UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MD 20814

This document has been electronically approved and signed.

BALLOT VOTE SHEET

DATE: January 7, 2015

TO: The Commission
Alberta E. Mills, Acting Secretary

THROUGH: Stephanie Tsacoumis, General Counsel
Patricia H. Adkins, Executive Director

FROM: Patricia M. Pollitzer, Assistant General Counsel
Ray M. Aragon, Attorney

SUBJECT: Drywall Safety Act of 2012; Federal Register Notice, Sulfur Content in Drywall Standard

BALLOT VOTE Due: January 13, 2015, 2014

CPSC staff recommends that the Commission publish a *Federal Register* notice setting forth the Commission's determination that the voluntary standard, ASTM C1396-14a, "Standard Specification for Gypsum Board," meets the requirements of the Drywall Safety Act of 2012 (DSA) for treatment as a consumer product safety rule promulgated under section 9 of the Consumer Product Safety Act. Attached is a draft of the *Federal Register* notice.

Please indicate your vote on the following options:

I. Approve publication of the attached notice in the *Federal Register*, as drafted.

_____ _____
Signature Date

II. Approve publication of the attached notice in the *Federal Register*, with the following changes:

_____

_____

_____

_____ _____
Signature Date

III. Do not approve publication of the attached notice in the *Federal Register*.

_____ _____
Signature Date

IV. Take other action (please specify):

_____

_____

_____

_____ _____
Signature Date

Attachment: Draft *Federal Register* notice announcing that ASTM C1396-14a, "Standard Specification for Gypsum Board," meets the requirements of the Drywall Safety Act of 2012.

Billing Code 6355-01-P

CONSUMER PRODUCT SAFETY COMMISSION

[Docket No. CPSC-2015- _____]

Notice of Determination Under the Drywall Safety Act of 2012

AGENCY: Consumer Product Safety Commission.

ACTION: Notice.

SUMMARY: The Consumer Product Safety Commission (CPSC, or Commission) is announcing that, pursuant to the requirements of the Drywall Safety Act of 2012 (DSA), the Commission has determined that: (a) ASTM C1396-14a, "Standard Specification for Gypsum Board," is a voluntary standard for drywall manufactured or imported for use in the United States that limits sulfur content to a level not associated with elevated rates of corrosion in the home; (b) ASTM C1396-14a became effective less than two years after the enactment of the DSA; and (c) ASTM C1396-14a was developed by Subcommittee C11.01 on Specifications and Test Methods for Gypsum Products of ASTM International. Based on these determinations, the sulfur content limit in ASTM C1396-14a shall be treated as a consumer product safety rule promulgated under the Consumer Product Safety Act (CPSA). Drywall manufactured or imported for use in the United States shall be subject to the general conformity certification (GCC) requirements of the CPSA.

DATES: This action becomes effective on _____. [INSERT DATE 180 DAYS AFTER PUBLICATION IN THE FEDERAL REGISTER].

FOR FURTHER INFORMATION CONTACT: Rohit Khanna, Office of Hazard Identification and Reduction, U.S. Consumer Product Safety Commission, 5 Research Place, Rockville, MD 20850; telephone (301) 987-2508; e-mail rkhanna@cpsc.gov.

SUPPLEMENTAL INFORMATION:

I. Background

CPSC began investigating drywall in 2009, after reports from homeowners that they were seeing corrosion of metal items inside their homes. According to homeowners' reports, the items primarily involved were electrical fixtures, appliances, plumbing, and air conditioner coils. CPSC used the term "problem drywall" to refer to drywall associated with elevated rates of metal corrosion. After CPSC's initial investigations, CPSC joined with the U.S. Department of Housing and Urban Development (HUD), the U.S. Centers for Disease Control and Prevention (CDC), and the U.S. Environmental Protection Agency (EPA) to form the Federal Interagency Task Force on Problem Drywall (Task Force).

In the course of this investigation, samples of problem drywall were analyzed for chemical content and emissions. CPSC staff analysis of chemical content and emissions from problem drywall determined that certain brands of drywall produced around the year 2006 contain elevated levels of elemental sulfur (octahedral sulfur, S_8) and have elevated emission factors for hydrogen sulfide (H_2S) and other reactive sulfur gases known to corrode materials containing copper and silver. CPSC staff's analysis of the technical data also determined that the presence of elemental sulfur in excess of 10 ppm in drywall is associated with elevated emission factors for hydrogen sulfide (H_2S) and other reactive sulfur gases that are known to cause accelerated corrosion of copper and silver in homes.

CPSC staff and HUD relied on the results of this analysis to develop guidance materials to help homeowners identify homes with problem drywall and to correct the problem by

removing and replacing the problem drywall and certain other components of the home. These guidance documents are available on CPSC's website.[1]

II. The Drywall Safety Act of 2012

On January 14, 2013, the President signed the Drywall Safety Act of 2012 (DSA) into law. Pub. L. No. 112-266, 126 Stat. 2437 (2013). The DSA established several requirements related to problem drywall.

The Drywall Labeling Requirement. The DSA states that 180 days after the date of enactment of the DSA, the gypsum board labeling provisions of standard ASTM C1264-11[2] must be treated as a rule promulgated by CPSC under section 14(c) of the CPSA. ASTM uses the more technical term "gypsum board" to refer to the class of products that CPSC refers to as "drywall." The labeling provisions in ASTM C1264-11 are currently in effect as a CPSC mandatory standard. The DSA provides a process for revision of the CPSC standard if ASTM revises the labeling provisions in the ASTM standard and notifies the Commission of the revision. To date, although ASTM has revised some provisions in ASTM C1264-11, ASTM has not revised the labeling provisions in ASTM C1264-11.

Revision of Remediation Guidance for Drywall Disposal Required. The DSA requires the CPSC to revise CPSC's guidance entitled "Remediation Guidance for Homes with Corrosion from Problem Drywall" to specify that problem drywall removed from homes pursuant to the guidance should not be reused or used as a component in the production of new drywall. CPSC

[1] Identification Guidance for Homes with Corrosion from Problem Drywall as of March 18, 2011, by the U.S. Consumer Product Safety Commission and the U.S. Department of Housing and Urban Development http://www.cpsc.gov//PageFiles/115328/IDguidance031811.pdf. Remediation Guidance for Homes with Corrosion from Problem Drywall as of March 15, 2013, by the U.S. Consumer Product Safety Commission and the U.S. Department of Housing and Urban Development http://www.cpsc.gov//Global/Safety%20Education/Safety-Information-Centers/Drywall/remediation031513.pdf.

[2] Standard Specification for Sampling, Inspection, Rejection, Certification, Packaging, Marking, Shipping, Handling, and Storage of Gypsum Panel Products.

revised the Remediation Guidance as directed when CPSC published a new Remediation Guidance on the CPSC website in March 15, 2013.

Sulfur Content Standard Requirement. The DSA requires CPSC to promulgate a final rule pertaining to drywall manufactured or imported for use in the United States within two years of the date of enactment of the DSA. The rule must limit sulfur content "to a level not associated with elevated rates of corrosion in the home." As discussed below, the rulemaking requirement does not apply if the Commission makes certain determinations regarding an ASTM voluntary standard and publishes the determinations in the *Federal Register*. With this notice, the Commission makes the necessary determinations.

III. Standard for Sulfur Content in Drywall

A. Determination

Section 4(a) of the DSA requires the Commission to promulgate a final rule limiting sulfur content in drywall manufactured or imported for use in the United States "to a level not associated with elevated rates of corrosion in the home." The rulemaking requirement does not apply if the Commission determines that:

(a) a voluntary standard pertaining to drywall manufactured or imported for use in the United States limits sulfur content to a level not associated with elevated rates of corrosion in the home;

(b) the voluntary standard is in effect within two years of enactment the DSA; and

(c) the voluntary standard is developed by ASTM International's Subcommittee C11.01 on Specifications and Test Methods for Gypsum Products.

Id. 4(c).

If the Commission makes such determinations, the sulfur content limit in the voluntary standard pertaining to drywall manufactured or imported for use in the United States "shall be treated as a consumer product safety rule under section 9 of the Consumer Product Safety Act." *Id*. 4(d).

The Commission determines that the sulfur limit stated in section 4.7 of ASTM C1396-14a, *Standard Specification for Gypsum Board* meets the requirements of section 4(c) of the DSA. CPSC staff worked with the relevant ASTM Subcommittee (ASTM Subcommittee C11.01 on Specifications and Test Methods for Gypsum Products) to develop a test method for elemental sulfur in gypsum products. The test method is stated in ASTM Standard C471M, Test Methods for Chemical Analysis of Gypsum and Gypsum Products (Metric). ASTM Subcommittee C11.01 then worked with CPSC staff to develop a requirement stated in section 4.7 of ASTM C1396-14a limiting the sulfur content of gypsum board. That provision requires that gypsum board must contain not greater than 10 ppm of orthorhombic cylooctasulfur (i.e., elemental sulfur or "S_8") when tested in accordance with the test methods for Determination of S_8 in Gypsum Panel Products by Liquid Extraction for Analysis by Liquid or Gas Chromatography in sections 55-65 of ASTM C471M.

In accordance with section 4(c) of the DSA, ASTM C1396-14a is a voluntary standard pertaining to drywall manufactured or imported for use in the United States stating that gypsum board (drywall) "shall contain not greater than 10 ppm of orthorhombic cyclooctasulfur (S_8)." As discussed in the staff's briefing memorandum,[3] this limit on sulfur content is consistent with CPSC staff's numerous corrosion studies, which showed an association between high levels of

[3] [will insert link to briefing package on website]

elemental sulfur (S_8) in drywall and corrosion in the home, but no association between sulfur levels that did not exceed 10 ppm and elevated corrosion.

ASTM C1396-14a was published and became effective October 14, 2014, less than two years after enactment of the DSA. Finally, ASTM C1396-14a was developed by Subcommittee C11.01 on Specifications and Test Methods for Gypsum Products of ASTM International.

Based on these determinations the Commission finds that the requirements of section 4(c) of the DSA have been met. Accordingly, the sulfur content limit requirement stated in section 4.7 of ASTM C1396-14a is a consumer product safety rule under the CPSA.

B. Effective Date and Certification

The DSA provides that if the Commission determines that a voluntary standard meets the requirements of section 4(c) of the DSA, the sulfur content limit stated in the voluntary standard shall be treated as a consumer product safety rule beginning on the later of:

- 180 days after publication of the Commission's determination; or
- the effective date stated in the voluntary standard.

ASTM C1396-14a took effect when the standard was published on October 14, 2014. Therefore, the sulfur content limit stated in ASTM C1396-14a shall be treated as a consumer product safety rule effective 180 days after publication of this determination in the *Federal Register*.

Section 14(a)(1) of the CPSA requires that every manufacturer of a product that is subject to a consumer product safety rule and is imported into or distributed in the United States must certify that the product complies with all applicable CPSC rules, rules, bans, standards, or regulations. 15 U.S.C. 2063(a)(1). As a product subject to a consumer product safety rule, drywall imported into or distributed in the United States will be subject to the certification

requirements of section 14(a)(1) of the CPSA (15 U.S.C. 2063(a)(1)) and the Commission's certification regulations at 16 CFR part 1110 once the voluntary standard sulfur limit requirement is in effect as a consumer product safety standard. Drywall manufactured or imported on or after the effective date must comply with the sulfur content limits of ASTM C1396-14a and must be accompanied by a general certification of compliance (GCC).

Dated: _____

_____
Alberta E. Mills
Acting Secretary
Consumer Product Safety Commission

UNITED STATES
CONSUMER PRODUCT SAFETY COMMISSION
4330 EAST WEST HIGHWAY
BETHESDA, MD 20814

This document has been electronically approved and signed.

Memorandum

Date: January 7, 2015

TO : The Commission
Todd Stevenson, Secretary

THROUGH: Stephanie Tsacoumis, General Counsel
Patricia H. Adkins, Executive Director

FROM : George Borlase, Assistant Executive Director
Office of Hazard Identification and Reduction
Rohit Khanna
Office of Hazard Identification and Reduction

SUBJECT : Drywall Safety Act of 2012; Briefing Memorandum for Draft Federal Register Notice, Sulfur Content in Drywall Standard

1. Executive Summary

CPSC began investigating problem drywall that was associated with corrosion of metal items inside homes in early 2009. Chemical content and emissions analyses from problem drywall determined that certain brands of drywall produced around the year 2006 contain elevated levels of elemental sulfur (S_8) and have elevated emission factors for hydrogen sulfide (H_2S) and other reactive sulfur gases known to corrode metals containing copper and silver.

The results of the studies assisted CPSC and the U.S. Department of Housing and Urban Development (HUD) in developing guidance materials[1] to enable homeowners to identify reliably homes with problem drywall and to correct the problem comprehensively by removing and replacing the drywall and certain other components in the home.

The Drywall Safety Act of 2012 (DSA) requires the CPSC to promulgate a final rule pertaining to drywall manufactured or imported for use in the United States that limits sulfur content to a level not associated with elevated rates of corrosion in the home, unless the Commission determines that: (A) a voluntary standard pertaining to drywall manufactured or imported for use in the United States limits sulfur content to a level not associated with elevated rates of corrosion in the home; (B) such voluntary standard is or will be in effect not later than two years after the date of enactment of this Act; and (C) such voluntary standard is developed by Subcommittee

[1] Identification Guidance for Homes with Corrosion from Problem Drywall as of March 18, 2011 by the U.S. Consumer Product Safety Commission and the U.S. Department of Housing and Urban Development http://www.cpsc.gov//PageFiles/115328/IDguidance031811.pdf. Remediation Guidance for Homes with Corrosion from Problem Drywall as of March 15, 2013, by the U.S. Consumer Product Safety Commission and the U.S. Department of Housing and Urban Development http://www.cpsc.gov//Global/Safety%20Education/Safety-Information-Centers/Drywall/remediation031513.pdf.

C11.01 on Specifications and Test Methods for Gypsum Products of ASTM International (ASTM Subcommittee C11.01).

ASTM Subcommittee C11.01 worked cooperatively with CPSC staff and developed a standard for S_8 in gypsum board that was included in ASTM Standard C1396-14a, *Standard Specification for Gypsum Board*. CPSC staff believes that this standard meets the requirements of the DSA and recommends that the Commission vote to approve the publication of the attached *Federal Register* notice.

2. Background

CPSC began investigating problem drywall that was associated with corrosion of metal items inside homes in early 2009. Homeowners reported corrosion or blackening of metal on electrical fixtures, appliances, plumbing, and air conditioner coils. CPSC's investigation of problem drywall led to the formation of the Federal Interagency Task Force on Problem Drywall, a multi-agency effort that involved HUD, the U.S. Centers for Disease Control and Prevention (CDC) and the U.S. Environmental Protection Agency (EPA). In addition to federal-level cooperation, staff coordinated with state and local health officials and visited affected homes and homeowners to obtain data to support the investigation. CPSC also engaged with our counterpart agency in China, General Administration of Quality, Supervision, Inspection and Quarantine of the People's Republic of China (AQSIQ) to share information and obtain access to information about the origin of the problem drywall. CPSC staff visited mines and manufacturers located in China and hosted a public website to keep the public informed about new developments related to this investigation.

From the outset of the scientific and engineering investigation into problem drywall, CPSC staff developed a multitrack test and evaluation program to determine if problem drywall may pose a hazard due to its composition and/or emissions into homes. The first track of the program included an analysis of drywall samples for differences in their chemical content and/or emissions that might account for the reported problems. A second track was an environmental analysis of homes containing problem drywall. In this second track, studies were conducted to look for the presence or evidence of the chemicals found in the first track in the building air environment and analyze the corrosion of building components. The third track consisted of an engineering analysis of the effects of problem drywall-related corrosion on the safety and operation of electrical, fire safety, and gas distribution components and materials. This analysis included samples collected from problem drywall-affected homes and new samples exposed to simulated, accelerated corrosion conditions. Additional studies were carried out as needed as the investigation unfolded to provide additional information and to follow new leads.

CPSC staff analysis of chemical content and emissions from problem drywall determined that certain brands of drywall produced around the year 2006 contain elevated levels of elemental sulfur (octahedral sulfur, S_8) and have elevated emission factors for hydrogen sulfide (H_2S) and other reactive sulfur gases known to corrode materials containing copper and silver. CPSC staff analysis also determined that the presence of elemental sulfur in excess of 10 ppm in drywall is associated with elevated emission factors for hydrogen sulfide (H_2S) and other reactive sulfur

gases which are known to cause accelerated corrosion of copper and silver in homes. These studies concerning S_8 and corrosion are discussed in greater detail below.

CPSC staff and HUD relied on the results of the studies to develop Identification Guidance and Remediation Guidance documents to enable homeowners to identify reliably homes with problem drywall and to correct the problem comprehensively by removing and replacing the problem drywall and certain other components (smoke alarms, carbon monoxide alarms, electrical distribution components, and fusible-type sprinkler heads, all unrelated to the DSA).

3. Drywall Safety Act

On January 14, 2013, the Drywall Safety Act of 2012[2] (DSA), was enacted. The DSA established several requirements, including tasks for the CPSC to meet by specified deadlines.

The Drywall Labeling Requirement. Section 3 of the DSA states that 180 days after the date of enactment of the Act, the gypsum board labeling provisions of standard ASTM C1264-11[3] must be treated as a rule promulgated by CPSC under section 14(c) of the CPSA. No further action was or is required by CPSC.

The Sulfur Content in Drywall Standard. Section 4 of the DSA covers sulfur content. This section requires CPSC to promulgate a final rule pertaining to drywall manufactured or imported for use in the United States within 2 years of the date of enactment of the DSA. The rule must limit sulfur content "to a level not associated with elevated rates of corrosion in the home." DSA §§ 4(a) and (b). This rulemaking requirement does not apply if the Commission determines:

> (A) a voluntary standard pertaining to drywall manufactured or imported for use in the United States limits sulfur content to a level not associated with elevated rates of corrosion in the home;
> (B) such voluntary standard is or will be in effect not later than two years after the date of enactment of this Act; and
> (C) such voluntary standard is developed by ASTM Subcommittee C11.01.

Id. § 4(c)(1). The determinations must be published in the *Federal Register*. *Id*. § 4(c)(2).

Revision of Remediation Guidance for Drywall Disposal Required. Finally, section 5 of the DSA requires the CPSC to revise its guidance titled, "Remediation Guidance for Homes with Corrosion from Problem Drywall," to specify that problem drywall removed from homes pursuant to the guidance should not be reused or used as a component in the production of new drywall. This was completed with the March 15, 2013 publication on the CPSC website of new Remediation Guidance.

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[2] http://www.gpo.gov/fdsys/pkg/PLAW-112publ266/pdf/PLAW-112publ266.pdf.

[3] Standard Specification for Sampling, Inspection, Rejection, Certification, Packaging, Marking, Shipping, Handling, and Storage of Gypsum Panel Products.

This briefing memorandum describes the technical justification for the Commission to determine that a voluntary standard exists and is in force to limit sulfur content to a level not associated with elevated rates of corrosion in the home and recommends publishing a notice in the *Federal Register* confirming that this requirement of the DSA has been met.

4. Association of Octahedral Sulfur in Drywall with Elevated Corrosion Rates in Homes

CPSC conducted numerous studies as part of the drywall investigation. Existing data show a clear association between S_8 and corrosion in homes, corrosion of test coupons (consisting of standardized strips of copper and silver metal exposed to air in homes and laboratory settings under specific conditions to determine relative corrosion rates in various studies discussed below), and emission of corrosive sulfur gases. Our contractor, Environmental Health & Engineering (EH&E), conducted a "Source Marker Study" (www.cpsc.gov//PageFiles/114652/EHESourceMarkers.pdf), which found that S_8 is a sensitive and specific marker of problem drywall and that S_8 is associated with chamber-based measurements of hydrogen sulfide and corrosion. Consistent findings were obtained using archived samples of drywall and measurements of hydrogen sulfide (H_2S) and corrosion in the "51-Home Study," also conducted by EH&E (www.cpsc.gov//PageFiles/114686/51homeFinal.pdf), indicating an association between elevated levels of the corrosive gas H_2S and elevated corrosion in those homes. In another study, Lawrence Berkley National Laboratories (LBNL) reported emissions for drywall. Testing included the same samples analyzed for S_8 by EH&E. The EH&E "Source Marker Study" compared the relationship between S_8 concentration as determined by EH&E and the emissions of hydrogen sulfide from the same samples as determined by LBNL. EH&E found S_8 to be strongly associated with corrosive H_2S emissions. The samples with S_8 concentrations above 10 ppm were associated with elevated H_2S emissions. The samples with S_8 concentrations below 10 ppm were not associated with elevated, corrosive H_2S emissions.

Additionally, EH&E found that S_8 in drywall samples was associated with silver sulphide and copper sulfide corrosion in chamber testing, where silver and copper test coupons were exposed to air in a test chamber together with drywall samples. In these tests, the corrosion rates for both silver and copper test coupons were elevated in cases where the S_8 concentrations in drywall were greater than 10 ppm. In contrast, the corrosion rates were not elevated in cases in which the S_8 concentration was less than 10 ppm.

Additionally, in studies by EH&E (www.cpsc.gov//PageFiles/114497/ehemay2011.pdf, www.cpsc.gov//PageFiles/114568/ehedomdrywall2011.pdf), it was reported that in "problem homes," which were defined as those suffering from the characteristic elevated corrosion rates related to problem drywall, S_8 levels found in drywall were in the range of 11ppm to 830 ppm, while control homes and remediated homes (post remediation) had no detected S_8 (below 10ppm). Thus, S_8 levels below 10 ppm were not associated with elevated corrosion rates.

Based on these findings, each of which shows elevated corrosion rates associated with drywall with elevated S_8 and none of which found an association between S_8 levels lower than 10ppm and elevated corrosion rates, staff believes that drywall that does not contain S_8 in excess of 10 ppm is not associated with elevated corrosion rates in homes.

5. Voluntary Standards

At the request of CPSC, ASTM undertook voluntary standards development related to problem drywall. ASTM uses the more technical term "gypsum board" along with other specific similar gypsum-product names to refer to the class of products which CPSC and HUD refer to as "drywall." ASTM Subcommittee C11.01 worked cooperatively with CPSC staff and developed a test method for S_8 in gypsum products, based on the methodologies used by CPSC's contractors and other industry experts, and incorporated these methods into ASTM Standard C471M Test Methods for Chemical Analysis of Gypsum and Gypsum Products (Metric). ASTM Subcommittee C11.01 continued to cooperate with CPSC staff and together they developed a standard for S_8 in gypsum board, and included the standard in ASTM Standard C1396-14a, Standard Specification for Gypsum Board, within section 4.7 of the standard. The requirements in section 4.7 limit the allowable level of S_8 to not greater than 10 ppm, when tested in accordance to the test methods for Determination of S_8 in Gypsum Panel Products by Liquid Extraction for Analysis by Liquid or Gas Chromatography in Sections 55-65 of ASTM C471M. These voluntary standard requirements were approved on October 1, 2014, published on October 14, 2014, and became effective immediately.

This standard requires that gypsum board must contain not greater than 10 ppm of orthorhombic cylooctasulfur (S_8), a level staff believes is not associated with elevated corrosion rates in homes, as described above in Section 4. Therefore, staff concludes that this ASTM standard satisfies the DSA requirements because ASTM C1396-14a:
(A) is a voluntary standard pertaining to drywall manufactured or imported for use in the United States that limits sulfur content to a level not associated with elevated rates of corrosion in the home;
(B) is or will be in effect not later than two years after the date of enactment of the DSA; and
(C) was developed by ASTM Subcommittee C11.01.

6. Conclusion

Staff recommends that the Commission vote to approve the attached *Federal Register* notice announcing that the Commission determines that the requirements of DSA have been met.