

Plastic Building Materials Can Reduce Power Use by Data Centers

Modern Materials Can Improve “Power Usage Effectiveness” (PUE)

Data centers that enable the Internet and artificial intelligence capacity use a growing amount of electrical power. This electricity comes from the same power grid used by other commercial/industrial buildings – and our homes – which can impact consumer utility costs (and other costs).

What is PUE?

Power use efficiency at data centers is typically determined using a widely accepted metric called Power Usage Effectiveness (PUE). PUE is a simple ratio: total facility power use divided by IT equipment power use.

$$\frac{\text{Total facility power use}}{\text{IT equipment power use}} = \text{PUE}$$

Total facility power

All power that enters a data center, e.g., power attributed to heating/cooling, electricity distribution, lighting, energy loss... including IT equipment.

IT equipment power

All power used in computing, storage, networking and related control components.

What is an Optimal PUE?

The lower the PUE number, the more efficiently the data center is using electricity. (The ideal but unrealistic ratio would be 1, meaning that all power use is dedicated to IT equipment.)

EXAMPLES

Highly Efficient Power Usage

PUE = 1.2

1,200 kilowatts = total facility power use
1,000 kilowatts = IT equipment power use
200 kilowatts = overhead power use

Inefficient power usage

PUE = 1.8

1,800 kilowatts = total facility power use
1,000 kilowatts = IT power equipment use
800 kilowatts = overhead power use

The more efficiently a data center uses electricity, the less power it will need from the power grid. Concurrently, the less power needed by a data center, the less impact on utility (and other) costs.

Can We Improve PUE?

Yes. Among other measures, extensive use of modern plastic building materials can help reduce the amount of electrical power used by data centers, thereby improving PUE and affordability. **Read on...**

Plastic Building Materials Are Used in Data Centers to Reduce Power Use

Multiple modern plastic building materials are increasingly used throughout data centers to reduce power use. For example, durable plastic components used in walls, floors and doors provide insulated barriers between hot and cold air zones, which helps cooling systems operate more efficiently. (Some materials also allow visual inspection of cables, ductwork, plumbing and conduit, much of which is also made with durable plastics.)

The durable plastic building components shown below work together to help reduce energy use and contribute to an improved PUE and affordability.

