Concluding report concerning the micro-biological examination of the raw concrete soffit, airtight partitioning and active cassettes of the GIF Ventilated Ceiling and also of various airborne germ measurements in the production kitchen of the refectory of the Students' Hall, Students' Building, Würzburg on 30.11.10.

Client: Hidria GIF GmbH, Brühlstraße 7, 79112 Freiburg

Objective: The state of hygiene of various structural elements in the GIF Ventilated Ceiling as well as the air quality was to be determined on the basis of micro-biological examinations and optical assessment (extended visual check). According to the manufacturer of the GIF Ventilated Ceiling the individual cassettes of the ventilated ceiling function as grease and condensation separators. Because of the effects of gravitation and condensation the flow of air via separation chamber leads to a build-up of dirt, grease and other floating particles on the inner side of the small register. According to the information provided, the accumulation of dirt in the ceiling cavity is thus avoided.

Description of the property:

Operational details: Refectory of the Students' Hall, Students' Building, Würzburg

Number of meals: approximately 2500 hot meals per day

Date of start of service of kitchen including ventilated ceiling: in year 2000

Volumes of extracted and supply air: (ventilation with nominal volume flow rate in operation): 33600m³ / h

Heights: GIF Kitchen Ventilated Ceiling: 3.0m above FFL, concrete soffit approx. 3.5 above FFL

Cleaning cycles: According to the information received, the cleaning of the kitchen ventilated ceiling is carried out every 3 – 6 months, or more frequently in individual places if necessary. The last cleaning was reported to have been carried out in September 2010.

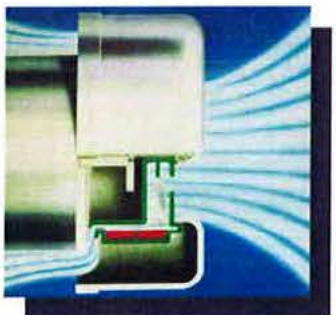
Details of the property: A GIF Kitchen Ventilated Ceiling was installed in the above property in 2000. The GIF Kitchen Ventilated Ceiling functions as an open type of construction with a ceiling pressure chamber in accordance with VDI 2052 and DIN 18869-2 feature B1. The extracted air and the supply air pass via pressure chambers in the ceiling cavity. The pressure chambers are formed by means of aluminium compartments inside the ceiling cavity. The extracted as well as the supply air is realised over structurally identical active cassettes at a modular dimension of 500mm x 500mm. The GIF Kitchen Ventilated Ceiling is fixed to a concrete soffit, which together with the air-tight compartments and the GIF Kitchen Ventilated Ceiling forms the pressure chambers. Besides the air pipes there are additional installations such as electrical cables present in the ceiling cavity. The active cassettes form a completely reversible ventilated ceiling with integrated lighting in all sections.

1. Methods and Results

1.1 Optical assessment (extended visual check)

The optical assessment which was carried out in the framework of an extended visual check in the areas of both extracted and supplied air showed no traces of flaws of hygiene or other possible harmful effects such as dirt, formation of rust, limescale deposits, damage, fibre discharges. As a result of the GIF-ceiling elements being removed immediately beforehand, the ceiling sections were shaped in such a way that they could be clearly and extensively examined. This made the inspection of the parts much easier and no anomalies were found. The assessed surfaces in the ceiling area (raw concrete, air compartments, air passages) were dry and free of deposits and dirt.

1.2 Airborne germ measurements with the help of an air sampler



Illustrations 1+2: Air sampler RCS Principle of measurement

The airborne germ measurements were carried out with an air sampler RCS High Flow from Biotest HYCON by means of repeated determinations. On each occasion 200l of air was collected for the test (Method BAV-IM-5. 4-55). The airborne germ measurements were carried out directly at the air outlet of the supply air passage (entry of air into the supply air pressure chamber – Point 10054152/-53) and also after a length of approx. 11m in the ceiling cavity (Point 10054156/-57). In a similar way measurements were taken at the air outlet inside the kitchen directly beneath the supply air component (active cassette – Point 10054154/-55) as well as at a representative place in the production area near the tilting frying pans at a height of approximately 1m (Point 10054158/-59).

No criticism could be made of the eight airborne germ measurements (repeated determinations at four measuring places) all produced satisfactory results. It should not be forgotten that the assessment “satisfactory” represents the best possible evaluation on the basic scale of “satisfactory”, “acceptable”, “unsatisfactory”. All the tests were below the benchmark of 400KbE (colony forming units) per cubic metre for the aerobic mesophilic germ count and below the benchmark of 1000 KbE per cubic metre for fungus. To arrive at the evaluation benchmarks were used which are valid for sectors dealing with food ready for consumption. At the endpoints of the incoming airflow in particular very small germ counts were recorded (some of which were below the limit of detection), which underline the manufacturer’s specification that the use of the voluminous ceiling cavity for the air-flow does not contravene the hygiene regulations.

1.3 Examination of surrounding areas (surface and swipe sampling)

Surface and swipe sampling were carried out on different elements in the ceiling area as well as on several active cassettes and evaluated (ISO 18593 (2004)): Horizontal procedure for testing techniques of surfaces by means of contact plates and swabs; DIN 10113 (1997); determination of surface germ content on the fixtures and implements in the food area.

The surface and swipe sampling on the raw concrete surfaces, active cassettes (extracted and supply air) together with the air-tight partitions (for the individual positions please see attachment) also produced exclusively satisfactory results. Again it must not be forgotten that the term “satisfactory” represents the best possible result. Enterobacteriaceae (to which also hygiene indicators such as E-coli and disease causing elements such as salmonella also belong) were not found in any of the tests. Seven from ten surface samplings and three from five swipe samplings showed no signs of germ growth. The germ count of covered agars gave no cause for complaint. What should be especially emphasised is that all the tests of active cassettes, which were cleaned before the testing in the on-site multi-tank conveyor dishwashing machine, showed no signs of germ growth. These results satisfy almost entirely the regulations concerning materials with direct food contact of DIN 10516 (Food hygiene – cleaning and disinfection) and demonstrate the possibility of cleaning the GIF ceiling elements simply and effectively. Moreover, the removal and reinstallation of the ceiling elements do not require any technical aids and can be integrated without difficulty in the operational cleaning processes.

2. Summary of Assessment

During the course of the tests described above it was shown that in the production kitchen of the refectory in the Students’ Hall in the Students’ Building in Würzburg while the GIF-kitchen ventilated ceiling was in use and during the air-supply feed over the ceiling pressurised chamber there was no additional germ-pollution caused by germs as set out in VDI 6022 Sheet 3, Point 3.3 or any other adverse effects found at the time the expert assessment was written on 30.11.10.

(signed) Dipl. LM-Ing. Dr. rer. Biol. Vet. Christian Kaiser