

## Standard Operating Procedure

### Grays\_SOP0011\_Inspection of Sulphuric Acid System used in the air washer

The objective of this procedure is to define the safety requirements as well as detail the inspections of the sulphuric acid system used in the air washer .

#### Document Control

Version Number: 0.1

Date: 14/02/2017

Reviewer name and role: AAG

Authorised by: AB

Comments:

#### Definitions and task description

The air washer is used to purify the air from the drier and evaporator from ammonia, odour and fine particles.

The dirty air is blown through the filter package of the washer. There is a continuous flow of a large amount of acidified water through the filter package that binds the ammonia into a salt.

As soon as the measuring and control system of the washer notices that a certain conductivity limit has been reached, signalling the end of the cleaning function, the system will automatically drain to remove the salts that were formed.

The washer features a system for the supply of chemicals and clean water, as well as a completely automated measuring and control system.

During operation two tasks are required

1. Refilling the sulphuric acid tank as it gets used (See Method statement for filling the tanks)
2. cleaning of the filter packages and water tank (see process section of this SOP)

The pipeline used to pump sulphuric acid from the storage tank to the washer, can never be damaged. For extra protection the pipe has been covered by a robust jacket pipe, with attached safety signs. The sulphuric acid pump is placed inside a drip tray. This drip tray contains a switch: if a leakage is observed the pump automatically shuts down and generates an alarm.

There is an emergency shower placed within the area for sulphuric acid storage. In case of an acid spill accident, the victim can be cleaned immediately. The shower is connected to the main water line

A safety cabinet is supplied with personal protective equipment relevant to working with sulphuric acid. It also contains a first aid kit for treating possible eye damage.

The following personal protective equipment for personnel filling the storage tank is required:

Standard Operating Procedure




<p>Eye and respiratory protection:</p> <ul style="list-style-type: none"> <li>▪ Face guard or protective eyewear. Use the face mask from the safety cabinet.</li> </ul>	
<p>Skin protection:</p> <ul style="list-style-type: none"> <li>▪ Suitable gloves. Preferably use the gloves from the safety cabinet.</li> </ul>	
<p>Skin protection:</p> <ul style="list-style-type: none"> <li>▪ Corrosion resistant protective clothing. Preferably use the apron from the safety cabinet.</li> </ul>	

Figure 1: Protective equipment required for working with sulphuric acid (Source: C08.17.01 Installation manual chemical air scrubber)

Process

**1. Cleaning of the technical space, filter packages and water tank**

- Be aware that the frame parts and the pipes can be wet and therefore slippery.
- When the technical space is dirty it must be cleaned with lukewarm water and household soap. Use water to rinse the remainder away.
- Clean up the spilled chemicals according to spill procedures.
- Check the piping for possible leakages.
- Also carry out the following inspections and maintenance operations:
  - Clean pump motors;
  - Inspection and cleaning of the water filter.

Standard Operating Procedure






No .	Description	Photo
1.	<ul style="list-style-type: none"> <li>➢ Check the ribs and the suction grill of the pump motors for excessive dust. Clean these with a brush.</li> </ul>	
2.	<ul style="list-style-type: none"> <li>➢ Check the water filter for dirt.</li> <li>➢ If the element is really polluted, then clean it like this:</li> </ul>	
2.a	<ul style="list-style-type: none"> <li>➢ Close the main valve (position-9 in the process diagram, see Illustration 9).</li> </ul>	
2.b	<ul style="list-style-type: none"> <li>➢ Take a bucket and place it under the water filter.</li> <li>➢ Open the nipple below the water filter so the rest pressure can escape (see arrow).</li> <li>➢ Use the supplied plastic key to open the filter beaker.</li> <li>➢ Clean the element with a fine brush and warm water.</li> <li>➢ Put the element back and replace the filter beaker.</li> <li>➢ Close the nipple below the water filter.</li> </ul>	
2.c	<ul style="list-style-type: none"> <li>➢ Open the main valve again.</li> </ul>	

Figure 2: Inspections and maintenance operations (Source: C08.17.01 Installation manual chemical air scrubber)

## Standard Operating Procedure

### 2. Daily Checks

The sulfuric acid system has to be checked every day (visual checks) for leaks.

- Leak detection sensor.
- Leak testing pipes at low points of the piping.
- Drops at the pump (pump is standing inside a drip tray).
- Verify that the main water valve is always kept open and the water inside cannot freeze.

### 3. Maintenance of the air washer

Maintenance aspect	See	Depending on circumstances	Weekly	Monthly	Annually
General inspection of the washer	§ 7.2		■		
Registration of data	§ 7.3		■		
Check the safety provisions	§ 9.6.1		■		
Check sulphuric acid	§ 9.6.1		■		
Check anti-foaming agent	§ 9.6.1		■		
Clean sensors	§ 9.6.2			■	
Clean technical space	§ 9.3	■		■	
Clean washer superficially	§ 9.4	■			
Clean washer thoroughly	§ 9.5	■			■
Major overhaul by Inno <sup>+</sup>	---				■

Figure 3: Items requiring maintenance on the air washer (Source: C08.17.01 Installation manual chemical air scrubber)

#### Competences

- Product Knowledge
- Process Knowledge
- COSHH

#### Related Documents

- SOP for

**Standard Operating Procedure**

References