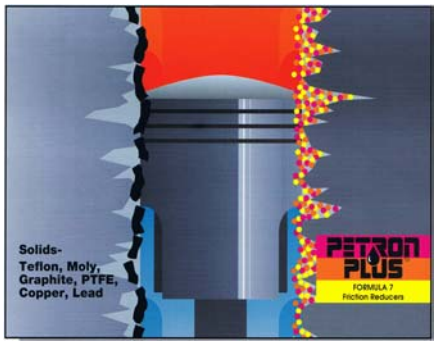
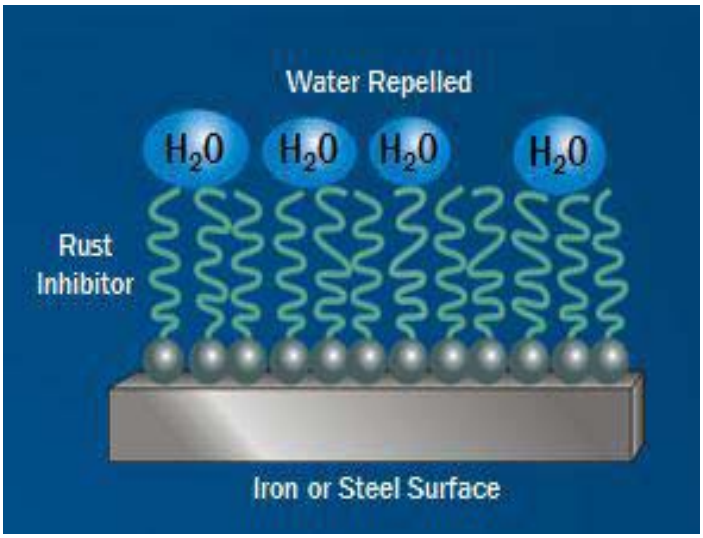
PETRON PLUS™
FORMULA 7



ADVICE for IMPROVING OIL with ADDITIVES

TECHNICAL SERVICE BULLETIN



We've always heard that increasing the percentage of a certain additive can improve one property of an oil while at the same time degrade another. Is this true?

The old saying, "If a little bit of something is good, then more of the same is better," is not necessarily true when using oil additives.

Anti-wear additives and extreme-pressure agents form a large group of chemical additives that carry out their function of protecting wear surfaces during boundary lubrication by forming a protective film or barrier on the wear surfaces. As long as the hydrodynamic oil film is maintained between the wear surfaces, boundary lubrication will not occur and these "boundary lubrication" additives will not be required to perform their function. When the oil film does break down and asperity contact is made under high loads or high temperatures, these boundary lubrication additives provide the frictional stress, rather than the wear surfaces themselves.

When the specified concentrations of additives become unbalanced, overall oil quality can be affected.

Some additives compete with each other for the same space on a wear surface. If a high concentration of a special anti-wear agent is suddenly added to the oil, the corrosion inhibitor may become ineffective. The result may only be an increase in corrosion-related problems.

When a higher than normal concentration of detergent/dispersant additive is used in an existing oil, the dispersant can hold the anti-wear agents or extreme-pressure additives in suspension and actually prevent them from forming their intended wear-reducing film on the surface of parts. The result may be an increase in wear.

A lubricity additive and an anti-wear/extreme-pressure additive are often used together in the formulation of lubricating oils. The lubricity agent assists the anti-wear/extreme-pressure agent when both are used in the correct concentrations. However, when used at higher concentrations, the lubricity additive can actually interfere with the ability of the other boundary lubrication additives to prevent scuffing of wear surfaces at high loads.

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During the blending process, the surface tension of any oil is strongly affected by the addition of such additives as detergents and extreme-pressure agents. As a result, anti□foam agents are often required to break down the air bubbles that form beneath the surface of the oil and would otherwise remain trapped.

The addition of some special extreme-pressure additives can unbalance the anti-foam additive concentrations, and the result may only be an increase in oil foaming, which can in turn cause a decrease in effective lubrication.