

**NORTH CAROLINA DIVISION OF
AIR QUALITY**

Air Permit Review

Region: Asheville Regional Office
County: Caldwell
NC Facility ID: 1400027
Inspector's Name: Mike Parkin
Date of Last Inspection: 06/25/2009
Compliance Code: 3 / Compliance - inspection

Permit Issue Date:

Facility Data			Permit Applicability (this application only)
<p>Applicant (Facility's Name): Thomasville Furniture Industries, Inc. - Lenoir Plant</p> <p>Facility Address: Thomasville Furniture Industries, Inc. - Lenoir Plant 315 Elizabeth Street NW Lenoir, NC 28645</p> <p>SIC: 2511 / Wood Household Furniture NAICS: 337122 / Nonupholstered Wood Household Furniture Manufacturing</p> <p>Facility Classification: Before: Title V After: Title V Fee Classification: Before: Title V After: Title V</p>			
Contact Data			Application Data
Facility Contact	Authorized Contact	Technical Contact	<p>Application Number: 1400027.09A Date Received: 09/03/2009 Application Type: 112(j) Part I Application Schedule: TV-Significant</p> <p style="text-align: center;">Existing Permit Data</p> <p>Existing Permit Number: 04172/T18 Existing Permit Issue Date: 10/21/2008 Existing Permit Expiration Date: 09/30/2012</p>
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<p>Review Engineer: Jenny Sheppard</p> <p>Review Engineer's Signature: _____ Date: _____</p>		<p style="text-align: center;">Comments / Recommendations:</p> <p>Issue 04172/T19 Permit Issue Date: Permit Expiration Date:</p>	

I. Purpose of Applications

Thomasville Furniture Industries, LLC, Caldwell County North Carolina Application No. 1400027.09A, received September 3, 2009, is a one step MACT "Hammer" application for four existing boilers, as listed below:

- **ESBL.1** – Wood/coal/finishing waste-fired boiler, 35 mmBtu/hr heat input capacity
- **ESBL.2** – Wood/coal/finishing waste-fired boiler, 35 mmBtu/hr heat input capacity
- **ESBL.3** – Natural gas/No. 2 fuel oil-fired fire-tube boiler, 6.7 mmBtu/hr heat input capacity

II. Permit Modifications/Changes

The following table describes the modifications to the current permit.

Page(s)	Section	Description of Change(s)
1	Permit Cover Page	Amend permit revision numbers and issuance/effective dates.
3	Section 1	Add 112(j) designations to table listing permitted sources.
7	Section 2.1B, Table	Add 112(j) standards to table of applicable standards.
10	Section 2.1 B 6	Add 112(j) condition

Page(s)	Section	Description of Change(s)
12	Section 2.1 C Table	Add 112(j) designation to the table of applicable standards
13	Section 2.1 C 4	Add 112(j) condition
19	Section 3 GC	Updated General Conditions and List of Acronyms
All	All	Updated testing condition language

III. Regulatory Review – 15A NCAC 2D .1109 – CAA § 112(j); Case-by-Case MACT for Boilers & Process Heaters

1. **Generally:** On July 20, 2007, the D.C. Circuit Court vacated the National Emission Standard for Hazardous Air Pollutants (NESHAP) for Industrial, Commercial, and Institutional Boilers and Process Heaters, which had been promulgated under 40 CFR 63, Subpart DDDDD. The North Carolina Attorney General’s office has determined that the NESHAP vacatur equates to the failure of the U.S. EPA to promulgate a valid standard as required under Section 112(d) of the Clean Air Act (CAA). As a result, the site-specific Maximum Achievable Control Technology (MACT) standards required under CAA §112(j), commonly referred to as the MACT “hammer” provisions, have been triggered. North Carolina regulations implementing the MACT hammer are found at 15A NCAC 2D .1109.

On September 10, 2009, the NC DAQ received a Part 2 MACT “Hammer” application from this facility asking that the NC DAQ establish 112(j) emissions limitations. The facility proposed Hg and CO emission limitations that are consistent with the NC DAQ application guidance (<http://daq.state.nc.us/permits/112j/>). NC DAQ has developed this guidance to provide standards and compliance procedures that it has determined meet the requirements of § 112(j).

The facility has chosen to comply with a Health-Based Compliance Alternative (HBCA) for HCl and manganese (Mn). NC DAQ conducted an analysis to support HBCA eligibility demonstration is consistent with the procedures provided by the U.S. EPA in the vacated § 112(d) standard for boilers and process heaters. The HBCA for Mn allows the facility to comply with the proposed total selected metals (TSM) standard without including Mn in the compliance demonstration. The HBCA for HCl allows the facility to establish an emission limitation for HCl based on risk.

a. Total Selected Metals (TSM)

In accordance with the § 112(j) application guidance provided by NC DAQ, affected facilities may propose either a TSM limit or a filterable PM limit. The filterable PM is a surrogate for the regulated TSM, which is the sum of the emission rates of arsenic, beryllium, cadmium, chromium, lead, manganese, nickel, and selenium. This facility proposed a TSM limit that is consistent with the NC DAQ application guidance, or 0.0005 lbs/mmBtu. The HBCA allows the Permittee to exclude Manganese when determining compliance with the TSM emissions limitation if the manganese emissions are less than the Allowable Manganese Emission Rate in Table 15-2.

NC DAQ used the manganese emission factors in Chapter 1 of AP-42 to determine that the total manganese emission rates from the facility would be **0.112** pounds per hour. The Allowable Manganese Emission Rate in Table 15-2 of the NC DAQ Application Guidance for a stack height of 5 meters and a receptor located at the property line is **0.29** pounds per hour. Since the total manganese emission rate from the facility is less than the Allowable Manganese Emission Rate, this facility is eligible for the HBCA for manganese. Therefore, manganese need not be included in the determination of TSM.

	Boiler	Mn emissions, lb/hr	Default TSM, lb/hr
Dry wood and coal	1	5.6E-02	1.75E-02
Dry wood and coal	2	5.6E-02	1.75E-02
Distillate 1 & 2 and	3	2.95E-04	6.9E-04
	sum =	0.112	3.57E-02

Boiler ID No.	Fuel	Boiler heat input, mmBtu/hour	TSM limit (lbs/mmBtu)
ESBL .1	Dry wood/coal	35	5.0 e-04
ESBL .2	Dry wood/coal	35	5.0 e-04
ESBL .3	No. 2 fuel oil/Natural Gas	13.8	5.0 e-05

To demonstrate compliance with the standard, the Permittee will conduct initial and periodic performance testing test on each boiler.

b. Mercury (Hg)

This facility has proposed a mercury limit that is consistent with the NC DAQ application guidance.

Boiler ID No.	Fuel	Boiler heat input, mmBtu/hour	Hg (lbs/mmBtu)
ESBL .1	Dry wood/coal	35	5.0e-06
ESBL .2	Dry wood/coal	35	5.0e-06
ESBL .3	No. 2 fuel oil/Natural Gas	13.8	3.0e-06

To demonstrate compliance with the standard, the Permittee will conduct initial and periodic performance testing on each boiler.

c. Carbon Monoxide (CO)

This facility proposed a CO limits which are consistent with the NC DAQ application guidance.

Boiler ID No.	Fuel	Boiler heat input, mmBtu/hour	CO, ppmvd (corrected to 7% O2)
ESBL .1	Dry wood Coal	35	508 for Wood 133 for Coal
ESBL .2	Dry wood Coal	35	508 for Wood 133 for Coal
ESBL .3	No. 2 fuel oil/Natural Gas	13.8	30

* No. 2 fuel oil has a lower NOx emission limit. The emission limit for natural gas is 66 ppmvd 7% O2.

d. HBCA for HCl

Thomasville requested that they demonstrate compliance with the HCl emission limit using the HBCA eligibility demonstration. NC DAQ agrees with U.S. EPA's risk based approach and is allowing use of the same approach in its implementation of the 112(j) requirements. A summary of the HBCA eligibility demonstration and resulting emissions limitations is provided below.

The wood fired boilers are the only sources for HCl and Cl₂ emissions. The emission factors for HCl and Cl₂ are 1.90e-02 lb/mmBtu and 7.9e-04 lb/mmBtu, respectively.

NC DAQ calculated the HCl-equivalent emissions using the equation given below. The emission rates for HCl and Cl₂ emissions from each boiler using the emission factor(s) in Chapter 1 of AP-42. NC DAQ then summed these emissions and assumed that the would be emitted from the shortest stack height and emitted at the property boundary. The estimated total emissions in pounds HCl-equivalent from the boilers is **6.86** pounds per hour HCl-equivalent in total. The “Allowable Toxicity Weighted Emission Rate Expressed in HCl Equivalents” from Table 15-1 of the NC DAQ application guidance is **114.9** pounds per hour. Since the HCl-equivalent emission is less that the 114.9 pounds per hour in Table 15-1, there are no further requirements and HCl **does not need to be an enforceable emission limit**.

Determination of *Hydrogen Chloride-equivalent (HCl)*:

- i. Hydrogen Chloride-equivalent (HCl): 0.02 lbs/mmBtu. HCl-equivalent is defined by the following equation:

$$E = E_{\text{HCl}} + E_{\text{Cl}_2} * (\text{RfC}_{\text{HCl}} / \text{RfC}_{\text{Cl}_2})$$

Where:

E	=	HCl-equivlent emission rate
E _{HCl}	=	HCl emission rate;
E _{Cl₂}	=	Cl ₂ emission rate;
RfC _{HCl}	=	Reference concentration for HCl (20 µg/m ³); and
RfC _{Cl₂}	=	Reference concentration for Cl ₂ (0.20 µg/m ³).

For coal - NC DAQ calculated the HCl-equivalent emissions using the equation given below. The emission rates for HCl and Cl₂ emissions from each boiler using the emission factor(s) in Chapter 1 of AP-42. NC DAQ then summed these emissions and assumed that the would be emitted from the shortest stack height and emitted at the property boundary. The estimated total emissions in pounds HCl-equivalent from the boilers is **84.3** pounds per hour HCl-equivalent in total. The “Allowable Toxicity Weighted Emission Rate Expressed in HCl Equivalents” from Table 15-1 of the NC DAQ application guidance is **114.9** pounds per hour. Since the HCl-equivalent emission is less that the 114.9 pounds per hour in Table 15-1, there are no further requirements and HCl **does not need to be an enforceable emission limit**.

Determination of *Hydrogen Chloride-equivalent (HCl)*:

- ii. Hydrogen Chloride-equivalent (HCl): 0.02 lbs/mmBtu. HCl-equivalent is defined by the following equation:

$$E = E_{\text{HCl}} + E_{\text{Cl}_2} * (\text{RfC}_{\text{HCl}} / \text{RfC}_{\text{Cl}_2})$$

Where:

E	=	HCl-equivlent emission rate
E _{HCl}	=	HCl emission rate;
E _{Cl₂}	=	Cl ₂ emission rate;
RfC _{HCl}	=	Reference concentration for HCl (20 µg/m ³); and
RfC _{Cl₂}	=	Reference concentration for Cl ₂ (0.20 µg/m ³).

The wood fired boilers (ESBL1 and ESBL2) are the only emission source that emits HCl and Cl₂