

*Cutting Edge Technology Pilot Project –
Gas Flow Measurement Systems for
Cement Plants optimization*

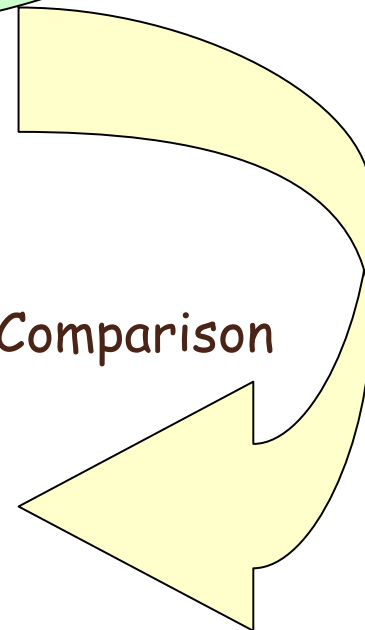
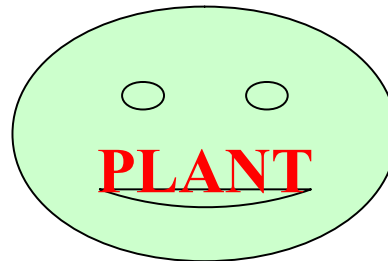
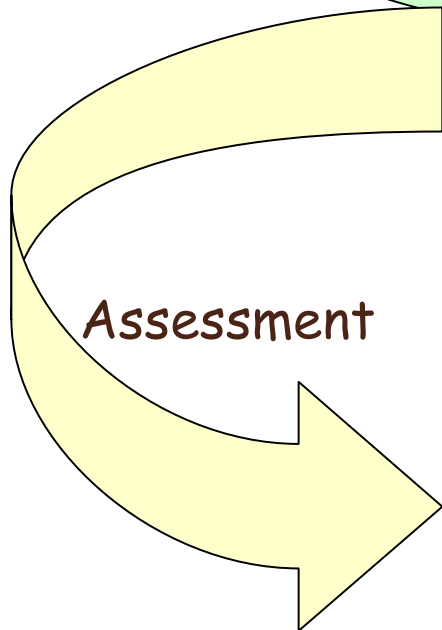
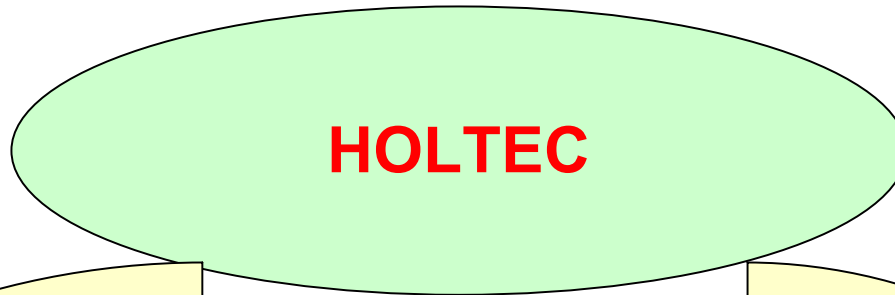
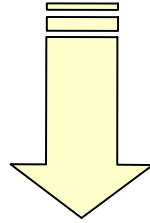
*By – Kamal Kumar
Chief General Manager*



HOLTEC CONSULTING PRIVATE LIMITED

MEASURING DUSTY AIR STREAMS in cement manufacturing

PROMECON + TECHFAB



Methodology adopted by PROMECON's **MECONTROL Air**

- System utilizes the triboelectric principle
- Metal sensors placed parallel to flow
- Electrical signals created by dust particles
- Particle movement correlated & referenced
- Time shift & distance provide flow velocity

Aspects of measuring dusty gas streams

- Location of the duct (accessibility & safety)
- Temperature, Pressure and Moisture
- Fluctuation in flow rate
- Dust concentration of the stream

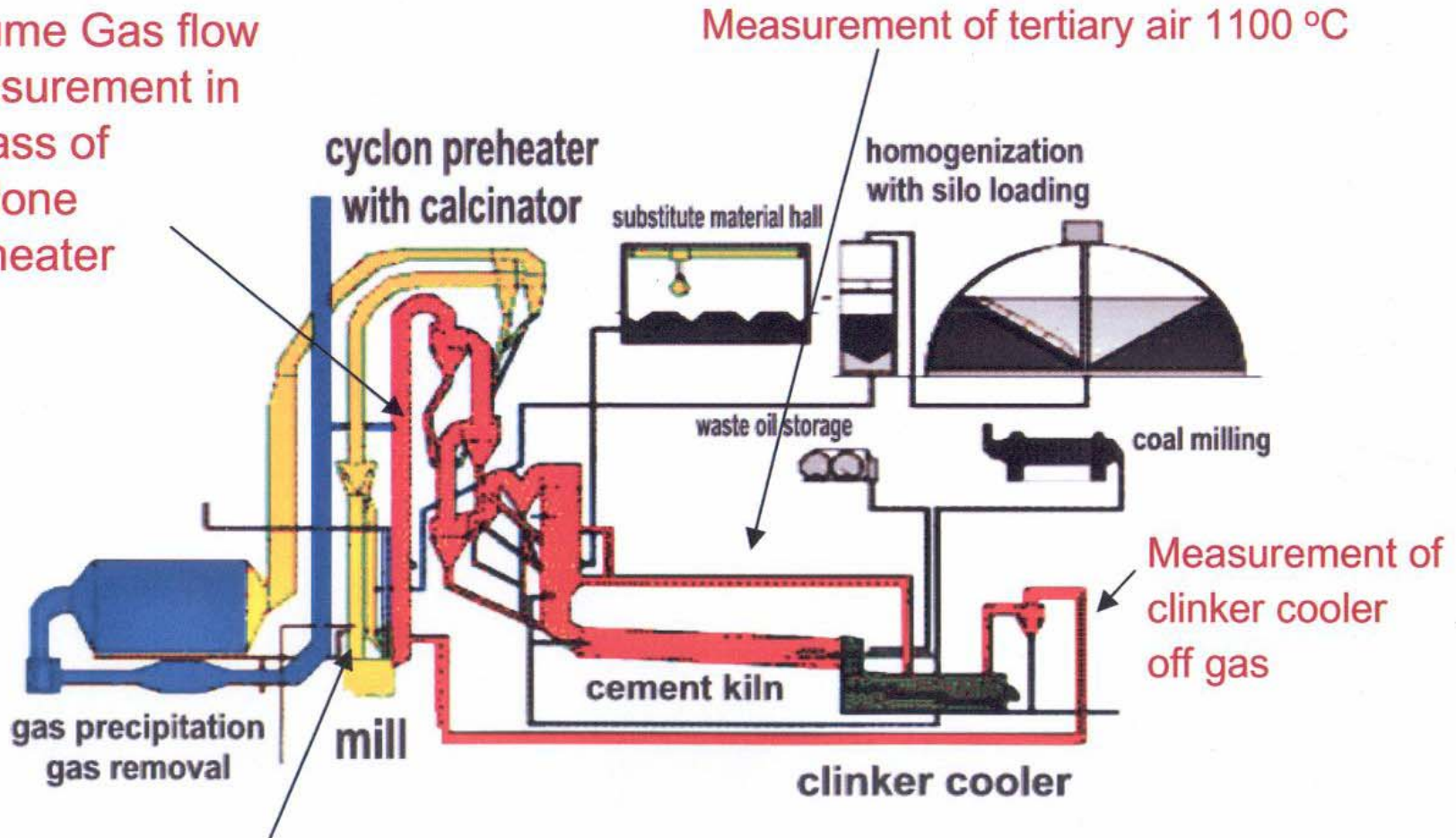
Areas

- Vertical Roller Mill
- Tube Mill
- Preheater/ Precalciner kiln
- Long Wet/ Dry kiln
- Direct fired burning system
- Kiln gas bypass system

Areas

Volume Gas flow measurement in bypass of Cyclone Preheater

Measurement of tertiary air 1100 °C



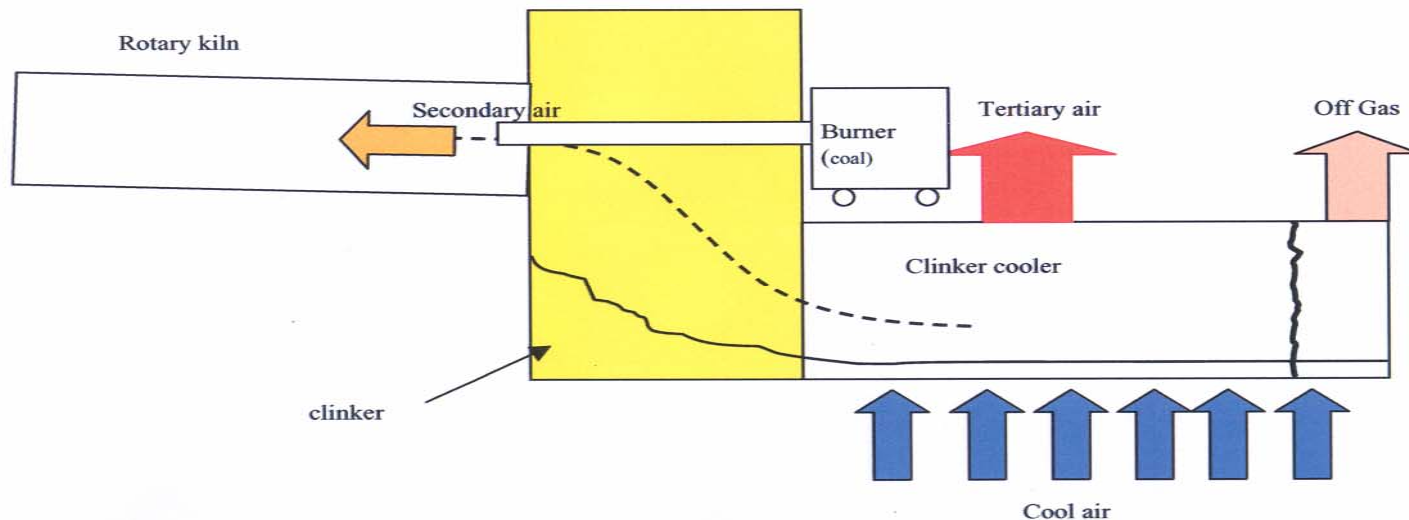
Gas volume flow behind mills

Online measurement

- Measurement of secondary air into the kiln
- Prevention of reduced atmosphere in the kiln
- Increase of fuel efficiency

Gas Balance by Tertiary Air measurement

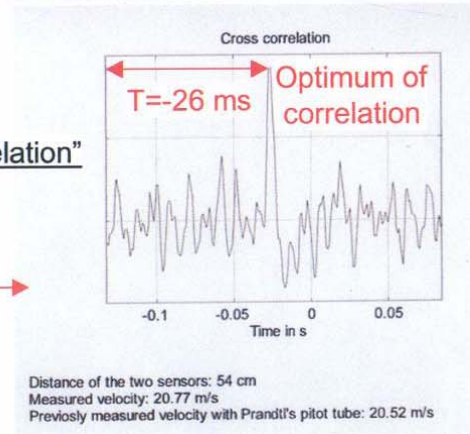
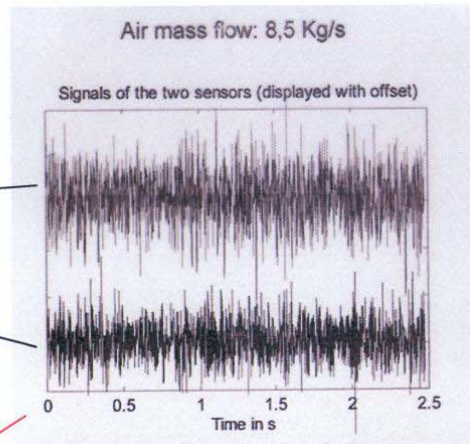
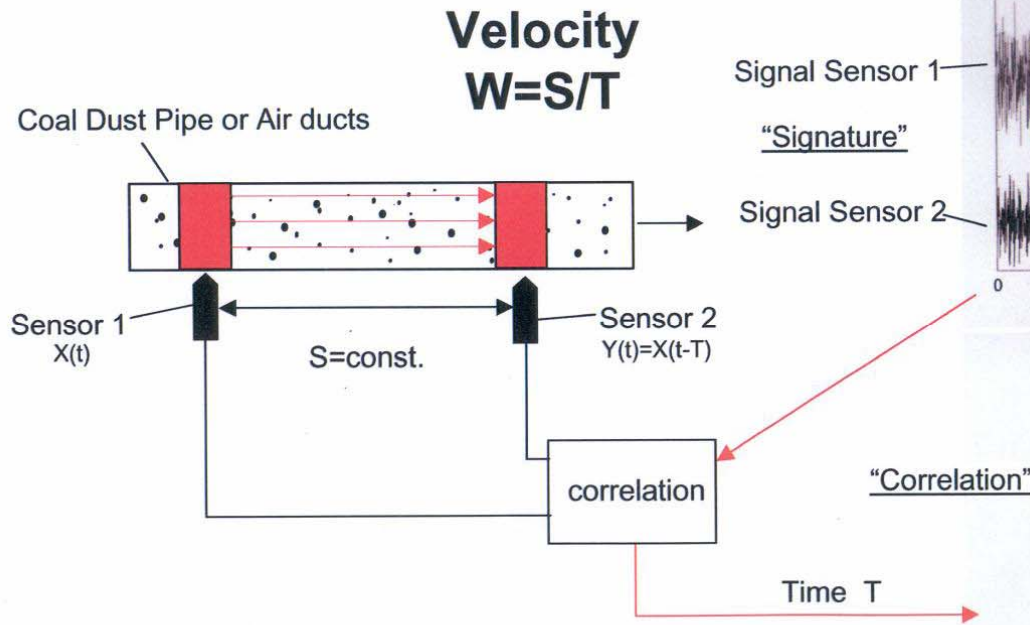
Measurement in the area of the clinker cooler exit
(kilo outlet) not possible



For better control of the stoichiometry and NO_x reduction as well as energy saving, the exact amount of secondary air is needed. This can be gained out of the clinker cooler gas balance through measurement of Tertiary Air, Cooler Air and Off Gas.

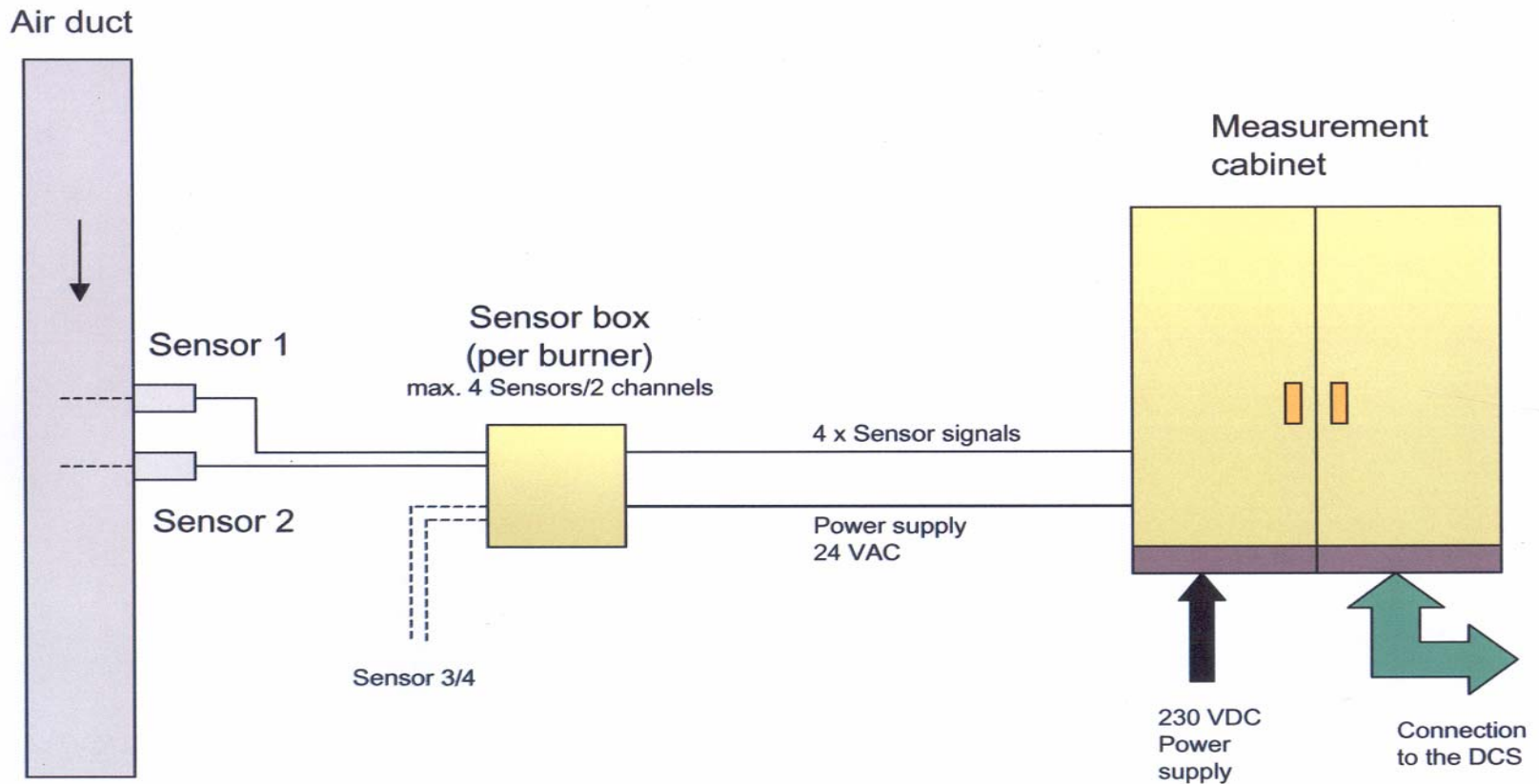
MECONTROL Air-Working principle

Measurement Principle „velocity“



Example
 $S=54\text{ cm}$ \longrightarrow $w=20,8\text{ m/s}$ (average velocity of the particles !)
 $T=26\text{ ms}$

MECONTROL Air-Installation overview



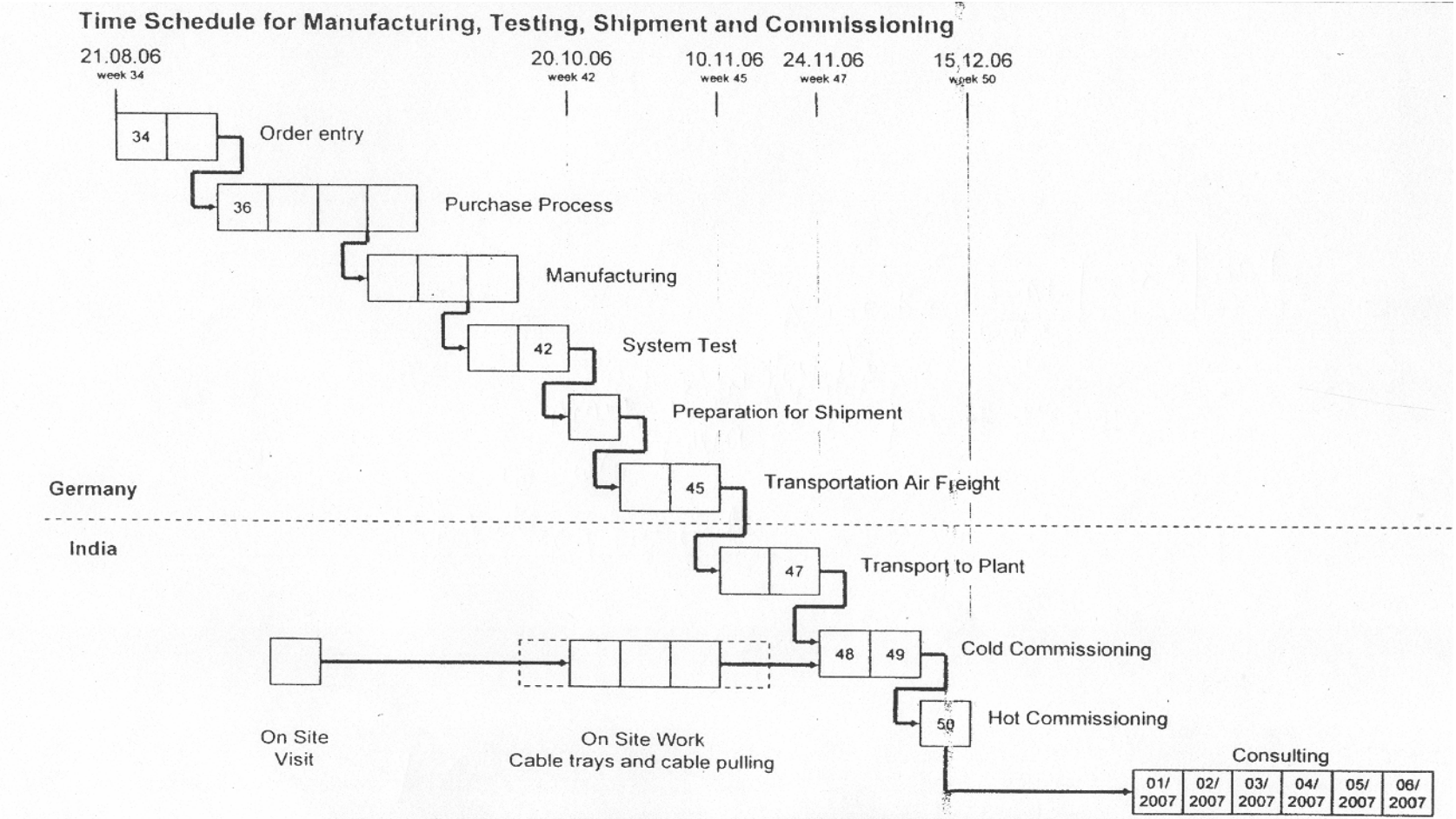
Measurement Locations finalised at Ambuja Cements - Kodinar

- Raw Mill outlet
- Coal Mill outlet
- Tertiary Air Duct
- Preheater Exhaust
- Grate Cooler inlet
- Grate Cooler Exhaust
- Cement Mill outlet

Measurement Locations finalised at Shree Cement - Beawar

- Raw Mill fan inlet
- Coal Mill fan inlet
- Tertiary Air Duct
- Preheater Downcomers
- Grate Cooler outlet
- Cement Mill Separator inlet & outlet

MECONTROL Air-Time Schedule



Thank You