Containment

Airflow Management Solutions
for Data Centers

Tate®

Containment Systems from Tate

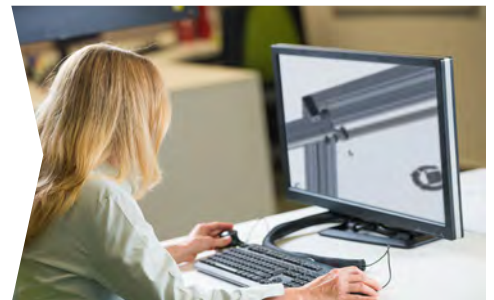## Hot and Cold Aisle Containment Solutions for Data Centers

No two applications are the same. Tate's custom engineering and manufacturing gives you the solutions you need for your application — not a one-size-fits-all approach

One Size Doesn't Fit All

Tate is the leading manufacturer of data center solutions. Our manufacturing process allows for the customization of containment needs to fit your specific applications. Tate offers application engineering, as well as design assist and specification assistance to develop the solution you need for your data center.

Our world-class manufacturing plants have the flexibility to create modular solutions quickly with up-front cost optimization and Tate's in-house engineering team has the experience and industry knowledge to design the best solutions from concept to completion. Whatever you need, Tate is your single source solution builder for your data center.

Engineered Product Support

- Application Engineering
- Specification Assistance
- Design-Assist
- Solution Building
- Budget Development
- Installation Support

Leverage our Experience

Tate®

Our innovative products control costs by providing increased durability and adaptability for future expansion and change, along with simple, low-cost installation and maintenance requirements. An industry leader in innovative data center solutions, Tate containment products offer cost effective and energy efficient solutions to maximize performance and create a flexible infrastructure that is prepared for the future.

When it comes to containment solutions from Tate, you have options. Tate's application engineering support and custom manufacturing capabilities give you the ability pick and choose the tailor-made solution that is best for your application. Tate's containment solutions are compatible with other Tate containment products and can be designed to fit your exact specifications.

Benefits of Tate's Containment Solutions

- Modular manufacturing capabilities

- In-house engineering team provides expert application engineering and solution building

- Up-front cost optimization

- Pre-engineered components that speed up installation

- Reduces the need for multiple trades on site

- Limited field fabrications

Single Hinged Door

No Threshold Design for Hot and Cold Aisles

Tate's Single Hinged 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 complements data center designs.

NFPA 75 2013 Requirements

The multiwall panel insert option meets 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

The pre-assembled aluminum design allows for quick and easy installation. With a standard right or left hinge option, the doors can also be custom built to suit your particular data center requirements. Viewing panels can designed with clear or multiwall polycarbonate.

Features & Benefits

- No threshold design prevents tripping
- Perimeter compression gaskets efficiently seal and minimize air leakage
- Sturdy aluminum framing
- Multiwall panel option adheres to NFPA codes
- Recessed Hinges allow for tighter joints
- Right or Left Hinged options available

Variable

Variable

36.0" (91cm)
Max Opening

Single Hinged Door

View Panel Options

- Clear Polycarbonate
  - Fully transparent
  - ASTM D-635 listed
  - 6mm thick with edge-sealing gaskets
- Multiwall Polycarbonate
  - Semi-transparent
  - Flame spread index <50
  - Smoke development <450
  - ASTM E-84 and ASTM D-635 listed
  - UL 94 listed
  - 8mm thick

Accessories

Available accessories include:

- Auto-closer
- Push Plate (for use with Autocloser)
- Hold open (for use with Autocloser)

Weight

- 165 lbs (75kgs) – Clear polycarbonate
- 135 lbs (61kgs) – Multiwall polycarbonate

Dimensions

- Variable width & height
- 3.6"d eep (9cm)
- 36" (91cm) max threshold width
- Fully supported by floor with rack attachments for lateral stability
- Custom sizes available

Finish Options

- White Painted
- Gray Painted
- Black Painted

Shown with Auto-closer

Dual Hinged Door

Cost Effective Overlapping Solution for Sealing Aisle Ends

Features & Benefits

- Pre-assembled panels and integrated door slide-locks allow for a simple and quick installation
- Perimeter compression gaskets efficiently seal and minimize air leakage
- Multiwall option adheres to 2013 NFPA 75 flame spread and smoke development requirements
- Supports aisle widths of 4' to 6'
- No-threshold design prevents obstructions or tripping
- Sturdy aluminum framing
- Fully supported by floor with rack attachments for lateral stability
- Ergonomic design, with angled handles to reduce pinch points

Hardware

Standard features include:

- Spring loaded double ball door catches
- Angled door handles
- Auto-close available

Weight

- 172 lbs. – Clear polycarbonate
- 140 lbs. – Multiwall polycarbonate

Dimensions

- Customized to width & height required
- 4.85" (12.3cm) depth
- 38.6" max opening width

View Panel Options

- Clear Polycarbonate
  - Fully transparent
  - ASTM D-635 listed
  - 6mm thick with edge-sealing gaskets
- Multiwall Polycarbonate
  - Semi-transparent
  - Flame spread index <50
  - Smoke development <450
  - ASTM E-84 and ASTM D-635 listed
  - UL 94 listed
  - 8mm thick

Finish Options

- White Painted
- Gray Painted
- Black Painted

Ergonomic Handles

38.6" (98cm) Max Opening

Tate®

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
- Customized to width & height required
- Max Threshold: 34" (86.4cm)
- Depth 4.85" (12.3cm)

Finish Options
- White Painted
- Gray Painted
- Black Painted

View Panel Options
- Clear Polycarbonate
  - Fully transparent
  - ASTM D-635 listed
  - 6mm thick with edge-sealing gaskets
- Multiwall Polycarbonate
  - Semi-transparent
  - Flame spread index <50
  - Smoke development <450
  - ASTM E-84 and ASTM D-635 listed
  - UL 94 listed
  - 8mm thick

34" (86.4cm) Max Opening

Dual Sliding Doors

Customizable Solution for Hot and Cold Aisles

Tate's 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 complements data center designs.
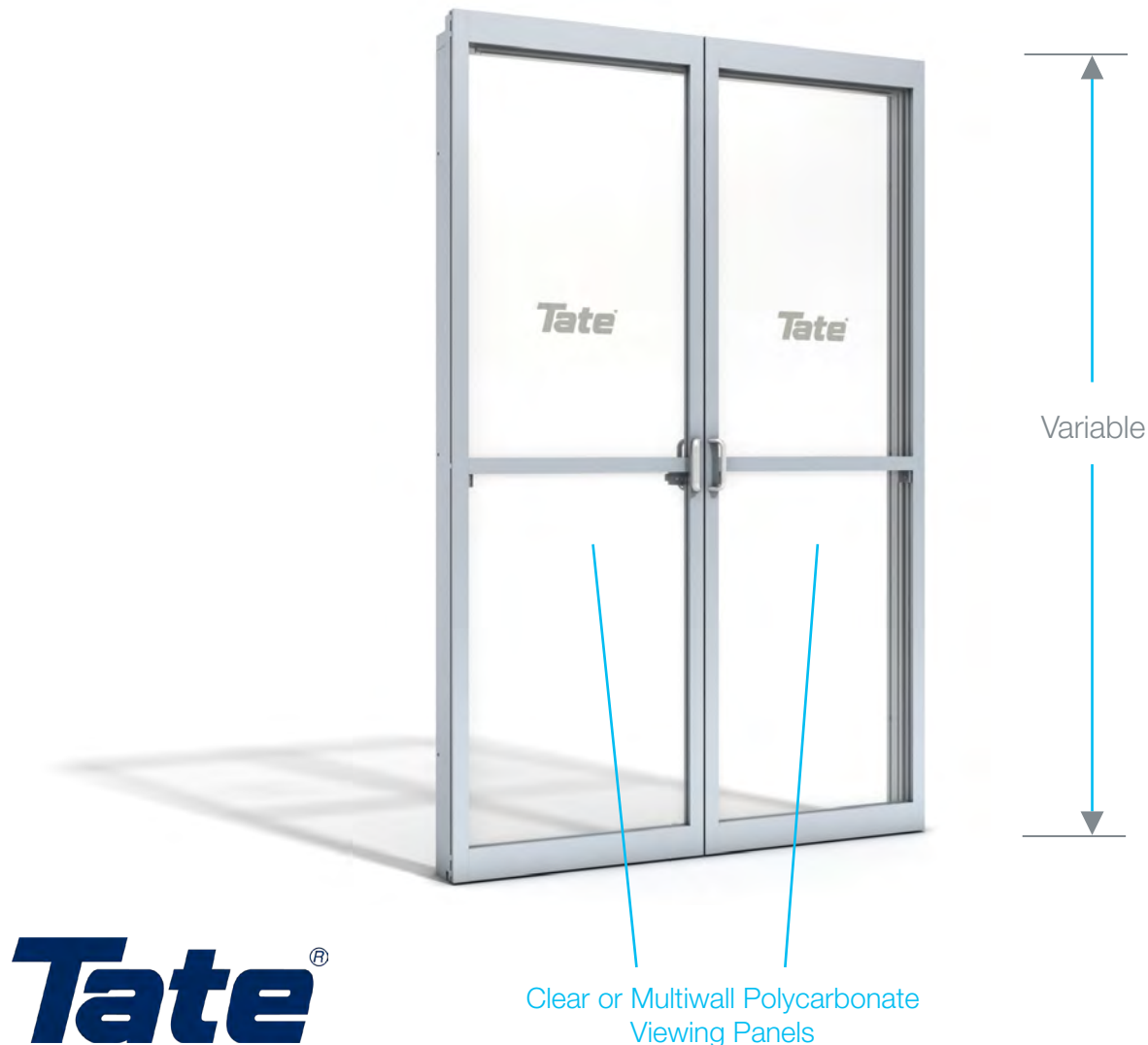
NFPA 75 2013 Requirements

The multiwall panel insert option meets 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

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 NFPA codes
- Ergonomically designed with angled handles to reduce pinch points
- Easy installation with integrated door slide locks

Variable

Clear or Multiwall Polycarbonate Viewing Panels

Dual Sliding Doors

Pre-Assembled for Easy Installation

View Panel Options
- Clear Polycarbonate
  - Fully transparent
  - ASTM D-635 listed
  - 6mm thick with edge-sealing gaskets
- Multiwall Polycarbonate
  - Semi-transparent
  - Flame spread index <50
  - Smoke development <450
  - ASTM E-84 and ASTM D-635 listed
  - UL 94 listed
  - 8mm thick

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

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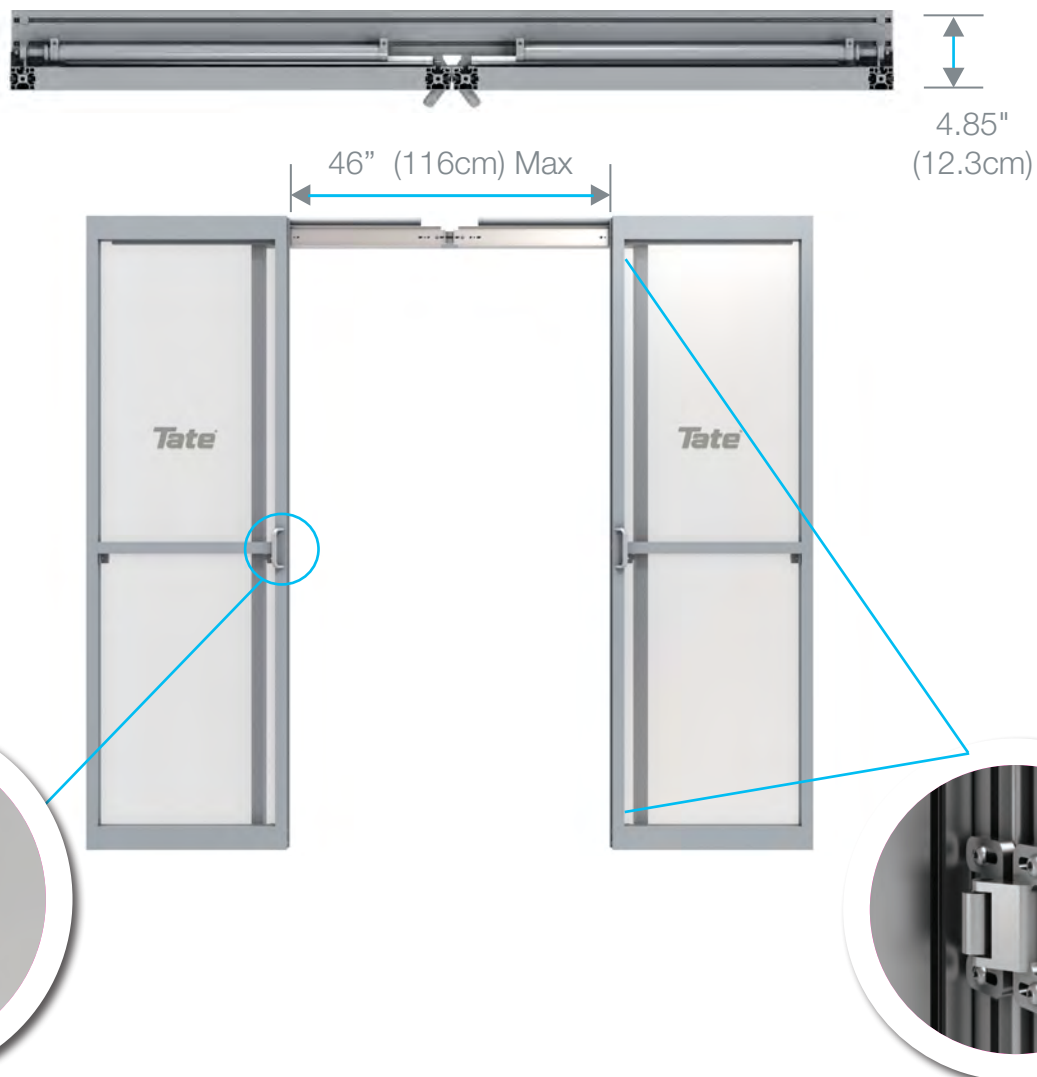- 200 lbs (91kgs) – Clear polycarbonate
- 140 lbs (64kgs) – Multiwall polycarbonate

Dimensions
- 46" (116cm) max opening width
- Fully supported by floor with rack attachments for lateral stability
- Customized to width & height required

Finish Options
- White Painted
- Gray Painted
- Black Painted

4.85"
(12.3cm)

46" (116cm) Max

Unique angled handle reduces pinch point

Integrated door slide-locks hold doors closed

Field Flexible Partitions

Stick Built Partition System for Any Aisle Environment

Tate Field Flexible Partitions are ideal for use in any containment applications. The system feature 5 aluminum extrusion profiles and that are used with multiwall polycarbonate to create custom hard partition in the field. The partitions can attach to a drop ceiling over head or be mounted to the top of the cabinets using angle brackets.

The unique extrusion design holds the multi-wall panel in place without the need for screws or other fasteners. Field trimming the aluminum extrusions allows for a seamless partition over varying cabinet heights resulting in an improved containment system. The lightweight system is quick to install, completely customizable and ready to ship saving both time and money.

Features & Benefits

- Cost effective site built partitions
- Professional High quality appearance with a high level of site customization
- Extrusions designed for press fit onto Tate supplied 8mm multiwall panels
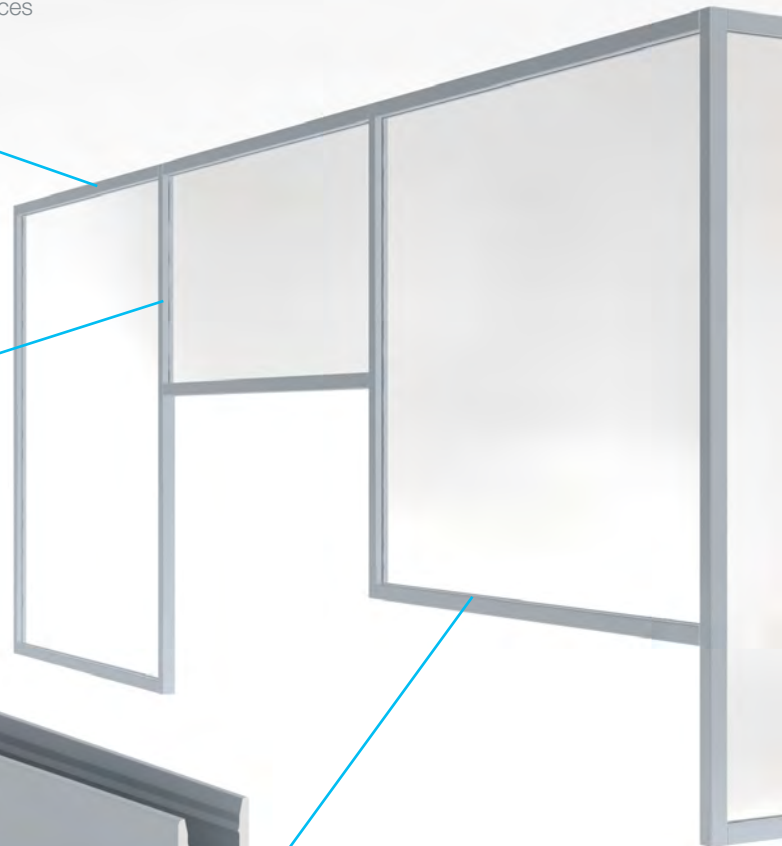- Easily hung from structural grid overhead or fully rack supported as required

Capital F-Channel
- Ideal for ceiling hanging of partitions
- Mounting to other surfaces

Capital H-Channel
- Ties Multiwall panels to each other vertically or horizontally

Capital U-Channel (stiffener)
- Attaches to any side of the Multiwall panel to stiffen and terminate.

Field Flexible Partitions

Shipping Information

- Containment system in a crate concept minimizes lead time and shipping cost by consolidating all pieces needed into ~60" Wide x 150" Long wooden crate with variable height based on material

Weights

- Capital F-Channel – 3 lbs.
- Corner Channel – 3.2 lbs.
- Brush Insert Channel – 2.2 lbs.
- Capital H-Channel – 2 lbs.
- Capital U-Channel – 2 lbs.
- 8mm Multiwall Panel – 10 lbs.

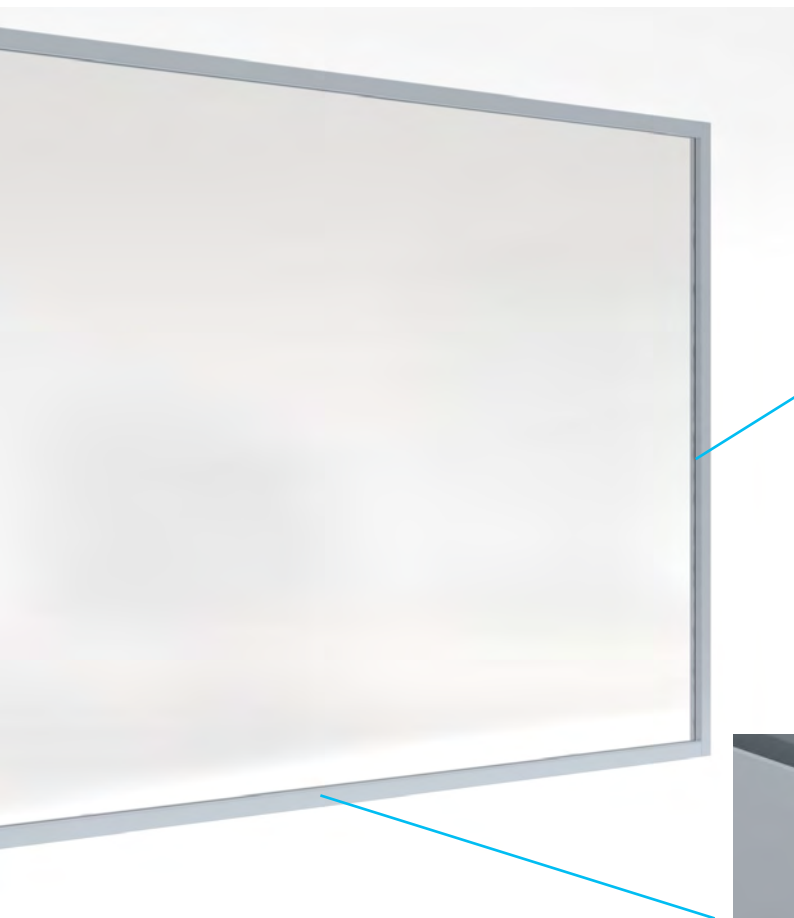## Panel Features

- Multiwall Polycarbonate
  - Semi-transparent
  - Flame spread index <50
  - Smoke development <450
  - ASTM E-84 and ASTM D-635 listed
  - UL 94 listed
  - 8mm thick

Dimensions

- Extrusions lengths in 12' increments
- Brushes Ordered to Length in 1' increments
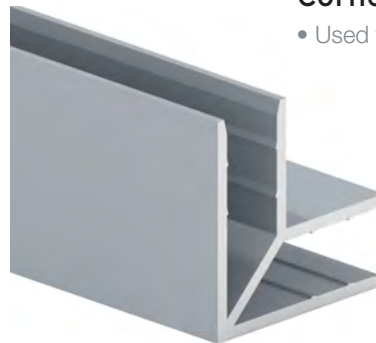- 8mm Multiwall Panels in 4'x8' sheets

Finish Options

- White Painted
- Gray Painted
- Black Painted

Corner Channel

- Used to make 90º corner turns

Brush Insert Channel

- Attaches to the bottom of Multiwall panels to accept brushes
- Brush lengths from 1/2" to 6" available

Hard Partitions

Versatile Partition with a Rigid Design

Tate 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 products when available.

Arriving with preassembled panels and supplied brackets, installation is quick and simple. The 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

Panel Options
- Clear Polycarbonate
  - Fully transparent
  - ASTM D-635 listed
  - 6mm thick with edge-sealing gaskets
- Multiwall Polycarbonate
  - Semi-transparent
  - Flame spread index <50
  - Smoke development <450
  - ASTM E-84 and ASTM D-635 listed
  - UL 94 listed
  - 8mm thick

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

Finish Options
- White Painted
- Gray Painted
- Black Painted

Example of containment design with Hard Partitions and Single Hinged Door

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 systems to work within the aisle.

Incorporating clear, black, or white anodized aluminum tracks, Tate's hard roof has been engineered to provide long lasting results. The 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
- Custom aisle widths
- Thin profile to prevent overhead obstructions
- Modular design works with any aisle length

Tate®

Hard Roof

Roof Design
- Aluminum tracks available in black, white, or gray painted aluminum
- 0.013" (0.3mm) thick clear or translucent rigid vinyl inserts

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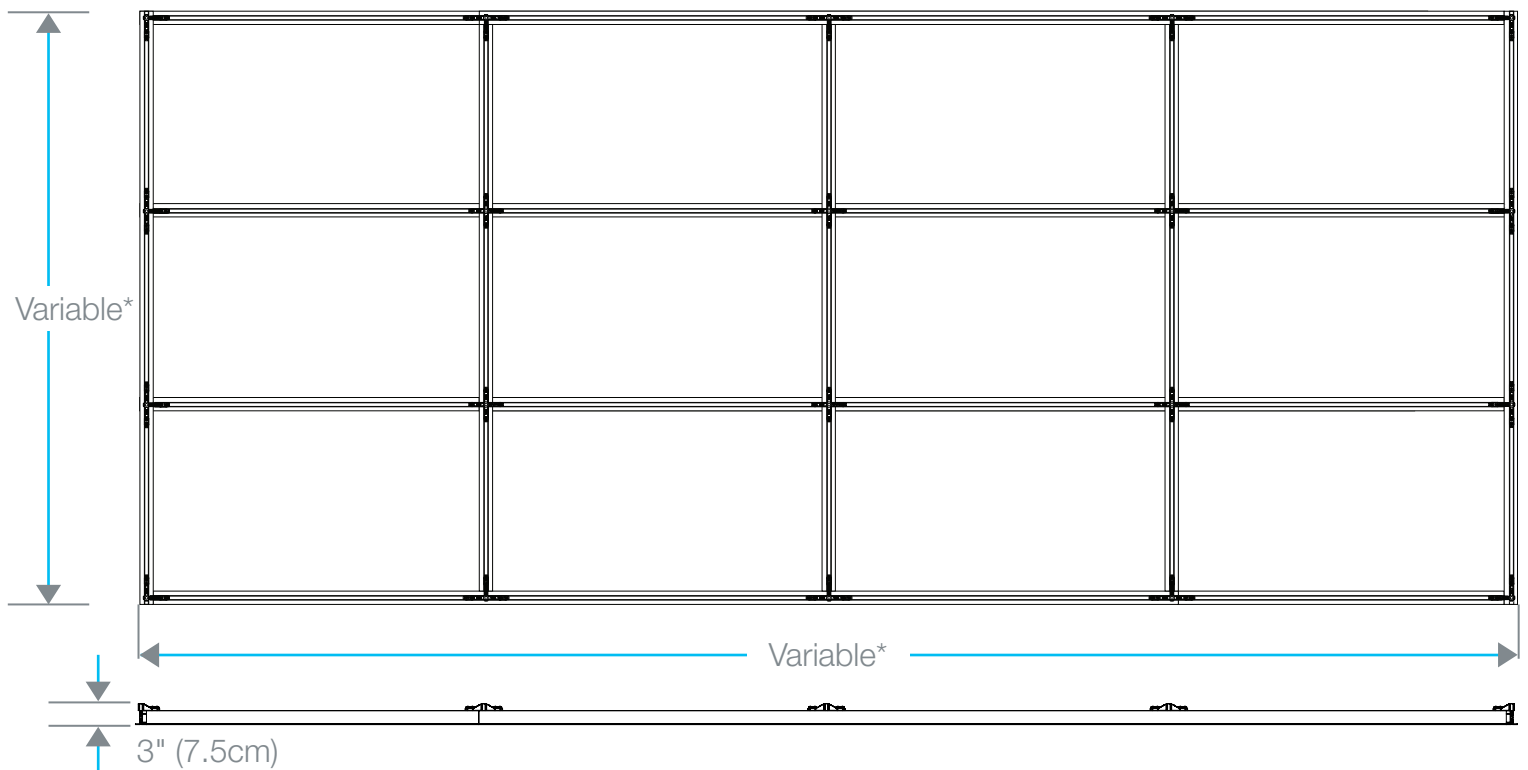
Fire Requirements
- Fire resistant vinyl meets the requirements of:
    - Class A Fire Rated
    - CA State Fire Marshal Listing No. 2200-1622:0100
    - Listed by Underwriters Laboratories and FM Global approved for installation beneath fire sprinklers

Dimensions
- Custom sizes available
- 2" Grid Height / 3" Max Height

Weight
- 0.65 lb/ft^2 (3.17 kg/m^2)

Variable*

Variable*

3" (7.5cm)

* Tate's hard roof can be custom-sized to fit your specific application needs. 16' x 12' (488cm x 366cm) nominal size is shown
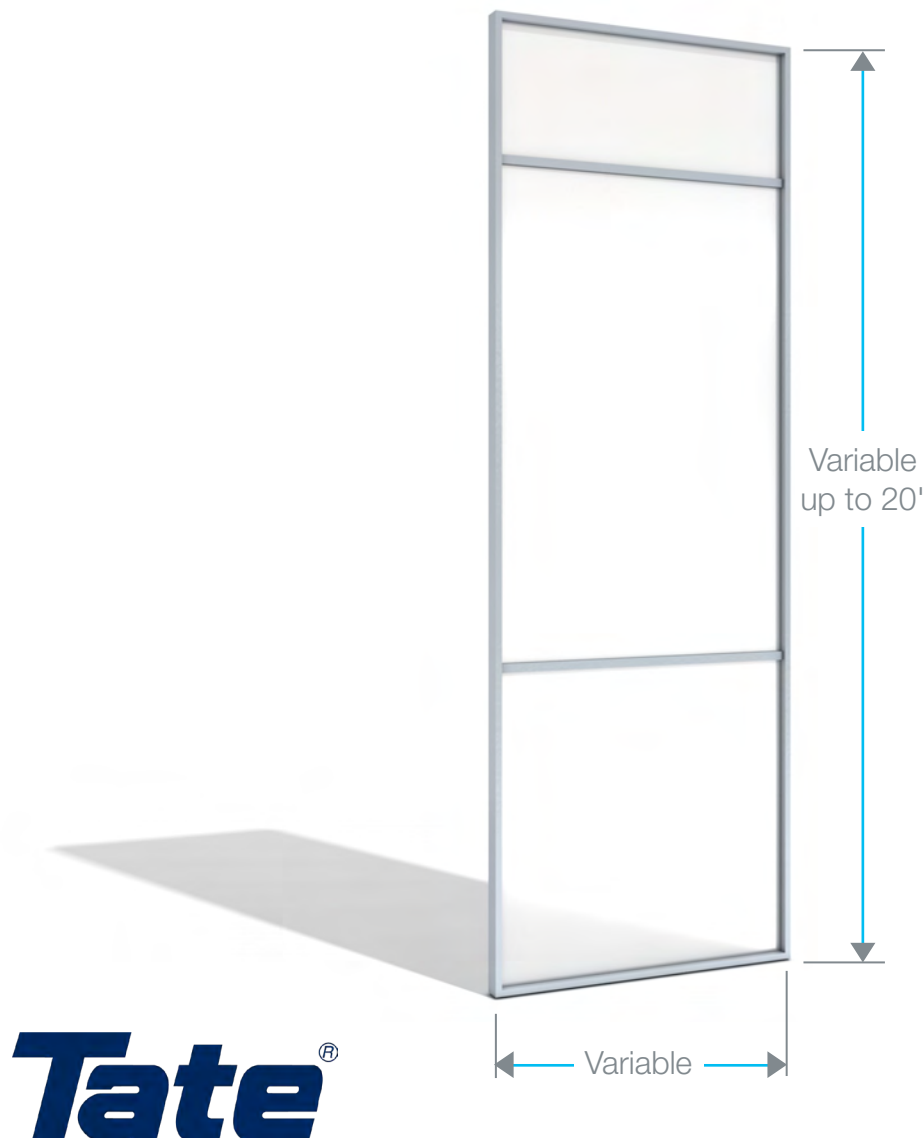
Wall Partition

Data Center Partitioning Panels

Tate Wall Partitions are ideal for dividing spaces to meet colocation, departmental, privacy or other requirements. Constructed of painted aluminium frames the partitions can be customized to a wide range of dimensions. There are four panel types available including clear polycarbonate, multi-wall polycarbonate, white AMC and expanded aluminum to meet any privacy and security needs.

Arriving in preassembled sections the panels help speed construction and installation with very little disruption. Depending on the overall dimensions partitions can be mounted at the floor, or mounted at both floor and ceiling. The wall partition system includes all of the components and brackets required to assemble and install.

Features & Benefits
- Pre-assembled data center partitioning panels design to allow for quick subdivision of data center spaces
- Variable height and width as required for each particular space
- Adheres to new NFPA 75 code
- Thru hole bolting for connecting panels to each other
- Sturdy 3.2" x 1.5" aluminum framing
- Meant for attachment to structural grid overhead and floor below

Variable up to 20'

Variable

Tate®

Wall Partition

Panel Options
- Clear LexanTM Polycarbonate
  - Fully transparent
  - ASTM D-635 listed
  - 6mm thick with edge-sealing gaskets
- Multiwall LexanTM Polycarbonate
  - Semi-transparent
  - Flame spread index <50
  - Smoke development <450
  - ASTM E-84 and ASTM D-635 listed
  - 8mm thick

- White ACM
  - Class A Fire Rating ASTM E-84
  - Flame spread index <10
  - Smoke development <10
- Expanded Metal Aluminum Panel
  - 3003 Aluminum
  - Unfinished
  - 0.158" Thick, 0.94" x 0.38" Opening

Dimensions
- Widths up to 4' (1200mm)
- Heights up to 20' (6000mm)

Weight
- 115 lbs. – ¼" Dibond Material – 4'x12'
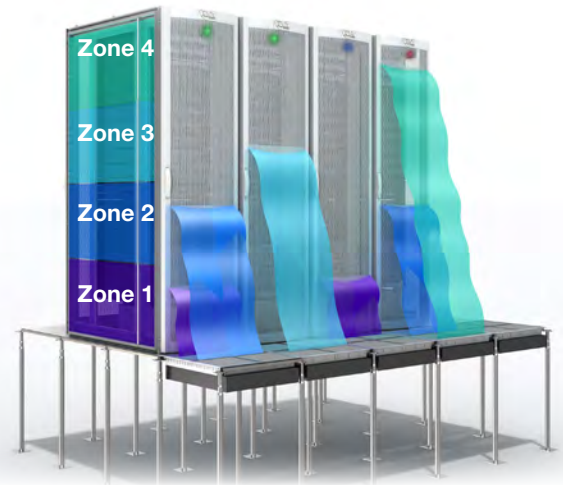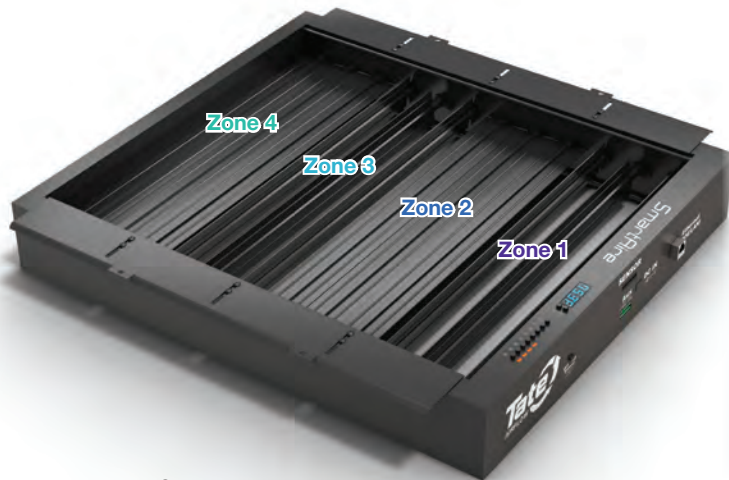- 80 lbs. – 8mm Multiwall Lexan – 4'x12'

Finish Options
- White Painted
- Gray Painted
- Black Painted

SmartAire® MZ

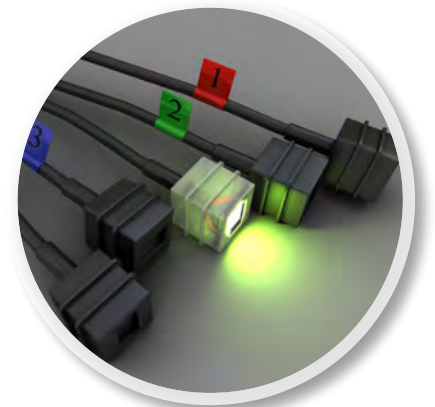## Automatic Airflow Controls

SmartAire® MZ

The new SmartAire MZ automatic variable-air-volume damper offers the most granular airflow control available for a data center. The unit monitors and adjusts cooling independently to 4 separate zones to allow for variable loads and partially deployed areas within a rack. During equipment changes, the unit automatically re-balances the airflow in the facility without manual control adjustments.
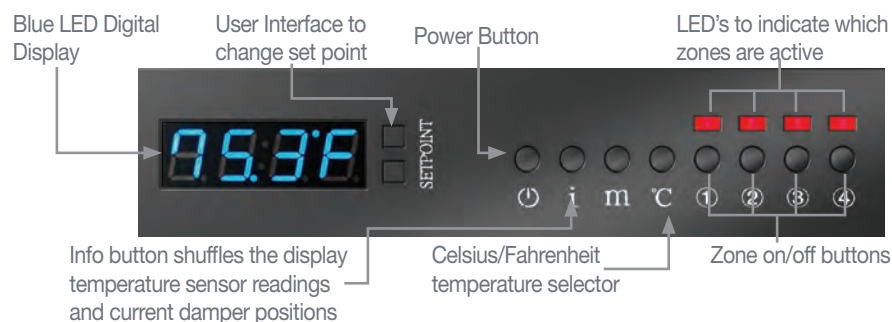
A SmartAire MZ Basic option is also available as a manual variable-air-volume damper with a single temperature probe and rack-mounted LED temperature status indicator.

Key Performance Characteristics

- Automatically re-balances airflow during equipment refresh or tenant changes
- 0-22kW supported IT load with DirectAire panel
- Fail safe operation: opens 100% during failure
- Four zone damper positions are variable from 0-100%
- Rack-Mounted LED Temperature Status Indicator

- Multiple control options available
  - Quad - control of each of the individual 4 zones
  - Dual - zones 1&2 and 3&4 are controlled together
  - Single - entire unit acts a single zone
  - P - pressure differential sensor
  - T - technician activated unit

The SmartAire MZ features a rack face-mounted LED temperature status indicator. The LED provides an at-a-glance indication of temperature by glowing blue, green, or red based upon the preset range.

Blue LED Digital Display

User Interface to change set point

Power Button

LED's to indicate which zones are active

Info button shuffles the display temperature sensor readings and current damper positions

Celsius/Fahrenheit temperature selector

Zone on/off buttons

Improved Containment Design

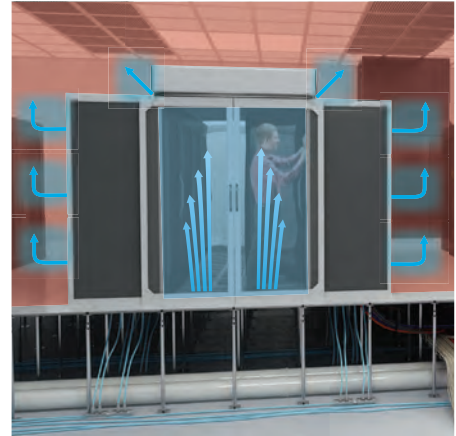## *Eliminate Server Leakage in Contained Cold Aisles*

SmartAire MZ's Pressure Sensing mode 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 MZ.

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

Cold Aisle Containment Air Leakage

Without SmartAire® MZ 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.

Static Pressure (Pa)	DirectAire® CFM (L/s)	CFM @ 100% (L/s)	CFM @ 0% (L/s)
0.02 (5Pa)	1151 (543)	1018 (480)	126 (59)
0.04 (10Pa)	1626 (767)	1426 (673)	181 (85)
0.08 (20Pa)	2318 (1093)	1998 (943)	260 (123)
0.10 (25Pa)	2594 (1224)	2226 (1051)	292 (138)

Increase Productivity

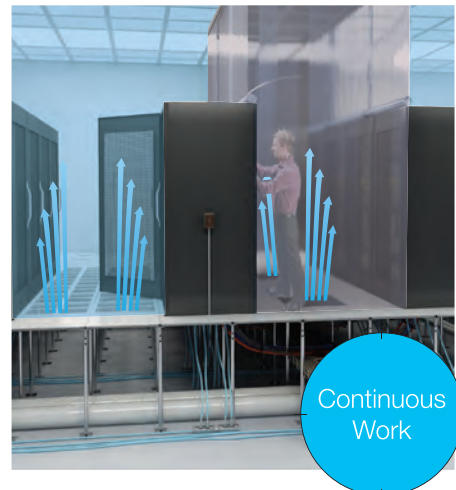## *On Demand Cooling to Allow for Longer Occupancy in Contained Hot Aisles*

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 MZ's Technician Mode gives the technician the ability to enter the hot aisle by controlling the temperature of the aisle. The technicians achieve 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.

Work Continuously in the Hot Aisle

Continuous Work

SmartAire® MZ 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.

Static Pressure (Pa)	DirectAire® CFM (L/s)	CFM @ 100% (L/s)	CFM @ 0% (L/s)
0.02 (5Pa)	1151 (543)	945 (446)	51 (24)
0.04 (10Pa)	1626 (767)	1313 (620)	73 (34)
0.08 (20Pa)	2318 (1093)	1824 (861)	106 (50)
0.10 (25Pa)	2594 (1224)	2226 (1051)	292 (138)

Tate®

Tate has been an industry leading global provider of innovative next generation products for data center applications for over 50 years. Our world-class manufacturing plants have the flexibility to create modular solutions quickly with up-front cost optimization and Tate's in-house engineering team has the experience and industry knowledge to design the best solutions from concept to completion.

Our wide range of custom manufactured data center products include raised access floors, structural ceilings, and containment, as well as, airflow panels and controls which work together to maximize your data center's performance. Tate is your single source solution builder for your data center.

Corporate Headquarters:
7510 Montevideo Road,
Jessup, MD 20794
Tate Hotline: 1-800-231-7788
Tel: +1 410 799 4200   Fax: +1 410 799 4207

Production Facilities:
7510 Montevideo Road,
Jessup, MD 20794

52 Springvale Road,
Red Lion, PA 17356
Tel: +1 717 244 4071   Fax: +1 717 246 3437

Canadian Sales & Support Office:
880 Equestrian Court, Oakville,
ON L6L 6L7 Canada
Tate Hotline: 1-800-231-7788
Tel: +1 905 847 0138   Fax: +1 905 847 0141

Australian Sales & Support Office:
3 Herbert Place, Smithfield NSW 2164, Sydney
Tel: +612 9612 2300   Fax: +612 9612 2301

Asia Sales & Support Office:
1 Commonwealth Lane
#07-26/27 One Commonwealth
Singapore 149544
Tel: +65 6264 5942

Central and South American Sales & Support:
Miami, FL
Tel: +1 954 412 2334

European Sales & Support:
Unit 3, Block K, Ballymount Industrial Estate
Ballymount Drive
Dublin 12, Ireland
Tel: +353 (1) 685 6518

Middle East Sales & Support:
Jebel Ali-Lahbab Road (E 77 Road)
Dubai Investment Park
United Arab Emirates
Tel: +971 56 199 8368

TateInc.com

A Kingspan Group Company

Our manufacturing supports wind power
renewablechoice.com

&EPA GREEN POWER PARTNER

Tate components are proudly made in the U.S.A.