Before

The California Bureau of Home Furnishings and Thermal Insulation

***Comments Pursuant to the California Department of Toxic Substances Control 'Methodology to Screen Flame Retardants in Upholstered Furniture with New California Law (SB1019)'***

Submitted on behalf of the Joint Industry Coalition by the American Home Furnishings Alliance:

American Home Furnishings Alliance (AHFA)

American Fiber Manufacturers Association (AFMA)

Business and Institutional Furniture Manufacturers Association (BIFMA)

California Furniture Manufacturers Association (CFMA)

National Cotton Council of America (NCC)

National Council of Textile Organizations (NCTO)

North American Home Furnishings Association (NAHFA)

Polyurethane Foam Association (PFA)

Upholstered Furniture Action Council (UFAC)

Bill Perdue
VP Regulatory Affairs
AHFA
P.O. Box HP-7
High Point, NC 27261
336-881-1017
bperdue@ahfa.us

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***Via Electronic Mail***

***Justin Paddock***, Bureau Chief
Bureau of Electronic and Appliance Repair, Home Furnishings and Thermal Insulation
3485 Orange Grove Avenue, Suite A
North Highlands, CA 95660-5595

Re: ***Comments by the Joint Industry Coalition Pursuant to the California Department of Toxic Substances Control 'Methodology to Screen Flame Retardants in Upholstered Furniture with New California Law (SB1019)'***

This joint position statement has been developed on behalf of the US home furnishings industry by the American Home Furnishings Alliance (AHFA), the American Fiber Manufacturers Association, the Business and Institutional Furniture Manufacturers Association (BIFMA), the California Furniture Manufacturers Association (CFMA), the National Cotton Council of America (NCC), the National Council of Textile Organizations (NCTO), North American Home Furnishings Association (NAHFA), the Polyurethane Foam Association (PFA), the Upholstered Furniture Action Council (UFAC).

These organizations represent manufacturers and retailers of residential and contract furnishings including upholstered furniture, wood furniture, home office, and decorative accessories, and related suppliers. Member companies participate in a highly competitive market characterized by ever-changing style preferences, margin pressures, and the tendency of consumers to postpone big-ticket purchases if their perceptions of value and function are not satisfied.

The AHFA has reviewed the DTSC methodology to screen for flame retardant chemicals in upholstered furniture pursuant to the requirements outlined by California SB 1019 as it relates to compliance with CA TB-117-2013.

***X-Ray Fluorescence (XRF) Screening Equipment Considerations***

While it is desirable to have an inexpensive and quick method to screen multiple samples, it is critical to ascertain if the equipment detailed in the methodology is readily

available, easy to use, affordable, and dependable with the ability to reproduce accurate readings. While it is understandable for a certified lab with qualified personal to have the ability to calibrate and maintain this type of equipment, it is unrealistic to believe that the various suppliers of covered components will have the same testing capabilities with trained technicians and access to equivalent analytical instruments.

Of particular concern is the described 'benchtop Energy Dispersive X-Ray Fluorescence (EDXF) spectrometer (Quant'x, Thermo Scientific) using a VF-50J rhodium anode x-ray tube and a 'Peltier Cooled Silicon Lithium-Drift Detector'. This is a costly instrument that has only one supplier, requires frequent calibration and a trained technician. Moreover, it should only be used in a controlled laboratory environment. This is not the same as the ***hand-held XRF 'gun'.*** In fact, neither the EDXF spectrometer (about $75,000) or an XRF gun (about $25,000) are likely to be affordable for typical small businesses that supply covered products used to manufacture upholstered furniture sold or offered for sale in California. There are few laboratories in companies supplying covered component parts and technical capabilities for chemical analysis are minimal. To that end, it is critical that an economical and practical 'low tech' screening method be available to upholstered furniture manufacturers and companies supplying covered component parts that may be affected by SB-1019.

Assuming the less costly XRF gun might be affordable for a few companies, there is no correlation data comparing the less sophisticated ***hand-held XRF gun*** to the EDXF spectrometer in the DTSC screening methodology. While some suppliers of covered components may have the ability to lease or purchase the hand-held XRF device to screen covered components for the absence/presence of flame retardant chemicals, without an assurance of the instrument's accuracy and the ability to correlate data with those of the DTSC test method, it is not apparent the XRF gun can provide an acceptable screening approach. If covered component suppliers can use the hand-held device, it will show promise for a more cost effective way to accurately screen multiple products, accurately ascertain the absence/presence of flame retardant chemicals, and provide the required declaration to the upholstered furniture manufacturer.

It will be critical for DTSC to establish an accurate correlation between these two technologies as ***a first step*** in the screening process. Successful predictive correlation will enable suppliers to provide the required declaration with confidence and remove the ***hindrance of compliance uncertainty*** that can lead to 'defensive labeling' of upholstered furniture. Defensive labeling is contrary to the intent of SB 1019 – providing the CA consumer with the ability to make informed purchasing decisions.

Another troubling issue is the difficulty in correlating the benchtop EDXRF or the hand-held XRF technology 'from lab-to-lab' and, in the case of the XRF guns with numerous suppliers, additionally from manufacturer model to model. Without going through a robust round-robin, it will be hard, if not impossible, to determine if there is an accurate correlation therefore rendering the use of this technology moot in an enforcement evaluation. If high correlations are not achieved, then there is little or no confidence in the data from different labs and use of different XRF models will make it difficult to have data that is repeatable or reproducible. It

should also be noted, that with any test method, a precision/bias statement must be developed that reveals the uncertainty of the test method and provides a ***'sense of certainty'*** that the data used to generate the declaration will indeed match the data from the DTSC lab.

Without an established precision/bias statement and an accurate predictive correlation between the hand-held and benchtop XRF technologies, data may conflict, subjecting Agency enforcement to possible litigation and leaving manufacturers with too much uncertainty due to unreliable data that may not be repeatable/reproducible forcing them into a potential liability position that prescribes defensive labeling.

The Joint Industry Coalition respectfully request the Bureau and DTSC to establish the necessary correlations, address the predictive margins of the test false/positive and develop an accurate precision/bias statement.

***Predictive False Positives***

In reviewing the data provided by DTSC (see Table 1), there is significant concern about the marginal predictive value embedded in the EDXF screening method. The validity of the method is questionable, challenging the validity of the test method. It is not only desirable but critical that the predictive design of the screen test method be accurately established.

Table 1

**P** OPFRs by MS

| | | yes | no | | | | | | n= | 43 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | yes | no | | | | Sens= | 1.00 | | | PredVal+ | 0.38 |
| ICP | P>100 | 5 | 8 | 13 | TP= | 5 | | | | | PredVal- | 1.00 |
| | P<100 | 0 | 30 | 30 | FN= | 0 | Spec= | 0.79 | | | | |
| | | 5 | 38 | 43 | FP= | 8 | | | | | | |
| | | | | | TN= | 30 | | | | | | |

**P** OPFRs by MS

| | | yes | no | | | | | | n= | 45 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | yes | no | | | | Sens= | 0.90 | | | PredVal+ | 0.53 |
| XRF | yes | 9 | 8 | 17 | TP= | 9 | | | | | PredVal- | 0.96 |
| | no | 1 | 27 | 28 | FN= | 1 | Spec= | 0.77 | | | | |
| | | 10 | 35 | 45 | FP= | 8 | | | | | | |
| | | | | | TN= | 28 | | | | | | |

**Br** BFRs by MS

| | | yes | no | | | | | | n= | 45 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | yes | no | | | | Sens= | 1.00 | | | PredVal+ | 0.20 |
| XRF | yes | 2 | 8 | 10 | TP= | 2 | | | | | PredVal- | 1.00 |
| | no | 0 | 35 | 35 | FN= | 0 | Spec= | 0.81 | | | | |
| | | 2 | 43 | 45 | FP= | 8 | | | | | | |
| | | | | | TN= | 35 | | | | | | |

In evaluating Table 1, it is essential that we see the actual instrument results to determine at what degree of sensitivity DTSC would consider the EDXF as positive for detection. This is critical to determine if the detected flame retardant chemical is actually present in the sample. The instrument must have adequate sensitivity to detect and isolate the energy keV for bromine without being distorted by possible interference. This speaks to the need for additional testing to overcome any inherent variability or interference prone in the test method.

Hand-held XRF instruments have been reported to be fairly accurate at qualifying elemental bromine in some products, but have also been reported to be somewhat less sensitive to detect chlorine and possibly unable to reliably detect elemental phosphorus. If this is the case, then the $75K EDXF instrument may be required to accurately screen covered components and this is simply not economically feasible for most companies.

It should also be pointed out that the sample set (n=43-45) is simply too small to be statistically significant and it hasn't been determined if sample age will affect detection accuracy. This speaks to the need for additional testing in order to refine the sensitivity/specificity of an XRF-type screening method. The coalition urges DTSC to conduct a robust round-robin study large enough to determine if accurate correlations exist and to refine the predictive values. This would establish greater certainty in the screening method lab to lab and sample to sample. This would aid in elevating the variability of equipment, calibration, and sample and would rule out any coincidence and reduce concerns about false positives or negatives.

Regarding possible predicted false positives or negatives, it is critical for the labs, the Agency and the regulated community to fully understand what is causing the results or lack of detection. The Coalition urges DTSC to list and review the influences affecting the conditions that might contribute to predictive false positives or negatives. Any condition that affects the accuracy of the screening test method could lead to difficulty stating with certainty that the sample contains less than 1,000 ppm aggregate flame retardant content. As previously stated, this creates a regulatory environment where the assumed risk is too great, leading to defensive labeling.

In regard to the proposed EDXF screening method, it should be determined if there are known factors that might interfere with the detection of bromine, chlorinated FR covered components and phosphorous. Again, it will be critical for the Agency to expand the data set through a robust round-robin to sift out the variance and improve the test method's selectivity.

It should be noted that if every sample is being tested, then a 'negative is a negative.' However, when testing randomly, companies must commit to having a TOF or GC/MS validation test method to rule out false positives. This may necessitate that suppliers of covered components have this sophisticated equipment installed and available in their manufacturing facilities. Since these instruments are simply 'out of financial reach' for many companies, DTSC

must provide reliable predictive data in order for suppliers and upholstered furniture manufacturers to make informed decisions in developing their compliance strategy.

The proposed screening and analytical method presents too many unanswered questions that compound the uncertainty manufacturers face in developing a compliance strategy. What are the false positives? Do other brominated or chlorine containing chemicals interfere? Were the original tests conducted with old samples or new products, hand-picked products, or at random? Are there covered products that are not appropriate for screening using an EDXRF or XRF technology?

As previously stated, there is a very real need for the Agency to conduct a robust round-robin validation and correlation of the EDXF screening method to determine if the data changes and establish the predictive sensitivity/selectivity within the data. These results must be correlated with data collected from the many different hand-held XRF devices that are available to the industry. Ultimately, this screening method may not be a bad option for the Agency, assuming they validate every positive test. However, for manufacturers, without a strong correlation between the bench-top EDXF and the hand-held XRF gun, the screening method is simply fraught with too much variability and uncertainty to be effectively used to determine the presence or absence of flame retardant chemicals in covered products.

**Conclusion and Recommendation**

The proposed EDXRF screening method may work well for detecting and quantifying PBDEs (e.g. DE-71), and selected chlorinated organophosphate flame retardants (e.g. TCEP, TDCPP), as well as some components of 'Firemaster 550'. However, an ***'aggregate compliance calculation'*** requires accurate quantification of all FR components. At the least, the test method and possible screening technology must be capable of detecting and identifying the full range of problematic flame retardants, which lends itself to creating some certainty. To serve this purpose, the coalition respectfully requests the Agency develop:

1. Develop a 'starter list' of flame retardant chemicals of interest.
2. Develop a mechanism for adding emerging chemistry as it becomes relevant.
3. Develop appropriate test/analytical methods to accurately assess the aggregate total of flame retardant chemicals in covered components.

The predictive values listed in the Agency's document only refer to the screening level assessment (e.g. EDXF) and not the analysis of the predictive values for the second tier test methods (e.g. TOF, GC/MS). The coalition recommends that the Agency further validate the second tier test methods and determine whether there is a valid correlation between the XRF screening method and their second tier test methods along with a very robust correlation between the bench-top XRF and hand-held XRF. This must include the development of a precision/bias statement for all test methods in accordance to prescriptive ASTM International methodology.