



DPC: 25/30487219 DC

BSI Group Headquarters

389 Chiswick High Road London W4 4AL

Tel: +44 (0)20 8996 9000

Fax: +44 (0)20 8996 7400

www.bsigroup.com

Date: 04 March 2025

Origin: International

Latest date for receipt of comments: 27 April 2025

Project No. 2024/00381

Responsible committee: MS/6 Methodologies for business process improvement using statistical methods

Interested committees:

Title: Draft BS ISO 24108-1 Grid Square Statistics and their Applications. Part 1: Fundamental Principle of Grid Square Statistics.

Please notify admin.start@bsigroup.com if you are aware of any keywords that might assist in clarifying or identifying the standard or of the content of this standard:

- i) has any issues related to 3rd party IPR, patent or copyright
- ii) affects other national standard(s)
- iii) requires additional national guidance or information

WARNING: THIS IS A DRAFT AND MUST NOT BE REGARDED OR USED AS A BRITISH STANDARD. THIS DRAFT IS NOT CURRENT BEYOND 27 April 2025This draft is issued to allow comments from interested parties; all comments will be given consideration prior to publication. No acknowledgement will normally be sent. **See overleaf for information on the submission of comments.**

No copying is allowed, in any form, without prior written permission from BSI except as permitted under the Copyright, Designs and Patent Act 1988 or for circulation within a nominating organization for briefing purposes. Electronic circulation is limited to dissemination by e-mail within such an organization by committee members.

Further copies of this draft may be purchased from BSI Shop <http://shop.bsigroup.com> or from BSI Customer Services, Tel: +44(0) 20 8996 9001 or email cservices@bsigroup.com. British, International and foreign standards are also available from BSI Customer Services.Information on the co-operating organizations represented on the committees referenced above may be obtained from <https://standardsdevelopment.bsigroup.com/>.E-mail: admin.start@bsigroup.com

Introduction

This draft standard is based on national and international discussions. Your comments on this draft are invited and will assist in the preparation of the consequent standard.

For international standards, comments will be reviewed by the relevant UK national committee before sending the consensus UK vote and comments to the international committee, which will then decide appropriate action. If the international standard is approved, it is usual for the text to be published as a British Standard.

For national standards, comments will be reviewed by the relevant UK national committee and the resulting standards published as a British Standard.

UK Vote

Please indicate whether you consider the UK should submit a negative (with supporting technical reasons) or positive vote on this draft. Please indicate if you are aware of any reason why this draft standard should not be published as a British Standard.

Submission of Comments

- **Annotated drafts are not acceptable and will be rejected.**
- All comments should be submitted online at <https://standardsdevelopment.bsigroup.com/>. You will need to register in order to comment.

Template for comments and secretariat observations

Date: xx/xx/20xx	Document: ISO/DIS xxxx
------------------	------------------------

1	2	(3)	4	5	(6)	7
MB	Clause No./ Subclause No./Annex (e.g. 3.1)	Paragraph/ Figure/Table/Note	Type of comment	Comment (justification for change) by the MB	Proposed change by the MB	Secretariat observations on each comment submitted
	3.1	Definition 1	ed	Definition is ambiguous and needs clarifying.	Amend to read '...so that the mains connector to which no connection...'	
	6.4	Paragraph 2	te	The use of the UV photometer as an alternative cannot be supported as serious problems have been encountered in its use in the UK.	Delete reference to UV photometer.	



DRAFT International Standard

ISO/DIS 24108-1

Grid Square Statistics and their Applications —

Part 1: Fundamental Principle of Grid Square Statistics

ICS: 03.120.30

ISO/TC 69/SC 8

Secretariat: JISC

Voting begins on:
2025-03-04

Voting terminates on:
2025-05-27

This document is circulated as received from the committee secretariat.

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENTS AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

Reference number
ISO/DIS 24108-1:2025(en)

Full document details: 25/30487219 DC

© ISO 2025  **Documents**
Document Sharing Hub



COPYRIGHT PROTECTED DOCUMENT

© ISO 2025

All rights reserved. Unless otherwise specified, or required in the context of its implementation, 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
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Grid square statistics	3
4.1 Basic concepts of grid square statistics	3
4.2 For categorical data and quantitative data	4
4.2.1 General	4
4.2.2 For categorical data	4
4.2.3 For quantitative data	4
5 Production process of grid square statistics	5
5.1 General	5
5.2 Method of Allocating from Microdata	6
5.2.1 Using census data	6
5.2.2 Using sample data	7
5.2.3 Using register data	7
5.3 Method of Allocating from Disaggregated Data	7
5.4 Method of Allocating from both Microdata and Disaggregated Data	8
6 Conversion between different grid reference systems	9
6.1 General	9
6.2 Method of Conversion	9
6.2.1 Conversion method based on grid intersection	9
6.2.2 Conversion method based on a point approximation	10
Annex A (informative) Japanese national Grid Square code	11
Annex B (informative) World Grid Square code	18
Annex C (informative) Outline of European Reference grid: ETRS89-LAEA (INSPIRE)	24
Annex D (informative) Potential Applications	25
Bibliography	27

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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO *had not* received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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

For an explanation of the voluntary nature of standards, 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 www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 69, Applications of statistical methods, Subcommittee SC 8, Application of statistical and related methodology for new technology and product development.

A list of all parts in the ISO 24108 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

Grid statistics are geospatial statistics produced by grids often with fairly high spatial resolution, which enable the analysis of regional dependence on population and labour from economic and social activities. They can help us to analyse demand and supply imbalances and can provide valuable insights to optimize a strategic plan for commercializing new products and services that can expand worldwide.

However, currently, the grid definitions employed to grid statistics coexist in many countries and organizations in different forms, which lacks controllability in data quality, reliability, and interoperability. Therefore, it is highly appropriate to produce, exchange, and utilize them under a common understanding based on international standards.

In order to promote a common international understanding not only of the formal description of spatial information related to grid statistics, but also of its statistical utilization, this standard takes the following two points as its Aim.:

- Communication and decision-making requiring common understanding of grid statistics across multiple sectors and organizations.
- Promoting to provide grid square statistics even for countries and areas not yet with grid statistics, covering new services of business sector.

ISO 24108 consists of the following parts, under the general title Grid Square Statistics and their Applications:

- Part 1: Fundamental Properties of Grid Square Statistics
- Part 2: Methodological Aspects of Grid Square Statistics
- Part 3: Suppression Techniques for Grid Square Statistics
- Part 4: Use of Grid Square Statistics

Grid Square Statistics and their Applications —

Part 1: Fundamental Principle of Grid Square Statistics

1 Scope

This document specifies a fundamental concept on grid square statistics and includes the followings scopes:

- To recommend the standard method to enable policy decisions based on common recognition from grid statistics produced with different grid coordinate standards in different countries and areas that may have different geographic coding systems with different geometric shapes.
- To standardize methods to accommodate the conversion calculation among grid statistics with different grid coordinate systems having different geometric shapes by employing prorating method based on the grid areas as well as the method to calculate the approximation errors, for exchanging the converted grid statistics.

NOTE Spatial expressions other than grid square also exist, but this document does not apply to the spatial expressions other than grid square.

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 3534-2, *Statistics — Vocabulary and symbols — Part 2: Applied statistics*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3534-2 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <https://www.electropedia.org/>

3.1 categorical data

variable with the measurement scale consisting of a set of categories

3.2 nominal data

variable with a nominal scale of measurement

[SOURCE: ISO 3534-2: 2006, 1.1.6]

3.3

ordinal data

variable with an ordinal scale of measurement

[SOURCE: ISO 3534-2: 2006, 1.1.7]

3.4

contingency table

tabular representation of categorical data, which shows frequencies for particular combinations of values of two or more discrete random variables

3.5

grid

network composed of two or more sets of curves in which the members of each set intersect the members of the other sets in an algorithmic way

Note 1 to entry: The curves partition a space into grid cells.

[SOURCE: ISO 19123:2005, 4.1.23]

3.6

grid square

grid whose shape is near to a square, which is not a hexagon or something else

Note 1 to entry: The centre position or area of a grid square can be expressed in longitude and latitude.

Note 2 to entry: Grids containing the north or south pole are exceptionally triangular.

3.7

grid square code

a sequence of numbers, letters, or characters to uniquely identify a *grid square* ([3.6](#))

3.8

grid square statistics

statistics computed by using *grid square* ([3.6](#)) as aggregation units, specifically appropriate summary statistics of the quantitative data contained in each grid square

Note 1 to entry: Mean and standard deviation are typical summary statistics both in interval and ratio scale data but total is only valid in case of ratio scale data.

Note 2 to entry: the number is typical summary statistics for qualitative data in both nominal and ordinal scale data.

3.9

microdata

dataset comprised of records related to individual data principals

[SOURCE: ISO/IEC 20889:2018(en), 3.23]

3.10

register data

microdata ([3.9](#)) stored in administrative registers

3.11

disaggregated data

cross-section statistical tables (or summary data) that are tabulated from the microdata of censuses, statistical surveys, registers, and so on

3.12**georeferenced data**

data obtained from the process of referencing data against a known geospatial coordinate system by matching to known points of reference in the coordinate system

Note 1 to entry: The georeferencing process unequivocally positions data to their precise and absolute location in the digital environment – i.e. geographic coordinates (latitude, longitude and elevation; x, y, z) - according to a defined geodetic reference system that enables to assign data to a unique geographic location (or geographical reference) on the surface of the Earth with higher spatial accuracy.

3.13**grid coordinate system**

coordinate system in which a position is specified relative to the intersection of curves

Note 1 to entry: grid coordinate system defines the intersection of curves and its projection method for geographical information under coordinate reference system

[SOURCE: ISO 19115:2019(en), 3.14]

3.14**grid reference system**

reference system to uniquely express *grid squares* (3.6) defined under a certain *grid coordinate system* (3.13) by using *grid square codes* (3.7)

3.15**geocoding**

translation of one form of location into another

Note 1 to entry: Geocoding is the process of transforming a description of the location or unreferenced location information (e.g., address or name of a place, etc.) to the location's measurable position on the earth's surface" in the digital environment (inspired by the GEOSTAT 4 and GSGF Europe terminology). Geocoding can be considered as a subset concept of georeferencing.

Note 2 to entry: Geocoding is typically preceded by the data cleaning step of preprocessing and standardizing the format of the data. Geocoding can be conducted through point and point-in-polygon operations from field data collection or administrative data (direct location information), based on full physical address description (text strings addressing indirect location information) and based on partial or incomplete physical address that can include only a postcode, a locality name, administrative unit and/or region.

Note 3 to entry: Geocoding can be conducted by joining or linking location data with tabular/alphanumeric/nominal data (i.e. non-geospatial data) within a database management system, a GIS environment (enterprise-owned software or open source) or a service (web-based or API) by taking description location information (e.g., address) as input and returning the respective geographic coordinates (point spatial objects) in digital format. The term of 'geocoding' is commonly associated with the 'geoenabling' term depending on the application type and has been supported by the advancement in geospatial technologies that increasingly improve and automate the matching process.

Note 4 to entry: Geocoding statistical data is considered a requirement within statistical production because it facilitates data integration and enables (dis)aggregation by location into smaller or larger geographic units for statistical analysis.

[SOURCE: ISO 19133:2007(en), 4.13]

4 Grid square statistics**4.1 Basic concepts of grid square statistics**

Grid square statistics (GSS) are geospatial statistics in terms of grid squares. grid squares are defined by a grid coordinate system to indicate their positions under a certain projected coordinate reference system. Each grid square is identified by a unique grid square code defined by a grid reference system. There are several types of grid squares in different spatial resolutions in a certain grid reference system. The grid square code is a text string corresponding with grid size under a certain projection coordinates system. The objective of the grid codes is to generate unique identifiers for each grid square. Therefore, GSS depends on