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Edition 1

SOUTH AFRICAN NATIONAL STANDARD

Civil engineering test methods

Part NG3: Calibration of a nuclear density gauge

WARNING

This standard references other documents normatively.

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Table of changes

Change No.	Date	Scope

Acknowledgement

The SABS Standards Division wishes to acknowledge the valuable assistance derived from the following organizations:

Committee of Transport Officials (COTO)

Department of Transport and Public Works Western Cape

South African National Roads Agency Limited (SANRAL)

Foreword

This South African standard was approved by National Committee SABS/TC 081/SC 04, *Construction materials, products and test methods – Road and pavement materials testing*, in accordance with procedures of the SABS Standards Division, in compliance with annex 3 of the WTO/TBT agreement.

This document was published in March 2014.

Reference is made in 4.1 to the "relevant national department". In South Africa, this means the Department of Health.

Reference is made in 6.1 to the "relevant national legislation". In South Africa this means the Hazardous Substances Act, 1973 (Act No. 15 of 1973).

SANS 3001 consists of the various parts, under the general title *Civil engineering test methods*.

Parts NG of the SANS 3001 series contain methods for the use of nuclear density gauges.

Annex A is for information only.

Introduction

The in situ density of road construction materials is only determined in civil engineering using indirect methods such as the nuclear density gauge and sand replacement methods. To achieve a consistent outcome from nuclear gauges it is required that they be calibrated using a set of standard calibration blocks. This document describes a procedure for manually calibrating a nuclear gauge. Certain gauge models are supplied with a self-calibrating module determined by the supplier, the use of which is permissible providing that the outcome is satisfactory in terms of the verification test described in SANS 3001-NG4.

This method forms part of a set of methods used to operate nuclear gauges, and includes the following:

- a) administration, handling and maintenance (see SANS 3001-NG1);
- b) validation of standard calibration blocks (see SANS 3001-NG2);
- c) calibration of a nuclear gauge (see SANS 3001-NG3);
- d) verification of a nuclear gauge (see SANS 3001-NG4): and
- e) in situ density determination using a nuclear gauge (see SANS 3001-NG5).

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Civil engineering test methods

Part NG3:

Calibration of a nuclear density gauge

1 Scope

This part of SANS 3001 describes a procedure to calibrate a nuclear density gauge using a standard set of blocks.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies. Information on currently valid national and international standards can be obtained from the SABS Standards Division.

SANS 3001-NG1, *Civil engineering test methods – Part NG1: Administration, handling and maintenance of a nuclear density gauge.*

SANS 3001-NG2, *Civil engineering test methods – Part NG2: Validation of standard calibration blocks for nuclear density gauges.*

SANS 3001-NG4, *Civil engineering test methods – Part NG4: Verification of a nuclear density gauge.*

3 Definitions

For the purposes of this document, the following definitions apply.

3.1

backscatter mode

mode in which the radiation source is at the surface

3.2

density

mass per unit volume of a material

3.3

direct transmission mode

mode in which the radiation source is located by means of a probe at a known depth in the material being tested