



# Co<sup>o</sup> Colour Opacity

Powered by Icon

## All Icon products are...

**Easy to use:** with an intuitive multilingual graphic user interface on a large armoured-glass wipe-clean touch-screen display.

**Certified to global standards:** ATEX, IECEx, UKEx, TIIS, EACEx, and ETL approved to give absolute confidence and peace of mind in hazardous areas and manufactured under an ISO9001:2015 certified Quality Management System.

**Robust and fully explosion proof:** with no air or inert gas purging required for safe operation in explosion hazard areas.

**Highly efficient:** with low sample consumption and no utility requirements.

**Safety assured:** with configurable status alarms.

**Flexible:** with standard Modbus, 4-20mA, and digital outputs.



## What does it do?

The Icon Colour/Opacity analyser uses a dispersive spectrometer module to carry out colour, opacity, and concentration measurements. It is designed to overcome the shortcomings of optical filter-based instruments, such as sensitivity losses due to bandpass width and the low transmission characteristics of fixed optical filters. The analyser can measure colour and opacity simultaneously, and can perform concentration measurements based on light absorption at single or multiple wavelengths.

A unique measuring instrument, the analyser is extremely versatile and can be readily re-programmed in the field. It provides accurate measurements on the many petroleum products that have colour as part of their specification, and can be used to duplicate a range of standard visual colour comparison tests dealing with light and dark samples. Delivering exceptional results, the analyser enables you to measure contamination, purity, or clarity of a liquid. It is also very good at detecting dye colour and product contamination in pipeline applications.

## How does it work?

The analyser uses visible light produced by a 12V tungsten halogen lamp running under reduced voltage to increase its lifetime. Light passes out of the analyser enclosure through an optical window and is guided along a fibre-optic cable to an external measuring cell. The light enters the cell through another window fitted with a focusing lens. It then passes through the test sample and out via a further window and fibre-optic cable. It travels back into the enclosure to the dispersive spectrometer module, where the optical transmission or absorbance measurements are carried out. These measurements are fed into a control computer which calculates the final results according to the method(s) selected.

## Why choose the Icon Scientific Colour/Opacity Analyser?

**Full-spectrum analysis:** with measurements over the full visible-light spectrum allows for precise colour detection and complex multi-product interfacing even when the peak absorption wavelength varies (ASTM colour, Red/Green dyes, etc).

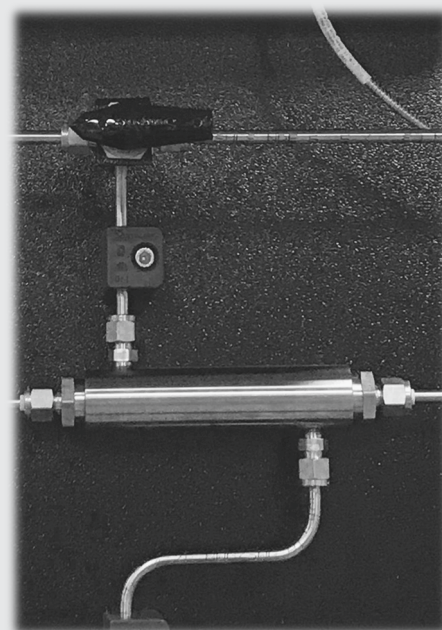
**Excellent stability:** to compensate for drift and dirt build-up on the cell windows, all measurements are carried out using one or more reference wavelengths.

**Dual method analysis:** the analyser can perform up to two simultaneous measurements as standard. These could include any combination of colour, opacity, concentration, or product interfacing measurements.

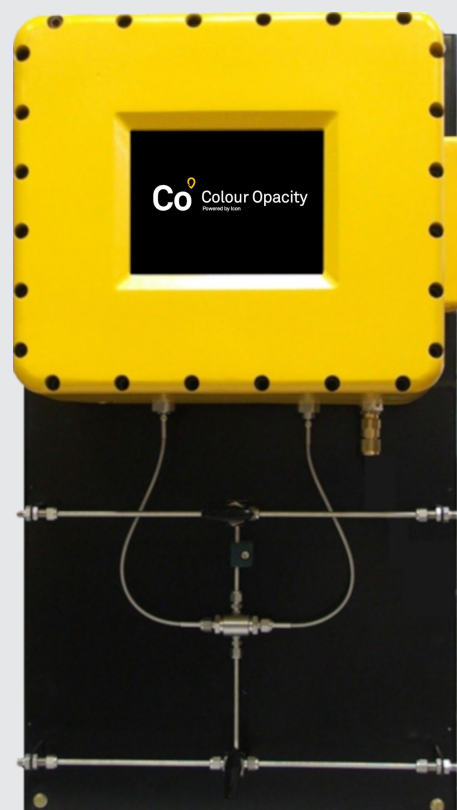
**Versatile measurements:** with a range of inbuilt detection and calculation algorithms to choose from to ensure the best match to any required application.

**Remote cell mounting:** extended fibre optic cables allow the separation of measuring cell and controller if required.

**Standard SMA connectors:** a range of third-party transmittance and reflectance-measuring cells can be used in addition to the standard Icon transmittance cells.



*“The Icon Scientific Colour Opacity Analyser is extremely versatile and may be readily re-application engineered by the user in the field. The use of a solid-state spectrometer module avoids the band pass and transmission loss problems associated with optical filters and moving parts such as filter wheels and chopper motor assemblies”.*



Sample Requirements	
Inlet Temperature	Maximum 200°C (390°F)
Inlet Pressure	Maximum 100 bar (1450 psi)
Outlet Pressure	Can be returned to pressure, provided minimum flow requirement is achieved.
Sample Flow (continuous)	Minimum 6 L/H Maximum 30 L/H
Filtration	Filtration generally not required.
Water Content	Sample should be 'clear and bright' at room temperature, bubble free, and contain no free water.

Utility Requirements	
Instrument Air	Not Required.
Coolant	Not Required.
Power	115-230VAC 50-60Hz, Max 75VA

Installation Requirements	
Location	Unit must be located out of direct wind sun and rain.
Ambient Temperature	+5 to +45 °C
Ambient Humidity	0-95% RH, non-condensing.
Remote Flowcell	Analyser can be optionally supplied with loose flowcell and extended fibre optic cables for remote installation in 3rd party sampling system.

Control System	
Control System	Based on fan-less industrial PC with solid state hard drive.
Graphical User Interface (GUI)	10.5" armoured glass touch-screen. The GUI is used to program the unit and display current and historical analyser results and alarm status.
Language	User-selectable multilingual display.

Certification	
Hazardous Area Certification	Exd certified to ATEX, IECEx, UKEx, and EACEx standards, suitable for zone 1 or zone 2 use with gas group and T-rating of IIB+H2 T6. It is also ETL listed for the USA and Canada Class 1, Div 1, groups B,C,D.
IP Ratings	Tested and certified to IP66/IP67 (dust tight and protected from temporary total immersion in water).

Specification	
Applications & Measuring Ranges (output freely adjustable within range)	ASTM D1500 (0 to 8 ASTM) ASTM D156 (+30 to -16 Saybolt) ASTM D1209 (Hazen / PtCo) Colour concentrations Dosing applications Multi-product identification  Other – contact Icon for details
Measuring Cell Pathlength	Standard flowcell pathlengths are: 10mm (ASTM D1500) 100mm (Saybolt D156)  Other – contact Icon for details (e.g.: 1mm, 60mm, etc)
Repeatability	ASTM Colour ≤0.2, (typically <0.03) Saybolt Colour ≤1.0, (typically <0.15)  Other – contact Icon for details
Cycle Time	Continuous output.
Multiple Methods	Up to 2 simultaneous measurement methods based on: linear interpolation of calibration curves, multi-wavelength regression calculations based on absorbance or transmittance at single or multiple wavelengths, peak area integration, opacity or transmission measurements, etc.
Light Source	10W tungsten halogen lamp (lifetime > 7000 hr)
Spectrometer	Full range: 360-1100 nm

Inputs/Outputs	
Analog Outputs	1 x 4-20mA isolated output (active or passive) is provided as standard.  Second output available as option.
Alarms	The analyser provides changeover alarm contacts for the following conditions: <ul style="list-style-type: none"> <li>Result 1 high / low level alarm</li> <li>Result 2 high / low level alarm</li> <li>Spectrometer fault alarm</li> <li>Bulb fail / low light transmission alarm</li> <li>Analyser online / offline (run / standby mode)</li> </ul> All contact ratings are 24VDC 0.5A, 230VAC 1A
Communications	Modbus RTU or OPC over RS485 or Ethernet (TCP/IP), with optional fiber optics. Optional OPC server software.

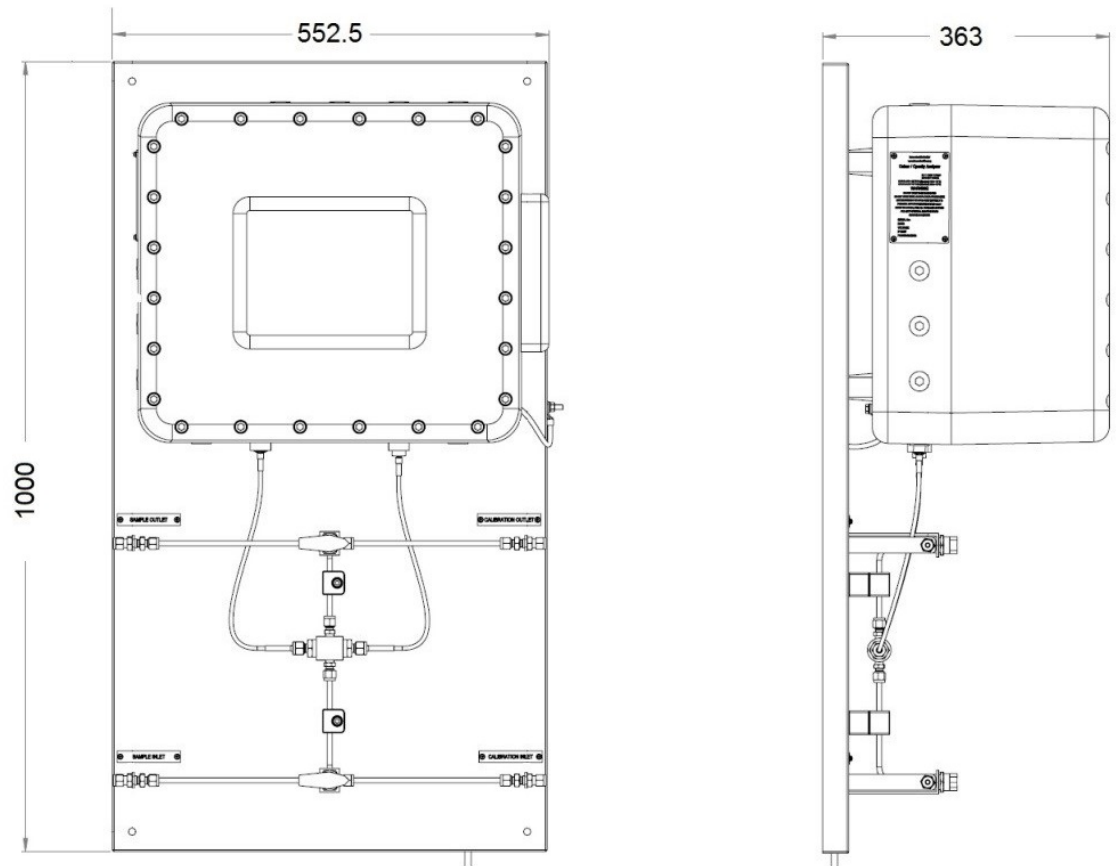
# Dimensions & Weights

## Notes:

All dimensions in mm

Unpacked weight approx. 103kg

Packed weight approx. 165kg



*Note: Icon Scientific products are subject to a program of continuous development and improvement and specifications are liable to change without notice. Please check that you have the latest information available before relying on any specification.*