California Environmental Protection Agency

Air Resources Board

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Guideline No.	CWP-10-002

Composite Wood Products
Airborne Toxic Control Measure (ATCM)

Title 17, California Code of Regulations, Sections 93120-93120.12

Third Party Certification Guideline:
Limitations of Chromotropic Acid in Small-Scale Test Methods

Manufacturers need to be apprised of the limitations inherent with the use of small-scale test methods in combination with analysis of formaldehyde concentration using chromotropic acid for Phase 2 compliant products. When the major portion of measured small-scale test data are below the analytic method limit of detection, additional tests should be performed to verify that the results are accurate.

> Section 93120.3, Appendix 2, subsection (g)(1) titled "Approved Small Scale Test Methods" reads:
>
> "The following small scale tests may be used as quality control test methods:
>
> (A) ASTM D 5582-00 (desiccator);
>
> (B) ASTM D 6007-02 (small chamber); and
>
> (C) alternative small scale tests that can be shown to correlate to the primary or secondary method tests as specified in subsection (g)(2) and are approved by the Executive Officer."

Program Issue: To date, approval has also been granted to use EN 120 (perforator), EN 717-2 (gas analysis), Dynamic Microchamber (DMC), and JIS A 1460 (24-hour desiccator) as small-scale test methods. Likewise, the ATCM requires that TPCs establish a correlation between small-scale test methods and the primary or secondary test methods. However, data reviewed by staff indicate that poor correlations can result when testing low-emitting products (i.e., products at Phase 2 levels) using selected small-scale test methods, such as ASTM D 5582 in combination with formaldehyde analysis with chromotropic acid (NIOSH 3500). This occurs because the amount of formaldehyde collected during the specified two hour sampling period may be at or below the method limit of detection for NIOSH 3500 (i.e., 0.02 parts per million). As originally developed, small-scale test methods combined with NIOSH 3500 analysis were not designed for use on products with emissions characteristic of Phase 2 hardwood plywood. Guidance is needed with respect to measures that TPCs could recommend be performed when a mill's small-scale test data are frequently below the method limit of detection.

Recommended CARB Guidance: The ATCM allows for the use of six small-scale test methods for quality control testing at manufacturing mills. As some methods were not designed for routine testing of products with the emission characteristics of Phase 2 compliant materials, their continued use may need to be augmented to affirm the test results collected using those methods. It recommended that for methods that frequently yield test results that are below the method limit of detection, the TPC should conduct periodic testing of positive controls (to eliminate uncertainties with respect to how the test is being performed) and periodic testing to verify that test sample formaldehyde concentrations are in the linear portion of the standard curve for the analytic method.

TPCs may need to exercise greater oversight at mills that use ASTM D 5582 (or other test methods) in combination with NIOSH 3500 analysis, particularly when the small-scale test values for a mill's products are repeatedly below the analytic method limit of detection. For purposes of small-scale testing of Phase 2 compliant products, if a manufacturer chooses to base their Phase 2 correlation on data collected using a small-scale test method with NIOSH 3500 analysis, then TPCs are advised to inform mill personnel that use of the test method is contingent upon periodically demonstrating that when a quantity of formaldehyde above the method limit of detection is collected, a non-zero test value is measured, and that the formaldehyde concentrations in the samples collected fall within the linear range of the standard curve for NIOSH 3500.

For example, when small-scale test methods with chromotropic acid are used for testing Phase 2 hardwood plywood products, TPCs are advised to encourage mill personnel to perform periodic tests of positive controls and the linearity of the standard curve of their analytic method, at a frequency of at least once per quarter. Positive controls may be achieved by increasing the test method sampling time or by modifying other test condition parameters, such that test results above the method limit of detection are achieved on a periodic basis. In this regard, mills may consider additional steps to remove formaldehyde from the background air in the desiccator or seeking CARB approval to use "ASTM D 5582 with modification" for their small-scale testing, in which a longer sampling time is used instead of two hours (see section 93120.12, Appendix 2, (g)(1)(C)). Another option may be to use an analytical method with a lower detection limit than NIOSH 3500, such as those based on the use of 3-methyl-2-benzothiazolone (MBTH; ASTM D 5014) or acetyl acetone.