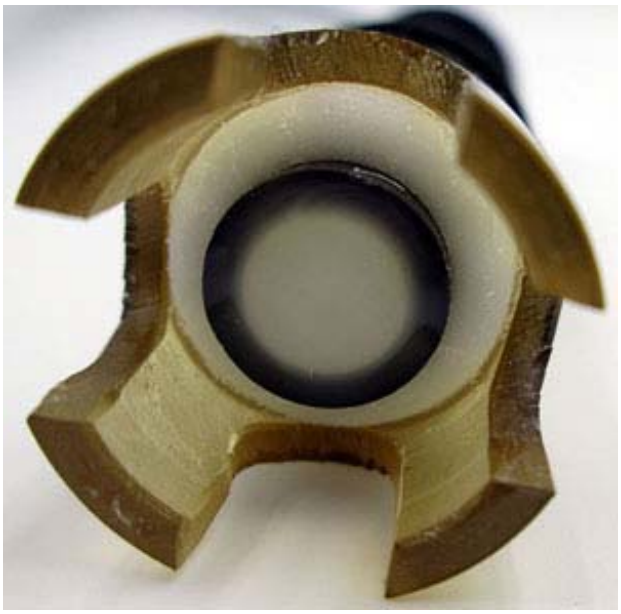
Applications (ISE)

SELECTED AMMONIUM (NH_4^+) ISE SENSORS APPLICATIONS:





THE ONLY AMMONIUM (NH_4^+) ion selective sensor that can be:

- **Used in heavy industrial process and wastewater treatment system**
- **Measurements up to saturated ammonium levels**
- **Operate continuous at temperature up to 50 degrees Celsius**
- **Fully submersible without the use of any standpipe or guiderod (a.k.a. immersion tubes)**
    - **Case Study # 7** for total ammonium determination for industrial wastewater compliance measurements.
    - **Case Study # 17** for free ammonium ion monitoring in municipal WWTP aeration basins
    - **Case Study # 18** Free Ammonia (NH3-N) and total nitrogen monitoring for municipal water districts using chloramination as a part of the sterilization process
    - **Case Study # 19** Ammonium ISE measurement in the presence of potassium and nitrate ion measurement in the presence of chloride with highly selective novel membranes

- The industrial ammonium ion selective sensors in the AB 6410 (3/4″-1″ MNPT), AB 8410 (1″MNPT Twist Lock) or AB 5410 (Sanitary or HOT-TAP) together with the a suitable mating dissolved ammonia gas resistant pH sensor can be used to compute the total unbound ammonia
    - **Total Ammonia** (NH3-N, or total ammonia as nitrogen)

SELECTED FLUORIDE (F^-) ISE SENSORS APPLICATIONS:



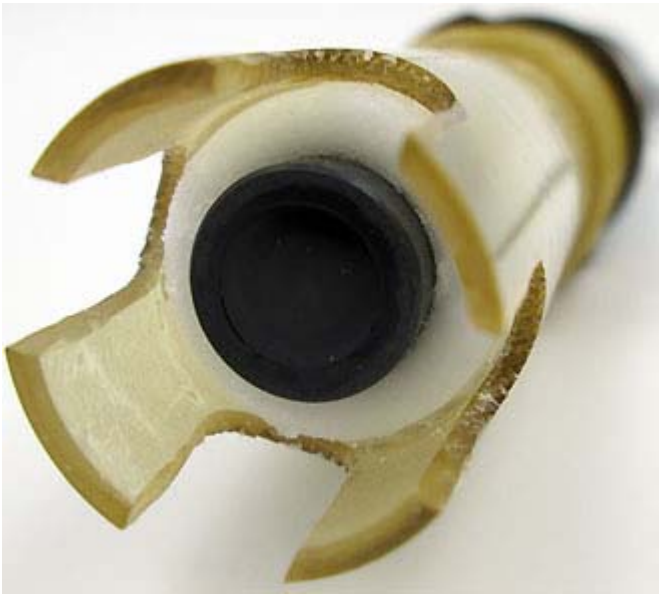
THE ONLY FLUORIDE (F^-) ion selective sensor that can be:

- **Used in strong acid fluoride etching service at elevated temperatures up to 70 degrees Celsius**
- **Undergo strong acid cleaning to remove calcium and silicate deposits**
- **Suitable for acid fluoride metal etching process process measurement or fluoride wastewater treatment systems.**
- **Ready for immersion installation standard or fully submersible with insertion tube or waterproofing option invoked.**
    - See **AB 6100 specification sheet** for details about the model that is suited for such acid service process and cleaning conditions.
    - See **Case Study # 21** for a detailed description of the specific features and technical advantages that enable far superior service lifetime for the AB 6100 fluoride ISE sensor for these metal etching and fluoride wastewater treatment (WWTP) type applications.
    - See **Case Study # 6** for an example of the use of the AB 6100 fluoride ion selective directly in the acid process media for metal can etching at low pH and elevated temperatures up to 70 degrees Celsius

- The acid service resistant AB 6100 fluoride ion selective sensor together with the X4XX series HF resistant pH sensor can be used to compute the total unbound fluoride species (see graph linked below for visualization):
    - **Total Fluoride** (Total HF, or unreacted fluoride species)

INDUSTRY LEADING FLUORIDE ISE SENSORS for process control and monitoring of:





- Fluoridation in potable water municipal plants (POTW)
- Compliance measurements for fluoride discharge levels from industrial processes.
- Convenient twist lock quick disconnect bayonet installation style for easy removal for cleaning, calibration and replacement
- Flush inline installation minimizing flow induced kinetic potential for the most stable readings possible

- See **AB 8100 specification sheet** for details about the inline twist lock fluoride ISE sensor that is suited for neutral pH inline conditions.
- See **Case Study # 13** for an example of using this type of fluoride ISE sensor for municipal fluoridation monitoring & control

OTHER SOLID-STATE TYPE ISE SENSORS APPLICATIONS:

- **Bromide** (Br^-) and **Iodide** (I^-) are commonly used for tracer environmental applications to monitor water distribution pathways.
- **Chloride** (Cl^-) for low-level trace measurements in clean water applications. Often combined with measurement of the common major counter cation sodium and/or conductivity measurements used as a proxy for the total dissolved solids.
- **Cyanide** (CN^-) is most commonly measured for environmental compliance in sensitive areas to ensure that the SOx or H2O2 destruction process is working normally. Often a pH adjustment must be performed inline and some special calibration and installation schemes employed. Please ALWAYS contact the ASTI factory before you plan to specify any ASTI cyanide ion selective sensors.
- **Silver** (Ag^+) for sterilization monitoring applications most typically for hospital water supplies. In some cases cupric (Cu++) divalent copper ions can also be monitored with special calibration schemes and setups.

OTHER PVC TYPE ISE SENSORS APPLICATIONS:



Calcium (Ca^{2+}) ion selective sensors for determined of ionized free unbound calcium levels to determine the state of the water softeners to automate regeneration as well as a proxy for the total water hardness.

See **Case Study # 15** for an example of this type of use.

Chloride (Cl^-) for high level chloride measurements up to saturation. Whereas the solid-state chloride ISE probe is most well suited for low level measurements (max 350 ppm continuous), the PVC based ion selective sensor does not suffer from measurement at high concentration up to saturation.

Lithium (Li^+) typically for nuclear or research applications uses. Include ultralow detection version for trace analysis.

Nitrate (NO_3^-) and **Nitrite** (NO_2^-) for monitoring of nitrate influent load as well as denitrification systems. Also used for blending operations with potable water to ensure compliance with max nitrate as nitrogen (NO3-N) levels. Photo above shows the fully submersible nitrate ion selective sensor assembly with integral waterproofing “B” sealing option in the without preamplifier configuration.

Perchlorate (ClO_4^-) primarily for environmental detection at or near rocket fuel manufacturing facilities.

Sodium (Na^+) is often measured in black liquor and white liquor (bleach plants) at pulp mills. Sodium can be measured up to saturation with special calibration schemes.

For any ion selective measurements not listed on our website **inquire to factory to see if it is available on a special order custom built basis**

There exists a set of **selected case studies for continuous field ion selective measurements** including write-up for various uses of fluoride and ammonium measurements (summarized below) as well as for ionized calcium for water softeners, nitrate and nitrite and various uses as well as other potential ISE measurement applications of interest.