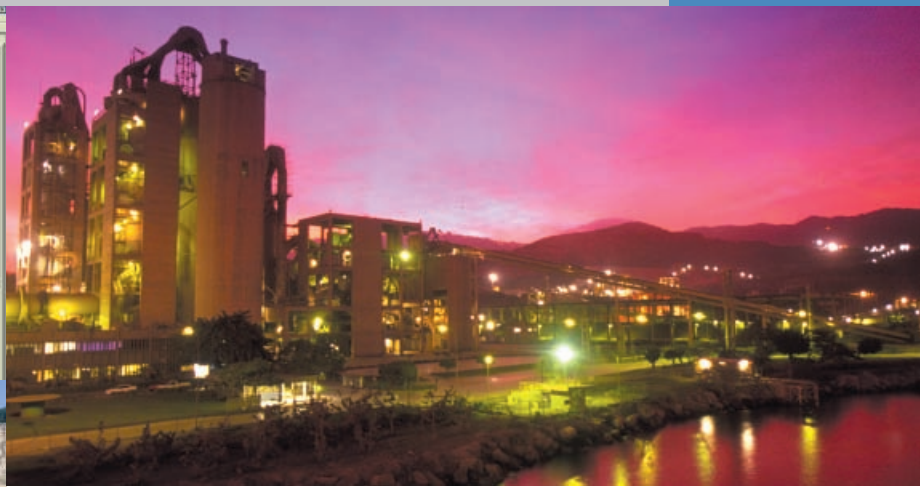
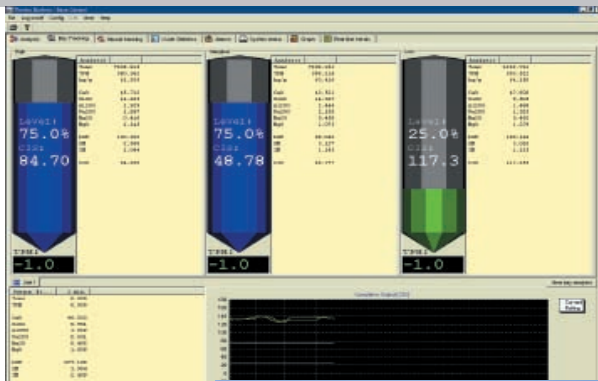


MSTS is a user-friendly software program that provides analysis information on the inventory contained in downstream bins or material storage bays, helping cement producers improve product quality.

Material Storage Tracking Software™ (MSTS)

Cement Quality in Storage Bays and Bins Defined in Real-Time



Benefits

- Estimates the current average composition of material storage contents at any time
- Presents real-time awareness of trends in downstream composition
- Enhances the management and control of material quality and inventory

Features

- Tracks incoming and outgoing material into storage areas
- Produces a weighted average from multiple storage bins
- Material level input from sensors are estimated using incoming and outgoing flow rates

The Thermo Scientific Material Storage Tracking Software (MSTS) is the perfect complement to its online cement analyzers. This product runs on the Operator Console (OpCon) and gives the operator an expanded knowledge of the composition of raw material conveyed to downstream bins or material storage bays. The analyzer's minute-by-minute analysis, along with the associated tonnage, is tagged by its destination, to create a database of the composition of all the raw material entering a downstream bin or storage bay. The destination is automatically provided to the MSTS from digital inputs reflecting tripper position.

The MSTS can also receive level sensor inputs from each downstream material storage bay or bin, as well as tph inputs from the weigh feeders which withdraw material from the silos. Armed with this information, the software is able to determine the current

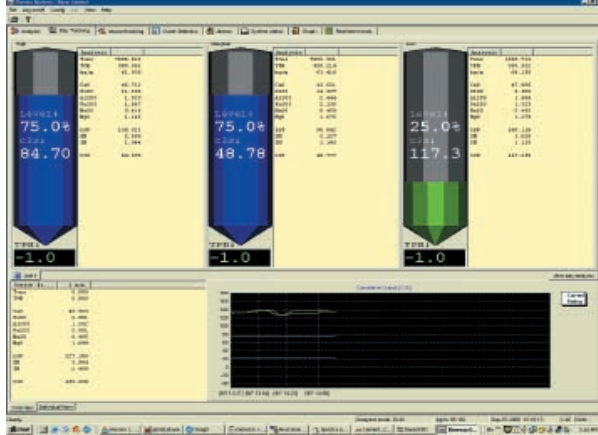
average composition of the material in each bin or storage bay. The program can also generate a weighted average composition of all the raw material being withdrawn at any time from multiple bins or storage bays.

This valuable tool gives the operator real-time awareness of trends in the downstream composition, trends that can impact plant operation if no operator intervention occurs.

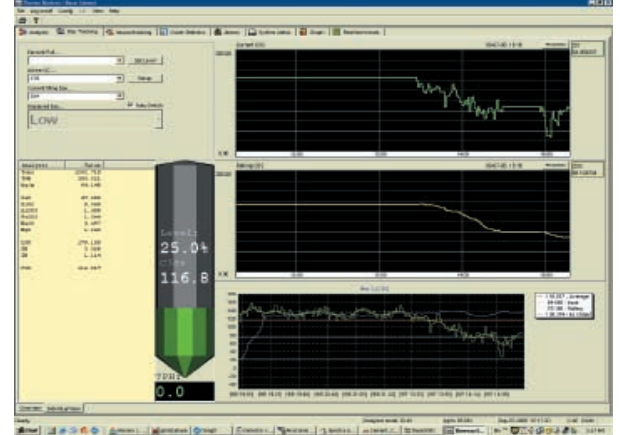
Specifications

The MSTS program consists of two displays on the OpCon. One display depicts all the material storage bays or bins, their levels, the current average composition of the two most important composition parameters, and the estimated weighted average composition of the raw material being withdrawn from all the bins. A second screen shows details associated with a given selectable bin or material storage bay.

Overview



Detail View



Material Storage Tracking Software™ (MSTS)

Specification	
Instrument Requirements	The Thermo Scientific CrossBelt On-Line Analyzer Series
Storage Bays or Bins	As many as six bins or storage bays in as many as eight storage buildings (a total of 48 destinations)
Composition Parameters	Typically CaO, SiO ₂ , Al ₂ O ₃ , Fe ₂ O ₃ , MgO, K ₂ O, Na ₂ O, etc., and calculated parameters such as LSF, C ₃ S Silica Ratio, Alumina ratio, etc.
Software Platform	CrossBelt Analyzer Base Cement Software Revision: 1.3.1; Build 2389 or higher
Signal Input Requirements	Level sensor from each bunker or bin Bunker or bin being filled Mass flow rate on conveyors feeding the bays or bunkers Mass flow rate on weigh feeders beneath the bays or bunkers
Selectable User Inputs	Number of bins or bunkers and units Degree of mixing within raw material storage area Top two composition parameters of interest Standard graphics choices, such as pen color, range of X and Y values in trend displays, etc.

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Process Instruments

Americas
+1 (800) 488-4399
+1 (858) 452-9250 fax

China
+86 (0) 21-6865 4588
+86 (0) 21-6445 1101 fax

Europe
+41 (0) 21-694 7111
+41 (0) 21-694 7112

India & Australasia
+91 (20) 6626 7000
+91 (20) 6626 7001 fax

South Africa
+27 (0) 11-609-3101
+27 (0) 11-609-3110 fax

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