

## CASE STUDIES

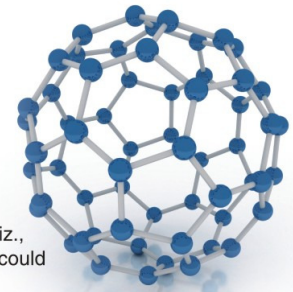
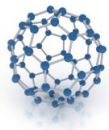
**Case 1:** Low fly ash content in PPC due to low 1-day strength.

**Value Delivered:** After addition of STAREX @ 0.025% at the cement mill inlet, the early age strength increased sufficiently to enable an increase of fly ash content from 25% to 30% with no reduction in cement strength. Mill output increased by 6%, which resulted in a net reduction in power consumption by 2 KWH per ton of cement produced.

| STAREX Dosage | Mill Output | Power Consumption | Clinker | Gypsum | Fly Ash | Blaine             | Residue |        | Compressive Strength in MPa |        |        |         |
|---------------|-------------|-------------------|---------|--------|---------|--------------------|---------|--------|-----------------------------|--------|--------|---------|
|               |             |                   |         |        |         |                    | 45 Mic  | 90 Mic | 1-Day                       | 3-Days | 7-Days | 28-Days |
| %             | TPH         | KWH/MT            | %       | %      | %       | M <sup>2</sup> /Kg |         |        |                             |        |        |         |
| Blank         | 140         | 33                | 71      | 4      | 25      | 334                | 25%     | 4.3%   | 8.5                         | 21.3   | 28.3   | 47.2    |
| 0.025         | 148         | 31                | 66      | 4      | 30      | 335                | 20%     | 3.5%   | 8.7                         | 21.5   | 28.9   | 48.5    |

Increased mill output and reduced power consumption

Increased fly ash content with same cement quality



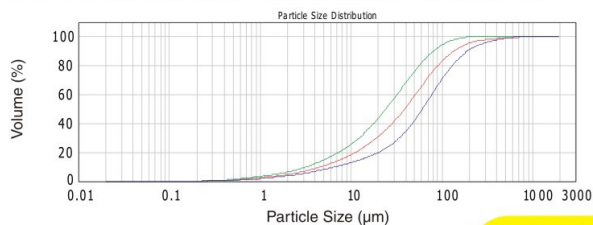
**Case 2:** Inability to increase cement mill output due to low efficiency of the grinding mill.

**Value Delivered:** After addition of STAREX at the cement mill inlet, all the three Tromp Curve Parameters viz., Circulating Load, Circulating Factor & By-Pass were significantly reduced. This indicated that the mill feed could be increased substantially without impacting the particle size distribution (PSD) of final cement.

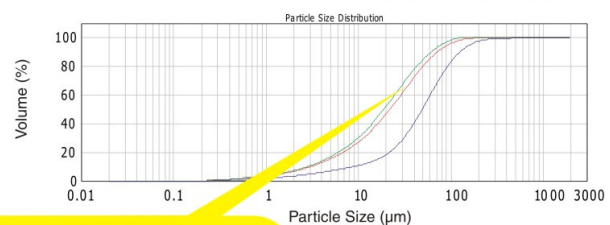
The frequency distribution curves (provided in the graphs below) show that there is little or no difference between the Mill Outlet (Separator Inlet) PSD and the Separator Product (Separator Outlet) PSD after addition of STAREX. This indicates that a large proportion of size reduction had already been achieved in the mill.

Subsequently the feed to the mill was increased by around 7-8%, so that the Circulating Load could be maintained above 100% and the Separator could be effectively utilised.

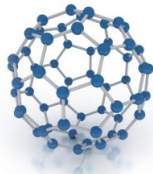
Cumulative Frequency Size Distribution of Separator Circuit Sample Without STAREX 300: Shows Clear Separation of Reject (Blue), Feed (Red) & Product (Green) Curves



Cumulative Frequency Size Distribution of Separator Circuit Sample – With STAREX 300: Shows Near Merging of Feed (Red) & Product (Green) Curves



Merging of Separator Feed and Separator Product curves indicate improved grinding efficiency of the mill with ST AREX 300



**Case 3:** Difficulty in commanding premium price for cement because of high residues on 90 micron.

**Value Delivered:** With STAREX, the plant was able to reduce residue at 90 and 45 microns to target levels, the mill output was increased by 5% and fly ash content was increased by 5%, with no change in cement strength.

STAREX addition has resulted in improved cement quality as well as reduced cost of production.

| STAREX Dosage | Mill Output | Clinker | Gypsum | Fly Ash | Blaine             | Residue |        | Compressive Strength in MPa |        |        |         |
|---------------|-------------|---------|--------|---------|--------------------|---------|--------|-----------------------------|--------|--------|---------|
|               |             |         |        |         |                    | 45 Mic  | 90 Mic | 1-Day                       | 3-Days | 7-Days | 28-Days |
| %             | TPH         | %       | %      | %       | M <sup>2</sup> /Kg |         |        |                             |        |        |         |
| Blank         | 90          | 75      | 4      | 21      | 339                | 30%     | 13%    | 11                          | 25     | 34     | 51      |
| 0.03          | 95          | 70      | 4      | 26      | 350                | 20.8%   | 5%     | 12                          | 27     | 35     | 53      |

Residues on 90 micron and 45 micron improved with improved mill output and flyash addition