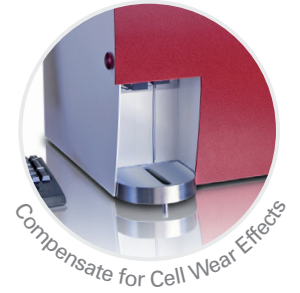


# 3C™ Solution

Reference Standard



Reduce how often you recalibrate your LactoScope FTIR



DELTA INSTRUMENTS IS NOW A PART OF PERTENT INSTRUMENTS

## 3C™ Reference Standard – Reduce how often you recalibrate your LactoScope FTIR analyzer

Regular use of the 3C™ Reference Standard on the LactoScope FTIR Advanced helps reduce how often you will need to recalibrate your analyzer. As a result, the annual expense of preparing or buying Calibration Sets, whose component values are determined, using primary methods, is reduced.

The time interval between recalibrations of an Infrared Analyzer depends on a variety of seasonal and instrument factors. Cell wear is one of the major instrument contributors to the need for recalibration and is addressed by the use of 3C™.

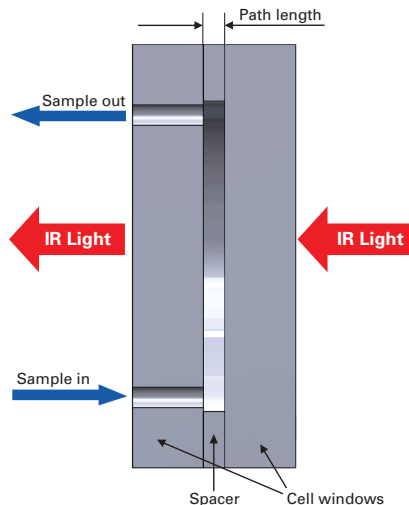
The LactoScope FTIR Advanced measures components such as Fat in a milk sample by pumping a thin film of the sample between two parallel windows of Calcium Fluoride ( $\text{CaF}_2$ ). The instrument measures the Infrared absorption of the components of interest in the milk by passing Infrared energy through the windows and sample to a detector.

$\text{CaF}_2$  is an industry standard window material because it is transparent to Infrared Energy and allows the absorption of the milk components to be measured accurately.

Measurements of Milk Components by Infrared Absorption analyzers depend directly on the thickness of the sample held between the two  $\text{CaF}_2$  windows. The relationship between sample thickness or “path length” and absorption is described by the Beer-Lambert Law. The path length of all cells are set at the factory but change with use. The interior surfaces of the  $\text{CaF}_2$  windows wear over time as samples are pumped through the cell. The path length slowly increases and affects the absorption measurements. Evidence of path length increase can be seen when Pilot samples are run over a period of a month and the values slowly drift over the limit. The typical change in path length of a cell is expected to be about 7% over the course of a year or 0.58% per month. A Pilot with 4.00 % Fat would, in this case, be reported as 4.029% after a month due to cell wear. The more abrasive the sample, the higher the rate of wear compared to the above example. Chocolate milk, whey concentrates and skim milk concentrates typically cause higher wear.



The use of a 3C™ Reference Standard on a monthly basis will compensate for cell wear effects on your results. When used with LactoScope FTIR Advanced Software Revision 1.60 or higher, the system will calculate the path length correction from the 3C™ Solution and apply it automatically to all of the calibrations in the analyzer. 3C™ Reference Standards come six 100 ml vials to the package: Part Number GA00072010. They are stable for a 1.5 year unrefrigerated from date of manufacture.



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