

FeCl<sub>2</sub>  
H<sub>2</sub>SO<sub>4</sub>  
HCL  
Density  
Water in oil  
Slurries

# Application Notes

▶ **HF - Hydrogen fluoride**

NaOH

Slurries



Model 8500 with hybrid sensor  
UFW 8"  
Monel-400



## Industries

This application can be found in a few industries, like:

- Alkylation in refineries
- Nuclear conversion and enrichment facilities
- Aluminium manufacturing
- Titanium pickling

## Application

Hydrogen fluoride is together the hydrofluoric acid the industrial source for fluorine, a raw material used in polymers and in the pharmaceutical industry. HF with water forms a very strong acid. Therefore, in many cases, impurities in HF are measured, like the measurement of water in HF. The concentration of HF is reported as wt% HF. Rhosonics has developed a very accurate analyser to determine its concentration in the whole range and with a broad temperature range.

The concentration is measured based on speed of sound determination. As the speed of sound is depending on the temperature, both parameters are measured with a very high accuracy. The higher the HF concentration, the higher the accuracy of the measurement.

## Description

HF is used in several industries either in concentrated form or in dilutions down to a few ppm. In practice, the product can be measured with high accuracy in a well equipped laboratory using off-line density or gravito meters. When the product must be measured inline with the same degree of accuracy, other methods are required. Inline sensor systems, like conductivity sensors, refractive index meters or coriolis meters, simply lack sensitivity for specific applications, or do not seem to respond anymore at larger concentrations of HF.

Therefore, the Model 8500 HF analyzer, together with the Monel 400 UFW sensor is the most accurate insitu real time process analyser on the market for this application.



The Chemicals Analyzer of the Future

## Model selection

Controller:  
Model 8500 Inline Process Analyzer  
Model 8520 Dual sensor Inline Process Analyzer

Sensor:  
UFW-Monel400 US sensor explosion proof

Options:  
Cables, connectors, enclosures, system integration

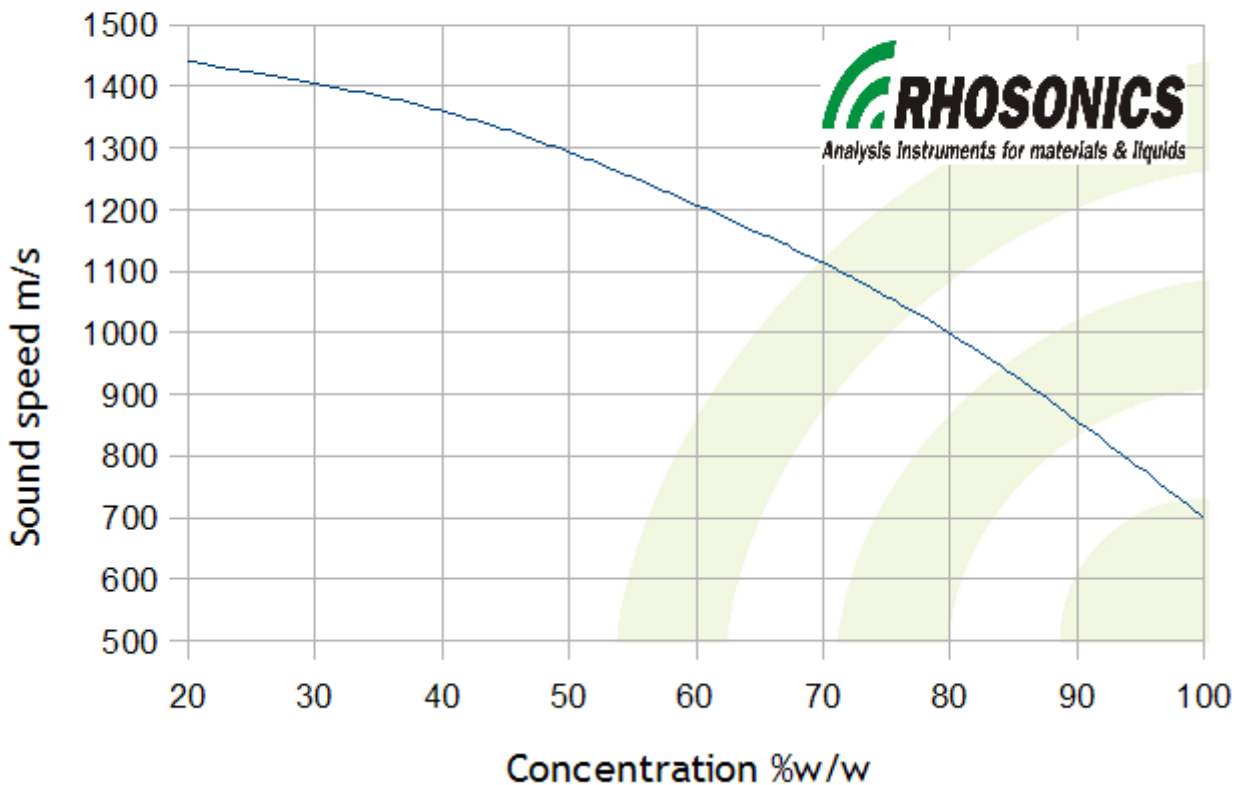
## Benefits

For this application our UFW probes are suitable, but also the new hybrid ultrasonic technology can be used for the determination of HF. The benefit is that the temperature is measured based on ultrasonic technology; we measure the speed of sound and we also determine the density of the liquid. Other benefits are:

- Low price and cost of ownership
- High accuracy and reproducibility
- Low Maintenance

## Sound speed vs. concentration

HF 0-100%w/w t=30°C





## The Solution Specialist

The mission of Rhosonics Analytical is to provide solutions for In-line concentration analysis of virtually all existing process liquids, including electrolytes, emulsions, suspensions and slurries.

For almost two decades, Rhosonics Analytical has been focusing on the development and employment of high-performance ultrasonic technologies for in-line liquid concentration analyzers and non-destructive testing of materials.

### Our products

- In-line concentration analyzers for virtually all existing process liquids, including solutions, electrolytes, emulsions, suspensions, solids and slurries.
- Piezo composite transducers for Ultrasonic NDT (Non-Destructive Testing) for new inspection methods, including ToFD and Phased Array.

### The Solution Specialist

Rhosonics Analytical is The Solution Specialist for the design, production and supply of ultrasonic in-line process analyzers for liquids and slurries in any industry world wide.



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