

GLOBAL ADOPTION OF TOC ANALYZERS PROVES VALUABLE FOR LEADING CHEMICAL COMPANY

More than 250 Hach BioTector Online TOC (Total Organic Carbon) Analyzers are installed at DOW sites globally.

Introduction

The DOW teams of TOC specialists are very aware of the commercial and operational value of TOC measurements. The first generation BioTector analyzer demonstrated to DOW the benefits of a rugged online TOC analyzer which would give reliable and accurate TOC measurements in difficult applications, even those where oils, fats, salts, particulates and greases are present in samples.

Over the years, DOW has become one of the largest users of Hach BioTector analyzers and has standardized them in the DOW organization as MET (Most Effective Technology). This highlights the expertise of the DOW team in the operational benefits of TOC and their confidence in the ability of the BioTector TSAO (Two Stage Advanced Oxidation) technology to work well in diverse applications. DOW applications for BioTector analyzers include:

1. Boiler Condensate Water
2. Cooling Water
3. Demineralized Water
4. Final Effluent Discharge
5. Potable Water
6. Process Water
7. Rainwater
8. Reverse Osmosis Water
9. WWTP Influent Water

A Closer Look at One of the Dow Sites: Dow Schkopau, Germany

A BioTector B7000 customer for 2 decades and located in eastern Germany, the DOW Schkopau site has 4 Hach BioTector analyzers which were originally installed in 1999 and upgraded in 2013.



Figure 1. Aerial shot of the DOW Schkopau site, courtesy of Mr. Steffen Bach.

Biotector Onsite Applications

Four Hach BioTector B7000 analyzers are installed on this DOW plant. These are used to monitor:

1 & 2 - COOLING WATER & RAIN WATER

Each analyzer utilizes 2 streams/channels. TOC data is used by the Operations Team to indicate broken or faulty process equipment, to make decisions regarding discharge or treatment of water and to ensure compliance with Government regulations. TOC levels >30ppm will drive the team to divert the water into a storage pond and to direct it to the WWTP (Wastewater Treatment Plant) for treatment when capacity exists.

3 - WWTP INFLUENT

The BioTector B7000 analyzer monitors incoming wastewater to the treatment plant. It has performed consistently over many years, even with salt-loads (up to 2000 mg/L Cl^- and 600 mg/L SO_4^{2-}) in the wastewater, DOW Schkopau uses brine during production for spill control. Data from the BioTector B7000 enables the team to stabilize the loading, dilute the water where necessary, optimize capacity and ensure smooth operations at the WWTP.

4 - WWTP FINAL EFFLUENT

The Schkopau site is COD regulated and DOW is allowed to control the sites online via TOC. Here the control limit is 25 ppm.

The plant discharges into the local river Saale. TOC measurements at this point are managed closely and any spike or contamination will result in the effluent valve being closed and pumped back into the Treatment Plant. This final check ensures that Government regulations are adhered to and that DOW does not experience penalties or negative publicity. Historically it has been proven that Hach BioTector analyzers work continuously with a very high accuracy level of >97% when compared to lab validation tests. There are strong financial benefits to correctly regulating the final discharge.

Alternative Technologies

DOW has trialed and tested many alternative analyzer technologies over the years but incurred significant, ongoing maintenance problems and downtime due to frequent analyzer blockages. These blockages were caused by salts and lime in the wastewater. BioTector was evaluated for this site in 1999 and the patented TSAO technology performed consistently throughout the trial. Hach BioTector Online TOC Analyzers have MCERTS certified uptime of 99.86%.

Mr. Bach, DOW Senior Analytical Specialist said “BioTector was the clear winner; it was the first TOC analyzer which operated 14 days without maintenance activities under worst conditions in the early 90’s. In BioTector we found a solution, not just a product.”

Superior Reliability

“BioTector has an excellent maintenance record at the Schkopau site” commented Mr. Bach. The analyzers require mostly routine six month services and monthly reagent change. Calibration is checked



Figure 2. BioTector B7000.

once a month as a precautionary measure. This high level of reliability allows DOW to budget for their maintenance resources. The analyzers onsite were upgraded recently after 14 years of solid performance.

Trustworthy Accuracy

The team at DOW trusts BioTector measurements and uses the information with confidence to make Operations decisions at the WWTP. Hach BioTector B7000 provides management information which is disseminated using DCS (Distributed Control System). This information enables stable production levels, predictable wastewater loading and optimal WWTP operations.

TOC lab tests are also carried out and provide further validation of BioTector B7000 data, using daily composite samples. Dr. Kathrin Heinrich, DOW EH&S Analytical Support, is satisfied with the accuracy and states “We trust the system.”

Conclusion

Historically, online TOC technologies were problematic and undermined the true and significant value of the TOC measurement. However, DOW understood this value and embraced the TSAO technology when it was introduced to the market in the 90’s. DOW was an early adopter of Hach BioTector TOC analyzers and they have continued to use them in increasingly diverse applications for a multitude of commercial, operational, regulatory and environmental advantages.

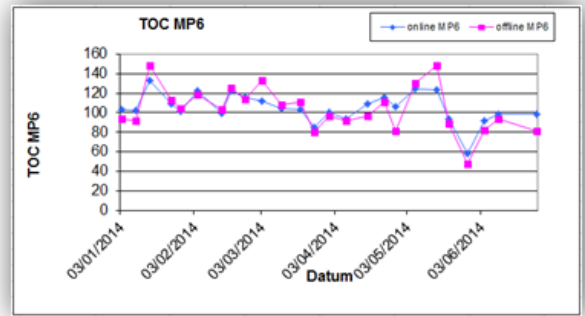


Figure 3. BioTector accuracy instills confidence in TOC measurements at the DOW site.

With thanks to Mr. Steffen Bach, Senior Analytical Specialist, DOW and Dr. Kathrin Heinrich, EH&S Analytical Support, DOW

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