

"Necessity is the Mother of Invention"

Revolutionary Refurbishment and Retrofit

Technology for Old Buildings

Commercial property owner/managers, consultants, and tenants around the world are benefiting from the installation of revolutionary, cost-effective and energy-efficient air conditioning units designed with DADANCO's new induction technologies.

Many older commercial office buildings are losing tenants due to poor air quality and circulation and unnecessary air conditioning noise caused by the inability of out-dated 'induction' air conditioning systems installed in the 1950s and '60s to meet today's cooling and comfort requirements.

The proliferation of electronic office equipment such as computers, printers, fax machines, photocopiers and electrical appliances has dramatically raised heat loads, greatly increasing cooling capacity requirements.

Until now, building owners faced a total system replacement; a costly capital investment and, in many cases, expenditure that was not totally justified.

When the existing ducting and infrastructure is in good condition and serviceable, DADANCO technology can greatly increase the entire system's performance, often within a building's maintenance budget.

DADANCO's cost-effective alternatives consist of:

1 refurbishment of key design elements in existing induction units, including replacing old nozzles with high-efficiency, low-noise STARLINE nozzles and adding a specially designed profiled side-wall to each unit. DADANCO has developed refurbishment kits for the following brands of induction units:

- * Barber-Coleman
- * Carrier
- * Environ
- * Sinko-Dunn Air
- * Trane
- * Velovent
- * Worthington
- * York;

2 retrofit (replacement) of the existing unit with new STARLINE or ACTIVE CHILLED BEAM induction units.

DADANCO refurbishment and retrofit technology reduces the primary air pressure from around 300-650 Pa (typical of existing induction systems fitted in the 1960s) to approximately 150-250 Pa. This provides an equivalent cooling capacity but at a much lower pressure, saving large amounts of energy ...

The reduction in primary air pressure entering through the novel STARLINE nozzle into the air conditioning unit results in large noise reductions, typically down to around NR30 to NR35.

A refurbishment or retrofit can be done quickly with minimal disruption to tenants. In Adelaide, the 13-storey Capita building (557 induction units) was refurbished in one weekend. Recent retrofit projects in Australia include:

- * CBA, 385 Bourke St, Melbourne
- * National Mutual, 360 Collins Street, Melbourne
- * Queensland Rail Centre, Edward St Brisbane

Recent refurbishment projects have been carried out in:

- * MLC Centre, Brisbane
- * 15 Adelaide St, Brisbane
- * NAURU House, Melbourne



DADANCO Starline Floor & Ceiling Mounted Units

For more information visit: www.dadanco.com



Hugh J. Higgins, Research Engineer for DADANCO

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Research Engineer for DADANCO

"From Aerospace to Air Conditioning"

After graduating with a Bachelor's Degree in Mechanical Engineering from the University of South Australia, Hugh James Higgins started work with British Aerospace Australia. During his three years with BAA, Hugh applied his mechanical engineering knowledge to the research and development of new aeronautical technologies.

From British Aerospace Australia, Hugh decided to return to University and completed a second Bachelor's Degree, this time in Theoretical Physics, at the University of Adelaide.

During this time, Hugh began to work for the Energy and Engines Research Group, associated with the Department of Mechanical Engineering at the University of South Australia. While working for the Research Group he witnessed some Calorimeter Room testing of DADANCO products where he met Mr Vladimir Petrovic, the co-founder of the company. At the time he did not realise where that chance encounter would lead.

Today, Hugh has made the transition to aerodynamics of a different kind, having taken the position of Research Engineer with DADANCO on May 1st, 1998. Hugh is reshaping testing and design processes to deliver on-line air conditioning solutions for specific building designs with innovative solutions using the full DADANCO product range.

A major focus of Hugh's research work has been product development, and also to provide clients with a view of air distribution using DADANCO equipment. Using CAD and a Computational Fluid Dynamics (CFD) modelling software package, Hugh conducts on-line testing, a vital role in the design of revolutionary new products which DADANCO will launch via its website at www.dadanco.com and at forthcoming trade shows around the globe.

"The research work DADANCO is undertaking with induction air conditioning systems is the most advanced of its type in the world," Hugh said recently.

Looking to the future, Hugh said he hoped to "capture the true physical nature of the entrainment process, and to harness this knowledge to develop air conditioning systems that meet the environmental challenges of the 21st century".

Revolutionary Refurbishment Retrofit and New System technology

New Building Design Opportunities

For designers of new buildings, DADANCO offers the STARLINE and ACTIVE CHILLED BEAMS air conditioning units which can be custom-designed to optimise comfort conditions and reduce energy consumption to new world standards.

But the advantages gained by DADANCO technology affect much more than the air conditioning system - they can have an enormous impact on building design, construction, and maintenance costs as well.

DADANCO systems require substantially smaller ducting due to the fact that DADANCO units operate by circulating only 25% to 35% of primary air required by other systems. This means that ceiling space can be reduced by approximately 300mm on every floor of a building. In a large building this presents two options:

- 1) The addition of another floor of lettable space for every 12 floors in the same planned building height; or...
- 2) The benefits of a lower building height but with the same net lettable space as the originally planned structure.

If the lower building height option is chosen there are remarkable flow-on benefits.

For example, if a 20-storey building has a 120-metre perimeter, the technology will eliminate 720 square metres of construction. Based on this estimation, 20 storeys x 300mm = 6m; 6m x 120m = 720sqm @ approx. \$750 per sqm: This equates to a construction cost reduction of around \$540,000.

The technology also allows savings to be made on:

- * shorter lift shafts and cabling
- * pipe and duct risers
- * shorter and narrower building pylons
- * reductions in excavation depth

Based on the example above, the reduction in the building perimeter and its surface area would also reduce the heating and cooling transmission loads by around 10 percent. This means that the demand on the chiller, pumps,

ducts, water and power is also reduced by approximately 10 percent, in the perimeter of the building.

A 10 percent reduction in demand means equipment requirements can also be reduced by 10 percent in size, which can translate to a savings in capital outlay of up to 40 percent.

These figures are not just theoretical examples; they represent an indication of savings already made in new building projects, 'retrofits', and 'refurbishments' in Australia and around the world, through the application of DADANCO's innovative technologies.

The most recent new building installation of STARLINE technology was in the TOGA Centre, 117 York Street, Sydney, NSW, Australia, which gained an extra floor without increasing building height. For more details visit www.dadanco.com

Special Visitor

His Excellency, Sir Eric Neal, Governor of South Australia visits DADANCO

Recent publicity of DADANCO's achievements in the world of air conditioning prompted His Excellency Sir Eric Neal, Governor of South Australia, to request a visit to the company's headquarters to meet the people behind the successes.

Sir Eric was given a tour of the premises and a demonstration of the high-tech research and development processes used by DADANCO to design optimum performance, energy-efficient air conditioning systems for clients across the globe.

As a qualified engineer, His Excellency recognised the uniqueness of the technology, which has been developed in South Australia by a burgeoning business with only eight employees.

"DADANCO is among the fastest growing businesses in South Australia, and with continued growth at this rate, will help to focus global attention on our State as a recognised leader in technology, innovation and business development," Sir Eric said.

Company co-founder Professor Sam Luxton referred to the support of the University of Adelaide. He emphasised that Mr Vladimir Petrovic, who was studying for a PhD in air conditioning when the company was founded, could not have developed his ideas into world patented technologies without such strong assistance.

Mr Petrovic also highlighted that DADANCO's global success was supported by excellent quality and craftsmanship in the manufacturing process, a job carried out by Mr Wayne Mason and his company, A1 Ducting Pty Ltd, also based in Adelaide, at Dry Creek.

The Governor said he recognised DADANCO as a true success story in the commercialisation of a new technology, a result of cooperation between research institutions and commercial industry.

Case study: 360 Collins St, Melbourne

Retrofit Technology - Cost effective solution to common problems

Problems associated with noise, air circulation and cooling capacity solved with an innovative application of DADANCO retrofit technologies.

CMR Consultants Australia, project managers for the renovations of 360 Collins Street Melbourne, were hoping to obtain an A-grade property status for the building once the project was completed. This required, amongst other things, upgrading the out-dated air conditioning system that had been the source of many problems for owner/tenants, National Mutual and Westpac, throughout the 35-storey building's life.

Typical of many buildings constructed in the 1950s, '60s and early '70s in and around Collins St, 360 Collins Street had an induction air conditioning system with 'Dunn Air' brand ceiling-mounted units installed in the perimeter zone.

Induction systems were designed in the 50s to handle heat load of that era. In the past 40 years, internal heat loads have increased almost 6-fold due mainly to an exponential increase of electric and electronic office equipment.

It would have been technically correct, by conventional methods, to conclude that the building required an entirely new system, which was seen to be a very expensive answer to the problem. However, a cost-effective, energy efficient solution that used DADANCO technology turned the project around.

As the building's existing infrastructure was basically sound and operative, consulting engineers, Lincolne Scott Australia, recommended using Award winning DADANCO STARLINE induction unit technology - which was half the cost of the previously proposed fan coil system - and subsequently won the tender.

Properties of the STARLINE Technology enabled consultants and owners to tap onto the old air conditioning system. The technology's energy-efficiency also avoids extra drainage on the power-grid so there was no need for extensive rewiring of the building. The retrofit option averted expenditure on new transformers, new ducting and air diffusers that were required by a proposed alternative.

The financial benefits of replacing only the existing induction air conditioning units with new Dadanco units appealed to the owners, and a subsequent contract was awarded to replace all 1700 ceiling-mounted induction air conditioning units, with DADANCO STARLINE units, specially modified to be compatible with the existing infrastructure.

An increase in the capacity of induction air conditioning systems often results in a significant increase in noise levels. However, the high efficiency of DADANCO patented STARLINE nozzles and the computer-modelled, profiled 'mixing chamber' allowed an increase in cooling capacity and noticeably reduced noise and energy consumption.

In the case of 360 Collins Street, primary air pressure was reduced to 250 Pa, system capacity was increased by 15 percent and noise levels reduced dramatically.

As a result of this major refurbishment, 360 Collins Street is again on the market and drawing much interest from potential tenants.

Details of the Collins Wales Place retrofit can be found at www.dadanco.com or by phoning 08 8351 9734.

Retrofit at 360 Collins Street, Melbourne Victoria



Table of benefits.

DADANCO amongst Australia's Best & Brightest

DADANCO Provides:

- Research
- Development
- Product design
- Modern manufacturing methods
- Engineering solutions
- Best products

Spanning the disciplines of:

- Aerodynamics
- Acoustics and noise control
- Psychrometrics
- Heat and mass transfer
- Refrigeration
- Process integration and optimisation
- Computational fluid dynamics
- System simulation
- System analysis and control
- Testing to international standards

For the worldwide air conditioning market involving:

- Consulting engineers
- Architects
- Property owners
- Property developers
- Hotel owners
- Facility managers
- Plant engineers
- Contractors

in the design of air conditioning for:

- Office buildings
- Hotels
- Hospitals
- Schools
- Airport lounges
- Public areas

The second annual Australian Technology Awards, held in Sydney in May 1999, saw DADANCO win a major category and share



the limelight with some of the leading technology innovators the nation has to offer.

DADANCO won the award for Excellence in the Development of Technology from an Organisation Employing less than 50 People.

A joint initiative of PriceWaterhouseCoopers and Technology Transactions, the Australian Technology Awards seeks to draw the attention of the investment and professional communities to excellence in technological development and application.

Sharing the limelight surrounding the technology award are DADANCO Chairman Professor Sam Luxton (left), and Managing Director Vladimir Petrovic, co-inventors of the revolutionary STARLINE technology.

www.dadanco.com

In 1998, DADANCO launched a website with the main aim of communicating to a global market and generating inquiries and sales via the Internet.

The modest initial outlay soon paid dividends with an inquiry from the UK which resulted in DADANCO securing a contract to provide a complete 'retrofit' of Boots The Chemist' headquarters in Nottingham, UK.

The large number of inquiries from the initial website convinced DADANCO of the potential for business growth through the Internet. This prompted a major

re-development of the website, with the ability to provide globally dispersed clients with 24 hour, on-line information, purchasing and support services.

The new site, launched in September 1999, far exceeded expectations by receiving almost 6500 'hits' in its first month of operation, almost double the previous month.

The original site has been significantly upgraded to include:

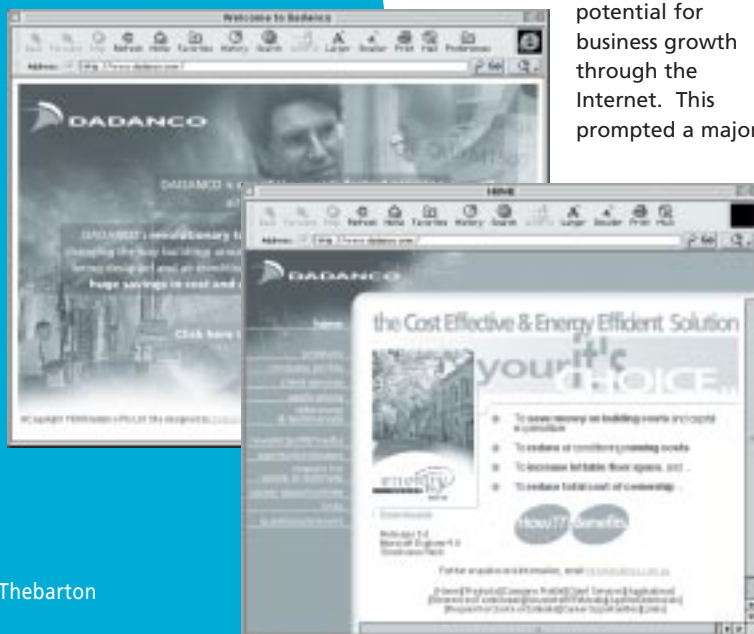
- * Corporate profile: The company and staff
- * Product information and technical design specifications
- * Projects completed around the globe: Case studies and testimonials
- * Electronic document exchange
- * R&D programs: New product development

"The website has now grown to be our most powerful marketing and information tool," said Mr Abel Podger, Dadanco's Client Relationship Coordinator.

For DADANCO staff, the Intranet section of the website will feature on-line product development, and a project-specific, integrated global database.

"The website enables clients to do everything from downloading product and design information to placing a purchase order, while the DADANCO team will use the new internal databases to increase efficiencies in the exchange of documentation on a global scale," Mr Podger explained.

Visit the new site today at www.dadanco.com



www.dadanco.com

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