POLARGY

Energy Saving Containment Systems for the Data Center

PolarPlex™
Containment Systems
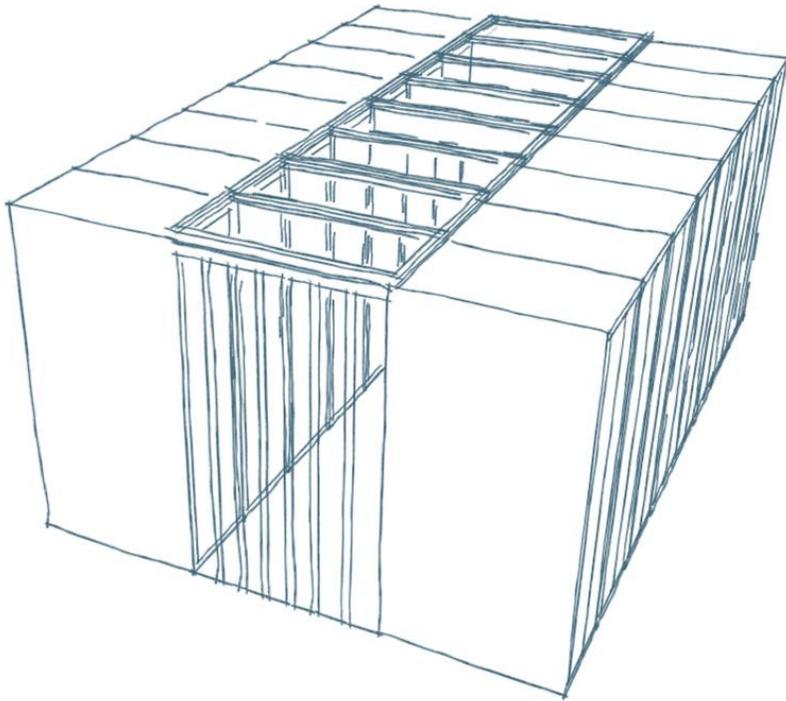
Saving Energy in the data center has become a crucial objective to companies as environmental pressures and energy costs increase. With cooling dollars accounting for up to 50% of total data center energy costs, improvements in cooling efficiency offer tremendous savings.

The key to capturing quick energy savings is to eliminate the mixing of cold supply air from hot exhaust air. Containment systems prevent this mixing and significantly improve cooling efficiency. Cold and hot aisle containment has emerged as a best practice for isolating airflow and reducing energy costs.

Cold and Hot Aisle Containment

Cold aisle and hot aisle containment allows cooling units to run at reduced capacity and still achieve ideal cooling conditions and energy cost savings. Industry analysts suggest effective containment of the hot or cold aisles will provide, for most users, the single largest payback among any of the current data center best practices.

What is Containment?

Aisle containment is a data center efficiency practice which utilizes physical barriers (PolarPlex™ curtains or panels) at the front, back, and top of the aisles to eliminate cold air loss and to stop hot air from penetrating into the cold aisle.

The concept is simple; eliminate mixing. The reduction in air mixing increases the return air temperature to the CRAC units. This raises the delta-T across the CRAC units, resulting in more efficient cooling. The isolation also eliminates hot spots and makes the supply air temperature more uniform across the server inlets. This increases reliability while allowing the supply air set points to be safely increased.

### Three Point Containment Strategy

Data center and facility managers can get more capacity from their data centers while spending less on energy by using these three effective measures:

- **Containing** hot or cold aisles with PolarPlex™ Containment Systems.
- **Monitoring** temperature, pressure and cooling system performance.
- **Controlling** cooling systems with real-time environmental information.
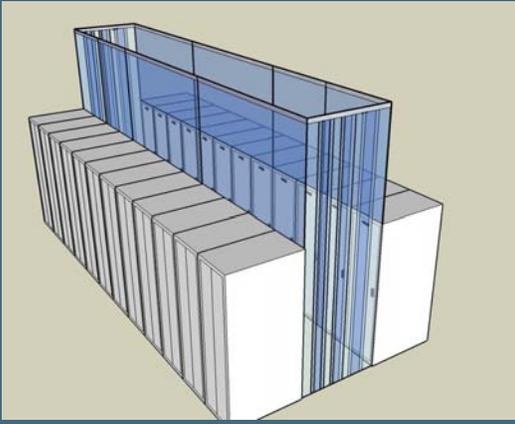
PolarPlex^{TM} Containment Curtains
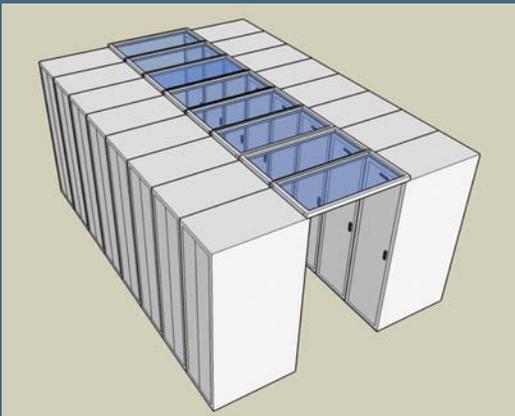
PolarPlex^{TM} Containment Panels
Horizontally Deployed

PolarPlex^{TM} Containment Panels
Vertically Deployed

PolarPlex^{TM} Containment Systems

Polargy's PolarPlex^{TM} Containment Systems are highly effective air isolation solutions for controlling airflow in the data center. The systems are comprised of soft-wall curtains and rigid panels. These eliminate hot spots and overcooled zones, saving energy while improving equipment reliability. Either hot aisle or cold aisle containment can be deployed with PolarPlex^{TM}. The curtains and panels feature a modular, flexible design allowing them to be tailored to meet specific site needs. Systems can be either self-installed or installed by Polargy.

## Solutions for All Ceiling Types

Curtains and panels can be deployed in a variety of ceiling types.

- For dropped ceilings, curtains are suspended from the grid system with an aluminum mounting track. The track easily attaches with T-bar brackets, making installation of curtains and strips simple and quick.

- In open ceilings the existing structure or additional unistrut framing is used for securing curtains or panels.

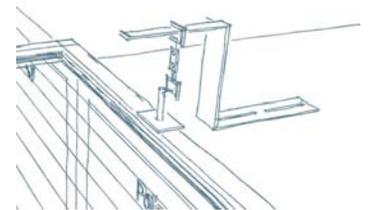- In tall ceilings panels secured to and supported by the racks is an option.

Quick and Durable Installation

PolarPlex^{TM} Curtains feature a hook-bead mounting system that allows the curtain strips to be quickly and securely hooked onto the aluminum mounting track. PolarPlex^{TM} Panels are mounted either vertically above the rack or horizontally across the aisle and are secured with brackets or suspended from the ceiling with cables. After installation, panels and curtains can be easily removed and re-installed.

Lightweight Panels and Curtains

The Containment Systems are light-weight, durable, and easy to handle.

- The panels are constructed of rigid twinwall polycarbonate sheets secured with rigid aluminum tube framing.

- Twinwall material provides excellent insulation between hot and cold zones.

- Panels are clear, letting light pass for visibility in aisles.

- The soft-wall curtains are made of a transparent, fire safe vinyl.

- Strip curtains are used for aisle end doorways.

- Swing door and sliding door options are available.
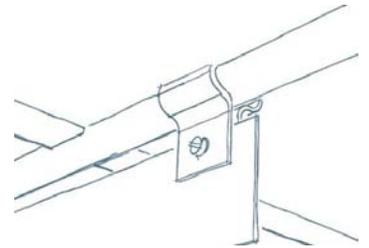
T-bar bracket for dropped ceiling

Z-bracket for rack supported panels

PolarPlex^{TM} and Fire Safety

Polargy understands how to deploy containment solutions while complying with fire detection and fire suppression requirements. A combination of fusible links, fire safe materials, and physical barrier layouts are used to achieve compliance with fire marshal and insurance requirements.

PolarPlex™ Containment Curtain Specifications

Materials:

Standard Vinyl	Formulated to resist yellowing, curling and cracking in data center environments.
Special PVC Film	Designed for more extreme requirements. Meets ASTM Class 1 flame spread and smoke test. It is also designed for the static-sensitive areas near equipment and people.
Mounting Track	Extruded anodized aluminum

Colors: Clear, frosted

Weights:

20 mil	0.125 lbs/square foot
40 mil	0.25 lbs/square foot
60 mil	0.375 lbs/square foot
Aluminum track	1.0 lb/linear foot

Fire Safety:

ASTM-E84 Class A/1 and Class B/2	Standard Vinyl meets Class B/2 and Special Alloy Vinyl meets Class A/1 of ASTM-E84 flame spread and smoke development test.
Fusible Links	Designed to release at a specific temperature, 135°F or 165°F. Used to hold the PolarPlex™ curtains in place and have been accepted by fire marshals for curtain deployments.

Curtains

Panels

PolarPlex™ Containment Panel Specifications

Materials:

Twinwall Sheets	6mm clear, two-wall polycarbonate
Frame System	Extruded 1" profile anodized aluminum

Colors: Clear, bronze, smoked grey

Weights:

2' x 4' PolarPlex™ Panel	7.5 lbs
Frame System	Between 0.258 and 0.426 lbs/linear foot
Twinwall Material	0.266 lbs/square foot

Fire Safety:

ASTM-E84 Class A/1	Polycarbonate sheets meet Class A/1 rating for ASTM-E84 flame spread and smoke development test.
Fusible Links	Temperature set points at 135°F or 165°F. They are used on the PolarPlex™ across aisle panels.

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About Polargy

Polargy is an energy efficiency company that provides airflow management solutions for mission critical data centers. Polargy's product portfolio includes PolarPlex™ Containment Systems, monitoring and control systems, PolarRack™ server cabinets, and consulting services. Polargy's emphasis on cooling performance helps data center operators and facilities managers achieve energy efficiency gains and extend the life of their data centers.