REMOVAL OF WATER CONDENSATE APPLICATION NOTE

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Preface

This Application Note outlines techniques/methods for the removal of water condensate from the sampling pipes prior to entering the VESDA/VESDA-E detector.

- That are hot and humid
- Where the sampling points and VESDA/VESDA-E detector are installed in different temperature zones; or
- Where regular wash-down activities are performed in the protected zone

Related Products

VESDA VLI, VLF, VESDA-E VEP, VEU and VES.

Contents

1 Introduction

Water condensation is a naturally occurring phenomenon that denotes the change of the physical state of water from the gaseous (vapor) to the liquid phase.

Water vapor will condense onto a surface when the temperature of the surface is at or below the dew point temperature of the water vapor. Similarly, the sampled air will condense onto the pipe surface when the temperature of the pipe surface is at or lower than the dew point temperature of the sampled air. Water condensation would normally occur under the following conditions:

- The air in the protected zone is warm and humid whereas the ambient temperature of the sampling pipes close to the detector is lower than the protected zone.
- Wash-down activities are performed in the protected zone and water vapour enters the sampling pipes.

Water condensate must be removed from the sampling pipes prior to entering the VESDA/VESDA-E detector to ensure reliable detector performance.

2 Water Condensate Prevention – Chemical Filter

One method of ensuring water condensate does not enter the VESDA/VESDA-E detector is by preventing it from occurring. This is accomplished by lowering the humidity of the sampled air with an in-line chemical filter container that houses moisture adsorbent media (i.e. silicone gel) and is located in close proximity upstream the VESDA/VESDA-E detector.

Figure 1 shows the chemical filter that is filled with the moisture adsorbent media. For further information, refer to the VESDA/VESDA-E Chemical Filter for Corrosive Environments Application Note (Document No. 14888).

(i) 10” Standard Filter Housing

(ii) Refillable Cartridge for 10” Standard Filter Housing

Figure 1: Chemical Filter Assembly

The efficiency of the chemical filter to reduce the humidity of the sampled air is related to the residence time of the sampled air within the media bed and the temperature and humidity of the sampled air. The manufacturer of the moisture adsorbent media should be consulted with regards to the VESDA/VESDA-E system operating parameters (i.e. pipe flowrate, sampled air temperature, humidity, area and depth of the chemical media).

Important Note!

The moisture adsorbent media must not support bacterial or fungal growth and must be non-toxic and non-hazardous.

Following the installation of the chemical filter or replacement of the filter foam element and chemical media, smoke tests must be conducted to ensure system performance (e.g., smoke detection performance and transport time) is maintained. It is recommended that smoke tests be conducted with the chemical filters on a monthly basis until the next media replacement schedule.

The service interval for the chemical media should follow the manufacturer's instructions. Some manufacturers (i.e. Purafil[1]) offer laboratory analysis to establish the life cycle of the chemical media and hence determine the replacement interval for different operating conditions. A visual check for discoloration of the chemical media can also be used as an indicator for replacement (manufacturer instructions should be followed when adopting this approach).

Important Note!

Monitoring the airflow should not be used as an indicator of chemical filter loading.

3 Water Condensate Removal – Water Trap

In case water condensate has already formed inside the sampling pipe it must be prevented from flowing into the VESDA/VESDA-E detector. This is accomplished with a water trap located in close proximity upstream the VESDA/VESDA-E detector.

The water trap consists of a vertical 0.5m (1.6ft) clear plastic tube (to allow visibility of the water level) connected to the sampling pipe with a Tee junction with a valve at the end to allow the discharge of water (Figure 2). It is recommended the VESDA/VESDA-E detector be mounted in the inverted orientation to prevent any flow of water into the detector.

Important Note!

The water trap must be placed at the lowest point in the pipe-sampling network (i.e., below the VESDA/VESDA-E detector).

Figure 2: Water Trap Arrangement

The maintenance interval will depend on the humidity level of the sampled air. Following installation, weekly inspections should be performed to assess the water level in the clear pipe and determine the maintenance regime applicable to the environmental conditions of the protected area.

Water should not be allowed to overflow in the sampling pipe. Should this occur the detector will issue a low flow fault.

[1] Purafil: http://www.purafil.com

Important Note!

The valve must be firmly shut after water discharge to ensure reliable detector operation. Normally an open valve will signal a high airflow fault condition.

4 Further Support

Contact an Xtralis office or distributor for further information.

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