

- Polygon interior rings are inside the exterior ring
- Multipolygons do not have overlapping polygons

Spatial functions fail if a geometry is not syntactically well-formed. Spatial import functions that parse WKT or WKB values raise an error for attempts to create a geometry that is not syntactically well-formed. Syntactic well-formedness is also checked for attempts to store geometries into tables.

It is permitted to insert, select, and update geometrically invalid geometries, but they must be syntactically well-formed. Due to the computational expense, MySQL does not check explicitly for geometric validity. Spatial computations may detect some cases of invalid geometries and raise an error, but they may also return an undefined result without detecting the invalidity. Applications that require geometrically valid geometries should check them using the `ST_IsValid()` function.

## 11.4.5 Spatial Reference System Support

A spatial reference system (SRS) for spatial data is a coordinate-based system for geographic locations.

There are different types of spatial reference systems:

- A projected SRS is a projection of a globe onto a flat surface; that is, a flat map. For example, a light bulb inside a globe that shines on a paper cylinder surrounding the globe projects a map onto the paper. The result is georeferenced: Each point maps to a place on the globe. The coordinate system on that plane is Cartesian using a length unit (meters, feet, and so forth), rather than degrees of longitude and latitude.

The globes in this case are ellipsoids; that is, flattened spheres. Earth is a bit shorter in its North-South axis than its East-West axis, so a slightly flattened sphere is more correct, but perfect spheres permit faster calculations.

- A geographic SRS is a nonprojected SRS representing longitude-latitude (or latitude-longitude) coordinates on an ellipsoid, in any angular unit.
- The SRS denoted in MySQL by SRID 0 represents an infinite flat Cartesian plane with no units assigned to its axes. Unlike projected SRSSs, it is not georeferenced and it does not necessarily represent Earth. It is an abstract plane that can be used for anything. SRID 0 is the default SRID for spatial data in MySQL.

MySQL maintains information about available spatial reference systems for spatial data in the data dictionary `mysql.st_spatial_reference_systems` table, which can store entries for projected and geographic SRSSs. This data dictionary table is invisible, but SRS entry contents are available through the `INFORMATION_SCHEMA.ST_SPATIAL_REFERENCE_SYSTEMS` table, implemented as a view on `mysql.st_spatial_reference_systems` (see [Section 26.3.36, “The INFORMATION\\_SCHEMA ST\\_SPATIAL\\_REFERENCE\\_SYSTEMS Table”](#)).

The following example shows what an SRS entry looks like:

```
mysql> SELECT *
FROM INFORMATION_SCHEMA.ST_SPATIAL_REFERENCE_SYSTEMS
WHERE SRS_ID = 4326\G
***** 1. row *****
      SRS_NAME: WGS 84
      SRS_ID: 4326
  ORGANIZATION: EPSG
ORGANIZATION_COORDSYS_ID: 4326
      DEFINITION: GEOGCS["WGS 84",DATUM["World Geodetic System 1984",
      SPHEROID["WGS 84",6378137,298.257223563,
      AUTHORITY["EPSG","7030"]],AUTHORITY["EPSG","6326"]],
      PRIMEM["Greenwich",0,AUTHORITY["EPSG","8901"]],
```