

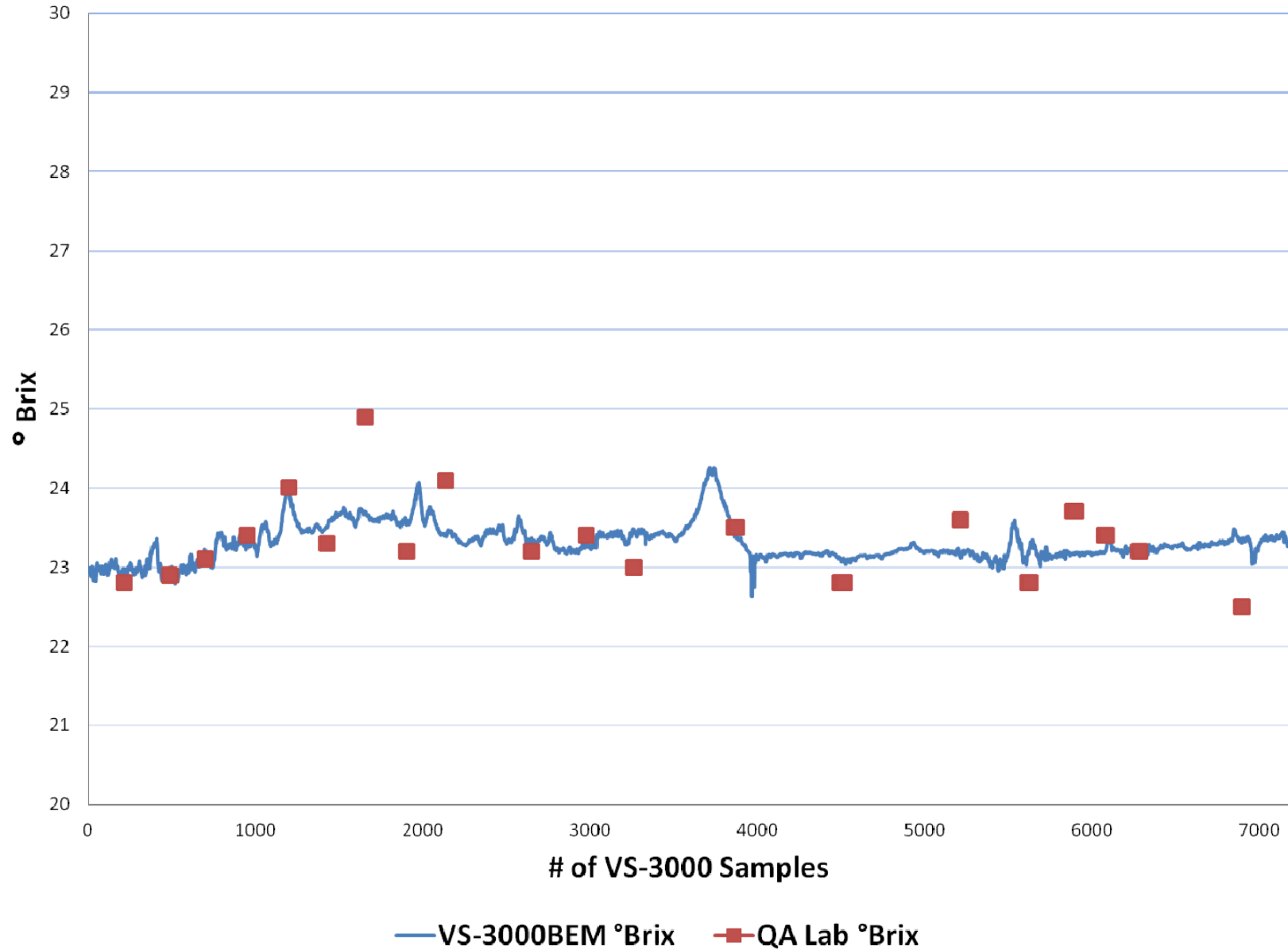


## *VS-3000 measures BioEthanol Slurry*

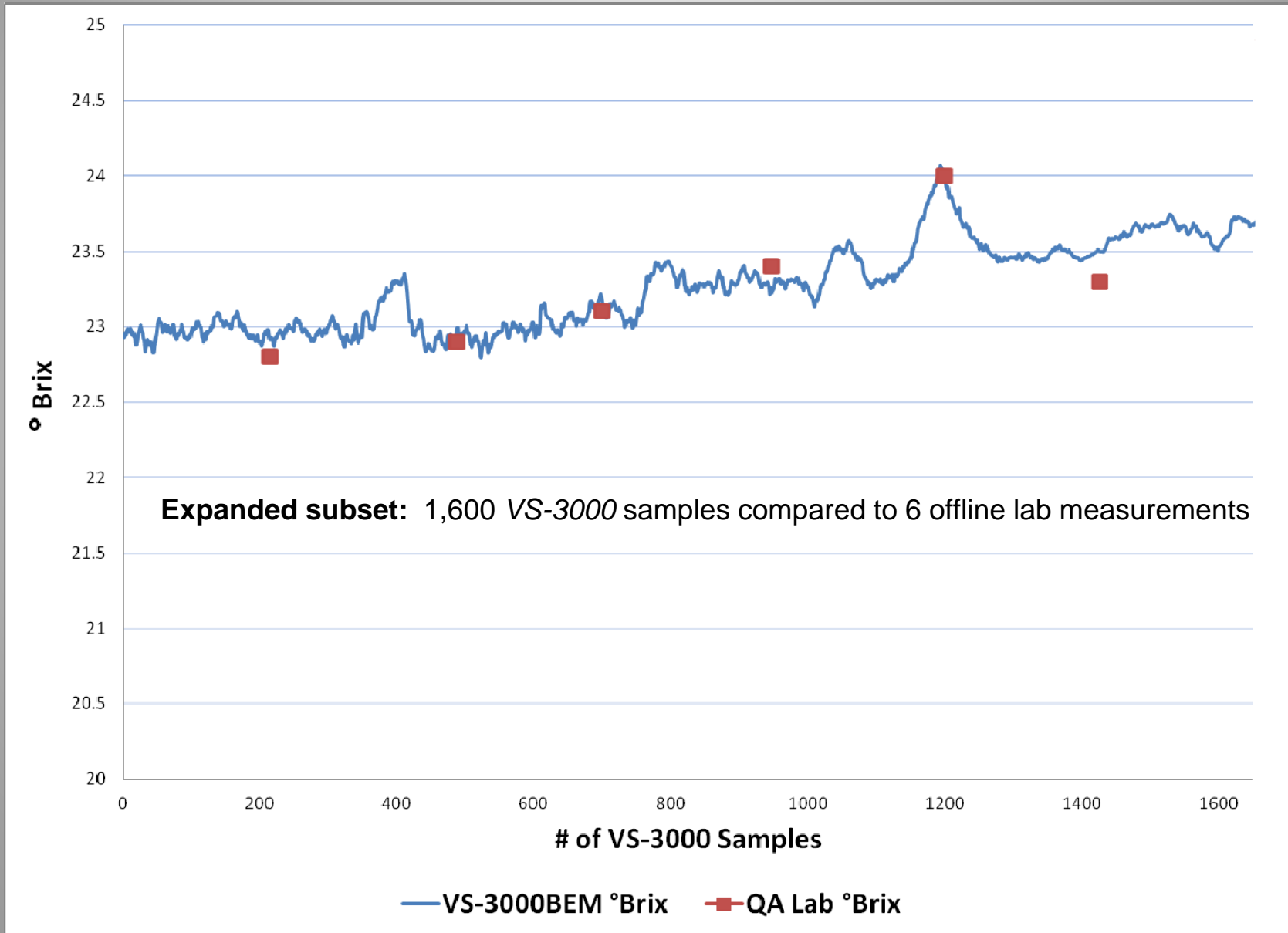
**These slides show *VS-3000 BioEthanol Process Monitor* performance while measuring °Brix and Ethanol in a SLURRY process stream. *VS-3000* is a solid-state, mid-IR instrument for measuring dissolved concentrations in solution, real-time 24x7.**

- Data comes from a *VS-3000* installation at a US BioEthanol plant with an output capacity of 50+ million gallons per year
- *VS-3000* data is compared to samples collected in the BioEthanol plant's QA laboratory
- Comparison samples were sourced from a **Refractometer** (for °Brix) and an **H.P.L.C.** (for Ethanol)
- The slides contain 20 instances of comparison between the QA Lab and *VS-3000* sensor readings
- *VS-3000* data recorded every 30 seconds, QA lab measurements taken approximately every hour

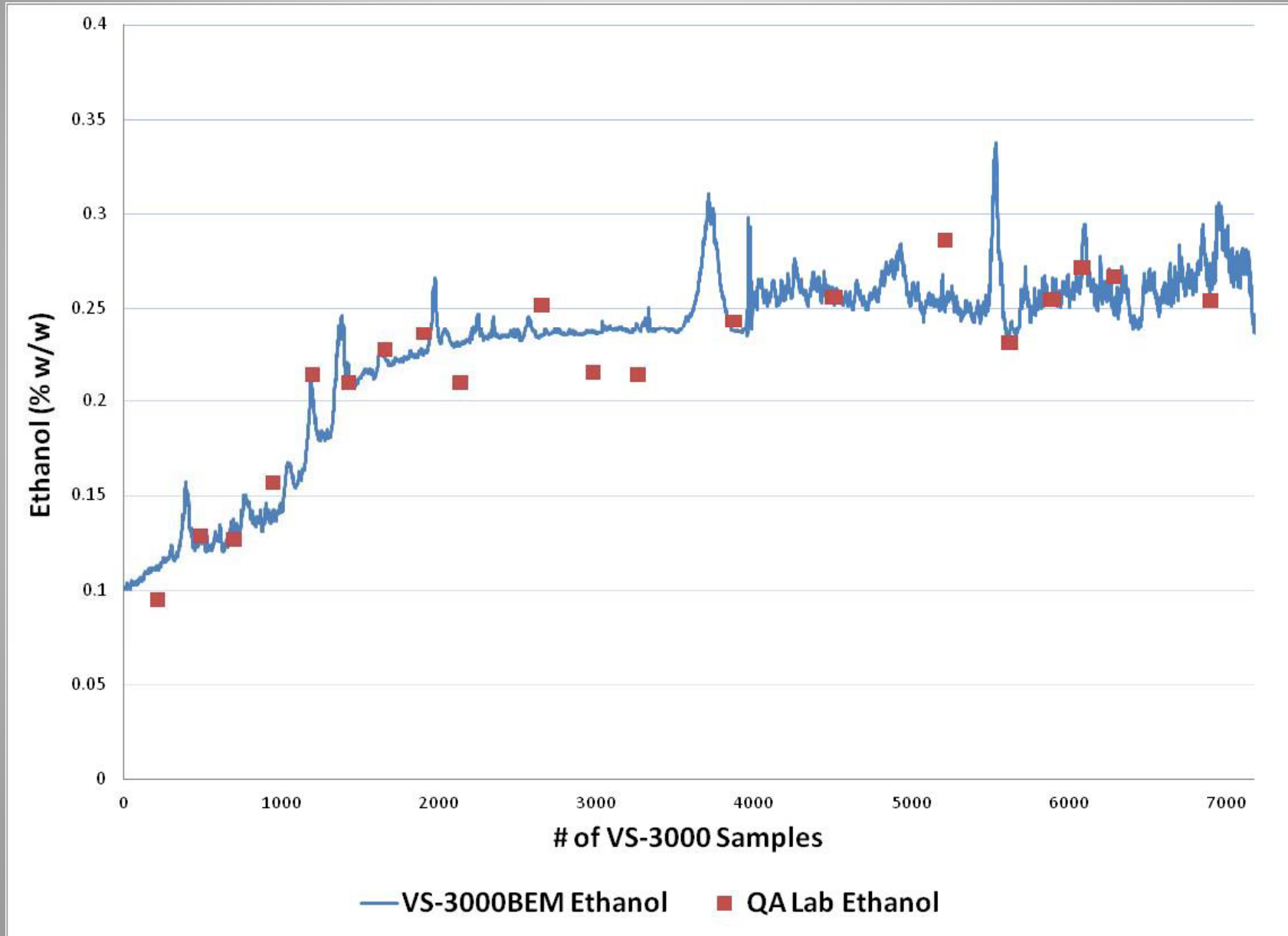
# VS-3000 °Brix vs. QA Lab °Brix



# Zoom: VS-3000 °Brix vs. QA Lab



# VS-3000 Ethanol vs. QA Lab Ethanol





## *Observations based on data*

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- *VS-3000BEM* measurements accurately trend along with measurements performed on Refractometer and HPLC in the BioEthanol plant's QA laboratory.
- *VS-3000BEM* data is highly repeatable.
- *VS-3000BEM* is able to **measure °Brix and Ethanol precisely** despite the extreme temperatures seen in the SLURRY line.
- *VS-3000BEM* measurements are not adversely affected by the solids in the SLURRY solution, nor the viscosity of the SLURRY solution.
- *VS-3000* operates 100% in-situ and does not require a slip-stream or CIP. *VS-3000* contains no moving parts and measurements are not adversely affected by un-dissolved solids.