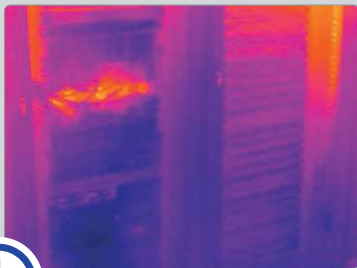


»» HIGHLY EFFICIENT COOLING FOR YOUR DATA CENTRE

Best practices for airflow management and cooling optimisation



DC ASSESSMENT SERVICES



AISLE CONTAINMENT



AIRFLOW MANAGEMENT

⊛ Achieving true 24/7/365 operation can prove to be an on-going struggle to ensure maximum reliability and availability of your data centre infrastructure. Doing so should use minimal resources, energy consumption and be as efficient as possible. Achieving the ambitious goals of increasing data centre efficiency and reducing your energy consumption is much easier than you may imagine. We would like to introduce you to our proven and recognised CoolControl best practice solutions. By implementing these purely mechanical tools in your existing or new data centre, it is possible to increase the cooling efficiency by up to 60 percent. The CoolControl range can be installed with minimal effort providing very short ROI periods. Furthermore, we are able to provide you with innovative and field-tested data centre essentials that ease your daily work load in your data centre environment.

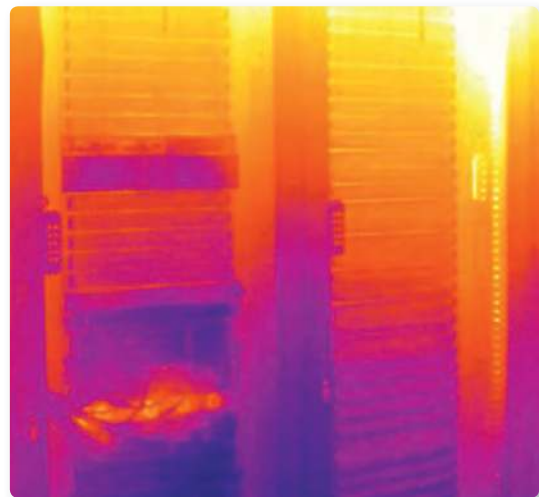


The complete Daxten CoolControl product range corresponds with the best practice recommendations set by the EU Code of Conduct on Data Centre Efficiency for increasing energy and cooling efficiency.



⊛ 1. Best Practice: **CoolControl Data Centre Cooling Assessment** Metering, evaluation and targeted optimisation

You can only improve things that can be measured and visualised – and this data capture is what is behind the CoolControl Cooling Assessment. Whilst on-site, we can evaluate and log the current state of your data centre airflow and cooling effectiveness, identify thermal problems and show you how these can be solved easily and cost-effectively in order to set and achieve DC efficiency targets and goals. Our philosophy is to optimise what is already there. As a result, energy consumption decreases, whilst server density can be increased, hotspots reduce and can even be eliminated, hardware failure rates fall and the health of the data centre is improved. In many cases energy costs can be reduced by more than 50 percent with an ROI of between and 6-12 months.



Our CoolControl Data Centre Assessment consists of modules that allow the on-site data centre analysis to fit your individual requirements.

COOLCONTROL DC ASSESSMENT SERVICES:

- » **Airflow** – Identify bypass airflow, evaluate air volume, velocity, cold air supply and hot air return
- » **Capacity Planning** – Evaluate total cooling capacity relative to current and planned usage
- » **High Density Cabinets** – Examine cabinets for sufficient airflow and temperature levels
- » **Hot Spots** – Identify cabinets with hot spots
- » **Hot and cold air mixing** – Identify and visualise inefficiencies with thermal camera images
- » **Plenums** – Evaluate air volume and pressure under the raised floor

2. Best Practice: **CoolControl Containment**

Soft, solid or hybrid cold and hot aisle containment

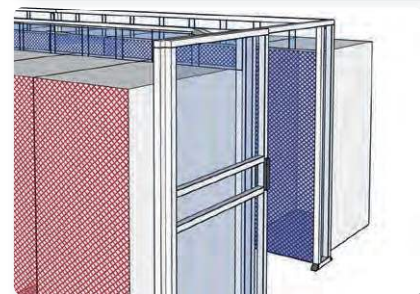
The containment of the cold or hot aisles is the undisputed top best practice in optimising the data centre. The simple separation of hot and cold air can achieve up to 30 percent energy savings whilst eliminating hot spots and reducing hardware failures. CoolControl Containment systems are provided in soft (with curtain), solid (with solid panels) or hybrid (with a combination of soft and solid) materials for seamless integration even in legacy data centres with differing cabinet dimensions or existing fire suppression systems.

COOLCONTROL CONTAINMENT HIGHLIGHTS:

- » Modular containment for the hot and cold aisle
- » Up to 30 percent higher cooling efficiency
- » Compatible with all rack vendors and dimensions
- » Increased server life and reliability
- » Easily installed – no downtime required for installation
- » Allows full integration of existing fire-protection systems



For individual containment solutions, we take on-site measurements, provide a 3D sketch for your approval and offer installation services.



“The installation of Daxten’s containment solution at the end of the rack aisles was a key factor in eliminating temperature differences in our environment.”

Simon Levey, Head of Data Centre Development at Fujitsu UK



⊗ 3. Best Practice: **Load-Bearing Ceiling System**

Suspension of aisle containment plus chimney systems and a plenum for hot air return

The structural suspended ceiling solution is an engineered load-bearing ceiling system that is both a suspended ceiling and a support grid in one cost effective solution. The system is based on a high grade aluminium extrusion with an M10 threaded slot along the entire grid, which proves an easier way to add or remove equipment and services whilst reducing labour costs. The design allows the suspension of aisle containment plus chimney systems whilst, at the same time creating an upper air plenum for the hot air to return to the cooling handlers. Furthermore, it allows the hanging of various services such as busbar, lighting, cable trays, fibre trunking and security cages in the data centre.



LOAD-BEARING CEILING HIGHLIGHTS:

- » Suspended ceiling and support grid combined
- » Suspension of hot aisle containment and chimney systems
- » Creates an upper air plenum for hot air to return to the cooling handlers
- » Allows hanging of busbars, lighting, cable trays and security cages
- » Easy to fit ceiling panels in a variety of different sizes, colours and brands



In addition the following best practice solutions are offered by Daxten:



POWER DISTRIBUTION



DC ESSENTIALS



DC MONITORING



LEAK DETECTION

⊗ 4. Best Practice: **CoolControl Blanking Panels**

Sealing horizontal and vertical open Rack

The fastest and least expensive way to optimise airflow and cooled air distribution in cabinets is by simply sealing free horizontal and vertical rack space with Daxten CoolControl Blanking Panels. The physical barrier keeps cold air at the front of the cabinet separated from the hot air at the back. This simple step not only ensures conditioned air is delivered to servers and network equipment, but helps prevent hot spots and downtime caused by overheating. The low costs and energy savings lead to a quick ROI in normally less than three months. According to Gartner the use of blanking panels allows for a passive decrease in supply air temperature of up to 5.6 degrees Celsius.



COOLCONTROL BLANKING PANELS HIGHLIGHTS:

- » Reliable sealing of free horizontal or vertical space in cabinets
- » Reduces the re-circulation of hot exhaust air into the cold aisle
- » Reduces hot spots and hardware failures caused by overheating
- » Tool-free installation and easy integration of existing cabling



⊗ 5. Best Practice: **CoolControl SwitchAirBox**

Optimised cooling for rack mounted network switches

Network switches that draw air from the sides or back of the rack do not get sufficient cooling when installed at the top of cabinets or if mounted in the hot aisle of the rack. The consequences are overheating, network and hardware failures. These problems can be exacerbated when the racks have been optimised with blanking panels. In general, blanking panels are highly recommended, but it cuts off the network switches from any cool air supply and leads to hot spots at the network switch intake vents. The SwitchAirBox systems can solve these issues by actively or passively conducting the cooled air from the front of the rack to the network switch fans.

COOLCONTROL SWITCHAIRBOX HIGHLIGHTS:

- » Redirects cooled air to the network switch fans
- » Optimal cooling supply for network switches
- » Effective heat dissipation and downtime protection
- » Installs quickly without disrupting network operations



6. Best Practice: **CoolControl Seals**

Sealing cable openings in the raised floor

In addition to the required and essential perforated floor tile openings in the raised floor, there are often other openings for cabling and power supplies. According to the Uptime Institute, up to 60 percent of conditioned air escapes before it reaches the hardware it was meant to cool. It is very easy to solve this problem by using cost-effective and easy to install sealing solutions. Our CoolControl Seal and KoldLok systems can seal any rectangular or round cut-out. There are various options made of foamed nitrile rubber panels, solid frames with brushes and thermo elastic polymers that seamlessly enclose cables and other equipment protruding through the raised floor. Many of which have a Class 0 rating. All sealing solutions are available for existing or new raised floor and cabling infrastructures.



COOLCONTROL SEAL, XPAND AND KOLDLOK HIGHLIGHTS:

- » Reliable sealing of openings in the raised floor
- » Available for round and rectangular cut-outs of any sizes
- » Reduces bypass airflow and helps eliminate hot spots
- » Significant increases in under floor static air pressure
- » Retrofit existing or new cabling openings



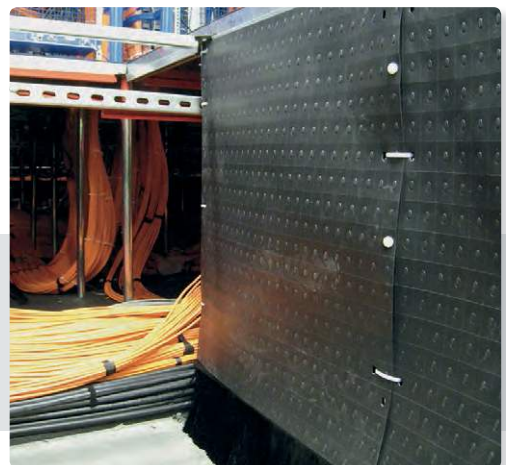
7. Best Practice: **CoolControl Airflow Baffles**

Guide airflow under the raised floor

Even under the raised floor, it is important to guide the conditioned air to the server racks. By directing the airflow, cooled air cannot escape into unused areas in the raised floor and decrease air pressure. PlenaForm airflow baffles are mounted under the plenum to shorten flow chambers, increase air pressure and airflow velocity in order to reduce cooling load on the CRAC system which in turn can reduce the energy requirements and costs.

COOLCONTROL AIRFLOW BAFFLES HIGHLIGHTS:

- » Control and balance airflow under the raised floor
- » Separate hot from cold areas in the raised floor
- » Inert, non-conductive and non-hygroscopic material
- » Flammability rating of UL94-V0



⊗ 8. Best Practice: **CoolControl Airflow Floor Tiles**

Efficient airflow from the raised floor to all rack levels

To ensure conditioned air makes its way from the CRAC unit through the raised floor, to the cold aisle and finally to the front of the server racks, it is necessary to ensure optimal airflow conditions at all raised floor openings. Using conventional grilles or perforated tiles is not ideal as they are not able to direct the conditioned air with the required pressure and velocity to equally cool hardware at the top and bottom of the cabinets. Our CoolControl passive floor tiles are equipped with airflow fins and baffles that ensure cooled air is directed to all cabinet levels. The unique design of the tile means that they can also be deployed to counteract the effects of negative airflow. The tiles fin and baffle design reverses the effects of air being sucked under the floor which is particularly common in vented tiles located close to CRAC units.



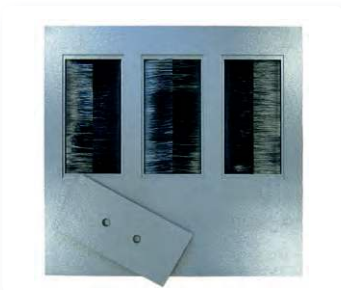
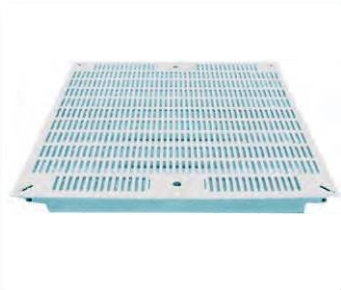
Airflow pressure and velocity adjustments through variable CRAC fans and floor tiles are essential for maximum cold aisle containment efficiency.

COOLCONTROL TILE HIGHLIGHTS:

- » Hi-plume stratification fins (not adjustable)
- » High airflow rate
- » Helps protect hardware against overheating and downtime
- » Supports loads of up to 1360 kg
- » Homogeneous airflow distribution to any rack height
- » Reduces load, power consumption and costs of CRAC units

COOLCONTROL INTEGRATED REPLACEMENT TILE HIGHLIGHTS:

- » Solid 600 x 600 mm tile for higher loads
- » Rack floor tile for new or existing raised floors
- » 3 integrated cable openings incl. sealing brushes and plates
- » Protects hardware against dust and dirt beneath the raised floor
- » Reduces bypass airflow at the rack
- » Protects against hotspots and heat-related system failures



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COOLING OPTIMISATION



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DC MONITORING



LEAK DETECTION