

Industrial Gas Cleaning

Urban Health

Salvador-Bahia 2014

Vermindering Luchtvervuiling

Air Pollution by Industry

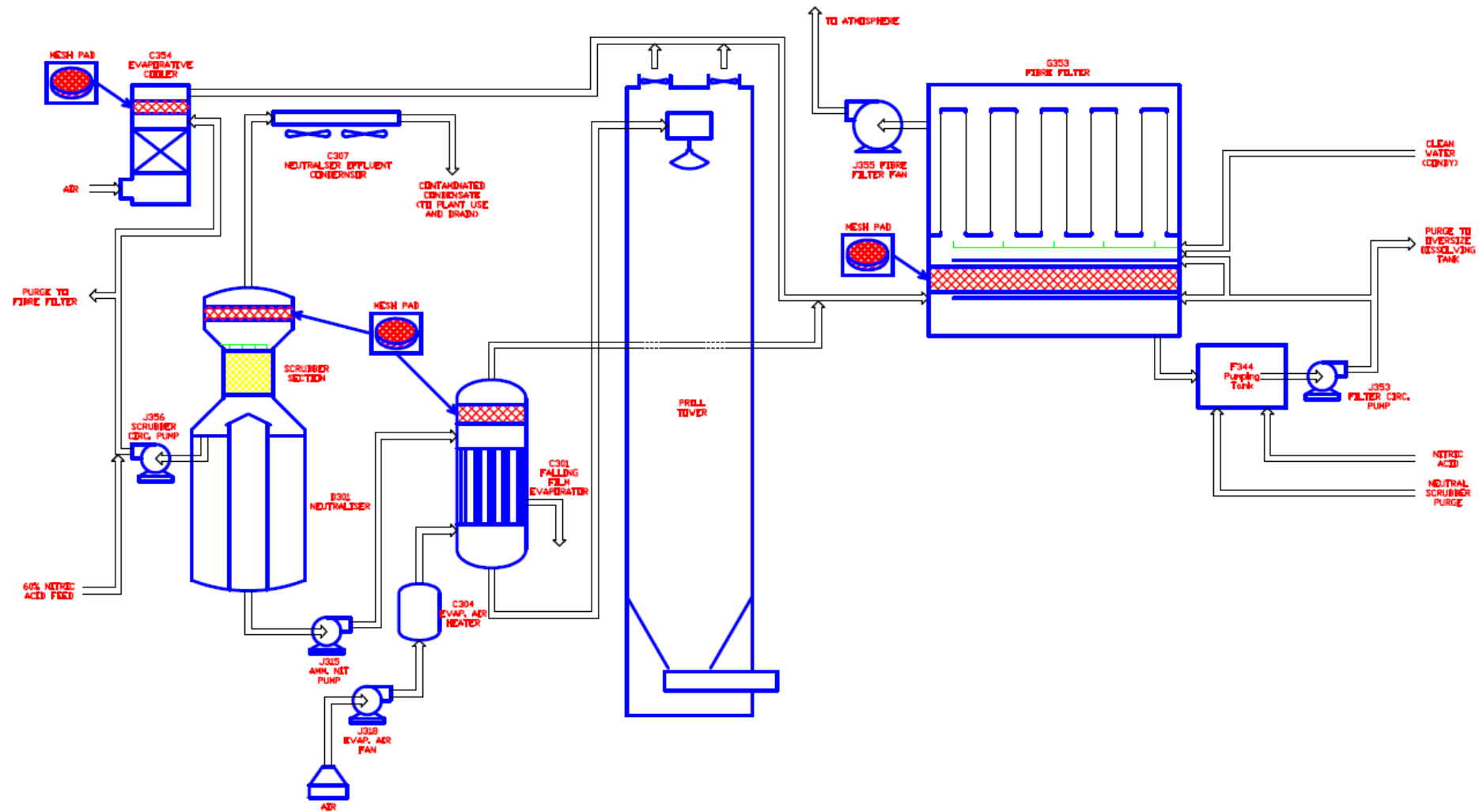
Emission Control

<u>Problem</u>	<u>Solution</u>	<u>Example</u>
Fine dust	Mist Eliminator	Growhow Billingham Vale Fertilizantes
Dust and Odour	Turbulaire	Sugar Industry
Sulphur Dioxide	Gas Scrubber	Tata Steel
Organic Vapour	Mist Eliminator	Procter&Gamble

Fertilizer Dust Removal

Growhow fertilizers
Billingham
United Kingdom

Vale Fertilizantes,
Cubatão – SP, Brasil



The Problem:

Ammonium Nitrate Production Growth United Kingdom

Flow	455.162 Nm ³ /hr		
Ammonia	151	mg/Nm ³	571.000 kg/year
Ammonium Nitrate	870	mg/Nm ³	3.297.000 kg/year

The Solution:

New AN Prill Brink[®] Mist Eliminator Scrubber System

Ammonia	< 5	mg/Nm ³	97% removal
Ammonium nitrate	< 10	mg/Nm ³	99% removal

The project had the benefits of:

- Reduced AN at very low level below allowable limit of 10 mg/Nm³ (dry basis)
- Eliminated the opacity
- Reduced ammonia emission to non-detectable level
- Improved relations with local community and environmental agency
- Setting a good example for environmental stewardship

SUGAR TBL Scrubber

Sugar Cane factory

The TBL is specially designed to reduce sugar emissions from rotating drums or fluidized bed dryers containing large amounts of sugar dust.

SUGAR TBL Scrubber

**Sucrierie Lesaffre Frères
Nangis France**

Hot oven dryer air

Temperature 150 oC

Flow 10.000 Nm³/hr

Cooling and sugar recovery

The Problem:

Sugar Dryer Off gas:	Sucrerie Lesaffre Frères, Nangis France		
Flow	10.000	Nm³/hr	
Fine Sugar Dust	790	mg/Nm³	38.000 kg/year

The Solution:

New TBL Turbulaire Scrubber System

Sugar	< 5	mg/Nm³	99,5% removal
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SUGAR TBL Scrubber

Bagasse Boiler

Loaf and waste from sugar cane is being incinerated to produce steam for the process.

**We have several installations working
Flow rates 10.000 – 80.000 Nm³/hr
Inlet temperature 230 oC
Dust and pollutant removal 90 – 98%**

SUGAR TBL Scrubber

Caustic NaOH

**Chemical
Initiatives
South Africa**

**Corus Steel
IJmuiden
Netherlands**

SOx removal: TATA Steel IJmuiden, the Netherlands

Client : **Steel manufacturer**

Sector : **Metalurgical**

Location : **IJmuiden**
(The Netherlands)

Technology: **Tail gas scrubber after Brink**
Mist Filter

TATA Steel IJmuiden

**SO₂ removal by gas scrubber working
With NaOH (Caustic Soda)**

**SO₃ (H₂SO₄) removal by Mist
Eliminators**

Caustic NaOH

The reaction between SO₂ and caustic (NaOH)



The bisulphites and sulphites are oxidized to sulphate:



The Problem:

Coke Off gas contains SO₂ and SO₃

Flow	15.000	Nm³/hr	
SO₂ sulphur dioxide	2500	mg/Nm³	330.000 kg/year
SO₃ (H₂SO₄ mist)	650	mg/Nm³	85.000 kg/year

The Solution:

New Mist Eliminator Scrubber System

SO₂	< 50	mg/Nm³	98% removal
SO₃	< 10	mg/Nm³	99% removal

The project had the benefits of:

- Improving the emission standard of TATA to the required level
- Eliminated the opacity
- Saving on maintenance, less corrosion
- Lower emission taxes,
- Setting a good example for environmental stewardship

**Condensed oil and Organics from food preparation
And Bitumen roofing plant.**

Visable plume and odour

**Pringles Production Mechelen
Belgium
Latexfalt, Koudekerk ad Rijn
Netherlands**

The solution

Client : **Procter&Gamble**

Sector : **Food**

Location : **Mechelen
(Belgium)**

High efficient (98 – 99% on particles < 3 micron) will reduce odor significantly.

The Problem:

Oil and Fatt from baking:

Procter&Gamble Mechelen Belgium

Flow

89.000

Nm³/hr

Oil vapor

135

mg/Nm³

105.732 kg/year

The Solution:

New Mist Eliminator Scrubber System followed by activated carbon

Oil vapor

< 5

mg/Nm³

98% removal

Odour

not detectable

99% removal

Client : Latexfalt

Sector : Bitumen

**Location : Koudekerk ad IJssel
(The Netherlands)**

The Problem:

Oil and Mercaptanes from Bitumen Storage:

Latexfalt, Koudekerk ad Rijn
Netherlands

Flow	2.500	Nm ³ /hr	
Oil vapor	250	mg/Nm ³	5.500 kg/year
Organics with sulphur	90	mg/Nm ³	1.980 kg/year

The Solution:

New Mist Eliminator Scrubber System followed by activated carbon

Oil vapor	< 5	mg/Nm ³	98% removal
Organics	< 10	mg/Nm ³	95% removal

Activated Carbon

The project had the benefits of:

- High removal of odour improving the relation with the neighbours
- Eliminated the opacity
- Safe practice , no slippery roads
- Setting a good example for environmental stewardship

From small to big, the problems are the same

Let's solve it

Questions?