



## Hy-Pro LSD Series

Low Spark Discharge Filter Elements for power generation high speed bearing lubrication & EHC hydraulic applications

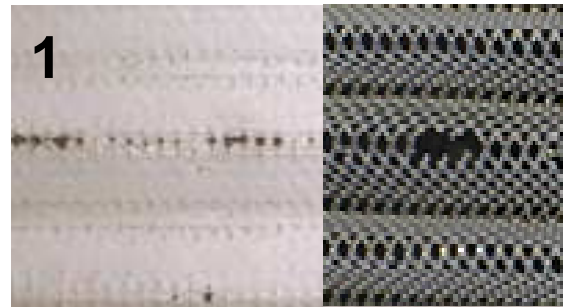
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Minimize turbine oil thermal degradation caused by filter element spark discharge.

### Spark Discharge and Fluid Electrification

High flow main lube and high pressure last chance filter elements from large frame gas turbines that have been afflicted by varnish have shown evidence of high voltage sparking events that result in fluid degradation possibly caused by high temperature spark discharge. Figure 1 shows filter media and support mesh from a lube filter element with spark discharge burn damage.

The main lube bearing filter elements can also contribute to increased varnish potential by fluid electrification. As fluid passes through the typical tortuous filter media fiber matrix both fluid velocity and turbulence increase resulting in thermal events as the fluid layers shear creating static accumulation on elements can lead to spark discharge from media to support tube. Group I base stock oils could conduct low levels of static charge out of the system to ground. The changes in resistivity with Group II base stocks mean that static charges stay in the system and can yield higher levels of static charge on filter elements.



### HY-PRO Low Spark Discharge Filter Elements

Hy-Pro has incorporated application specific filter media and element design modifications to reduce spark discharge and dissipate element static charges. Lower media flow density (reduced fluid velocity through media) and reduced friction conductive media minimize filter element spark discharge. Many factors contribute to varnish potential including:

- Increased oil stress from combined hydraulic & lube reservoir (GE F7).
- New oil formulations (Group I vs Group II base stock)
- Micro-Dieseling
- Increased output and flow rate yielding higher bearing temperatures.
- Auto-degradation



It is still unclear to what degree element spark discharge contributes to overall lube oil varnish problems, but any reduction in thermal sparking events and tribo-electric effect will have a positive impact on fluid condition.

