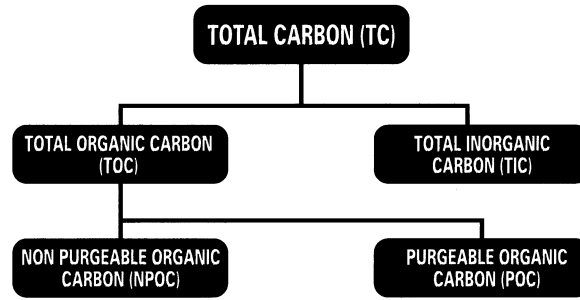


SOME COMMONLY MEASURED PARAMETERS

All water generally contains some amount of carbon in the form of organic (TOC) and inorganic carbon (TIC) compounds and dissolved carbon dioxide. These may exist as solids, suspensions, dissolved particulates or as volatile organic carbon (POC) compounds. The most useful and frequently measured carbon form is the organic component. The total of all the carbon (TC) can also be a useful measurement in certain applications. Astro analyzers are available that can separate and measure all of these carbon components; however, process analyzers are commonly limited to a TOC or TC measurement.

TOTAL CARBON (TC)

Measurement of the total carbon content of a stream is easily accomplished in the Astro TC analyzer with the following steps. The untreated sample is continuously mixed with an air carrier gas and sodium persulfate reagent then passed through an ultraviolet reactor. All of the carbon in the sample reacts with the persulfate and ozone created by the UV to form CO₂. The CO₂ is then measured by an NDIR detector and directly correlated to TC levels in ppm.



TOTAL ORGANIC CARBON (TOC)

Understanding the measurement of TOC must first begin with the proper definition of TOC. In the strictest definition, TOC is comprised of all organic carbon present including both purgeable (POC) and nonpurgeable (NPOC) components. The prescribed EPA method for analyzing TOC directly requires sample treatment that will eliminate the POC prior to the oxidation step, resulting in a TOC number that actually represents only the NPOC content in the sample. The user needs to fully understand these semantic differences when establishing the correct analyzer configuration for the application.

NON-PURGEABLE ORGANIC CARBON (NPOC)

Analyzing the stream for the NPOC content is a multi-step process. The continuously flowing sample is first acidified to a pH of less than 3. This causes a conversion of the inorganic carbon into CO₂. The sample is then passed into a sparging column where purge gas is passed through the sample removing the resulting CO₂. The POC components are eliminated in this step as well. This results in a sample which contains only NPOC at this

point. A persulfate reagent is then added and the sample stream is passed into the UV reactor where the organic carbon is converted into CO₂. The CO₂ is then measured and correlated directly to the NPOC content.

PURGEABLE ORGANIC CARBON (POC)

In many TOC applications, the POC contribution of a sample is of considerable interest. Because of the process of TOC analysis, it is extremely difficult to directly measure POC, therefore the POC contribution must be derived by another method. The most common way is to use a TC analysis and subtract the TIC portion. Consult the factory in these applications.

TOTAL INORGANIC CARBON (TIC)

The analysis of the TIC in most sample streams has little value. More often, the TIC is an interfering factor that is eliminated prior to analysis. In applications where TIC is of interest, it is easily measured by acidifying the sample to cause the inorganic carbon to convert to CO₂, then sparging the sample and passing the resulting CO₂ gas into an NDIR detector for measurement.

