



PULP & PAPER

MONITORING ON-LINE COD/TOD IN THE PULP AND PAPER INDUSTRY

Water is used at nearly every stage of pulp and paper production. The quality of a mill's water impacts product quality and plant profitability while effluent quality determines a plant's compliance. Online monitoring helps to achieve the combined goals of reduced consumption, increased water re-use and improved effluent quality. (see figure 1)

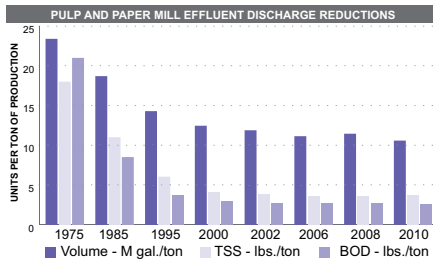


Figure 1. Graph courtesy: 2012 Sustainability Report, American Forest & Paper Association.

The pulp and paper industry is one of the heaviest users of water in the U.S., requiring 54 cubic meters on average per metric ton of product. And the manufacturing of paper generates significant waste.

The environmental impact of waste streams from pulp and paper is typically measured as Biological Oxygen Demand (BOD), and while this measurement is almost always required by a plant's discharge permit, the 5-days required to complete the test significantly limit its value for process control.

For same-day results, most plants turn to COD to analyze effluent and process conditions in the plant. The most common test method is the potassium dichromate test (EPA Method 410.4). This 2-hour COD test is much faster, but it still isn't fast enough for process control. Using

Method 410.4, measurements above 900 mg/L require dilution and the accuracy of the results is only ± 20 percent. Worse still, Method 410.4 generates toxic residue.

The TOD Alternative

Oxygen demand can be determined a number of ways; biologically (BOD), Chemically (COD), or thermally (Total Oxygen Demand, or TOD). While the BOD test requires at least five days to complete, the sample is only partly oxidized. Chemical methods are faster and the oxidation is greater, but still not 100 percent. Thermal oxidation provides results that closely approximate the molar maximum.

The clear advantage of a thermal measurement is that a sample can be oxidized instantly and the results can be determined in only three minutes. The method has field-proven, repeatability and accuracy of three percent or better, requires no dilution for higher range measurements, requires no catalysts, no reagents, and produces no toxic residue.

TOD analyzers are found in dozens of industries, where they play a key role in process control and discharge monitoring.



LAR's **QuickCODultra** is a robust, online COD analyzer. Operating at 1200°C the **QuickCODultra** easily provides rapid, accurate, repeatable COD analysis every three minutes. The non-fouling design is ideally suited to industrial applications and the analyzer can be configured to monitor up to six streams for COD and/or TOC and Total Nitrogen.

LAR's TOD technology is also available in a laboratory-scale as the **QuickCODlab**.

LAR's Global Presence in the Pulp and Paper industry spans 15 countries, serving a client base that includes:

Akzo Nobel	Norske Skog Paper Mills
Aviretta GmbH	Papier und Kartonfabrik
Baiersbronn Frischfaser	Papierfabrik Lenk
Celulose Nipo	Papierfabrik Palm
Cheng Loong Corp.	Propapier PM2
CVG Papier	SAICA
Delkeskamp Packaging	Sappi GmbH
DS Smith Paper	Sappi NA
Eurowell GmbH	SCA Hygiene Products
Hamburger Hungaria Kraft	Schumacher Packaging
Heinzel paper	Stora Enso
Iggesund Paperboard	UIPSA
Klingele Papierwerke	UPM GmbH
Lee & Man Paper Factory	Waggeryd Cell AB
Mayr-Melnhof Gernsbach	WEPA Hygieneprodukte
Neu Kalib Spezialpapier	Yeni Elektrik Üretim A.S.

