



Shaping Tomorrow's  
Built Environment Today

## **Standard 90.4** **Energy Standard for Data Centers**

### **Purpose**

Provides minimum energy efficiency requirements for the design and operation of data centers.

### **Significance**

Standard 90.4 offers a framework for the energy efficient design of data centers with special consideration to their unique load requirements compared to other buildings. This includes the maximum mechanical load component (MLC) and electrical loss component (ELC) values required for compliance which have been lowered in recognition of the industry's changing technologies and improved efficiencies.

This standard was developed under the guiding principle that data centers are mission critical facilities demanding careful attention to the potential impact of its requirements. Since 2019, ASHRAE Standard 90.1 (Energy Standard for Buildings Except Low-Rise Residential Buildings) has referenced Standard 90.4 as an alternative compliance path for large computer rooms, i.e. data centers.

### **Scope**

Standard 90.4 applies to data centers with a conditioned floor area greater than 20 W/ft<sup>2</sup> and IT equipment loads greater than 10 kW, and contains specific requirements for mechanical and electrical systems installed in new data centers or in data center additions/alterations that require new mechanical or electrical systems.

### **Additional Benefits/Facts:**

- Provides important guidance for energy-intensive data centers in the U.S that consume more than 90B kilowatt-hours of electricity per year (Forbes Technology Council, 2017.)



## Shaping Tomorrow's Built Environment Today

- Addresses a large number of facilities: “There are about 3 million data centers in the United States. That’s 1 data center for every 100 people.” (Office of Energy Efficiency & Renewable Energy, 2014.)
- Initiated to provide guidance for designers and operators of data centers, where energy efficiency and sustainability are key priorities.
- Is a code-intended companion to Standard 90.1 since 2013 and requires compliance with Standard 90.1 for building envelope, service water heating, lighting, and other equipment.
- Compliance is based on mechanical load component (MLC) and electrical loss component (ELC) in comparison to maximum allowable values.
- Incentivizes energy efficient designs that harness the increasing availability of improved systems and techniques to enhance data center performance without compromising availability or reliability.
- Provides informational charts, checklists, and example calculations to assist designers in calculating benchmarks values.