Design of wet scrubber with its main functional elements

1 - Exhaust air
2 - Fan
3 - Liquid dispenser
4 - Contact bed/plastic packing
5 - Washing water tank
6 - Circulation water pump
7 - Sewage sludge pump
8 - Drop separator
9 - Clean air

Wet scrubber: one way to reduce ammonia and odours emitted by pig units

Due to growing conflicts between breeders and neighbourhood – essentially based on odours – some exhaust air treatments, like wet scrubber have gained in importance in practice. Because of the way it works, surface and times of contact between wet scrubber and exhaust air are the essential parameters conditioning the efficiency of this treatment. Results showed in this poster are the results of several studies achieved in experimental and commercial farms.

Air speed in relation with ammonia efficiency

High value of air speed in wet scrubber limit the duration of contact between water and microorganisms and limit the efficiency of the air treatment. With our data, air speeds over 1.5 m.s\(^{-1}\) reduce ammonia efficiency under 50 %. Basing on this air speed limit, calculation of packing bed surface is used for practical application. The small relation between air speed and odour abatement illustrates the biological action of scrubber on odorous compounds.

Impact of emptying on odour and ammonia abatements

The emptying considerably reduced the odour’s efficiency. Four days after emptying, the odour’s efficiency is close to 10 % vs 40 % before emptying. Duration of one month appears to be necessary to reach the efficiency level measured before. Impact on ammonia shows that the efficiency of wet scrubber is not only connected to its solubilisation in water. In our study, biological effect of wet scrubber is responsible of close to 30 % of odour abatement.

Conclusion

The efficiency of wet scrubber is a combination of a physical-chemical action and a biological one. Efficiency over 50 % on ammonia and odours can be reach only with water if air speed is under 1.5 m.s\(^{-1}\). Incidence of emptying was highlighted with this experiment. New studies on the frequency of washing water draining in order to reach a correct efficiency on odours and ammonia and limiting the water consumption are necessary.

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