Cold Aisle Containment Solutions

A cold aisle containment system physically encloses an aisle, trapping the supply air inside the aisle.

Containing an entire row of air can improve capacity and energy efficiency by reducing by-pass airflow.

All Tate ContainAire® products work together to provide a seamless energy efficient containment system.

Eliminate Server Leakage
Constant airflow with variable loads can force air through servers even when they are idle, wasting energy.

SmartAire P eliminates leakage by modulating the airflow in the cold aisle so that a zero static pressure differential is maintained. See pages 14-15 for more information.

Cold Aisle Configurations
A cold aisle containment system can be created using ContainAire Partitions or a Hard Roof. Our hard roof keeps the cool air closer to the equipment and SmartAire P helps eliminate server airflow leakage.

ContainAire partitions can be used around the top of the racks provided there are solid ceiling tiles in place over the aisle.

Cold Aisle Option:
ContainAire hard roof with single or dual sliding doors

Cold Aisle Option:
ContainAire hard partitions with single or dual sliding doors

Cold Aisle Option:
ContainAire soft partitions with single or dual sliding doors

Cold Aisle Option:
ContainAire single or dual sliding doors with directional airflow panels

Cold Aisle Option:
ContainAire soft partitions with strip doors
Hot aisle containment isolates hot air from the room and provides a return path to the plenum. The entire room can be cooled using perimeter CRAC units, with the exhaust air being isolated to keep it from mixing with the cool air in the rest of the room.

By containing the hot aisle, the two air streams are kept separate. It segregates supply and return air to provide predictable airflow temperature to equipment.

**Increase Productivity**

OSHA requirements limit the length of time a person can work in elevated temperatures, which could mean reduced time for a technician to be able to complete work in a hot aisle.

SmartAire T provides on-demand airflow in the hot aisle to bring the temperature down so that continuous work can be performed. See pages 16-17 for more information.

**Hot Aisle Configurations**

A hot aisle containment system will need to use the ContainAire partitions around the top of the racks since the hot air needs to exhaust through the ceiling return grilles. These systems can be used with any door option. SmartAire T allows for continuous work in a contained hot aisle.

**Hot Aisle Option:** ContainAire soft partitions with single or dual sliding doors

**Hot Aisle Option:** ContainAire hard partitions with single or dual sliding doors

**Hot Aisle Option:** ContainAire soft partitions with strip doors
Tate’s ContainAire™ Dual Sliding Doors are the ideal solution for both cold and hot aisle containment designs. Combining cost-effectiveness with ease of installation, the no threshold design eliminates tripping hazards, and complement data center designs.

**NFPA 75 2013 Requirements**
The multiwall panel insert option meets new NFPA requirements which state that the materials "shall have a flame spread index of 50 or less" per ASTM E84 or ANSI/UL 723.

**Installation**
ContainAire Dual Sliding Doors come pre-assembled, having been expertly engineered to facilitate a smooth installation process. Frame components are provided pre-assembled and are easily connected to a header rail which secures the assembly together. The assembled door frame is then secured to the end cabinets and raised floor.

**Features & Benefits**
- No threshold design prevents tripping
- Perimeter compression gaskets efficiently seal and minimize air leakage
- Sturdy aluminum framing
- Multiwall panel option adheres to new NFPA codes
- Ergonomically designed with angled handles to reduce pinch points
- Easy installation with integrated door slide locks

Clear or Multiwall Polycarbonate Viewing Panels

80.0” (203cm)
Contiene Aire Dual Sliding Doors
Pre-Assembled for Easy Installation

View Panel Options
- Clear Polycarbonate
  - Fully transparent
  - AST D-635 listed
  - 6mm thick with edge-sealing gaskets
- Multiwall Polycarbonate
  - Semi-transparent
  - Compliant to the new NFPA 752013 requirements
  - ASTM E-84 and ASTM D-635 listed
  - 6mm thick with edge-sealing gaskets
  - UL 94 listed

Hardware
Standard features include:
- Door slide locks
- Door stop bumpers
- Angled door handles
- Spring loaded double ball door catch
- Auto-close available

Dimensions
- 90.6"w x 80.0"h x 4.85"d
  (230cm x 203cm x 12.3cm)
- 31.5" (80cm) max threshold width
- Fully supported by floor with rack attachments for lateral stability
- Custom sizes available

Weight
- 200 lbs (91kgs) – Clear polycarbonate
- 140 lbs (64kgs) – Multiwall polycarbonate

Finish Options
- Clear Anodized
- Black Anodized

Unique angled handle reduces pinch point
Integrated door slide-locks hold doors closed
**ContainAire Single Sliding Door**

*No Threshold Design for Hot and Cold Aisles*

**Features & Benefits**
- No threshold design prevents tripping
- Factory installed perimeter compression gasket system
- Sturdy aluminum supports
- Custom attachments (locks, stays)
- Side panels attach easily
- Easy installation
- Ergonomically designed with angled handles to reduce pinch points
- Auto-close option available

**Sliding Options**
- Left (LD)
- Right (RD)

**Dimensions**
- Custom sizes available on request
- Standard: Height 80" (203cm)
  - Width 90.6" (230cm)
  - Depth 4.85" (12.3cm)
- Max Threshold: 39.25" (99.7cm)

**Finish Options**
- Clear Anodized
- Black Anodized

**View Panel Options**
- Clear Polycarbonate
  - Fully transparent
  - ASTM D-635 listed
  - 6mm thick with edge-sealing gaskets
- Multiwall Polycarbonate
  - Semi-transparent
  - Compliant to the new NFPA 75 2013 requirements
  - ASTM E-84 and ASTM D-635 listed
  - 6mm thick with edge-sealing gaskets

**Right Sliding Door**

39.25" (99.7cm) Max Threshold

80.0" (203cm)

90.6" (230cm)
ContainAire Strip Door
Cost Effective Overlapping Solution for Sealing Aisle Ends

Features & Benefits
• Modular design (field adjustable)
• 4’ (1.2m) standard width
• 96, 144, 192 inch drop down length (229cm, 366cm, 488cm)
• UL listed fire suppression links
• 360 degree ceiling attachment
• Overlapping vinyl (prevents leaks)
• Temperature release point
• Toolless assembly and installation

Fire Resistant Vinyl
• 12” (30cm) wide strips, with 2” (5cm) of overlap on each side
• Vinyl meets requirements of:
  o UL 94 V-0
  o NFPA 2009
  o CPAI-84
  o NFPA 701
  o 1,000 hours U. V. ASTM Weatherometer
• AMI-TUF TR curtain meets requirements for NFPA 2013 sections 75

Track
• Clear Anodized
• Black Anodized
• Single Splicer included for connection to neighboring track

Fire Suppression Link
• Listed by Underwriters Laboratories
• Mechanical heat activated.
• Maximum load = 45lbs (20.4kgs)
• 135°F (57°C) Release point

Lengths
Modular heights to fill the following gaps:
• 0 - 96” (0 - 229cm)
• 96 - 144” (229cm - 366cm)
• 144 - 192” (366cm - 488cm)

Pivot and Grip Installation
Tate ContainAire Soft Partitions, for use in hot and cold aisle applications, have aluminum tracks with overlapping fire resistant vinyl sheets. Equipped with fire suppression links, the partitions attach to a drop ceiling T grid with a spring steel twisted on lock. Tate ContainAire partitions do not require tools for assembly and are easy to modify. The unique connection design and overlapping curtains provide a seamless partition, resulting in an improved containment system. Tate’s distinctive difference is the ability to adjust the partitions at any location using our Pivot and Grip installation method, without disassembling the rest of the row, saving both time and money.

Features & Benefits
- Modular design (field adjustable)
- Overlapping design for improved air sealing
- 360 degree mounted fire suppression link equipped hanger and the partition frame
- Pivot and Grip vinyl assembly method allows for easy installation and adjustment
- Toolless assembly and installation
**ContainAire Soft Partitions**

**Fire Requirements**
- Fire resistant vinyl meets the requirements of
  - UL 94 V-0
  - NFPA 2009
  - CPAI-84
  - NFPA 701
  - 1,000 hours U. V. ASTM Weatherometer
- AMI-TUF TR curtain meets requirements for NFPA 2013 sections 75
- UL rated fusible link
- Mechanically activated under thermal stress at 135°F (57°C) to release system

**Ceiling Attachment**
- Spring steel twist-on to lock securely onto the ceiling
- Mounting hardware allows for a 360 degree mounting of the fire suppression link equipped hanger and the partition frame

**Lengths**
Modular heights to fill the following gaps:
- 0-36” (0 - 91cm)
- 36-96” (91cm - 244cm)
- 96-144” (244cm - 366cm)

**Standard Rail Length**
- 4’ (1.2m)
Hard Partitions
Versatile Partition with a Rigid Design

Tate ContainAire Hard Partitions are an exciting alternative to soft partitions. Constructed of anodized aluminium, the partitions can be customized to seal numerous gap sizes and areas. Tate’s Hard Partitions easily attach to other ContainAire products when available.

Arriving with preassemble panels and supplied brackets, installation is quick and simple. The ContainAire® Partition kit includes all of the components and brackets required to assemble and install the hard partition system.

Features & Benefits
• Modular design (all parts screw together)
• Transparent or semi-transparent panel
• Pre-assembled for easy installation
• Partition frame available in anodized aluminum
• Compression gaskets efficiently seal and minimize air leakage

Close up of Corner Connection
Hard Partitions

Custom Sized for Each Application

View Panel Options

- Clear Polycarbonate
  - Fully transparent
  - ASTM D-635 listed
  - 6mm thick with edge-sealing gaskets

- Multiwall Polycarbonate
  - Semi-transparent
  - Compliant to the new NFPA 75 2013 requirements
  - ASTM E-84 and ASTM D-635 listed
  - 6mm thick with edge-sealing gaskets
  - UL 94 Listed

Dimensions

- Custom sizes
- Max Height 96” (244cm)
- Max Width 48” (122cm)
- Depth 1.575” (4cm)

Finish Options

- Clear Anodized
- Black Anodized

Example of containment design with ContainAire Hard Partitions and Single Sliding Door
ContainAire Hard Roof
Energy Efficient Solution for Cold Aisle Systems

Tate’s unique hard panel roof fully segregates hot and cold air, improving the cooling capacity of any data center. It attaches to the top of the rack, fully supported by the racks, and lies flat to avoid interference with other overhead obstructions and extrusions. Should a fire occur, the roof panels drop away to allow overhead suppression system to work within the aisle.

Incorporating clear or black anodized aluminum tracks, Tate’s hard roof has been engineered to provide long lasting results. The ContainAire hard roof kit includes all of the components and fasteners required to assemble and install the roof containment system.

Features & Benefits
- Pre-assembled sections for quick easy installation
- Drop away tiles allow for use under water sprinkler system when permitted by code
- 4’ (1.2m) and 6’ (1.8) foot aisle widths
- Thin profile to prevent overhead obstructions
- Modular design works with any aisle length
ContainAire Hard Roof

Roof Design
• Aluminum tracks available in black or clear anodized aluminum
• 0.013" (0.3mm) thick clear or translucent rigid vinyl inserts

Fire Requirements
• Fire resistant vinyl meets the requirements of
  ° Class A Fire Rated
  ° CA State Fire Marshal Listing No. 2200-1622:0100
  ° Listed by Underwriters Laboratories and FM Global approved for installation beneath fire sprinklers

Dimensions
• Custom sizes
• Length 75.125" (190.8cm)
• Width 54.16" (137.6cm)
• Depth 1.57" (4cm)

Drop Away Panels
• Clear
• Translucent

Weight
• 45 lbs (20.4kgs) - for a 4’ x 6’ (1.2m x 1.8m) nominal section
Improve Cold Aisle Containment Design
Eliminate Server Leakage in Contained Cold Aisles

SmartAire® P

SmartAire P (pressure sensing) Variable-Air-volume damper is designed for situations where the contained aisle or rack experiences a variable load profile.

When servers enter idle mode they draw less air from the contained system, causing static pressure to increase.

As static pressure builds in the aisle, the air will also be forced through servers even if the fans are idle or off. This wasted energy can be solved with the use of SmartAire P.

When installed under airflow panels, SmartAire P can vary the airflow into a contained system to satisfy a desired static pressure, reducing bypass air.

Cold Aisle Containment Air Leakage

Cold Aisle Containment with SmartAire P

Without SmartAire® P Dampers in the cold aisle to maintain a neutral static pressure, conditioned air will leak through idle servers and other gaps in the containment structure.

SmartAire® P monitors the static pressure differential from the contained cold aisle to the hot aisle in order to maintain a balance when rack loads vary. This balance reduces bypass airflow through servers, racks and other containment structures.
### SmartAire P

**Features & Benefits**
- Allows For Pressure Control Management in Contained Cold Aisle Environments
- Fail Safe Operation
- Damper Control 0-100%
- Zero Maintenance
- Powder Coat Finish

**Dimensions**
- 23.1” X 26.7” X 6.2” (58.7cm x 67.8cm x 15.7cm)
- Suitable for new build and retrobuild applications

---

**Airflow of DirectAire & SmartAire P**

<table>
<thead>
<tr>
<th>Static Pressure in. H₂O (Pa)</th>
<th>DirectAire CFM (L/s)</th>
<th>SmartAire P - CFM @ 100% (L/s)</th>
<th>SmartAire P - CFM @ 0% (L/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.02 (5Pa)</td>
<td>1151 (543)</td>
<td>1018 (480)</td>
<td>126 (59)</td>
</tr>
<tr>
<td>0.04 (10Pa)</td>
<td>1626 (767)</td>
<td>1426 (673)</td>
<td>181 (85)</td>
</tr>
<tr>
<td>0.05 (12.5Pa)</td>
<td>1844 (870)</td>
<td>1590 (750)</td>
<td>204 (96)</td>
</tr>
<tr>
<td>0.06 (15Pa)</td>
<td>2007 (947)</td>
<td>1738 (820)</td>
<td>224 (106)</td>
</tr>
<tr>
<td>0.08 (20Pa)</td>
<td>2318 (1093)</td>
<td>1998 (943)</td>
<td>260 (123)</td>
</tr>
<tr>
<td>0.10 (25Pa)</td>
<td>2594 (1224)</td>
<td>2226 (1051)</td>
<td>292 (138)</td>
</tr>
<tr>
<td>0.12 (30Pa)</td>
<td>2823 (1332)</td>
<td>2432 (1148)</td>
<td>321 (152)</td>
</tr>
<tr>
<td>0.14 (35Pa)</td>
<td>3027 (1429)</td>
<td>2620 (1237)</td>
<td>347 (164)</td>
</tr>
<tr>
<td>0.16 (40 Pa)</td>
<td>3217 (1518)</td>
<td>2795 (1319)</td>
<td>372 (176)</td>
</tr>
<tr>
<td>0.18 (45Pa)</td>
<td>3378 (1594)</td>
<td>2960 (1397)</td>
<td>396 (187)</td>
</tr>
<tr>
<td>0.20 (50Pa)</td>
<td>3433 (1620)</td>
<td>3114 (1470)</td>
<td>417 (197)</td>
</tr>
</tbody>
</table>
Increase Productivity in Hot Aisle Systems
On Demand Cooling to Allow for Longer Occupancy

The Hot Aisle in a containment system can often exceed acceptable working conditions, meaning that the amount of time which a technician can work on the equipment is reduced, limiting productivity. OSHA exposure limits for working environments indicate a certain ratio of rest and work when working in high temperatures.

SmartAire T (Technician) gives the technician the ability to enter the hot aisle by controlling the temperature of the aisle. The technicians achieves this by activating the unit which modulates the amount of cool plenum air which enters the hot aisle.

Before the technician enters the hot aisle, the units are activated by a user supplied trigger. Once activated, the units automatically modulate to allow cool air to reach the hot aisle. Once the established temperature is reached, the tech can comfortably and easily work in the contained aisle without the need for breaks.

By using SmartAire T daisy chained to multiple units in a primary/secondary configuration all the dampers in the aisle will automatically modulate together to quickly reduce the temperature, allowing for maximum productivity, and satisfying OSHA requirements.

Without SmartAire T temperatures in contained hot aisles can exceed acceptable working conditions and limit the amount of time a technician can safely work on equipment in the aisle.

SmartAire T provides on-demand cooling lowering temperatures in a contained hot aisle allowing the technician to safely work on equipment in the aisle for an extended period of time.
SmartAire T

Features & Benefits
• Designed To Bring Hot Aisle Temperatures Down Below OSHA recommended Levels
• Fail Closed Operation For 100% Closed for Minimum Hot Aisle Leakage.
• Zero Maintenance
• Temperature based Damper Control 0-100%
• Powder Coat Finish
• 20 Gauge Steel Construction
• Six Vane Automatic Damper Design
• Adjusted via automatic or user controlled switch

Dimensions
• 23.1”x 26.7”x 6.2” (59cm x 67.8cm x 15.8cm)
• Suitable for new build and retrobuild applications

Airflow of DirectAire & SmartAire T

<table>
<thead>
<tr>
<th>Static Pressure in. H2O (Pa)</th>
<th>DirectAire CFM (L/s)</th>
<th>CFM @ 100% (L/s)</th>
<th>CFM @ 0% (L/s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.02 (5Pa)</td>
<td>1151 (543)</td>
<td>945 (446)</td>
<td>51 (24)</td>
</tr>
<tr>
<td>0.04 (10Pa)</td>
<td>1626 (767)</td>
<td>1313 (620)</td>
<td>73 (34)</td>
</tr>
<tr>
<td>0.05 (12.5Pa)</td>
<td>1844 (870)</td>
<td>1460 (689)</td>
<td>83 (39)</td>
</tr>
<tr>
<td>0.06 (15Pa)</td>
<td>2007 (947)</td>
<td>1592 (751)</td>
<td>91 (43)</td>
</tr>
<tr>
<td>0.08 (20Pa)</td>
<td>2318 (1093)</td>
<td>1824 (861)</td>
<td>106 (50)</td>
</tr>
<tr>
<td>0.10 (25Pa)</td>
<td>2594 (1224)</td>
<td>2026 (956)</td>
<td>119 (56)</td>
</tr>
<tr>
<td>0.12 (30Pa)</td>
<td>2823 (1332)</td>
<td>2208 (1042)</td>
<td>131 (62)</td>
</tr>
<tr>
<td>0.14 (35Pa)</td>
<td>3027 (1429)</td>
<td>2373 (1120)</td>
<td>141 (67)</td>
</tr>
<tr>
<td>0.16 (40 Pa)</td>
<td>3217 (1518)</td>
<td>2527 (1192)</td>
<td>152 (72)</td>
</tr>
<tr>
<td>0.18 (45Pa)</td>
<td>3378 (1594)</td>
<td>2672 (1261)</td>
<td>162 (76)</td>
</tr>
<tr>
<td>0.20 (50Pa)</td>
<td>3433 (1620)</td>
<td>2807 (1325)</td>
<td>172 (81)</td>
</tr>
</tbody>
</table>
Air Sealing Grommets

By-pass air, which is any air delivered into the data center that is not consumed by the equipment and exhausted as waste heat, can have a significant impact on the cooling capacity of a data center.

Tate’s air sealing grommets are designed to improve the energy efficiency and air sealing performance of your data center by preventing leakage from the raised floor plenum when penetrations are required for power and data cables above the floor.

Tate has identified a standard cut-out location that works with any rack to ensure that the cutout is always in the proper location inside the back door. Tate’s unique standardization option means that the time and mess associated with field cutting is eliminated.

Wave
The Wave is a 8.75” x 11” injection molded ABS plastic grommet supplied with an optional rigid lid capable of supporting up to 250lbs (113kgs)

Split Integral
The large 32 square inch usable cabling area accommodates a variety of cabling requirements, including 100 amp power connectors

Surface Mount
Seals a variety of existing raised-floor panel cutouts creates flexibility by allowing tiles to be removed without capturing cables. Available in three different length and width dimensions.

Mini
Designed to seal small cable openings in the raised floor of new or existing computer rooms. The 5” x 2.5” opening offers flexibility for data centers that have multiple cable opening sizes.

Round
The Split feature of the Round 4” allows product installation or removal without disturbing cables. Designed to seal openings in new and existing raised floor cutouts to block bypass airflow and maximize cooling system efficiency.

Extended
Designed to seal a variety of existing larger openings, with the added flexibility of modification for unique openings. Can be modified to seal unique cable openings and areas such as gaps around CRAC & CRAH units.

<table>
<thead>
<tr>
<th>Grommet Name</th>
<th>Area</th>
<th>US Unite of Measurement (Inches)</th>
<th>Metric (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wave</td>
<td>Usable Cable Area</td>
<td>7 x 5 7/8</td>
<td>197 x 149</td>
</tr>
<tr>
<td>Split Integral</td>
<td>Usable Cable Area</td>
<td>8 x 4</td>
<td>203 x 102</td>
</tr>
<tr>
<td>Surface Mount</td>
<td>Usable Cable Area</td>
<td>10 x 7</td>
<td>254 x 178</td>
</tr>
<tr>
<td>Mini</td>
<td>Usable Cable Area</td>
<td>5 x 2 1/2</td>
<td>127 x 64</td>
</tr>
<tr>
<td>Round</td>
<td>Usable Cable Area</td>
<td>4</td>
<td>102</td>
</tr>
<tr>
<td>Extended</td>
<td>Usable Cable Area</td>
<td>22 2 1/2</td>
<td>559 x 64</td>
</tr>
</tbody>
</table>
Snap In Blanking Panels
Blanking panels eliminate the migration of hot and cold air through unoccupied areas of an IT equipment rack. Ergonomically designed for simple tool free installation. Also available with quick view temperature strips that display a temperature range from 50° - 102° F (10° - 38.8° C).

Pass Through Blanking Panels
This innovative aluminum and Hybrid Brush Technology panel cost effectively controls airflow. Designed to provide an effective airflow sealing solution when used in conjunction with pullout switches or servers that may be occasionally extracted.

Full Rack Blanking Panels
Designed to seal up to 42U of opening in the server rack, the Full Rack Blanking Panel Kit greatly reduces bypass airflow by eliminating the gaps in the server rack and creating a contained server rack environment.

Under Rack Panels
Designed to seal large and unique openings found under various sized racks and cabinets, the Under Rack Panel allows easy modifications for new and retrofit applications.

Air Sealing Tape
Tate’s air sealing tape is an innovative time released, self-expanding tape that provides an excellent seal for unique spaces with varying dimensions.

Rack Level Management

Aisle Level Management