement (NDA), may be at risk if the design information happens to be shared with other (offshore) subsidiaries who are not subject to US laws. In some cases manufacturers may not fully disclose who the information is being shared with, creating an atmosphere of risk.
- ⇒ **Lead times:** The more geographical distance between the manufacturer and the chiller's final destination naturally requires a more extensive supply chain. The more complex the chain, the more potential for interruptions and increased lead times. These potential interruptions can happen as a result of many factors, including but not limited to weather, geopolitical problems, and customs. When these interruptions happen, lead times tend to increase which can add to project delays, or in the case of replacement parts, extended downtime.

**Designed and Manufactured in the USA**

The Next Generation of Process Chillers - ETL Listed

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