SINCE 1839 Schaeffer MANUFACTURING COMPANY

ISO 9001 CERTIFIED

TECHNICAL DATA

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#113 VARNICLEAN®

Description

VarniClean® is a specially formulated cleaner that is designed to remove varnish, sludge and contamination from hydraulic systems. VarniClean® when added to an in-service hydraulic fluid at 10% by volume (1gallon to 10 gallons of hydraulic fluid) will remove existing varnish and sludge from the hydraulic system. For lightly varnished systems, a lower concentration of VarniClean® can be used. For heavily varnished and contaminated systems, a higher concentration may be necessary to clean the system.

Application

VarniClean® can be used at concentrations up to 20% by volume in used petroleum and synthetic blend base hydraulic fluids. The exact concentration of VarniClean® to use is determined by the extent and the severity of the varnish and sludge accumulation present in the system, as well as the age and integrity of the system. Once VarniClean® is added directly to the existing fluid, the system can be operated for a period of up to 48 hours. Once the cleaning process is complete the system should be drained, flushed and recharged with one of Schaeffer Mfg's anti-wear hydraulic fluids that contain VarniShield™ to ensure protection against the further formation of varnish deposits. VarniClean should not be left in the system for continued operation beyond the cleaning process.

VarniClean® can also be used straight in a bath type application to clean spools and valves that have been previously removed from the system. Parts can be placed into the bath and allowed to soak for up to 48 hours to remove varnish and sludge deposits.

In addition to be used in hydraulic systems VarniClean® can also be used to clean the following systems of existing varnish and sludge:

- Turbine applications
- Paper Machine systems
- Quench baths
- Air compressor systems using petroleum base compressor fluids

Benefits

VarniClean® when used to remove varnish and sludge deposits will provide the following benefits:

- **Removes varnish buildup and sludge which decreases productivity**
- **Significantly reduces equipment downtime when compared to manual cleaning**
- **Cleans equipment while operating**
- **Helps eliminate valve sticking due to the presence of varnish improving production**
- **Helps reduce filter changes due to the presence of varnish**
- **Compatible with petroleum based lubricants**
- **Helps reduce health and safety concerns that may be present when using solvent based cleaners**
- **Increased productivity due to shortened cycling times**
- **Compatible with common seal materials**

Cleaning Procedure

A. Inspect system prior to cleaning in order to establish the extent to which varnish and/or sludge are present in the system, the degree to which they have compromised system integrity and the nature and frequency of system malfunctions related to sludge and varnish deposits
B. Make sure replacement filters are available prior to initiating the clean up procedure since any deposits will be loosened during cleaning, thereby increasing the possibility of filter blockage
C. If possible replace existing filters with new high soil capacity filters to maximize the efficiency of debris removal during cleaning
D. Remove a sufficient amount of the current fluid from the system to accommodate the recommended quantity of VarniClean®
E. Add the VarniClean® gradually to the system tank or reservoir near the inlet of the system pump(s) with the pump(s) running. Actuate and cycle valves as necessary to ensure that the VarniClean® is distributed throughout the entire system for the duration of the cleaning. Monitor system closely including pressure differentials across all filters to ensure adequate flow is maintained to all components throughout the cleaning process. For lightly varnished systems, a lower concentration of VarniClean® can be used, for heavily varnished systems a higher concentration may be used. **The concentration of VarniClean® should never exceed 20% by volume of the system capacity.**
F. Maximize flow rates when possible through the portions of the system where sludge and varnish are most prevalent
G. Establish flow or operate the system for the prescribed cleaning period with the VarniClean®. For heavily varnished systems, additional time may be required. The maximum cleaning time should not exceed 48 hours

H. Establish flow or operate the system for the prescribed cleaning period with the VarniClean®. For heavily varnished systems, additional time may be required. The maximum cleaning time should not exceed 48 hours.
I. After the prescribed cleaning time, drain the VarniClean® and oil mixture thoroughly including any dead zones. The use of a system flush and drain using new oil may be necessary when possible.
J. Properly dispose of the used fluids
K. Inspect the system for cleanliness
L. Introduce one of Schaeffer's hydraulic fluids that contains VarniShield™ into the system to keep the system clean and to protect against further varnish and sludge formation.

Typical Properties

Specific Gravity @ 60°F (15.6°C)	0.927
Viscosity, cSt @ 40°C, ASTM D-445	280
Viscosity, cSt @ 100°C, ASTM D-445	32
Flash Point °F/°C, PMCC ASTM D-92	187°/86°C
Pour Point °F/°C, ASTM D-97	-38°/-39°