



# Mill Ventilation · is the air carrying the cement out

Gas speed through each chamber and the diaphragms, against the band a cement mill needs.

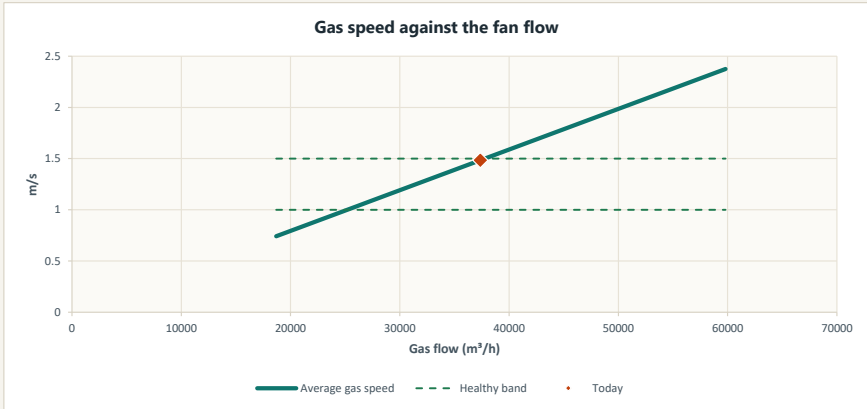
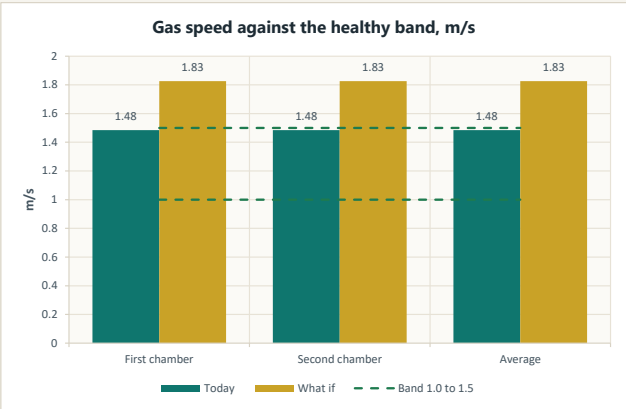
Licensed to: Sample file · worked example on a demonstration plant

| AVERAGE GAS SPEED                               | VERDICT |
|-------------------------------------------------|---------|
| 1.48<br><small>m/s · healthy 1.0 to 1.5</small> | RIGHT   |

| GAS FLOW WITH FALSE AIR       | AIR PER TON                |
|-------------------------------|----------------------------|
| 37,378<br><small>m³/h</small> | 311<br><small>m³/t</small> |

| YOUR FIGURES                          |        |         |                   | RESULTS |                                          |        |         |        |                                                                   |
|---------------------------------------|--------|---------|-------------------|---------|------------------------------------------|--------|---------|--------|-------------------------------------------------------------------|
|                                       | Today  | What if |                   |         | Today                                    |        | What if | Change | What it means                                                     |
| The mill                              |        |         |                   |         |                                          |        |         |        |                                                                   |
| Mill diameter inside the liners       | 3.81   |         | m                 |         | Average gas speed (m/s)                  | 1.48   | GOOD    | 1.83   | +0.34<br>The healthy band for a cement mill is 1.0 to 1.5 m/s.    |
| First chamber length                  | 3.81   |         | m                 |         | Gas speed, first chamber (m/s)           | 1.48   | GOOD    | 1.83   | +0.34                                                             |
| First chamber free height (tape)      | 2400   |         | mm                |         | Gas speed, second chamber (m/s)          | 1.48   | GOOD    | 1.83   | +0.34                                                             |
| Second chamber length                 | 7.62   |         | m                 |         | Gas flow including false air (m³/h)      | 37,378 |         | 46,000 | +8,622                                                            |
| Second chamber free height (tape)     | 2400   |         | mm                |         | Free area, first chamber (m²)            | 6.99   |         | 6.99   | 0<br>The section left free by the balls and the material in them. |
| The gas                               |        |         |                   |         | Free area, second chamber (m²)           | 6.99   |         | 6.99   | 0                                                                 |
| Gas flow through the mill             | 37,378 | 46,000  | m³/h              |         | Filling, first chamber (%)               | 33.6   |         | 33.6   | 0                                                                 |
| False air entering the mill           | 0.0    |         | %                 |         | Filling, second chamber (%)              | 33.6   |         | 33.6   | 0                                                                 |
| Charge swell (material in the charge) | 5.0    |         | %                 |         | Through the intermediate diaphragm (m/s) | 22.8   | GOOD    | 28.0   | +5.3<br>Usual 20 to 25 m/s through the slots.                     |
| Open area, intermediate diaphragm     | 4.0    |         | % of mill section |         | Through the outlet diaphragm (m/s)       | 16.3   | GOOD    | 20.0   | +3.8<br>Usual 12 to 18 m/s.                                       |
| Open area, outlet diaphragm           | 5.6    |         | % of mill section |         | Air per ton of cement (m³/t)             | 311    |         | 383    | +72                                                               |
| Mill output                           | 120.0  |         | t/h               |         |                                          |        |         |        |                                                                   |

Yellow cells are yours. Leave a What-if cell empty to keep today's figure; type a new one to see what changes, before anything is changed in the plant.



WHAT TO DO FIRST

|      |                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| READ | <p><b>WHAT THE GAS IS DOING</b></p> <p>With 37,378 m³/h passing through, the gas moves at 1.48 m/s in the first chamber and 1.48 m/s in the second, averaging 1.48 m/s over the mill. The healthy band is 1.0 to 1.5.</p> <p>Do: Read the speed, not the fan setting; re-check whenever the charge changes.</p> <p>Why: The balls take up most of the section, so the same fan gives a completely different speed in a full mill and an empty one.</p> |
| GOOD | <p><b>THE GAS SPEED IS RIGHT</b></p> <p>At 1.48 m/s the mill is inside the healthy band. Ground material leaves without dragging coarse out with it.</p> <p>Do: Log the flow, the tape readings and this speed together.</p> <p>Why: When the charge wears down the speed drifts up on its own. Having the reference makes that obvious instead of gradual.</p>                                                                                        |
| READ | <p><b>AIR PER TON</b></p> <p>The fan moves 311 m³ of gas for every ton of cement.</p> <p>Do: Track it against tonnage, not on its own.</p> <p>Why: It is the cleanest way to see the fan quietly working harder for the same output.</p>                                                                                                                                                                                                               |

