Tests for Mediaa Trading Norway based on Norwegian standard TEK17:

Based on the TEK17 standard from Norway, Mediaa Trading has asked PlasmaMade b.v. to perform a number of tests according to this standard: on the one hand tests according to the standard, as it applies in Norway, on the other hand the same tests, but with a PlasmaMade GUC1214 filter and recirculation instead of the regular direct discharge to the outside according to the said standard.

The interest is mainly in the performance with regard to humidity during these tests. The interest from PlasmaMade is mainly in the field of tVOCs (gases and odors) and particulate matter (the particles pm 2.5 were examined in the tests).

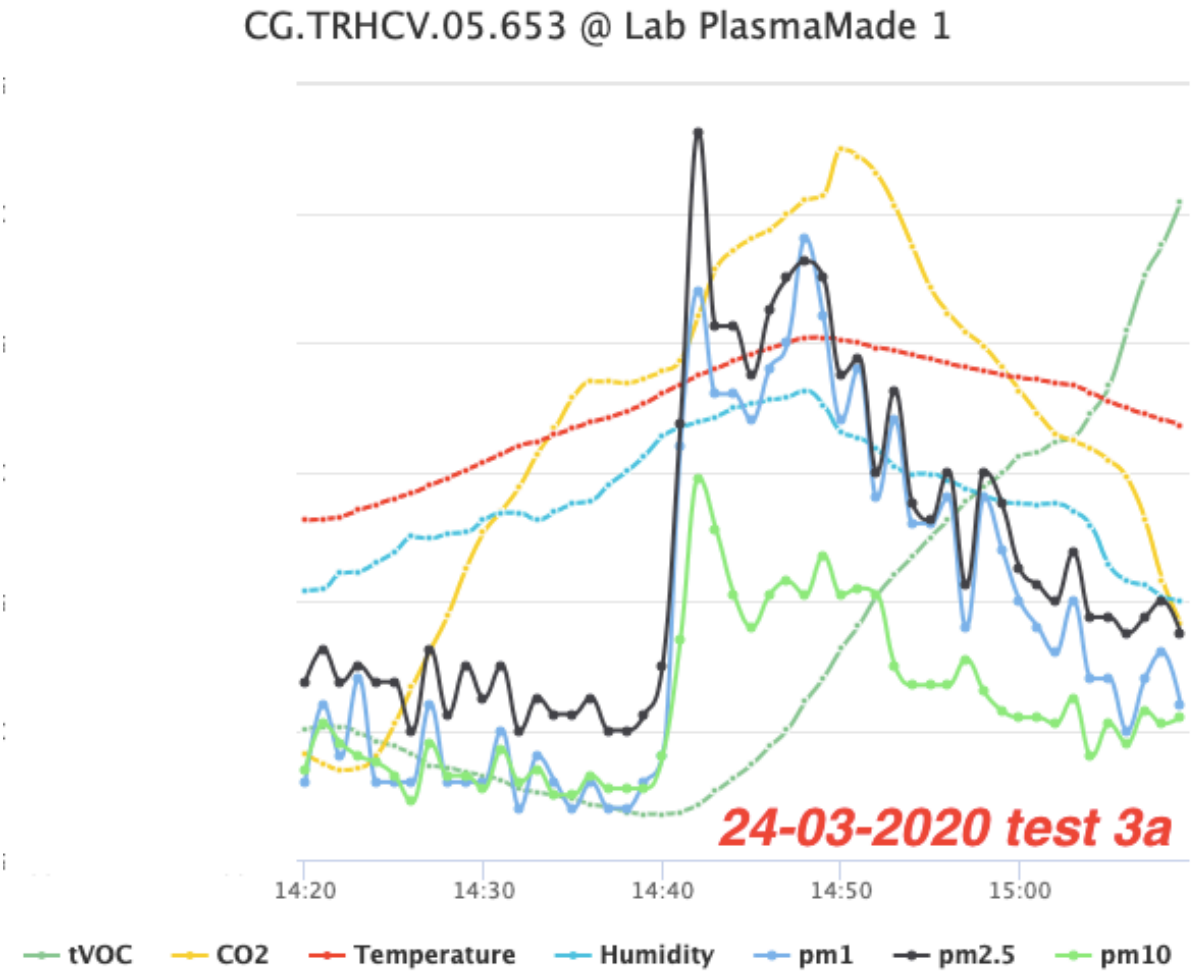
In anticipation of a short calculation with regard to the reduction of the mentioned points of attention and a number of graphs of the tests, below are the principles of the tests:

- The location is the PlasmaMade test kitchen in Staphorst, a space with a volume of 47.6 m^3.
- In the tests, 2.5 liters of tap water were heated from tap temperature, and 3 standard Mora burgers were fried in 20 grams of olive oil.
- After baking, the used gas burners were turned off and the pans with boiling water and fried hamburgers were covered. This was followed by another 20 minutes, for measuring purposes. During that time, nothing was altered in the test kitchen.
- According to the TEK17 standard, ventilation must be carried out at a minimum of 108 m^3 / hour during the cooking process. The hood and ventilation are adjusted for this. For the comparison with the GUC1214, the same adjustment in terms of ventilation is used, only with recirculation instead of direct exhaust to the outside.
- TEK17 has also been tested with a minimum ventilation of 36 m3 / hour: these tests are not taken into account here, because they give an unrealistic picture in a practical situation (rapidly rising temperature and rapidly rising humidity). The data is available, if there is a need for it.

	Test 3A 108 m3/h straight	*Reduction in %*	Test 4B 108 m3/h GUC1214	*Reduction in %*
tVOC start/max/end	1212/2703.50/2703.50	0	136/1142/998	12.6
Humidity start/max/end	24.86/30.51/24.14	20.9	23.82/43.4/31.68	27.0
Pm 2.5 start/max/end	5.5/18.5/8	56.8	11.5/85.5/40	53.2
	Test 3B 108 m3/h straght		**Test 4A 108 m3/h GUC1214**	
tVOC start/max/end	3050/5856/4462,50	23.8	4648/7308/5047	30.9
Humidity start/max/end	26.59/31.25/26.96	13.7	24.09/45.09/34.91	22.6
Pm 2.5 start/max/end	5/24.5/7.5	69.4	7.5/41.5/19.0	54.2

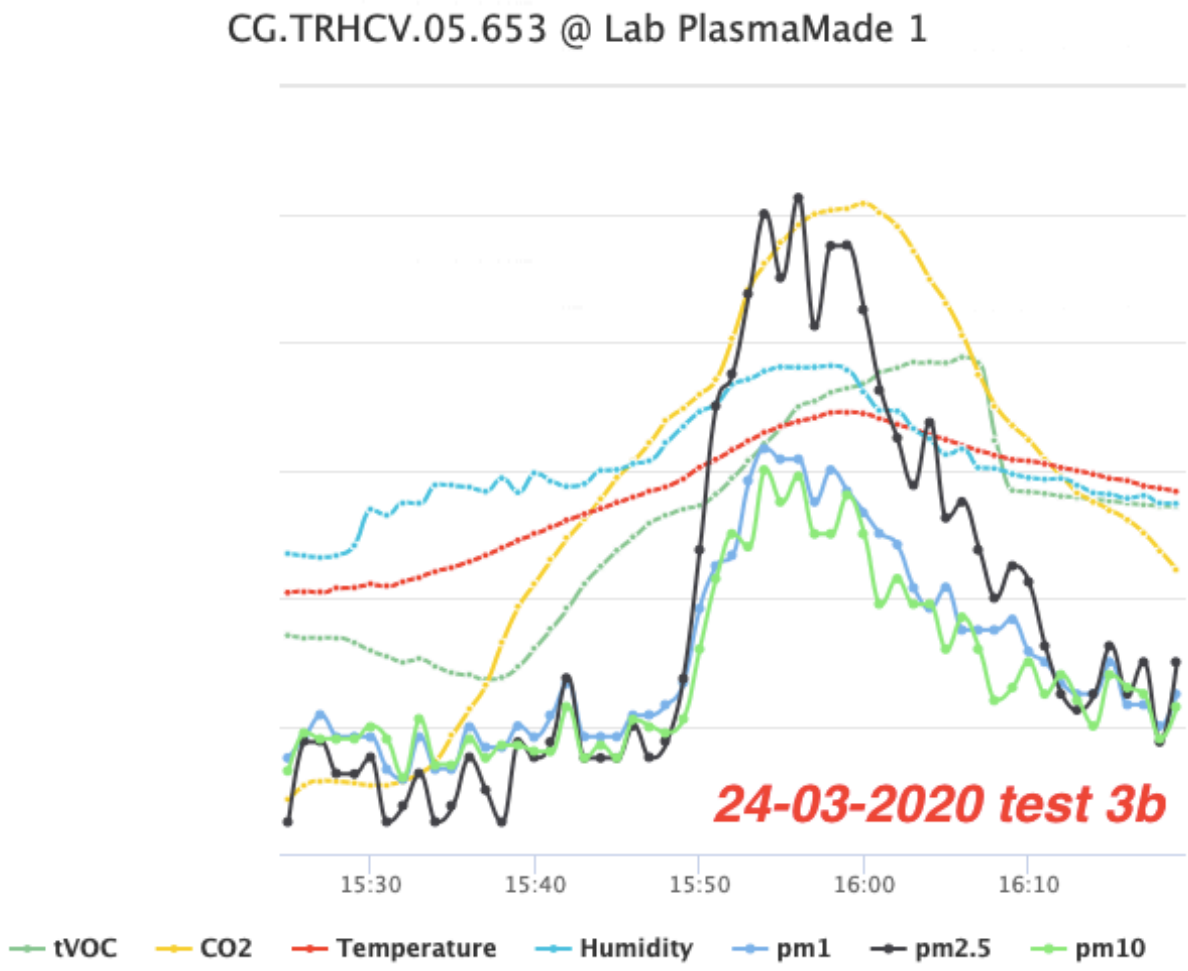
The above overview calculates the reduction of the measured substances during the tests. The start and end of the tests and the highest measured value were taken as reference points. The latter value usually corresponds to the end of the baking process with humidity and fine dust. For this fact, it is always advisable to ventilate afterwards, and not to switch off the extractor hood, whether direct extraction or recirculation takes place. What is striking is the slight differences in the methods used, in other words, in this test design it is clear that there is little difference between the use of a PlasmaMade recirculation filter such as the GUC1214 and the direct discharge of the cooking gasses during baking and water boiling. In terms of humidity, there is even a slight advantage with the GUC1214.

DIRECT EXTRACTION:



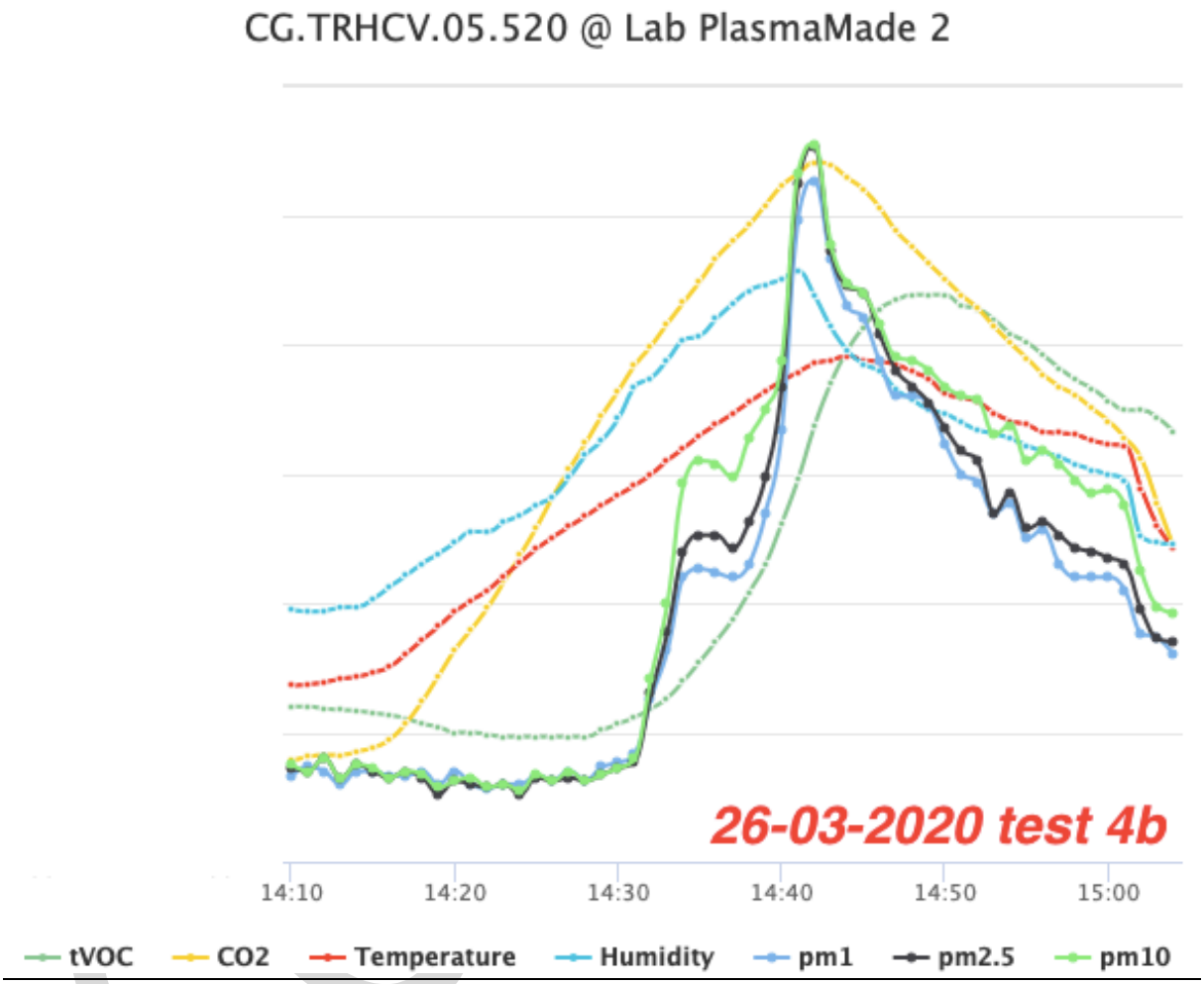
The graph above is the result of cooking / baking with direct extraction to the outside. You can clearly see the peak of most values (this is around the end of the cooking / baking process) and then the steady decrease.

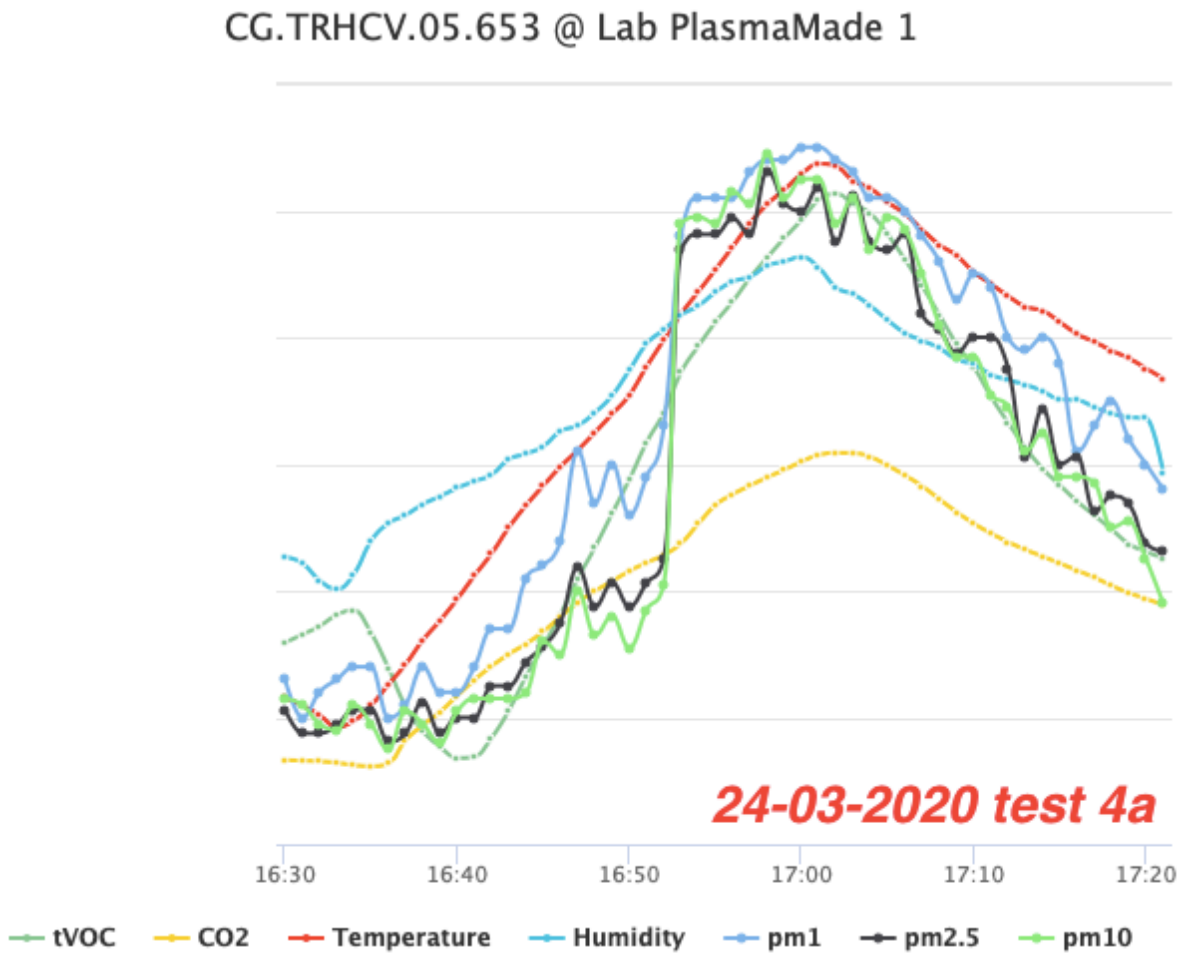
For reference, below is a representation of the same test performed at a different time: The lines differ in details, which is easy to explain, especially for particulate matter, due to a smaller number of particles, but the build-up and decrease are comparable.



USE OF A PLASMAMADE GUC1214 FILTER:

The two graphs below show the measurement results of tests performed with a PlasmaMade GUC1214 filter. The cooking air is therefore recirculated and there is ventilation in the room. Here you can clearly see that the curves decrease rapidly after the peak (around the end of the cooking / baking process). Certain values, such as CO_2, temperature and humidity, even decrease significantly faster than with the direct discharge.





CONCLUSION:

Based on the graphs and data shown above, it can be stated that a PlasmaMade GUC1214 filter under exactly the same conditions, based on the standards as set in TEK17 from Norway, produces a very similar result. In some areas, such as temperature and humidity, the results are even better than with what is now the standard: direct exhaust of cooking air to the outside.

Sources:

https://dibk.no/globalassets/byggeregler/regulation-on-technical-requirements-for-construction-works--technical-regulations.pdf
For the complete text of TEK17 in English.