

FABRIC FILTERS - Exercitation

EXAMPLE: SIZING FF



Example: Sizing FF

Calculate the number of bags required for an 8-compartment pulse-jet baghouse with the following process information and bag *dimensions*:

Q, process gas exhaust rate: $45 \text{ (m}^3\text{/s) (=162000 m}^3\text{/h)}$

A/C, air (flow)-to-cloth ratio: $0.02 \text{ (m}^3\text{/s)/m}^2 \text{ (= } v_f \text{ filtration velocity!)}$

$v_f = A/C = 0.02 \text{ m/s (1.2 m/min)}$

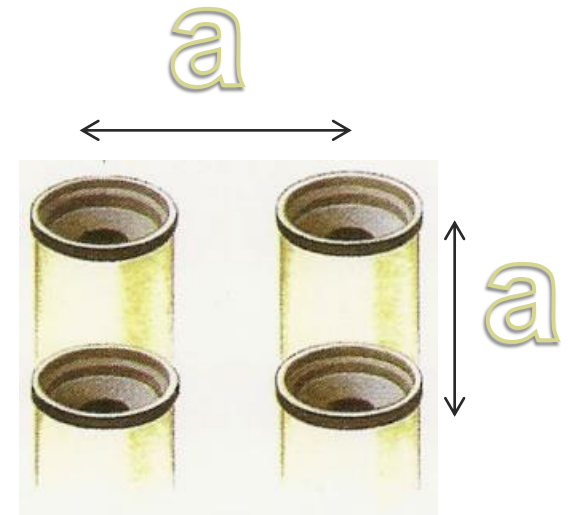
Bag size

bag diameter: 0.15 m (6")

bag height: 3.6 m

Bag spacing: 5 cm

Finally, calculate the can velocity in the baghouse



$$\begin{aligned} a &= \text{bag diameter} + \text{bag spacing} \\ &= 15 + 5 = 20 \text{ cm} = 0.2 \text{ m} \end{aligned}$$

EXAMPLE: PRESSURE DROP ESTIMATION



Example: PRESSURE DROP IN A BH

Calculate the design pressure drop in a baghouse after 70 minutes of operation with dust loading $(L)=5.0 \text{ g/m}^3$ and superficial filtering velocity $(v)=0.9 \text{ m/min}$.

Base the estimate on the test carried out on a clean fabric at the same operating conditions.

Test data at planned operating conditions:

Time [min]	ΔP [Pa]
0	150
5	380
10	505
20	610
30	690
60	990

Note: the pressure drop increase with the time