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# Turb® 750

## Clear view with AQA…

…AND THE INTELLIGENT VALUE CHECK IRPC







# The new Turb® 750 Series for Labs

## Good Reasons!

- Measurement acc. to DIN EN ISO 7027-1 and US EPA 180.1
- Small but powerfull with optical finesse: ease of use for reliable readings and AQA with LIMS connection from 0-1100 FNT/NTU
- Pay what you really need: splendid price/perfomance ratio!





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# The new Turb® 750 Series

## Designed and produced in Germany

**2 models: Turb® 750 IR & Turb® 750 T**




- Well-proven optics  with light trap
- High precision measurement procedure: **IRPC**
  **I**ntelligent **R**eproducibility
  and **P**lausibility **C**heck
- Lab compliant functionality
- Fast and easy handling including quick routine
- USB interface for data export
- PC-Software for GLP compliant data mangement

# The new Turb® 750 Series

## Space saving - Intuitive – Versatile

Powerful meter not needing much bench space

- Well-arranged, easy-to-clean keypad
- Function keys for direct function call
- Tactile und acoustic feedback
- Clear menu
- Menu guidance on-screen
- Quick and easy or professional:
  with tools for AQA, ID,
  various calibration options
- Simple data transfer via USB
- Documentation





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# Turb® 750 – Simply right with „IRPC“

Not every „stable“ reading is a correct finding!

Moving particles in solution don‘t stand still for measurement!

Precise results in turbidity measurement mean but yet to rmeasure reliably and reproducible. With the



**Intelligent Reproducibility- and Plausibily Check IRPC**

=> Internal multiple readings per measurement

=> Evaluation of these values

⇒ Elimination of outliers

⇒ Stable data output of proven values

⇒ Best reproducibility

| Turbidity | |
|---|---|
| [IRPC] | [AQA] |
| 157.0 | FNU<br>NTU |
| [3-P StdCAL] | |
| | 15.01.20 15:12 |

| | | | | | |
|---|---|---|---|---|---|
| 25.03.2020 | 11:53:57 | 100 | 0,26 | NTU | VALID |
| 25.03.2020 | 11:53:55 | 100 | 0,26 | NTU | VALID |
| 25.03.2020 | 11:53:53 | 100 | 0,27 | NTU | VALID |

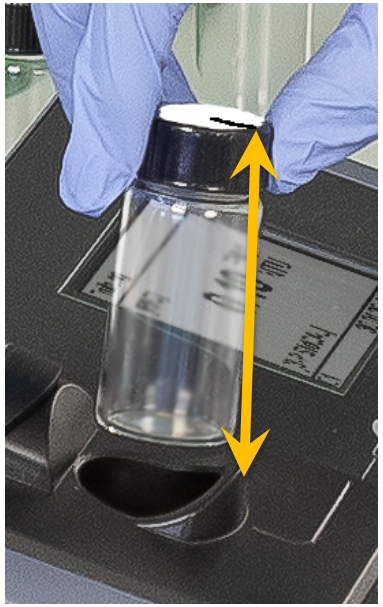
**=> „Stable“ is, what is correct!**



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# Turb® 750: Precise - eliminating disturbing factors



## Excluding error sources

**Prepare vials ahead of measurement** (for multiple-use):
Reommendation in regulations (e.g. EPA)

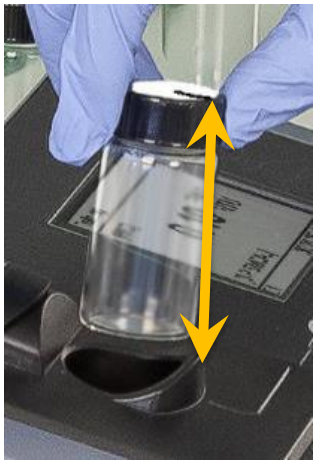
- Place vial, press START and slighly turn right and left
- Release START at „stable“ value range:
  meaning no big jumps up or down*)
- Mark position on cap label

*) Tolerance for value deviations:
± 0,02 NTU below 1 NTU
± 2 % above 1 NTU

## Then measuring routine is fast, precise, comfortable

- Place prepared = marked vial
- Press and release START instantly
- Value will be stored, or store with ID

# Turb® 750: Precise- excluding disturbing influences





Advantage: Always using the optimal measurement window

- In contrary to pre-marked vials are scratches and glass inhomogenities always excluded: Value jumps indicate scratches or glass fault.
- Scratches in pre-marked vials at light path result in wrong turbidity values => less precise (mostly higher)!
- => NO Silicon oil for our instruments to mask scratches: Oil can have a differing refractive index and attracts dust and dirt => resulting in inaccurate values
- Longtime use of vials due to multiple positions for measurement window
- **For single use of vials:** Search best position by aligning the vial with lowest value during measurement procedure. (acc. to preparation procedure of vials)

# Turb® 750 – Rapid settling samples

## Fast measurement = Fast Response Time!

- Turb® 750 IR – 4 seconds
- Turb® 750 T – 7 seconds

**Best practice for measurement:**

- Use marked = prepared vials
- Don‘t shake vigorously, no bubbles!
- Swivel gently, place instantly in aligned position and START measurement
- Turb 750 IR has the shorter response time.

## IRPC = Supports via outlier elimination

No notable difference when changing number of multiple IRPC takings => no setting options



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# The new Turb® 750 Series – Professional

## Lab Functions

- Quick handling via function keys
- AQA with proof standard and tolerance setting
  step 2 planned: Administrator, IQOQ, Single standard 10 NTU
- AQA intervall setting
- AQA flag in data set
- Data storage with sample ID
- 2500 data sets
- Data filter for data export
- GLP-compliant data management




Turbidity

| | |
|---|---|
| AQA protocol | |
| AQA | On |
| AQA tolerance | 10 % |
| AQA interval | 90 d |

Store (996 *free*)

15.01.2020 11:24:16
16.80 FNU/NTU

*assign ID*: 1

**Store (ID: 1)**

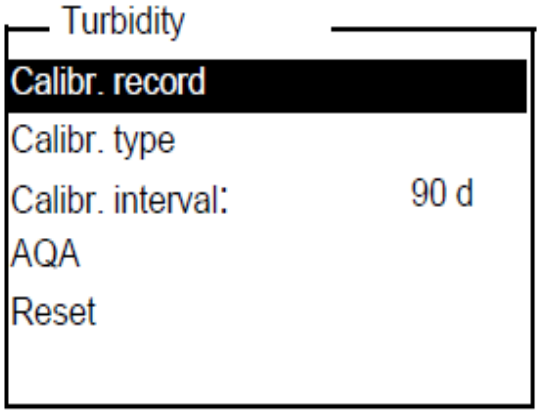
| | A | B | C | D | E | F | G | H | I | J |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Meter: Turb 750 T, S/N: 19472062 | | | | | | | | | |
| 2 | Date: 02.04.2020, Time: 10:39:30 | | | | | | | | | |
| 3 | | | | | | | | | | |
| 4 | No. | Date | Time | ID | Value | Unit | Status | AQA/Cal | Date cal. | Time cal. |
| 5 | 30 | 02.04.2020 | 09:38:09 | 0 | 9,00 | NTU | VALID | [AQS][QuickCAL] | 25.02.2020 | 11:18:30 |
| 6 | 29 | 02.04.2020 | 09:37:55 | 0 | 8,95 | NTU | VALID | [AQS][QuickCAL] | 25.02.2020 | 11:18:30 |
| 7 | 28 | 02.04.2020 | 09:37:51 | 0 | 8,95 | NTU | VALID | [AQS][QuickCAL] | 25.02.2020 | 11:18:30 |
| 8 | 27 | 25.03.2020 | 12:34:54 | 1 | 0,01 | NTU | UFL | [3-P StdCAL] | 04.02.2020 | 14:23:54 |
| 9 | 26 | 25.03.2020 | 12:34:30 | 1 | 0,01 | NTU | UFL | [3-P StdCAL] | 04.02.2020 | 14:23:54 |
| 10 | 25 | 25.03.2020 | 12:34:12 | 1 | 0,01 | NTU | UFL | [3-P StdCAL] | 04.02.2020 | 14:23:54 |
| 11 | 24 | 25.03.2020 | 12:30:05 | 123 | 1029 | NTU | VALID | [3-P StdCAL] | 04.02.2020 | 14:23:54 |
| 12 | 23 | 25.03.2020 | 12:29:49 | 123 | 1027 | NTU | VALID | [3-P StdCAL] | 04.02.2020 | 14:23:54 |
| 13 | 22 | 25.03.2020 | 11:53:58 | 123 | 1029 | NTU | VALID | [3-P StdCAL] | 04.02.2020 | 14:23:54 |
| 14 | 21 | 25.03.2020 | 11:53:57 | 100 | 0,26 | NTU | VALID | [3-P StdCAL] | 04.02.2020 | 14:23:54 |
| 15 | 20 | 25.03.2020 | 11:53:55 | 100 | 0,26 | NTU | VALID | [3-P StdCAL] | 04.02.2020 | 14:23:54 |
| 16 | 19 | 25.03.2020 | 11:53:53 | 100 | 0,27 | NTU | VALID | [3-P StdCAL] | 04.02.2020 | 14:23:54 |
| 17 | 18 | 25.03.2020 | 11:53:51 | 100 | 0,26 | NTU | VALID | [3-P StdCAL] | 04.02.2020 | 14:23:54 |
| 18 | 17 | 25.03.2020 | 11:53:48 | 100 | 0,26 | NTU | VALID | [3-P StdCAL] | 04.02.2020 | 14:23:54 |



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# Turb® 750 Serie: Reliable Calibration

## 1 – 5 point calibration




- Default 3P-calibration
  0.02 – 10.0 -1000 FNU/NTU
  with **AMCO Clear® Standards**
- User defined flexible calibration with 2-5 cal.points
- QuickCAL => 1P-calibration
  10 NTU (calibration on base of standard cal. for low range)
- Cal.protocol stored with data set
- Export of calibration protocol:
  via print, hyperterminal or Turb® Data (in delivery)
- Step 2 planned:
  Pharmacopeia calibration option

```
15.01.20 16:13
Turb® 750 IR Ser. no. 12345678
Calibration Turbidity
Calibr. date 15.01.20 16:13:33
Calibr. interval 90 d
3-P StdCAL
Standard 1          1000 NTU
Standard 2          10.0 NTU
Standard 3          0.02 NTU
```



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# Turb® 750 Serie: Reliable Calibration

## Calibration with AMCO Clear® Standards = Maximum Accurary!

- Standard of polymer beads are longtime stable w/o drift
- Accurate to 1 % lot-to-lot
- Optimized to each model optics
- Higher overall-accuracy in comparison to formazine
- Traceable to formazine
- Environmentally friendly – non-toxic
- Easy-to-dispose



## Easy handling:

Fill, align, mark – change after three months

## Advantage:

Assurance of a stable and optimal calibration with best overall-accuracy w/o stability change over time or material influence



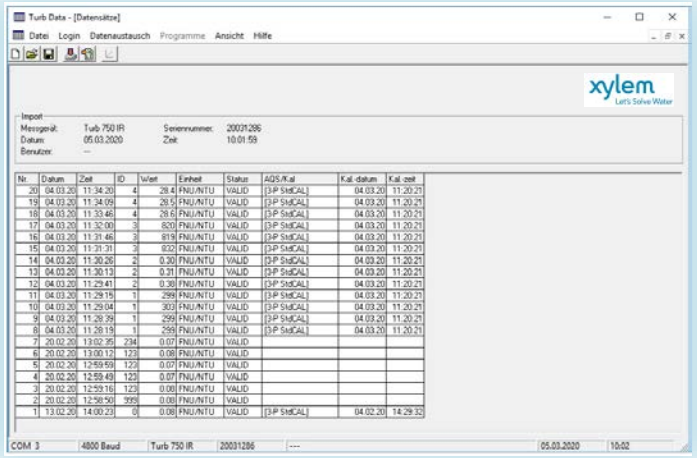
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# Turb® 750 – Handy Data Management

## Documentation fulfilling lab needs:



- PC-Software Turb® Data and USB cable in delivery
- GLP compliant data output
  - Instrument with Serial ID
  - User Name
  - Transfer via CSV-formate
- Import into Excel
- Import into LIMS



Alternatively data output can be sent via Pint-Key to Windows hyperterminal or to printer.



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# Turb® 750: Convincing Price/Performance Ratio

## First impressions of testers and Sales colleagues:

Turb® 750 provides all, what our customers demand and need:

Lots of lab functionality in the smallest space
at an excellent price/performance ratio



List price **2750,-- €** net

Competition:

- Either more functionality or more economic but less features
- Just pay what you need and use!

An even more economic alternative with the same precision:
Turb® 430 – same IRPC measurement procedure but less AQA

# Turbidimetry – many can use it, some don‘t know it yet

## Turbidity = Indicator = Quality check = Production Check



- ✓ Contamination Check:
  Bacteria, Allergen, dirt….
  - ➢ **In drinking water** => water puritiy!
    Particles offering surface for bacterial growth
  - ➢ **In production** => successful cleaning processes
    e.g.: washing water check in food production to avoid carry over
- ✓ Status of ground water
  Overload check
- ✓ Quality- and process control





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# Turbidimetry –many can use it, some don‘t know it yet

## Turbidity = Indicator = Quality Check = Production Check

- Beverage check: from water to wine, from soda to juice
- In food production: production and products
- Chemical products like wall paint
- Filter monitoring: Filter load control
- Fuel: production and supply chain control
  e.g. motor development
- Check of blood bottles, fermentation, vaccines…
- Environmental monitoring:
  heavy rain events, sediment entry







# Turb® 750 - Delivery

- Instrument model: Turb® 750 T or Turb® 750 T
- PC-Software Turb® Data for comfortable data management
  Will be put for download on website
- Kal.Kit Turb® 430/750 IR (0.02-10.0-1000 NTU/FNU)
- Quick guide for daily work with key and measurement description, Short manual, CD-ROM with complete manual
- 6 vials and cap labels for marking
- Cloth
- Cable USB-A to USB-B mini
- Power supply with plugs for EURO, AUS, GB, US
- Inspection protocol



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# Turb® 750 - Technical Data

| Model | Turb 750 IR LED 0-1100 (ISO) | Turb 750 T (EPA) |
|---|---|---|
| **Light source** | LED 830-890 nm<br>fulfills DIN EN ISO 7027-1 | Tungsten filament lamp<br>fulfills US EPA 180.1 |
| **acc. to standard methods** | DIN EN ISO 7027-1 | US EPA 180.1 |
| **Measurement mode** | Nephelometric (scattering 90°) | Nephelometric (scattering 90°) |
| **Range** | 0-1100 FNU/NTU | 0-1100 NTU |
| **Units** | FNU/NTU | NTU |
| **Display** | Backlit graphics display 160x104 | Backlit graphics display 160x104 |
| **Resolution** | 0,01 for 0,00 -9,99,<br>0,1 for 10 – 99,90,<br>1 for 100 - 1100 | 0,01 for 0,00 -9,99,<br>0,1 for 10 – 99,90,<br>1 for 100 - 1100 |
| **Accuracy NTU/FNU** | 0.01 NTU/FNU or +/- 2% of finding | 0.01 NTU or +/- 2% of finding, 500-1100 NTU: +/- 3% of finding |
| **Repeatability** | < 0.5% of finding | < 1% of finding |
| **AQA-Support** | Calibration protocol , AQA flag, Cal flag | Calibration protocol , AQA flag, Cal flag |
| **Data storage** | 2500 data sets | 2500 data sets |
| **Sample Identification** | Alphanumeric (…999) | alphanumeric (…999) |
| **Firmware-Update** | via USB | via USB |
| **Interface** | RS 232, USB, Printer via PC or RS232 | RS 232, USB, Printer via PC or RS232 |
| **GLP-compliant PC software** | Turb® Data | Turb® Data |
| **Power supply** | Wide range power supply | Wide range power supply |
| **Certificates** | CE | CE |

# Turb® 750 Series – Introduction Package

## Launch package

- PPT
- Technical Data for various needs
- Images and screen shots
- Press work: Intro paper
- Flyer

Newsletter on-going DE/EN

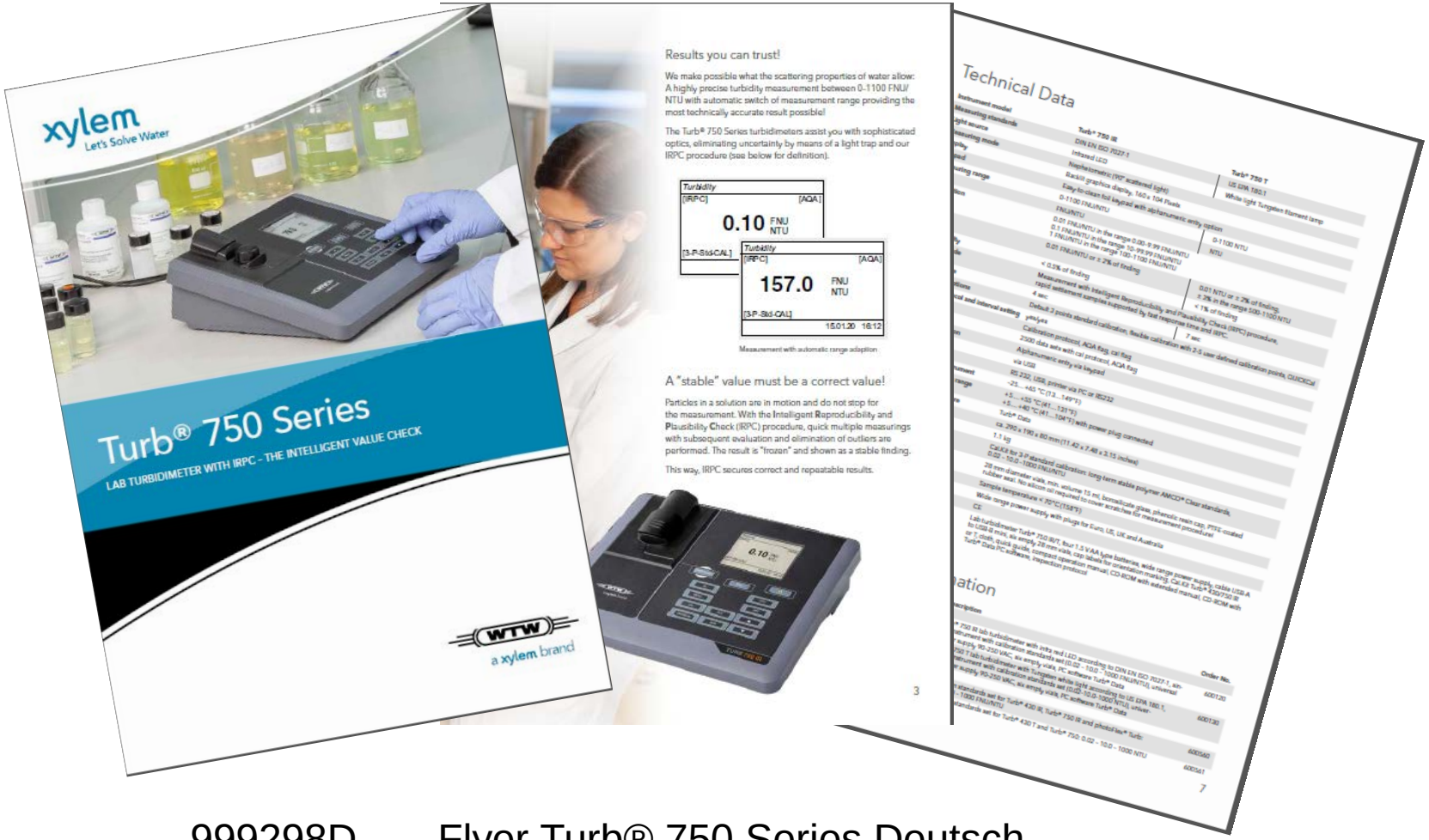
**More features planned for Q3 / step 2**
IQOQ dDocuments together with introduction of proof standard 10 NTU

For more images and flyer raw data for regional activites:
Please refer to your sales representative.



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# Turb® 750 Series Flyer




999298D Flyer Turb® 750 Series Deutsch
999298US Flyer Turb® 750 Series English



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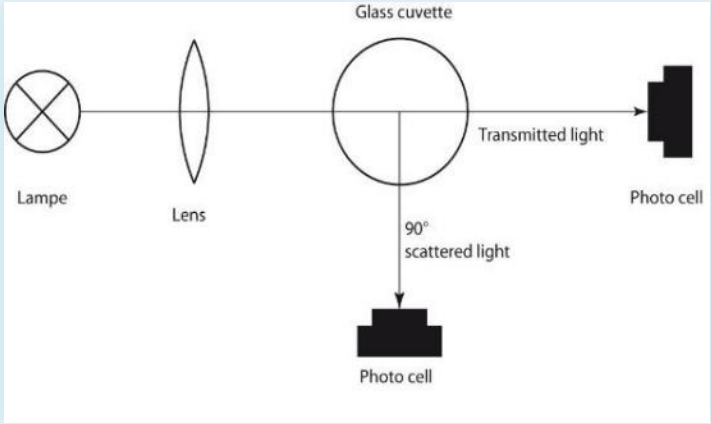
# Turb® 750: Comparison with other meters

Calibration of all meters must be performed with **one and the same freshly prepared** formazine standard using the same measurement procedure! Formazine drifts quickly and is varying +/- 10%, polymer standards are optimized for optics.

## RATIO procedure is not comparable!

Ratio is not nephelometric but an application or manufacturer specific optical system, used for higher turbidity:

- The higher the particle number in the sample, the bigger the backscattering effect between particles in solution.
- With ratio procedure, different angles are measured and computed via algorithms.
- Ratio procedures are used mainly above 1100 NTU or – e.g. in brewery – depending on particle size.




## Attention:

There are instruments in the market switching to ratio procedure above 40 NTU!

# Turb® 430 Series: Portable & Powerful Alternatives

## Turbidity Measurement with Turb® 430 in Lab and Field



### Applications

- Environmental Monitoring
- Surface / Rivers waters / Water reservoirs
- QC Fuel / Food & Beverage / Aquacultere

### Benefits



- Same measurement procedure as Turb® 750
- Sample ID with numbers, Cal. Protocol/interval
- Optional: LabStation with PC software and rechargeable battery pack
- List price EU: IR 1770.--/ Tungsten 1.804.-- € net

# Optical Instruments: Potential Chances and Fields

## A one-shop stop with WTW®

- photoLab® 7600 with OptRF und IQ SENSORNET in waste water
- photoLab® 7600 with OptRF und IQ SENSORNET in surface water
- pHotoFlex® and IQ DO probe in aquaculture
- Turbidity in drinking water with Turb®, pHotoFlex® Turb and IQ

## Marktes and Applications

- Education and Research Institutions
- Chemicals and paint (mid size industries with niche products),
- (Bio-) drinks, vintage, wine labs
- pHotoFlex in pools (chlorine and ORP in one instrument)-health admin
- NGO‘s

Talk with our sales representative for your local promotions!



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Let's Solve Water

# Our contact for you:

# Your Sales Representative or

www.TechInfo.WTW@Xyleminc.com

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