



Ultra Selective Wine Filtration

MNA Smoke Taint Standard Operating Procedures (SOPs)

In estimating the time and pricing for your work, MNA SOPs are assumed to be as follows. If the following parameters are not true, or if you have any questions, please let us know as soon as is possible.

- **Commercial Lab Analysis Required:** MNA will estimate the processing time required for your wine according to the starting level guaiacol and 4-methylguaiacol in your wine. You must supply us with commercial lab results prior to estimating the cost of your job. The wine must be analyzed after all planned primary fermentation is complete and the wine has been racked off the gross lees. See below for important information on lab analysis.
- **Winemaker or Designated Taster Present:** Smoke taint threshold levels vary from wine to wine. We require the presence of somebody empowered to approve the end of processing on behalf of the Customer.
- **Estimated Threshold Levels:** If we reach the end of our anticipated threshold range and the responsible party wishes to continue beyond, they will be advised of any additional cost at that time. In the case of smoke taint processing, we do allow for 15% extra processing due to the error of margin of laboratory analysis results. After 15% extra smoke taint processing, we charge \$350/hour to continue processing if we are already onsite.
- **Overnight Processing Approved:** MNA equipment is designed in such a way that processing parameters are programmed in advance and the equipment will shut off automatically when set points are reached. All MNA operators are equipped with Loss Prevention Systems which allow them to continue processing wines overnight, or while otherwise unattended.
- **One Homogeneous Tank to be Processed per Lot:** MNA estimates assume one tank per lot of wine. If your winery cannot accommodate the volume of each lot within one tank, MNA will need to process each tank separately and may charge for each tank processed as a separate lot due to reduced efficiency. We will need to set up our equipment (8 ½' L x 4' W x 6' H max) within 100 feet of the tank to be processed.
- **Less Than 85 NTU:** If your wine is not under 85 NTU, we may not be able to process your wine. You may be assessed charges for delays due to turbid wine or canceled work.
- **At Least 60 Fahrenheit:** If your wine is not ≥ 60 degrees Fahrenheit, this will slow processing and may lead to assessment of delay charges. When wine is less than 55 degrees Fahrenheit we will not be able to process the wine at all.
- **Little to No Residual Sugar:** Residual sugar may slow down our processing. Please let us know if your wine contains more than 4 grams per litre of residual sugar.
- **Ready for Processing:** All contracted lots must be ready to process (see above) prior to the agreed arrival date/time. MNA will determine the processing order and may change the order at any time.
- **Appropriate Electrical Power:** MNA equipment requires the use of 1 x 480V, three phase, 30 AMP circuit or 1 x 240V, 60-100 AMP circuit.
- **Cellar Support:** Clients are expected to provide at least 1 person in their cellar as intermittent support for our operator. This person will be needed to :





Ultra Selective Wine Filtration

- help hook up & disconnect to the designated wine tank(s)
- provide assistance in locating sanitized hoses/clamps/misc equipment/load & unload equipment
- answer general cellar related questions and provide support as needed

Guaiacol/4-methyl guaiacol versus Smoke Taint

Guaiacol (G) and 4-methyl guaiacol (4MG) levels in unoaked wines are currently the best indicators of smoke taint and are analyzed via GC/MS. We reliably approximate the amount of processing required to get below threshold from their initial level. Due to several issues, however, this test is more useful prior to smoke taint removal than after processing.

G/4MG are only two of the numerous aromatic phenols associated with smoke taint (Kennison, *et al.*, 2008; Wittkowski, *et al.*, 1992). They are an excellent indicator of initial smoke taint level if you eliminate the confounding influence of toasted oak. They have become important indicators of smoke taint firstly because of their concentration correlation to all of the other compounds associated with smoke taint, but also because an analytical method already existed for G/4MG.

The GC/MS analysis for G/4MG in wine was developed by Pollnitz *et al.*, (1994). Commercial labs which utilize this or similar methods have found up to 20-25%, margin of error. This is mostly due to the difficulty of measuring very low concentrations in wine. In fact, as G/4MG levels go down, the margin of error increases and it may not be accurate at all under 10 ug/L, which is the subject of ongoing research.

Although, G/4MG correlate well with the overall level of smoke taint in a wine, these compounds are not very active in the sensory perception of smoke taint (Boidron *et al.* 1988, Simpson *et al.* 1986). The sensory perception of smoke taint is mostly due to the other 12-20 compounds (AWRI). During smoke taint removal, our process removes many of these other 12-20 compounds at a different rate than G/4MG. Thus, your smoke taint character will be completely removed sensorily and you will see a drop in the G/4MG level after processing. However, the resulting G/4MG levels will no longer reliably correlate with smoke taint character in your wine.

The bottom line is that we can estimate the amount of processing that a wine will need based on the initial G/4MG levels. The exact end point for processing however, can only be decided accurately by sensory perception as the correlation between G/4MG levels and smoke taint are lost during processing and the lab analysis becomes more and more inaccurate as their relative levels are reduced.

WARNING: MNA's processes are unique and not similar to the processes used by any other company. Utilizing MNA's trial services will not produce results useful in assessing the processes utilized by another company.

REFERENCES

- Boidron, J.N.; Chatonnet, P. and Pons, M. (1988) Influence du bois sur certaines substances odorantes des vins. *Connaissance Vigne Vin*, 22, 275-294.
- Kennison, K.R.; Wilkinson, K.L.; Pollnitz, A. P. and Gibberd, M.R. (2008) The timing and duration of grapevine exposure to smoke effects the chemical composition of wine. Poster Abstract. 13th Australian Wine Industry Technical Conference, Adelaide, Blair, R., Williams, P. and Pretorius, S. (Eds).
- Pollnitz, A.P., Pardon, K.H., Sykes, M. and Sefton, M.A. (2004) The effects of sample preparation and gas chromatograph injection techniques on the accuracy of measuring guaiacol, 4-methylguaiacol and other volatile oak compounds in oak extracts by stable isotope dilution analyses. *J. Agric. Food Chem.* 52, 3244-3252.
- Simpson, R.F.; Amon, J.M.; and Daw, A.J. (1986) Off-flavour in wine caused by guaiacol. *Food Tech. Aust.* 38, 31-33.
- Wittkowski, R., Ruther, J., Drinda, H. and Rafiei-Taghanaki, F. (1992). Formation of smoke flavour compounds by thermal lignin degradation. In *Flavour Precursors—Thermal and Enzymatic Conversion*. Teranashi,



355A Tesconi Circle, Santa Rosa, CA 95401
P:707.320.0672 F:206.984.2872
www.mavrikna.com