

Wrexham Lead Melting Emissions Failure Investigation**DATE :** 14th January 2015**AUTHOR:** Derick Forsyth (Health, Safety & Environment Manager)**REFERENCE:** Lead Melting –Environmental Permit YP3732LZ**SITE:** Prysmian Cables & Systems Ltd
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LL13 9PH**ABSTRACT:**

The monitoring of the stack emissions from the lead melting process at Wrexham carried out at the end of November 2014 and reported in January 2015 showed that the emissions failed to meet the permit conditions for both Lead and particulate. The process had been stopped over the New-year period and the filter and duct contractors were requested to attend to determine if the abatement system was operating correctly.

The filter unit was determined to be operating in accordance with the manufacturer's specification but the opportunity was taken to clean the system and replace the filters.

The ductwork was of a rolled construction and the spiral joints were found to be a trap for dust which could be disturbed during movement of the pipe during monitoring. Thus it was concluded to exchange this section of duct for one of a smooth construction. The monitoring port was removed from the old duct and re-fitted into the new in the same relative position. The overall design of the abatement system remains unchanged.

The process will now be started up and a set of monitoring results obtained as soon as practicable.

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Wrexham Lead Melting Emissions Failure Investigation**1.0 INTRODUCTION**

This document details the investigation and corrective actions taken following a failure to comply with the permit emission conditions.

2.0 BACKGROUND

The sampling of the Lead melting pot emissions was reported on 5th January 2015 and showed that the stack emissions failed to meet the permit conditions as detailed below:

Attribute	Permit Limit	Measured value	Units
Lead	0.1	0.15	mg/m ³
Particulate	1.0	1.341	mg/m ³

3.0 INVESTIGATION

On 7th January 2015 the Kemper Abatement filter system and ducting was inspected and serviced as part of the corrective action plan following the failure to meet the permit emission requirements. The servicing of the filter system was carried out by an engineer from the manufacture of that equipment.

During the servicing of the machine, the filtration cabinet was broken down to its component parts and checked for operational competency. During the work the filters were exchanged for new. The old filters were found to be in good condition. However, it is considered to be good practice to change the filters as part of the complete service for the machine.

The Silencer fitted on the exit flow of the machine was inspected for operational condition and was found to be in good condition. The silencer is in-built to the LEV pipe work, and the Kemper engineer decided to vacuum clean the filter to remove any residual particles.



Internal picture of
silencer

All waste from the servicing of the Kemper system was removed as hazardous (as per local procedures), including the filters and hoover bag used during the service of the machine.

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The LEV exhaust flue from the Kemper system was opened and inspected by the original installation contractor: Isaac's Ltd. The pipe was of a rolled construction which has ridges running along its length, and it was considered that these could be a catch for dust build up in the area used for the monitoring measurements. When the pipework was opened it was found that the original theory concerning the pipework being a trap for dust was founded. There was a small ridge that was found at the lowest point of the internal pipe which looked consistent with dust. This was vacuum cleaned.

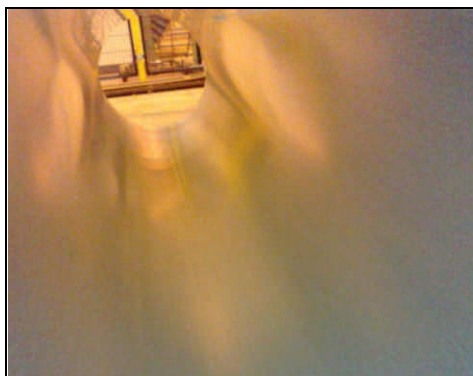
Internal pictures of old pipework and ridge – note some residue from removal process



4.0 CORRECTIVE ACTION

The inspection had shown that dust could become trapped in the section of pipe used for the monitoring and possibly give variable readings and so it was concluded to replace this section of pipe with one of a smooth design which will allow a clear flow of air and assist in avoiding build-up of dust over an elongated period of time. The replacement pipe was of the same aperture dimension as the previous pipe and the connection between the old and new pipe work is a sealed flange and with compression bolts.

Internal picture of new pipework

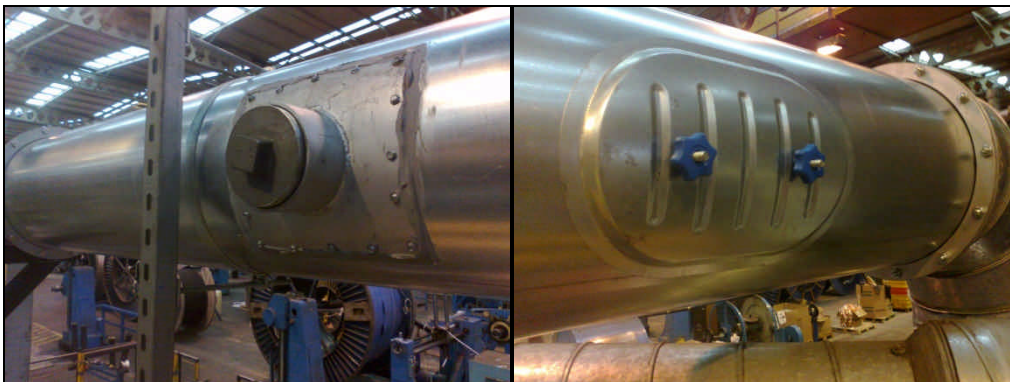


Flange connection

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The emissions sample port was removed from the old pipe and fitted into the new pipework. Also fitted into the new length of pipe is a service hatch which will allow for inspection of the internal pipework and, if required, the top of the Kemper system.

Sample port located in new pipework



New inspection hatch

Picture of new pipework in position



5.0 CONCLUSION

The service of the Kemper filter unit did not find any irregularities with the system, and the unit was confirmed to be operating within the manufacturer's specifications. As there has been no change to the operation of the lead crucible and the filter system is working within the manufacturer's specification it was concluded that the small build-up of dust within the spiral ridges of the monitoring duct section could be an issue during monitoring. This dust could be disturbed by movements of the pipe during the measurement process and give erroneous readings of the emissions. Thus this section of pipe has been exchanged for one of a smooth design. However, the filtration and duct pipework configuration remains the same as the original installation as shown in the above photo.

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It is envisaged that the remedial action undertaken on the exhaust flue should ensure that the monitoring data complies with requirements of the permit. This will be confirmed through another Stack emission sample at the earliest opportune date.

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