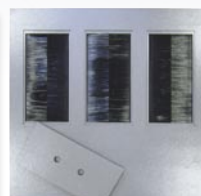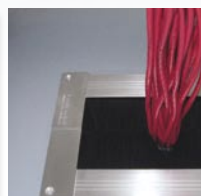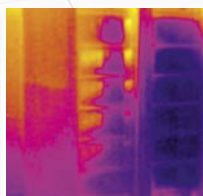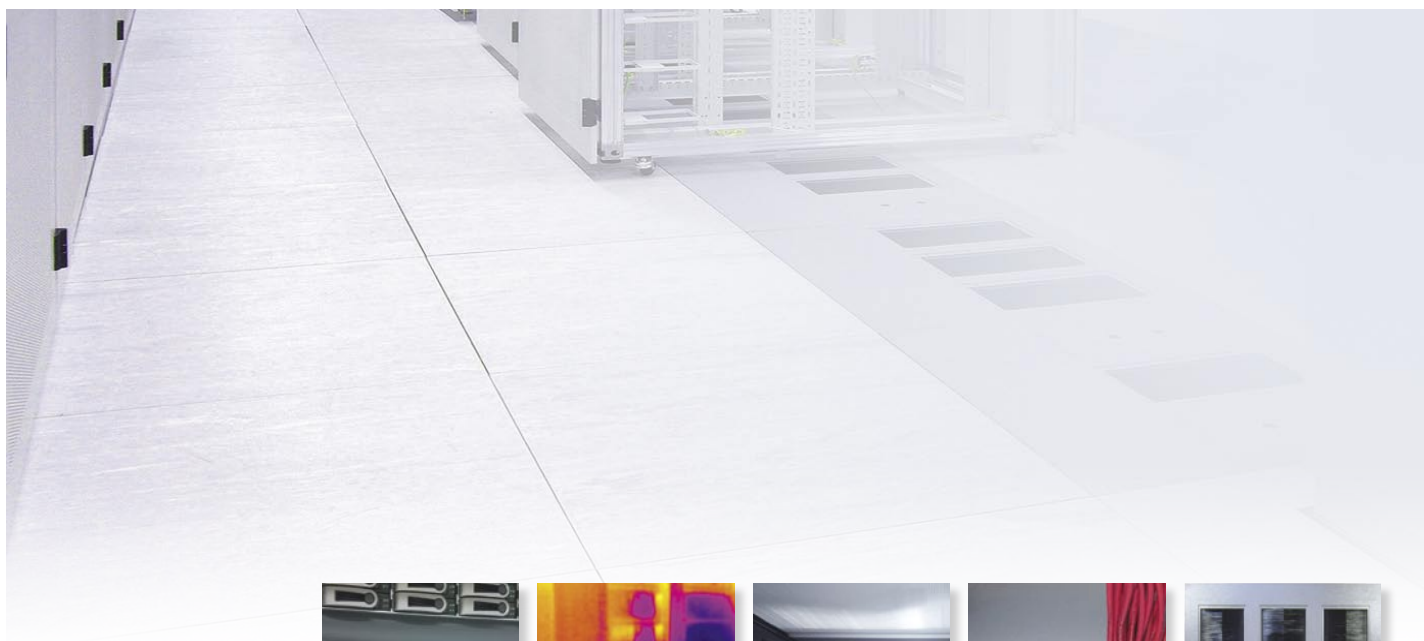# BEST PRACTICES FOR AIRFLOW MANAGEMENT AND COOLING OPTIMISATION IN THE DATA CENTRE

Network Switch Cooling

CoolControl

Data Centre Optimisation Analysis

Cold Aisle Containment

Airflow Floor Tiles

Blanking Panels

Seal Cable Openings

Hot Aisle Containment

Airflow Optimisation

For 24/7/365 operation, it is an on-going struggle to ensure maximum reliability and availability in 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 expenditure are much easier than you 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 possibly to increase the cooling efficiency by up to 60 percent. The CoolControl range can be installed with minimal effort providing very short ROI periods.
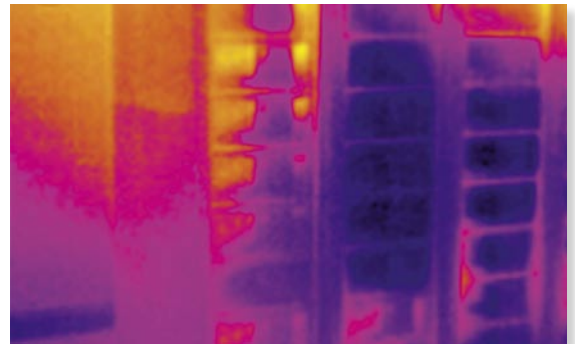
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The complete Daxten CoolControl product range corresponds with the best practice recommendations set by the EU Code of Conduct on Data Centre Efficiency for increasing energy and cooling efficiency.

>> 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.

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

Hot and cold air mixing inefficiencies in the data centre are identified with thermal camera images.

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
- >> **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.

Hot and cold air is separated using containment.

Daxten 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 reliability and lifetime
- » Easily installed – no downtime required for installation
- » Allows full integration of existing fire-protection systems
- » Hot and cold air mixing is eliminated

➤➤ 3. 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 routing these issues by actively or passively conducting the cooled air from the front of the rack to the network switch fans. There are even versions specifically designed for cooling and dissipating heat on the Cisco 6509 and Nexus 7018 switches.

This SwitchAirBox version delivers cooled air from the front of the cabinets to the side fans of rack mounted network switches.

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

⟫⟫ 4. 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

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

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.

Perforated floor tiles optimise cold air distribution in the cold aisle.

## CoolControl Tile Highlights:

- ⟫ Hi-plume stratification fins (not adjustable)
- ⟫ High airflow rate
- ⟫ Helps protect hardware against overheating and downtime
- ⟫ Supports loads of up to 1360kg
- ⟫ 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
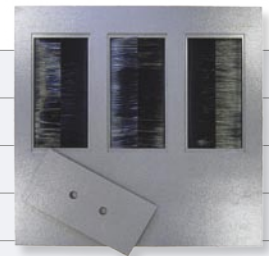
Perforated floor tiles can be integrated into any existing raised floor infrastructure.

➤➤ 5. 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.

Openings with a large number of cables can be effectively sealed using KoldLoK or CoolControl.

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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

➤➤ 6. 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.

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The high flexibility of the airflow baffles ensures a perfect fit around any raised floor pedestal.
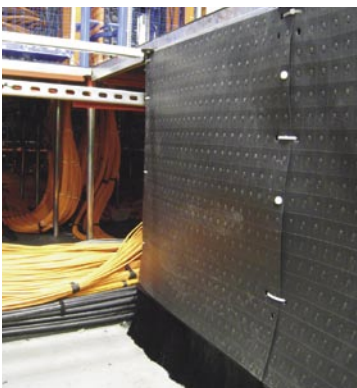
CoolControl Airflow Baffles Highlights:

➤➤ 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

Airflow baffles control and balance airflow in the raised floor.

⟫⟫ 7. Best Practice: **CoolControl Blanking Panels**

Sealing horizontal and vertical open rack space

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.

Please note: Blanking panels are indispensable components for any kind of cold or hot aisle containment.

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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 Side Baffles Highlights:

⟫ Reliable sealing of free vertical space in cabinets

⟫ Reduces the re-circulation of hot exhaust air into the cold aisle

⟫ Reduces hot spots and hardware shutdowns due to overheating

⟫ Easy installation and integration of existing cabling

Horizontal CoolControl Blanking Panels Highlights:

⟫ Reduces the re-circulation of hot exhaust air into the cold aisle

⟫ Reduces hot spots and hardware failures caused by overheating

⟫ Tool-free installation

⟫ Fits all vendor cabinet types

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All methods correspond to the best practice recommendations of the EU Code of Conduct on Data Centre Efficiency for increasing the energy and cooling effectiveness.

➤➤ 8. Best Practice: **Keep people and equipment safe**

The DC responsibility is on your shoulders – let the ServerLIFT carry the load

Now that you are familiar with all best practices of how to reduce costs and efficiently optimise your DC environment, you should take care of your health and that of your IT staff. Let the ServerLIFT take some of the load and burden off your back and shoulders - quite literally. The ServerLIFT is a transport and lifting solution specifically designed for the data centre. It is capable of moving 227 kilograms of IT equipment to any location within your data centre and can used to automatically lift the load to a maximum height of 2.4 metres. Best of all, it allows you to easily slide your equipment into the cabinet at any rack level without breaking a sweat.

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The ServerLIFT has optional platform risers (lift equipment up to 3m) and lift extension modules for lifting loads out of transport boxes.

ServerLIFT: The easiest and safest way to move, lift and install heavy IT equipment.

ServerLIFT SL-350 and SL-500X Highlights:

- ➤➤ Automatic (SL-500X) or manual (Sl-350X) server lifter
- ➤➤ Platform lowers to the bottom of standard racks
- ➤➤ Telescopes platform to rise up to 2.4 m
- ➤➤ Maximum loads: 227 kg (SL-500X) or 160 kg (SL-350X)
- ➤➤ Side loading for easy equipment alignment
- ➤➤ Ideal for cold aisle containment rooms
- ➤➤ Easy steer handles

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Daxten was founded in 1994 as Dakota Computer Solutions. Today Daxten is a market leader in data centre cooling optimisation solutions. As a manufacturer and distributor of innovative solutions, Daxten is at the forefront of promoting energy efficiency within the Data Centre. Daxten offers cutting edge power distribution and management solutions which improve the energy efficiency and reliability of the Data Centre. Power distribution solutions such as the Starline Track Busway support IT managers in their pursuit of reliability and efficiency of IT operations. Daxten is also a Value Add Distributor for IT management and data centre facility solutions from Austin Hughes, Avocent, CoolControl, Dataprobe, Digi, Elliptical Mobile Solutions (EMS), Geist, Minicom, Packet Power, PlenaFill, Raritan, ServerLift, Server Technology, Triad, UE Corp. (Starline), Upsite Technologies (KoldLok), Uptime Devices, USystems and Zonit. In addition Daxten is a leading manufacturer of its own connectivity product lines. The company has facilities, subsidiaries and partners across Europe and the USA. As a provider of connectivity, power and cooling optimisation and high-end KVM products as well as infrastructure management solutions it is our mission to support IT managers worldwide, to ease their working life and to protect their companies against critical downtime. In Europe Daxten is headquartered in London and Berlin. For further information please visit www.daxten.com, www.daxten.co.uk or www.daxten.com/de/.

Daxten BPC data sheet - version 012013