

# On-Demand Project Ordering Tool

## PRINT FOR FUTURE USE

### LANDING PAGE:

We designed on-demand testing protocol to provide a cost effective solution for everyday-type analyses.

Cost is for standard testing methodology appropriate for the sample type. This document will provide detailed instructions to assist with system familiarization.

On the Landing Page you will find the following screen:

The screenshot shows a web browser window with the URL [om/volatile-on-demand-project-tool/](http://om/volatile-on-demand-project-tool/). The browser's address bar and tabs are visible. The page header includes a green navigation bar with the text "Give us a call: (256) 486-3531" and social media icons for Facebook, Twitter, LinkedIn, and a shopping cart. Below the header is a logo for "VOLATILE ANALYSIS" featuring a molecular structure. A horizontal menu contains the following items: SERVICES, QUOTE, INDUSTRIES, KNOWLEDGE CENTER, SCIENTIFIC ODOR COMPANY, and STORE. A search icon is located below the menu. The main heading is "Volatile On-Demand Project Tool". Below this heading, the text "Current Price:" is displayed. A link for "For complete instructions on how to use the quote engine, click here" and an email address "quotehelp@volatileanalysis.com" are provided. The "Select Test Type" section contains four buttons: "STANDARD OFF-ODOR PROJECT", "STANDARD GC-MS/O", "STANDARD QUANTITATIVE ANALYSIS", and "STANDARD GC-MS". A "NEXT" button is positioned below these options. At the bottom, a "Restart Quote" link is visible.

Choose (click) the box that represents the type of analysis desired (details providing descriptions and instructions for each project type are outlined below). All selections except Standard Off-Odor require input as to the number of samples to

analyze. Once the correct number of samples are provided, click NEXT. Thereafter, the platform moves you through one or more screens applicable to each type of project. Project Parameters and shipping information are provided at checkout and must be reviewed and accepted prior to check out.

If you have a question regarding what type of project is appropriate for your needs, or how to use the on-demand ordering tool, please contact our office by phone: 256.486.3531, or by email: [quotehelp@volatileanalysis.com](mailto:quotehelp@volatileanalysis.com).

## PROJECT DESCRIPTIONS AND UNIQUE ORDERING INSTRUCTIONS

**For all projects the VAC team will determine the appropriate sample prep, GC column(s) and other parameters necessary for analyses. Pricing for these on-demand services are based on standard processes that do not include consulting. Our consultants are available and bill by the hour if needed. You may contact us: 256.486.3531.**

**1. Standard Off-Odor Project:** Select this option if you seeking to identify the cause of an off-odor in your product. This project utilizes a standard approach that is successful in resolving most off-odor problems (sample prep, gas chromatography-mass spectrometry/olfactometry, sample comparison and review). It is also the first step in incremental analyses required for the most difficult off-odor problem. When ordering this option online our system requires input as to whether your material is a liquid or solid. Also a description of the off-odor (musty, floral, earthy, rotten egg etc.), type of material (fabric, wood, paper) and any special conditions for perceiving the odor. We request you ship to us a sample of the off-odor (enough for minimum of two samples) material, and one that is understood to be the exact product, or as near as possible, but has no off-odor. It is best to choose the non-odorous material from the same production facility and same production line, if possible. ***The project goal is to determine the off-odor GC retention index, compare and contrast mass spectra and olfactometry odor profiles (odor retention times, intensities, descriptors) between odorous and non-odorous, and identify the chemical responsible for the odor by library ms confirmation, retention index, and our specialized experience with odors and their corresponding chemical structures.***

The project report includes olfactometry data (odor peak retention times, intensities, descriptors) and alignment with total ion chromatogram data (olfactometry and GCMS data are aligned by retention time). Based on the complexity of a sample, and the nature of the off-odor, there may exist co-elution problems, or the MS peak may be very small or not apparent. We will utilize MS tools including ion extraction methods and literature retention index and odor matches to aid component identification. An example of an aromagram is shown

on the last page of this document. We charge a flat fee of \$5000 for this Standard Off-Odor Project and it includes: four full aromagrams (2 analyses of the good material and 2 analyses of the off-odor material), and our interpretation of the data.

***(More information on aromagrams below)***

**2. Standard GC-MS/O Project:** This selection will provide detailed chemical and aroma profile information for a product or material. Please select this option if you have one or more materials to analyze by standard gas chromatography-mass spectrometry/ olfactometry (GC-MS/O). Olfactometry utilizes an expert odor judge who evaluates (sniffs) GC effluent and rates odor intensity and character. Data is recorded and aligned with mass spectrometric data by software for construction of an aromagram (aromagram example is listed at the end of this document). Please review detailed information about the GC-MS/O technique in the GC-MS/O services section located on this website. This is a standard analysis. Primary odorants judged strong, or “4” on 1-4 point intensity scale, and judged moderate, or “3” on 1-4 point intensity scale, will be reported in detail. Abundant chemicals (including non-odorous volatile chemicals) will be labeled if their identity is available in spectra library searches with appropriate confidence levels.

The selection of this project is appropriate when you have an off-odor, off-flavor, or if you desire to obtain a product’s aroma profile. When using our website’s ordering engine, you will be asked about each material, and the number of analyses or identical reps desired. Up to four reps (each rep has its own cost component) for any sample material may be ordered. If there is an off-odor or off-flavor, please provide the odor descriptor, describe the type of material, and any unique conditions to enhance perception of the off-odor. If you are providing a control (non-odorous sample), please designate this in the ordering engine box. If you do not have an odor or flavor question, please answer “none” for each sample you are providing in each box that addresses odor. An example of an aromagram and more information regarding this tool can be found later in this document. The pricing for this project is \$1450 per analysis. It is important to remember this includes GC-MS and olfactometry with an expert odor judge who provides odor descriptors and intensities for aromagrams.

**3. Standard Quantitative Analysis:** *NOTE: If you have a very complex project it is highly recommended that you provide information through our Volatile Analysis Quote Builder intake form. You can find this by clicking on the Quote selection at the top of the page in the On-Demand Ordering Tool.*

Standard Quantitative Analysis allows you to order up to 8 separate samples and each sample will be analyzed 3 times (3 reps). For each sample, up to three unique chemicals (Chem Set) can be evaluated. Chemicals of interest will be

quantitated in each rep for each sample. The three unique chemicals are chosen as part of the ordering tool and are defined as a Chem Set. You have to remember which Chem Set you assign groups, because you select which set you want to use for each sample. Once you input the number of Chem Sets, you will then provide up to three CAS numbers for the Chem Set. These are for our knowledge as you will be responsible to send the STANDARDS to Volatile Analysis Corporation or we can order them and **bill you for their cost and shipping.**

Quantitative analysis includes construction of calibration curves for each chemical and the cost of this work is included in the sample price. Therefore the price for this service includes construction of a calibration curve for each chemical, and the sample analysis for each chemical conducted in triplicate. The pricing for each sample is \$9500.00. It is important when you are ordering that you provide in the "more information" box, the type of material that you are sending. *If you have multiple samples using the same CHEM Set, it is recommended to use our Quote Builder form referenced earlier in this section so pricing can be appropriately reduced due to the front-end set-up costs embedded on each sample.*

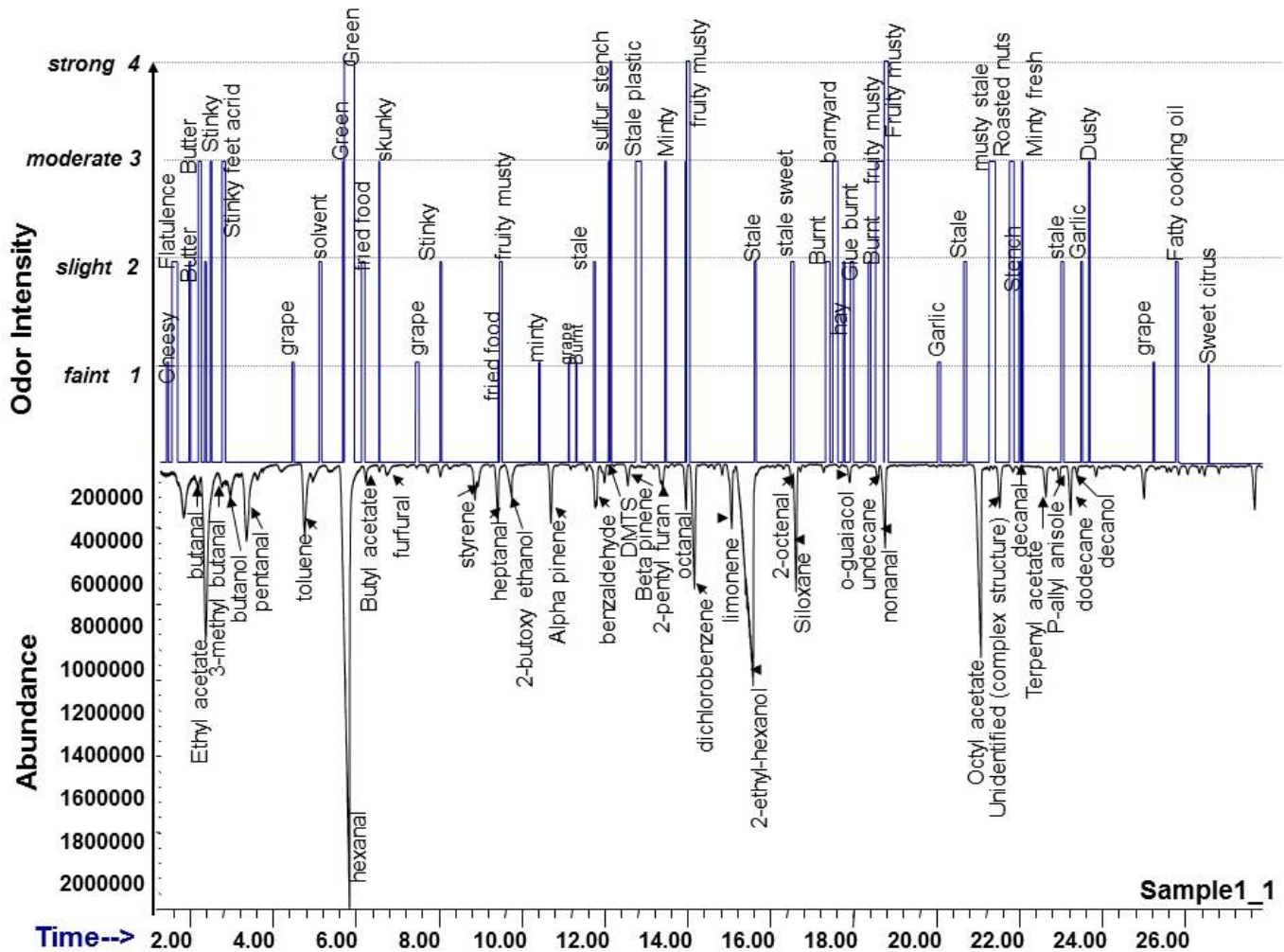
**4. GC-MS:** This choice is to be selected for standard analysis by gas chromatography-mass spectrometry (GC-MS). When up to eight samples are submitted for GC-MS analyses, the number of reps desired per sample is requested by the ordering engine. Please provide details regarding the type of sample you are submitting. The pricing for GC-MS is \$400 per analysis (per rep).

## **GC-MS/O AND AROMAGRAM INFORMATION STARTS ON THE NEXT PAGE AROMAGRAMS- A CORE PART OF OUR ODOR AND AROMA SCIENCE**

When focusing on aroma active volatile chemicals, VAC utilizes gas chromatography-mass spectrometry/olfactometry, or GC-MS/O. Here the extracted headspace of the sample is separated in a GC, and the effluent is split between a mass selective detector (MSD) and an olfactory detection port (ODP). This method accounts for aroma activity (sniffing) of all odorous chemicals in the sample's headspace. At the same time that aroma intensity and character are recorded via ODP and software, the MSD records the identical chemical's retention time and mass spectra. (Sample of Analysis shown below in **Figure 1**). Aroma intensity, or peak height, is either 1, (faint), 2 (slight), 3 (moderate), or 4 (strong). Aroma duration is how long the odor was perceived. Together (height and width) provide indication of how much odor a chemical (identified below in the MS region) contributed to the overall aroma of a product.

Mass spectrometry helps to identify what chemicals were responsible for the odor detected by olfactometry. Computer software matches the 2 peaks together based on time of detection (they are detected and recorded simultaneously). Many peaks present on the MS total ion chromatogram (bottom) have no corresponding olfactometry peak (top) thereby indicating the chemical has no odor. Sometimes olfactometry peaks (top) have no corresponding MS peak thereby indicating the human nose was more sensitive than was the mass spectrometer for this chemical (this occurs frequently, especially with sulfur containing chemicals).

Aromagram on Next Page



**Figure 1** Example of Aromagram produced from GC-MS/O analysis. Aromagrams contain **2 separate parts**: olfactometry (odor) data listed on the top, and mass spectrometry (MS) data on the bottom, and they correlate with one another. Olfactometry includes aroma intensity and duration, and an aroma character descriptor.

**NOTE:** Each aromagram is different and this may or may not fairly represent the complexity of your sample's aromagram.