Space for Innovation
Our clients represent among others, real estate owners and developers, real estate users, general contractors, public institutions and industrial companies.

Caverion was established in June 2013 when the Building Services and Industrial Services businesses were demerged from YIT Group into a new independent company. The Caverion shares are traded on Nasdaq Helsinki.

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The products are well-known in public and business premises, but also in places where quality and reliability is especially important, like clean rooms, nuclear facilities, biosafety laboratories or isolation wards.
The Research & Development Centre in Aachen is Caverion’s creative hub on 1,000 m² of floor space we realise today the building services of tomorrow by making them reliable, safe, comfortable, efficient and sustainable.

Caverion has specific competence in deliveries for demanding properties, such as gas-tight biosafety labs and clean rooms, acoustically sensitive theatres and TV studios, and comfortably air-conditioned auditoriums, exhibition halls.

We also develop our own products and solutions for ventilation, building automation, systems integration and automated waste collection.

Aachen R&D centre
- Specialises in the research and development of advanced products related to ventilation, cooling and heating
- Builds test stations to simulate ventilation, cooling, heating and acoustics concepts under real-life conditions for demanding sites and building systems
- Validates the functions of ventilation and air conditioning components and systems in laboratory tests on a 1:1 scale to guarantee high standards of comfort, airflow and noise emissions requirements
- Uses computer simulations (CFD – Computational Fluid Dynamics) to calculate airflows in a room based on a computer model in cases where lab testing on a 1:1 scale is not feasible e.g. regarding airports, sports arenas, auditoriums or theatres

Test stations
- 200 m² echo chamber for acoustic measurements
- Measuring room for HVAC systems equipped with a facade where summer and winter weather conditions can be simulated
- Test room for indoor climate testing where comfort parameters can be set according to your specific needs
- 12-m-high climate hall for air conditioning in event venues with air volume flows of up to 20,000 m³/h and cooling capacities of up to 250 kW

The R&D Centre in Aachen is focused on creating highly functional solutions that keep people and their working and living environments safe, healthy and comfortable.
How well do you manage energy consumption?

Caverion’s specifically designed services and solutions optimise a property’s energy consumption throughout its life cycle. With the help of Caverion’s solutions, you can lower the energy costs of your premises, reduce their environmental impact and comply with the EU’s tightening energy goals.

Buildings account for approximately 40% of energy consumption and 36% of CO₂ emissions within the EU. Designing and maintaining energy-efficient buildings has a major impact in slowing down climate change.

Caverion supports you in decreasing the environmental impacts of your operations. For example, remote management helps prevent business interruptions which could often result in increased energy consumption. Our competence and ability to analyse large volumes of data together with advanced building automation solutions and monitoring tools support overall industrial productivity and energy savings targets.

Caverion’s energy efficiency specialists provide analyses and recommended actions from energy inspections extending to complex energy contracting business models where savings are guaranteed.

ENERGY EFFICIENCY

Mora municipality, Sweden

Mora municipality promotes long-term sustainable development...

...to reduce the energy consumption in municipality-owned buildings in a profitable way. The improvement of energy efficiency is financed with the accrued savings.

Challenge
- Guarantee energy efficiency for all types of property holdings
- Reduce energy costs
- Improve energy quality of property maintenance
- Improve the state of the environment

Solution
- Detailed measures per property object based on comprehensive analyses of heating, ventilation, control, electricity and building envelope
- Energy Performance Contracting (EPC) guarantees savings and reduces client’s financial risk
- Cutting yearly costs by €500,000
Are people satisfied with the environment in your building? What is their productivity level?

At Caverion, we support our clients in the management of property such as hospitals, schools, sports venues and office buildings. The environment developed in the projects has been a lot of attention, but research shows that the optimal indoor air quality increases productivity and satisfaction, improves performance as well as reduces absences.

Caverion offers innovative and modular solutions throughout the building's lifecycle to ensure comfortable, pleasant, safe and healthy indoor conditions. In a broad-based Norwegian research project, Dr Ragnhild Wiik has shown that great gains in productivity are achieved by improving air, sound and aesthetic conditions. Research concludes that 25% of our productivity is controlled by the indoor environment.

ByggSim
- Building simulator tool for builders and property developers
- Shows how increased productivity translates into hard cash in energy, operational and maintenance costs
- Estimates how much more productive your employees can be in optimal conditions

Caverion has developed a tool called ByggSim based on this four-year research into how much more productive employees can be in optimal conditions and what that actually translates into in hard cash on the bottom line.

Helsebygg Midt-Norge: Hospital Development Project for Central Norway...

One of the buildings is the Knowledge Centre, a building for research, teaching and patient treatment. It houses the university hospital's auditorium with 380 seats, a medicine and health library, and workspaces for students and facilities for research and teaching.

Knowledge Centre, St. Olavs Hospital, Trondheim, Norway

Challenge
- Special requirements for fire safety, hygiene, infection control and ventilation
- Technical installations to be adapted to varying functional needs of the hospital building
- Brisbane must meet energy demands for the passive house standard
- Flexible technical solutions for easier future renovations

Solution
- Energy consumption reduced through additional insulation, extra density, heat recycling, low-energy lighting, smart shading devices and demand control of light and air flow
- Passive house standard achieved by Caverion's patented ClimaCeil solution
- Total technical solution and intelligently controlled from a centralised system
- Utilisation of BIM for collaborative design, construction and operation throughout the building lifecycle

INDOOR CLIMATE
The Triotto office building ... is an extension of the Duetto Business Park. Triotto, measuring 16,000 m² in area, was completed in 2012. Telecom group DNA Ltd and national grid company Fingrid Oyj are headquartered in the building. The owner of Triotto is the German real estate investor Hansainvest.

Triotto consumes less energy but also encourages ecological behaviour. It provides an energy-efficient and flexible work environment. The building has been awarded Gold level LEED environmental certification based on LED lighting, energy use monitoring and the building's location.

**Challenge**
- High security control
- Data system redundancy
- Centralized control of high utility rate environment management

**Solution**
- Design, engineering, assembly and delivery of total technical solutions
- LuxCool suspended ceiling element used in the building containing all technical elements including LED lighting
- Five-year guarantee for energy consumption level and system functionality

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John Deere is the world’s leading manufacturer ... of agriculture machinery established in 1837. The EDPC aims to reduce transportation costs and environmental impact by improving the product flow between factories, suppliers and parts distribution facilities in Europe.

Krantz have installed the AVACS multifunctional sails in the office spaces (ground floor, 1st and 2nd floor) of its administrative building, the European Parts Distribution Centre in Bruchsal, Germany.

**Challenge**
- Ensuring thermal comfort
- Optimising exchange of fresh and stale air
- Providing a draught-free environment

**Solution**
- Controlled air flow ensured by combination of supply air outlet and return air return
- Invisible supply air outlet
- Enhanced room ventilation
- Flat shape and attractive design
- Special discharge pattern prevents the ceiling sail from dirtying
Caverion has extensive know-how in the design and installation of ventilation and air-conditioning products. We are an independent supplier and can design the best possible solution for each individual customer, complete with the hardware needed.

We also offer our own proprietary products and solutions, such as the LuxCool element. LuxCool is an innovative chilled beam which integrates building systems in one ceiling element. It provides a compact and cost-efficient solution where one device is equipped with high-quality cooling units including lighting, presence detectors and other necessary office building technology. LuxCool has mobile flexible design and can be used for renovation projects where space is limited. Both for new buildings and also for renovation projects where alterations are easy to implement.

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AVACS
The AVACS (Air Ventilation And Cooling System) multifunction sail is designed to build an attractive cooling/heating ceiling system. There are a number of configurations available, e.g. made up of one or several panels, rigid or pull-down design, with or without supply air distribution, optionally with remote control. The AVACS sail can also be fitted with inspection elements for maintenance of control valves installed by the client. AVACS sails come into use in offices, meeting rooms and other places where air conditioning is important, among others.

ClimaCeil
ClimaCeil is an end-to-end solution that gathers all the technical installations in one place, including ventilation, electrical and ICT cables, sprinklers and pipes. The various parts are made in advance, so that they can be quickly assembled on the construction site, if a standard base installation is in place. The product can be customised, for example, according to noise and fire requirements. With large parts of the technology in the same pathway, and with flexible prefabricated modules and well-planned production, time is saved on construction sites. The solution allows for quick room alterations and lower energy consumption levels, resulting in significant cost savings during the building's life cycle.
What is the life cycle cost and how efficient is the technical investment payback? Will your property last for decades to come?

A life cycle perspective is included in everything Caverion does. For clients, this means their buildings are functional, safe, sustainable, and energy and cost-efficient. Energy efficiency is a vital element for lowering life cycle costs, increasing eco-friendliness, improving sustainability and preserving property value in the long run.

At Caverion, we can take responsibility for designing and installing all of the technical systems and solutions as well as for the service and maintenance of the property or industrial plant. This includes managing your properties' labels, certifications and regulations, reducing risk and increasing rent income.

Huhtasuo school and day-care centre, Jyväskylä, Finland

The Huhtasuo school and day-care centre ...

... is a learning facility for children in day care up to youngsters in elementary school. The school hosts almost a thousand pupils of which more than 100 are children with special needs. Thus, innovative technology is at the core of everything ensuring that the children can spend their days in a healthy indoor environment.

The buildings are also full of life in the evenings when recreational activities take place and the modern facilities are available to nearby residents.

Challenge

- Maintaining the facility in good condition for years to come
- Optimizing indoor conditions for children, pupils and staff
- Ensuring that the municipality need not invest in unplanned and corrective maintenance
- Guaranteeing high energy efficiency

Solution

- 20-year service agreement ending in 2033
- Installation and maintenance of systems
- Real-time property management and monitoring with fully integrated systems
- High-speed fibre network connections
- Predictive maintenance model for regular facility management
- Optimal levels of energy consumption for lighting, air conditioning and cooling
- Quality of the facility remains stable for its entire lifecycle
The new National Courthouse for Western Jutland in Denmark was completed in 2014 as part of a PPP (public-private partnership) project together with the authority for the courts of Denmark. Caverion has carried out the technical design and installation and will have the full facility management responsibility in its 25 years of service.

**Challenge**
- New national courthouse for the western part of Denmark
- High architectural and technical standards
- Improved life cycle performance compared to other public building projects

**Solution**
- A. Enggaard and Caverion as partners in a public-private partnership
- Design, construction and maintenance of the building
- Caverion responsible for most of the technical design as well as the installation and management of the whole facility
- The maintenance contract includes full responsibility of energy usage

National Courthouse, Viborg, Denmark
How smart buildings communicate?

When a building’s operating environment is functioning correctly, it increases productivity and end-user comfort. With the automation and remote management technology available today, clients can achieve dramatic improvements in building and process energy efficiency as well as in cost and quality control.

Business continuity is ensured with smart solutions providing high predictability and accuracy of operation. This minimises the need for expensive shutdowns and lets end-users focus on their core business activities, helps in predicting and reducing operational costs, and improves scheduled maintenance.

Caverion’s solutions require in-depth expertise in integrating various types of total technical and IT solutions and skills in analysing and utilising data from numerous sources. This applies to underfloor heating, LED technology, motion detectors, presence-based ventilation, or the combining of terrestrial heat and solar collectors alike.

In addition, Caverion offers its modern ServiFlex service concept for preventive planned maintenance for single or multiple technical systems. The objective is always to offer ease and efficiency in everyday operations. ServiFlex prolongs the life of the technical installation and increases the value of the building.

INTELLIGENT SOLUTIONS

Max Hamburgers, Sweden

Max was one of the first burger chains in Europe ... and was founded close to the Arctic Circle in 1968. Max runs 97 restaurants in Sweden, three in Norway and one in Denmark. Most restaurants are located in their own freestanding buildings.

The Max Hamburgers chain has a nationwide ServiFlex agreement with Caverion for preventive maintenance covering 93 restaurants in Sweden.

Challenge

- Uniform technical maintenance in 93-Max restaurants in Sweden
- Coordinating maintenance with several on-going installation projects
- Standardised services including reporting to authorities
- Quick response time

Solution

- Fixed contract for technical maintenance with pre-agreed prices
- Focus on preventive maintenance with corrective maintenance easy to add
- Quality-assured processes and standardised services
- Administration of reports according to authority regulations
- 24/7 help desk
- One contact person from Caverion for all services
- Energy-saving measures frequently identified

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Seabrokers, Stavanger, Norway

Seabrokers are experts in shipbroking, real estate, facility management, construction, sea surveillance, and safe lifting operations. Amongst others, they own and operate five buildings in western Svanholmen in Forus, Stavanger, Norway.

The tenants are high-profile companies and the buildings are often referred to as "gullrekka" ("the golden line"). The tenants of these five buildings are Statoil with two buildings, Gas de France, Sandnes Sparebank, and ENI.

**Challenge**
- Maintenance of technical installations
- Designing of functional buildings for high-profile tenants
- Provide a healthy indoor climate

**Solution**
- ServiFlex agreement covering all five buildings
- Includes electrical installations, ventilation and air conditioning, security and piping
- Caverion’s service and bi-annual maintenance of the ventilation and air conditioning and annual maintenance for the other disciplines
Friedrich-Loeffler-Institut, Greifswald-Insel Riems, Germany

The work of the Friedrich-Loeffler-Institut...

...Federal Research Institutes for Animal Health (FLI) focuses on farm animal health and welfare and on the protection of humans from zoonoses, i.e. infections which can be transmitted from animals to humans. Aims of the work are the prevention of diseases by developing and improving rapid diagnostics and prophylactic measures, providing the background for modern control strategies for animal diseases and zoonoses, improving farm animal husbandry in compliance with animal welfare, preserving the genetic diversity of farm animals and supporting the efficient utilisation of animal feed as basis for the production of high-quality animal-based foodstuffs. The FLI was founded in 1910.

Challenge

- HVAC systems for high biosafety level laboratories
- HVAC and fire protection systems for pressurised spaces
- Gas extinguishing systems for pressurised spaces

Solution

- Installation of a high-end clean room HVAC system
- HEPA filtering of supply and exhaust air
- Development of a scoreboard for sensitive areas
- Installation of extinguishing systems with halon substitutes

How safe and reliable is your facility?

Urbanisation is growing fast everywhere. Municipalities need to invest in cities and growth centres to provide attractive, functional and safe built environments. At the same time, there are industries and organisations in densely built areas that deal with hazardous substances. This could cause serious danger to multiple people or the environment, either on- or off-site.

Today, new buildings are designed for flexible and multiple use. In addition, existing industrial buildings are being converted into new use. Infrastructure often needs to be upgraded to respond to such diverse needs. All this aims at developing safe and ecological physical environments for citizens and communities enabling daily functionality and well-being.

Caverion provides reliable solutions for safety and well-being, taking into account indoor and outdoor conditions, tight building regulations, biodiversity issues as well as the broader needs of complex and networked infrastructures in urban environments.

SAFE ENVIRONMENT
Complete clean room solutions

Designing and developing high tech and pharmaceutical clean rooms requires in-depth understanding of controlled process environments, e.g. regarding microbiological control. Customer requirements need to be transferred into system and building solutions including the design of HVAC, piping and electrical systems.

Caverion has a solid track record in working with regulatory demands required for building and validating clean rooms and pharmaceutical projects and the competence to conduct qualification activities. We have developed...

... innovative clean room systems where highest demands on quality, flexibility and modularity are achieved in production facilities.

Features

- Complete delivery of clean rooms with Cleanplus® system and Krantz components
- Compliance with GMP applications
- Turnkey contracts including design, installation and validation
- Modular systems with short installation times
- HVAC engineering
- Control system for airlocks, code locks, card readers

Reference customers

- Cepheid, Sweden
- Karolinska University Hospital, Sweden
- Astra Zeneca, Sweden
- Nanolab, NTNU, Norway

Technical installations

- Clean room envelope
- Ventilation
- Automation
- Piping
- Electricity
- Cooling

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How to create most value and quality?

As much as 54% of the world’s population live in urban areas today, a proportion that is expected to increase to 66% by 2050. In Europe, by 2014 72% were already living in urban environments. This trend is growing fast and will have a huge impact on working and living environments as well as on the design and maintenance of buildings.

Providing public transportation, as well as housing, electricity, water and sanitation for high-density city areas is typically more cost-efficient and reduces the human impact on nature. Functional and controlled systems enable a comfortable urban life, where safety is the perfect interaction of technology and human behaviour.

Caverion provides opportunities to make cities and growth centres connected and accessible with reliable infrastructures. Also, the property value of existing buildings can be significantly increased through their new use. Caverion’s expertise covers the full scope of technical design, installation, project management and maintenance – competences areas required for major infrastructure and urban solutions.

RELIABLE INFRASTRUCTURE

Ardning tunnel monitoring control room, Arding, Austria

ASFINAG is responsible for Austria’s 2,200 km top-tier road network … and due to the topographical features of the country a major part of its work is tunnel construction. In order to comply with the extremely stringent safety requirements, ASFINAG’s state-of-the-art tunnel monitoring control room system will eventually cover the whole of Austria. On a daily basis 25,000 cars and 2,500 lorries pass through the tunnel systems monitored by Arding.

Challenge

- Monitoring scheme on 25 tunnel entrances for the A9, a heavily used north/south transit corridor
- Use of process control technology to be flexibly adapted to expansion stages, including all peripheral devices
- Highly complex high complexity in the converging of more than 200,000 data points
- Compliance with stringent safety requirements for 24-hour operations including backup systems

Solution

- Development and expansion of the existing control room technology
- Process control engineering
- Installation of technical building systems
- Projection screen with 16 monitors controlling the motorway and highway camera network
- In-house development of video stream connection and control software
- Compliance with stringent safety requirements for 24-hour operations including backup systems

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Henninger Tower, Frankfurt am Main, Germany

A new 140-m-tall residential tower…

…which is externally inspired by the old grain silo of the former Henninger brewery will replace the former city landmark. It covers 77,000 m² and will contain more than 200 luxury apartments over its 40 floors. A U-shaped block development will provide additional floor space for commercial service providers. The cornerstone for this project was laid in June 2014 and the first residents are expected to move into the building in 2016.

Challenge

- Unique residential building project due to the location, building method and technical equipment of the tower
- Securing top quality project execution and smooth on-site logistics despite the tight time frame
- Limited space and storage in the city centre location

Solution

- Caverion is responsible for delivering the total technical solution
- Years of experience in high-rise building and logistical processes
- Multidisciplinary work as technical general contractor
- Geothermal energy system for heating and cooling
- Use of prefabrication to shorten mounting time
Life Cycle Solutions for Buildings and Industries