



SOLID AIR[®]
INTERNATIONAL



Active Chilled Beam OKNI[®]

*Good climate,
better performance!*

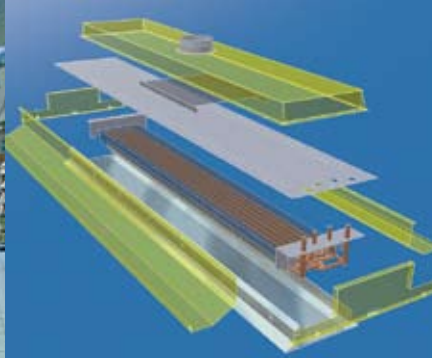
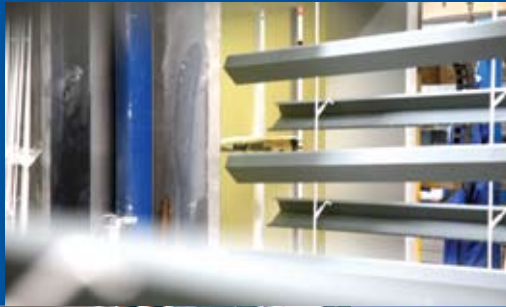
Who is Solid Air® International?

Solid Air® International is part of the Nijburg Industries Group with its parent company based in Holland, specialises in all aspects of air distribution for climate control of buildings with manufacturing plants in Holland and the UK producing quality products to meet market demand.

We have a full range of air distribution equipment, air handling units, fans, grilles, diffusers, dampers, variable air volume and constant air volume units, active and passive chilled beams, fan coil units etc.

From system concept our engineers design, manufacture and install complete systems with our R&D department developing products and testing them in one of our laboratories to meet the demands of the industry whilst coordinating our products with new architectural designs.

The OKNI Active Chilled Beam is produced in the Solid Air® manufacturing plant in Sappemeer Holland with our sales markets being Europe, The Gulf Region, Australia, United States and South Africa.





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The OKNI Active Chilled Beam:

An Active Chilled Beam is a sheet metal air distribution unit with a cooling or cooling & heating coil.

The Active Chilled Beam is duct connected to the central air handling system which provides conditioned fresh air to rooms for ventilation purposes and is also supplied with hot and/or cold water to comfort condition the space.

The operation of the Active Chilled Beam is based upon the old principle of induction whilst utilising modern energy friendly technology like geothermal and heat pump systems for the production of hot and cold water which provides a “green” solution to the comfort control of most buildings.

The Active Chilled beam provides the following benefits

1. No fan in the room - therefore no electrical supply.
2. No air filter
3. Low maintenance
4. Cold water typically 57 °F / 14 °C
5. No condensation drain
6. Hot water typically 122 °F / 50 °C
7. Integration with simple or intelligent control systems.
8. Low operating noise

The Active Chilled Beam can be a simple stand alone unit or can be combined with light fittings, audio and sprinkler systems etc. to provide a multi service functionality.



OKNI Active Chilled Beam		Performance Data	
Room Volume (m³)	Room Area (m²)	Flow Rate (l/s)	Power (kW)
100	100	1.5	0.15
200	200	3.0	0.30
300	300	4.5	0.45
400	400	6.0	0.60
500	500	7.5	0.75
600	600	9.0	0.90
700	700	10.5	1.05
800	800	12.0	1.20
900	900	13.5	1.35
1000	1000	15.0	1.50

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600	600	9.0	0.90
700	700	10.5	1.05
800	800	12.0	1.20
900	900	13.5	1.35
1000	1000	15.0	1.50

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How to use the OKNI?

The units are typically used in the following types of buildings:

- Commercial offices
- Schools, universities, congress centres, etc.
- Government institutions like city halls, libraries, etc.
- Hotels
- Laboratories

The units require limited building space for comfort control and the system operating conditions provide the advantages of:

- Smaller central air handling unit.
- Smaller ductwork distribution.
- Smaller hot and cold water pipe work
- Low unit height means reduced suspended ceiling

The system reduces running costs by:

- Reducing the supply conditions of fresh air, and the cooling, heating of the building.
- Very efficient and energy friendly therefore reducing cost of central systems.
- Integration with intelligent control systems will optimise energy costs reducing primary air flow rate when unoccupied and benefiting from free cooling when possible.
- No specific maintenance is needed, no moving parts, filters etc.

The use of the OKNI Active Chilled Beam is expanding, since the market for the application of induction units is growing rapidly in buildings in more parts of the world and now provides clients with an alternative to traditional systems like VAV or CAV, Fan Coil- and VRV-systems.





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The OKNI range

In most buildings the OKNI Active Chilled Beam unit is integrated flush in a suspended ceiling. The powder coated sheet metal face plate combines linear slots for the supply of air into the room with a perforated central section for induced return air. All the components are combined in one simple unit with the option of factory fitted controls.

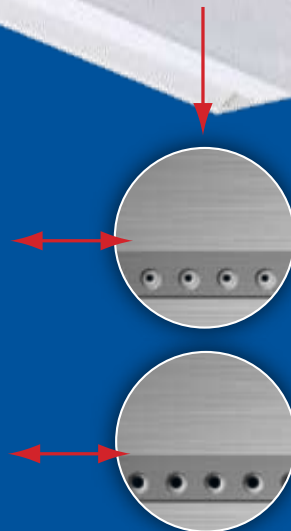


OKNI eXtravent

The OKNI eXtravent is an adjustable Active Beam with uniquely designed nozzles called eXtravents. These eXtravent shifts can alternate from small to large, in sections along the beam, simply by sliding a magnetic strip. An operation easily performed through the face of the beam, allowing for effortless retro-fitting. This patented system guarantees an air tight seal and prevents unwanted sound generation.

The use of eXtravent allows the volume of primary air to be significantly varied without excessive sound generation or a decrease in capacity performance.

For the first time, Active Chilled Beam Technology offers the flexibility to change an application from a conventional office space to a meeting room, without the need for re-design or retrofitting.





The OKNI Active Chilled beam unit is available in the following sizes:

TYPE	WIDTH		LENGTH*	
300	1 ft	300mm	2 1/2 - 10 ft	800 - 3000 mm
600	2 ft	600mm	2 1/2 - 10 ft	800 - 3000 mm
600x600	2 ft	600mm	2 ft	600 mm

Other types:**

Typical hotel unit (As FCU replacement for bulkhead mounting in suspended ceiling).

The complete range can be used as a free hanging version where no ceiling system is used*

Options:

- Extravent (total flexibility in fresh air volume)
- FPC (flow pattern control for optimal air distribution)

* Every casing length is possible, most casing widths are possible, extensions in length and width are to be discussed if ceilings require other solutions.

** Information on these units on demand.



OKNI 600 x 600



OKNI 600



OKNI hotel unit



OKNI free hanging

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How does the OKNI work?

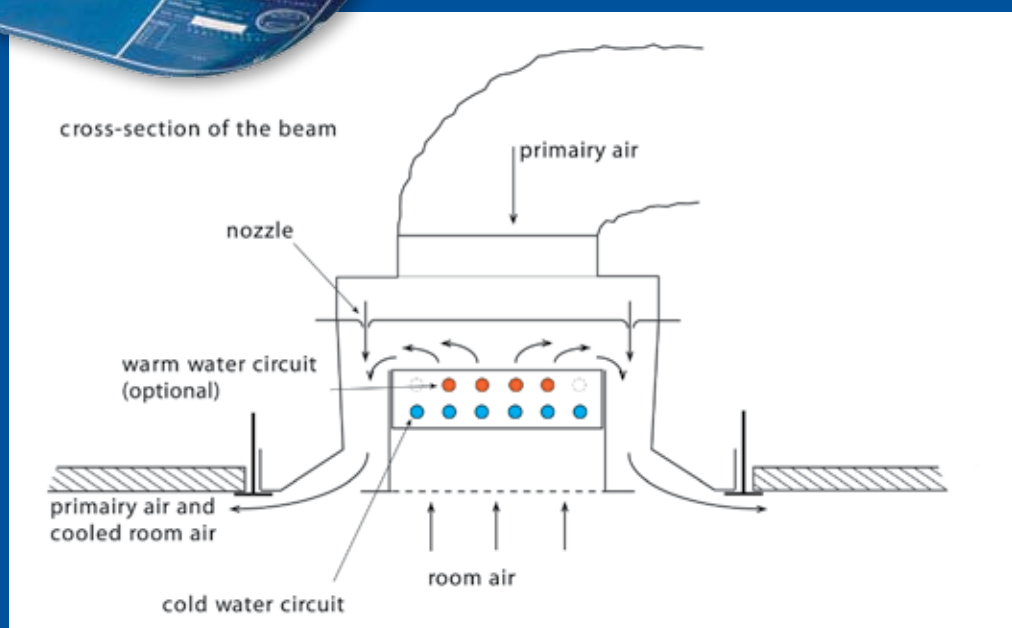
The design principles for selecting the units are:

- To calculate the minimum amount and condition of fresh air to the room.
- To ensure that the volume flow rate of cooling and heating water ensures an energy friendly central system.
- To provide optimum flexibility within the space by the use of Extravent. To ensure fresh air can be varied when changing room layout.
- To ensure that the performance of the unit meets design requirement to provide comfort conditions in the space.

The OKNI Active Chilled Beam is driven by the pressure within the central air handling system of the building. Fresh air is provided to each beam unit and is evenly distributed over the unit by a system of nozzles. Return air from the space is induced into the unit via a perforated central section located between the supply air slots and is cooled or heated by the coil within the unit and is then mixed with the fresh air from the central plant. The supply air slots ensure that the mix of supply air is evenly distributed into the space.

Our selection programme can calculate room velocities and noise levels to ensure that design comfort conditions are achieved.

System operation above room dew point and water coil design ensure that coil contamination is avoided.





Technical data OKNI Active Chilled Beam:

Cooling capacities: *

TYPE	MAX CAPACITY		MAX PRIMARY AIR DUTY	
300	2312 BTU/ft	680 W/m	13 CFM/ft	67 m ³ /h/m
600	3409 BTU/ft	1000 W/m	20 CFM/ft	100 m ³ /h/m
600x600	3740 BTU/ft	1100 W	76 CFM	130 m ³ /h

General outlines:

Supply temperature fresh air down to 50 °F / 10 °C

Supply temperature fresh air up to 122 °F / 50 °C

Air side pressure drop in the units 40 to 150 Pa

Supply temperature chilled water down to 54 °F / 12 °C

Supply temperature warm water up to 190 °F / 90 °C

Water side pressure drop in the units up to 80 inchW / 20 kPa

The coils are available in 2 or 4 pipe version. Electrical heating available on demand.

All data published in our documentation is available in a very efficient selection program.

Ask your representative for a copy.

* pressure drop up to 150Pa, delta T room - supply fresh air and water 11K, sound power level max 40dB(A) for type 300
pressure drop up to 150Pa, delta T room - supply fresh air and water 11K, sound power level max 40dB(A) for type 600
Heating capacities are in most selected OKNI ACTIVE CHILLED BEAM possible at a much higher power level, but never needed in building design



Research at lab

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How does Solid Air® International support you?

As a supplier of Active Chilled Beam systems for over more than 20 years, Solid Air® will provide you with the following support.

- Up to date technical department, trained staff and representatives
- Outstanding R&D facilities
- Custom made production, packing and transport
- Simple and adequate documentation and calculation program
- Project directed support (like full scale testing mock up)
- Efficient trouble shooting by our staff and representatives

Since 2009 Solid Air is a member of the EUROVENT commission on testing and rating Active Chilled Beams, We are active in the Active Chilled Beam Certification Program so we can guarantee our data on coil capacities. For the testing of the cooling capacity of the units, the EN 15116 standard is held. The selection and calculation software is also based on EN 7730 standard on comfort in acclimatised rooms. With this we can predict efficiently the comfort in rooms. Since the scientific version of our program is validated by Mock Up testing in independent laboratories we can confidently predict comfort in rooms.

Cooling		Heating	
Room temperature	17.0 °C	Room temperature	16.0 °C
Primary air temperature	16.0 °C	Primary air temperature	16.0 °C
Water temperature in	16.0 °C	Water temperature in	120.0 °C
Water flow	0.2 GPM	Water flow	0.1 GPM





References



Millennium Tower Amsterdam, the Netherlands, 2003
 Destination Office building
 Installation Geo thermal systems with 2600 OKNI units and 600 VAV systems
 Designer Deerns Holland
 Contractor Schulte & Lestraden
 User Reed Elsevier Publisher



Prinsenhof The Hague, the Netherlands, 2004
 Destination Office building
 Installation Geo thermal systems with 3600 OKNI units
 Designer Deerns Holland
 Contractor Wolter&Dros
 User Ministry of Finance



420 George Street Sydney, Australia, 2009
 Destination Office building
 Installation Traditional systems with 1400 OKNI units and 600 VAV systems
 Designer Connell Wagner, Australia
 User Commercial Renting



Bouwhuis Zoetermeer, the Netherlands, 2007
 Destination Office building
 Installation Geo thermal systems with 700 OKNI units
 Designer Van Heugten, Holland
 Contractor BAM
 User Dutch Builders Society



Legnano Legnano (Milano), Italy, 2007-2008
 Destination Hospital
 Installation Traditionel Compression Cooling, with 1029 OKNI units
 Contractor Hitrac Engineering Group S.r.l
 User Legnano Hospital



Montoyer Brussels, Belgium, 2009
 Destination Office building
 Installation 880 OKNI units
 Designer Emerco
 Contractor Herpain
 User tenants not known



Oradour Paris, France, 2009
 Destination Office building
 Installation 1480 OKNI units and 150 VAV
 Designer Union Investment real estate
 Contractor Bernet
 User tenants not known



Sabic Sittard, The Netherlands, 2008
 Destination Office building
 Installation 560 OKNI units
 Designer Becks
 Contractor GTI
 User Sabic Petrochemicals Research Centre



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Your representative: