MDH

ModularChef Low proximity Capture Jet™ Hood

◦ Downward exhaust ◦ Freestanding with integrated power supplies



**In Brief**- Halton ModularChef is a low proximity and freestanding Capture Jet™ hood. Its design allows for connecting it to the ventilation ductwork on the back, the side or from the bottom.

## Main technologies and options

**Capture Jet™ technology**
Better smoke capture and up to 48% reduction in exhaust airflow

**KSA aerosol separators combined with MFA mesh filters**
Up to 99% efficient on 10 microns and above particles

**Halton Skyline (HCL)**
Daylight similar LED based Culinary Light

**Integrated power supplies**
Sockets for electrical cooking appliances

## Recommended combinations

To further enhance the performance of your kitchen, whether talking about the energy savings, safety, Indoor Environment Quality (IEQ) or the kitchen's impact on the environment, here are couple of combinations with other Halton products or technologies we recommend.

**Further increase the energy savings and improve the working conditions of the staff**
Go for M.A.R.V.E.L. energy saving technology for kitchens ventilation to up to 64%

**Reduce the ductwork cleaning costs, increase your safety and reduce the impact of your kitchen on the neighborhood**
Go for the Capture Ray™ grease and odors neutralization technology

**Get peace of mind by making no compromise on fire safety**
Go for the factory pre-installed FSS Fire Suppression System

**Optimize the ductwork cleaning costs and further improve your safety**
Go for KGS grease deposition level monitoring system for ductwork

Halton

# Description and main technologies

**In Brief** - Halton ModularChef is a low proximity and freestanding Capture Jet™ hood. Its design allows for connecting it to the ventilation ductwork on the back, the side or from the bottom.

**Up to 48% reduction in exhaust airflow rates** compared to traditional suspended hoods. Here is the first benefit that distinguishes ModularChef hood. Its exhaust plenum can't be closer to the cooking appliances and the heat, smoke, steam, grease and other pollutants they release. This proximity combined with the Capture Jet™ technology's action and the full height sides makes it the less airflow-consuming hood out of all Halton solutions. ModularChef hood hence achieves **massive savings** on the ventilation bill while reducing the ventilation noise.

MDH hood's high-efficiency capture is achieved way below the breathing area of any personnel standing in front of the hood. The exposition risk of the staff to pollutants during emissions peaks cant' be also lower. The Capture Jet™ technology enables the hood's front to be as much as possible backward regarding the cooking appliances. The **ergonomics** is comparable with that of a hood installed at the regular height.

MDH hood promotes the feeling of openness in the kitchens by freeing the space from the traditional hoods' footprint.

In addition to the energy savings, MDH hood then combines **thermal, acoustic and visual comfort to productivity and health** for the staff.

MDH hood's cyclonic filters greatly limit the grease deposits in the ductwork. At man height, they are faster to remove, without the need for a ladder. The ducts cleaning are less frequent, and that of the filters is faster. The **maintenance costs** are sensibly reduced.

The downward exhaust plenum also allows for a connection on the back or the side of the hood. Combined with the airflow reduction, MDH hood greatly facilitates the path of the ductwork to outside in the most challenging situations.

It is also the ideal hood to be used with PST PolluStop exhaust units or RAH RecoAir recirculating units by increasing their global cost effectivity. Another asset to establish restaurants in previously unfeasible locations.

ModularChef is suitable for all types of kitchens, especially in low height rooms. It is also an aesthetic solution for front or show cooking areas.

**Considerable energy savings**

- Up to 48% reduction in exhaust airflow rates due to the Capture Jet™ technology.
- Possibility to greatly increase the energy savings with M.A.R.V.E.L. airflow optimization technology.

**Improved safety and maintenance savings**

- KSA cyclonic aerosol separators constructed of stainless steel in compliance with EN 16282-6. Up to 95% efficient on 10 microns particles or larger. Also certified UL 1046, NSF and LPS 1263.
- Efficiently limits the build-up of grease deposits in the exhaust plenums and ductwork which constitute a serious hygiene and fire safety hazard. Reduces the cleaning costs.
- Collection tray for the grease and condensates integrated in the right or left side.

**Other features and benefits**

- Compatible with all electric or gas table top or modular cooking appliances (700, 800 or 900 mm depth).
- Integrated self-supporting structure.
- Halton Skyline LED culinary light provides the best visual comfort while contributing to further improve the safety and the energy savings.
- Services distribution on the back of the hood equipped with the electric plugs for the cooking appliances.
- No need for an extra duct for the Capture Jet™ technology.
- Capture Jets are automatically switched off when the hood is not used or operates at a minim airflow.
- Exhaust airflow rates determined with a EN 16282-1 based calculation method taking into account the loads of the cooking appliances, the configuration of the extract system and its capture and containment efficiency.
- Capture and containment efficiency tested in accordance with the ASTM 1704 standard.
- Modular design allowing flat pack deliveries to make transportation and site handling easier. Assembly on site easy and quick. Possibility to assemble several sections for the lengths over 3 m.
- Quick and easy commissioning. Hoods delivered "ready to install", with all accessories included, such as light fitting, T.A.B.™ taps for quick balancing on-site.

# Capture Jet™ technology

◦ High capture efficiency ◦ Energy savings ◦ Staff less exposed to pollutants



**The Capture Jet™ technology ensures the grease, smoke and the other pollutants released by the cooking appliances are captured with the lowest possible airflow rate. In the majority of cases, it pays back upon start-up of the kitchen.**

**The energy savings directly contribute to your profitability while the staff benefits from improved working conditions.**

## Benefits

- Up to 48% reduction in exhaust airflow rates compared to traditional suction only hoods while maintaining the air quality.
- Significant energy savings for the cooling/heating make-up air systems (less air out, less air in!).
- Reduced infrastructure costs on the smaller duct and fan system, saving on the capital cost of the installation.
- No specific duct required for the Capture Jets operation. Installation cost is reduced.
- Less drafts inside the kitchen and reduced noise levels due to the airflow rate reduction.
- Combined to the low proximity capture, the Capture Jets allow for a negative overhang for ergonomics similar to that of suspended hoods.
- High protection of the staff against pollutants released by cooking.

## How does it work?

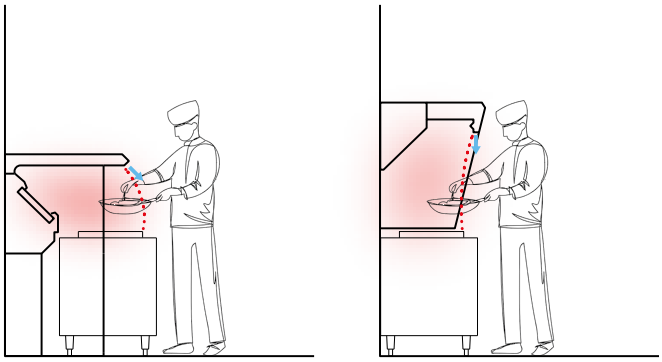
The Capture Jet™ technology is based on the use of one or several sets of single or double aerodynamic nozzles, supplied with an extremely low airflow.

These nozzles form one or several air curtains which, carefully located and oriented, increase the capture efficiency on the grease, steam, smoke and heat released by the cooking appliances. In other words, they greatly reduce the airflow to remove them.

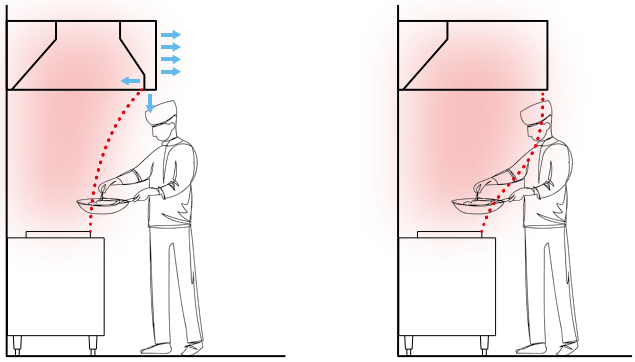
Halton ModularChef is equipped with 1 set of single Capture Jet™ nozzles on the front, with a carefully tested angle to allow the hood's negative overhang regarding the cooking appliances.

The nozzles form a curtain of air which acts like a barrier that prevents the all what is released by the cooking operations to escape to be quickly and efficiently removed by the close proximity exhaust plenum.

**It is possible to significantly increase the exhaust airflows' reduction by combining Capture Jet™ and M.A.R.V.E.L. airflow optimization technology.**



A- MDH Low proximity Capture Jet hood™
B- Low proximity Capture Jet™ hood
C- Suspended Capture Jet™ hood
D- Suspended basic hood



MDH hood's high-efficiency capture is achieved way below the breathing area of any personnel standing in front of the hood. The exposition risk of the staff to pollutants during emissions peaks cant' be also lower

# KSA aerosol separators

Cyclonic effect



**Reduces cleaning costs and energy consumption while boosting hygiene and fire safety.**

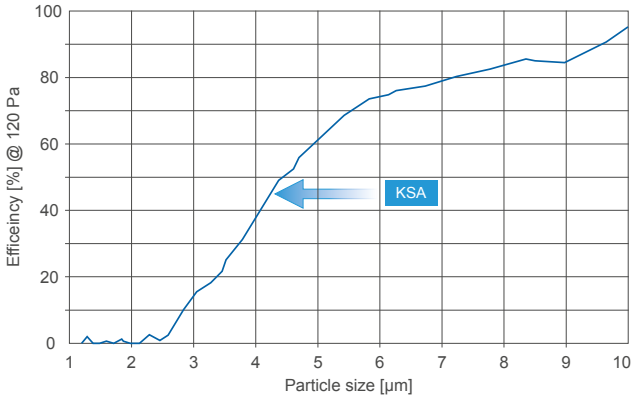
## Benefits

- KSA cyclonic aerosol separators constructed of stainless steel in compliance with EN 16282 6. Up to 95% efficient on 10 microns particles or larger with a reasonable pressure loss of 120 Pa.
- KSA separators' flame-behaviour also complies with UL 1046 and LPS 1263 standards. They also have NSF (National Sanitation Foundation) hygienic and safe approval.
- KSA filters are 95% efficient on 10 µm particles with a reasonable pressure loss of 120 Pa.
- Improved hygiene and fire safety thanks to fewer grease deposits in the exhaust plenums and ducts.
- Lower maintenance costs due to lower cleaning frequency.
- Improved noise levels, thanks to the low pressure loss.
- Reduces the fans' energy consumption compared to baffle filters, thanks to the lower pressure loss.
- Improves the performance of UV-C Capture Ray™ technology due to its high extraction rate.

## How does it work?

KSA cyclonic filters are composed of vertical honeycomb sections. Opening only at the top and bottom, they are designed to force the air to swirl inside. The centrifugal effect is impactful, and continuous – a mechanism that traditional baffle filters do not have. Particles are thus pushed against the honeycomb walls, resulting in better performance.

Schlieren tests on a KSA filter




Tests carried out by VTT according to VDI 2052 (part 1) "Ventilation Equipment for kitchens. Determination of Capture Efficiency of Aerosol Separators in Kitchen Exhaust"

# Halton Skyline

Culinary and Human Centric light



**Halton Skyline is the first LED based lighting technology specifically developed for the needs of commercial kitchens. Everyone agrees the light it provides is simply the closest possible to natural light. It offers many tangible benefits, in many regards, especially when installed in all kitchens' areas, and beyond kitchens' limits.**

Halton Skyline is based on the use of two types of light sources, both equipped with the latest generation of highly efficient LEDs.

A broad beam spot- It is designed to provide a uniform and bright general lighting at a color temperature of 4000K. In the most advanced Human Centric version, it is equipped with two sets of LEDs enabling varying the color temperature from 2200 to 6500K.

A focussed beam spot (@ 2800K)- This is used to further improve the lighting level and the color render of the food in strategic locations, above cutting machines or griddles for instance, or even the plating presentation area.

Halton Skyline is first a Culinary Light that improves the working conditions and safety of the staff. When extended to entire working spaces, its Human Centric version creates daylight-similar sequences depending on the kitchen activity. In other words, it creates lighting conditions that are Circadian rhythm-friendly with recognized biological and psychological benefits.

The significant energy savings may almost be viewed as secondary, but Halton's Skyline is a highly efficient LED technology which contributes to impressive energy savings.

Fitted in Halton Capture Jet™ hoods, ventilated ceilings and front cooking solutions, Halton Skyline light fittings' use can be extended to entire spaces, and beyond kitchens, integrated in Halton's suspended hard ceilings or thanks to standalone modules.

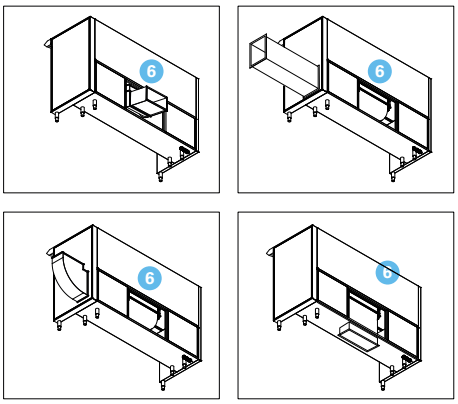
Halton ModularChef is equipped with light fittings based on the Halton Skyline broad beam spots.

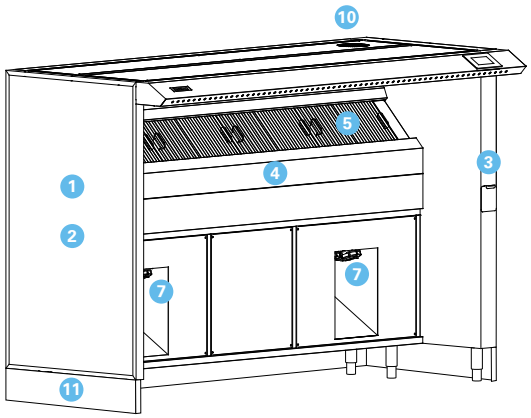


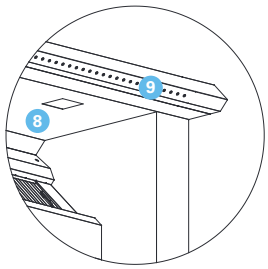
## Benefits

- Uniform light, with a good balance between the direct and diffuse components and with a Color Rendering Index (CRI) of 83 @4000K.
- Remarkably respects the natural food color and texture.
- Improved safety and best visual comfort, without alteration over time.
- Halton Skyline consumes up to 2,8 times less than fluorescent tubes while having a luminous efficacy of 120 lm/W,
- Very good lighting levels on the cooking surfaces.
- 50,000 hours lifetime for both the LEDs and the drivers.
- Saves the replacement of up to 125% of the fluorescent tubes, adding significant maintenance savings to the energy savings

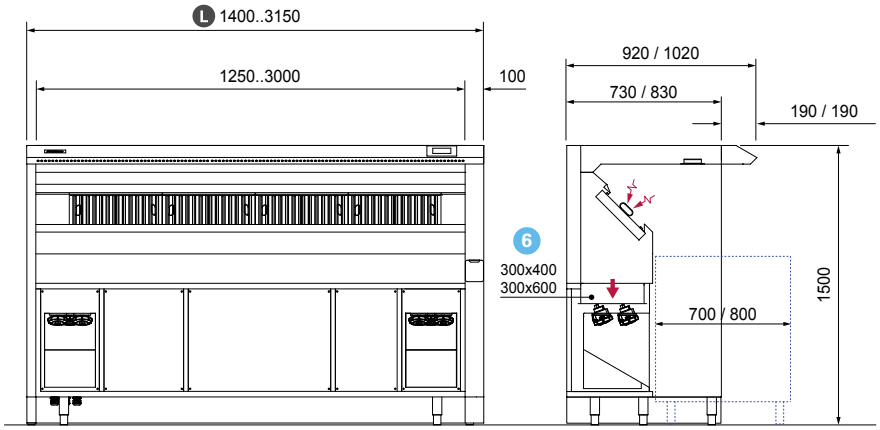
# Description and dimensions

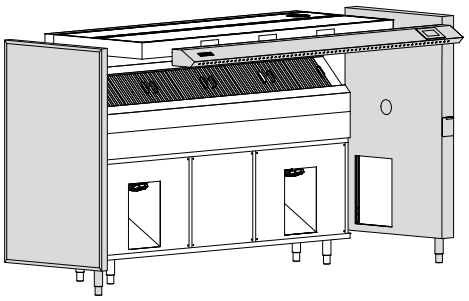


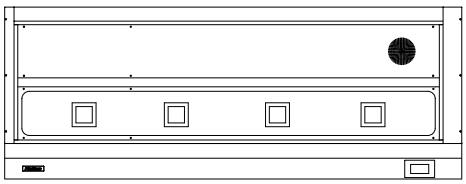




| CODE | DESCRIPTION |
|---|---|
| 1 | Outer casing – visible parts in stainless steel AISI 304 (1,0 mm) |
| 2 | Double skin side (left or right) |
| 3 | Double skin side with grease collection tray (left or right)<br>Also Used for hoods junction |
| 4 | Exhaust plenum - stainless steel AISI 304 (1,0 mm) |
| 5 | KSA cyclonic aerosol separators |
| 6 | Single rectangular spigot for the connection to the ductwork |
| 7 | Option / Integrated services distribution unit opened on the back and bottom for the duct connection with 3-phase sockets |
| 8 | Halton Skyline LED light fitting and UV controls |
| 9 | Capture Jet™ nozzles |
| 10 | Integrated Capture Jet™ fan |
| 11 | Optional cover-board for the feet |



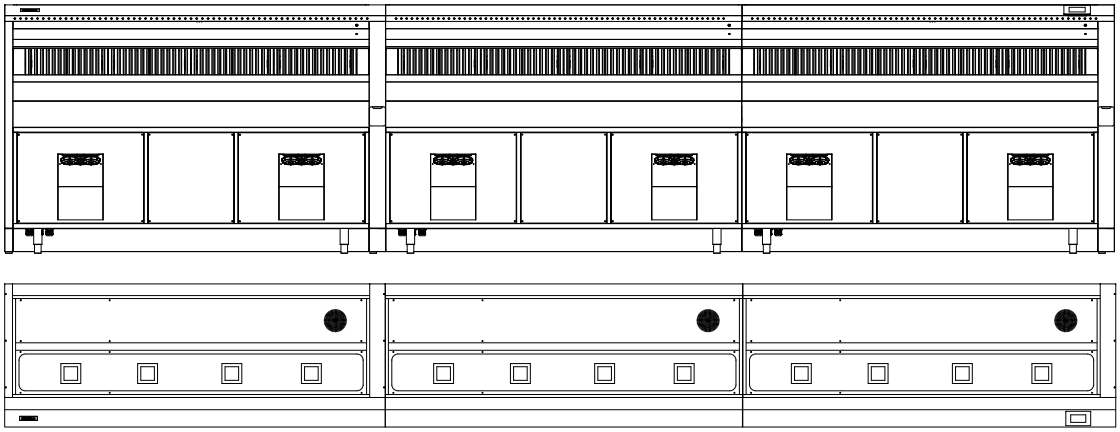



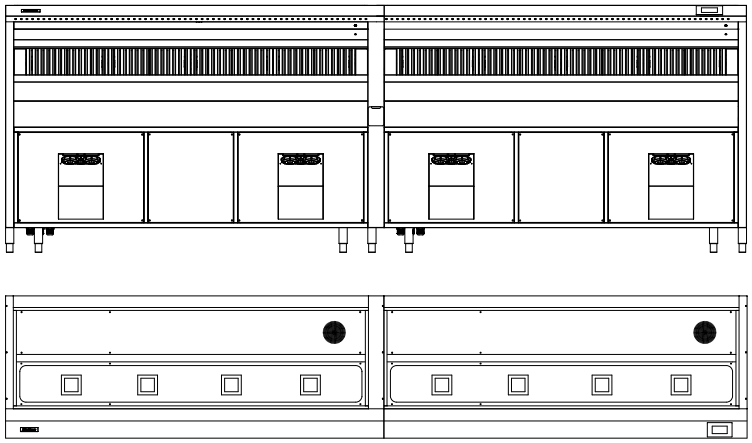


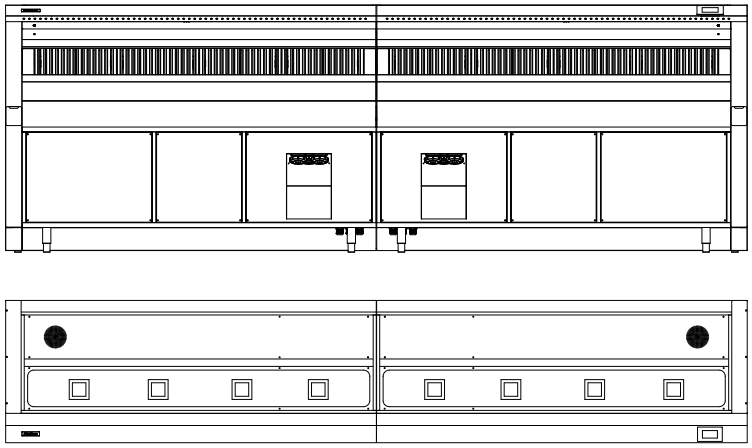
## Modular design

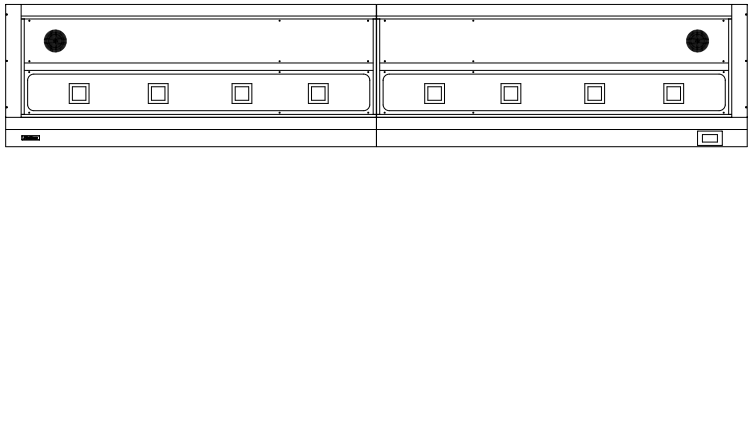
MDH hoods modular design allows for delivering them flat-packed, for an assembly on site. Up to 2500 mm length, the ModularChef hood is equipped with a unique junction module (3) on the right or left side, equipped with a grease collection tray. Above 2500 mm, the junction module is used to assemble several hoods together. Some of the grease collection trays can then be common to two sections.

# Examples of assembly configurations









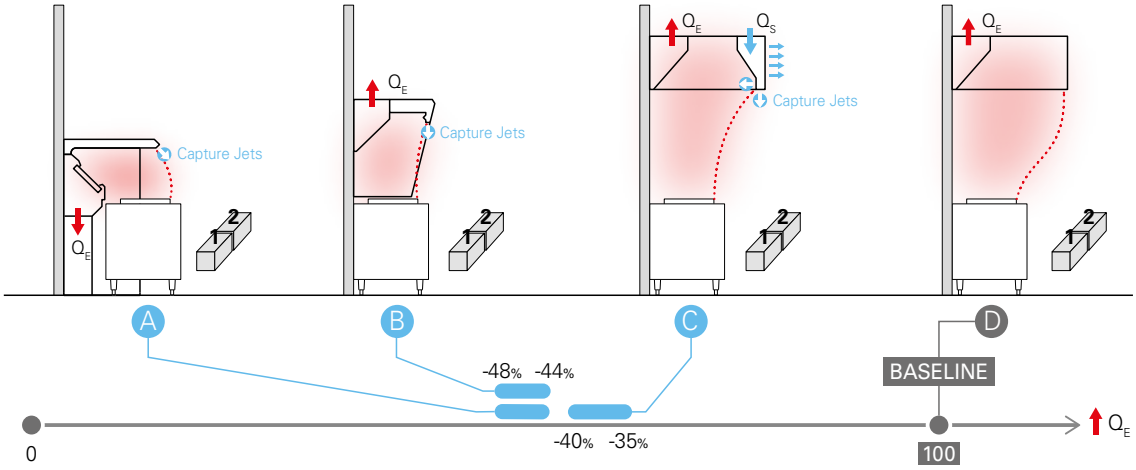
# Calculated airflows

The exhaust airflow rates of Halton's Capture Jet™ hoods are determined with a EN 16282-1(1) based calculation method. It relies on the evaluation of the convective volumes (air mixed with heat, steam, grease, smoke and other pollutants) generated by the cooking appliances, depending on the energy used and their installation conditions (central, on a wall, in an angle).

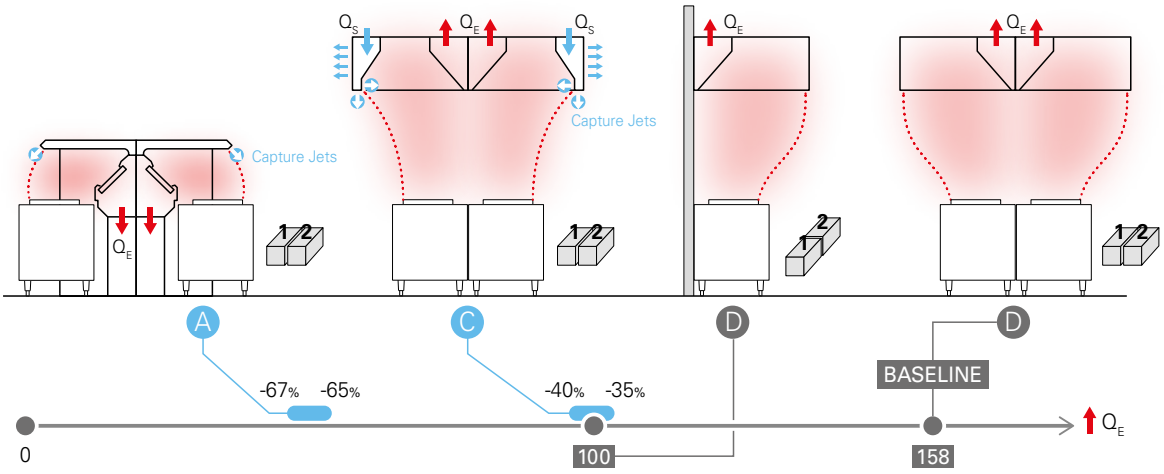
The air volume required to remove the convective loads is then calculated depending on:
- the hood or ventilated ceiling installation conditions;
- The makeup-air strategy (mixing or displacement);
- The hood or ventilated ceiling capture efficiency according to ASTM 1704-12 standard.



## MDH / Up to 48% reduction for wall mounted hoods(1)




## MDH / Up to 67% airflow reduction for island hoods(1)




A- Low proximity, downward exhaust, Capture Jet hood™
B- Low proximity Capture Jet™ hood
C- Suspended Capture Jet™ hood
D- Suspended basic hood

(1) These airflow reductions are indicative. Traditional exhaust-only hoods, combined with mixing diffusers, constitute the baseline. They are compared with Capture Jet™ hoods, with the same cooking appliances, combined with mixing or displacement diffusers, whether integrated or not. The hoods are open on 3 sides for the wall mounted hoods, and 4 for the island installation. Many more factors impact the the exhaust airflow needs. Our sales teams are at your disposal to provide you with a calculation note depending on your kitchen configuration.

# Admissible airflows

| L | KSA | ↓ | ↓ $Q_E$ min..max[1] | ↓ $Q_E$ min..max[1] |
|---|---|---|---|---|
| [mm] | [Nb] | [mm] | [m³/h] | [l/s] |
| 1750 | 2 | 1x 450x200 | 1010..1572 | 280..437 |
| 2000 | 3 | 1x 450x200 | 1515..2358 | 420..654 |
| 2500 | 4 | 1x 450x200 | 2020..3144 | 560..872 |

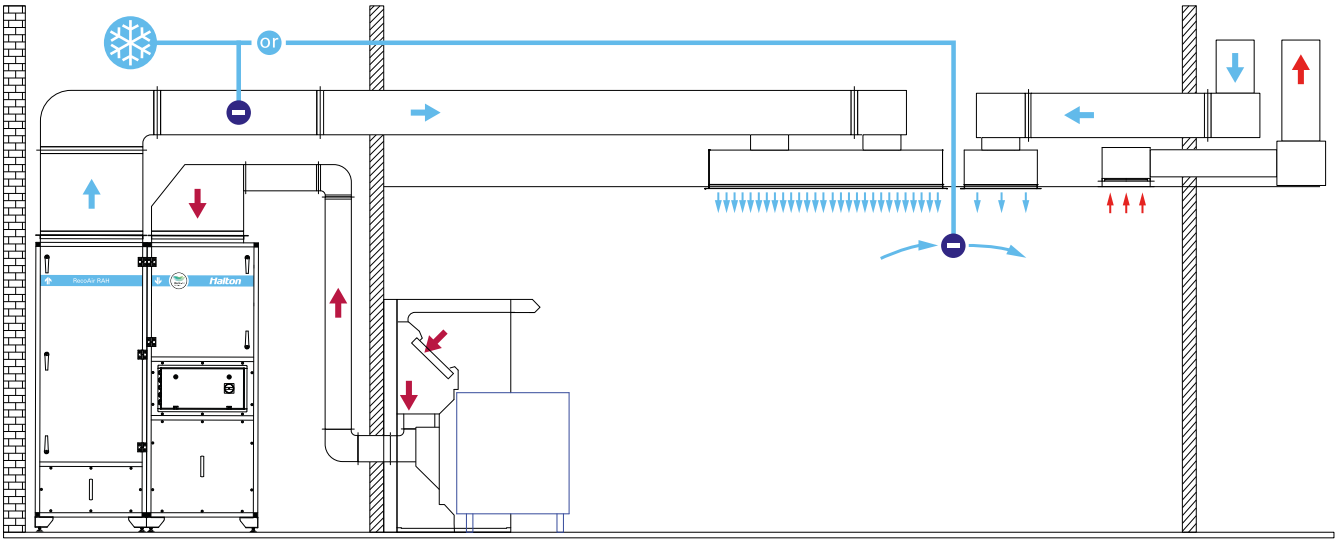
(1) $Q_E$ min @$\Delta P_{T.A.B.}$=59 Pa / $Q_E$ max @$\Delta P_{T.A.B.}$=120 Pa



# Combination with RAH RecoAir recirculating units

RecoAir is a range of advanced and cost-effective recirculating unit that enables setting up a kitchen in a room which doesn't have an exhaust ductwork available. They work at the heart of a kitchen ventilation system serving electric catering equipment.

The very low airflow levels required by ModularChef hoods make them an ideal capture solution for RecoAir units. They allows for reducing the units' size to improve more the cost effectiveness.




**Cooling down the return air**

After Reco-Air unit, the return air is a similar temperature to that extracted and needs to be cooled down before being blown back into the kitchen.
- Spot cooling i.e. fan coil units within the kitchen space;
- Chilled water coil or DX refrigerant cooling coil installed on the return air ductwork etc...

# Specifications

The low proximity hoods shall be Halton brand- range MDH.

This range is equipped with the Capture Jet™ technology. MDH hoods are freestanding and distinguish by an extraction that is made downwards. The connection to the ventilation ductwork is done from the back, the bottom or one side.

The hoods shall be supplied ready to be installed. All technologies and systems shall be delivered fully prewired. The following specifications shall be fully observed.

**Capture Jet™ technology**

- The Capture Jet™ technology is based on the use of sets of aerodynamic blowing nozzles. Each set forms an air curtain that is used to increase the capture and containment efficiency on smoke, steam and heat.
- The exhaust airflow rates shall thus be reduced by up to 48% while removing the same heat, steam and smoke load compared to traditional systems.
- The nozzles shall be designed to get a high air speed at output while not creating draughts that could have an opposite effect to that expected. They shall not represent more than 5% of the calculated exhaust airflow rates.
- The Capture Jets shall be fed with an integrated fan, in order to provide the airflow and static pressure required for an optimal efficiency. A specific ductwork is thus not required.
- The Capture Jet™ fans shall be controlled by a pressure switch to stop it when the kitchen exhaust is off or at minimum speed.

**Exhaust airflow rates**

- The exhaust airflow rates shall be determined with an EN 16282-1[3] based calculation method. Hence, they shall take into account:

1. the convective loads released by the cooking appliances, whether they are characterized by the EN 16282-1, the manufacturer or a third party;
2. the type and installation configuration of the exhaust device(s).

- The calculation method shall, in addition, consider the capture efficiency of the exhaust devices according to ASTM 1704 standard. Both the exhaust airflow rates, and capture efficiency shall be justified by a calculation note.
- Any modification of the exhaust devices' installation height or of the input power, type and dimensions of the cooking appliances shall be brought to the attention of the manufacturer as they all significantly impact the exhaust airflow rates.

**Makeup-air design**

- The makeup air design, especially the diffusers type, size, and location as well as the means to get a correct balance between exhaust and supply, shall be entrusted to the manufacturer. It impacts the exhaust airflow rates, the capture efficiency and is also key to preventing cross-contaminations.
- Diffusers of laminar-flow type or any other type of low velocity diffuser shall be privileged.

**Outer casing and general**

- Constructed from 1.0 mm AISI 304 (DIN EN 1.4301) stainless steel, with a 320 grit on the visible side.
- All exposed welds are ground and polished to the metal's original finish.
- Sides shall be double-skin.
- The hoods' modular design shall allow delivering some of them without the right and/or left side for tacking them together, without separation between modules.
- The hood shall be freestanding. To that purpose, a non-visible stainless steel structure shall be integrated on the back and sides of the hood.

**Exhaust plenums**

- The plenum shall be of downward-exhaust type.
- Constructed from 1.0 mm AISI 304 (DIN EN 1.4301) stainless steel, with a 320 grit on the visible side.
- The lower part of the plenum's sides shall be welded for a durable tightness to condensates.
- The exhaust plenums shall be equipped with KSA cyclonic aerosol separators. Their efficiency shall be at least 95% on 10 microns particles or larger, as tested by an independent laboratory. Constructed from stainless steel, they shall comply with EN 16282-6. They shall also be certified UL 1046, NSF and LPS 1263.
- The exhaust plenum shall have a unique spigot on the bottom. The hood shall be designed to enable a connection to the ductwork on the back, the sides or the bottom of the hood.
- The plenum shall be equipped with a T.A.B.™ (Testing And Balancing) pressure tap for quick airflow measurement.

**[Option] Airflow optimization technology**

- The exhaust hoods shall be equipped with an airflow optimization technology. It shall be Halton Brand, MRV (M.A.R.V.E.L.) model.
- The optimization technology shall automatically adjust the exhaust airflow rates, depending on the cooking activity, in real time and independently. If only one cooking zone is operating, only the airflow required for

that zone would be automatically adjusted. The other zones shall continue to operate at a low flow rate.
• The control system shall be part of Halton Connect IoT (Internet of Things) control platform.
• Refer to the specific description.

**Integrated services distribution unit**
• The hoods shall have an integrated rear distribution unit, equipped with factory installed sockets. Cables, wiring and circuit breakers by the electrician.

**Light fittings**
• The light fittings shall be constructed from stainless steel. They shall be equipped with Halton Skyline flush-mounted broad beam spots.
• The illuminance on the working surfaces shall be at least 500 lx.
• The spots shall provide a uniform light, with good balance between the direct and diffuse components, to make forms and textures clearer and richer in contrast without dazzling the staff.
• They shall have a color temperature of 4000K and a Color Rendering Index (CRI) of at least 83.
• The LEDs and drivers lifetime shall be at least 50,000 hours. The drivers shall be DALI compatible. The spots' efficiency shall be at least of 105 lm/W.
• The spots shall be closed by a seamlessly glued safety glass plate for a better hygiene and ease of cleaning. Its protection against water spraying shall be IP54. The glass shall be fire-rated A1 i.e. nonflammable according to EN 13501-1.
• As standard, the power supplies shall enable switching on/off or dim the light (1-100%) with one or several switches.
• [Option] A specific DALI user interface, with scenario and zoning functions, shall be used to control the light fittings.

**[Option] Fire Suppression System**
• The fire extinguishing system shall be the Ansul® R-102™ or Piranha type.
• It shall be pre-installed from the factory for better integration.
• The detection chain and fusible link(s) shall be fully integrated inside the exhaust plenums to not be visible.
• The nozzles and pipework used inside the exhaust plenums, at the connections to the ductwork and above the cooking appliances shall not block or obstruct any of the extract devices' components neither interfering with their operation, whether during commissioning or maintenance.
• The commissioning shall be carried out by the hood manufacturer or a certified partner. In all cases, it shall be an authorised representative of Ansul, and the installation shall comply with UL 300 requirements and local codes.

(1) The European Standards published by CEN are developed by experts, established by consensus and adopted by the Members of CEN. It is important to note that the use of standards is voluntary, and so there is no legal obligation to apply them (source: CEN).

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