

# Technical Specifications for the Fluoride Ion-Selective Electrode ELIT 8221

## Introduction

The Fluoride Ion-Selective Electrode has a solid-state mono-crystalline membrane. The electrode is designed for the detection of fluoride ions ( $F^-$ ) in aqueous solutions and is suitable for use in both field and laboratory applications.

The Fluoride Ion is a monovalent anion .

One mole of ( $F^-$ ) has a mass of 18.998 grams; 1000 ppm is 0.053 M

Dissolve 2.210g anhydrous sodium fluoride (NaF) in 1 litre water.

## Physical Specifications

Length of body excl. gold contact	130 mm
Length of body incl. gold contact	140 mm
Diameter of body	8 mm
DC resistance at 25° C	< 2.5 MOhm
Minimum feasible sample volume	5 ml

## Chemical / Operational Specifications

Preconditioning / Standard solution <i>(But see General Operating Instructions)</i>	Normally 1000 ppm $F^-$ as NaF
Preconditioning time	5 minutes
Optimal pH range	pH 4 to pH 8
Temperature range	0 to 80° C
Recommended ISAB	SPECIAL TISAB (1:1 v/v) <i>(TISAB = Total Ionic Strength Adjustment Buffer: added to samples (and standards) to optimise the pH value at 5.5, liberate any fluoride which may be complexed with hydrogen, aluminium, iron or other cations, and equalise the activity coefficient between sample and standards. Dissolve 57ml acetic acid + 45g Sodium Chloride + 4g CDTA (1,2-diamino cyclohexan N,N,N,N-tetra acetic acid) in 500ml distilled water. Adjust pH to 5.5 by adding drops of 5M NaOH, then make up to 1L with water.)</i>
Recommended reference electrode	Single Junction AgCl (ELIT 001)
Electrode slope at 25° C	54 +/- 5 mV/ decade
Concentration range	0.02 to 1,900 ppm ( $1 \times 10^{-6}$ to 0.1 Molar)
Response time	< 10 seconds <i>(Defined as time to complete 90% of the change in potential after immersion in the new solution.)</i>
Potential drift <i>(in 1000 ppm)</i>	< 3 mV/ day (8 hours) <i>(Measured at constant temperature and with ISE and Reference Electrode continually immersed)</i>

## Interference:

The only interference on the fluoride electrode is from the hydroxyl ion ( $OH^-$ ) with a selectivity coefficient of about 0.1. ie if  $OH^-$  has the same concentration as  $F^-$  then it will increase the measured  $F^-$  concentration by approximately 10%.

This interference is eliminated by ensuring that the pH is kept below 8.

Note low pH range for this electrode.

For more information, see: [www.nico2000.net](http://www.nico2000.net).