

Case Study – 3	Low Tension Ceramic Insulators manufacturing industry having tunnel kiln (Fuel: Natural Gas)																					
Implementing the technology	<p>Flue gas exhaust at the tunnel kiln furnace was monitored. %O₂ in flue gas varies from 5.1% to 15.6%.</p> <p>Flue gas temperature also varies from 169°C to 200°C. % O₂ in flue gases should be between 2 – 6%.</p> <table border="1"> <thead> <tr> <th>Parameters</th> <th>At Kiln Exhaust</th> <th>At Firing Zone</th> </tr> </thead> <tbody> <tr> <td>O₂ (%)</td> <td>17.3</td> <td>10.2</td> </tr> <tr> <td>CO (ppm)</td> <td>131</td> <td>65</td> </tr> <tr> <td>CO₂ (%)</td> <td>2.4</td> <td>6.1</td> </tr> <tr> <td>Efficiency (%)</td> <td>67.5</td> <td>64.1</td> </tr> <tr> <td>Excess Air (%)</td> <td>364.3</td> <td>95.3</td> </tr> <tr> <td>Pressure (mbar)</td> <td>0.12</td> <td>0.20</td> </tr> </tbody> </table> <p>Recommendations:</p> <p>It is suggested to control the combustion air through reducing the RPM of combustion air blower by 1-2 Hertz at a time by monitoring required temperature within kiln and set the appropriate frequency and monitoring the required O₂ percentage in flue gas to optimize the air fuel ratio and thus combustion efficiency at the kiln.</p> <p>The proper control of air to fuel ratio can result in combustion efficiency more than 75 % with old burners as well. Thus increase in 10 % combustion efficiency will result in saving of approximately 12,971 SCM gas per annum.</p>	Parameters	At Kiln Exhaust	At Firing Zone	O ₂ (%)	17.3	10.2	CO (ppm)	131	65	CO ₂ (%)	2.4	6.1	Efficiency (%)	67.5	64.1	Excess Air (%)	364.3	95.3	Pressure (mbar)	0.12	0.20
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Benefits																						
Environmental	<ul style="list-style-type: none"> Per Day reduction in the gas consumption: 35.5 SCM. Per Year reduction in gas consumption: 12,971 SCM. Per Day reduction in Greenhouse Gas (CO₂) emission: 65 Kg Per Year Reduction in Greenhouse Gas (CO₂) emission: 24.3 MT 																					
Economical	<p>Investment: NIL</p> <p>Annual Savings: Rs. 4,21,000/- per annum</p> <p>Payback Period: Immediate</p>																					