

Induced Draft Cooling Tower: A Simple, Yet Useful Guide

 linquip.com/blog/induced-draft-cooling-tower

August 20, 2020



As you may know, a cooling tower is a heat rejection device that rejects waste heat to the atmosphere through the cooling of a water stream to a lower temperature. Most cooling towers use an electrical fan motor to create an air draft or airflow through the cooling tower. In this article, Linquip is providing valuable information on induced draft cooling tower which is a type of mechanical draft cooling tower.

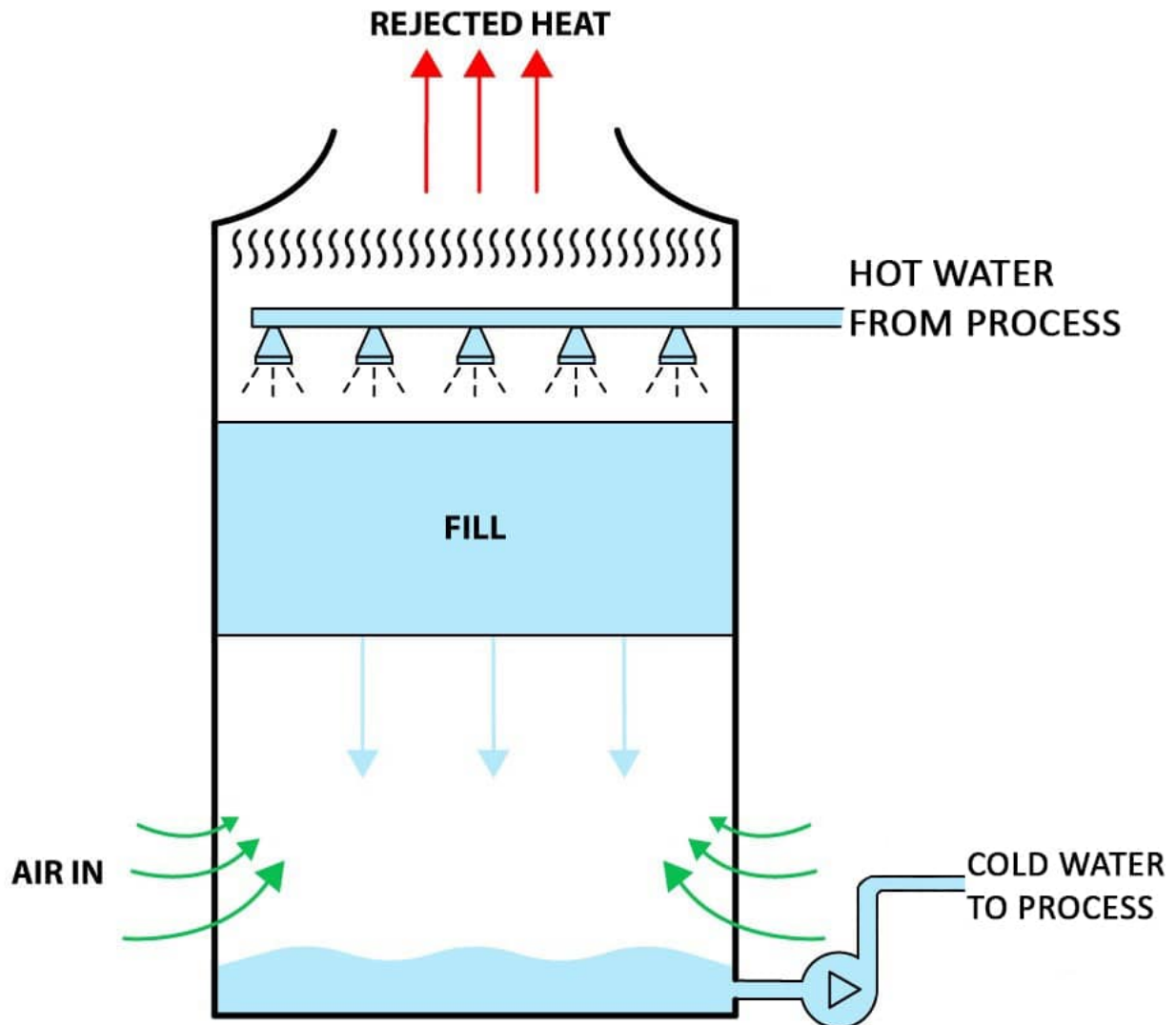
Our goal is to make this website as informative as possible – to provide you with all the data you may need about induced draft cooling towers so that you can make an educated decision. Linquip is your best choice of the solution when it comes to cooling tower questions. You can contact Linquip as soon as you have a question regarding Cooling Towers. We invite you to spend some time reading Linquip's article titled, "**What Is An Induced Draft Cooling Tower?**".

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What is an Induced Draft Cooling Tower?

An induced draft tower is a type of mechanical draft tower which has one or more fans, located at the top of the tower, that draw air upwards against the downward flow of water passing around the wooden decking or packing. Since the airflow is counter to the water

flow, the coolest water at the bottom is in contact with the driest air while the warmest water at the top is in contact with the moist air, resulting in increased heat transfer efficiency. Induced draft tower comes in square or round shape and the distribution of water may be done either by static branch system or by the sprinkler.



A schematic diagram of an induced draft cooling tower (Reference: savree.com)

Induced Draft Cooling Tower Working Principle

At induced draft cooling towers, the incoming cooling water is injected throughout the cooling tower with a spray distribution header. The spray is directed downwards to baffles for maximizing the time of contact of water with air. Maximizing heat exchange surface area is accomplished through the 'cooling water fill', made of PVC, wood, metal or other material. Air enters the interior of cooling tower through properly designed 'louvers'. Air is drawn through the baffled area by big fans and causes the cooling of water. In order to avoid the entrapment of water droplets in the leaving air stream, special device called 'drift eliminators' are used.



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Advantages of Induced Draft Cooling Tower

The induced draft tower generally offers the most effective and economical solution to most of cooling needs. Its numerous advantages are as follows:

- flexibility
- cost effectiveness
- easy installation and maintenance
- Low noise level
- constant airflow regardless of ambient air temperature
- adaptability to any water flow
- flexibility of operation by shutting some cells
- adaptability to high thermal performance
- compatibility with all types of structure – wood, FRP, concrete, steel
- compatibility with all types of heat exchange surfaces from splash grids to high performance film
- Ability to provide excellent protection against icing of the mechanical components.



Application of induced draft cooling tower (Reference: [pinterest.com](#))

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Comparison Between Forced Draft And Induced Draft Cooling Tower

The difference between an induced draft cooling tower and a forced draft one is the placement of the fan in order to meet the requirement of atmospheric air suction. In Induced draft tower, the fan is placed at the top and above the eliminator such that atmospheric air is circulated from the top to the bottom. However in Forced draft tower, the fan is placed outside the tower and at the bottom such that atmospheric air is circulated from the bottom to the top.

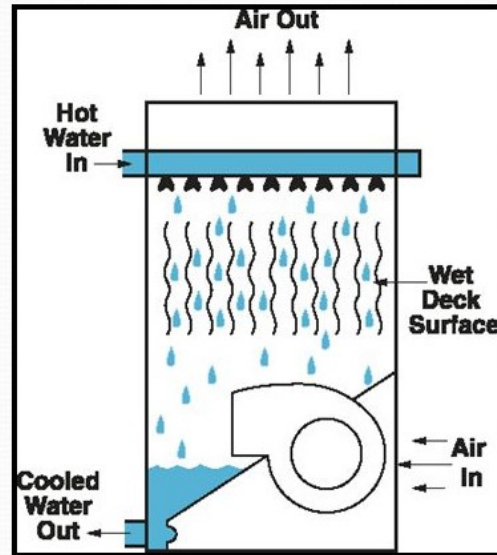
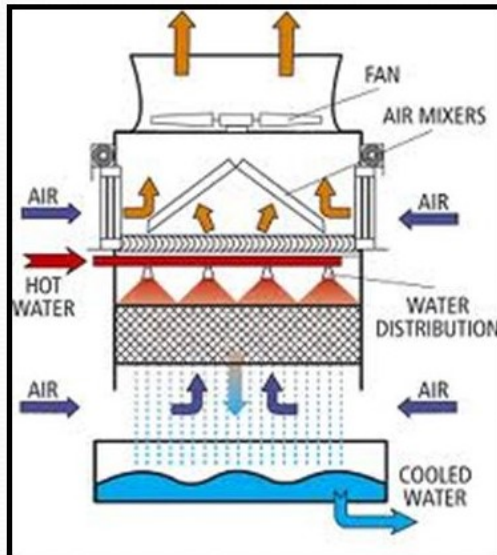
Some benefits of using induced draft tower over forced draft cooling tower are listed as below:

- More efficient compared to forced draft cooling tower
- Employs 50% less energy while comparing to forced draft design
- Contains a fan located on the top, which drives the air via the fills
- Placement of an inlet fan on the top of the cooling tower, which creates low pressure
- Location of the fan in the warm air stream provides excellent protection against icing of the mechanical components
- Forced draft designs typically require more motor power than equivalent induced draft towers

Induced Draft

vs.

Forced Draft



Difference between induced draft and forced draft cooling tower (Reference: [slideplayer.com](https://www.slideplayer.com))

Furthermore, induced draft towers work by use of axial fans while in forced draft towers, both axial and centrifugal fans can be used. The following table indicates advantages and disadvantages of each fan used in forced and induced draft cooling towers.

Advantages

Disadvantages

Induced draft – Axial fan

- | | |
|--|--|
| <ul style="list-style-type: none"> • Low absorbed capacity • little space required | <ul style="list-style-type: none"> • Higher noise level • Humid air stream drive |
|--|--|

Forced draft – Axial fan

- | | |
|---|--------------------|
| <ul style="list-style-type: none"> • Low absorbed capacity • Easy maintenance • Dry air stream drive | Higher noise level |
|---|--------------------|

Forced draft – Centrifugal fan

- | | |
|---|--------------------------|
| <ul style="list-style-type: none"> • Low noise level • Easy maintenance • Dry air stream drive | Higher absorbed capacity |
|---|--------------------------|

So, this is all you need to know about the induced draft cooling tower and its advantages. If you enjoyed your time on Linqip and want to share your experience with others, feel free to leave it in the comment section. We will be more than glad to have your viewpoint on the article. If you need any assistance with similar subjects, do not hesitate to [sign up](#) on our website where our experts are prepared to solve your issue.