GEA Aroma Management

Combining technology, knowledge and experience to understand aroma loss

GEA Engineering for a better world.

GEA.com

Coffee process analytical services to help you understand and reduce aroma loss

Aroma is key to great-tasting instant coffee, and here at GEA we are committed to helping you minimize loss of those key aromatic compounds from the bean during manufacture. We have combined gas chromatography-mass spectrometry (GC-MS) technology with decades of GEA knowledge and insight to offer analytical services that can help you to understand just where in your process aromatic compounds are lost, and potentially how to minimize that loss. And if you want to come and make your own purely olfactory assessment, we can generate a sniffogram of your results.

Understanding aroma flow

It's perhaps inevitable that some aroma will be lost from coffee beans during instant coffee manufacture, but the overall process may result in a final product containing only 30-40% of that original raw bean aroma. Understanding and reducing aroma loss in any process has traditionally been a matter of trial and error – and assessed by taste. Experts at our GEA Soeborg site in Denmark now offer a suite of analytical services for generating a detailed evaluation of dozens of aroma compounds, and/or aroma balance, at multiple stages of your instant coffee process.

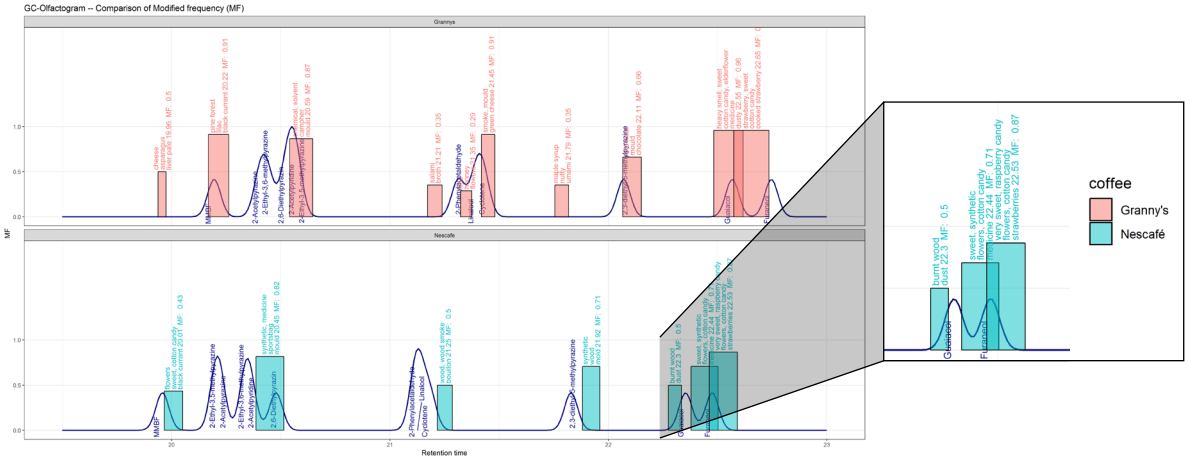
Tracking aroma loss

Using GC-MS analysis we can identify and quantify up to 50 of the most important aroma components in coffee. Importantly, we can map the flow of aroma in the entire process, to find points at which aroma is lost. And the ability to calculate mass balances of aroma in and out of specific process equipment provides further data for fine-tuning your running parameters. The overall results can help you to understand where aroma might be lost or even destroyed - perhaps due to high temperatures - and so suggest how to better optimize each process and get the most out of your valuable beans and technology investment.

Full mapping of aroma flow in a factory requires samples to be collected from every flow, and frozen before sending to our test facilities in Soeborg, Denmark, for analysis.

Sniffograms

The GC-MS system is also equipped with an olfactory port where human testers can smell the individual aroma components as they pass through the analysis apparatus. This means we can give you the opportunity to come to Soeborg and undertake your own GC-sniff analysis of your coffee, from which we generate detailed sniffograms (olfactograms). This approach lets you assess the aroma in either roasted beans or final product, and can give an indication of which components are strong contributors to the overall aroma profile of coffee in the cup.



GS-Olfactogram
A section of a typical sniffogram also known as GS-Olfactogram

A suite of aroma management service options

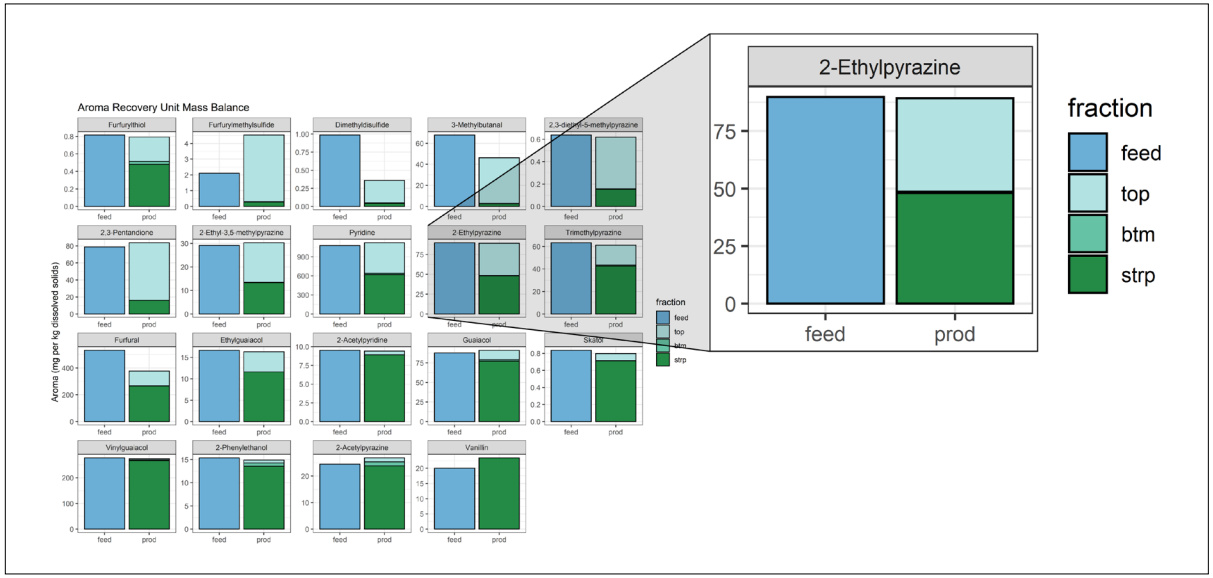
We offer a number of aroma management service packages:

Complete aroma flow mapping
Samples are collected at 13 sample points in the process and analyzed by GC-MS at GEA. The result is a report including graphical representation of aroma levels and flow throughout the process. Based on the findings in the report, we can give you recommendations on points of interest where aroma compounds might be lost or degraded.

Aroma recovery mass balance
Samples are collected from four points (feed, stripped extract, top and bottom of distillation column) in the aroma recovery unit and analyzed by GC-MS. The results are presented as a report and a graphical depiction of the most notable aroma components, including assessment of the degree of stripping and recovery.

Individual samples with quantification
Individual samples can be analyzed to determine the concentration of aroma compounds. The results are recorded for you as an excel file with the measured concentrations.

Here's an example of a mass balance study:



Contact your local GEA representative to find out more about the different services that we provide. And just to let you know, for accurate results it is important that all liquid samples are frozen as quickly as possible after sampling, and they must arrive frozen at GEA. For liquid samples 100 mL is enough to carry out several GC analyses. For dry samples we need 100 grams.

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