LAR Process Analysers AG

- 1986 found as innovation-oriented company
- R&D and production for 27 years in Berlin
- 1989 and 1996 awarded prices for the most innovative products in environmental equipment
- Specialist for on-line measurement technique
  - Waste Water Treatment
  - Process Control
- LAR solutions
  - customer oriented
  - flexible
  - fast
LAR Process Analysers AG

Headquarters in Berlin

Seminars and Trainings:
- Technical trainings
- Operators meetings
- Sales and product seminars
- Analyser presentations
- FAT
International

3 sales offices in Germany

A distributor network throughout the world

- Europe (20)
- North America (13)
- Latin America (10)
- Asia (10)
- Middle East (5)
- Subsidiary in China
- Sales office in USA
International Projects

- Joint project Integrated Water Concept in Vietnam, Tra Noc
- Sponsored by Federal Ministry of Education and Research (BMBF) and Ministry of Science and Technology (MOST)
- Further projects in China, Saudi-Arabia and South Africa
Innovative Products

- UV-Oxidation
- Thermal combustion at 1200° (patented)
- Electro-Chemical (patented)
- Respiration of Biomass (patented)
Innovative Products

- More than 3,000 installations worldwide
- Market leader in Germany

Sum parameters in LAR’s range of products

- TOC, Total Organic Carbon (several methods)
- COD, Chemical Oxygen Demand (several methods)
- $\text{TN}_b$, Total bound Nitrogen
- BOD, Biochemical Oxygen Demand
- TP, Total Phosphor
- Respiration
- Toxicity (several methods)
Innovative Products

Applied digestion methods for TOC/ COD/ TN$_b$

- electro-chemical measurement method (OH-Radicals)
- Chemical oxidation method
- UV-oxidation with oxidants
- catalyst-free thermal high temperature oxidation method (1,200° C)
Applications

Environmental protection begins with correct monitoring

- Prozess water
- Deicing water
- Wastewater
- Surface water
- Drinking water
- Pure water
- Condensate return
- Boiler feed water
- Pharmaceutical water

<table>
<thead>
<tr>
<th>TOC in mg C/l</th>
<th>50.000</th>
</tr>
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<tbody>
<tr>
<td>Industrial wastewater</td>
<td>Deicing water</td>
</tr>
<tr>
<td>Process Water</td>
<td>Municipal wastewater</td>
</tr>
<tr>
<td>Surface Water</td>
<td>10</td>
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<tr>
<td>Drinking water</td>
<td>4</td>
</tr>
<tr>
<td>Pure water</td>
<td>0.05</td>
</tr>
</tbody>
</table>

Typical TOC values
Drinking water
· Drinking water monitoring

Requirements
· Particle-free
· Range: 0.5 - 4 mg / l TOC

TOC determination
· No need in Germany
  → Chlorine-free treatment of drinking water
· Important when use of Chlorine
  → Chlorine-Byproducts Rule (Safe Drinking Water Act, EPA)
Surface water
  - Inlet monitoring
  - Rivers and lakes
  - Environmental protection

Requirements
  - Range: 0..10 mg/l TOC
  - Toxicity: < > 0 %

Determination of sum parameters
  - Protection of the plant-own biomass
Industrial and municipal wastewater
  - Wastewater monitoring
  - Inlet
  - Outlet

Requirements
  - High particle density
  - High salt concentration
  - High concentration of TOC, COD, TNb
  -Ranges: 0..50.000 mg / l TOC

Determination of sum parameters
  - Robust equipment
  - Accurate determination of peaks throughout the day
Pure water in processes
- Process control
- Optimization
- Condensate return
- Boiler feed water
- Water for Injections

Requirements
- Lowest TOC concentration
- Difficult to calibrate/validate
- Ranges: 0..2,000 µg/l TOC

Determination of sum parameters
- TOC/TC
- Accurate determination of peaks throughout the day
Explosion proof

Housings
- ATEX Zone I
  - T1 to T4
- ATEX Zone II
  - T1 to T4

Certificates
- TÜV
- GOST (Russia)
- PCEC (China)

» Quick– Series and Elox
Mobile Lab

Integrated Water Resources Management Pilot Project “Middle Olifants” in South Africa.

Resulted in the development of the Mobile Lab
Objective:
Support and improve governmental monitoring systems

- stand-alone solution that applies innovative online analysis of water quality and the fast and comprehensive data transfer to all partners.
- monitors diverse discharges from various sources including rainwater run-off, residential, agricultural and industrial pollution sources
- helps authorities prepare measures for improvement of water quality enabling the coordinated development and management of water, land and related resources.
Parameters for measurement:

- pH, conductivity and redox.
- TOC (total organic carbon), COD (chemical oxygen demand) and TNb (total bound nitrogen)
- ammonia levels and toxicity.
- the LAR QuickTOC analyser is equipped for the online operation as well as for individual measurements on site.
- In total, the mobile lab will be able to monitor more than 20 parameters automatically on site.
Thank you!

The TOC Company

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