

# YORK® YZ Water-Cooled Magnetic Bearing Centrifugal Chiller



March 20, 2019 we hosted a webinar – Choosing Magnetic Bearing Technology for Improved Performance – A Case Study. If you missed the webinar, [access the full recording](#).

The following questions were asked during the session and the links will take you directly to the question and answer in the webinar recording.

**Is the UPS integrated into the chiller or is it separate?**

[Answer](#)

**Does the UPS have batteries?**

[Answer](#)

**What is the battery life?**

[Answer](#)

**How much damage will be caused if the UPS fails and you have a power failure?**

[Answer](#)

**What is the lifespan of the emergency bearings that are used when the power and UPS fail?**

[Answer](#)

**Do the YZ compressors utilize a gear drive between the motor and compressor like YORK's traditional compressors?**

[Answer](#)

**Is the lowest entering condenser water temperature 40 degrees F?**

[Answer](#)

**R-1233zd is used in the YZ chiller, can someone talk a little more about this refrigerant as a whole?**

[Answer](#)

**Is the refrigerant charge amount less compared to an HFC chiller equivalent?**

[Answer](#)

**What is the reason for using high speed induction motor in YZ?**

[Answer](#)



**Where are these chiller available?**

[Answer](#)

**How many YZ projects do you have?**

[Answer](#)

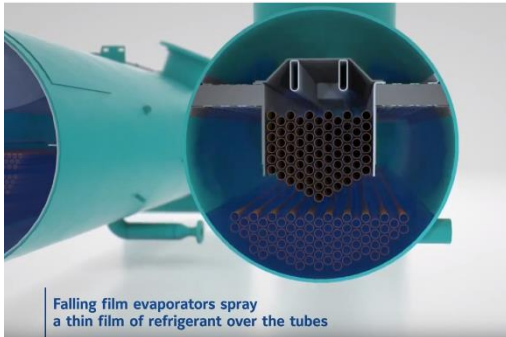
**What are the main differences between YZ and YMC<sup>2</sup> chillers?**

[Answer](#)

**Where can I find more information about the falling film design?**

[Answer](#)

Here is the [Falling Film video](#) as referenced.



**What is the speed of the compressor?**

[Answer](#)

**Can the operating data of the chiller be checked via mobile?**

[Answer](#)

The following questions were asked during the session but we ran out of time to answer. Please see responses below.

**Can you speak to the noise levels of the YZ compared to other magnetic bearing technology?**

The YORK® YZ chiller has sound levels similar to other magnetic bearing products.

**Is the variable speed drive a standard feature?**

Yes, the variable speed drive is standard on the YZ chiller. It is the only drive option for this product.

**What is the expected life of the YZ?**

Like other YORK® centrifugal chillers, YZ chillers are designed for 25+ years.

**Does YZ come with a standard harmonic filter?**

The YZ chiller has an optional harmonic filter to help meet the intent of IEEE.

### Is there a purge unit? If so what is the maintenance for it?

R-1233zd(E), the refrigerant used in the YZ chiller, is a low pressure refrigerant and a purge is part of the system design. There are very few maintenance items associated with the purge and the OptiView control panel will provide alerts if there are issues with the purge unit or if you are purging excessively – indicating a leak in the chiller.

### Is the YZ chiller available with R-134A or any other refrigerant?

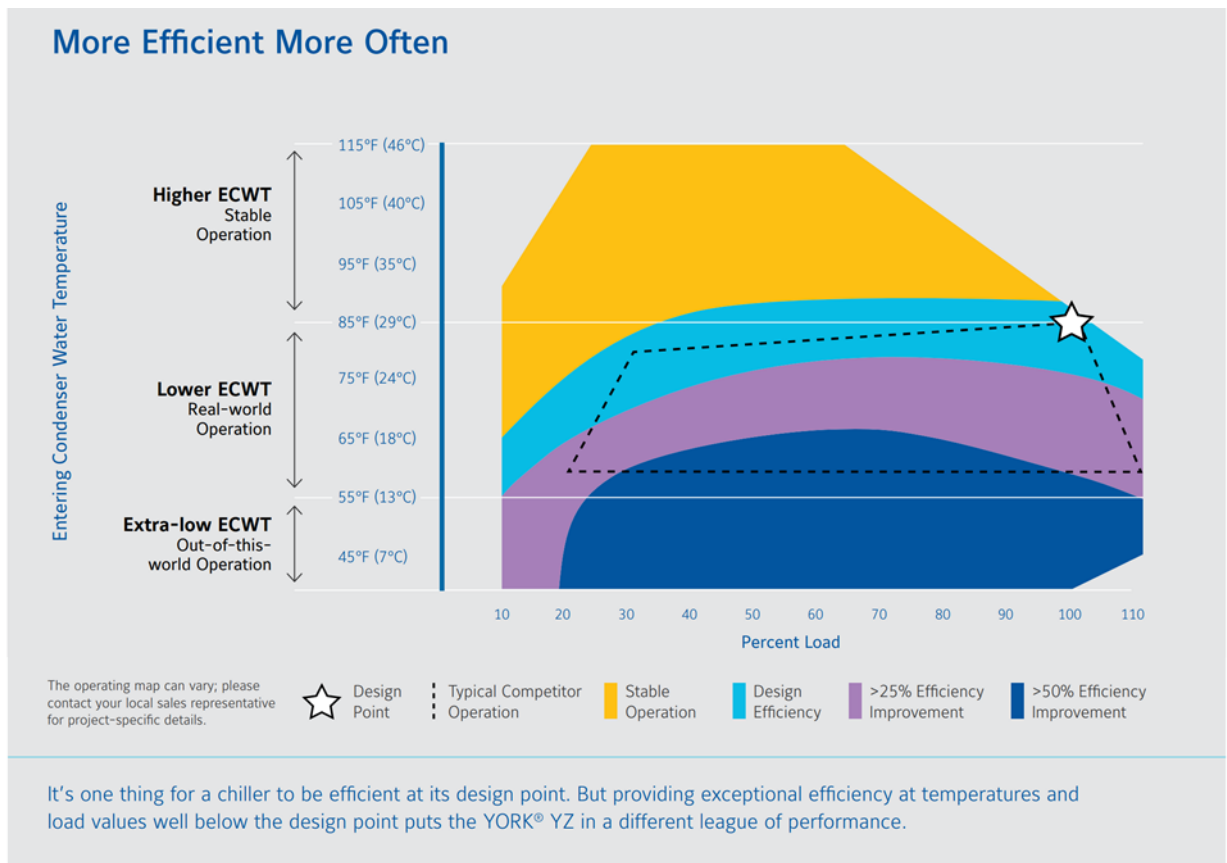
YZ is available with just the low-pressure, low GWP, non-flammable, low toxicity refrigerant R-1233zd(E). R-134a is available on our medium pressure chillers like YK and YMC<sup>2</sup>.

### How do you achieve inverted operation?

Evaporator and condenser temperatures run inverted, but the refrigeration cycle continues as normal. Without having to push oil through the system, the YZ chiller can operate at a lower differential pressure and still operate efficiently.

### What is the lower limit for YZ chiller operation? What is the minimum acceptable temperature?

The YZ chiller can offer temperatures as low as 40 degrees F (4.5 degrees C)  
View the Operating Range of the YZ chiller below:



**Does the YZ offer a 1 pass for series counterflow operation?**

Yes, the YZ is available in 1, 2, or 3 pass configurations and can be sold in SCF pairs.

**What is the UTA total CHW plant kw/ton for the case study?**

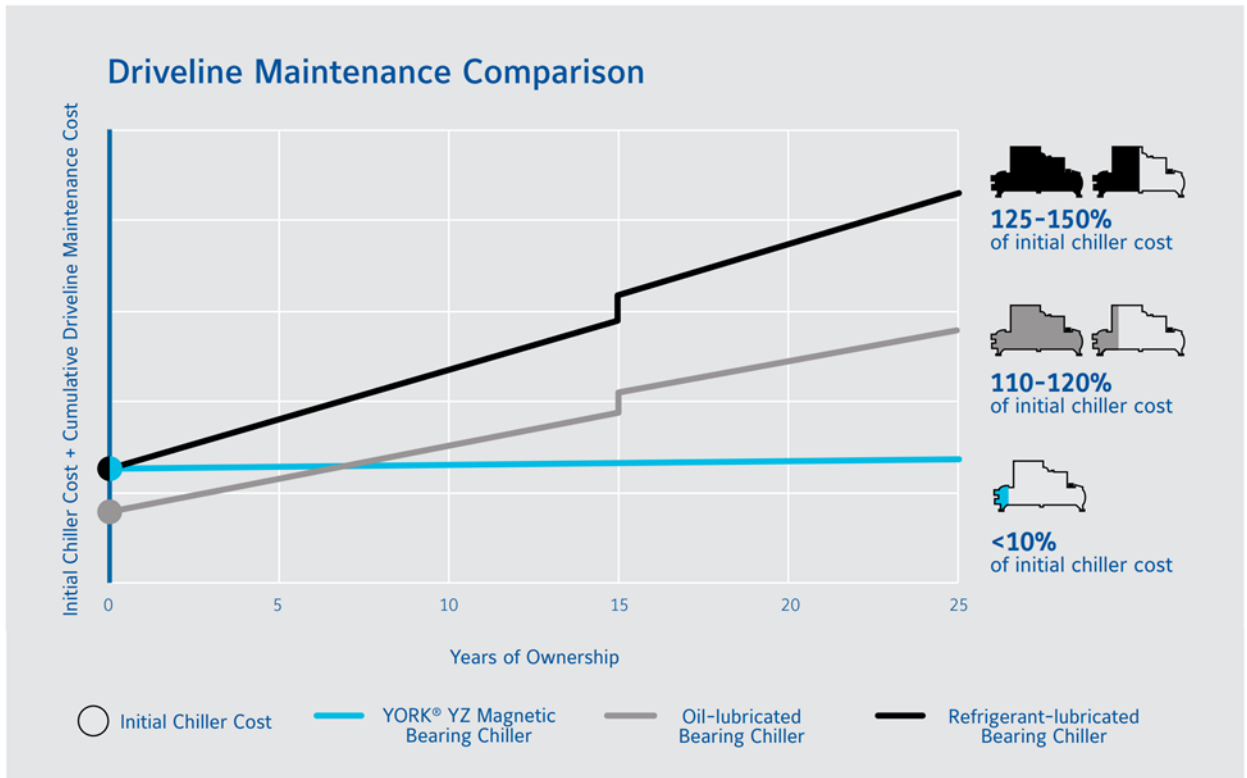
For this case study, we focused on the chiller kW/ton, which averaged less than 0.5 kW/ton

**Is the motor of the YZ chiller refrigerant cooled?**

The motor is hermetic and refrigerant cooled.

**Costs... what is the additional capital required per ton, the kw/ton savings, and difference in maintenance cost? Additionally, is there a change in design/useful life?**

There is an additional first cost compared to a traditional centrifugal chiller, somewhere around 20%. An installed YZ chiller can result in huge energy savings (15-20%) and lower maintenance costs. A traditional oil chiller will cost more than the initial chiller cost to maintain the driveline, for a YZ this will be less than 10% of the initial chiller cost. See the below chart for driveline maintenance benefits of the YZ chiller.



All centrifugal chillers require scheduled maintenance, such as cleaning tubes and checking refrigerant levels. The distinction in maintenance differences lie within the driveline. Without scheduled compressor teardowns, filter changes or any maintenance on a complex bearing lubrication system, the YORK® YZ is unrivaled in maintenance savings over the lifetime of the chiller.

## Why can't you drive down the condenser water temperature on a conventional oil-lubricated VFD drive chiller vs the mag-drive unit?

A conventional oil-lubricated chiller always has to maintain enough differential pressure to push oil up to the driveline to keep bearings lubricated. This typically causes the limit.

## What is the acceptable % change of flow rate acceptable across the evaporator bundle, in regards to staging chillers in variable flow situation?

The chillers can tolerate a 50% flow rate change in one minute that is typically associated with the staging on or off of an additional chiller; however a lower flow rate change is normally used for better system stability and set point control.

## Does the YZ compressor have inlet guide vanes?

No, the YZ does not require inlet guide vanes or pre-rotation vanes for capacity control. Our design uses a patented variable geometry diffuser and VSD combined. This results in less moving parts.

## Is this chiller cooler and condenser flooded?

The evaporator is hybrid falling film and the condenser is a traditional design including a sub-cooler.

## Does this chiller qualify as a water side economizer with it's low entering condenser water temperatures or do I still need to provide a PFHX?

Yes! This chiller eliminates the need for a WSE because of being able to run down to 40°F on the ECWT. You can use this to meet 90.1 without needing to provide a WSE saving on plant room space, added cost, and maintenance.

Access the University of Texas at Austin case study [here](#).

**University of Texas at Austin**  
Energy Center  
Case Study

The University of Texas at Austin is a leader in sustainability. In 2010, the university set a goal of reducing quality factor emissions by 20% by 2015. Through the next 100 years, UT Austin has grown to over 1,000 professors, 65,000 students and has grown to become a global leader. The pursuit of green, the university takes pride in its active attention to pursuing sustainable energy solutions.

In the pursuit of reducing the carbon footprint, the university has set the goal of an 80% reduction in CO<sub>2</sub> emissions. To achieve this goal, the university has implemented a number of energy efficiency measures. One of the most significant is the installation of a new chiller system. The new system has a capacity of 1,000 tons and is designed to operate at a lower condenser water temperature. This is more than twice the efficiency of a typical chiller. With all of the improvements in efficiency, the system can be used to provide cooling to 100% of the university's buildings.

Because the energy efficiency of the new chiller system is so high, the university has implemented a number of other energy efficiency measures. These include the installation of a new lighting system, the installation of a new HVAC system, and the installation of a new water treatment system. The university has also implemented a number of other energy efficiency measures, such as the installation of a new energy management system, the installation of a new energy monitoring system, and the installation of a new energy conservation program. The university has also implemented a number of other energy efficiency measures, such as the installation of a new energy conservation program, the installation of a new energy monitoring system, and the installation of a new energy management system.

**Johnson Controls**