



REFERENCE

viledon®

DUST LOADING TEST IN THE AIR FILTRATION SYSTEM OF A SINTERING PLANT

The production of stainless steel creates emissions at many points. During the sintering process, tons of fine dust containing iron are produced which need to be reliably filtered out of the process exhaust air. Fresh and clean air in workrooms and production halls is essential to protect the employees from high temperatures and fine dust.

Application

In sintering plants, fine ores and other fine-grained materials are agglomerated and prepared for use in a blast furnace. Here, the fuel (usually coke) in the raw material mixture is ignited. The resulting heat melts the surface of the fine ores, so that they combine and compress to form porous ores. In addition to gases, this process produces fine dust (less than 10 µm) which contains iron that has to be filtered out of the exhaust air. Furthermore the intake air for workrooms and production halls must be filtered in order to create good working conditions for employees.

Initial situation

During the construction of the sintering plant, the stainless steel factory installed an air filter system with 5 units each for the intake and exhaust air filtration on the roof of the building. Each unit consists of 24 pocket filters with filter class M5 and was initially operated at a volume flow of 126,000 m³/h. After commissioning, it was found that the dust load was greater than expected. In the first year, competing glass fiber pocket filters only achieved a lifetime of one week with a final pressure drop of 900 Pa.



Viledon® Compact pocket filter F50

Caverion

Caverion designs, builds, operates and maintains user-friendly and energy-efficient technical solutions for buildings and industries. For a long time Caverion has cooperated with the world's leading stainless steel producer in Northern part of Finland. Together with Freudenberg Filtration Technologies, Caverion equipped the air filtration systems with Viledon air filters on site.

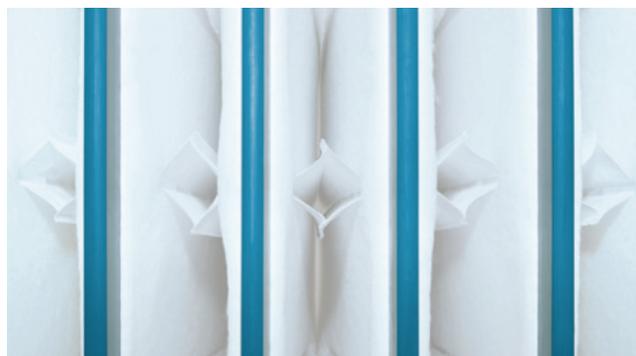


TECHNICAL DATA

| | |
|---|--------------------------|
| Number of filter units for intake air filtration | 5 |
| Number of filter units for exhaust air filtration | 5 |
| Total number of air filters per unit | 24 each |
| Filter class | M5 |
| Volume flow of each unit | 57,600 m ³ /h |
| Final pressure drop | 450 Pa |



(a)



(b)

Comparison of test runs

The stainless steel factory carried out several test runs to find air filters of filter class M5 which could achieve a longer lifetime under these heavy conditions. Viledon® Compact pocket filters F50 equipped with synthetic filter media were compared with pocket filters with glass fiber media from various manufacturers.

During the test runs, there was some dust breakthrough and mechanical damage of the pocket filters with glass fiber media due to the high dust load, so that the filters had to be replaced more frequently. Overall, the glass fiber pocket filters achieved an average lifetime of 7 to 9 days over the test phase.

A detailed analysis of the air filter unit showed that a reduction of the volume flow to 57,600 m³/h did not have a negative effect on the air quality and made considerably more efficient operation possible. In the test run, the Viledon® Compact pocket filter F50 showed a lifetime of up to 18 weeks without dust breakthrough, with a final pressure drop of 450 Pa. Weight measurements after the test run showed an average dust load of 19 kg per filter.

Advantages of Viledon® Compact pocket filters F50

- Multi-layered progressively structured high performance nonwovens produced in-house.
- Highly functional dependability against dust breakthrough due to leakproof welded filter pockets, foamed into the front frame (a).
- Welded aerodynamic spacers in intrinsically rigid pockets and even dust loading (b).
- Energy efficiency class A for reduced energy costs and less CO₂ emissions.

Result

Viledon® Compact pocket filters F50 have a longer lifetime in comparison to competitor filters. While glass fiber filters are cheaper, the operator of the stainless steel factory had to replace the filters considerably more often in the 18-week test period. The change to Viledon® pocket filters therefore reduces not only purchase costs but also the replacement frequency and is therefore more cost-effective.



Total weight of a dust loaded filter

| WEIGHT (SEE IMAGE) | NEW |
|--------------------------------------|----------|
| Total weight of a dust loaded filter | 21.45 kg |
| Weight of filter | 2.10 kg |
| Weight of dust | 19.35 kg |

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