



west virginia department of environmental protection

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ENGINEERING EVALUATION / FACT SHEET

BACKGROUND INFORMATION

Application No.: R13-2192P
Plant ID No.: 067-00095
Applicant: JELD-WEN, Inc.
Facility Name: Craigsville Facility
Location: Nicholas County
NAICS Code: 321219/325510
Application Type: Modification
Received Date: March 22, 2013
Engineer Assigned: Steven R. Pursley, PE
Fee Amount: \$3,500
Date Received: April 2, 2013
Complete Date: June 13, 2013
Due Date: September 11, 2013
Applicant Ad Date: March 21, 2013
Newspaper: *The Nicholas Chronicle*
UTM's: Easting: 529.8 km Northing: 4,243.8 km Zone: 17
Description: Modification to remove the requirement to vent the rotary valve to the biofilter.

DESCRIPTION OF PROCESS

The facility manufactures door skins in a process similar to the hardboard manufacturing process. The fiber-containing material, or furnish, consists of green poplar chips. The furnish is mechanically separated into fiber by the refiner and is then dried in a tube dryer. Next, the fiber is blended with a no-added formaldehyde resin and a fiber mat is formed. The mat continues into a cold pre-compressor, which is followed by trimming operations. The mat is then consolidated in a steam-heated press. After the press, the door skins are cut to the final dimensions and painted with waterborne primer.

A wood-fired boiler burns wood residuals from the production process, as well as purchased hogged fuel to generate steam for the facility. Additional combustion sources at the facility include a natural gas-fired backup boiler and natural gas-heated ovens associated with the priming operations. The fiber dryer is heated by both steam and natural gas (direct fired).

Permit R13-21920 required JELD-WEN to vent the rotary valve (among other sources) to the biofilter. JELD-WEN has stated that “High moisture levels in the Rotary Valve exhaust were found to cause serious plugging and process problems in particulate control devices upstream of a Biofilter at another JELD-WEN facility during recent start-up trials.” Therefore, JELD-WEN has elected to meet the requirements of 40 CFR 63 Subpart DDDD using the production-based compliance option limit rather than the add on control requirement for the rotary valve.

SITE INSPECTION

No site inspection was performed by the writer since JELD WEN is an existing, well known facility. The facility was inspected by Eric Ray of DAQ’s enforcement section on August 18, 2011. The facility was deemed out of compliance. As discussed below under the Regulatory Applicability section of this document, JELD WEN has entered into a consent decree with USEPA and has a negotiated timeline in which to come into compliance.

ESTIMATE OF EMISSIONS BY REVIEWING ENGINEER

Only the emission rates of VOCs, PM₁₀, and some HAPs will be effected by this change.

Existing emissions are taken directly from permit R13-21920:

Emissions from the biofilter, as limited in the existing permit were as follows:

	E18	
	lb/hr	tpy
Acetaldehyde	0.88	1.96
Acrolein	0.68	1.59

Fact Sheet R13-21920
 JELD-WEN, Inc.
 Craigsville Facility

Benzene	0.02	0.03
Formaldehyde	0.08	0.19
Methanol	1.30	2.55
Phenol	1.91	4.68
Propionaldehyde	0.55	1.35
MDI	0.55	2.15
Total HAPS	5.97	14.5
PM ₁₀	0.17	0.32
VOCs	18.15	38.42

HAP emissions are based on 2007 testing of the rotary valve plus one standard deviation. VOC emissions were assumed by JELD-WEN to be 1.5X HAP emissions. PM emissions were based on JELD-WENs engineering judgement. Emissions from the biofilter and the now uncontrolled rotary valve, will be as follows (note that sometimes hourly emissions from E18 change and not annual and vice versa. This is because the changes are so small, they may effect rounding of one and not the other):

	E18		E16		Total	
	lb/hr	tpy	lb/hr	tpy	lb/hr	tpy
Acetaldehyde	0.87	1.96	0.01	0.01	0.88	1.97
Acrolein	0.55	1.34	0.13	0.24	0.68	1.58
Benzene	0.02	0.03	--	--	0.02	0.03
Formaldehyde	0.08	0.18	0.01	0.01	0.09	0.19
Methanol	1.26	2.48	0.33	0.61	1.59	3.09
Phenol	1.91	4.68	0.01	0.01	1.92	4.69
Propionaldehyde	0.55	1.34	0.01	0.01	0.56	1.35
MDI	0.55	2.15	--	--	0.55	2.15
Total HAPS	5.79	14.16	0.5	0.89	6.29	15.05
PM ₁₀	0.17	0.32	0.59	1.09	0.76	1.41

VOCs	17.72	38.42	0.71	1.30	18.43	39.72
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Therefore, the increase in emissions from the change will be as follows:.

	lb/hr	tpy
Acetaldehyde	--	0.01
Formaldehyde	0.01	--
Methanol	0.29	0.54
Phenol	0.01	0.01
Propionaldehyde	0.01	--
Total HAPS	0.32	0.55
PM ₁₀	0.59	1.09
VOCs	0.28	1.30

REGULATORY APPLICABILITY

Units covered under this permit modification are subject to the following state and federal rules:

STATE RULES

45CSR7 To Prevent and Control Particulate Air Pollution from Manufacturing Process Operations

The process weight rate for the rotary valve is 23,944 pounds per hour. This would equate to a 45CSR7 limit of 17.58 pounds per hour. Total stack PM emissions from the rotary valve will be limited in the permit to 2.35 pounds per hour.

45CSR13 Permits for Construction, Modification, Relocation and Operation of Stationary Sources of Air Pollutants, Notification Requirements, Temporary Permits, General Permits, and Procedures for Evaluation

The applicant voluntarily applied for a permit modification in order to change permit conditions.

Fact Sheet R13-2192O
JELD-WEN, Inc.
Craigsville Facility

As required under §45-13-8.3 (“Notice Level A”), JELD-WEN placed a Class I legal advertisement in a “newspaper of general circulation in the area where the source is . . . located.” The ad ran on March 21, 2013 in the *Nicholas Chronicle* and the affidavit of publication for this legal advertisement was submitted on April 2, 2013.

45CSR30 Requirements for Operating Permits

The facility is subject to 45CSR30 because it has the potential to emit more than 100 tons per year of CO, NO_x and VOCs. The facility has an existing Title V permit that will also need to be modified.

FEDERAL RULES

40 CFR 63 Subpart DDDD Plywood and Composite Wood Products MACT

JELD-WEN is not currently in compliance with the PCWP MACT. However, they have entered into a Consent Decree (Civil Action No. 11-453ST, DOJ No. 90-5-2-1-09567) with USEPA which requires final compliance with all MACT requirements by August 4, 2014. This permit application is part of that compliance plan.

There are three compliance options outlined in 40 CFR §63.2240. These compliance options are 1) Production-based compliance option, 2) Add on control systems, or 3) Emissions averaging. To demonstrate final compliance with the Final MACT requirements, JELD-WEN has decided to use the compliance option for add-on control systems for each Affected Process Unit with the exception of the Rotary Valve (pressurized refiner) that is the subject of this permit modification.

The production based compliance option limits “Total HAP” emissions (“Total HAP”, as defined in § 63.2292) from the rotary valve (regulated as a pressurized refiner) to 0.039 pounds per oven dried ton. In their permit application update received May 14, 2013, JELD-WEN used a testing based emission factor of 0.038 pounds per oven dried ton. JELD-WEN will have to demonstrate compliance with this limit in accordance with §63.2260.

40 CFR 63 Subpart QQQQ Surface Coating of Wood Building Products MACT

The facility has previously chosen to comply with the MACT by using the

Fact Sheet R13-21920
JELD-WEN, Inc.
Craigsville Facility

compliant materials option as specified in 40 CFR 63.4691(a). 40 CFR 63.4690 (when combined with the compliant materials option) requires that the primer contain no more than 0.06 pounds of HAP per gallon of solids. The facility must maintain records as required by 40 CFR 63.4730 to demonstrate compliance with this limit. The initial compliance status notification requirements have been met. The facility shall submit semi-annual reports and maintain records as applicable in §§63.4730 and 63.4731 as required within this subpart.

TOXICITY OF NON-CRITERIA REGULATED POLLUTANTS

The emission rates of the following HAPs are effected by this modification.

The following information comes directly from EPA's Air Toxics Website:

Acetaldehyde:

Acetaldehyde is mainly used as an intermediate in the synthesis of other chemicals. It is ubiquitous in the environment and may be formed in the body from the breakdown of ethanol. Acute (short-term) exposure to acetaldehyde results in effects including irritation of the eyes, skin, and respiratory tract. Symptoms of chronic (long-term) intoxication of acetaldehyde resemble those of alcoholism. Acetaldehyde is considered a probable human carcinogen (Group B2) based on inadequate human cancer studies and animal studies that have shown nasal tumors in rats and laryngeal tumors in hamsters.

Formaldehyde:

Formaldehyde is used mainly to produce resins used in particleboard products and as an intermediate in the synthesis of other chemicals. Exposure to formaldehyde may occur by breathing contaminated indoor air, tobacco smoke, or ambient urban air. Acute (short-term) and chronic (long-term) inhalation exposure to formaldehyde in humans can result in respiratory symptoms, and eye, nose, and throat irritation. Limited human studies have reported an association between formaldehyde exposure and lung and nasopharyngeal cancer. Animal inhalation studies have reported an increased incidence of nasal squamous cell cancer. EPA considers formaldehyde a probable human carcinogen (Group B1).

Fact Sheet R13-2192O
JELD-WEN, Inc.
Craigsville Facility

Methanol:

Methanol is released to the environment during industrial uses and naturally from volcanic gases, vegetation, and microbes. Exposure may occur from ambient air and during the use of solvents. Acute (short-term) or chronic (long-term) exposure of humans to methanol by inhalation or ingestion may result in blurred vision, headache, dizziness, and nausea. No information is available on the reproductive, developmental, or carcinogenic effects of methanol in humans. Birth defects have been observed in the offspring of rats and mice exposed to methanol by inhalation. EPA has not classified methanol with respect to carcinogenicity.

Phenol:

Exposure to phenol may occur from the use of some medicinal products (including throat lozenges and ointments). Phenol is highly irritating to the skin, eyes, and mucous membranes in humans after acute (short-term) inhalation or dermal exposures. Phenol is considered to be quite toxic to humans via oral exposure. Anorexia, progressive weight loss, diarrhea, vertigo, salivation, a dark coloration of the urine, and blood and liver effects have been reported in chronically (long-term) exposed humans. Animal studies have reported reduced fetal body weights, growth retardation, and abnormal development in the offspring of animals exposed to phenol by the oral route. EPA has classified phenol as a Group D, not classifiable as to human carcinogenicity.

Propionaldehyde:

Propionaldehyde is used in the manufacture of plastics, in the synthesis of rubber chemicals, and as a disinfectant and preservative. Limited information is available on the health effects of propionaldehyde. No information is available on the acute (short-term), chronic (long-term), reproductive, developmental or carcinogenic effects of propionaldehyde in humans. Animal studies have reported that exposure to high levels of propionaldehyde, via inhalation, results in anesthesia and liver damage, and intraperitoneal exposure results in increased blood pressure. EPA has not classified propionaldehyde for carcinogenicity.

AIR QUALITY IMPACT ANALYSIS

Since this is a minor modification to an existing minor stationary source (as defined

Fact Sheet R13-2192O
JELD-WEN, Inc.
Craigsville Facility

in 45CSR14), no modeling was performed.

MONITORING OF OPERATIONS

In addition to the existing monitoring requirements of R13-2192O, the permittee will be required to monitor the following:

When performing the initial compliance test JELD-WEN “must identify and document the process unit controlling parameter(s) that affect total HAP emissions during the three-run performance test.” They must then monitor those parameters per Table 2 of 40 CFR 63 Subpart DDDD.

CHANGES TO PERMIT R13-2192O

The following changes were made to permit R13-2192O

- * Table 1.0 was updated to reflect the changes made. Specifically, the Rotary Valve emission unit was removed from emission point E18 and given its own emission point, E16.
- * The rotary valve and it’s associated emissions were removed from condition 4.1.6.
- * The rotary valve and it’s associated emissions were removed from emission point E18 and given its own emission point, E16, in condition 4.1.7.
- * Condition 4.1.8 was changed since the MACT only requires a 90% reduction efficiency for Methanol OR Formaldehyde, not both.
- * The rotary valve and it’s associated emissions were removed from emission point E18 and given its own emission point, E16, in condition 4.1.10.
- * The rotary valve and it’s associated emissions were removed from emission point E18 and given its own emission point, E16, in condition 4.1.11.
- * Condition 4.1.15 was added. It was added because previous versions of the permit had only limits for PM₁₀ and not TSP. This condition corrects that error, at least for the new emission point.

Fact Sheet R13-2192O
JELD-WEN, Inc.
Craigsville Facility

RECOMMENDATION TO DIRECTOR

Information supplied in the application indicates that compliance with all applicable regulations (except as noted under regulatory applicability) will be achieved. Therefore it is the recommendation of the writer that permit R13-2192O for the modification of an door skin manufacturing facility be granted to JELD-WEN, Inc

Steven R. Pursley, PE
Engineer

June 19, 2013

Fact Sheet R13-2192O
JELD-WEN, Inc.
Craigsville Facility