

# DATA CENTERS

Advanced engineering solutions on energy efficiency.  
Sustainability and profitability.



Since 2010, the number of internet users worldwide has doubled, while global internet traffic has increased 12 times or 30 percent per year. With the increasing demand for data and digital services global internet traffic is expected to double by 2022, to 4.2 zettabytes (4.2 trillion gigabytes). Most of the IP traffic goes through data centers. Therefore, data centers and therefore the use of electrical energy are increasing. According to the Data Centers and Data Transmission Networks report published



by the International Energy Agency in 2019, the power consumption of data centers on a global scale in 2019 is approximately 200 terawatt-hours. This is approximately 0.8 percent of the total electrical energy consumed in the world.

The biggest power demand in data centers is due to cooling loads. This ratio corresponds to approximately more than half of the energy consumed in data centers. Considering all these, the most efficient and least lossy designs will be the most reasonable solution approach for data centers. **We take you beyond excellence in terms of efficiency, sustainability and profitability.**

## What Can We Do for You?

With our expertise in numerical analysis and simulations for high energy consumption due to cooling load in data centers, we examine the air flow in the data center room for you by working within your criteria and goals. We use computer modeling to ensure efficiency, sustainability and profitability in your projects.

For design improvements, we can produce high-precision feedback at reasonable time and costs. We have the experience of quickly evaluating computing capabilities and concepts that enable you to clearly see the effects of various options when making design decisions. We are at your service as an independent consultant to reach the best information.

We will help you with the following and more questions.

- Is the cooling system used in the data center room efficient?
- Which cooling systems will be efficient in the data center room and which ones should be preferred?
- Is hot air recirculating in the data center?
- Will it be cold air bypass? How is it prevented?
- How does leakages from raised floors change the quantity of cold air delivered to rack cabinets?
- In cooling the data center room, are the cooling capacities of the devices and the quantity of cold air sufficient or insufficient?
- Is the air flow and temperature distribution in the corridors homogeneous?
- In case of failure of cooling devices, will alternative devices show homogeneity in air flow and temperature distribution in the room?

First of all, we answer these questions quantitatively. Then, based on our experience, we go beyond the numbers to provide integrated solutions.

ALKAZAR,

TO BE YOUR MOST VALUABLE  
PARTNER...

## We Discover Innovations

We always renew ourselves in order to use the latest technology in the best way. We do not stop looking for information to make our analyses better every day.

## We Create Opportunities

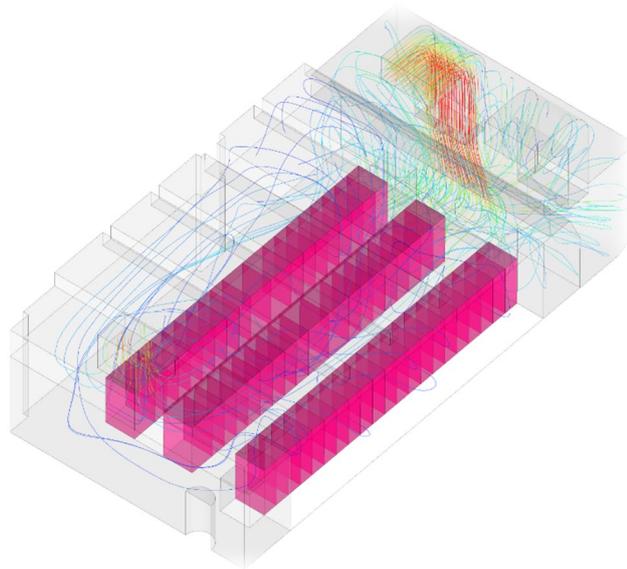
Our knowledge and experience as a result of our analyzes bring you unique designs.

## We Resist Difficulty

In order to solve the problems that may arise for your new designs or existing designs in the data center, we will examine the different experiments to be done with you for the best.

## We Meet Your Expectations

We try to get you to the most accurate results by analyzing each parameter from the beginning of the study.



## How We Work?

We use the Computational Fluid Dynamics (CFD) method for cooling system design, cooling loads, and placement of air conditioners and rack cabinets. We adapt your designs to accepted standards for data centers such as ASHRAE 90.4 by evaluating the problems before proceeding with the implementation of changes to your new designs or current designs.

A three-dimensional model of the data center room is created by adhering to the architectural and mechanical design provided by the employer. Depending on this, a mathematical model that we can apply the CFD method is created.

We analyze the air flow with the CFD method to provide the ambient temperature that the employer wants from us. We perform these analyzes by analyzing the highest heat transfer with air flow to be homogeneous. We follow all the development together by visualizing the analysis results.

The most critical support provided by our calculation tools, we can simulate every detail thanks to the modeling detail.

We take into account all these factors in our analyses, such as the layout and types of cooling devices, fan models, grill permeability, grid structures and cabin details. We use tools that show the effect of each parameter in design in real time. We visualize the analysis results in high resolution in the most understandable way. Our team, who has been involved in many projects for many years, is your biggest solution partner with their special presentations and experiences at every step of the project.