

2 Overview

2.1 Name

INSPIRE data specification for the theme Geographical Grid Systems.

2.2 Informal description

Definition:

Harmonised multi-resolution grid with a common point of origin and standardised location and size of grid cells.

[Directive 2007/2/EC]

Description:

The scope of the theme “Geographical grid systems” covers quadrilateral grids used for the indirect geo-referencing of themes with typically coarse resolution and wide (pan-European) geographical extent.

The theme establishes two Pan-European grids to be used within continental Europe in the INSPIRE context: The *Equal Area Grid* and the *Zoned Geographic Grid*.

Either of these grids, with fixed and unambiguously defined locations, shall be used as a geo-referencing framework to make gridded data available in INSPIRE, unless other grids are specified for specific INSPIRE spatial data themes for the purpose or in regions outside continental Europe.

The *Equal Area Grid* is proposed as the multipurpose Pan-European standard for spatial analysis or reporting. It consists of a two-dimensional grid based on the ETRS89 Lambert Azimuthal Equal Area projected coordinate reference system.

The *Zoned Geographic Grid* is proposed as an optional geo-referencing framework when gridded data (raster data) is delivered using geodetic coordinates, mainly suited for reference data (such as elevation or orthoimagery), to achieve their interoperability for data provision. It is aimed to serve cross-border purposes at global level. It consists of a two-dimensional multi-resolution geographic grid based on the ETRS89-GRS80 geodetic coordinate reference system, following a structure analogue to DTED (Digital Terrain Elevation Data) which divides the world into different zones in latitude.

Both geographical grids have multiple predefined resolution levels, and are provided with a designator and a coding system for identifying individual cells at all these levels.

It is recognised that there is a need to enable grid referencing for regions outside of continental Europe, for example for overseas Member States (MS) territories. For these regions, MS may define their own grid, although it must follow the same principles as laid down for the Pan-European Grids defined in this specification.

The requirements and recommendations regarding “Geographical grid systems” are harmonised with the requirements of the Coordinate Reference Systems data specification [INSPIRE-DS-CRS].

2.3 Normative References

[Directive 2007/2/EC]	Directive 2007/2/EC of the European Parliament and of the Council of 14 March 2007 establishing an Infrastructure for Spatial Information in the European Community (INSPIRE)
[ISO 19111]	EN ISO 19111:2007 Geographic information - Spatial referencing by coordinates (ISO 19111:2007)
[ISO 19111-2]	EN ISO 19111-2:2009 Geographic information - Spatial referencing by coordinates – Part 2: Extension for parametric values
[ISO 19115]	EN ISO 19115:2005, Geographic information – Metadata (ISO 19115:2003)
[ISO 19123]	EN ISO 19123:2007, Geographic Information – Schema for coverage geometry and functions
[ISO 19129]	ISO/TS 19129:2009, Geographic information – Imagery, gridded and coverage data framework (ISO 19129:2009)
[ISO 19135]	EN ISO 19135:2007 Geographic information – Procedures for item registration (ISO 19135:2005)
[Regulation 1205/2008/EC]	Regulation 1205/2008/EC implementing Directive 2007/2/EC of the European Parliament and of the Council as regards metadata

2.4 Terms and definitions

General terms and definitions helpful for understanding the INSPIRE data specification documents are defined in the INSPIRE Glossary¹⁴.

Specifically, for the theme Geographical Grid Systems, the following terms are defined:

(1) grid

A 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.

(2) grid cell

A cell delineated by grid curves.

(3) grid point

A point located at the intersection of two or more curves in a grid.

(4) gridded data

Data made available as a coverage (or coverages) whose domain is a grid.

NOTE Gridded data are often also referred to as “raster data”. A raster is defined in ISO 19123:2005 as a “usually rectangular pattern of parallel scanning lines forming or corresponding to the display on a cathode ray tube”, i.e. as a specific type of grid.

2.5 Symbols and abbreviations

¹⁴ The INSPIRE Glossary is available from <http://inspire-registry.jrc.ec.europa.eu/registers/GLOSSARY>

CRS	Coordinate Reference System
DTED	Digital Terrain Elevation Data
EC	European Commission
EEA	European Environment Agency
EIONET	Environmental Information and Observation Network
ETRS89	European Terrestrial Reference System 1989
ETRS89-LAEA	Two-dimensional Lambert Azimuthal Equal Area Coordinate Reference System
ETRS89-GRS80	Two-dimensional Geodetic Coordinate Reference System in ETRS89 on the GRS80 ellipsoid
GCM	Generic Conceptual Model
GRIB	WMO standard for gridded data exchange GRIdded Binary http://www.wmo.ch/pages/prog/www/WMOCodes/GRIB.html
Grid_ETRS89-LAEA	Pan-European Equal Area Grid
Grid_ETRS89-GRS80zn	Pan-European Zoned Geographic Grid
GRS80	Geodetic Reference System 1980
ICAO	International Civil Aviation Organisation
IOC	Intergovernmental Oceanographic Commission
ITRS	International Terrestrial Reference System
MS	Member States
NetCDF	Data Exchange Standard of the Climate and Forecasting Community Network Common Data Form http://www.unidata.ucar.edu/netcdf
TWG	Thematic Working Group
WMO	World Meteorological Organisation
WMTS	Web Map Tile Service

2.6 How the Technical Guidelines map to the Implementing Rules

The schematic diagram in Figure 1 gives an overview of the relationships between the INSPIRE legal acts (the INSPIRE Directive and Implementing Rules) and the INSPIRE Technical Guidelines. The INSPIRE Directive and Implementing Rules include legally binding requirements that describe, usually on an abstract level, *what* Member States must implement.

In contrast, the Technical Guidelines define *how* Member States might implement the requirements included in the INSPIRE Implementing Rules. As such, they may include non-binding technical requirements that must be satisfied if a Member State data provider chooses to conform to the Technical Guidelines. Implementing these Technical Guidelines will maximise the interoperability of INSPIRE spatial data sets.

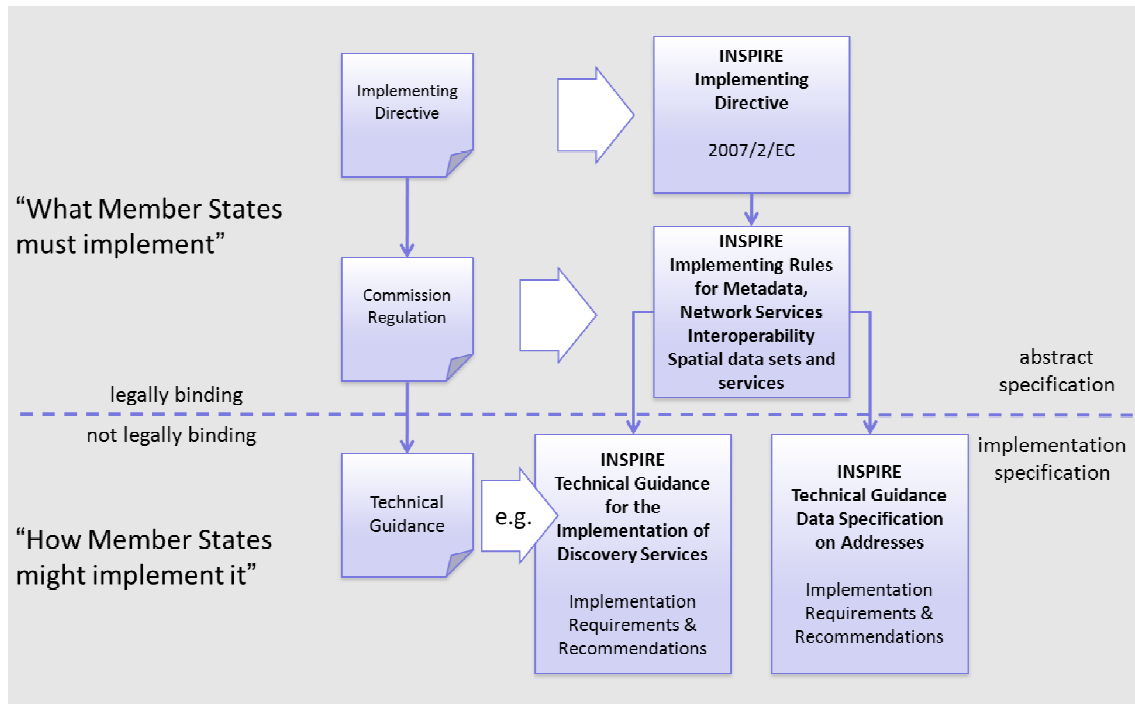


Figure 1 - Relationship between INSPIRE Implementing Rules and Technical Guidelines

2.6.1 Requirements

The purpose of these Technical Guidelines (Data specifications on *Geographical Grid Systems*) is to provide practical guidance for implementation that is guided by, and satisfies, the (legally binding) requirements included for the spatial data theme Geographical Grid Systems in the Regulation (Implementing Rules) on interoperability of spatial data sets and services. These requirements are highlighted in this document as follows:

IR Requirement
Article / Annex / Section no.
Title / Heading

This style is used for requirements contained in the Implementing Rules on interoperability of spatial data sets and services (Commission Regulation (EU) No 1089/2010).

For each of these IR requirements, these Technical Guidelines contain additional explanations and examples.

NOTE The Abstract Test Suite (ATS) in Annex A contains conformance tests that directly check conformance with these IR requirements.

Furthermore, these Technical Guidelines may propose a specific technical implementation for satisfying an IR requirement. In such cases, these Technical Guidelines may contain additional technical requirements that need to be met in order to be conformant with the corresponding IR requirement *when using this proposed implementation*. These technical requirements are highlighted as follows:

TG Requirement X This style is used for requirements for a specific technical solution proposed in these Technical Guidelines for an IR requirement.

NOTE 1 Conformance of a data set with the TG requirement(s) included in the ATS implies conformance with the corresponding IR requirement(s).

NOTE 2 In addition to the requirements included in the Implementing Rules on interoperability of spatial data sets and services, the INSPIRE Directive includes further legally binding obligations that put additional requirements on data providers. For example, Art. 10(2) requires that Member States shall, where appropriate, decide by mutual consent on the depiction and position of geographical features whose location spans the frontier between two or more Member States. General guidance for how to meet these obligations is provided in the INSPIRE framework documents.

2.6.2 Recommendations

In addition to IR and TG requirements, these Technical Guidelines may also include a number of recommendations for facilitating implementation or for further and coherent development of an interoperable infrastructure.

Recommendation X Recommendations are shown using this style.

NOTE The implementation of recommendations is not mandatory. Compliance with these Technical Guidelines or the legal obligation does not depend on the fulfilment of the recommendations.

2.6.3 Conformance

Annex A includes the abstract test suite for checking conformance with the requirements included in these Technical Guidelines and the corresponding parts of the Implementing Rules (Commission Regulation (EU) No 1089/2010).