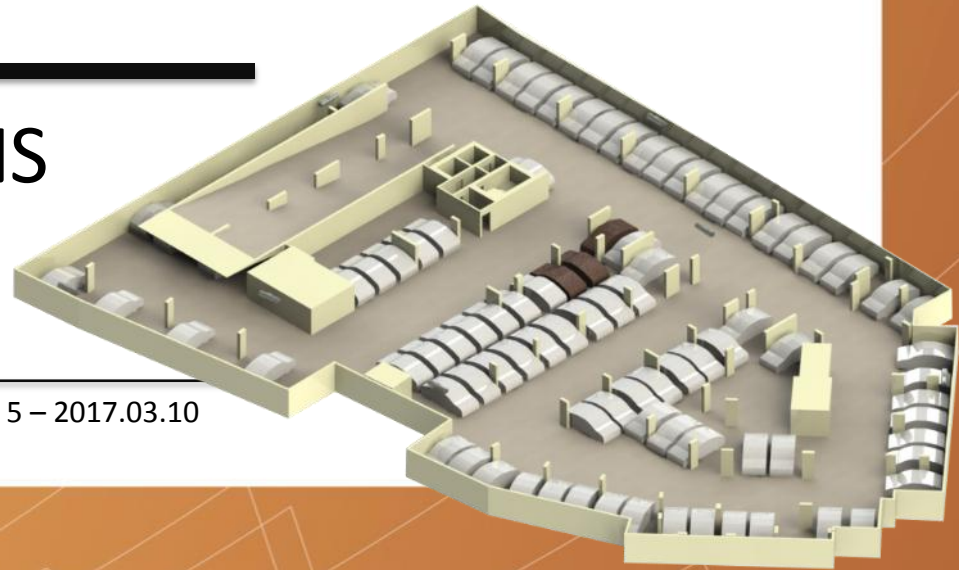




FLÄKT WOODS PRODUCT RANGE PRESENTATION

FIRE SAFETY SOLUTIONS CAR PARK FAN RANGE

VER. 5 – 2017.03.10



WE BRING
BETTER
AIR TO LIFE





AIR COMFORT

Solutions for superior Air Comfort, with exceptional energy efficiency and low life cycle cost



FIRE SAFETY

Reliable products to protect people and buildings with ventilation systems in the event of fire



e³ – THE CORNERSTONES IN OUR QUEST TO PROVIDE THE BEST POSSIBLE AIR COMFORT AND FIRE SAFETY



**ENVIRONMENT
ECONOMICAL
EXPERTISE**



ENVIRONMENT

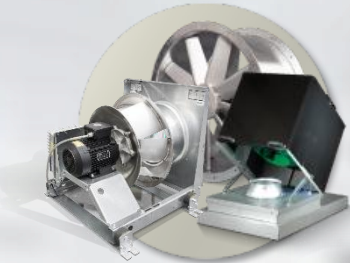


**ECONOMICAL &
ENERGY EFFICIENT**

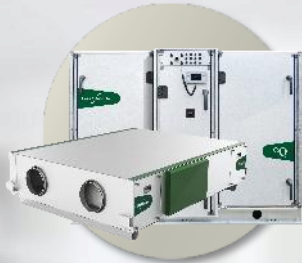


EXPERTISE

WITH 5 PRODUCT FAMILIES THAT COVERS THE LARGEST PRODUCT RANGE IN THE MARKET – **THERE'S ALWAYS A PERFECT FIT**



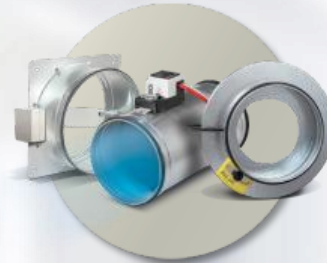
AIR MOVEMENT



AIR TREATMENT



AIR DISTRIBUTION



AIR MANAGEMENT



AIR DIFFUSION



A 3D perspective rendering of a large, rectangular industrial air handling unit. The unit is composed of a grid of grey panels with yellow structural frames. It is shown against a background of a dramatic, cloudy sky with orange and yellow light, suggesting a sunrise or sunset. The unit is positioned on a brown, textured surface that looks like a wooden floor.

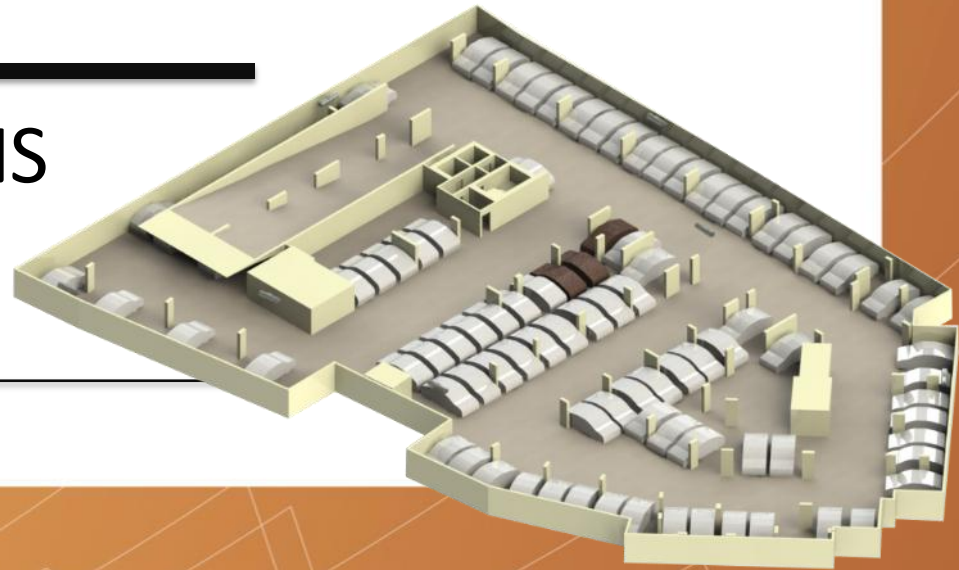
WORLD-CLASS INNOVATIONS AND **AIR TECHNOLOGY** **PRODUCTS RESEARCH**

Fläkt Woods has a proud history of innovation. Our Centres of Excellence has some of the most advanced facilities for product development and lab testing anywhere in the world.



FLÄKT WOODS PRODUCT RANGE PRESENTATION

FIRE SAFETY SOLUTIONS CAR PARK FAN RANGE



OUR FIRE SAFETY SOLUTIONS ARE TAILORED TO INDIVIDUAL CUSTOMER NEEDS:



ENVIRONMENT

- Pollution detection for on-demand ventilation
- We improve and safeguard the Environment for people by delivering fire safety security and pollution control within car parks and loading bays



ECONOMICAL & ENERGY EFFICIENT

- Intelligent design reduces Jet Thrust Fan numbers resulting in lower consumed power
- Discrete Jet Thrust Fans allow fast and cost-effective installation of services and eases coordination with other services



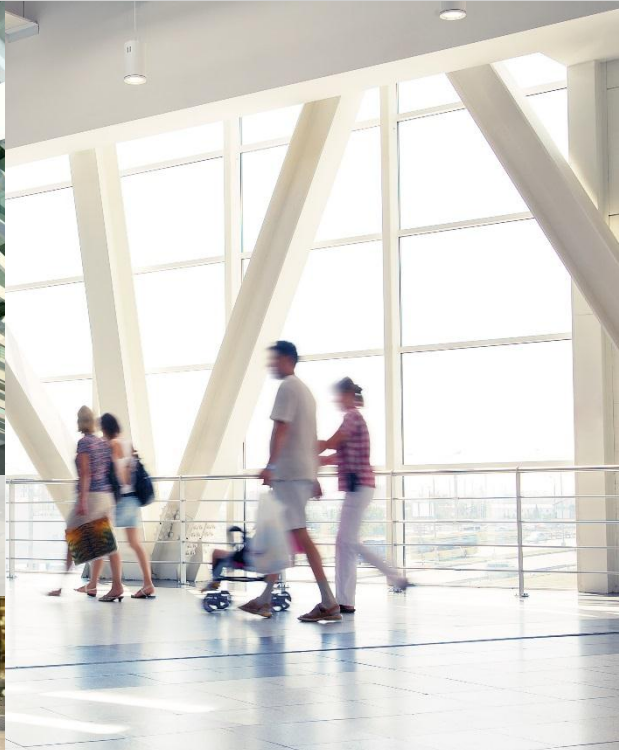
EXPERTISE

- In-house CFD analysis retains expertise and drives improvements to our solution
- Appropriate CFD Analysis for every project optimises Jet Thrust Fan locations and demonstrates key acceptance criteria to the end client; air movement pollution distribution and/or heat and smoke.



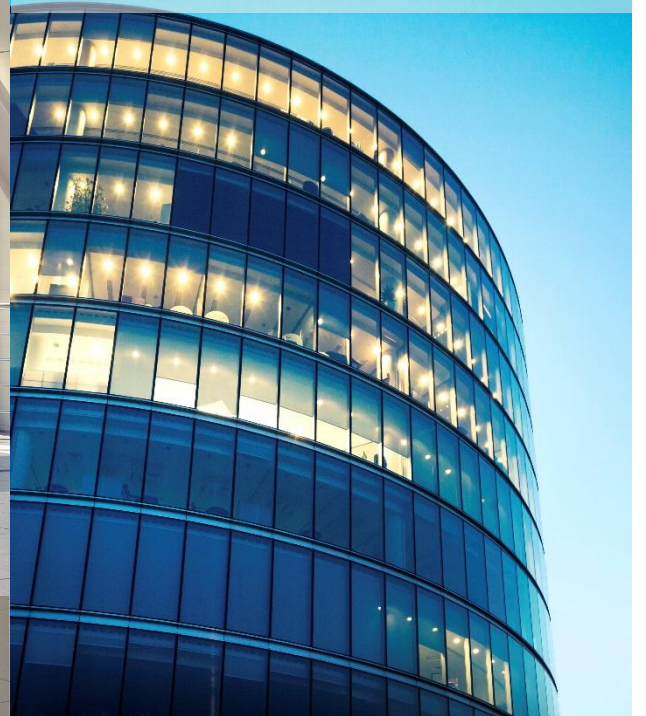


SHOPPING CENTRES



AIRPORTS

OFFICE BUILDINGS





INDUCTION THRUST FAN



JMv AXIAL FLOW FAN

Examples from
our complete
range of energy
efficient and
reliable fans for
all your needs



JM AXIAL FLOW FAN



**LOW PROFILE CAR
PARK FAN**



CENTRIFUGAL FAN



**JTv SLIM LINE CAR
PARK FAN**

WHY ARE FANS FOR CAR PARKS A NECESSITY?

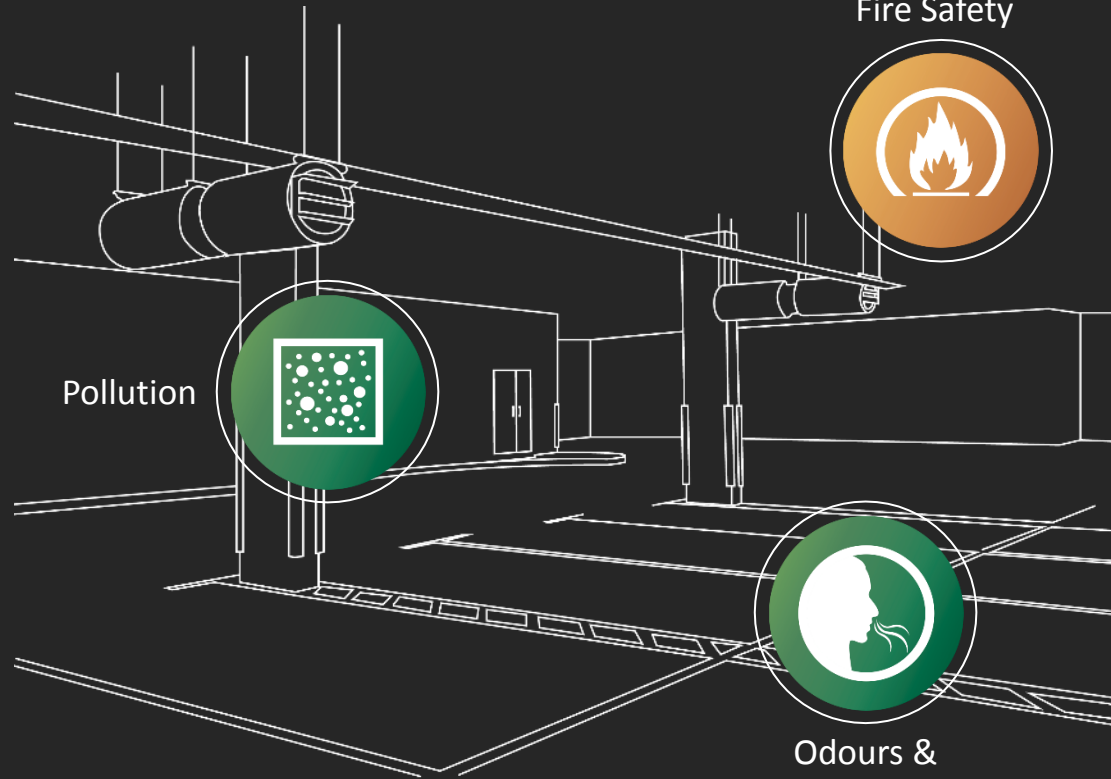
Enclosed or underground car parks normally require a general ventilation system that will manage the air flow quality, reducing the chances of Carbon Monoxide build-up and odour development.

Additionally, and very importantly, these systems can assist with fire-fighting operations should there be an emergency.



COMMON CHALLENGE:

- Parking structures in cities likely to be underground or can occupy a “land-locked” position within a building
- External facade is usually reserved for occupant areas
- The build-up of exhaust gases could lead to unpleasant odours
- In extreme cases over-exposure to harmful gases like Carbon Monoxide
- To prevent this harmful build-up of gases, ventilation is required
- Energy can be spent unnecessarily if the control of the system is not adequate



Odours &
Carbon
Monoxide

FLÄKT WOODS

SOLUTION:

TO MONITOR DANGEROUS POLLUTANT LEVELS WITHIN THE CAR PARK

- Monitor dangerous pollutant levels within the car park
- Typically this is Carbon Monoxide prevalent in exhaust gases
- System operates in demand
- 3 stages of pollution ventilation: Background, High and Emergency
- Fläkt Woods can provide tailor-made solutions for any project
- Delivering real energy savings throughout the life of the project
- No compromise to occupant safety or comfort

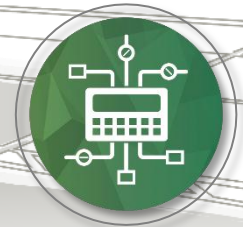
Air Movement
to remove
pollution



Fire Safety
Protection



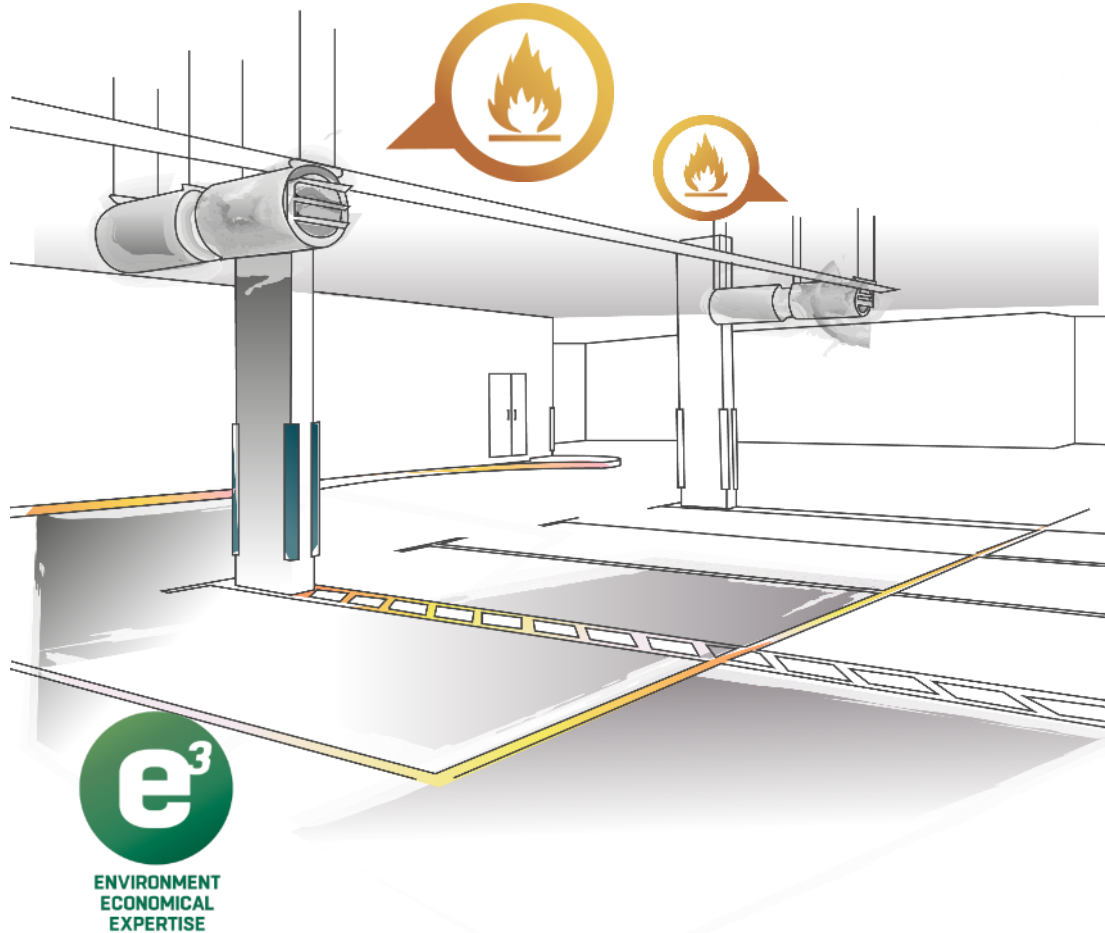
Air Management
Controls for 3 stage
Ventilation



FLÄKT WOODS FIRE SAFETY SOLUTION:

PROVIDE EMERGENCY SMOKE EXTRACTION

- Emergency management of smoke and toxic fumes
- Emergency ventilation can be designed using volumetric or design fire calculations
- On detecting a fire emergency signal, the Jet Thrust System is automatically switched into fire mode. Jet Thrust Fans and main extract fans are run to full design speed - reaching full speed and maximum thrust in just a matter of seconds

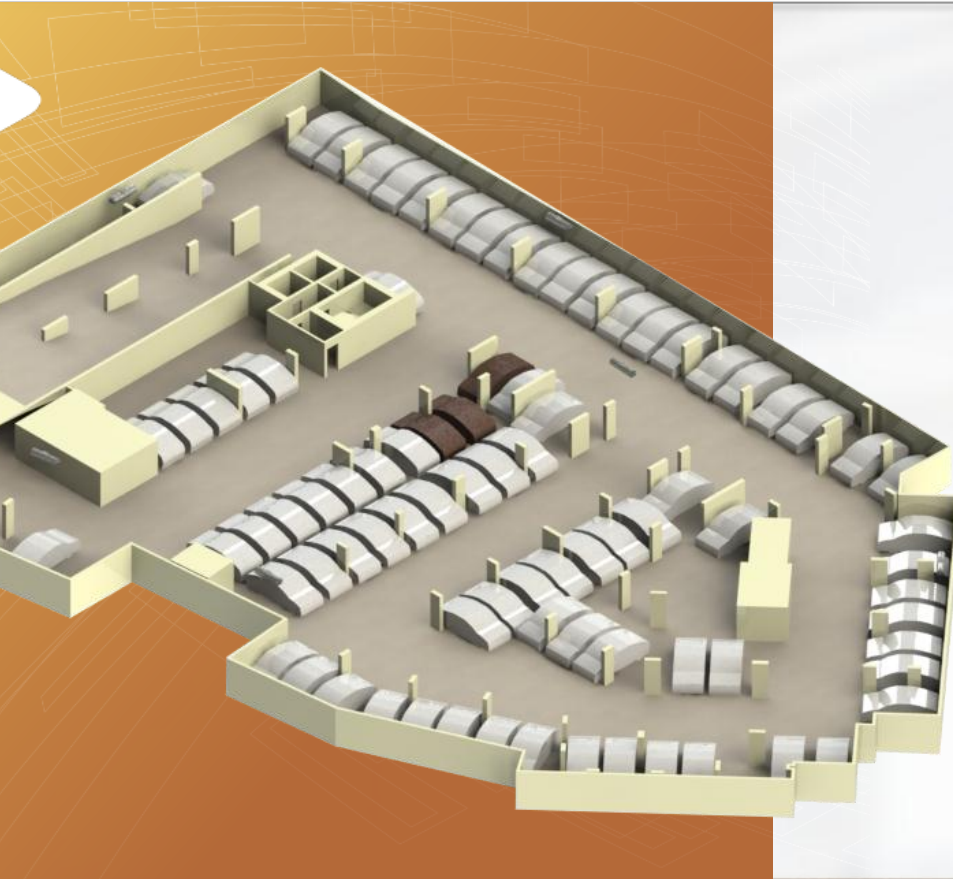


CAR PARK SYSTEMS

QUICK & EASY INSTALLATION

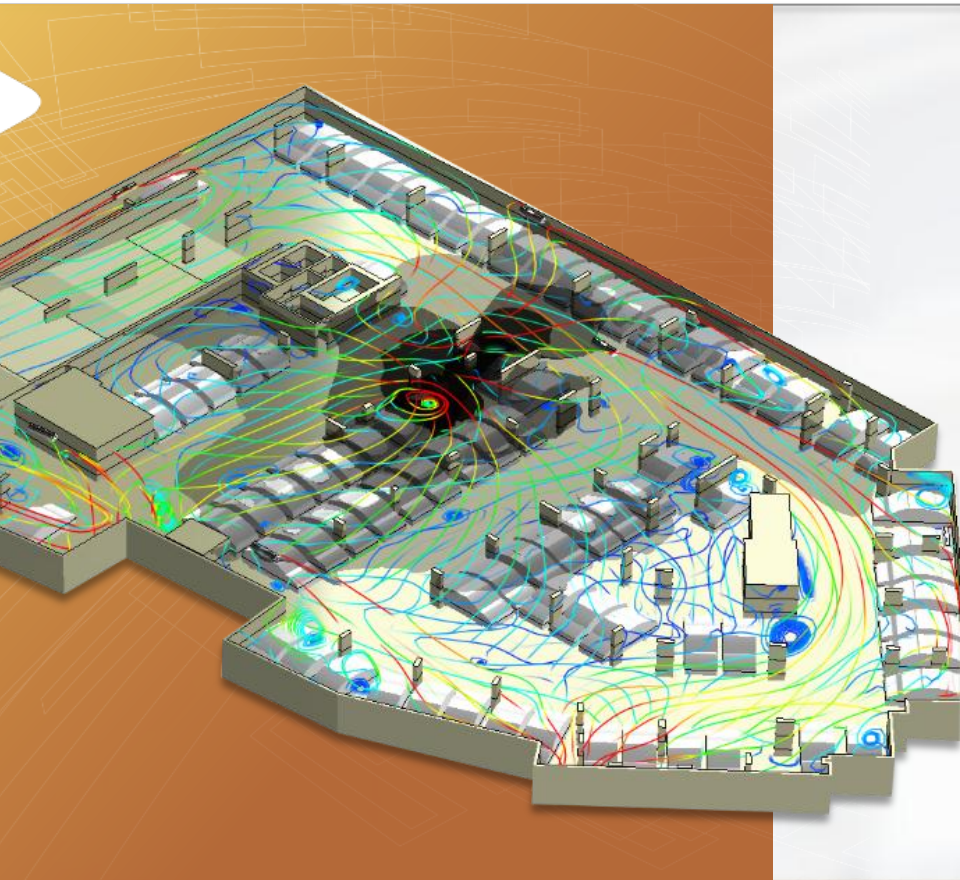
- CFD modelling ensures that the system is specifically suited to each application for quicker installation
- Variety of solutions for the perfect fit
- Unit attachment for ceiling installation included





THE CFD MODELLING PROCESS

- Model is created from a 2D or 3D drawings of the Car Park
- Fläkt Woods then simplifies the drawings to only include major obstructions in the car park
- All minor obstructions are considered when coordinating Jet Thrust Fans even if not modelled
- The model is sent to the client for approval so that all parties understand what is being delivered and what has been interpreted from the drawings



THE CFD MODELLING PROCESS

SIMULATION IS GENERATED TO:

- ✓ Optimise fan positioning
- ✓ Test before installation
- ✓ Discover potential “dead-spots” and solve them
- ✓ Increase the opportunity to protect lives

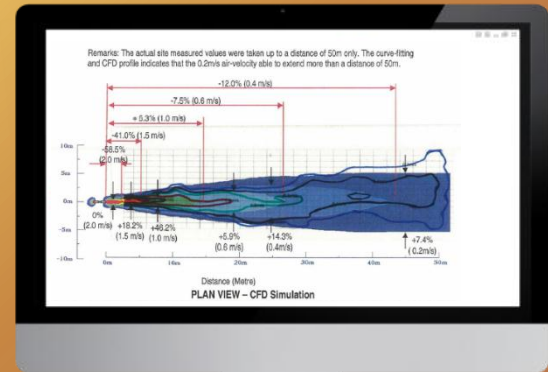
ADVANCED RESEARCH & TESTING FACILITIES

The cornerstone of good initial design is understanding how Jet Thrust Fans operate in car parks.

Fläkt Woods perform live testing of our Jet Thrust Fans in a controlled environment and compare these results to an identical CFD model.

This allows us to use Jet Throw Profiles for initial design and follow up with CFD modelling of live projects whilst retaining confidence in the accuracy of our modelling.

CFD Modelling





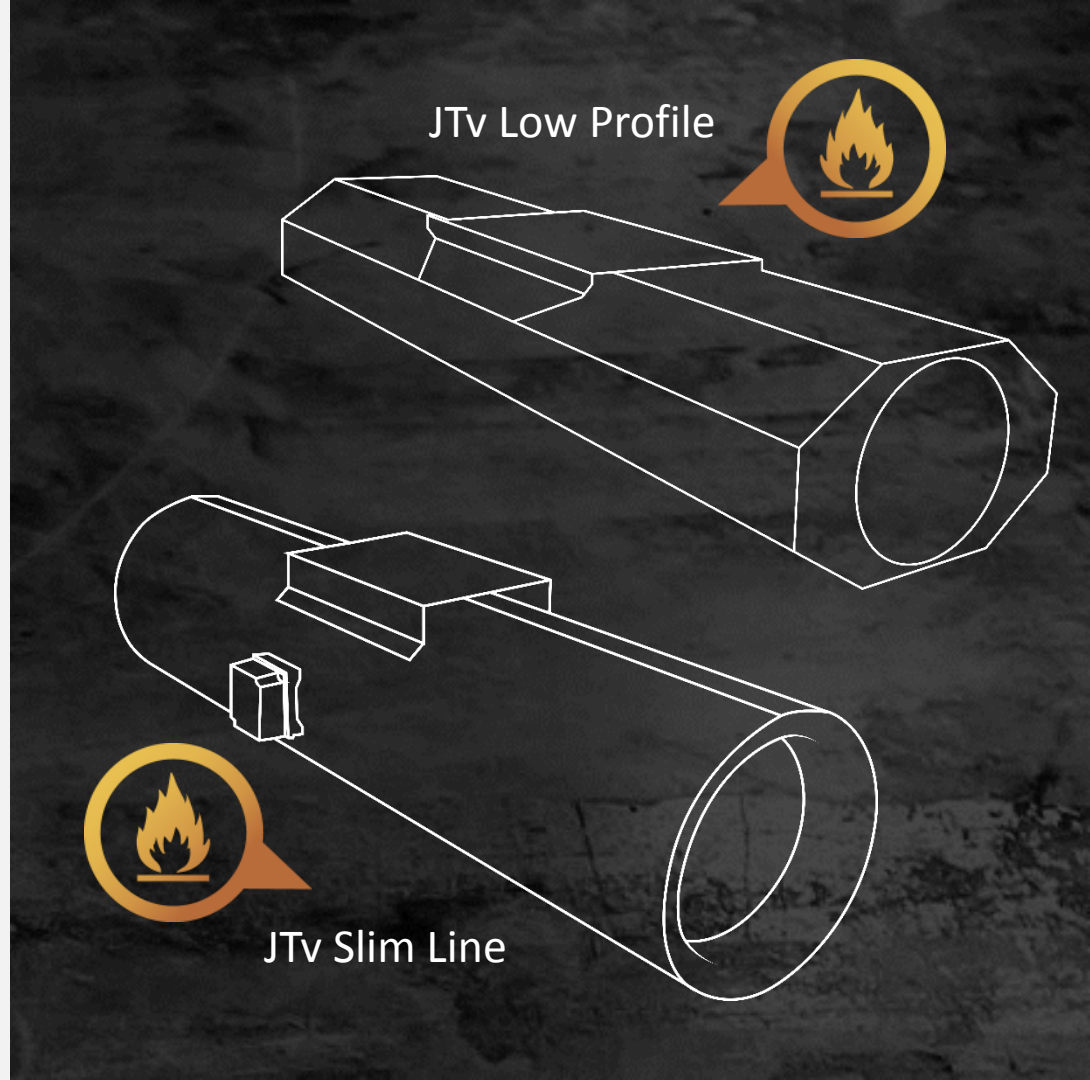
JTv

AN AERODYNAMIC
REVOLUTION

JTv
by FLÅKT WOODS

ABOUT OUR JTv FANS

- Available in 315, 355, 400mm diameter and 400mm diameter Max Thrust
 - F200, F300 & F 4000 High Temperature specifications
 - 50Hz and 60Hz 3-phase supply
 - High Thrust
 - Low noise emittance
 - Simple installation
-



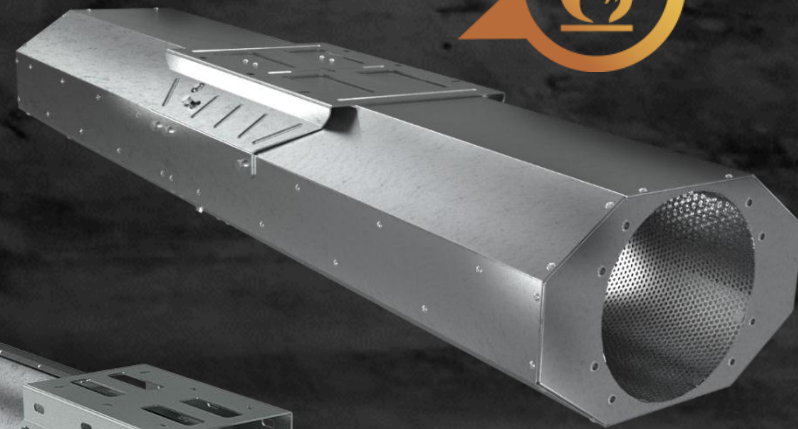
JTV JET THRUST RANGE

INCREASED THRUST

INCREASED EFFICIENCY

AERODYNAMIC HUB-DESIGN

JTv Low Profile



JTv Slim Line



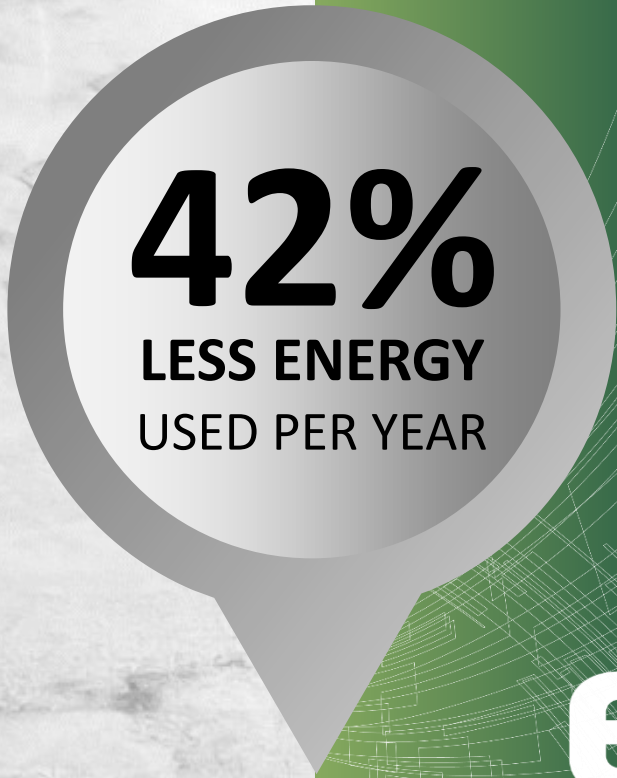
INCREASED THRUST = INCREASED BENEFITS

- Fewer fans required saves on fan costs and installation costs
- Smaller diameters can be used to save on cost and space as well as being easier to install
- Enhanced safety: Capable of handling larger design fires, where lower thrust fans can't cope
- Can remove the need for sprinkler systems, significantly reducing project cost and increase the lettable floor space
- Potential to reduce insurance premiums due to increase in fire safety



INCREASED EFFICIENCY

- Lower running costs. 42% less energy used per year
- Smaller backup power supply requirement, reducing project cost and freeing up space
- Buildings with lower carbon footprints and reduced energy usage can generate higher rental income as ownership costs are lower



42%
LESS ENERGY
USED PER YEAR



e³

AERODYNAMIC HUB DESIGN

- The JTv uses the successful JMv hub design
- Curved profile enables closer fitting components which reduces losses



e³



Look for the VCC logo on the blade to make sure that your new fan delivers optimum efficiency.

INNOVATION AND VCC TECHNOLOGY GIVES YOU THE AERODYNAMIC ADVANTAGE.



REDUCED TIP GAP CLEARANCE TO REDUCE LOSSES
ACHIEVABLE THROUGH TIGHTER MANUFACTURING
TOLERANCES

CLOSER FIT TO HUB

AERODYNAMIC CURVED
HUB PROFILE

HIGH TWIST DESIGN WITH UNIQUE
AERO FEATURES DESIGNED TO
WORK WITH A GUIDE VANE TO
INCREASE THRUST

SINGLE-STAGE GUIDE VANES
TO AID EFFICIENCY



Look for the VCC logo on the blade to make sure that your new fan delivers optimum efficiency.



INNOVATION AND VCC TECHNOLOGY GIVES YOU THE AERODYNAMIC ADVANTAGE.



- **The JTv** is an extremely efficient fan, which often exceeds **ErP 2015** efficiency targets
- CFD optimised blade design
- Vortex generators on the trailing edge of impeller blades
- Total fan design optimised for increased efficiency
- Advanced technical components
- Single stage guide vane boosts efficiency further
- Average running cost savings are 17% (24% max)

An architectural rendering of a modern shopping centre courtyard. The scene is dominated by a large, curved glass and steel canopy structure that covers the walkway. The canopy features a complex, grid-like steel framework with glass panels. The surrounding buildings are multi-story with extensive glass facades and balconies. The ground is paved, and there are some small plants and benches in the foreground. The overall atmosphere is bright and modern.

Single Floor Basement Level Shopping Centre Car Park

JTV CASE STUDY

SINGLE FLOOR BASEMENT LEVEL SHOPPING CENTRE CAR PARK

The project is a single basement level car park with two access ramps from street level above. Supply air is provided on the Eastern-edge of the car park via 2No. Mechanical supply rooms [not shown], whilst air exhaust is provided by 3No. Mechanical extract rooms on the Western-edge of the car park, shown in green (FIG.1 & FIG.2).

At the concept stage of project design it is possible to provide even greater assistance: Here we show a representative volume of excavated earth within the car park that would be saved should a Fläkt Woods system be added using smaller, Low Profile Jet Thrust Fans, compared to the generic design (FIG.2).

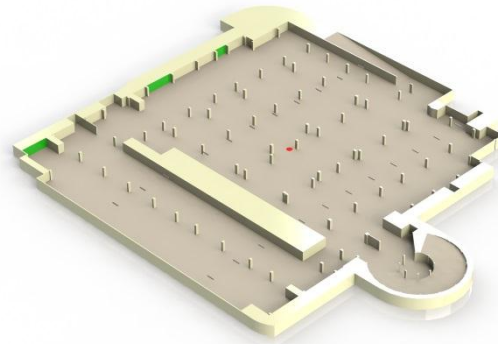


FIG.1

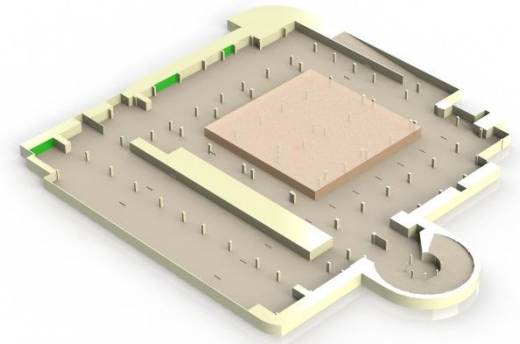


FIG.2

SINGLE FLOOR BASEMENT LEVEL SHOPPING CENTRE CAR PARK

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	CONSULTANTS SPEC	FLÄKT WOODS JTV SOLUTION	PROJECT SAVINGS
Number of Fans	35	22	27% install cost saving
Diameter of unit	400mm Jet Thrust Fans	355mm JTv Slim Line	41% Acquired cost saving
kWh per annum (pollution control mode at half speed)	26mWh	15mWh	57% Energy saving (11mWh)
Co2	13.6 tonnes per annum	7.9 tonnes per annum	-5.7 TONNES per annum
Excavation saving if Low Profile JTv were	-7.8 TONNES or 5800m³ OF EARTH PER FLOOR		

1. TEMPERATURE

The Fläkt Woods design [FIG.4] shows a smaller spread of high temperature [60°C and above] than the generic design [FIG.3], the extent of heat spread towards the supply point is also much reduced which aids fire-fighter access from the Eastern-end of the car park.

Larger region of high-temperature air

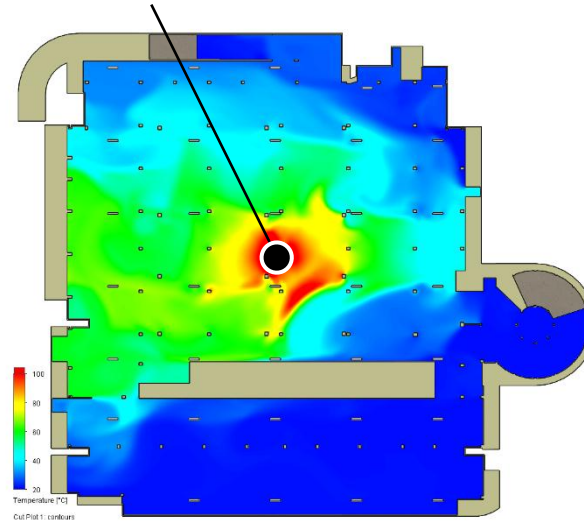


FIG.3

Hot region is pushed towards extract

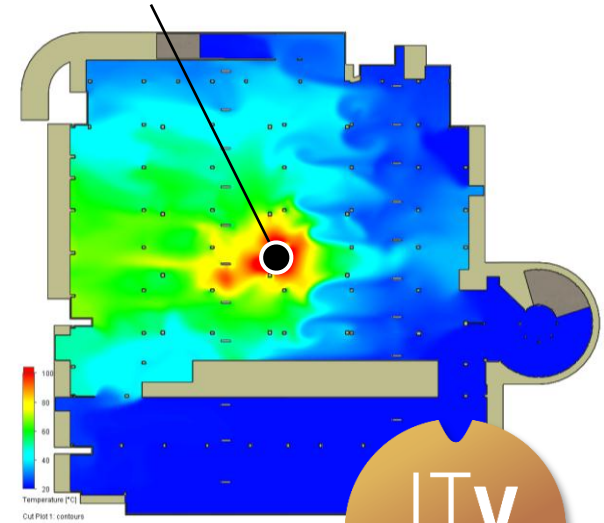
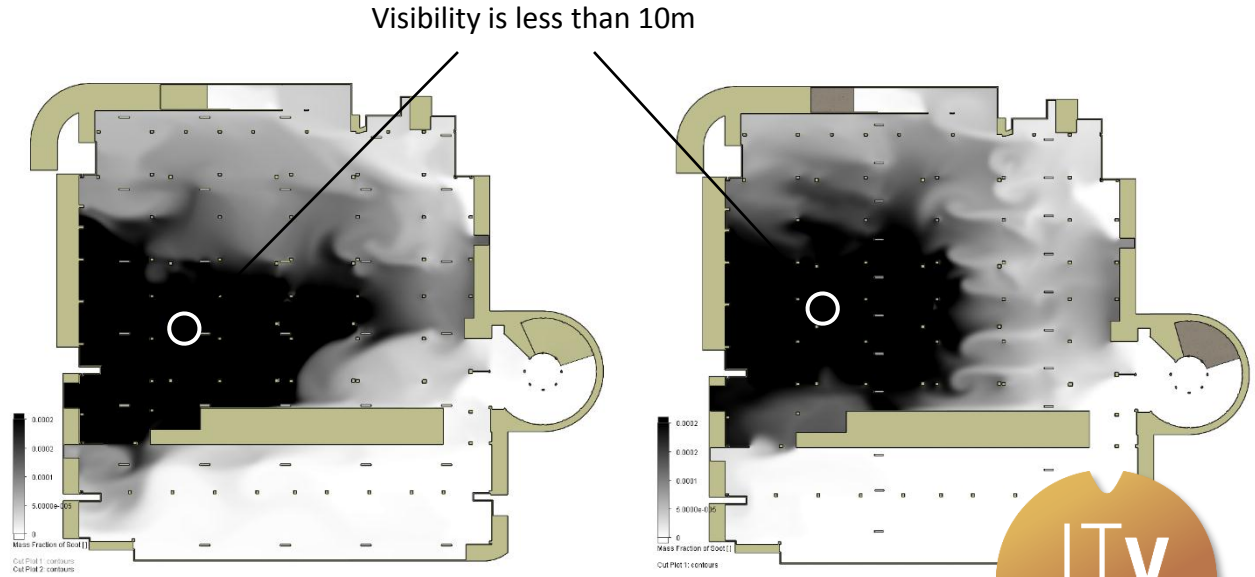


FIG.4



2. VISIBILITY

The generic design (FIG.5) shows a greater density of smoke spreading up-stream of the fire and also shows smoke leaking into the Southern area beyond the large central set of rooms. The Fläkt Woods design (FIG.6) shows a wider distribution of smoke within the Northern area, though allows for fire-fighter access from the East of the fire due to the improved visibility here at a close point to the fire.



3. SMOKE SPREAD

Highlighted in blue is the extents of the 10m visibility mark, a common design criteria for smoke systems. This shows a deeper spread of smoke around the fire in the generic system (FIG.7) This smoke plume edge is greater than 10m from the source of the fire in the generic system, but has a shorter travel distance to the edge in the Fläkt Woods design (FIG.8)

Smoke Spread back to Fire
Fighter entrance point

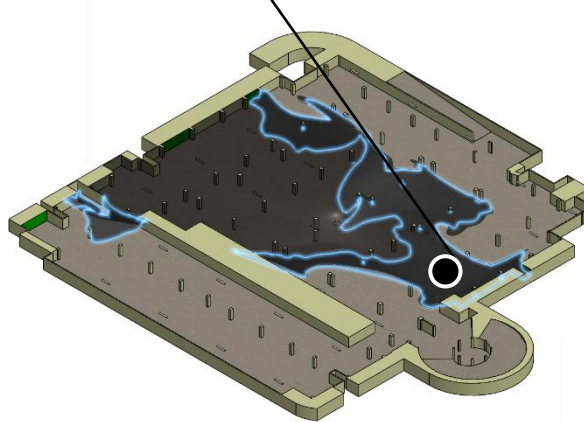


FIG.7

Visibility is less than 10m

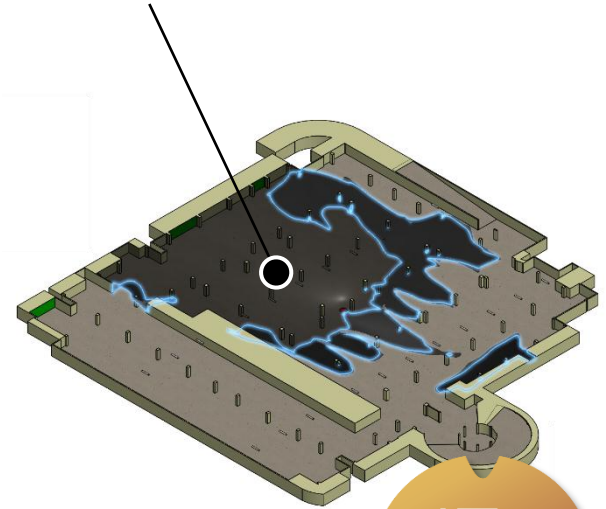


FIG.8



4. VELOCITY

The Fläkt Woods design allows for enhanced fire safety as the amount of recirculation has been significantly reduced; these velocity plots show that in the area closest to the fire the Fläkt Woods design is generally moving air towards the extract point, where-as the generic design has recirculating flow and air predominantly travelling back towards the supply points.

Jet Flows too spread out and being deflected

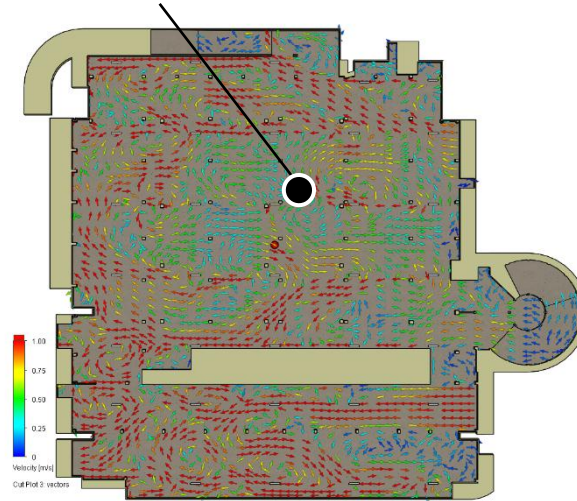


FIG.9

Jet Flows maintain direction towards extract through fire region

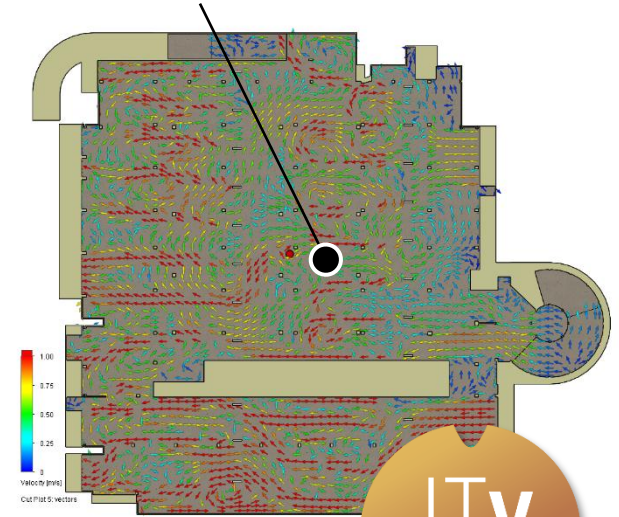


FIG.10

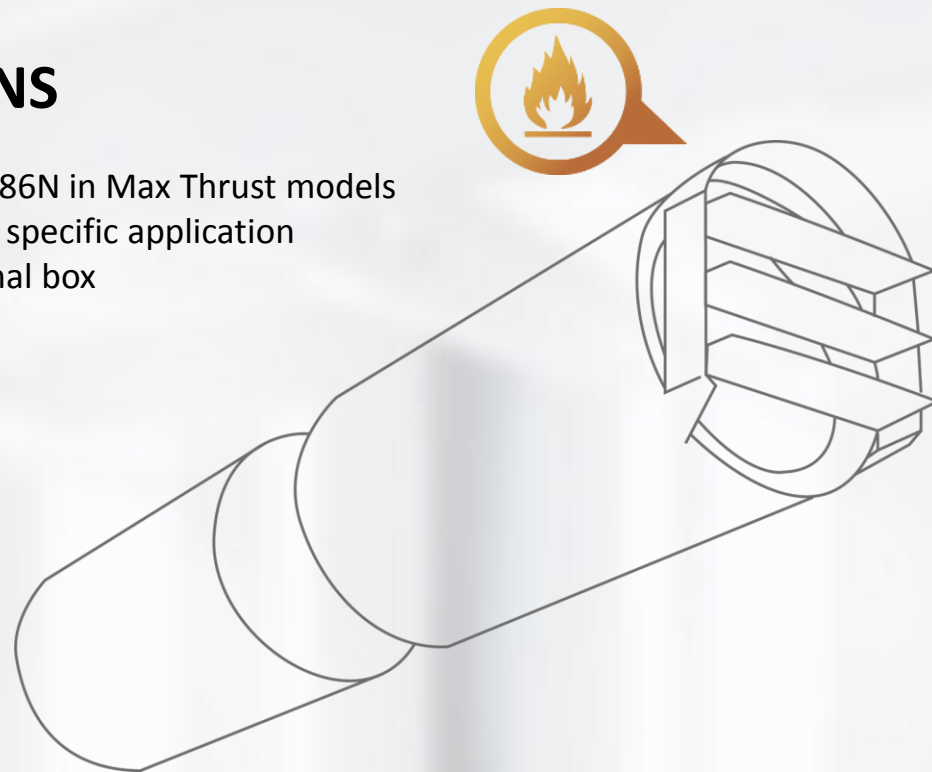




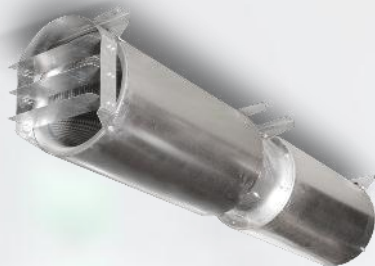
FIRE SAFETY
FLÄKT WOODS PRODUCTS

ABOUT OUR JET THRUST FANS

- Performances: 22-73N for original models or 86N in Max Thrust models
- Large variety of solutions to precisely fit your specific application
- Choice of high temperature isolator or terminal box
- 2 Speed and inverter controlled motors
- Can be supplied with guard or deflectors
- Truly Reversible operation available
- Integrated Mounting Feet



JET THRUST FANS



STANDARD

Simple installation and low noise car park Jet Thrust Fan for uni-directional or Truly Reversible operation



SLIM LINE

Smooth look & easy installation car park Jet Thrust Fan for uni-directional or Truly Reversible operation. Simple maintenance with split silencer and a single mounting foot

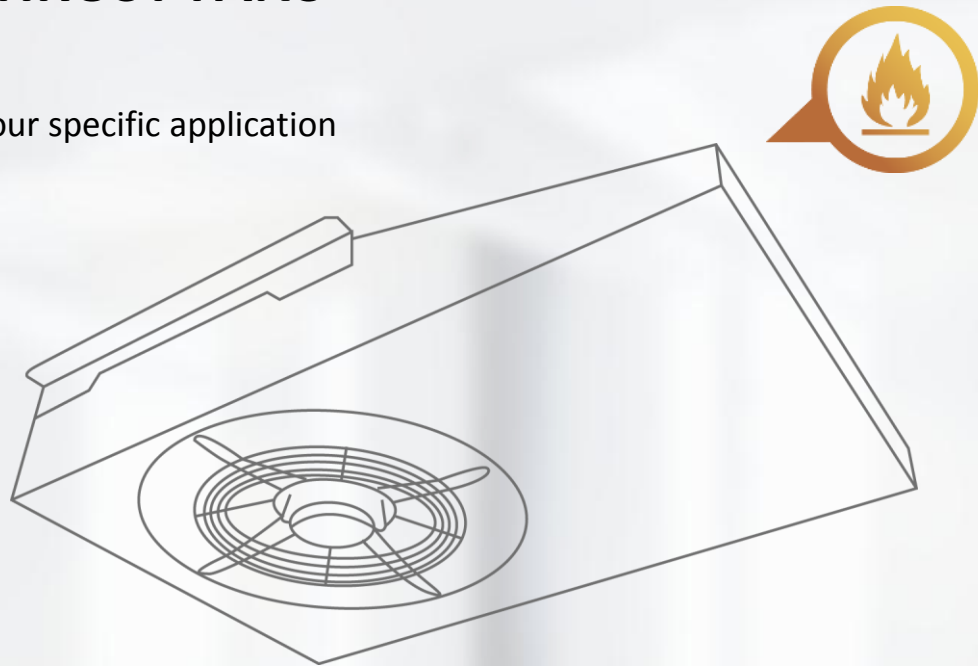


LOW PROFILE

Low-height car park Jet Thrust Fan for uni-directional or Truly Reversible operation. Simple maintenance with split silencer and a single mounting foot

ABOUT OUR INDUCTION THRUST FANS

- Performances: 50-100N
- Large variety of solutions to precisely fit your specific application
- 2 Speed and inverter controlled motors
- Integrated mounting feet
- High temperature isolator
- Inlet guard and outlet deflector
- Extremely low profile



INDUCTION THRUST FANS



INDUCTION THRUST FAN

The Induction Thrust Fan is the super low profile product of the Fläkt Woods range of Thrust Fans. The unit comprises of a centrifugal fan with factory fitted inlet bell mouth & guard, plus a deflector vane at the discharge



PROPERTY OWNER

- Fläkt Woods design expertise and responsibility gives confidence in a workable, efficient solution
- Low-height Jet Thrust Fans allow for maximum clear floor-ceiling height or a reduction in excavation costs



CONSULTANT

- In-house CFD design proofing results in cost effective solutions provided with our own expertise, resulting in an optimised design
- Ultra-low profile provides space savings by allowing ceiling height reductions



CONTRACTOR

- Simple installation & coordination with other services
- Jet Thrust Fan positions optimised are confirmed through CFD Analysis before installation; removes the need for re-positioning fans



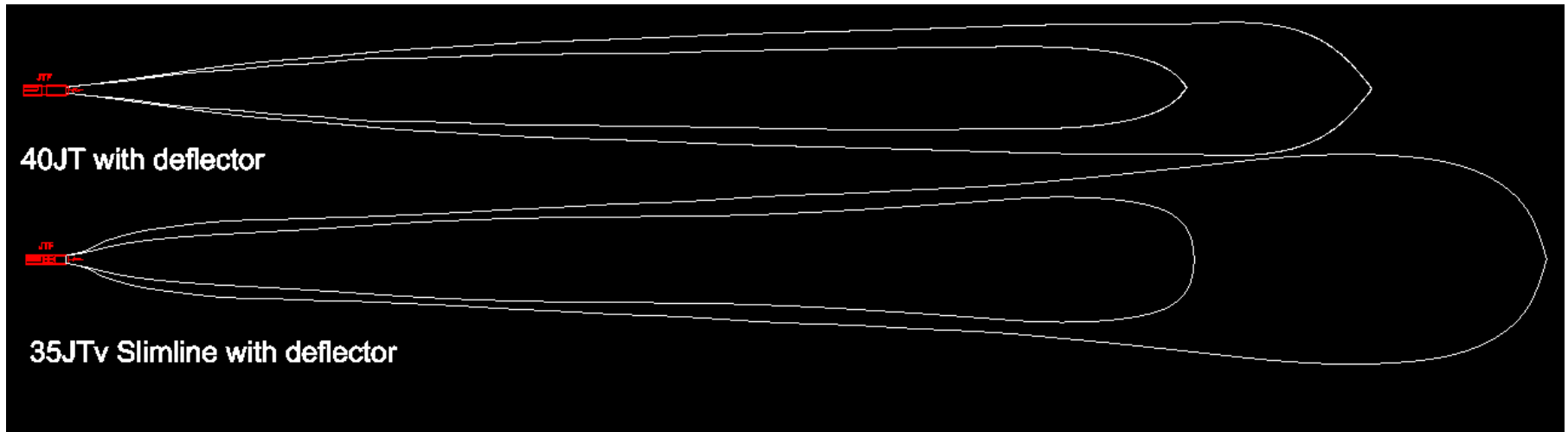
At initial design stage, the following like-for-like replacement can be made:

31JTv => 35JT & 31JT Max Thrust

35JTv => 40JT & 35JT Max Thrust

40JTv => 40JT Max Thrust

For designs with 31JT the 31JTv can be used, though consideration should be made for excessive thrust in what are usually small car parks.



For Tender Stage & Smoke Control system designs please refer to the COE



FLÄKT WOODS PRODUCT RANGE PRESENTATION

FIRE SAFETY SOLUTIONS CAR PARK FAN RANGE

