

Todd Stevenson

CPSC-I-11-0009
INTERAGENCY AGREEMENT
BETWEEN THE
U.S CONSUMER PRODUCT SAFETY COMMISSION AND
THE NATIONAL INSTITUTE OF STANDARDS AND TECHNOLOGY
MATERIAL MEASUREMENT LABORATORY

1. Introduction

The U.S. Consumer Product Safety Commission, hereinafter referred to as CPSC, and the National Institute of Standards and Technology Material Measurement Laboratory, hereinafter referred to as NIST-MML, hereby agree that NIST-MML shall provide technical services for conducting additional metallurgical and corrosion analysis of residential HVAC, gas distribution, and fire safety components and provide results to CPSC, in accordance with the terms and conditions set forth below. This Interagency Agreement (IAG) will form part of CPSC staff's investigation of problem drywall.

2. Authorities

The authorities for NIST and CPSC to enter into this Agreement are:

- (1) NIST Authority 15 U.S.C. §§ 273, 275a, and 278b; 15 U.S.C. § 272(b)(11) and (c)(8).
- (2) CPSC Authority Section 29(d) of 15 U.S.C. 2078(d).

3. Title

"Additional Metallurgical and Corrosion Analysis of Residential HVAC, Gas Distribution, and Fire Safety Components Exposed to Emissions from Imported Drywall."

4. Objective

The purpose of this IAG is to conduct additional metallurgical and corrosion analysis of residential HVAC, gas distribution, and fire safety components exposed to emissions from imported drywall to identify possible safety hazards. CPSC will provide NIST-MML field samples collected from homes and smooth and U-bend coupon samples representative of alloys subjected to accelerated corrosion testing (ACT). NIST-MML will conduct examinations of samples removed from service and samples subjected to corrosion tests under controlled exposure conditions by CPSC or a CPSC contractor. The examinations conducted by NIST-MML will consist of visual (macroscopic) examination of all components to characterize degradation and to identify specific parts of the components for subsequent examinations. Selected parts that are deemed representative of the damage observed will be removed from the components (destructively) and either cross-sectioned for metallographic examination or prepared for examination in the scanning electron microscopy (SEM). The samples prepared for metallographic examination will be prepared in such a manner as to preserve the corrosion product layer and allow examination of the corrosion product layer in cross-section. The samples prepared for examination in the SEM will be cut to fit in the vacuum chamber in a manner that will preserve the corrosion product layer and will be examined in the SEM to determine surface morphology and X-ray microanalysis using energy dispersive spectroscopy (EDS) will be used to help identify chemical composition of the base metal and corrosion product layers.

NIST-MML will produce a technical report on their findings and technical assistance in the area of corrosion mechanisms that will assist CPSC in determining possible safety hazards resulting from exposure of these components to drywall emissions.

5. Background Information

Some imported drywall installed in U.S. homes is reported to be associated with corrosion to central air conditioning components, copper tubing, and exposed copper wiring. There have been reports of premature failures of HVAC evaporator coils, electric appliances, televisions, and electrical switches in homes. A range of health effects have been reported by residents in these homes as well.

CPSC's investigation of drywall is proceeding simultaneously on three distinct tracks: (1) evaluating the relationship between drywall and reported health effects; (2) evaluating the relationship between drywall and effects on electrical, gas distribution, and fire safety components that can result in potential fire and shock hazards; and (3) tracing the origin and distribution of drywall in commerce to identify the scope of potential problems presented by drywall.

To assess impact on health, CPSC is determining whether scientific evidence can be developed linking chemical emissions from the drywall to the reported health complaints. At this time, however, any such relationship or long-term health effects are unknown. CPSC is undertaking a multi-track testing approach to assess the impact on human health. The data collected will form the basis for a health risk assessment.

- *In-home air sampling (field) studies* - Continuous, real-time measurements of sulfur, acids, and gases, including the presence of refrigerant byproducts. Measurements will take into account environmental conditions (e.g., humidity), as well as time of day. Testing will be done over longer time periods because many symptoms have been reported to occur after hours of sleeping.
- *Laboratory elemental characterization studies of domestic and imported drywall* - Characterization of components of drywall and identification of any differences.
- *Laboratory chamber studies of domestic and imported drywall* - Chamber studies to separate and isolate chemical emissions from drywall as opposed to chemicals emitted from other home products (e.g., carpets, cleaners, paint, adhesives, and beauty products).

To assess the possible fire and shock hazards presented by imported drywall, the CPSC technical staff is conducting an engineering test program to determine the qualitative effects of emissions from imported drywall on residential electrical, gas distribution, and fire safety components. The engineering test program will consist of two major phases: (1) Examination of various components collected from affected residences (Field Component Analysis) and (2) Qualitative assessment of the reaction of new components or representative coupon alloys to elevated levels of emissions (Accelerated Corrosion Testing).

6. Statement of Work

The following tasks shall be completed by NIST-MML under this IAG:

Task 1. Examination of Components Removed from Service - NIST-MML will conduct metallographic examinations of components removed from service in HVAC, gas distribution, and fire safety systems that will be provided by CPSC. The total number of components of all types removed from service that will be examined shall not to exceed 20. These examinations will be considered to be destructive and the components will be provided to NIST-MML after CPSC or its contractors have finished functional testing. The examinations will include:

1. Disassembly with optical examinations and macro photography of all components to characterize the extent and range of corrosion damage and to identify parts and sectioning approaches for subsequent analyses.
2. Selected parts of components will be identified as representing typically damage modes and removed from the components, mounted, and cross-sectioned for metallographic examination (optical microscopy). The corrosion product layer will be preserved for these examination using standard techniques for this purpose.
3. The corrosion product layer, the base metal, and the interface between these regions will be characterized and photographed in the samples selected and prepared for metallographic examination.
4. Selected parts of the components that are deemed representative will be prepared for examination in the scanning electron microscope (SEM). Due to the physical size limitations of the vacuum chamber required by these instruments, the parts examined will cut from the components and mounted.
5. The samples prepared for examination in the SEM will be examined including characterization of the surface morphology and X-ray microanalysis of the chemical composition of the corrosion products films using energy dispersive spectroscopy (EDS).
6. NIST-MML will report its findings of these examination to CPSC and provide sound scientific technical advice on the corrosion mechanisms consistent with the findings, potential failure modes, and the design of experiments that will be required to estimate rate determining processes in these failure modes.

Task 2. Examination of Components/Coupons Subjected to Accelerated Corrosion Testing - NIST-MML will conduct analyses similar to those conducted in Task 1 on samples of smooth coupons of representative alloys tested by CPSC or its contractors under controlled environmental conditions to evaluate the ability of these tests to represent the damage observed in the samples removed from service. The total number of samples of all types to be examined shall not exceed 20. The results of mass change measurements at time intervals during the exposure tests on smooth coupons of representative alloys will be provided to NIST for analysis. Stainless steel U-bend samples will also be included in the exposure tests to enable evaluation of the susceptibility of these alloys to pitting, intergranular corrosion, or stress corrosion cracking

and provided to NIST for microscopic examinations. In addition NIST will conduct similar analyses of smoke alarm and fire sprinkler samples subjected to ACT testing.

Task 3. NIST-MML will prepare a detailed report documenting the corrosion analysis of samples collected through the Field Component Removed from Service program and the Accelerated Corrosion Testing program. The report shall:

1. Be formatted in Microsoft Word
2. Be provided in electronic and one hard copy
3. Include:
 - a. SEM and Optical microscopy
 - b. EDS analysis of the corrosion products
 - c. Cross-sectional examination to determine effects on grain structure, depth of corrosion.
 - d. Kinetic analysis of corrosion rates and uncertainty.

Task 4. Metallurgical Consultation Services - NIST-MML will provide consultation services in the form of reviewing and providing comments on relevant corrosion reports, sample analyses, future test planning, and inquiries from outside parties.

7. NIST-MML Furnished Materials and Equipment

NIST-MML agrees to furnish all necessary personnel, equipment, materials, services, and facilities to complete the tasks listed in the **Statement of Work**.

8. CPSC Furnished Materials and Equipment

CPSC will provide NIST-MML with samples collected through the Field Component and Corrosion Testing programs. CPSC will begin sending field samples on the effective date of this IAG. Additional samples will be provided as soon as they have been collected and processed.

9. Confidentiality Requirements

This work is being funded to support a federal investigation that has potential for litigation. Except as may be required by the Freedom of Information Act or any other provisions of law or order from a court of competent jurisdiction, any information developed from this IAG must be held in the strictest of confidence and may not be shared with outside entities unless permission is granted by CPSC in writing. NIST shall notify CPSC immediately about any request from an outside party for any information related to this IAG.

Notwithstanding the foregoing, NIST shall submit to the Commission any report, manuscript, presentation or other document containing the results of work performed under this Agreement, before such document is published or otherwise disclosed to the public, to assure compliance with Section 6(b) of the Consumer Product Safety Act (15 U.S.C. 2055(b)), Commission regulations (16 C.F.R. Part 1101), and a Commission directive (Order 1450.2). These provisions

restrict disclosure of information that (1) permits the public to identify particular consumer products or (2) reflects on the safety of a class of consumer products. Prior submission allows the Commission staff to review the information and comply with applicable restrictions. CPSC should be advised of NIST's desire to submit or publish an abstract or report as soon as possible.

10. Period of Performance

The period of performance shall begin on the effective date and shall not extend beyond September 30, 2011. This agreement may be modified by mutual consent of CPSC and NIST-MML.

11. Delivery of Performance

All deliverables required under the terms and conditions of this IAG shall be provided to the CPSC. The following items shall be performed or delivered to CPSC in accordance with the schedule below:

Delivery Item	Performance
A. Bi-weekly status reports on samples analyzed from Field Component Analysis program and ACT	Within 15 calendar days after IAG effective date and every two weeks thereafter (email to project officer)
B. Draft Report on Corrosion Analysis of Field Components and Accelerated Corrosion Testing Samples	July 29, 2011 (as detailed in Task 3 of the Statement of Work)
C. Final Report on Corrosion Analysis of Field Components and Accelerated Corrosion Testing Samples	August 31, 2011
D. Metallurgical Consultation Services	September 30, 2011

12. Funding and Accounting Data

Estimated funding requirements to complete the tasks and provide deliverables for this IAG are \$150,000. The transfer of funds shall be from CPSC to NIST through the On-Line Payment Collection (OPAC) system using the following accounting data:

CPSC Accounting Data:

ALC: 61-00-0001
 TIN: 520978750
 DUNS: 069287522
 US TREAS CODE: 6110100
 FUNDING AGENCY CODE: 6100
 BETC: DISB
 AMT: \$150,000
 FUNDS EXPIRE: 9/30/2011
 ACCT DATA 0100A11DPS 2011 3371200000 EXFM004000 253A0

NIST Accounting Data:

ALC: 13-06-0001
 TIN: 530205706
 DUNS: 929956050
 TAS: 13X4650
 FUNDING AGENCY CODE: 1341
 BETC: COLL

13. Disagreements

Should disagreements arise on the interpretation of the provisions of this agreement or amendments and/or revisions thereto, that cannot be resolved at the operating level, the area(s) of disagreement shall be stated in writing by each party and presented to the other party for consideration. If agreement or interpretation is not reached within 30 days, the parties shall forward the written presentation of the disagreement to respective higher officials for appropriate resolution. If a dispute related to funding remains unresolved for more than 30 calendar days after the parties have engaged in an escalation of the dispute, disputes will be resolved in accordance with instructions provided in the Treasury Financial Manual (TFM) Volume I, Part 2, Chapter 4700, Appendix 10, available at <http://www.fms.treas.gov/tfm/index.html>.

14. Termination and Modification

Either party may terminate this Agreement at any time with 90 days written notification. If CPSC cancels the order, NIST is authorized to collect costs incurred prior to cancellation of the order. This Agreement may be modified through a written amendment agreed to by both Parties.

15. Liaison Officers**A. NIST Project Officer**

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B. NIST Administration Officer

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C. CPSC Project Officer

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Approved and Accepted for
NIST

BY: 

TITLE: Division Chief, 635

DATE: 7/13/11

Approved and Accepted for
CPSC

BY: 

TITLE: Contracting Officer

DATE: 7/20/11