

**DEPARTMENT OF ENVIRONMENTAL QUALITY  
AIR QUALITY DIVISION  
ACTIVITY REPORT: Scheduled Inspection**

N681842667

FACILITY: Linn Products Inc		SRN / ID: N6818
LOCATION: 1200 Lipsey Drive, CHARLOTTE		DISTRICT: Lansing
CITY: CHARLOTTE		COUNTY: EATON
CONTACT: Mark Korienek , Maintenance/Tooling Manager		ACTIVITY DATE: 11/28/2017
STAFF: Michelle Luplow	COMPLIANCE STATUS: Compliance	SOURCE CLASS: MINOR
SUBJECT: Scheduled, unannounced compliance inspection to determine compliance with PTI 141-00A.		
RESOLVED COMPLAINTS:		

Inspected by: Michelle Luplow (author)  
Other AQD Staff Present: Sue Thelen, Permits Section

Personnel Present: Joe Kolwick, General Manager ([jkolwick@linnproducts.net](mailto:jkolwick@linnproducts.net))

Other Personnel Involved in Compliance Process:

Mark Korienek, Maintenance/Tooling Manager ([mkorienek@linnproducts.net](mailto:mkorienek@linnproducts.net))  
Biplab Roy, Director & Lead Consultant, Advanced Matrix Inc.

**Purpose:**

Conduct an unannounced, scheduled compliance inspection of Linn Products. A complaint was received June 7, 2017 wherein the complainant stated the air was burning his eyes, and irritating his throat, and the symptoms have gotten worse during the 1.5 years he has lived at 1022 Tumbleweed (see attached map), which is located approximately 1 mile WSW of both Linn Products and Charlotte Anodizing Products, the only facilities located within the vicinity of this complainant. While the source of the alleged air irritants could not be determined based on the information the complainant provided, I told the complainant I would inspect these facilities and check for odors and physical irritations when in the area. This inspection was conducted in part as a response to this complaint. I detected no odors nor experienced any physical symptoms while in this area for the inspection. An unofficial copy of the complaint report is attached. This inspection in no way associates the alleged health affects with Linn Products' production, but is merely a demonstration that Linn Products is in compliance with all permitted air quality requirements, and therefore less likely to be the source associated with the complaint.

Linn Products was last inspected October 2014.

**Facility Background:**

Joe Kolwick, General Manager, said Linn Products is an aluminum etching facility composed of 2 plants. He said 65% of the business is acid and base-etching, and anodizing (metal treatment) of aluminum power sunroof tracks for various automobile manufacturers, including Toyota and GM; 15% of the business is for metal treatment for the architectural (conveyors, hinges, etc) industry, and the remaining fraction is for miscellaneous parts. They operate 2 10-hour shifts, 4 days per week. There are occasions when a 5<sup>th</sup> day is worked.

J. Kolwick said Linn Products took ownership of the building that currently houses Plant 2 of their facility in late 2014, soon after the last inspection was conducted. It is used solely for parts assembly, QA/QC, wrapping and packaging parts, and warehouse of the parts. Plant 1 contains all permitted equipment and is source of all air emissions.

J. Kolwick verified that Linn Products does not currently have any emergency generators or boilers installed.

**Inspection:**

Sue Thelen and I arrived at Linn Products at approximately 10:00 a.m. November 28, 2017 and met with Joe Kolwick, General Manager. Mark Korienek, Maintenance and Tooling Manager, was not available, but would be the main contact for future air inspections. I provided J. Kolwick with a January 2017 Permit to Install Exemptions handbook.

M. Korienek said that the entire scrubber system for both the anodizing and etching processes, including the stacks, was replaced approximately 6.5 years ago. The original, permitted packed bed scrubbed systems for both EUETCHSTRIP and EUALANODIZING were replaced with composite mesh pads. M. Korienek said these changes were done to accommodate the added volume associated with the installation of an acid etch tank that occurred approximately 4.5 years ago in early 2012. He said that the ERM consulting firm in Grand Rapids worked closely with Linn Products to ensure that the new scrubber system was sufficient for handling the additional tank. The additional tank is used for a hydrofluoric acid etch process for the cosmetic appeal of the aluminum parts.

I have requested exemption demonstrations be conducted (including Rule 278/278a demonstrations) for the following changes at this facility: an exemption demonstration for the addition of the HF etch tank; an exemption demonstration for the replacement of the packed bed scrubber systems with the composite mesh pads (CMP) systems; and an exemption demonstration for controlling the HF etch tank emissions with the same control equipment that services EUETCHSTRIP and EUALANODIZING. The demonstrations will be provided by consultant, Biplab Roy, by January 15, 2018.

Table 1 contains a list of all permitted and exempt equipment which I identified during the inspection. Evaluation of exempt equipment is also presented in this table.

**Table 1.** Equipment located onsite

Unit	Description	Control	PTI/Exemption
EUALANODIZING	3 aluminum anodizing tanks containing H <sub>2</sub> SO <sub>4</sub>  Originally permitted with packed bed scrubber control	Composite mesh pads  (Enforcer III)	PTI 141-00A
EUETCHSTRIP	Aluminum etch and strip tanks containing a caustic, NaOH solution	Composite mesh pads (MW-300)	PTI 141-00A
HF Etch Tank	Treating aluminum parts for cosmetic purposes/a component of the permitted etching process	NA	TBD
Parts Washer  (located in tool shop)	Safety Kleen solvent (100% petroleum distillates)  Operating instructions present  Lid was open, not being used. J. Kolwick said he would add a label to cleaner reminding personnel to close lid when not in use  Surface area is less than 10 ft <sup>2</sup>	NA	Rule 281(2)(h)
2 Aluminum extruders	Used to form the aluminum billets into profiles	NA	Rule 285(2)(l)(i)
2 natural gas-fired aging ovens	Rated at 10 MMBtu/hr (3-chambered oven) and 1 MMBtu/hr (oven #13).  They are used for heat-treating aluminum parts	NA	Rule 282(2)(a)(i)
Cutting saws for aluminum	Saws used to cut lengths of aluminum billets.  Aluminum shavings/particulate captured from this process are collected and sold back to the billet company to remelt and make new aluminum billets	In-plant baghouse  (not exhausted to atmosphere)	Rule 285(2)(l)(vi)(B)
20+ Presses	Used to form aluminum via bending/shaping	NA	Rule 285(2)(l)(i)

**PTI 141-00A**

Permit for 3 aluminum anodizing tanks containing H<sub>2</sub>SO<sub>4</sub> (EUALANODIZING), and aluminum etch and strip tanks containing NaOH (EUETCHSTRIP). The emissions from these processes are controlled by their own separate scrubber systems. The

permit describes the scrubber systems as packed bed scrubbers; however, Linn Products has replaced the packed bed scrubbers with composite mesh pads (CMP) for the EUALANODIZING scrubber (Enforcer III) and for the caustic EUETCHSTRIP tanks (MW-300). The pending exempt HF etch tank is also part of the etching process.

J. Kolwick said that all parts are etched before they are anodized.

**Etching Process:**

Alkaline cleaner → Deionized water rinse → Acid Etch (HF etching) or Caustic Etch (NaOH)

**Anodizing Process:**

Anode Rinse → 2-step tin application (fills pores) or black organic dye → Nickel seal → Deionized water rinse → Air dry

**EUALANODIZING**

*There are no Emission Limits for this unit at this time.*

*Process/Operational Limits & Recordkeeping*

Linn Products is required to ensure that no more than 7200 square feet per hour be processed through the anodizing equipment and records are required to be kept for the amount of parts treated per hour in square feet. M. Korienek said that the most each rack hold is 1000 square feet and Linn Products has the capability of treating a maximum of 6 racks per hour; therefore, on any given day, Linn Products would never exceed 6000 square feet per hour. Currently J. Kolwick said they push 4-5 racks per hour. M. Korienek provided me with records from January 2016 through October 2017. These records cover both EUETCHSTRIP and EUALANODIZING as all parts that are processed through EUETCHSTRIP are also processed through EUALANODIZING. He calculated square footage per hour by dividing by 20 (two 10-hour shifts). None of the operational days exceeded 7200 square feet per hour. Linn Products is in compliance with Special Condition (SC) 1.1 as well as SC 1.6 for keeping records on file of the amount of parts treated per hour. Attached are the square footage records.

*Equipment & Monitoring*

SC 1.2 requires that the scrubber system for EUALANODIZING be operated according to manufacturer's specifications for the pressure drop and liquid flow rate. M. Korienek provided me with Midwest Air Products (MAPCO) Preventative Maintenance Report which provides the type of maintenance and frequency that the maintenance is required to be conducted: weekly, monthly and annual inspections are required. M. Korienek, upon my request, provided me with the weekly and monthly maintenance records for June 2017. The required weekly and monthly inspections were conducted for June for all appropriate manufacturer-required maintenance activities. In addition to these maintenance procedures, M. Korienek said that water flow for washdowns on the CMP system are controlled by an electronic timer, where the manufacturer recommends 6 wash downs at 30-second intervals over a period of 24 hours. He said they are currently running 12 wash downs per day and that each wash down requires 70 gpm. The manufacturer's acceptable wash down range is 60 – 80 gpm.

SC 1.3 requires that the scrubber system for EUALANODIZING be equipped with a pressure drop indicator and liquid flow indicator. This condition is reflective of the old system (packed bed scrubber system) that was in place when Linn Products was first permitted for this unit. M. Korienek explained that the new scrubber system, the CMP with mist eliminator, does not require a constant flow of water and therefore the liquid flow indicator and its associated alarm no longer apply (presuming that the pending exemption demonstrations allow for replacement of control equipment with equal or greater control efficiency), per SC 1.4. He said there are 4 stages in the CMP system. Each stage has an increasingly smaller micron mesh. Stages 1 – 3 are used for ensuring there are no malfunctions within the system, such as plugging: these stages measure pressure drop across individual phases for maintenance and troubleshooting purposes. The 4<sup>th</sup> stage measures the overall pressure drop across the CMP, and what is used to ensure the CMP is operating properly.

*Monitoring*

SC 1.4 requires that the pressure drop of the scrubber be monitored at least once per week. M. Korienek said that the Enforcer III scrubber has a nameplate allowable pressure drop range of 1" – 5" w.g. at Stage 4 of the scrubber. He said they monitor the pressure drop once per week. Although the permit does not require pressure drop records be kept, M. Korienek provided me with pressure drops for the anodizing (acidic) process for January 2016 – November 29, 2017, attached. During the inspection I recorded the pressure drop at each stage, seen in Table 2. According to records and onsite investigation Linn Products has maintained the Stage 4 pressure drop within the 1" – 5" w.g. range, as recorded on a weekly basis.

**Table 2.** Anodizer acid mist eliminator (inches of H<sub>2</sub>O) 11/28/17

Stage 1	Stage 2	Stage 3	Stage 4
1.1	1.8	0	3.0

*Stack/Vent Restriction*

The required stack height for the EUALANODIZING scrubber is 25 feet above ground level. M. Korienek reported via email that the new stack height for the scrubber is 33.5 feet.

Linn Products is in compliance with all EUALANODIZING requirements at this time.

### **EUETCHSTRIP**

#### *Emission Limits*

EUETCHSTRIP is limited to 0.3 lb/hr NaOH, where testing is only required if requested by the Department. At this time, it is my professional judgment that performance tests are not necessary for determining compliance with the NaOH limit at this time.

#### *Process/Operational Limits & Recordkeeping*

Linn Products is required to ensure that no more than 7200 square feet per hour be processed through the etching equipment and records are required to be kept for the amount of parts treated per hour in square feet. As discussed under the EUALANODIZING section of this report, the hourly production rate for EUETCHSTRIP is the same as the rates reported for EUALANODIZING, as all parts that are processed through EUETCHSTRIP are also processed through EUALANODIZING. M. Korienek calculated square footage per hour by dividing by 20 (two 10-hour shifts). None of the operational days exceeded 7200 square feet per hour. Linn Products is in compliance with SC 2.1 as well as SC 2.6 for keeping records on file of the amount of parts treated per hour. Attached are the square footage records.

#### *Equipment & Monitoring*

SC 2.2 requires that the scrubber system for EUETCHSTRIP be operated according to manufacturer's specifications for the pressure drop and liquid flow rate. M. Korienek provided me with Midwest Air Products (MAPCO) Preventative Maintenance Report which provides the type of maintenance and frequency that the maintenance is required to be conducted: weekly, monthly and annual inspections are required. M. Korienek, upon my request, provided me with the weekly and monthly maintenance notes for June 2017. The required weekly and monthly inspections were conducted for June for all appropriate manufacturer-required maintenance activities.

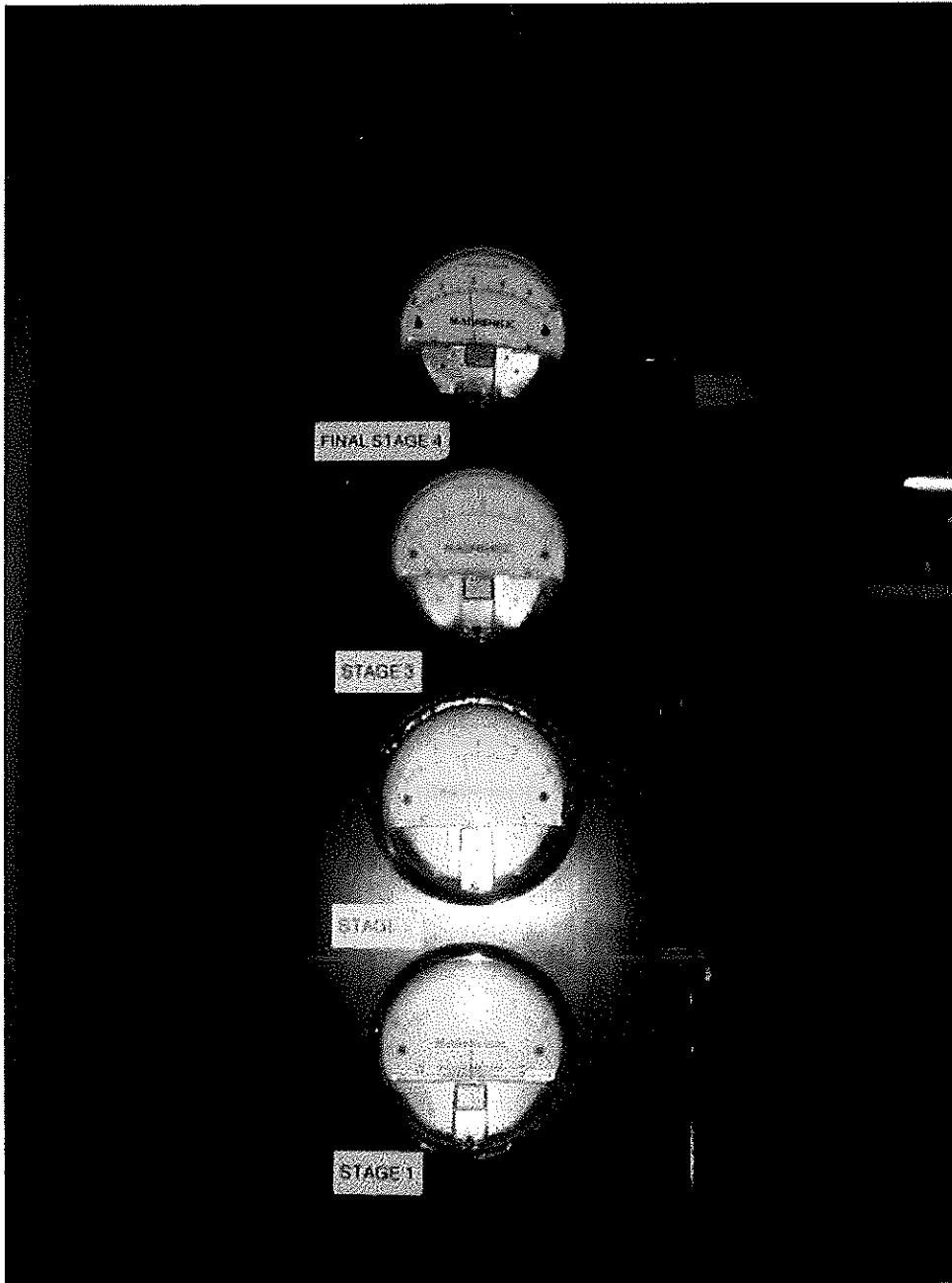
SC 2.3 requires that the scrubber system for EUETCHSTRIP (MW-300) be equipped and maintained with pressure drop and liquid flow indicators. This condition is reflective of the old system (packed bed scrubber system) that was in place when Linn Products was first permitted for this unit. M. Korienek explained that the new scrubber system, the 2-stage CMP, still requires a constant flow of water to be properly operated, and therefore the liquid flow indicator and its associated alarm requirement still applies to this control equipment. There is a liquid flow indicator and 2 pressure drop gauges for this unit. The liquid flow indicator was clouded with water scale and I was not able to read the liquid flow rate during the inspection. I explained to M. Korienek that this should be cleaned so that during future inspections I am able to read the monitor to verify that the flow meets manufacturer's specifications. M. Korienek said that the system is due mid-January for cleaning and that they plan to clean the equipment, including the liquid flow indicator. I found this to be acceptable. He said that Linn Products mostly relies on the alarm system (audible and visual, which is required under SC 2.5) to let them know when the flow of water has dropped below the acceptable minimum of 44 gpm (the operating range is 44-88 gpm). He said the alarm has gone off a few times within the past year.

Linn products is also required to monitor the pressure drop across the control system at least once per week. M. Korienek said that the MW-300 scrubber has a nameplate allowable pressure drop range of 1" – 4" w.g. During the inspection I recorded a pressure drop of 2.8 inches w.g. He said they monitor the pressure drop once per week. Although the permit does not require pressure drop records be kept, M. Korienek provided me with weekly pressure drop readings for January 2016 – November 29, 2017, attached. Per review of these records, Linn Products has maintained pressure drops for the scrubber within manufacturer's specifications for the majority of the time; for the week of 5/8/17 and 7/3/17, pressure drops were recorded at 0.2 and 0.8 inches w.g., respectively. Although these are below the manufacturer's recommended operating range, they appear to have been corrected by the following week's readings and it is therefore my professional judgment that Linn Products is consistently operating this control device properly.

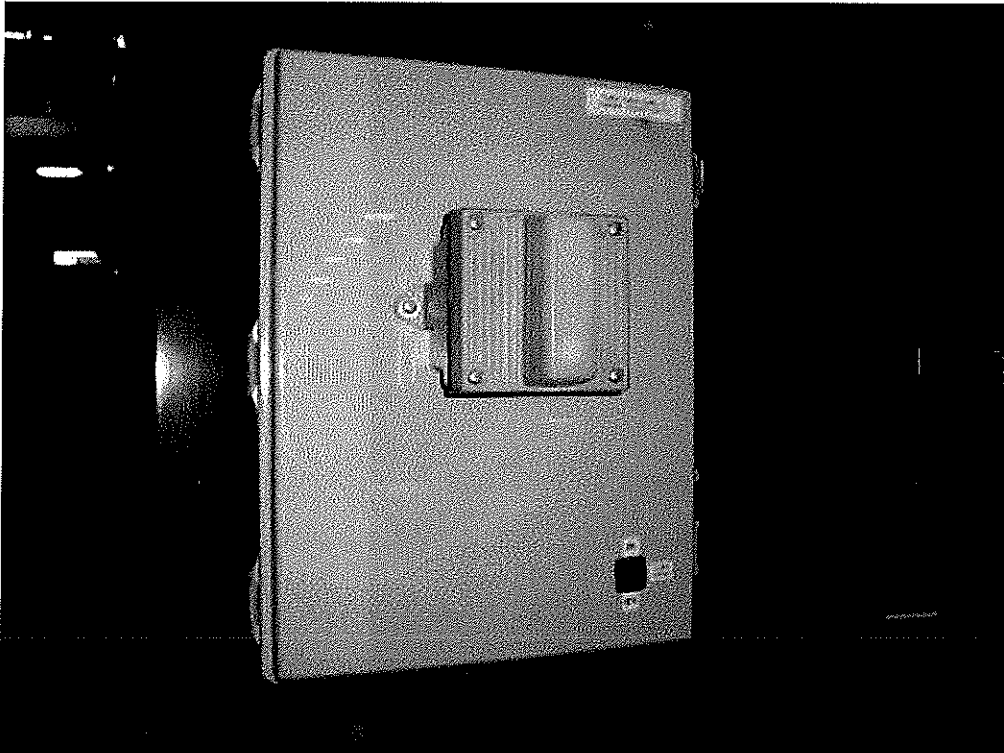
#### *Stack/Vent Restriction*

The required stack height for the EUETCHSTRIP scrubber is 26 feet above ground level. M. Korienek reported via email that the new stack height for the scrubber is 35.25 feet above ground level.

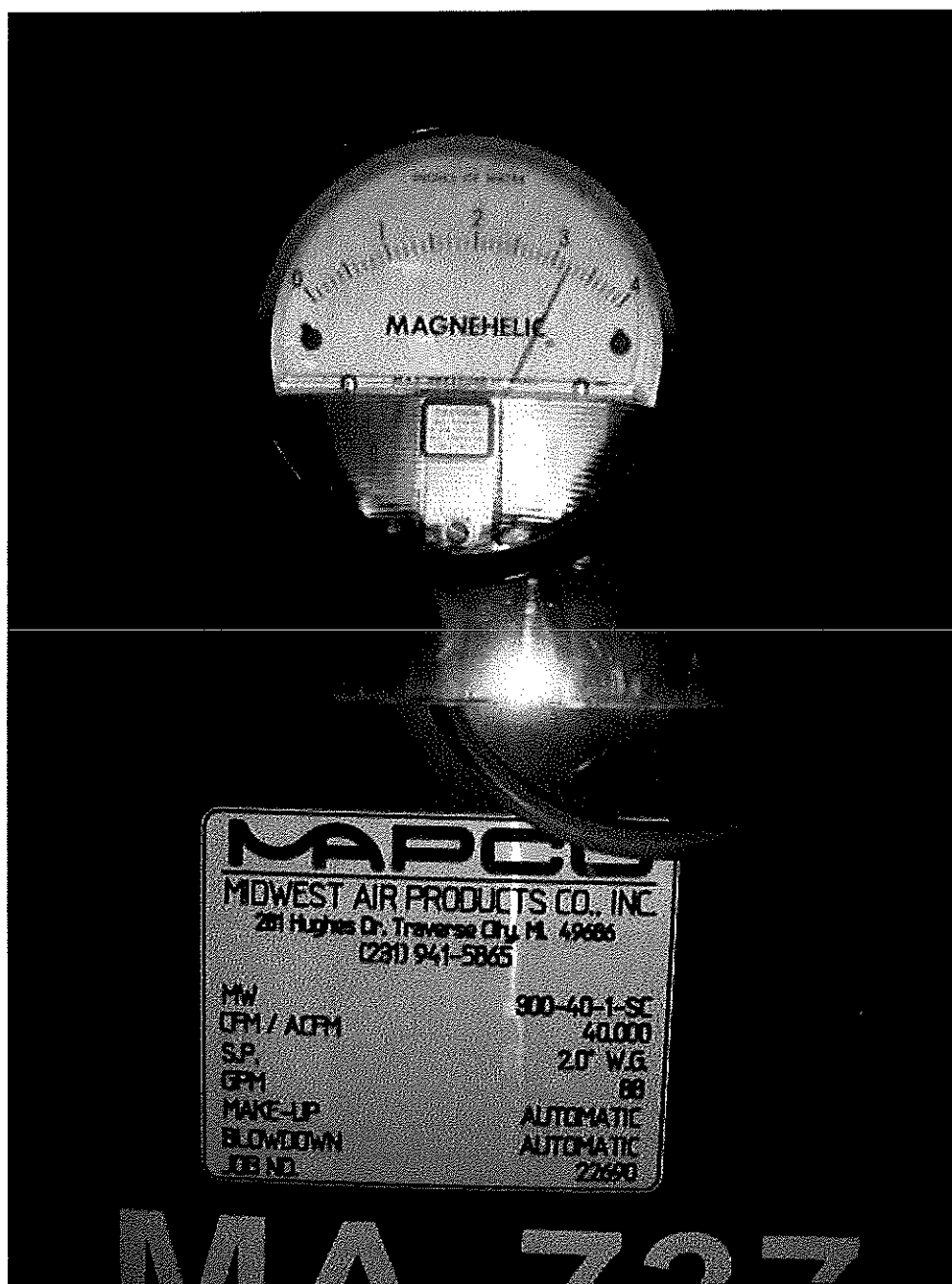
**Compliance Statement:** Linn Products is in compliance with PTI 141-00A at this time. Complete compliance will be determined after exemption demonstrations have been submitted.



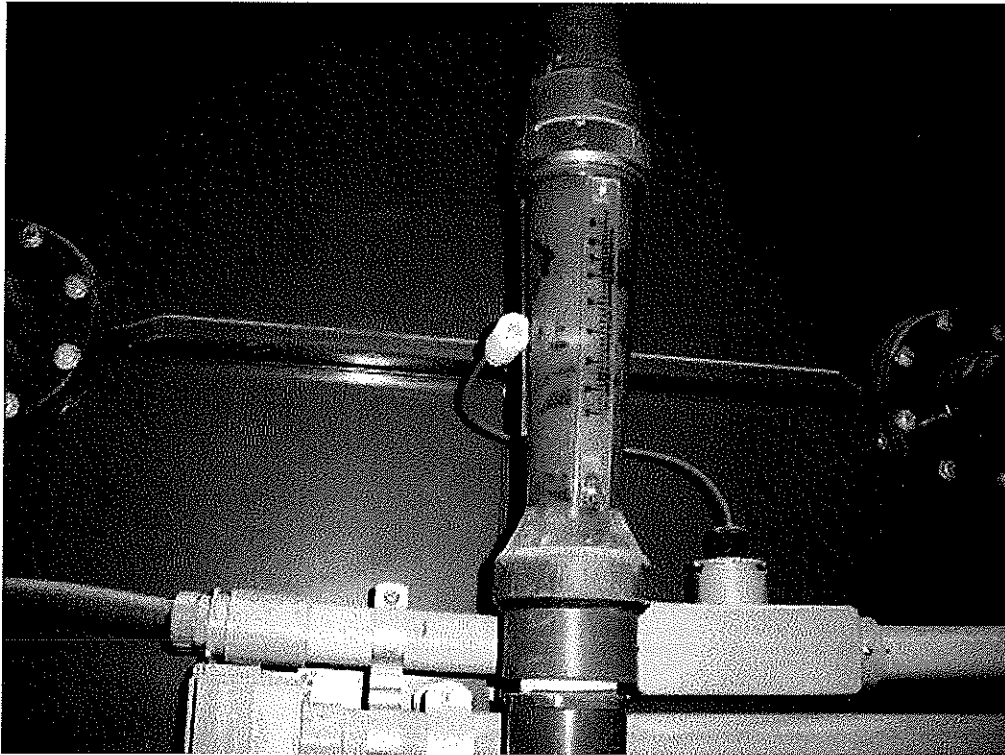
**Image 1(EUALANODIZING CMP) :** Pressure drop gauges for each stage of CMP for EUALANODIZING. Photo provided by M. Koriemek



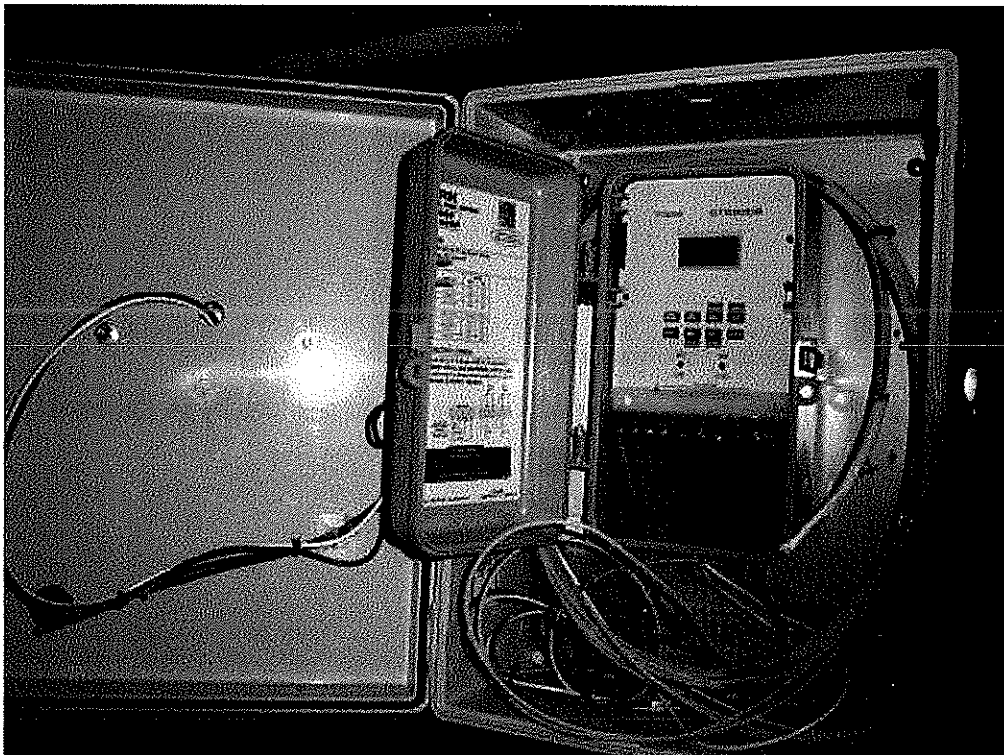
**Image 2(Liquid Flow Alarm)** : For EUETCHSTRIP - audible and visual alarm for liquid flow rate. Photo provided by M. Korienek



**Image 3(EUETCHSTRIP dp) :** EUETCHSTRIP Pressure drop monitor gauge. Photo provided by M. Korienek



**Image 4(Liquid Flow Meter)** : for EUETCHSTRIP. Note scale on inside of monitor. Photo provided by M. Korienek



**Image 5(CMP Timer)** : Water washdown electronic timer for EUALANODIZING CMP control equipment. Photo provided by M. Korienek



NAME M. M. Lewis

DATE 1/3/18

SUPERVISOR B.M.

