

CHECKING CLEANING EFFICIENCY OF METAL PARTS WITH THE INFRACAL TOG/TPH ANALYZER



INTRODUCTION



For gas regulators, space shuttle components, weaponry parts and oxygen sensors, it is critical that metal parts be free of hydrocarbon contamination before use. Prior to its ban due to ozone layer depletion, Freon was the most commonly used solvent for metal parts cleaning. The metal part is soaked in a known volume of solvent, then the solvent is tested for its hydrocarbon content. Several replacement solvents for Freon are currently in use, including Hexane, Vertrel MCA, AK 225 and S-316. Like Freon, both AK225 and S-316 are infrared transparent solvents and do not contain hydrocarbons. To analyze the hydrocarbon levels, they are placed directly into a 10mm quartz cuvette cell and measured by transmission with InfraCal Cuvette Holder Analyzer, Model CVH. Both

hexane and Vertrel MCA contain hydrocarbons that interferes with the infrared measurement using a cuvette and transmission. Many labs have been forced to switch to a gravimetric method which is cumbersome and time consuming. Wilks Enterprise developed the InfraCal IR Platform Analyzer, Model HATR-T2, for use with solvents that contain hydrocarbons such as Vertrel MCA or hexane. The sample is placed on the analyzer's horizontal ATR crystal and the heat from the infrared source evaporates off the solvent. The residual hydrocarbon film left on the crystal is measured by internal reflection techniques.

PRINCIPLE OF OPERATION

The InfraCal Analyzer is a compact, fixed-filter mid-infrared analyzer with no moving parts and an insignificant optical air path. It weighs less than 5 pounds and can be operated from a battery pack or a cigarette lighter adapter cable. This makes it portable, sturdy and operable in a range of ambient conditions typically found in field environments. An internal calibration table and easy-to-use operator interface allows for analysis by non-technical personnel. Hydrocarbons have a characteristic infrared absorption band at $3.4 \mu\text{m}$ (2930 cm^{-1}). As hydrocarbon concentration increases, the infrared absorbance increases. An internal calibration table converts the absorbance to the desired unit of measure. In less than one minute a result is displayed.

PRODUCT SPECIFICATIONS

Dimensions: 6.5 x 6.5 x 5" (165 x 165 x 127 mm)
Weight: 4.5 lbs. (2.0 kg)
Display: 4 digit, 7-segment red LED, 5/8 in. character height
Power Requirements:

Voltage - 12 V dc, +2% max.
Power - 7.5 watts max., 5 watts typical
Input - Switchcraft 760 plug or equivalent, center positive

Suggested Power Sources:

Wall supply; AC/DC converter type (supplied as standard)
12 volt auto battery adapter connector
Portable 12 volt battery pack

Measurement Range:

2 to 5000+ ppm (Dependant on InfraCal Model)

Operating Temperature Range:

40°F (4°C) to 110°F (45°C)

User Selected Calibration:

Zero balance adjustment
Up to 20 point curve fitting calibration

Communications Port:

RS232 port, 9-pin D-Sub female, PC compatible, for upload to PC, datalogger or printer

InfraCal TOG/TPH Analyzer, Model CVH

For S-316 or AK 225-part number 405-0003

InfraCal TOG/TPH Analyzer, Model HATR-T2

For Hexane or Vertrel-part number 405-1009

