

Measuring point	Installation	Measuring task
1	pipeline	determination of the oleum concentration
2	pipeline	monitoring of the sulfuric acid / oleum concentration
3	pipeline	control and monitoring the blending to the desired concentration

H₂SO₄ in Copper Mining

Introduction

Copper is obtained by the extraction of copper sulfide ores, which have a copper content of ~ 2 wt%. The raw metal production includes a wide variety of process steps.

The processing of copper sulfide ores is carried out by flotation. Thereby, crushed copper sulfide ores are enriched with water and a foaming agent, to skim quartz or silicates. The obtained copper concentrate has a copper content of 20 - 40 wt%.

In the pyrometallurgical extraction, SO₂ is generated which is oxidized with atmospheric oxygen to form sulfur trioxide SO₃ (contact process). What remains is a copper content of approx. 96-99 wt%. In order to reach a purity of 99.99 wt%, an electrolytic refining takes place subsequently. Otherwise, the impurities strongly influence the thermal and electrical conductivity and quality of copper.










Application

In the pyrometallurgical extraction, the copper concentrate is slagged by adding SiO₂ in the furnace at 1200 to 1400 °C. The melt of copper and iron sulfide is removed as the so-called copper matte from the slag phase. The liquid copper matte is poured into a converter and the iron sulfide reacts with air to sulfur dioxide SO₂.

Resulting SO₂ is oxidized to sulfur trioxide SO₃ (contact process), which SO₃ is directed into sulfuric acid (96 wt%). In the absorber, sulfuric acid in high concentrations by adding water or oleum is generated. In the blending process, the H₂SO₄ is diluted on desired target concentration.

Each process step can be both monitored continuously by the inline LiquiSonic® measurement technology and optimally set. The high dependency on sonic velocity enables an accuracy of +/- 0,05 wt% for sulfuric acid.

Customer value

-  easy installation: plug 'n play
-  maintenance-free and excellent long term-stability
-  improved process control
precise H_2SO_4 strength ± 0.05 wt%
corrosion protection
-  no unclear laboratory values anymore
-  inline measurement 24/7 real-time data
-  strong diagnostic capabilities
-  powerful data storage
-  corrosion-resistant sensor material
Hastelloy C2000, Hastelloy BC1 Hybrid
Tantalum
PFA coating
-  LiquiSonic® replaces laboratory costs:
No sampling
No titration (common laboratory method)
reduced personell costs
amortization < 1 year

Installation

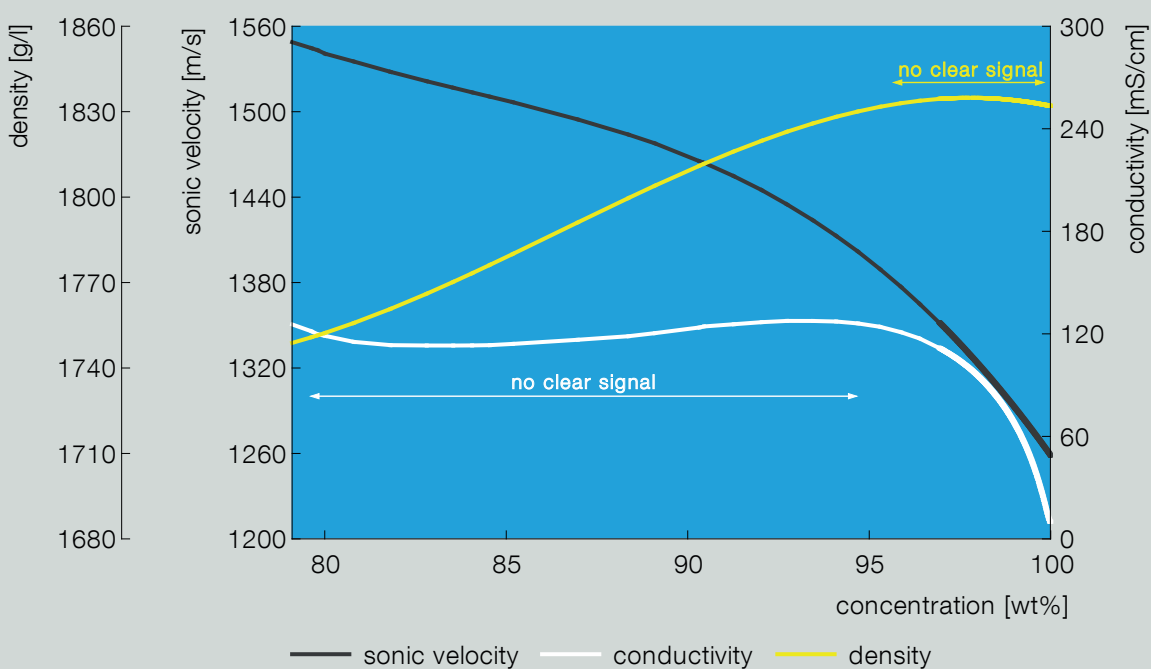
The LiquiSonic® immersion sensor is easily installed into pipelines after absorber or sulfuric acid production and blending.

By using the LiquiSonic®, up to four sensors can be connected, allowing the simultaneous monitoring of several measuring points.

Typical measuring range:
concentration range from H_2SO_4 : 80 to 100 wt%
temperature range: 20 to 90 °C

concentration range from oleum: 0 to 10 wt%
temperature range: 10 to 60 °C

LiquiSonic® sonic velocity measurement



LiquiSonic®



21001311
LiquiSonic® Controller 30 V10



21010123
Flange sensor V10 DN80 (3"), PFA coating



21004435
BUS connection: Profibus DP



21004449
Network integration



21004110
High power sensor electronic



21004202
Bus cable indoor (100m)



21007846
Factory acceptance test (FAT) certificate



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