

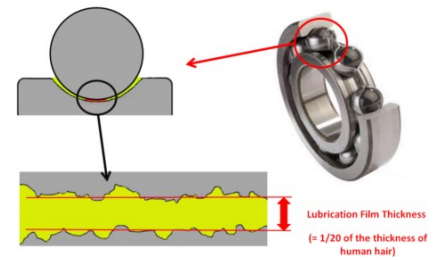


**Percussive drills benefit from
Liquid Shield Polar high temperature rock drill oils**
25 Years - Liquid Shield Polar rock drill oils / air tool lubricant
Powerful, economical protection for miners and equipment



Percussive drills develop much more heat than other equipment in mining applications

Most moving components within equipment are subject to friction forces generated by movement of parts in close proximity to each other. Generally, parts are separated by bearings that maintain spacing between surfaces, and the friction generated by rotation and sliding is reduced by the presence of a rock drill oil which provides lubricity, and to some extent cooling. As long as RDO is present between surfaces, friction and heat buildup are maintained at acceptable levels, within the heat tolerance levels of conventional RDOs.



Percussive drills produce very high heat levels due to the kinetic energy released as a result of the constant hammering of the drill piston on the steel bit. To give you an idea of the amount of energy released as heat, take a look at the video <https://youtube.com/shorts/2nA385KPFEU?feature=share> (copy, right click - open hyperlink)

Within 15 blows of a mallet, enough heat was generated to ignite matches, which is generally estimated to be 360°F (≈180°C). A percussive drill piston will strike the bit at hundreds of times per minute, so it is not unrealistic to estimate temperatures at well in excess of 300°C (≈570°F.) Mineral oil RDOs decompose at temperatures in excess of 199°C (390°F), which would explain why carbon buildup is typically present around the piston, and why scoring and scuffing develops in other parts after the piston.



DTH and other drill manufacturers often mention inadequate lubrication as cause for scoring and premature wear in drill components. This is sometimes blamed on insufficient RDO delivered in the compressed air stream. However, knowing the potential temps reached during drilling, it is reasonable to assume that the conventional RDO is not up to the task of lubricating very hot surfaces. That is why turning up the lubricator doesn't improve the situation. **That is why we developed Liquid Shield polar rock drill oils.**

Liquid Shield polar RDOs have addressed the issue of high temperature tolerance in a couple of ways:

Formulation using high temperature esters that provide effective lubrication up to 315°C (600°F)

Use of VI (viscosity index) improvers to help resist viscosity thinning due to heat.

Fortification with specialized EP/Anti-Wear additives to help protect metal surfaces in high heat situations.

There are other synthetic lubricants intended for extreme operating temperatures, but they are expensive (Ex. Krytox XHT oils - temperatures up to 400°C). The decision to purchase any lubricant typically has to pass through more than one decision maker, any lubricant that is way outside expected cost parameters is difficult to sell. **Therefore, our hybrid blend of high temperature synthetic esters with mineral oils provides a cost effective way to deal with heat.** As temperatures surpass the evaporation point of mineral oil fractions, the mineral oil flashes off. However, it does not evaporate the synthetic ester, but concentrates it, along with the EP/AW additives to produce a powerful film that limits boundary contact.



With little investment beyond what you are currently paying for a conventional rock drill oil, mining operations can benefit from the increased wear protection provided by Liquid Shield High Temperature Polar Rock Drill Oils.

