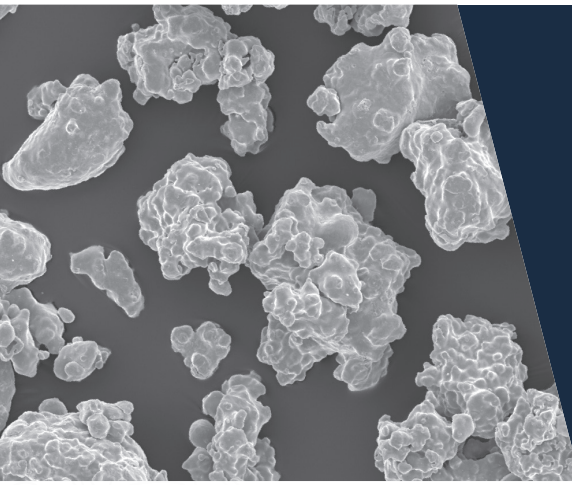


# ENHANCED FERROPHOSPHORUS

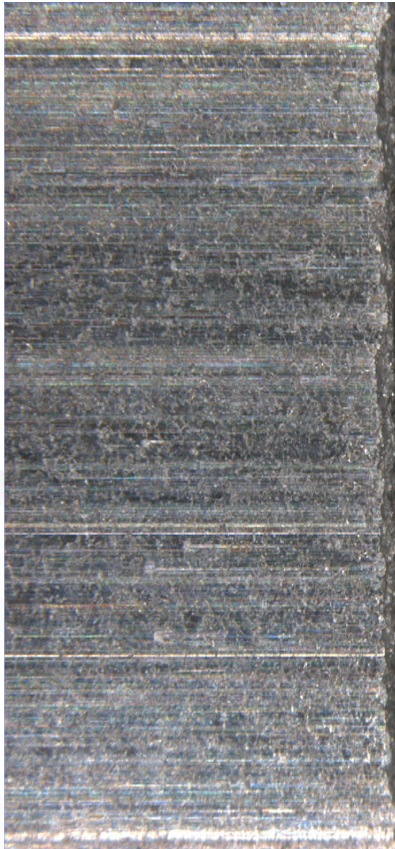


Hoeganaes Corporation offers an enhanced additive to substantially improve tool life and part quality.

Hoeganaes is able to surface-engineer abrasive ferrophosphorus additives to offer:

- > Drastic improvements to tool life
- > Minimized part scoring and improved surface quality
- > Reduction or elimination of compaction defects such as pull-out, picking, chipping, and cracking
- > No effect on powder, green, sintered, or magnetic properties

Standard FY-4500



Enhanced FY-4500



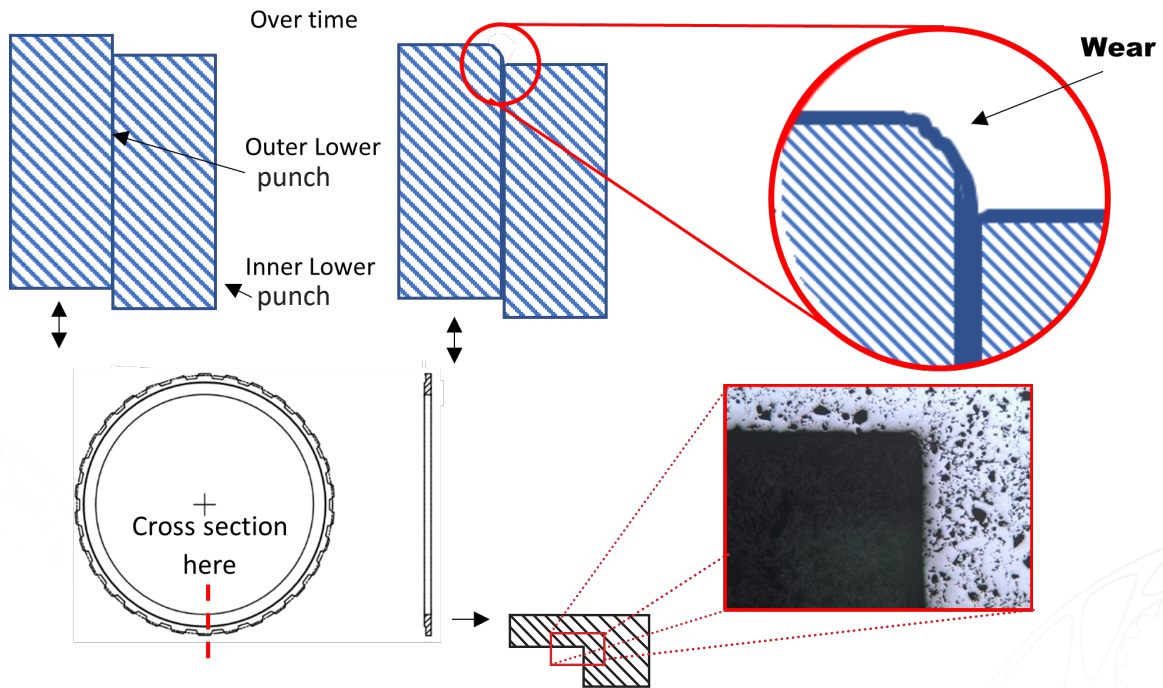
**Observed greater than 20% reduction in stripping and sliding pressure in lab testing**

Substantial reduction in ejection forces and improved surface finish on parts. Parts above are cylindrical samples compacted to a nominal density of 7.0 g/cm<sup>3</sup>.

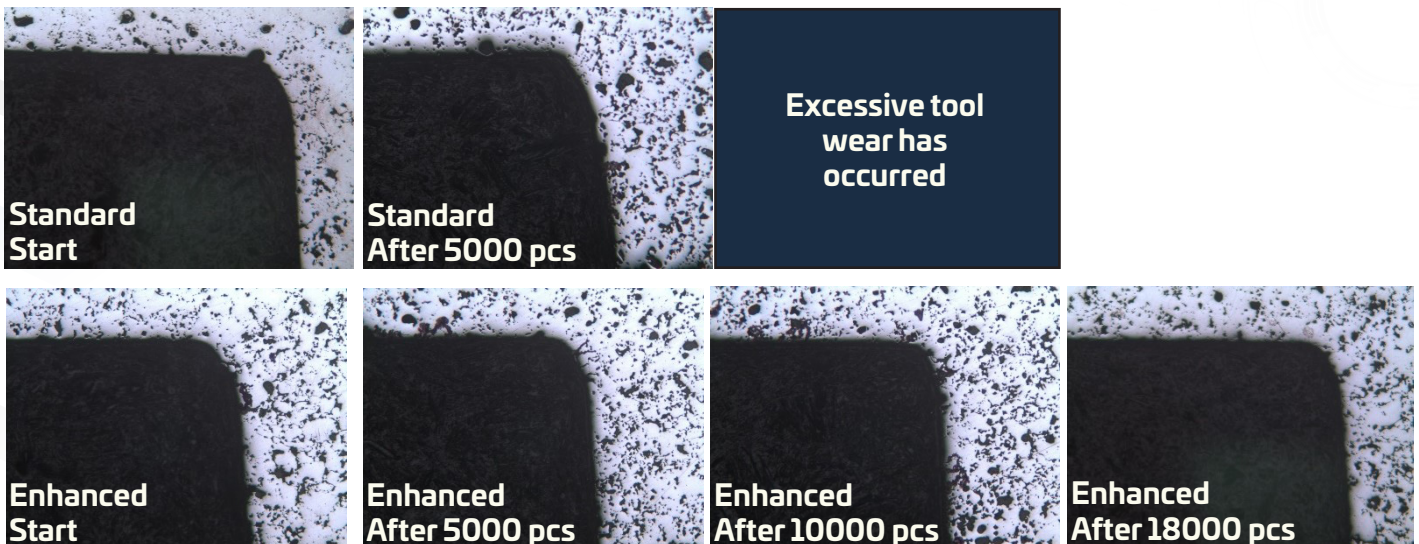
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# ENHANCED FERROPHOSPHORUS



Diagrams for case study showing wear over time on tooling for compacting clutch plates to a density of  $7.0 \text{ g/cm}^3$  with FY-4500 materials.



After just 5,000 pieces, wear on clutch plate tooling was worse than with enhanced ferrophosphorus after 18,000 pieces.

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