Since establishing our operation in South Africa, we have had orders from clients such as:

- AECI
- African Products
- AfriSam
- Alstom Power
- Anglo American
- Anglo Platinum
- ArcelorMittal
- ASA Metals
- Assmang
- Babcock
- Tenova Takraf
- BHP Billiton
- Cato Ridge Alloys
- Columbus Stainless Steel
- DRA
- Drytech
- Dundee Precious Metals
- E & PC
- ELB Engineering
- Eskom
- Exxaro
- Ferro Metals
- Fluor-Daniel
- Foskor
- Glencore
- Hatch
- Heckett
- Hernic Ferrochrome
- Hillside Aluminium
- Hulamin
- Impala Platinum
- K’Enyuka
- Kumba
- Lafarge
- Loesche
- Metalloys
- Metso
- Moma Mineral Sands
- Mozal
- Murray & Roberts
- Namzinc
- Outotec
- PPC
- Richards Bay Minerals
- Rio Tinto
- Samancor
- Scaw Metals
- Senet
- Tati Nickel
- Tronox
- Zinchem
John Thompson Air Pollution Control offers five different designs to meet almost any requirement:

- Vaned scrubber with no moving parts
- Dynamic scrubber with integral fan
- High efficiency venturi scrubber
- Multi-venturi scrubber
- Packed towers for gas absorption

In addition, we can provide these in several configurations and a full range of sizes as well. Our scrubbers can be supplied in carbon steel, plastics/FRP or exotic stainless steels.

With our experience, John Thompson Air Pollution Control has the capability to engineer a wet scrubber system that efficiently meets your needs.

Our scrubbers are found in a wide variety of industries, including:

- Aluminium
- Automotive
- Chemicals
- Coal
- Detergents
- Fertilizers
- Foundries
- Incineration
- Iron ore
- Mining
- Plastics
- Potash
- Pulp & Paper
- Rock products
- Waste water treatment
- Steel

### Selection Guide

#### Sample Applications

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<th>Selection Guide</th>
<th>Sample Applications</th>
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<tr>
<td>Mikro-Vane</td>
<td>Dryers</td>
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<tr>
<td>Dynamic</td>
<td>Lime kilns</td>
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<tr>
<td></td>
<td>Lime shakers</td>
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<td>Dissolving tanks</td>
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<td>Mining</td>
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<tr>
<td></td>
<td>Minerals</td>
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<tr>
<td>Venturi</td>
<td>Lime kilns</td>
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<tr>
<td></td>
<td>Dryers</td>
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<td>Foundries</td>
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<td>Shredders</td>
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<td>Minerals</td>
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<tr>
<td>Multi Venturi</td>
<td>Wood fired boilers</td>
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<td>Metallurgical fumes</td>
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<td>Mining</td>
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<td>Packed Tower</td>
<td>Waste incineration</td>
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<td>Flotation cells</td>
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<td>Calcining</td>
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<td>Odour Control</td>
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<td>Reagent preparation</td>
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#### Typical Pressure Drop Ranges

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<tbody>
<tr>
<td></td>
<td>0.5-1.5 kPa</td>
<td>1.2 kPa</td>
<td>2.5 – 15 kPa</td>
<td>1.5-15 kPa</td>
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<tr>
<td></td>
<td>equivalent to Venturi @ 4 kPa</td>
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#### Approximate Liquid Requirement / 1,000 ACFM (l/m³)

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<tbody>
<tr>
<td></td>
<td>0.3-0.6 l/m</td>
<td>0.3-0.4 l/m</td>
<td>1-2 l/m</td>
<td>0.6-2 l/m</td>
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<tr>
<td></td>
<td>Application dependent</td>
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John Thompson Air Pollution Control can provide complete turnkey dust control system design including scrubbers, cyclones, fabric filters and other components. Our capabilities include:

- Process analysis
- Equipment supply
- Start-up
- System design
- Installation
- Testing
Collection efficiency of wet scrubbers can usually be related to pressure drop. This graph shows the efficiencies obtainable for various pressure drops from 0.3 to 10 microns.

Care should be taken to use this as a general information tool rather than a product selection guideline. The actual performance of a given scrubber will depend on the specific dust characteristics and the amount of scrubbing water.
Standard Models

- High Efficiency Venturi
- Multi-Venturi
- Multi-Vane
- Dynamic
- Packed Tower
Venturi Scrubber

Operation

The design of the venturi scrubber consists of a “wet approach” venturi followed by a liquid entrainment separator. Dust laden gases enter the venturi and instantly make contact with the tangentially introduced scrubbing liquid swirling down the venturi’s converging walls.

At the venturi throat, the gas and liquid streams collide and the liquid breaks down into droplets which trap dust particles. This gas/liquid mixture passes through a flooded elbow, and then enters the entrainment separator through a tangential inlet. Centrifugal action removes the heavy wetted particles from the gas stream. As an alternative, when very large diameter separators are required, the liquid is separated by passing the stream through a chevron-type mist eliminator baffle.

The dust/liquid mixture is discharged from the separator bottom drain and the cleaned gas leaves through the top of the separator.
• Typically used for removing particles in submicron to 3 micron range
• Wetted wall venturi inlet eliminates build-up
• Adjustable venturi throat maintains constant pressure drop at varying airflows
• 98%+ collection efficiency in 1 – 3 micron range
• Capacities of 700 – 500,000 m³/hr
Dynamic Scrubber

Operation

Dust laden gas enters the lower chamber of the scrubber tangentially, imparting a cyclonic action to the stream. Coarse particles are removed by a combination of centrifugal and gravitational forces.

The stream encounters slurry, created in a later stage, coming down from the upper chamber and becomes partially wetted, initiating agglomeration. As the stream spins through a series of scrubber vanes, intermediate sized particles impinge on the wetted surfaces of the vanes. These particles are then washed down.

The gas stream containing the remaining fine dust is drawn into an adjacent chamber containing a fan. Atomized scrubbing liquid is sprayed into the eye of the fan, further reducing droplet size. These droplets encapsulate the fine dust particles, thus enhancing agglomeration.

The gas stream then flows into the upper chamber tangentially at high velocity. The wet agglomerated particles are forced by cyclonic action against the chamber walls and drain down to the internal discharge cone. The gas stream, free of liquid droplets, spins out through an outlet atop the scrubber.
Dynamic Scrubber

Description & Characteristics

- Versatile, compact design with integral wetted fan
- Reduced installation and energy costs
- At 1.25 kPa, performance equal to Venturi Scrubber at 3.75 kPa
- 98%+ collection efficiency in 1 – 3 micron range
- Capacities of 700 – 130,000 m³/hr
Multi-Vane Scrubber

Operation

Scrubbing liquid is introduced into the scrubber as a spray directed down over a circular “scrubbing vane” arrangement. As the liquid drains through the vanes, it creates curtains of scrubbing liquid. Dust laden gas enters the scrubber tangentially and collides with the curtains initiating particle agglomeration. The coarser particles produced are washed down to the slurry outlet.

A restriction disc located in the scrubbing vane assembly accelerates the spin velocity of the gas. This action combined with the flood of atomized liquid from the spray causes the formation of fine liquid droplets which encapsulate the fine particulates, again enhancing agglomeration.

The cyclonic action of the saturated gas stream as it spins upward forces the agglomerated particles to fall out of suspension. The coarser droplets impinge on the mist eliminator vanes and the finer droplets are forced to drop out of suspension by gravitational and centrifugal forces acting on the gas stream as it exits through the top.
• Generally used for de-dusting applications
• Most economical wet scrubber lineup
• Low liquid and energy requirements
• 90%+ collection efficiency in 1 – 3 micron range
• Capacities of 700 – 100,000 m³/hr
Multi-Venturi Scrubber

Operation

The dirty gases are directed through a venturi-rod deck where atomized scrub water is introduced concurrently with the gas stream. The scrub water is sprayed through a series of low pressure, large orifice nozzles, distributing it evenly across the deck.

The gas rapidly accelerates as it passes through the venturi-rods. This action creates smaller droplets, causing encapsulation of the particles and increasing the collection efficiency of submicron particles.

As the gases exit the venturi-rod area, velocity slows causing the larger particulate laden droplets to fall out of the stream. The scrubbed gasses are then directed toward a two-stage demisting zone by distribution baffles or turning vanes. Primary demisting and gas distribution occurs in the pre-demist area, which removes 90% of the water. The remaining free water droplets are removed by impingement on the final stage demist vanes.

The scrub water collected prior to the demist section flows down the scrubber floor to the drain trough.

The dewatered scrubbed gases are exhausted via the scrubber outlet.
Multi-Venturi Scrubber

Description & Characteristics

- Low headroom requirements
- Lower pressure drops and lower liquid-to-gas ratios than venturi designs
- 98%+ collection efficiency in 1 – 3 micron range
- Capacities of 700 – 850,000 m³/hr
Packed Tower

*Operation*

Pollutant laden gases enter at the bottom of the packed tower and rise upward, making contact with the scrubbing liquid draining down through the packed column. Since the pollutant concentration decreases as the gas rises, there is constantly fresher solvent available for contact, resulting in an efficient removal of contaminants. Finally, the fine moisture droplets, still suspended in the cleaned gas stream, are removed by a mist eliminator.

Scrub liquid from the eliminator is collected in an integral reservoir and recycled to the tower. Makeup liquid is constantly introduced, and reagent is added on demand using a dosing pump controlled by a pH monitor.
**Packed Tower**

*Description & Characteristics*

- Can be used for gas absorption, cooling, humidification, or condensing
- High removal efficiencies for many gaseous pollutants, such as SO₂, HCl, HF, NH₃, etc.
- Complete skid mounted units with reagent preparation, fan, pumps, controls, etc.
- Custom engineered and optimized
- Capacities of 850 – 130,000 m³/hr
Wet Scrubbers

Kolomela Mine  
Kumba Iron Ore, Sishen South  
*Photo 1*
Venturi Scrubbers & Dust Suppression  
Crushing and Screening

Kolomela Mine  
Kumba Iron Ore, Sishen South  
Venturi Scrubber and Dust Suppression  
Sishen South Load Out Station

Assmang - Khumani Iron Ore Mine  
(KEP Project)  
*Photo 2*
Venturi Scrubber System

Kumba - Sishen Expansion Project  
*Photo 3*
Venturi Scrubbers & Dust Suppression Crushing & Screening Plants
**Wet Scrubbers**

**Foskor, Phalaborwa – PEP**
Photos 4 & 5
Venturi Scrubbers – Crusher and Stockpile Extraction

**Hulamin**
Photo 6
Venturi Scrubber – Linishing Plant Dust Extraction
**Assmang - Khumani Iron Ore (BKM Project)**
Venturi Scrubber – Primary Crusher

**Avmin, Chambishi Metals – Cosac Project**
Venturi Scrubber

**Palabora Mining Company – PUMP 2**
Dust extraction and ventilation systems for underground crushing installations and dust suppression systems, installed in a shaft.

**Palabora Mining Company – PUMP 1**
*Photo 7*
Underground dust extraction systems: Venturi Scrubbers.
**Palabora Mining Company**
*Photo 8*
Venturi Scrubber plant - underground extension to the opencast mine.

**Tarkwa Gold Mine, Ghana**
Venturi Scrubber – Gold Plant

**Mintek, Randburg**
*Photo 9*
SO$_2$ Scrubber – Arc Furnace
**Wet Scrubbers**

**Scaw Metals Ltd, Germiston**  
*Photo 10*  
Bag filters and venturi scrubber

**Rossing Uranium**  
Two size 102 Dynamic Scrubbers.

**Xstrata Alloys, Lydenburg**  
Furnace Feed Venturi Scrubber Plant

**Kumba Iron Ore, Sishen South**  
*Photo 11*  
Venturi Scrubber & Dust Suppression  
Sishen South - Load Out Station

**Randgold Resources (Afrilog)**  
Loulou Gold Mine, Mali. Ex works supply of  
Venturi Scrubber and installation

**Assmang - Khumani Iron Ore Mine (KEP Project)**  
*Photo 12*  
Venturi Scrubber System – Primary Crusher
Product Range

50 years in Southern Africa

- Air Pollution Control
- Gas Cleaning
- Dust Control Systems
- Product Recovery
- Standard Products
- Turnkey Systems
- HVAC
- Dust Suppression
- After Sales Service and Spares

**Product Range**

- **Reverse Pulse Bag Filters:**
  - Tubular
  - Envelope

- **Reverse Air Baghouses**

- **Wet Scrubbers**

- **Cyclones**

- **Shaker Type Filters**

- **Silo Vent Filters**

- **Pressurisation Units**

- **Dust Suppression**

- **HVAC**

Air pollution control systems across the spectrum … from engineered systems to unit dust collectors.