

House of Social – Manchester - Kitchen Extraction Solution

1. Premises Information

The project consists of Five individual kitchens, of similar footprint, designed to offer a variety of cuisines, to the communal dining hall. The intention being that operators could change over time and, therefore, a flexible solution has been presented, to future proof the operations.

The initially the concepts will include:

- Kitchen 1: Dough Religion (pizza)
- Kitchen 2: Burger & Beyond (Burger)
- Kitchen 3: Choi Wan (Chinese)
- Kitchen 4: Mughli (Indian Street Food)
- Kitchen 5: OK Tacos (Mexican)

The Food Hall is operational as follows:

- Tuesday, Wednesday and Sunday 8.00 am – 10.00 pm (Kitchens close at 9.30 pm)
- Thursday, Friday and Saturday 8.00 am – 1.00 am (Kitchens close at 10.00 pm)
- Kitchen Operating hours will vary, although within the range of 7.00 am to 10.00 pm

Given the extensive accommodation above the kitchens, a Recirculation solution has been selected, as provided by the industry leader, Reco-Air Ltd., Centrix, Keys Business Village, Keys Park Road, Cannock, Staffordshire, WS12 2HA.

The Company Brochure, Specification & Product Overview, is attached for general information

2. Plans & Drawings

Reco-Air manufacture Recirculation systems that comply with the Industry Guidelines, DW/172. This is an internal Kitchen extraction system, with each kitchen having its own dedicated recirculation unit, located next to the Extraction Canopy. Plans of the units, overall kitchen layouts and external elevations are attached.

With the Reco-Air units proposed, there are no external elements to the system; the filters, fans, carbon canisters, controls, canopy and connecting ducts are all internal. The existing approved external grilles in the façade, will be connected internally, with a secondary 650 mm square, carbon filter housing. A general bleed duct, for 10-15% of the clean return air, is proposed to help create negative pressure within the kitchens and improve capture & containment at the canopy.

3. Reco-Air Unit Specification

The RA0.8-42C has been selected for its flexibility, to future proof the operation. The unit has a maximum capacity of 1.2 m³/s, with two of each grade of primary filters possible, although, it is envisaged that most operations will operate the unit on the lower air volume of 0.8 m³/s. At this duty, just one of each primary filter

will be required, as the maximum duty of each of these filters is 0.9 m³/s. In both air volumes, the standard 42 carbons canisters will be installed, offering a minimum dwell time of 0.2 sec, rising to 0.3 sec on the lower setting.

The following grade filters are included in this model.

- F1: G4 - 595 x 595 x 48 – Large Grease Particles
- F2: M6 - 595 x 595 x 98 – Fine Grease Particles / Oil Mist
- F3: E10 - 595 x 595 x 300 – Smoke & Moisture
- F4: Carbon Canister 600 mm – Odour Suppression

In addition to the Reco-Air filters, we have proposed that the bleed duct has two Bonded Carbon Panels.

F5: Bonded Carbon Panel - 594 x 594 x 98

Specifications for the above filters are attached.

All filter media is 'Passive'. There is no UV, Ozone Injection or ESP proposed.

4. Capture Canopy (Hood)

A double skinned Halton Canopy with Capture Jet Technology has been selected for these kitchens. Each Canopy will be 3.0 m wide and 1.6 m front to back. This ensures that the requirements for DW/172, in respect of 'overhang' are met, for instances where combination ovens are or will be installed in the future.

Halton Capture Jet Technology has a dedicated fan that blows a low velocity 'curtain of air' around the perimeter edge of the canopy, thereby reducing drift and overspill. The manufacturer also claims that the addition of capture jet reduces the extract air volume required. Information on the Capture Jet system is attached, for information.

Given the various cooklines, we have sized the Reco-Air unit based on the face velocity method for the canopy size at 0.25 m/s and have excluded the benefit of the capture jet technology.

There will be a minimum of 600 mm Canopy overhang to the front, although both sides are contained by the Reco-Air unit on one side and the building column on the other, therefore, the usual 300 mm side overhang is not required.

5. System / Duct Design

As stated, the canopy is located next to the Reco-Air unit. The canopy has two spigot connections into a tapered duct above, sized to provide an extract air velocity of less than 6.0 m/s. The duct enters a plenum on the top of the Reco-Air unit, passes through the three primary filters, through the fan and then into the active carbon canisters, before discharging at low level through the front diffuser.

A side bleed duct connection is also in place, ducting a proportion of the clean air above the plenum, where a small shunt fan, extracts 10-15% through the internal double carbon panel housing, to atmosphere. A damper

is included in this duct run in the unlikely event that the discharge causes nuisance, should a particularly 'aromatic' operator be engaged.

6. Noise

The system is internal and is double skinned, with rock wool insulation between. The breakout noise levels from the unit (at 1.0 metre free field) in the kitchen are around 55 dB(A) when all filters are dirty and the fan working the hardest. As filters degrade at different levels, it is unlikely that all filters will be dirty at the same time. The fan will be running between 60-80% (6.0 V – 8.0 V output) most of the time.

The shunt fan is noted at a maximum 62 dB(A), although this is contained in the ceiling void and some 4 metres away from the point of discharge, with the two carbon filters to attenuate the sound and an air volume of just 0.3 m³/s through the external grille. It is unlikely to cause a nuisance, although, as with the odour, it can be shut off if required.

7. Maintenance

The Reco-Air smart controls, monitor the pressure of the primary filters and activate warning alarms at 85% saturation. The unit will continue to run for a further 80 hours, before automatically shutting down. Once the filter 'in alarm' is replaced, the system resets. Typically, filters F1 & F2 last approximately 3 months, with the F3 lasting around 6 months. Obviously, the busier the operation the more frequently filters will need to be changed. Carbon Filters tend to be changed annually, although, should the operator sense that the quality of the return air is deteriorating, then these can be changed more frequently.

We recommend that each Operator 'opens up' their respective filter cabinet on a weekly basis, to check the filters for any visual damage or undetected decay.

The fans do not require any maintenance, although, once a year with the carbon change, a full health check of the unit and capture jet system would be undertaken. Operators can

sign up to a service agreement.

8. Background Ventilation

As recommended by DW172, a small fresh air supply into each kitchen has been provided, along with some general extraction and cooling to the space.

9. Summary

The Reco-Air Solution is an internal Kitchen Extract System, with no visual impact to the external building. The existing approved external louvres have been utilised to aid capture and containment at the canopy, with a small proportion of the clean return air being discharged at low velocity. The system is approved as an alternative to high or low level kitchen extraction to atmosphere.

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