



Rittal – cold aisle containment



Targeted cooling
and higher energy efficiency!

Increase server performance by implementing cold aisle containment

Instead of flooding the Data Centre with cold air, the **cold aisle containment system** from Rittal effectively traps the cool air exactly where it is needed **directly in front of the air intake of the servers**. Cold air is directed across the whole height of the enclosure ensuring that there are no hotspots and the hot air is exhausted out of the system. Due to the cold aisle being contained there is no chance of the hot exhaust air mixing with the cold inlet air, therefore there is an increase in system efficiency.

The **special energy efficiency** of the Rittal cold aisle concept has a simple and plausible explanation:

1. Cold and hot **air cannot mix**, warm air does not flow into the cold aisle.
2. The system can be operated **with a much higher extracted air temperature**.
3. Standard air circulation cooling units are operated **at an optimum thermal efficiency** level.

Nowadays, servers are increasingly positioned in rooms that were not designed as Data Centres.

If these rooms are fitted with a raised floor space for cable runs and air conditioning, the room height is correspondingly reduced.

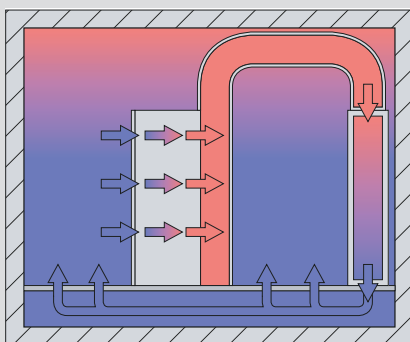
Standard height server racks (2000/2200 mm) then extend into the hot air cushion present just beneath the ceiling.

In the uppermost rack slots this can lead to considerable thermal problems, because the cooling output decreases from the bottom upwards. In particular, heat pockets in hotspot racks are not dissipated.

To overcome this problem in particular, Rittal developed a cold aisle containment system, in which the generated **cold air is not output all over the room but rather in a targeted manner to the space where cooling is most needed** – the server.

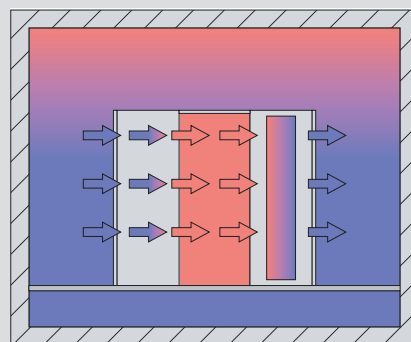
The result: **increased reliability as well as higher energy efficiency!**

Standard market concepts



Hot air extraction using a duct system

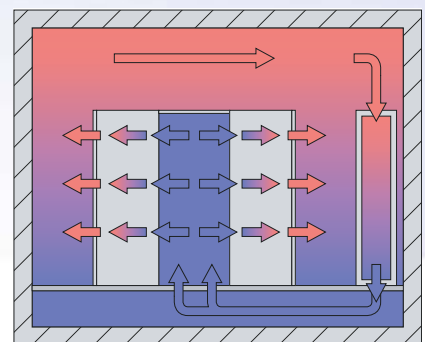
- Complex and costly duct system.
- Larger surface and height requirements.
- Limitation of the raised floor height.
- As a result, no uniform cooling air supply to the room area.
- Cable management is made more difficult.
- Limited rack positioning flexibility due to the air duct connection.



Hot aisle enclosure

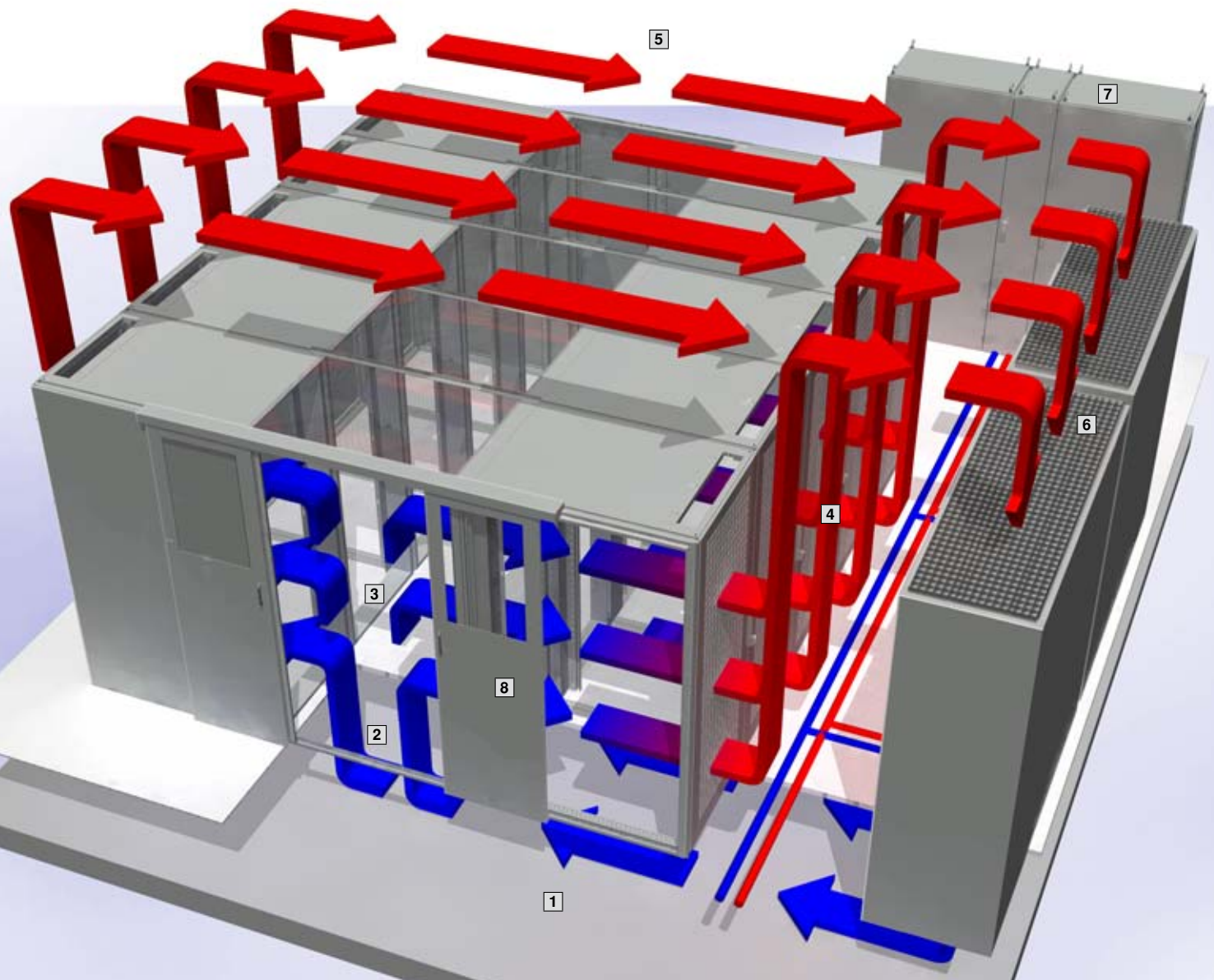
- Standard air circulation cooling units cannot be used.
- Adequate air cooling only achievable with costly in-row chillers.
- These require additional expensive floor space in the rack suite.
- Poor working conditions for the operating personnel (high exit speed of the cold air and excessive noise caused by the fan).
- Hardware racks not connected to the warm aisle enclosure impair the cooling result because of their heat emissions.

Rittal



Rittal cold aisle containment

- Use of standard inexpensive air circulation cooling units. Positioning outside the server area.
- Even with low room heights, maximisation of the raised floor height for cooling air supply without flow losses.
- Undisturbed and uniform air flow distribution of cooling air in the cold aisle guarantees high efficiency.
- Favourable working conditions in the cold aisle due to low temperature, flow and noise load conditions.
- Hardware racks not connected to the enclosure do not impair the cooling efficiency of the cold aisle.



Representation of the air flows with cold aisle containment

- 1 Supply of cooled air via the floor void. The recirculation cooling units can be installed in an air conditioning strip or an external technical building.
- 2 Air supply to the cold aisle via air outlet grilles in the floor void. The feed air quantity is calculated and regulated based on the cold load to be removed.
- 3 A cold air pool forms in the sealed cold aisle according to the fresh air principle. The hardware components draw the required cooling air quantity from this source.
- 4 The extracted warm air which is discharged to the surroundings and may be further extracted rises to the ceiling.

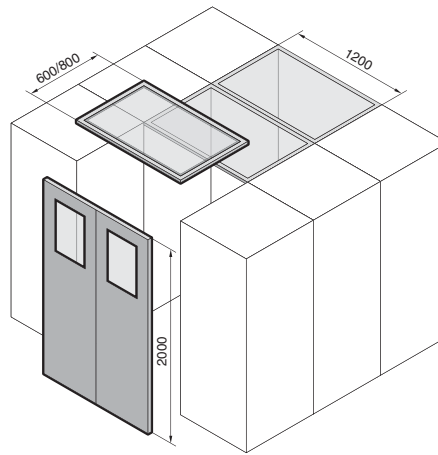
- 5 A warm air cushion forms above the ceiling of the cold aisle containment. The warm air cushion cannot extend into the cold aisle due to the roof panels.
- 6 The separation enables high exhaust air temperatures, therefore the overall equipment efficiency of the cooling units is maximised.
- 7 The temperature neutrality of server racks fitted with LCP climate components allows them to be positioned in the room for expansion or extension purposes.
- 8 Optimised use of the server room area by use of sliding doors to further isolate the cold aisle.

The advantages at a glance:

- Cooled and heated air do not mix.
- Warm air does not flow into the cold aisle.
- The system can be operated with a much higher exhaust air temperature.
- Air circulation cooling units are operated at an optimum thermal efficiency level.
- Simple cooling air ducting direct to the servers.
- Shielding of the hardware sound emissions.
- Pleasant temperature in the cold room.
- Human-friendly climate rather than a wind tunnel.
- Use of conventional air circulation cooling units.
- Can be used in conjunction with liquid cooling systems.

Cold aisle containment

System concept for isolating the cold aisle in Data Centres



Equipment:

Slim door element with viewing panel.
Robust roof elements made from metal/plastic composite with high light transmittance.
Optional safety glass.

Advantages:

- Fire load is not significantly increased thanks to the incorporation of toughened safety glass.
- Increased energy efficiency and performance of the climate components.
- Higher power density achievable with guaranteed cold air supply.

- Simple installation and retrofitting ability thanks to full compatibility with TS 8 enclosure system.
- Inexpensive performance enhancement for your existing installation, extending your investment cycle until replacement purchase.

Note:

Further size variants and individually tailored systems available upon request.

Model No. SK roof element	3300.170	3300.180	–
Model No. SK door element	–	–	3300.160
Element width (identical to enclosure width) mm	600	800	–
Cold aisle width mm	1200	1200	1200
Cold aisle height mm	–	–	2000

Queries and information

Do you require more detailed information than is provided by this brochure? Fax us or call us.

In the future we will be increasingly targeting cold aisle solutions at project business. This, of course, includes support in planning and selection, in installation as well as servicing.

Could you please send me the following brochure(s):

- IT Catalogue
- IT News 2008
- IT Cooling Solutions
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