

Item	Air beam type clinker cooler	Application
		Burning process
Background	Improvement of heat recovery rate for secondary or tertiary air from the heat in clinker is one of the most important technologies in the burning process. As heat recovery rate in conventional grate coolers are approximately 50 to 60 %, more improvement has been desired.	
Descriptions	<p>When high temperature clinker is dropped on the grate of cooler from the outlet of kiln, it is not in flat or balanced. With the conventional cooler, cooling air is supplied to each air chambers, therefore, improvement of heat recovery rate is limited by imbalance of cooling air.</p> <p>This problem is solved by installing air beam type cooler which has unique point as follows;</p> <ol style="list-style-type: none"> 1) Cooling air is supplied directly to each block that is constructed by 4 to 8 pieces of grate plate. 2) The grate plate is structured, as more air tight and fined clinker is not able to spill down through grate. 3) This type of grate can be installed to the part of kiln outlet or main heat recovery area. <p>As cooling air is controlled for each block, air distribution can be optimized. Therefore, heat recovery rate is improved and the life of grate plate is extended.</p> <p>By 2000, these types of coolers have been installed into approx. 30% of Japanese cement plants. Most of them (71%) have been installed at kiln outlet part of existing cooler. For 57% of these cases, improved heat recovery rate is not more than 5 %. In case only installed at kiln outlet part, improvement rate cannot be adequate.</p> <div style="text-align: center;"> <p style="text-align: center;">Comparison of cooling air supply</p> </div>	
Results	<ol style="list-style-type: none"> 1) Heat consumption: Approx. 42 – 167 kJ/kg decrease 2) Power consumption: Approx. 0.5 – 1.5 kWh/t decrease 3) Maintenance cost of grate plate: decrease (Extension of life) 	
Cost estimation	About 2.7 ~4.5 million US\$ for 1-stage cooler retrofitting [1US\$=¥110]	
Related matters		
Reference		