



Keeping Space Moving

Advanced Solid Lubricant Solutions



Solid Lubricant Technology at ESTL

Heritage & Expertise

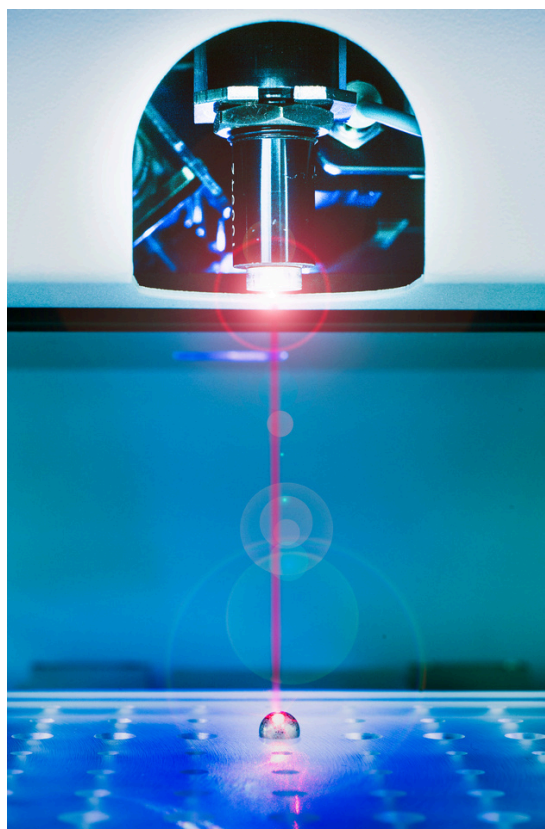
- Leading European specialist in solid lubricant coatings since the 1980s.
- Proven PVD (Physical Vapour Deposition) coatings used extensively in space and vacuum environments.
- Products qualified and flown by multiple clients in demanding space missions.



Why Solid Lubricants?

- Essential where oils/greases can't be used (extreme temperatures, contamination-sensitive areas).
- No migration issues; long-lasting and reliable.
- Used in sliding/rolling applications and complex mechanisms.

Our Solid Lubricant Products



1. Metallic Coatings (PVD Sputtered Films)

Lead (Pb)

- Excellent for sliding/rolling, wide temp range (cryogenic to >300°C)
- Self-repairing, corrosion-resistant, enhances PFPE lubricant life (x30)

Silver (Ag)

- Ideal for high-temp vacuum use (>100°C to >800°C)
- Applied as ultra-thin film (~<1µm), durable in sliding/rolling motion

2. Lamellar Coatings

MoS₂-101 (Heritage Product)

- Widely qualified and flown (missions: JWST, Bepi-Colombo, EarthCARE, Solar Orbiter, etc.)
- Ultra-low friction in vacuum, cryogenic to 800°C
- Used with composite cages (e.g. PGM-HT, TS8591)
- Requires dry nitrogen purge during ground testing (avoids humidity degradation)

3. Next-Generation MoS₂-Based Products

In addition to our heritage formulation, known as “MoS₂-101”, we can now offer a number of variant products with well-defined and tightly-controlled processes and promising performance benefits.

MoS₂-202

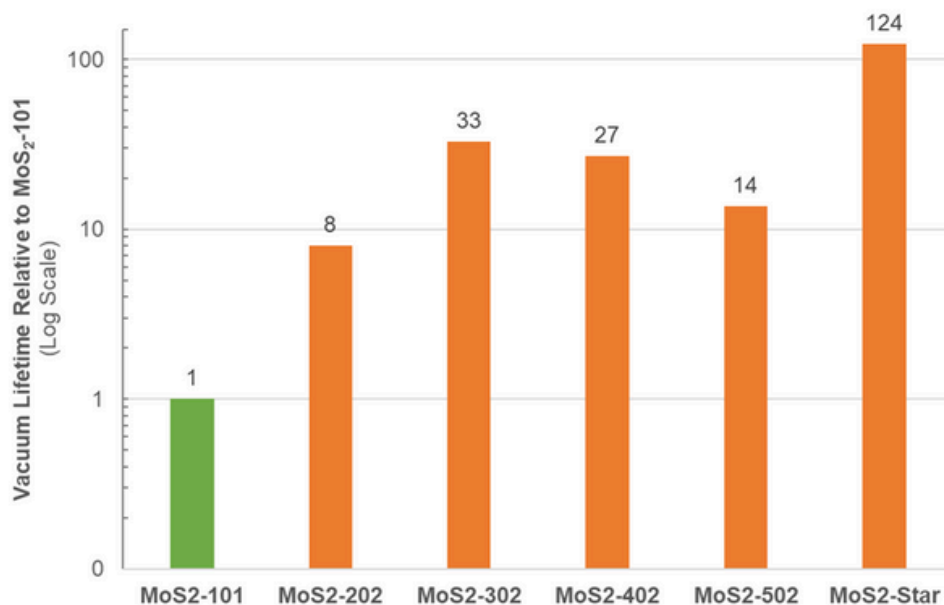
- Process-optimised version of MoS₂-101
- ~8–10x longer life in vacuum
- Suitable for “balls-only” and full bearing coatings
- Promising results even after air exposure

MoS₂-302 / 402 / 502

- Non-stoichiometric doped variants
- ~15–35x life over MoS₂-101
- Improved moist-air resilience
- May require delta-qualification for use

MoS₂-Star

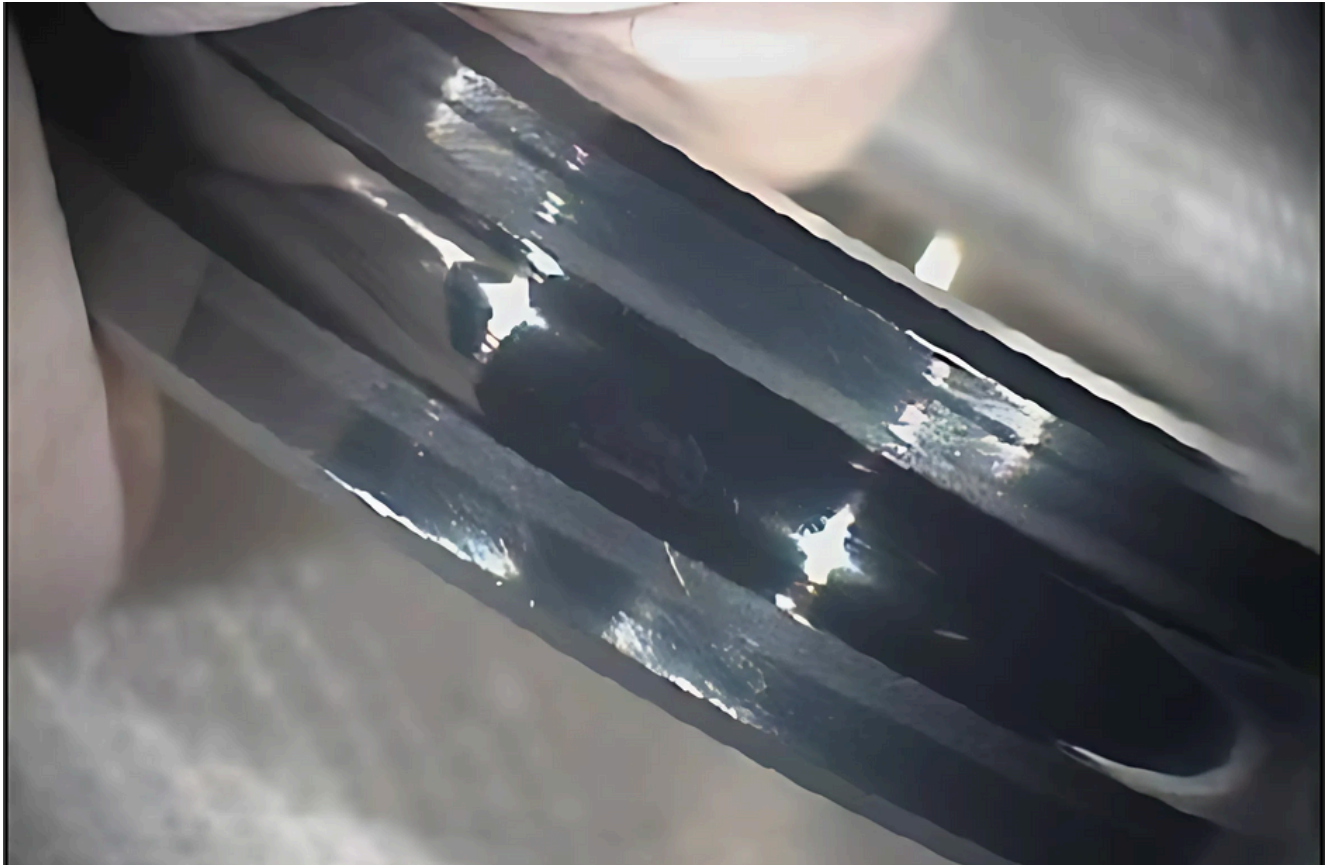
- Premium doped variant with ~95x or more longer life in vacuum
- Maintains similar friction performance
- Evaluation under moist-air and vacuum due 2025



Typical in-vacuum lifetime - pin-on-disc

Application & Process

- Coatings tailored to part type: both or single surface (e.g. “balls-only” on bearings if required)
- Our validated coating processes are:
 - PRA-ESTL-PP-7704 MoS₂ and MoS₂-based Variant Lubrication Processes
 - PRA-ESTL-PP-7710 Lead Lubrication Process
 - PRA-ESTL-PP-7711 Silver Lubrication Process
- All processing under AS/EN9100:2018 accredited Quality Management System



*Want a digital version of this
brochure?
Scan QR code.*



Contact for more information:

Simon Lewis – Manager

Simon.Lewis@esrtechnology.com | +44 (0)1925 843451

Daniel Lloyd – Coatings Manager

Daniel.Lloyd@esrtechnology.com | +44 (0)1925 843453

ESR Technology also provides partnership mechanism and sub-assembly design, development and recurrent build through its **ESR Space Team**. Details here...

