Turbidity Systems

INGOLD
Leading Process Analytics

InPro 8000 Sensor Series
M800 1-Channel Transmitter

Improved product quality and process reliability

Increased productivity

Enhanced process control

In-line Turbidity Measurements

For More Visibility into Your Process

METTLER TOLEDO

Versatile Turbidity and Color Measurement
For Multiple Industries and Applications

METTLER TOLEDO offers several types of in-line turbidity sensors that are optimized for specific measurement ranges and different applications. Typical industries include breweries, chemical processing, pharmaceuticals, sugar refining, food and beverage, and wastewater

Leading-edge technology provides the best solutions

- Forward scattered light/absorption
  Turbidity sensors with this technology (i.e. InPro® 8300 RAMS series and InPro 8600i series) are designed for applications with low to medium turbidity levels.
  Color measurement (yellowish) is also available in the same sensor (i.e. InPro 8300 RAMS type TCS and COMBINE/InPro 8600i/D3).
- Backlight scattered light
  Such sensors (i.e. InPro 8050/InPro 8100/InPro 8200) are designed for samples with a high particle concentration of up to 250 g/l suspended solids. Depending on the application, the sensors are available in both stainless steel and a polysulfone body for pharmaceutical and wastewater use respectively.

Easy to operate M800 transmitter
For use with the InPro 8600i series, the traffic light color-coded touchscreen on the M800 transmitter allows operators to evaluate the sensor and process condition at a glance. The M800 also provides excellent security (setting can be password protected) and convenient operation.

Industries

Brewing Industry
Turbidity, clarity, color

Chemical Industry
Particle concentration, crystallization

Pharmaceutical Industry
Filtration, purification, fermentation

In-line turbidity sensors provide accurate real-time turbidity measurements

Compared to on-line measurements, in-line turbidity sensors provide more accurate real-time measurements by minimize the error due to sample conditioning or long sampling lines.

M800 1-channel transmitter

Sugar Refining Industry
Filtration, turbidity, color

Food and Beverage
Filtration, turbidity, color

Wastewater process
Suspended solids

Optical Fiber Backscatter Turbidity Measurement

Wide Measuring Range with High Linearity

InPro 8100 and 8050 single optical fiber turbidity sensors, with their wide linear measuring range, are designed for samples that have a high particle concentration. The InPro 8200 dual optical fiber turbidity sensor is designed for samples with medium to high concentration and where high resolution is a requirement. The high quality and wide measuring range of these sensors ensures high process uptime and improves product quality.

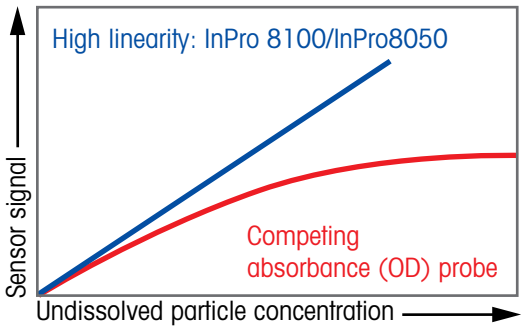
High quality, low maintenance turbidity sensor for extreme process conditions

Backscattered light technology enables a sensor design with a uniform, unbroken surface structure. This reduces fouling and the need for maintenance. The sapphire windows can withstand aggressive media (i.e. strong acid/alkaline) and high temperatures. The sensors are steam sterilizable and autoclavable to minimize the effort of manual sensor cleaning. Alternatively, fully automatic sensor self-cleaning is possible with the optional Easy-Clean systems.

Advantage of the backscattered light technology provides unbeatable high turbidity measuring range (up to 4000 FNU) without losing its linearity.

Compact sensor design enable installation in process confined space

Compact sensor design and various sensor lengths are available. Retractable sensor housings are available for processes where sensor retraction from the running process is required. This provides maximum process flexibility in installation. As a result, it reduces the installation cost as no reengineering to the tank/process piping is required.

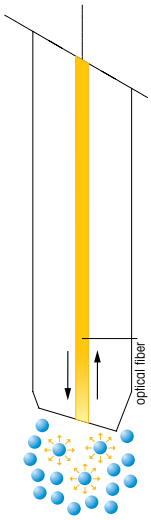


Advantage of backscattered light technology

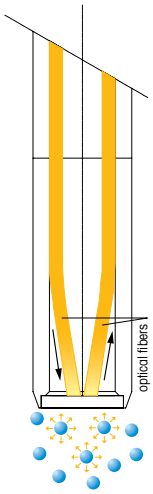
InPro 8100 (single fiber)
is recommended for use in fermentation process/pharmaceutical applications

InPro 8050 (single fiber)
is recommended for use in high turbidity raw water intake, and/or industrial waste water applications

InPro 8200 (dual fiber)
is recommended for use in crystallization control, biomass growth monitoring and liquid/solid separation processes.



Single optical fiber: emitted and backscattered light travel on same fiber.



Two optical fibers: emitted and backscattered light is protected by scratch resistant sapphire window.

Visit the competence center
www.mt.com/turbidity

25°, 90° Turbidity and Color Measurement
Reliable Measurements for Tight Process Control

The InPro 8600 i/D1 and /D3 turbidity sensors combine precision technology with advanced measurement electronics in one compact sensor head, and provide highly reliable turbidity measurements at a reduced installation cost. The forward and 90° sideward-scattered light measurement technology are designed to provide highly dependable turbidity measurements in the low to medium particle concentration range. The ratio principle compensates for sample color change, or window fouling.

Not one, but two light scattering measurement technologies in the same sensor!
The InPro 8600 i/D3 sensor additionally includes the 90° scattered light measurement and an additional blue LED light source.

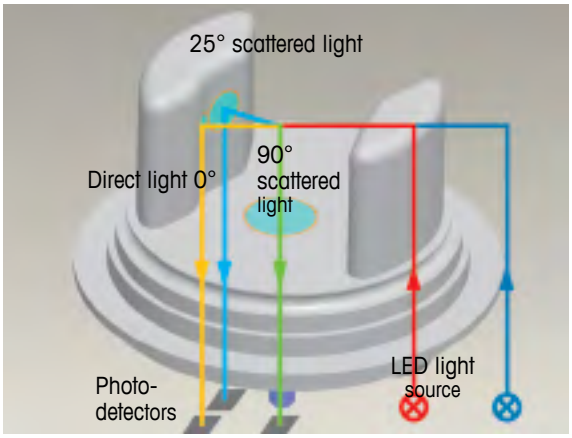
The 25° forward scattered light measurement is far more sensitive than 90° light scattered for detecting particles bigger than 0.3 µm.

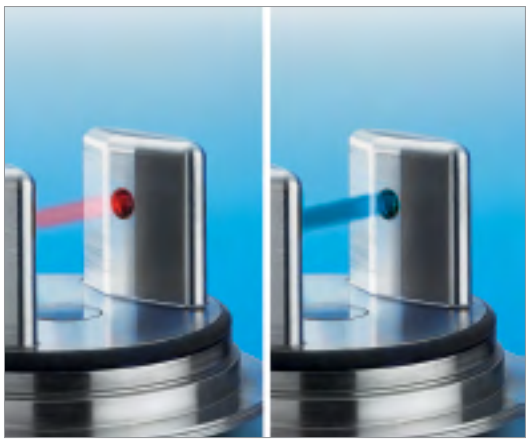
This provides a very clear indication of filter break-through. The 90° scattered light measurement is very good in low turbidity applications with particle sizes smaller than 0.3 µm.

With the combination of both 25° and 90° measurement, the InPro 8600 i/D3 provides a very useful function in product quality monitoring and process control.

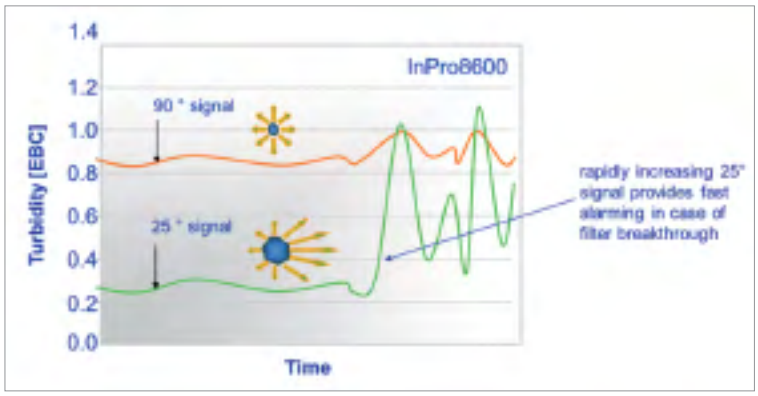
The second LED (blue light), implemented in the InPro 8600 i/D3 sensor, enables color measurement (yellowness) for beer and sugar processing applications.

The sensors' hygienic design meets the requirements of the European Hygienic Engineering and Design Group (EHEDG).





Additional blue light LED for simultaneous color measurement. Change between red (turbidity) and blue (color) light operating mode.



Dual angle measurement

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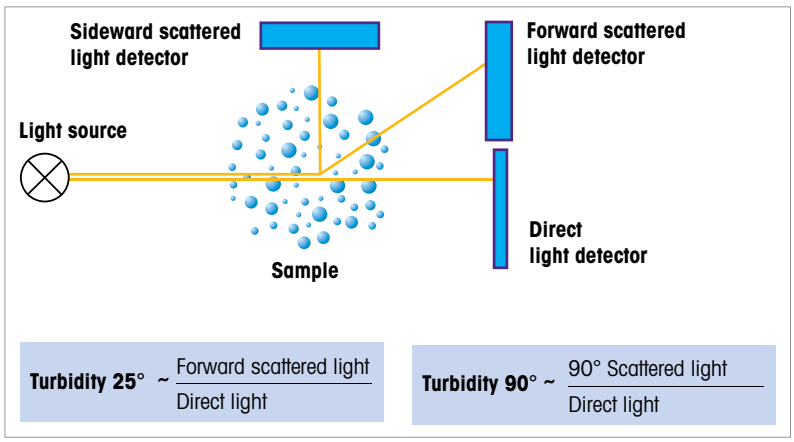

Measurement principle

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Turbidity and Color Change Identification System

Simple Set-up for Phase Separation Automation

The InPro 8300 RAMS (Reflection Absorption Multi-Switch) systems are designed for in-line use in phase separation and product identification applications by turbidity or color. The rugged InPro 8300 RAMS systems are simple to configure, easy to use and require minimal maintenance. These systems are widely used in brewery applications for beer/water separation, before the filler line and in separator control.

The InPro 8300 RAMS is an optical multi-switch for monitoring product/water phase separation processes and for the identification of products in the process. In process automation applications, the unit supplies the switching signal for the product/water or product/product phase separation without any need for a transmitter.

The InPro 8300 RAMS can be configured direct via a PC. Product identification can be displayed in table or chart form. The data log is easy to access and can be copied to Excel™.

Long shelf-life LED light source provides steady and reliable turbidity and color measurement
Thanks to the LED light source, drift in the turbidity measurement is virtually absent. The sensors are factory pre-calibrated for fast and easy start-up. It is not necessary to exchange the light source or perform standard calibration.

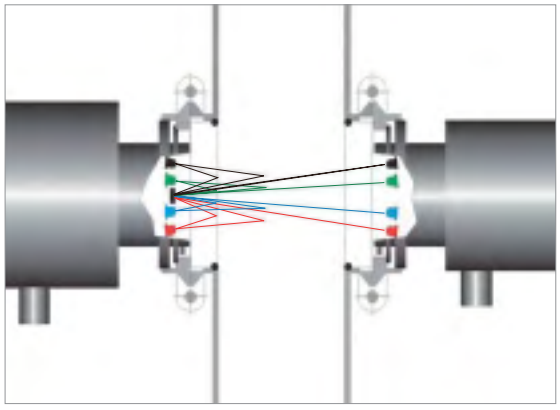
Easy installation
The InPro 8300 RAMS series is easy to retrofit to VarinLine™ sight glasses without the need for welding.

Four InPro 8300 RAMS product configurations are available for various process control requirements:

Configuration	Description
InPro 8300 RAMS TCS	Freely selectable either turbidity or color mode for process monitoring. The TCS unit with one 4 – 20 mA analog signal output for direct process control. Typical application: phase separation control
InPro 8300 RAMS Basic	Simultaneous measurement of backscatter and absorption at four wavelengths. Identification of up to eight different products plus water. Medium identification code is forwarded to the DCS/PLC via digital output. Typical application: product identification
InPro 8300 RAMS Cali	Factory calibrated for EBC measurement. The CALI offers the additional option for mA output related to EBC unit. Typical application: monitoring turbidity/color in high turbidity range samples
InPro 8300 RAMS Combine	Factory calibrated for EBC measurement. Combined measurement of NIR reflection and absorption for extended measurement turbidity/ color measuring range and enhanced sensitivity at low turbidity. Typical application: monitoring turbidity/color in low to high turbidity range samples

Highest measurement sensitivity increases yield

Up to four light sources (NIR, red, green and blue) are used in InPro 8300 RAMS models. The simultaneous measurement of reflection and absorption of NIR, red, green and blue LEDs enhances sensitivity in low turbidity and/or color measurement. Any changes of the process reading will be detected immediately and hence reduces waste and increases yield.

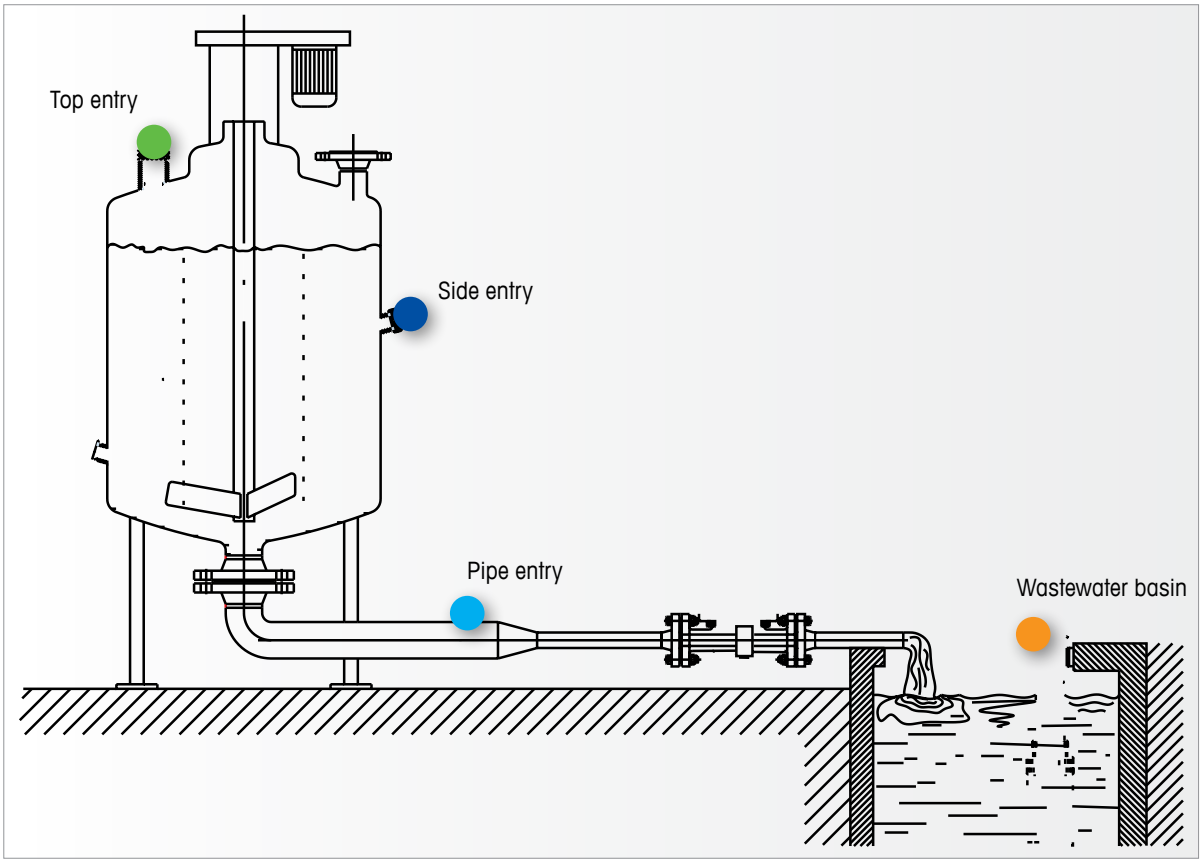


Simultaneous absorption/reflection measurement at four wavelengths

High Product Quality
Safeguards Reliable Measurements

The InPro 8000 series of turbidity sensors deliver highest performance to suit various applications. This series works seamlessly with METTLER TOLEDO state-of-the-art housings and transmitters, giving you greater process uptime and more confidence in your process analytics.

Several available sensor connection and insertion lengths provide easy and flexible installation
All our turbidity sensors are obtainable with the PG 13.5 thread or Tuchenhagen-Varinline process connections to ensure simplicity and flexibility in installation without the need for modifying or reengineering of process pipes. Various sensor insertion lengths and housings are available to suit every application.



InPro 8100/ 8200
12 mm diameter sensor body saves valuable space and is compatible with a wide range of housings.

Retractable and sterile housings
InTrac 779 e
InTrac 797

InFit 762 e housing

InPro 8600 i/D3
Perfect for color and turbidity measurement

InPro 8300 RAMS series
Outstanding performance for identifying phase separation

InPro 8050
Durable turbidity sensor for industry wastewater applications

InDip 500 series housing

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