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Edition 1

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SOUTH AFRICAN NATIONAL STANDARD

Water quality — Determination of electrical conductivity

This national standard is the identical implementation of ISO 7888:1985 and is adopted with the permission of the International Organization for Standardization.

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Table of changes

Change No.	Date	Scope

National foreword

This South African standard was approved by National Committee SABS SC 147A, *Water – Water sampling and analysis*, in accordance with procedures of the SABS Standards Division, in compliance with annex 3 of the WTO/TBT agreement

This SANS edition cancels and replaces SANS 6057 (SABS SM 1057:1982).

Reaffirmed and reprinted in November 2011.
This standard will be reviewed every five years
and be reaffirmed, amended, revised or withdrawn.

International Standard 7888

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

Water quality — Determination of electrical conductivity

Qualité de l'eau — Détermination de la conductivité électrique

First edition — 1985-05-15

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 7888 was prepared by Technical Committee ISO/TC 147, *Water quality*.

INTERNATIONAL STANDARD ISO 7888-1985 (E)

Water quality — Determination of electrical conductivity

1 Scope and field of application

This International Standard specifies a method for the measurement of the electrical conductivity of all types of water.

Electrical conductivity can be used to monitor the quality of

a) surface waters;

b) process waters in water supply and treatment plants;

c) waste waters.

The completeness of analysis for ionic constituents[1 to 3] can be checked using this method.

In some cases absolute values are important, in other cases only relative changes are of concern.

For interferences, see clause 9.

2 Definitions

2.1 specific conductance; electrical conductivity, γ: The reciprocal of the resistance, measured under specified conditions, between the opposite faces of a unit cube of defined dimensions of an aqueous solution. For water quality examination, this is often expressed as "electrical conductivity" and may be used as a measure of the concentration of ionizable solutes present in the sample.

(Definition taken from ISO 6107/2.)

It is expressed in siemens per metre.[1)]

NOTE — The symbols σ and κ are also used for electrical conductivity (see ISO 31/5).

2.2 cell constant, K: Quantity, in reciprocal metres, given by the equation

$$K = \frac{l}{A}$$

where

l is the length, in metres, of an electrical conductor;

A is the effective cross-sectional area, in square metres, of an electrical conductor.

The cell constant results from the geometry of the cell; it can be empirically determined.

2.3 temperature coefficient of electrical conductivity,[2)] α: The temperature coefficient of conductivity $\alpha_{\theta,25}$,[4, 5] is given by the equation

$$\alpha_{\theta,25} = \frac{1}{\gamma_{25}} \left(\frac{\gamma_\theta - \gamma_{25}}{\theta - 25} \right) \times 100$$

where 25 and θ °C are the temperatures at which the electrical conductivities γ_{25} and γ_θ respectively were measured.

2.4 temperature correction factors, f: Factors used to correct for the temperature dependence of electrical conductivity.

In order to make comparisons, it is essential that measurements are corrected to a chosen reference temperature, usually 25,0 °C, even if the temperature of the water sample differs only slightly from that temperature.

Conversions to the electrical conductivity at 25 °C, γ_{25}, can be made using the equation

$$\gamma_{25} = \frac{\gamma_\theta}{1 + (\alpha/100)(\theta - 25)}$$

where

α is the temperature coefficient of electrical conductivity;

γ_θ is the electrical conductivity at the measured temperature, θ;

θ is the measuring temperature, in degrees Celsius, of the sample.

1) 1 S/m = 10^4 µS/cm = 10^3 mS/m

2) The temperature coefficient of electrical conductivity can be expressed in reciprocal kelvin or % per °C.