

## STATEMENT OF BASIS

For the issuance of Draft Air Permit # 1630-AR-5 AFIN: 16-00275

1. PERMITTING AUTHORITY:

Arkansas Department of Environmental Quality  
5301 Northshore Drive  
North Little Rock, Arkansas 72118-5317

2. APPLICANT:

Thomas & Betts Corporation  
5601 E. Highland Drive  
Jonesboro, Arkansas 72401

3. PERMIT WRITER:

Bart Patton

4. NAICS DESCRIPTION AND CODE:

NAICS Description: Noncurrent-Carrying Wiring Device Manufacturing  
NAICS Code: 335932

5. SUBMITTALS:

11/27/2012 , 12/12/2012, 12/21/2012, 1/17/2013, 1/29/2013, 3/8/2013, 5/21/2013,  
7/1/2013, 9/3/2013, 9/4/2013

6. REVIEWER'S NOTES:

Thomas & Betts Corporation (AFIN: 16-00275) is located at 5601 E. Highland Drive,  
Jonesboro, AR 72401.

In this modification , the following changes were made:

- 1) SN-45 through SN-52 were added.
- 2) SN-13 through SN-16 were removed, with freedom to reuse and re-identify portions of that equipment under SN-45 through SN-52.

Annual emissions changed as follows: PM/PM<sub>10</sub>, + 38.1 tpy; CO, -2.5 tpy; NO<sub>x</sub>, -3.1 tpy;  
and Chromium Trioxide, +0.17 tpy.

7. COMPLIANCE STATUS:

The following summarizes the current compliance of the facility including active/pending enforcement actions and recent compliance activities and issues.

There are currently no enforcement or compliance activities against the facility. The facility was last inspected on 2/20/13 and found to be in compliance.

8. PSD APPLICABILITY:

a) Did the facility undergo PSD review in this permit (i.e., BACT, Modeling, etc.)? N

b) Is the facility categorized as a major source for PSD? N

- *Single pollutant  $\geq 100$  tpy and on the list of 28 or single pollutant  $\geq 250$  tpy and not on list, or*
- *CO<sub>2</sub>e potential to emit  $\geq 100,000$  tpy and  $\geq 100$  tpy/ $\geq 250$  tpy of combined GHGs?*

If yes, explain why this permit modification is not PSD.

9. SOURCE AND POLLUTANT SPECIFIC REGULATORY APPLICABILITY:

Source	Pollutant	Regulation (NSPS, NESHAP or PSD)
None		

10. EMISSION CHANGES AND FEE CALCULATION:

See emission change and fee calculation spreadsheet in Appendix A.

11. NAAQS EVALUATIONS AND NON-CRITERIA POLLUTANTS:

a) NAAQS:

Pursuant to Act 1302 of the Regular Session of the 89th General Assembly of the State of Arkansas, no dispersion modeling was performed by ADEQ because it was not voluntarily proposed and agreed to by the facility. No other information was submitted by the applicant. Criteria pollutants were not evaluated for impacts on the NAAQS.

## b) Non-Criteria Pollutants:

This permit contains a TLV table for non-criteria pollutants. Modeling was used to determine the permitted emission rates for ranges of non-criteria pollutants (grouped by TLV) that pass the PAIL.

Minimum Allowable TLV (mg/m <sup>3</sup> )	Maximum Allowable Single HAP Content (lb/gal) <sup>a</sup>
>290	8.33
290	8.33
278.5	8.00
208.9	6.00
139.3	4.00
69.6	2.00
34.8	1.00
31.3	0.90
27.9	0.80
24.4	0.70
20.9	0.60
17.4	0.50
13.9	0.40
10.4	0.30
7.0	0.20
3.5	0.10

a Chemicals such as HDI (CAS 822-06-0), MDI (CAS 101-68-8), and other low vapor pressure chemicals are not expected to rapidly volatilize and are emitted at a rate of less than 1.0 tpy shall be exempt from this table.

Because Hexavalent Chromium from SN-51 was excluded from the TLV table, the TLV table was not affected by R5 of the permit and was not re-calculated.

1<sup>st</sup> Tier Screening (PAER)

Estimated hourly emissions from the following sources were compared to the Presumptively Acceptable Emission Rate (PAER) for each compound. The Department has deemed the PAER to be the product, in lb/hr, of 0.11 and the Threshold Limit Value (mg/m<sup>3</sup>), as listed by the American Conference of Governmental Industrial Hygienists (ACGIH).

Pollutant	TLV (mg/m <sup>3</sup> )	PAER (lb/hr) = 0.11 × TLV	Proposed lb/hr	Pass?
Hexavalent Chromium* (water-soluble Cr VI compounds)	0.05	0.0055	0.04259	No

2<sup>nd</sup> Tier Screening (PAIL)

AERMOD air dispersion modeling was performed on the estimated hourly emissions from the following sources, in order to predict ambient concentrations beyond the property boundary. The Presumptively Acceptable Impact Level (PAIL) for each compound has been deemed by the Department to be one one-hundredth of the Threshold Limit Value as listed by the ACGIH.

Pollutant	PAIL (µg/m <sup>3</sup> ) = 1/100 of Threshold Limit Value	Modeled Concentration (µg/m <sup>3</sup> )	Pass?
Hexavalent Chromium*	0.50	0.30957 (650 ft/s gas velocity) 0.49194 (200 ft/s)	Yes

\* SN-51's emissions of hexavalent chromium required modeling. The facility reported a stack gas upward velocity of 650 ft/s, based on equipment rating and calculation, not testing. This velocity seems considerably higher than expected (perhaps by an order of magnitude), so modeling was also performed for lower stack velocities (that is, more conservative assumptions). At an emission rate of 0.04258 lb Cr(VI) /hr, at 8,760 operating hours/year, the facility passes modeling for hexavalent chromium with an upward stack gas velocity of at least 200 ft/s. This velocity is still higher than velocities typically reported to the Department and would be best substantiated through testing.

Other Modeling:

No other modeling was required at this time.

12. CALCULATIONS:

SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc)
09, 10	NYSDEC - Estimated Emissions Table A12-C	Gassing Factor = 3% to 5%	None		All HAPs below 1 tpy

SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc)
17, 20, 21, 22, 26, 28, 35, 36, 37	AP-42 Tables 1.4-1,2,3	NO <sub>x</sub> = 100 lb/MMft <sup>3</sup> , etc.	None		Combustion
23, 25, 26, 27, 28, 30, 35, 36, 38	Material Balances and MSDS	100% Evaporation 10% overspray	Baghouse for SN-27 and SN-28		
42	Engineering Estimate	0.2 gr/dscfm @6,700 dscfm	Baghouse	90%	
43	Engineering Estimate	2.43 lb/hr VOC			
45	AP-42, tables 1.4-1, 2, and 3	<b>lb/MMscf</b> 7.6 PM/PM <sub>10</sub> 0.6 SO <sub>2</sub> 5.5 VOC 84 CO 100 NO <sub>x</sub>	Baghouse (SN-52) PM/PM <sub>10</sub> only	98%	0.66553 MMbtu/hr; 1000 MMbtu/MMscf; 8760 op hr/yr
46			None	N/A	2 burners x 1.1942 MMbtu/hr; 1000 MMbtu/MMscf; 8760 op hr/yr
47	11/18/09 test data at Jonesboro site, concentration of Zinc Oxide in fumes in ambient air above kettle before entering collection hood	0.9466 mg ZnO / m <sup>3</sup> air	Baghouse (SN-52)	98%	15,290 cfm, max inlet gas flow to baghouse; included in limits as PM/PM <sub>10</sub>
	AP-42, Table 12.14-2 for Galvanizing, SCC 3-04-008-05	5 lb PM/ton Zinc used	Baghouse (SN-52)	98%	Max input 400 lb zinc/hr; Max input 750 tons zinc/yr; zinc ingots contain 0.03% lead, 0.02% cadmium

SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc)
48	$SA_{\text{exterior of pipe}} = 34.689 \text{ ft}^2$	4 mil (0.004") exterior coating of zinc / pipe; assumed 0.5 mil of coating emitted as PM / pipe	Baghouse (SN-52)	98%	$SA_{\text{exterior}} = 2 \times \text{Pi} \times \text{Outer Radius} \times \text{Length}$ ; $SA_{\text{exterior}} = (6.625'' \text{ OD}) \times (1'/12'') \times (1/2, \text{ convert OD to Outer Radius}) \times 20' \text{ pipe length}$ ; $445.74 \text{ lb/ft}^3$ , density of zinc slab per MSDS; 400 pipes/hr, 8760 hr/yr
48	11/18/09 test data at Jonesboro site, concentration of Zinc Oxide in fumes in ambient air above kettle before entering collection hood	50% of SN-47's $0.9466 \text{ mg ZnO} / \text{m}^3 \text{ air}$	Baghouse (SN-52)	98%	15,290 cfm, max inlet gas flow to baghouse; SN-48 process is some distance away from SN-47's zinc kettle, so 50% of SN-47's tested ZnO is assumed; included in limits as PM/PM <sub>10</sub>
49	$SA_{\text{interior of pipe}} = 31.903 \text{ ft}^2$	4 mil (0.004") interior coating of zinc / pipe; assumed 0.5 mil of coating emitted as PM / pipe	Baghouse (SN-52)	98%	$SA_{\text{interior}} = 2 \times \text{Pi} \times \text{Inner Radius} \times \text{Length}$ ; $SA_{\text{interior}} = (\text{Inner Diameter} = 6.625'' \text{ OD} - (2 \times 0.266'' \text{ wall thk})) \times (1'/12'') \times (1/2, \text{ convert ID to Inner Radius}) \times 20' \text{ pipe length}$ ; $445.74 \text{ lb/ft}^3$ , density of zinc slab per MSDS; 400 pipes/hr, 8760 hr/yr

SN	Emission Factor Source (AP-42, Testing, etc)	Emission Factor and units (lbs/ton, lbs/hr, etc)	Control Equipment Type (if any)	Control Equipment Efficiency	Comments (Emission factor controlled/uncontrolled, etc)
50	AP-42, tables 1.4-1, 2, and 3	<b>lb/MMscf</b> 7.6 PM/PM <sub>10</sub> 0.6 SO <sub>2</sub> 5.5 VOC 84 CO 100 NO <sub>x</sub>	None	N/A	1.76 MMbtu/hr; 1000 MMbtu/MMscf; Vol. limit of 2,190 op hrs/yr
51	Heat transfer Calculation (hot pipe dipped in solution, CrO <sub>3</sub> vaporized)	3.216 lb solution vaporized/hr; solution is 0.49% chromic acid in water	None	N/A	Assumed SA <sub>pipe</sub> = 2 x SA <sub>exterior</sub> = 69.38 ft <sup>2</sup> ; 0.2859 lb soln lost/pipe x max throughput 4240 lb steel/hr / 377 lb steel/pipe = 3.216 lb soln/hr; 1 lb soln/8.34 gal x 0.0049 chromic acid / 1 gal soln x 1 gal/ft <sup>3</sup> x 168.59 lb/ft <sup>3</sup> chromic acid; vol. limit of 2,920 gal soln added to tank/yr (= 8 gal soln lost max/day x 365 days/yr)
52	Baghouse at SN-45, 47, 48, and 49				
02	Removed at R1				
06, 07	Removed at R2				
11, 12	Added to SN-13 at R3				
18, 19, 20, 29, 30, 39, 40	Removed at R3				
05, 08, 24, 31, 32, 33, 34, 41, 44	Removed at R4				
13	Replaced by SN-45 at R5				
14	Replaced by baghouse at R5				
15,16	Replaced by SN-46 at R5				

Sources not affected at R5 were not recalculated. However, sources removed at revisions before R5 were moved to separate lines as “Removed,” “Replaced,” or “Added to” entries.

SN-51's chromium emissions occur because a heated section of pipe is quenched in a solution of 0.49% chromic acid in water. Periodically, more chromic acid must be added to the tank. It is believed that most of the chromic acid is lost by "drag-out" losses, the liquid present on the pipes when they are removed from the tank, but some amount is lost through evaporation also. The pipes are approximately 250° F when quenched and approximately 150° F afterward, so some of the solution, including some of the chromium, is being vaporized. The facility submitted an analysis of the heat loss, to quantify the chromium emissions.

13. TESTING REQUIREMENTS:

The permit requires testing of the following sources.

SN	Pollutants	Test Method	Test Interval	Justification
51	N/A; Test for vertical gas exit velocity			Required to substantiate air dispersion modeling (Non-criteria pollutant strategy)

14. MONITORING OR CEMS:

The permittee must monitor the following parameters with CEMS or other monitoring equipment (temperature, pressure differential, etc.)

SN	Parameter or Pollutant to be Monitored	Method (CEM, Pressure Gauge, etc.)	Frequency	Report (Y/N)
None				

15. RECORDKEEPING REQUIREMENTS:

The following are items (such as throughput, fuel usage, VOC content, etc.) that must be tracked and recorded.

SN	Recorded Item	Limit (as established in permit)	Frequency	Report (Y/N)
Plantwide	Coatings and Solvent usage; VOC contribution from natural gas combustion	99.0 tpy VOC	Monthly	N
		9.9 tpy Single HAP 24.9 tpy Combination HAP	Monthly	N
46, 47	Zinc throughput	750 tons throughput per year	Monthly	N



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SN	Recorded Item	Limit (as established in permit)	Frequency	Report (Y/N)
50	Operating hours	2,190 operating hours per year	Monthly	N
51	Chromic acid usage	2920 gallons per year of 0.0049% Cr solution	Monthly	N

16. OPACITY:

SN	Opacity %	Justification (NSPS limit, Dept. Guidance, etc)	Compliance Mechanism (daily observation, weekly, control equipment operation, etc)
01, 09, 10, 23, 24	20%	§18.501. These are uncontrolled sources, or low efficiency controls, such as paint filters.	Inspector's Observation
All other sources	5%	§18.501	Inspector's Observation

17. DELETED CONDITIONS:

Former SC	Justification for removal
	None

18. GROUP A INSIGNIFICANT ACTIVITIES:

Source Name	Group A Category	Emissions (tpy)						
		PM/PM <sub>10</sub>	SO <sub>2</sub>	VOC	CO	NO <sub>x</sub>	HAPs	
							Single	Total
Injection Molding	A-13							
Warming Ovens	A-13							
Chemical Recovery Room Centrifuge Exhaust	A-13							
Chemical Mix Process Exhaust	A-13							
Pipe Primer Pre-Heat	A-13							
Inside Pipe Blow-Out Booth No. 1 and No. 2	A-13							

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19. VOIDED, SUPERSEDED, OR SUBSUMED PERMITS:

List all active permits voided/superseded/subsumed by the issuance of this permit.

Permit #
1630-AR-4

20. CONCURRENCE BY:

The following supervisor concurs with the permitting decision.

\_\_\_\_\_  
Paula Parker, P.E.

APPENDIX A – EMISSION CHANGES AND FEE CALCULATION

## Fee Calculation for Minor Source

Revised 08-26-13

Facility Name: Thomas & Betts  
 Corporation  
 Permit Number: 1630-AR-5  
 AFIN: 16-000275

			Old Permit	New Permit
\$/ton factor	23.42	Permit Predominant Air Contaminant	194.75	194.75
Minimum Fee \$	400	Net Predominant Air Contaminant Increase	0	
Minimum Initial Fee \$	500			
Check if Administrative Amendment	<input type="checkbox"/>	Permit Fee \$	400	
		Annual Chargeable Emissions (tpy)	194.75	

Pollutant (tpy)	Old Permit	New Permit	Change
PM	39.6	77.7	38.1
PM <sub>10</sub>	39.6	77.7	38.1
SO <sub>2</sub>	2.1	2.1	0
VOC	99	99	0
CO	12.8	10.3	-2.5
NO <sub>x</sub>	19.5	16.4	-3.1
Single HAP	9.9	9.9	0
Total HAP	24.9	24.9	0
Acetone	194.75	194.75	0