INTRODUCTION TO
SAMPLING FOR
MINERAL PROCESSING

Part 5 in a series
“Process Control
Samplers”
SERIES CONTENTS

1 - Introduction to course and sampling
- Course objectives
- Course introduction
- Objectives for sampling

2 - Sampling Basics
- Some definitions
- 3D/2D/1D Sampling
- Delimitations / Extraction
- Rebounding / Cutter Speed and geometry

3 - Sampling Errors
- Delimitations / Extraction
- Bridging / Cutter issues / Multiple cutters
- Back pressure

4 - Metallurgical Samplers
- Belt Samplers / Crushers
- Linear Samplers and enclosures
- Rotary Vezin / Arcual Samplers
- Secondary / Tertiary Samplers

5 - Process Control Samplers
- Launder / Pressure / Poppet sampler
- Analyzers (XRF or particle)

6 - Effects on Mass Balancing
- Some aspect of the AMIRA code
- Detrimental effects and metallurgist responsibility
- Sampling errors in launder / pressure sampler
- Mass balance effects

7 - Effects on Recovery and NSR
- OSA and sampler errors
- Grade and Recovery targets
- Recovery - Error propagation
- Net Smelter Return - Error propagation (loss of revenues)
Objectives of Sampling

- **Process Control**
  - Normally for concentrate and tailings of each stage of the flotation process
  - Requires sampling to verify tendencies in the process
  - Important for maximizing metal recoveries
  - Feed for On Stream (OSA) and Particle Size (PSM) Analyzers
  - Required to produce 8 to 12 m³/hr of continuous sample
Sampling - Golden Rule

- The “golden rule” states that for correct sampling “all parts of the material being sampled must have an equal probability of being collected and becoming part of the final sample for analysis” (Gy)
Process Control Samplers

- Slurry should be properly mixed before cutter or nozzle
- Velocity of slurry going through the cutter or nozzle should be the same as the velocity of main slurry
Gravity Flow Fixed Cutter

TMC™
w/ Integrated Diverter
CONSTANT FLOWRATE CONTROL TO AN ON-STREAM ANALYZER EVEN DURING PROCESS FLUCTUATIONS
TMC™ Primary Sampler w/ M1860 Flow Diverter
TMC – Primary Sampler
TMCF – Primary Sampler
PPV – Primary Sampler

Note:
Value of SH must remain lower than PH (SH<PH).

Sample Height (SH) feet (m)
Process Height (PH) - feet (m)

Main Process Stream

Secondary Sampler or analyzer

Automatic 2-way Water Flush System (Optional)

Sample Pipe

Secondary Process Stream

Model PPV Sampler

Pipe Spool

Process Pump or Elbow Pipe

Sample Out

Sample Connectors
- replaceable rubber lined sample nozzle
- computer modelling for sizing each nozzle to the application

Process Flow Out to Next Stage

Process Connections
- installs on a vertical process line near pump discharge

Secondary Sampler

Secondary Sample

Process Flow In from Pump

Slurry Mixing Rods
- turbulence rods promote proper mixing
- replaceable UHMW polymer covers

Typical Applications
- melding streams in concentrate

Rubber Lined Inner Surface
- prevents wear
- special lining materials are available
- not vulcanized process
- prevents separation of rubber from metal surface

Process Connections
- installs on a vertical process line near pump discharge
- available connections:
  - ANSI 150#
  - vacuum
PPVNB – Primary Sampler

Sample Connections
- removable rubber lined sample nozzle
- computer modelling for sizing each nozzle to the application

Shurry Mixing Body

Rubber Lined Inner Surface
- prevents wear
- hot vulcanized process
- prevents separation of rubber from metal surface
- special lining materials are available

Process Connection
- installs on a vertical process line near pump discharge
- available connections: ANSI 150# flanges or Victaulic cut grooves

Sample Out

Process Flow Out

Process Flow In from Pump
PPH – Primary Sampler

Sample Connections
- removable rubber lined sample nozzle
- computer modelling for sizing each nozzle to the application

Sample Extracted from Middle of Flow

Process Flow In from Pump

Rubber Lined Inner Surface
- prevents wear
- hot vulcanized process preventing separation of rubber from metal surface
- special lining materials are available

Sample Out

Process Flow Out

Process Connection
- installs on a horizontal process pipe near pump discharge where flow is turbulent
- #150 flanged or Victaulic cut grooved connections
Pressure Pipe Horizontal Sampler PPH
Poppet Sampler
Sampling Points

Diagram:
- Feed
- Rougher
- Scavenger
- Cleaner
- Concentrate
- Reject
OSA System Overview

- Samplers provide sample to the MXA’s
- Return lines go back to the process
- MXA’s direct a single sample to the probe to be measured
- Assays results generated and sent to plant’s DCS and displayed locally
Slurry Multiplexer (MXA)
On Stream Analyzer (OSA)

XRF Measurement of Slurry
Particle Size Analyzer

Particle Size Measurement of Slurry
For more information you can always contact us at:
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