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**Technical Support Document  
Title V Permit  
Prowall Building Products, Inc.  
Permit #V20671.000**

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**1. Background**

1.1 Applicant

Facility : Prowall Building Products, Inc.  
1092 N. Jefferson Avenue  
Casa Grande, Arizona  
Assessor Parcel # 503-83-018J

Mailing Address: Prowall Building Products, Inc.  
3652 E. Miami Avenue  
Phoenix, AZ 85040

1.2 Attainment Classification

The facility is situated in an area classified as attainment for Volatile Organic Compounds (VOCs).

1.3 Compliance/Enforcement History

The facility was last inspected on January 13, 2016, and found to be in compliance with the permit.

1.4 Permitting History

Permit	Permit Type	Issue Date	Equipment/Change
B30735.000	Minor Source	4/12/02	Initial permit.
V20631.000	Title V	10/13/06	Initial Title V Permit.
V20631.R01	Revision	2/17/07	Increase allowable pentane content from 5.1% to 6%. Source becomes synthetic minor for PSD.
V20651.000	Renewal	10/11/11	
V20651.R01	Revision	3/27/12	Increase the allowable maximum pentane content from 6% to 6.4%
V20651.R02	Revision	8/16/13	Addition of a 10 mm btu/hr boiler and replacement of the current pre-expander with a new one.

**2. Process Description**

The principal operation at the facility is the molding of expandable polystyrene (EPS) foam blocks. The facility's SIC Codes is 3086 (Plastic Foam Products). The main processes involved in the manufacturing of the final product are:

2.1 Raw Material Receiving

EPS resin is received in the form of bags of beads formulated to contain up to 6% by weight of pentane, a blowing agent.

## 2.2 Pre-expansion

In order to mold the desired part, it is necessary to first generate a pre-expanded foam particle, "prepuff", the size of the required density. A pre-measured amount of beads is automatically fed into a pre-expander equipped with a controlled steam inlet and agitation. By controlling the bead feed rate, the steam and air flow, and the agitator rpm, the beads soften and expand to the required density. The prepuff exiting the pre-expander are fed to a bed dryer where they are gently dried. During the expansion, pentane, a Volatile Organic Compound (VOC) is released from the beads.

## 2.3 Aging

After the pre-expander and dryer, the prepuff are blown into large nylon storage bags and allowed to reach ambient temperature. The aging process can take from 5 to 48 hours, depending upon the desired density. Additional VOCs are released during this process.

## 2.4 Molding

The aged prepuff are transferred from the storage bags into the bead hopper directly above the molds. This facility has an existing mold and will be installing a new one authorized by this permit. A pre-measured amount of prepuff is dropped into the mold cavity. Once the cavity is full, it is closed and a vacuum system evacuates air from the cavity. Then, the mold is subjected to steam, which flows over the entire mass of the prepuff, until it reaches atmospheric pressure. The heat and increase in pressure cause the prepuff to soften and further expand. With no place for expansion, fusion occurs. After reaching the desired manufacturing parameters, the computer releases pressure and the prepuff are now fused into a block. The entire molding cycle generally lasts from 3 to 15 minutes. VOCs are released during this process.

## 2.5 Block Curing

Molded blocks are allowed to stabilize, stored in the warehouse at room temperature or by heat curing. During storage, typically 3 days, additional VOCs are emitted.

## 2.6 Finishing

Molded blocks are trimmed and cut to desired dimensions using a series of thermal hot wire cutting tools.

# 3. Emissions

## 3.1 Methodology

Revision V20651.R01 authorized the maximum pentane content of the polystyrene pellets to increase from 6% to 6.4%. Prowall has been experiencing difficulties with US suppliers manufacturing beads with a 6% content. Typical productions have been 6.1-6.2%, but sometimes it goes as high as 6.4%. While Prowall will continue to purchase beads from their oversea suppliers, which can produce a bead with 6% and under contents, product availability from those suppliers is not consistent. While there is a potential increase in VOC emissions in the form of pentane, the permit's limits prevent any actual increases. Permittee will have to reduce their bead use per month to maintain their emissions below the 240 tons per year VOC cap.

In order to demonstrate compliance, the applicant will have to forecast bead use every day that beads are expanded, and after the end of each month demonstrate that the bead use limitation determined by the formula  $Q \text{ (ton/month)} = 20/\text{pentane \%}$ , has not been exceeded.

Monthly calculations are also required to determine VOC emissions. When the rolling 12 month emissions exceed 200 tpy, the calculations will be performed once per week until calculated emissions dip below 200 tons again.

Emissions will be calculated as follows:

VOC Emissions (tons) = bead use (tons) x pentane % by weight

For all calculations, the applicant will have to use the highest pentane % if a range is given by the manufacturer.

### 3.2 VOC Emissions

#### **Potential Emissions Increase**

Current Potential = 2000 lb beads/hr x 8760 hr/yr x 1 ton/ 2000 lb x 6% = 525.60 tpy

Proposed Potential = 2000 lb beads/hr x 8760 hr/yr x 1 ton/2000 lb x 6.4% = 560.64 tpy

**Proposed Potential Increase = 35 tpy**

**Allowable VOC emissions = 20 ton VOC/month x 12 = 240 tpy**

If the permittee chooses to use 6.4% beads, their allowable bead use will be reduced (from 333 tons/month, 4000 tons per year) to:

$Q = 20/6.4\% = 312.5 \text{ ton/mo} = 3750 \text{ ton per year of beads.}$

By reducing the pentane content of the beads used, the number of beads the applicant can use will increase.

## 4. Regulatory Requirements and Monitoring

### 4.1 Title V/PSD Applicability

Title V permit V20631.000 issued on 10/13/06 imposed limitations to avoid becoming a "major emitting source" for VOCs within the meaning of 40 CFR §51.166, which would require the facility to go through a Prevention of Significant Deterioration (PSD) review. This source is considered a "synthetic minor" with respect to PSD.

The permit's pentane content limitation is being revised from 6 to 6.4%. At 6%, potential VOC emissions were 526 tpy, and at 6.4%, potential emissions are 561 tpy, so the increase in potential emissions is 35 tons per year.

In order to maintain synthetic minor status of emissions of VOCs in respect to PSD, the permit restricts the amount of EPS beads used per year, so that emissions never exceed approximately 20 tons per month or 240 tons per year. Since there was no net increase in emissions due to Revision V20671.R02, the permit action was not a significant revision with respect to PSD.

### 4.2 Applicable Requirements

Since the boiler has a maximum design heat input capacity of 10 mm btu/hour and was manufactured in 1997, it is subject to the Standards of Performance for Small Industrial - Commercial Institution Steam Generating Units, Subpart Dc. However, since the boiler runs on

natural gas, Permittee is only required to show compliance with the sulfur dioxide emission standards by keeping monthly records of the fuel used and maintaining fuel supplier certification.

#### 4.3 Non-Applicable Requirements

4.3.1 CAM: The requirements of 40 CFR 64, Compliance Assurance Monitoring (CAM), are not applicable since Prowall does not use a control device to achieve compliance with any emission limitation or standard for a pollutant for which the source has potential pre-control device emissions greater than or equal to major source levels for that pollutant.

4.3.2 This source is not a major or area source of HAPs so it is not subject to any MACT standards.

### 5. Ambient Impact Assessment – VOCs Modeling

While anticipated VOC emissions from the facility will potentially approach 240 tons-per-year, VOCs do not directly fall subject to an ambient limitation under the CAA.

Maximum anticipated emissions from this facility do not reach the quantity-threshold that would trigger an obligation to analyze the additional impact on any nearby ozone nonattainment areas.

### 6. List of Abbreviations

CAA	Clean Air Act
CAM	Compliance Assurance Monitoring
CFR	Code of Federal Regulations
EPS	Expandable Polystyrene
hr	Hour
lb	Pound
MACT	Maximum Achievable Control Technology
MMBTU	Million British Thermal Units
MSDS	Material Safety Data Sheet
NOV	Notice of Violation
NSPS	New Source Performance Standard
NSR	New Source Review
PCAQCD	Pinal County Air Quality Control District
PGCAQCD	Pinal-Gila Counties Air Quality Control District
PM10	Particulate Matter nominally less than 10 Micrometers
PSD	Prevention of Significant Deterioration
SIC	Standard Industrial Code
tpy	tons per year
VOC	Volatile Organic Compound
Yr	year