
Soil quality — Sampling —
Part 201:
Physical pretreatment in the field

Qualité du sol — Échantillonnage —

Partie 201: Prétraitement physique sur le terrain

Sample Document

get full document from standards.iteh.ai



Sample Document

get full document from standards.iteh.ai



COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Preliminary considerations	3
5 Incorporation in the sampling plan	5
6 General requirements	5
7 Safety	6
8 Homogenization	7
9 Subsampling	7
9.1 General	7
9.2 Equipment for subsampling	7
9.3 Minimum size of the subsample	8
9.4 Procedure for macro-aggregate reduction by hand	9
9.5 Subsampling methods	9
9.5.1 General	9
9.5.2 Long pile and alternate shovel method	10
9.5.3 Coning and quartering	11
9.5.4 Riffing	12
9.5.5 Application of Tyler divider	12
9.5.6 Application of mechanized turntable (rotating divider)	13
9.6 Selective subsampling based on the particle size	13
9.6.1 General	13
9.6.2 Sieving	14
9.6.3 Hand picking	14
10 Forming composite samples	15
10.1 General	15
10.2 Minimum size of increments or subsamples	16
10.3 Production of composite samples	16
10.3.1 Composite sample based on incremental sampling	16
10.3.2 Composite sample based on parts of individual samples	16
11 Packaging and storage	16
12 Reporting	16
Annex A (informative) Illustrations of apparatus	18
Bibliography	21

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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html

This document was prepared by Technical Committee ISO/TC 190, *Soil Quality*, Subcommittee SC 2, *Sampling*.

A list of all parts in the ISO 18400 series can be found on the ISO website.

Introduction

Pretreatment of samples is usually required before they are tested to determine chemical or other properties, although there are some situations when any pretreatment would be unacceptable because it would affect the results.

Sample pretreatment is to preferably take place in the laboratory, as sample integrity can be best controlled under laboratory conditions. However, under some circumstances, pretreatment may be started in the field directly after sampling, to obtain a representative laboratory sample from the material extracted from the ground, or to prepare a composite laboratory sample.

The representativeness of a sample depends on factors like sample size, particle size, particle shape, contaminant type and concentration, consistence of soil materials and sampling strategy (see ISO 18400-104¹⁾).

When volatiles are present, the procedures described in ISO 22155 are to be used as appropriate if possible. No further pretreatment is allowed. Other specified pretreatment methods will result in a significant loss of volatiles.

Pretreatment comprises one or a combination of the following:

- homogenization;
- sample division: obtaining subsamples of smaller size than the original sample without reducing the particle size of the individual particles;
- particle size reduction: grinding and crushing the sample in order to reduce the particle size of the sample without reducing the sample size (mass);
- separation of fractions on the basis of particle sizes (sieving or screening) if only a separate size fraction of soil is of interest for investigation or on the basis of the physical nature of the materials (e.g. appearance);
- preparation of composite sample(s).

Several cycles of a number of these activities could be required to derive the test sample (e.g. analytical sample) from the material extracted from the ground. Except as noted above when pretreatment would affect the results of subsequent testing or analysis, subsampling is normally required in the laboratory because the amount of material in the laboratory sample (i.e. that sent from the field to the laboratory) is almost always larger than the amount of material necessary for the test or analysis.

There might be occasions when it is considered desirable to combine soil material in the field from, for example different locations into a composite sample. A suitable procedure for doing this is described in this document.

For reasons explained in [Clause 4](#), only some of the pretreatment measures listed above can be carried out in the field.

This document is part of a series of sampling standards for soil. The role/position of the International Standards within the total investigation programme is shown in [Figure 1](#).

NOTE This document is intended to complement ISO 23909 and ISO 22155.

1) Under preparation.

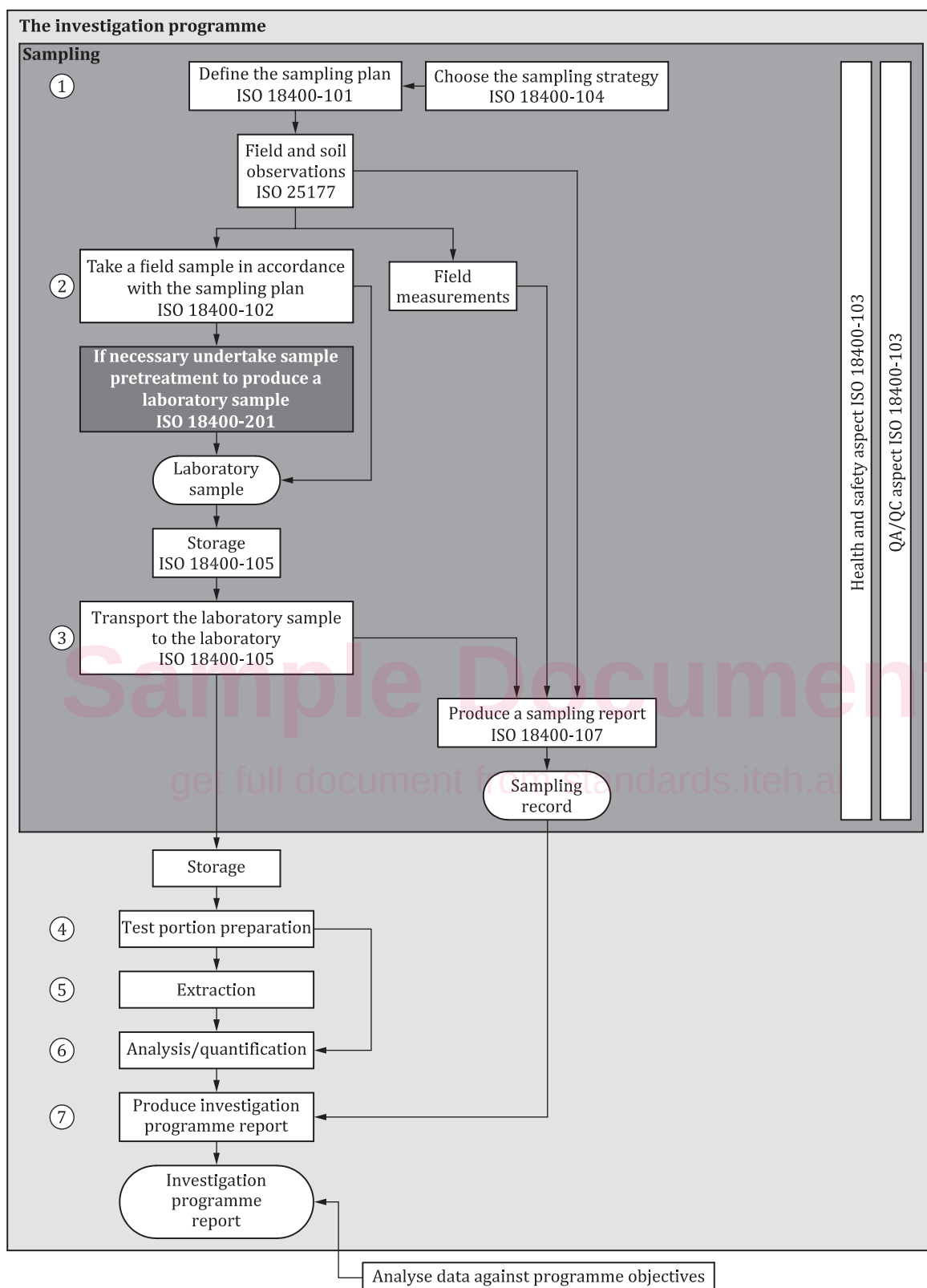


Figure 1 — Links between the essential elements of an investigation programme

NOTE 1 Numbers in circles define the key elements and steps of the investigation programme.

NOTE 2 [Figure 1](#) displays a generic process which can be amended when necessary.

Soil quality — Sampling —

Part 201: Physical pretreatment in the field

1 Scope

This document specifies methods for the pretreatment of samples that can be applied “in the field” directly after sampling. Pretreatment methods in this document are limited to:

- sample division methods aimed at reducing the size/volume of the sample;
- the production of composite samples;
- the selection of a specific fraction of the sampled material.

This document

- does not apply to samples required for biological or microbiological examination,
- does not apply to soil materials sampled for the content of volatile components, and

NOTE 1 These soil materials are intended to be sampled according to ISO 22155.

- does not give instructions for particle size reduction.

NOTE 2 Guidance for particle size reduction is given in ISO 11464, ISO 14507 and ISO 23909.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

ISO 565, *Test sieves — Metal wire cloth, perforated metal plate and electroformed sheet — Nominal sizes of openings*

ISO 11074, *Soil quality — Vocabulary*

ISO 18400-101:2017, *Soil quality — Sampling — Framework for the preparation and application of a sampling plan*

ISO 18400-104²⁾, *Soil quality — Sampling — Strategies*

ISO 18400-105, *Soil quality — Sampling — Packaging, transport, storage and preservation of samples*

ISO 18400-107, *Soil quality — Sampling — Recording and reporting*

ISO 22155, *Soil quality — Gas chromatographic determination of volatile aromatic and halogenated hydrocarbons and selected ethers — Static headspace method*

DIN 19747, *Investigation of solids — Pre-treatment, preparation and processing of samples for chemical, biological and physical investigations*

2) Under preparation. Stage at the time of publication: ISO/DIS 18400-104:2016.