



Detailed Technical Report comparing XPL+ Anti-Friction Technology with traditional MoS₂ (Molybdenum Disulfide) greases, aimed at guiding mechanical engineers, maintenance engineers, lubrication specialists, and procurement teams in making an informed decision.

Technical Report: XPL+ Technology Over Traditional MoS₂ Grease

Executive Summary

XPL+ (Xtreme Pressure Lubrication Positive (+) Ionic charged) technology is a proprietary, high-performance lubrication solution developed by ProOne Inc. It offers a significant advancement over traditional MoS₂ (molybdenum disulfide) greases by delivering superior friction reduction, shock load resistance, molecular bonding to metal surfaces, and cleaner operation. This report outlines the critical differences, performance characteristics, and key benefits that make XPL+ a superior alternative in many industrial and heavy-duty applications.

Composition Formulation and Mechanism of Action

XPL+ is comparable in purpose to additives like molybdenum disulfide (MoS₂), PTFE or EP (extreme pressure) sulphur-phosphorus compounds, **XPL+** emphasize superior molecular bonding and extreme shock and pressure load handling beyond standard EP additive formulations (MoS₂, PTFE, EP, Sulphur-phosphorus compounds, chlorine or zinc)

Feature	XPL+	MoS ₂
Type	Proprietary organometallic liquid-phase formulation	Inorganic solid lubricant (MoS ₂ particles)
Lubrication Mechanism	Molecular bonding to metal surfaces, forming a microfilm	Layered crystalline structure allows particles to slide easily
Form	Fully dissolved in grease/oil base (no settling)	Suspended solid particles in base grease
Chemical Nature	Likely polar, synthetic compounds (non-metallic)	Molybdenum disulfide (MoS ₂), often abrasive if improperly used
Friction Reduction	Excellent (bonded layer remains effective)	Good
Extreme Pressure (EP)	>200,000 psi resistance in solid state	Up to 4000 psi in solid state
Shock Load Resistance	Very High (molecular bonding resists displacement)	Moderate to High
Boundary Lubrication	Exceptional (solid film remains after grease lost)	Good (limited solid film remains after grease loss)
Wear Protection	Very High (film prevents scoring)	High (sacrificial film reduces wear)
Cleanliness	Clean; no black/gray residue	May leave black residue or stain surfaces
Settling/Separation	None (molecule structured integrated)	Can settle or separate

Application Suitability

XPL+ maintain lubricating film in boundary lubrication regimes, where normal grease additives break down due to metal-to-metal contact under extreme environmental conditions, **XPL+** delivering superior friction reduction and shock load resistance. **XPL+** polar molecular formulation is designed to be attracted to metal ions and form a robust barrier and film strength vs MoS₂ to limit abrasion within applications for equipment operating in Mining, Construction, Industrial and Marine

Application Type	XPL+ Preferred	MoS ₂ Preferred
Enclosed Gear Systems	Yes (no solids to clog passages)	Sometimes (if no risk of separation)
High Speed Bearings	Yes (low drag, no abrasion)	Not ideal (abrasive risk)
Dirty/Open Environments	Yes (film strength remains when grease is pushed out)	Possibly (depends on exposure when grease is pushed out)
Automatic Lubrication Systems	Yes (won't clog injectors or passages)	No (settling and clogging risk)
Hydraulic Systems	Yes	No (solid particles may damage pumps)
Mining/Construction Equipment	Yes (especially for pins/bushing, gears, bearings, chains with EP)	Yes (MoS ₂ commonly specified)

Maintenance and Efficiency Benefits

Category	XPL+ Preferred	MoS ₂ Preferred
Reapplication Interval	Longer (film remains after lubricant loss, less reapplication intervals needed)	Medium (film remains, but more frequent reapplication intervals needed)
Wear Rate Reduction	Significant (bonded film strength)	Moderate to Average
Dirty/Open Environments	Yes (film strength remains when grease is pushed out)	Possibly (depends on exposure when grease is pushed out)
Energy Efficiency	Excellent (less friction, less drag)	Good (more friction, more drag)
Clean-Up Time	Minimal (non-staining)	High (dark residue is hard to remove)
Total Lifecycle Cost	Lower (due to extended service, reduced wear)	Moderate (due to frequent reapplication)

Environmental and Compatibility Considerations

XPL+ Advantages:

- No solids offer environmentally friendly benefits working that it is plant-base, stable non-corrosive, non-reportable
- Less abrasive and safer on soft or exotic metals
- Fully compatible with other greases
- Fully compatible with automated systems and modern seals
- Safe for human contact as possible with minimal inhalation, skin contact or ingestion problems for operators
- Free of traditional EP additive or harmful solvents XPL+ formulation do not containing MoS₂, PTFE, EP, Sulphur-phosphorus compounds, chlorine or zinc

Molybdenum Disulfide (MoS₂) Limitations:

- Residue may be problematic in sensitive to the environment
- Potential abrasion if particle size is too large
- Compatibility with some metals can be an issue
- Prolonged or repeated contact may cause mild irritation in sensitive skin
- Low toxicity if accidentally ingested in small quantities
- Formulated grease containing MoS₂ may have other components (e.g. thickeners, base oil, additives) that can be harmful to the environment if improperly disposed

CONCLUSION:

XPL+ Technology grease delivering superior friction reduction, minimal water washout and sock load resistance offering clean, durable, bonded film strength without relying on solid particles as in MoS₂ grease, allowing XPL+ Technology grease to perform better in systems or applications where solids can cause abrasion or clogging.

XPL+ Technology grease is reportedly more stable under high temperatures unlike traditional EP films (MoS₂, PTFE, EP, Sulphur-phosphorus compounds, chlorine or zinc) greases that may degrade or oxidize quickly

XPL+ Technology greases could be more expensive up front, but often pays off in reduce downtime, extended component life and lower consumption of grease reapplication maintenance intervals and reduce grease/lubricant waste

XPL+ Technology grease is truly a superior alternative to replace traditional MoS₂ greases based on evaluating both greases, Typical Properties, ASTM Test results, performances and values.