Compliance sheet — star-mercator

Everything a supplier qualification, a legal review or an export check usually asks about star-mercator 0.1.0, in one document.

1. Identity

Document	STAR-PKG-STAR-MERCATOR-EN · v2.3 · 2026-11-14
Package	star-mercator
Version	0.1.0
Capability	star.geodesy.mercator
Maturity	Released & Verified (RELEASED)
Python	>=3.9
Source commit	dc09f61d
Source	https://github.com/Andrea07072000/S.T.A.R.-/tree/main/packages/star_mercator

2. Licence and obligations

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3. What it needs at run time

Nothing beyond the Python standard library: it works offline.

4. Integrity

SHA-256 fingerprints of the files published on this website. Check a downloaded file with:

```
python -c "import
hashlib,sys;print(hashlib.sha256(open(sys.argv[1],'rb').read()).hexdigest())" star_mercator-
0.1.0-py3-none-any.whl
```

FILE	SHA-256
star_mercator-0.1.0-py3-none-any.whl	041758ecb84df5944bae264e4497563c504c32c1f0e4fb4dcc492baa4c7fc5a1
star_mercator.py	427352ea5cee6cebcdc716dce4ed52cf736ae5262d9e21e01c3c54c4f7bc37ee
star_mercator-0.1.0-source.zip	c2fffe52f5aeef49e7235a062b74c81971cd6ed73d9a7632f38e01054dd8a378

5. What it does, and its limits

Mercator projection on the ellipsoid with optional latitude of true scale, forward, inverse and scale factor, and Web Mercator; within 6e-8 m of PROJ, 7.5e-9 m of PyGeodesy's isometric latitude and 3e-8 m of both for Web Mercator on 600 cases; reproduces Snyder's published x and scale factor.

Web Mercator is not conformal and its y differs from the ellipsoidal Mercator by tens of kilometres at mid-latitudes: do not mix them. PyGeodesy has no ellipsoidal Mercator: it confirms the isometric latitude (hence y) and Web Mercator, not x or the scale; and it refuses Web Mercator beyond 85.05 deg, so 19 of the 600 cases were compared with PROJ only. The y of Snyder's example is not cited: its last printed digit could not be confirmed. At longitude 180 exactly `web_mercator_forward` returns the East edge (+20037508.34 m) while `mercator_forward` reduces the difference from its central meridian to [-180, 180) and returns the West edge. No rhumb-line distances or bearings.

- `mercator_forward`, `mercator_inverse`: the conformal Mercator of the ellipsoid, y = a·k0·ψ with ψ the isometric latitude written without cancellation, any central meridian, an optional latitude of true scale. Reproduce the x of Snyder's numerical example (USGS PP 1395, p. 266) to the printed 0.1 m.
- `mercator_scale`: point scale factor, 1 on the parallels of true scale. Reproduces Snyder's k = 1.2194146. `web_mercator_forward`, `web_mercator_inverse`: EPSG:3857.
- Measured on 600 cases on WGS-84 (latitudes to ±89, true scale to ±80): forward within 5.5e-8 m and inverse within 6e-8 m of PROJ; y within 7.5e-9 m of PyGeodesy's isometric latitude; Web Mercator within 3e-8 m of PROJ and PyGeodesy; scale within 7.5e-8 of PROJ (whose factors are numerical).
- Every function returns finite floats or raises `ValueError`: non-numeric, boolean, NaN or infinite input, latitude beyond ±89.5, latitude of true scale beyond ±80, longitudes beyond ±180, an ellipsoid outside the stated ranges, plane coordinates beyond the image. Inverse longitudes are in [-180, 180).

6. Export, use and certification

The package is published and freely available. That usually takes software out of export-control lists, but not every use of it: read the page on space activities and export control before using it in a controlled programme. It is not certified or qualified for flight; the evidence describes what was tested and how.

7. Citation and bill of materials

```
@software{cavazzini_star_mercator_0_1_0,
  author  = {Cavazzini, Andrea},
  title   = {{star-mercator}: Mercator on the ellipsoid, and Web Mercator},
  version = {0.1.0},
  year    = {2026},
  url     = {https://andrea07072000.github.io/S.T.A.R.-/software/star_mercator/},
  note    = {Apache-2.0. Source: https://github.com/Andrea07072000/S.T.A.R.-, commit dc09f61d}
}
```

CITATION.cff · BibTeX · SBOM CycloneDX 1.5 · SBOM SPDX 2.3

8. Warranty and liability

Provided "as is", without warranties or conditions of any kind (Apache License 2.0, sections 7 and 8), to the extent the law allows. This never excludes liability that the law does not allow to exclude.

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