April 17, 2014

Clerk of the Board
Air Resources Board
1001 I Street
Sacramento, California 95814

Re: Reducing Emissions from Consumer Products

To Whom It May Concern:

I appreciate the opportunity to submit the following comments on behalf of the California Manufacturers & Technology Association (CMTA):

As previous comments have identified, the deletion of 3.6.3 creates a problem for manufacturers of non-hydrocarbon based chemicals. Although we understand that the deletion of 3.6.3 is not the subject of the current comment period, we wanted to take this opportunity to further explain CMTA's concerns with this deletion as described below. CMTA understands that the deletion was a result of the methods no longer being used by CARB to verify chemicals compliance with the LVC-VOC exemption. Given this, we strongly recommend that CARB explicitly state that they will recognize as valid vapor pressure data developed by these methods in cases where conflicts arise between results of 3.6.1 and 3.6.2. As explained below, failing to do so will unnecessarily cause manufacturers to either retest to the boiling point test or in some cases, to eliminate their ability to fall within the LVC-VOC exemption. To ensure a level playing field, CARB must allow manufacturers to rely on these other methods to verify the LVC-VOC status.

Striking Section 3.6.3 unnecessarily eliminates the ability for the Executive Officer to test for LVP-VOC applicability for non-hydrocarbon based chemicals. This creates uncertainty for companies who rely on more rigorous vapor pressure measurements rather than boiling point data to justify the LVP-VOC status of chemicals.

Different classes of chemicals have different vapor-pressure vs. temperature curves. Please see Table 1 below as an example of the differences between the boiling points and vapor-pressures of a few different chemicals. Although there is a direct correlation between vapor pressure and temperature for liquid substances, the vapor pressures will differ based on the chemical structure of the liquid. Reliance on boiling point measurements and a testing threshold of 216°C as described in Section 3.6.2 will in some cases lead to incorrect conclusions that non-hydrocarbon based chemicals should not be given LVP-VOC exemption. This is a problem because many non-hydrocarbon based chemicals have lower boiling points than hydrocarbon based chemicals while still having a low vapor-pressure that qualifies them as LVP-VOCs (vapor pressure of less than 0.1 at 20°C, mm Hg). This behavior is typical of chemical compounds with polar functional groups, including esters and alcohols among others, many of which have desirable safety and environmental attributes.

Table 1: Substance Comparison of Boiling Point and Vapor Pressures

Substance	CAS number	Boiling point	Vapor pressure at 20°C, mm Hg
Undecane	1120-21-4	195.9 (3)	0.286 (2)
Dodecane	112-40-3	216.3 (3)	0.098 (2)
Tridecane	629-50-5	235.5 (3)	0.038 (2)
Dimethyl succinate	106-65-0	196.2 (3)	0.146 (1)
Dimethyl glutarate	1119-40-0	214.0 (3)	0.055 (1)
Dimethyl adipate	627-93-0	221.9 (3)	0.019 (1)
Benzyl alcohol	100-51-6	204.7 (3)	0.053 (2)

(1) Calculated from data given in Nikitin, Popov, and Krasnykh, J. Chem. Eng. Data **2006**, *51*, 1896-1905. Vapor pressures measured by the transpiration method, independently verified by ASTM E 1719.
(2) Yaw's Handbook of Antoine Coefficients for Vapor Pressure (2nd Electronic Edition)
(3) Yaw's Critical Property Data for Chemical Engineers and Chemists

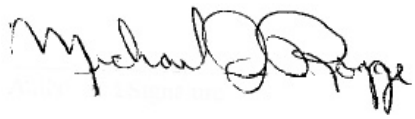
For example, as noted above in Table 1, dimethyl glutarate has boiling point 214°C, but vapor pressure at 20°C of about 0.05 mm Hg. It qualifies as an LVP-VOC based on actual vapor pressure measurement being less than 0.1 mm Hg at 20°C (Section 3.6.1), but would not meet the boiling point criteria of 216°C of Section 3.6.2. Dimethyl glutarate has been thoroughly reviewed according to EPA's Design for the Environment criteria (http://www.epa.gov/dfe/) and successfully listed in the CleanGredients® database (https://www.cleangredients.org/home). Deletion of Section 3.6.3 would eliminates the ability of the Executive Officer to test dimethyl glutarate for compliance with the LVC-VOC criteria per the ASTM standard, limiting the review to the boiling point criteria in 3.6.2. Thus, although this substance has a low vapor pressure, the Executive Officer would not be able to confirm the substance's conformance with the LVC-VOC.

Clearly, the differences in the testing methods outlined in 3.6.1 and 3.6.2 can result in discrepancies. Section 3.7.3 states that if discrepancies cannot be resolved between the results of Method 310 and the supplied formulation data then the results of Method 310 shall take precedence over the supplied formulation data. For hydrocarbon-based chemicals, the testing methodology in Sections 3.6.1 and 3.6.2 of Method 310 will normally agree and will substantiate an LVP-VOC exemption. For non-hydrocarbon-based chemicals, the testing methodology of Sections 3.6.1 and 3.6.2 may not agree because of the selection of the arbitrary boiling point criteria of 216°C, potentially eliminating the opportunity for many non-hydrocarbon based chemicals to be properly classified as LVP-VOCs. Retaining Section 3.6.3 in the Method 310 framework will prevent non-hydrocarbon based chemicals from being unfairly disadvantaged. Section 3.6.3 offers the Executive Officer the ability to confirm the LVC-VOC status using either ASTM D2879-97 or ASTM E 1719-97 as specified in Title 17, CCR, Section 94508(a).

Utilizing testing methods that determine vapor pressure is a more accurate testing methodology than using one based off of boiling points. By retaining Section 3.6.3 in Method 310, discrepancies between testing methodologies can be accounted for, resulting in a more thorough and accurate analysis for all chemicals, not just those that are hydrocarbon based. The dimethyl glutarate example is just one of many unintended consequences of the elimination of Section 3.6.3 of Method 310 may have on consumer products.

CMTA strongly encourages CARB to continue to offer this alternative method for verifying conformance with the LVC-VOC criteria and explicitly state in Method 310 that CARB will recognize as valid vapor pressure data developed by the ASTM methods in cases where conflicts arise between results of 3.6.1 and 3.6.2.

Sincerely,



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