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RE: National Gypsum® products and new OSHA Dust and Silica Regulation

OSHA began enforcing its crystalline silica rule on September 23, 2017. The rule affects two million construction workers and, among other things, creates a new permissible exposure limit (PEL) to respirable crystalline silica of 50 micrograms (.05 milligrams) per cubic meter ($50 \mu\text{g}/\text{m}^3$ or $.05 \text{mg}/\text{m}^3$). In addition to the $50 \mu\text{g}/\text{m}^3$ PEL, sets an "Action Level" of $25 \mu\text{g}/\text{m}^3$, averaged over an eight-hour shift that requires a written silica exposure control plan from the contractor. For detailed information about the new rule visit www.osha.gov/silica.

National Gypsum® joint compounds and gypsum boards contain silica in very small amounts as indicated in the Safety Data Sheets (SDS). Third party testing shows that when these products are used in normal operating conditions, respirable crystalline silica remains well below the new PEL.

ProForm® and Easy Finish® Brand Joint Compounds have been third party tested in jobsite conditions for respirable crystalline silica exposure. The test results show that with normal use of these products, respirable crystalline silica exposure remains well below the OSHA guidelines. Under normal jobsite conditions, National Gypsum® joint compounds show exposure levels as low as 72 percent below the new OSHA PEL of $50 \mu\text{g}/\text{m}^3$ and below the action plan limit of $25 \mu\text{g}/\text{m}^3$. However, jobsites vary and tests results may differ. After testing All Purpose, Multi-Use, Lite and XP and XP LITE with Dust-Tech®, Dust-Tech® performed the best and should be used if additional dust control is needed and OSHA labels the use as engineering control. Testing was completed using NIOSH (National Institute for Occupational Safety and Health) testing criteria.

OSHA recommendations of using vacuum sanding or wet sanding also help reduce dust exposure drastically. While silica free joint compounds are called out in the new regulation, these products do not exist currently from any manufacturer.

Gold Bond® and DexCell® Brands Gypsum Board contain very little respirable crystalline silica, approximately .5% by weight. Third party testing revealed respirable crystalline silica was non-detect using cutting methods of score, snap and rasp, hand saw and rotary saw. The tests were conducted using NIOSH approved methods and respirable crystalline silica analysis was calculated using NIOSH 7500 testing criteria. The gypsum board testing was conducted in a lab using a 16' x 16' room, as well as jobsite conditions and participants were monitored for respirable crystalline silica during the cutting methods listed above. All three methods showed silica exposure as non-detectable. However, jobsites vary and tests results may differ. OSHA still may require additional testing for verification of respirable crystalline silica exposure.

Please note even with compliance to the respirable silica rule, OSHA is also monitoring total dust at jobsites which includes dust from other trades, jobsite conditions and jobsite cleanliness. These factors may be out of the control of jobsite workers but might have to be addressed with OSHA. Safety Data Sheets (SDS) for joint compound and gypsum board products provide additional information and product composition details.

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OSHA Respirable Crystalline Silica Standard: CertainTeed Gypsum Board Products

Date: October 18, 2017

CertainTeed Gypsum publishes Safety Data Sheets (SDS) for our gypsum board products to comply with the OSHA Hazard Communication Standard. The level of crystalline silica in the bulk gypsum material used in the products is reported in the SDS.

OSHA's Crystalline Silica Rule for Construction (29 CFR 1926.1153) which went into effect on September 23, 2017 further controls the exposure to respirable crystalline silica during construction work.

CertainTeed Gypsum contracted with an independent third-party test laboratory to conduct industrial hygiene tests on the release of respirable crystalline silica during the installation of gypsum board products. Three methods of cutting the gypsum board were evaluated; 1) score and snap and rasp, 2) hand saw, and 3) rotary saw. Air samples were collected within the breathing zone of the worker and within the test chamber during each cutting operation on multiple samples of gypsum board. These tests have shown that none of the air samples collected exceeded the OSHA PEL (Permissible Exposure Limit) during installation. Respirable crystalline silica was **not** detected to be present in any of the air samples collected. The reported detection limit for the air samples was less than or equal to $16 \mu\text{g}/\text{m}^3$ (less than the OSHA PEL of $50 \mu\text{g}/\text{m}^3$ and ACGIH TLV and OSHA action level of $25 \mu\text{g}/\text{m}^3$).

Note that OSHA has determined that the installation and finishing of gypsum board products are activities that generate low levels of silica exposure and therefore these activities are excluded from "Table 1" of the new OSHA Crystalline Silica Rule. For activities not listed in Table 1, such as installation and finishing of gypsum board products, OSHA has established alternate control methods to ensure no employee is exposed above the PEL for respirable crystalline silica. To accomplish this, employers may be required by OSHA to conduct initial and reassessment job-site air monitoring according to an OSHA schedule.

A separate TechUpdate on this topic for CertainTeed Gypsum joint compounds is in progress.

References for Further Information:

<https://www.gypsum.org/gypsum-association-2015-study-on-respirable-crystalline-silica-emissions-when-sizing-drywall/>
<https://www.osha.gov/Publications/OSHA3681.pdf>
https://www.osha.gov/silica/Silica_FAQs_2016-3-22.pdf

Marketing Technical Services
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Technical Services recommendations are provided solely for the information of the project designer, architect, engineer or contractor. It is the responsibility of the project designer, architect, engineer and/or contractor to check local code requirements - prior to installation of any CertainTeed product - to assure suitability and code compliance of any design or recommendation described above. CertainTeed is not responsible for applications that do not meet jurisdictional code requirements.

October 2017

Regarding: Airborne Respirable Crystalline Silica Compliance

Recent guidance documents issued by the federal government and industry stakeholders refer to silica-free joint compounds. However, testing of both our products and our competitors' products indicates that silica-free joint compounds do not exist from any manufacturer. Low concentrations of crystalline silica are present as a natural impurity in all limestone- and gypsum-based wallboard and joint compound products.

Continental Building Products has commissioned independent third party testing of our wallboard and joint compound products. The testing shows that under the conditions described below, concentrations of respirable crystalline silica in the air are below OSHA's new Action Level (AL) of 25 µg/m³, and well below the new Permissible Exposure Limit (PEL) of 50 µg/m³.

Testing of Continental Wallboard Products

Measurements of airborne exposure to respirable crystalline silica were taken when using common work practices to size drywall for installation. This sampling showed no detectable levels of crystalline silica in the air during common practices of score, snap and rasp, hand saw cutting, and rotary saw cutting.

Testing of Continental Joint Compound Ready Mix

Likewise, measurements were taken of airborne exposure to respirable crystalline silica using the common practices of sanding drywall joint compound. Multiple tests were conducted in a room where sanding was performed using a pole sander. The results show that under these conditions, concentrations of respirable crystalline silica in the air were below OSHA's new AL of 25 µg/m³ and new PEL of 50 µg/m³.

It must be noted that the methods used in the testing were limited to general conditions in a controlled environment. Actual field conditions and work methods may vary. Therefore, the results of this testing do not relieve any contractor of the obligation to conduct the required testing, monitoring or controls as required in OSHA's new rule covering crystalline silica.

Although our test data did not show exposures above the AL or PEL, the OSHA Compliance Guides and our safety data sheet (SDS) will continue to recommend the use of engineering controls including pole sanders, vacuum assist and/or wet sanding to reduce airborne dust levels.

Scott W. Walton, CSP, CHMM
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Continental Building Products



**OSHA 29 CFR 1926
Respirable Silica Dust Exposure
OBJECTIVE TEST DATA
USG Sheetrock® Brand Dust Control Joint Compound**

Independent industrial hygiene testing during sanding of USG Sheetrock® Brand Dust Control Joint Compound has shown levels of total and respirable airborne dusts below OSHA’s new permissible exposure limits (PEL).

Testing was performed under the following conditions:

- Room size of 16’ x 16’ x 8’
- Minimal air was exchanged during testing (\leq one AC/hour)
- Sanding was performed using a pole sander with 150 grit abrasive paper
- Air sampling was conducted for 2 hours with intermittent sanding totaling 12 minutes.*
- Temperature of 77 – 80°F and humidity of 59 – 64%RH
- Entire surfaces of three gypsum panels were coated with USG Sheetrock® Brand Dust Control Joint Compound
- Uniform mixed air was maintained in the room

Personal air samples were collected from the breathing zone of the worker. Air samples were collected and analyzed for total dust (a.k.a. particulates not otherwise regulated – PNOR), respirable dust and respirable crystalline silica. SKC aluminum cyclones and SKC disposable parallel particle impactors (PPI) were used to selectively sample respirable dust.

Total dust samples were analyzed using NIOSH method 0500. Respirable dust samples were analyzed for respirable dust and respirable crystalline silica per NIOSH Methods 0600 and 7500, respectively.

Results

Time-Weighted Average (TWA) Respirable Crystalline Silica Dust Exposure	Below detectable limit **	OSHA PEL = 50 $\mu\text{g}/\text{m}^3$
Time-Weighted Average (TWA) Total Dust Exposure	>70% below PEL	OSHA PEL = 15 mg/m^3

* See recent industrial hygiene studies on drywall workplace exposures: Boelter et al. 2015

** Cyclone samples have a detection limit of 16 $\mu\text{g}/\text{m}^3$. PPI samples have a detection limit of 10 $\mu\text{g}/\text{m}^3$.



29 CFR Sec. 1926.1153(d)(2)(ii) Performance Option Using USG Objective Data

Section 1926.1153(d)(2)(i) of the OSHA Silica Rule states:

“General. The employer shall assess the exposure of each employee who is or may reasonably be expected to be exposed to respirable crystalline silica at or above the action level in accordance with either the performance option in paragraph (d)(2)(ii) or the scheduled monitoring option in paragraph (d)(2)(iii) of this section.”

Section 1926.1153(d)(2)(ii) defines employers’ “Performance Option”:

“Performance option. The employer shall assess the 8-hour TWA exposure for each employee on the basis of any combination of air monitoring data or objective data sufficient to accurately characterize employee exposures to respirable crystalline silica.”

USG engaged an independent testing company, RJ Lee Group, Inc., to conduct testing to determine the respirable silica dust exposure associated with the application of **USG Sheetrock® Brand Dust Control Compound**. The testing was designed to provide an 8-hour Time-Weighted Average (TWA) for respirable silica exposure as required by OSHA. The purpose of these tests was to provide our customers with “Objective Data,” as described in the new Silica Rule, that can be used as part of employers’ exposure assessment requirements under Section 1926.1153(d)(2)(i) of the rule.

Testing was designed to reflect workplace conditions that closely resembled, or exceeded, potential respirable silica exposure under the workplace conditions and practices typically found on jobsites during the application of joint compound. The testing was performed for two hours in a 16’ x 16’ x 8’ closed room. Minimal air was exchanged during the testing period. Sanding was performed using a pole sander with 150 grit sandpaper, which was changed between each panel sanded. Oscillating fans were used to mix the air in the room. The joint compound selected for the testing had the highest bulk content of respirable crystalline silica in our network.

However, when applying the USG Objective Data to a specific jobsite exposure assessment, there are several issues that must be also considered:



1. More or less of the subject work performed on the jobsite over a certain period of time will increase or decrease the exposure level. USG's testing is based on workplace studies that show a drywall worker spends approximately 11% of his work day sanding.
2. The size of the room on a jobsite will impact exposure levels. The larger the room, the lower the potential exposure.
3. The level of air exchange on a jobsite will impact exposure levels. The greater the rate of air exchange, the lower the exposure. The USG testing was conducted in a closed room and intended to resemble a low air exchange rate and therefore, higher potential exposure conditions.
4. The level of exposure will be affected by the amount of joint compound that is being sanded off. Sanding in the USG testing was done on 4' x 8' panels that had been intentionally thick-coated to create higher exposure potential.
5. USG testing was performed with 150 grit sandpaper which is commonly used by professional drywall workers for the finishing/sanding step.