

# Sodeca, a company specialising in smoke extraction, and the Murcia Metal Technology Centre carry out an experiment -unique in Europe- on a large volume fire

**Sodeca technicians, working with researchers from the University of Jaén, the Comillas Pontifical University and the Murcia Region's Metal Technology Centre, have carried out experiments on large volume fires in closed spaces.**



The Murcia Metal Technology Centre's Industrial Building for Fire Testing was the perfect facility for investigating the behaviour of flames and the smoke generated. Atrium-type constructions are commonly found in many large buildings, including hotels, shopping centres, office blocks, public transport stations, airport terminals and auditoriums. The special characteristics of these large open spaces mean that, when there is a fire, the flames and smoke can freely propagate through the whole of the building, since there are no architectural barriers to prevent this happening. This puts the occupants' lives at risk and renders the fire prevention techniques and protocols designed for conventional, smaller premises useless and ineffective.

In the experiment, a flame more than seven metres high was created. The aim was to research the movement of the smoke generated in a fire and the effectiveness of smoke extraction systems using different ventilation strategies, such as continuous and variable forced extraction, natural ventilation, and different sizes and layouts of ventilation grilles.

Using high precision instrumentation, the researchers measured and analysed conditions in the interior - gas concentrations and temperatures. For smoke extraction, fans specially designed by Sodeca were used - Sodeca specialises in this type of application.



This type of experiment is unique in Europe, since the building used measures 20m x 20m x 20m, which makes it an actual-scale facility for performing these tests.

The objective of the project is to obtain new numerical simulation models based on experimental tests, which assist in setting the parameters for the behaviour of the gas layer generated as a consequence of the fire, and this translates into optimising the efficiency of fire protection systems.

The study will allow general conclusions to be reached, criteria to be proposed and recommendations made for designing fire protection installations. This will result in considerable progress in terms of knowledge, a great contribution to the international engineering community, and will ultimately help save more lives.



# JET FANS

## CAR PARK VENTILATION SYSTEMS

### F400 - F300 - F200



EN-12101-3-2002  
Powered smoke and  
heat exhaust ventilators  
for use in Construction Works

**SODECA**  
®





ISO 9001  
BUREAU VERITAS  
Certification



## OUR COMMITMENT TO THE ENVIRONMENT

Sodeca has begun a new stage of study and design of new trends in ventilation which will help to preserve the environment and to make the energy saving which so much concerns today's society.



To obtain an **improvement in energy efficiency** of fans and of ventilation facilities, the engineering department of Sodeca has **balanced the energy consumption of the fans** with their maximum performance, in the habitual areas of work. This has required a restructuring of the curves and their presentation in this and future Sodeca catalogues.

**SODECA** has concentrated its activity on the production of industrial fans, ventilation systems and extractors for the removal of smoke in case of fire since 1983, when it was founded.

**SODECA's** fans and extractors are present in all European countries and in many parts of the world, thanks to the quality of the product and the methods of research and development used.

Our quality procedures used and certified by BUREAU VERITAS, in accordance with ISO 9001:2008, are another of the reasons which make **SODECA** one of the best and most renowned fan manufacturers in Europe.

Without a doubt, the most important factor to achieve our objectives is the human factor, the great professionals who work at your service, offering not only ventilation equipment but also solutions to any ventilation need required by our customers.

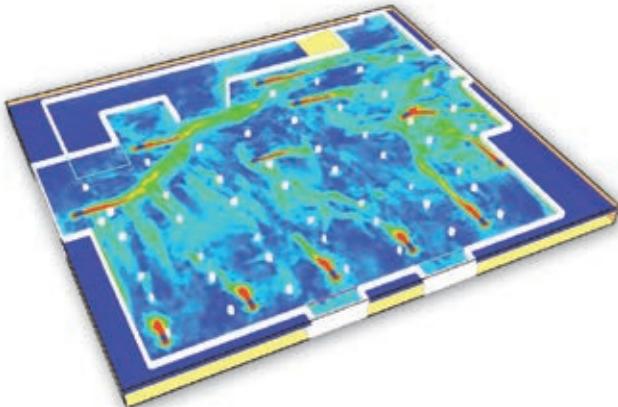
We sincerely offer you the possibility of visiting our facilities in Sant Quirze de Besora, with over 16,000 square metres of built area, where you will be able to see our fan manufacture with perfect clarity and with the highest standards of quality, complying with the ISO and AMCA standards.

This catalogue is only a small part of our possibilities. Do not hesitate to contact us. We will put all our experience and our human resources at your disposal.



installations  
headquarters of  
**SODECA s.a.**,  
at Sant Quirze  
de Besora and  
manufacturing plant  
in Santiago  
de Chile.

# SPECIALISTS IN JET FAN VENTILATION

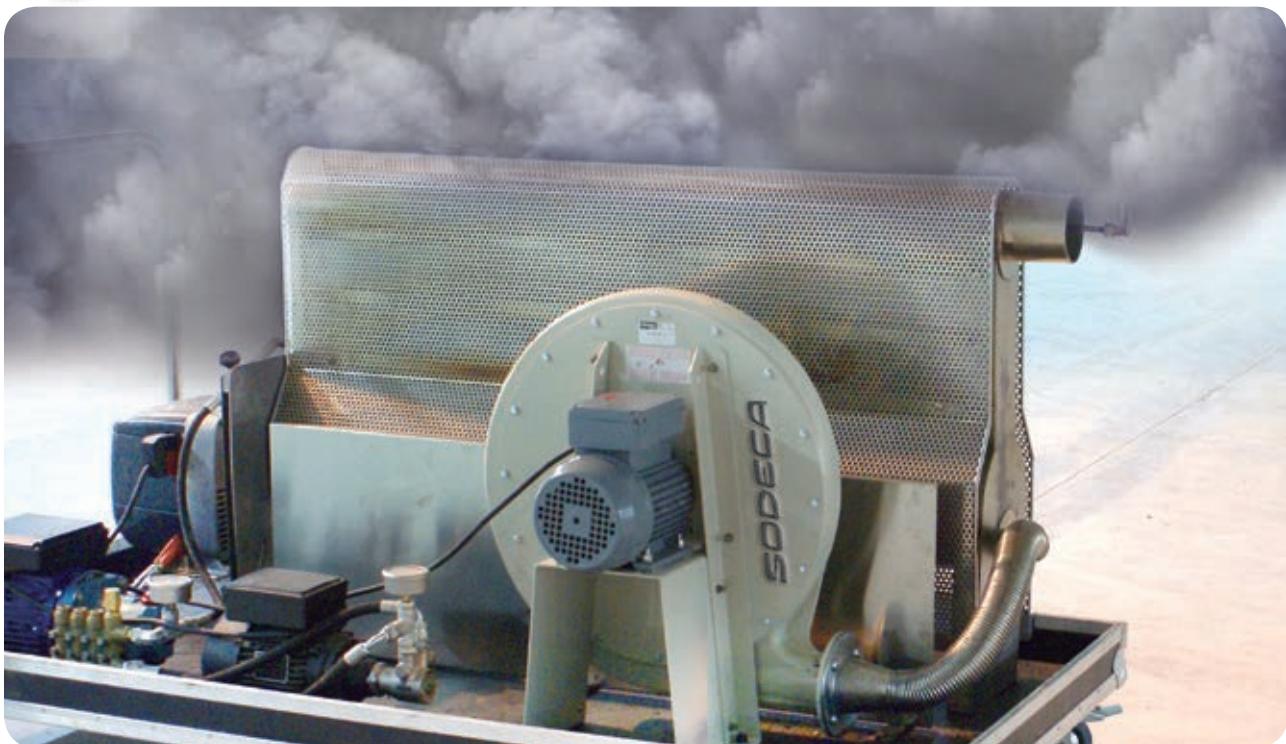


SODECA has extensive experience in manufacturing and installing jet fans throughout the world.

Our Projects Department, which has technicians specialised in the design of ventilation and smoke control systems, **can advise on the design of your projects**, providing you with a complete **technical study**, including sizing calculations and drawings showing the location of the equipment.

We can carry out the system checks necessary for the Competent Authorities' approval by calculation methods which use Sodeca's own design tools with **CFD computational simulations**. This can also be done by using software which has been extensively proven at an international level, and displays the ventilation system's operating parameters, such as the behaviour of the smoke and the values of temperature, visibility, air speed and CO concentrations.

Sodeca also offers you the option of having our technicians perform **real smoke tests**, once the installation is complete.





# JET FANS

## VENTILATION FOR CAR PARKS



CI installed in a car park



CI installed in a car park



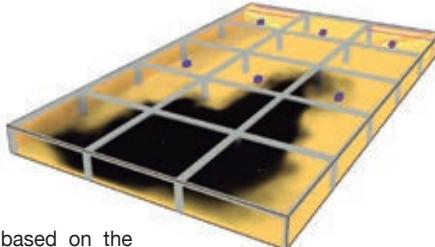
Smoke Machine for performing real smoke tests



THT/IMP installed in a car park

## JET FAN VENTILATION

In recent years, horizontal ventilation systems, also known as impulsion or induction ventilation systems, have been established as an alternative to the traditional ones which were based on networks of ducts for extracting and supplying air.



This technology is based on the longitudinal ventilation systems used in tunnels, which create a flow of air at sufficient speed to sweep the area to be ventilated.

Fans at air entry and exit points create the induction phenomenon, extracting the air and smoke from the area.

This ventilation system is based on the impulsion of a small amount of air at a high speed, which homogenises the rest of the air.

The system also makes it possible to keep polluting gases at low concentration levels without the need to start up the whole of the car park's ventilation system.

By starting up just the induction fans, in combination with designing zoned or staged ventilation systems and a gas detection system, it is possible reduce power consumption and noise levels, and to extend the useful life of the equipment.

With impulsion ventilation, it is possible to design smoke control systems to be used when there is a fire and which satisfy the three standards enshrined in British and Belgian regulations. These regulations form the basis on which the European Committee for Standardisation is drafting the future European Smoke Control in Car Parks Standard - EN 12101-11:

- Extract the smoke during and after the fire (smoke clearance)
- Facilitate the work of the fire service (fire fighting)
- Facilitate the safe evacuation of occupants (means of escape)

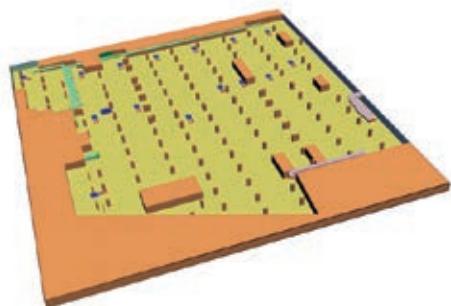
## ADVANTAGES OF THE SYSTEM

The two most important advantages of the impulsion or induction ventilation system are:

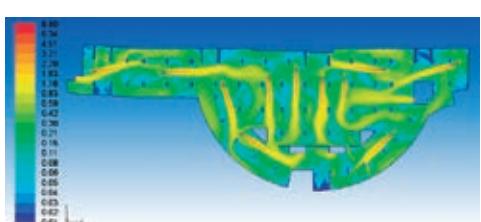
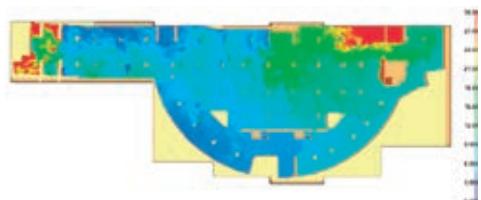
- They keep contaminating gases at low concentration levels
- They are better at controlling smoke during a fire and therefore safer.

These systems also have the following additional benefits.

- Quicker and easier to install, and interfere less with other facilities (sprinkler networks, electrical ducting, drains)
- Occupy less space within the building's framework, allowing a ventilation system to be installed in car parks with low ceilings, thus reducing the cost of excavation.
- Wider field of view available within the car park, allowing the CCTV systems to function more efficiently.
- The ventilation system consumes less power since: (a) the fans do not have to compensate for losses of pressure in the ducts and (b) the system is started up less frequently, and operates for fewer hours.



*Examples of studies using CFD computational simulations*





# THT/IMP

**F400, F300 tested 300°C/2h and F200 single-direction or reversible long-range impulsion fans**

F200, F300 tested 300°C/2h and F400 single-direction or reversible long-range impulsion fans with circular (THT/IMP-C), octagonal (THT/IMP-L) or octagonal painted (THT/IMP-O) design

Fan:

- Single-direction or reversible ventilation unit consisting of a fan, silencers, deflectors and brackets, certified for smoke extraction in accordance with standard EN-12101-3-2002, certification no. 0370-CPD-0394
- Turnable impellers cast aluminium designed for optimum thrust.
- Protection guard against contacts, in accordance with standard UNE 100250, in single-direction models
- Deflector to increase airflow range, on the impeller side. Reversible models are fitted with deflectors on both sides.
- Highly effective silencers with thermal and acoustic insulation
- Safety switch, IAT series, supplied built-in to the fan (THT/IMP-L and THT/IMP-O) or on request (THT/IMP-C)
- Airflow direction from motor to impeller or 100% reversible
- THT/IMP-C: Steel sheet circular casing
- THT/IMP-L: Galvanized sheet steel casing
- THT/IMP-O: Painted sheet casing
- THT/IMP-LS: Casing length limited



THT/IMP-C



THT/IMP-O



THT/IMP-L



Deflector to increase range

Motor:

- Class H motors, ongoing use S1 and emergency use S2, with ball bearings and IP55 protection, 2-speed
- Three-phase 400V.-50Hz. DHALANDER
- Max. air temperature to transport: S1 Service -20°C+ 40°C for ongoing use, S2 Service F200, F300 tested 300°C/2h and F400

Finish:

- Anticorrosive in polyester resin, polymerised at 190°C, after alkaline degreasing and phosphate-free pre-treatment (THT/IMP-C, THT/IMP-O) or anticorrosive galvanized sheet steel (THT/IMP-L)

On request:

- Different thrust performance from that indicated.



# CI



## **Centrifugal long-range induction and impulsion fans F300 tested 300°C/2h and F400, for working within the fire danger zone, with low profile**

Centrifugal long-range induction and impulsion fans F300 tested 300°C/2h and F400, for working within the fire danger zone, with low profile

Fan:

- Steel sheet casing
- Impeller with backward-curved blades made from robust sheet steel
- Outside connecting box.
- Fixing stand included

Motor:

- Class H motors, ongoing use S1 and emergency use S2, with ball bearings, IP55 protection, and one- or two- speed depending on the model
- Three-phase 230/400V.50Hz. (up to 4CV) and 400/690V.-50Hz. (power over 4CV)

• Max. air temperature to transport:

- S1 Service -20°C+ 40°C for ongoing use,
- S2 Service F300 tested 300°C/2h, F400.

Finish:

- Anticorrosive finish in polyester resin, polymerised at 190°C, after alkaline degreasing and phosphate-free pre-treatment.



# THT



## **THT: Short cased axial fans F400, F300 tested 300°C/2h and F200**

## **THT/ATEX: Short cased axial fans F400, F300 tested 300°C/2h and F200 with ATEX certification**

Cased axial fans with short casing for working inside fire danger zones, F400 THT/ATEX: with ATEX certification, category 3 Ex II3G. In accordance with Spanish Low Voltage Regulation Itc 29 ATEX for Zone 2 rated car parks.

Fan:

- Sheet steel long casing. THT/ATEX: with aluminium strip in the impeller area in accordance with Standard EN-14986:2005
- Turnable impellers cast aluminium.
- Approval according to Standard EN-12101-3-2002, certification No.: 0370-CPD-0305
- Airflow direction from motor to impeller

Motor:

- Class H motors, ongoing use S1 and emergency use S2, with ball bearings, IP55 protection, and one- or two- speed depending on the model.
- Three-phase 230/400V.-50Hz. (up to 4CV) and 400/690V.-50Hz. (power over 4CV)
- Max. air temperature to transport: S1 Service -20°C+ 40°C for ongoing use, S2 Service F200, F300 tested 300°C/2h and F400

• Finish:

- Anticorrosive finish in polyester resin, polymerised at 190°C, after alkaline degreasing and phosphate-free pre-treatment.

On request:

- Long cased fans with inspection hatch
- 100% reversible impellers.



## SODECA'S PROJECTS IN THE WORLD



Commercial Mall SAAR  
Kingdom of Bahrain



Center Point Mall of the  
Emirates  
United Arab Emirates



Mine Ventilation  
Sierra Gorda  
Chile



Emirates Garden  
Phase 1  
United Arab Emirates



Cinemas and  
Commercials Mall of  
Costanera Center  
Chile



Kazakhstan Lojistik  
Center  
Kazakhstan



Hotel Grand Hyatt  
Chile



Isik University  
Iraq



Bashra Sports City  
Iraq



Car park of  
Somacampagna  
University  
Italy



Van Schaek  
Mathonsingel (BAM)  
Carpark in Nijmegen  
Netherlands



Cora Bacau Supermarket  
and Carpark  
Romania



National Theatre  
Romania



Consum Supermarket  
car park  
Spain



Centro Comercial  
Puerto Venecia  
Spain



Shopping Mall  
Constanta  
Romania



Uprise Elite Towers  
Turkey



Discovery Mall  
Kuwait



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