

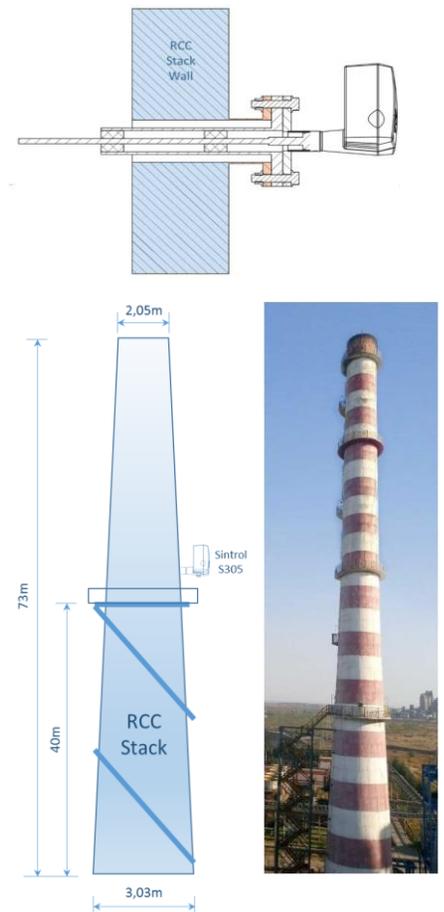
Application Notes – Dust Measurement in Concrete Stacks

Although many of the today's mid-sized flue gas stacks are metal constructions, Reinforced Cement Concrete (RCC) Stacks are widely used in many industries. From large, up to 220m high stacks in power stations, down to a huge number of existing installations in the midsize range.

Generally, RCC stacks have wall thicknesses larger than 100mm. This often causes moisture condensation in the process connection to the dust measurement instrument. Such moisture condensation creates problems for any monitor. Sintrol found a unique and easy way to avoid and eliminate the influence of moisture condensation without using purge air.

The problem was addressed first time several years ago during the installation of an S305 into a stack in Asia. Shortly after the installation the monitor showed a zero signal. It was found that there was moisture and wet dust inside the process connection nozzle and on the sensor probe. RCC is a poor heat conductor and caused condensation due to the temperature difference between the outer wall and the process gas. Such condensation is problematic for all kind of instruments from Inductive Electrification to optical dust monitors. First of all, the droplets may be interpreted as dust particles and influence the measurement. The droplets may also contaminate and destroy the sensor. Sintrol therefore developed a special installation accessory which is an air tight cage to cover-up the sensor probe over the thickness of the RCC wall which was in this case 500mm. The monitor with the cage is working reliably since many years at a dust concentration of about 35-40mg/m³ and the signal is not influenced by the droplets.

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|------------------------|------------------------|
| Power Plant Capacity: | 18MW |
| Plant Type: | Thermal Coal Fired |
| Location: | Asia |
| Total Height: | 73m |
| Sampling Point Height: | 40m |
| Bottom Diameter: | 3030mm |
| Top Diameter: | 2050mm |
| Dust Emission Range: | 35-40mg/m ³ |
| Flue Gas Temperature: | 140°C |
| Negative Pressure: | 100 Pa |



Principle of Operation

Sintrol dust monitors are based on a unique Inductive Electrification technology. The measurement is based on particles interacting with an isolated probe mounted into the duct or stack. When moving particles pass nearby or hit the probe a signal is induced. This signal is then processed through a series of Sintrol's advanced algorithms to filter out the noise and provide the most accurate dust measurement output.

Classic triboelectric technology is based on the DC signal, which is caused by particles making contact with the sensor to transfer charges. Compared to DC based measurements, the Inductive Electrification technology is more sensitive and minimizes the influence of sensor contamination, temperature drift and velocity changes. By using the Inductive Electrification technology, it is possible to reach dust concentration measurement thresholds as low as 0.01 mg/m³.

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