



The Elco Corporation

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Elco 160

Ashless Antiwear Hydraulic Oil Additive

Features

Elco 160 is an ashless, multifunctional, universal additive for use in preparing premium hydraulic fluids and compressor lubes. When formulated in a suitable base stock, Elco 160 imparts these benefits:

- Elco 160 contains no zinc or other heavy metals
 - Biodegradable (OECD – 301F)
 - Extended oil life and pump durability
 - Antiwear and EP performance
 - Filterability and demulsibility
 - Excellent thermal and oxidation stability
 - Compatible in most Group I-IV base stocks, esters and vegetable oils
- Solubility testing is recommended

Application

Treated at 0.65% volume (0.75% weight) in suitable base stocks, Elco 160 will meet or exceed the requirements of:

- Cincinnati Machine P-68, P-69, P-70
- U.S. Steel 127, 136
- DIN 51524 Parts 1 and 2
- DIN 51506, VDL Performance also for lower grades

Characteristics

<u>Physical</u>	<u>Typical</u>
Flash Point	130°C min
Specific Gravity	1.00 (8.34 lb/gal)
Viscosity @ 40°C	70 cSt
<u>Chemical</u>	
Phosphorus	2.6% wt
Sulfur	10.2% wt

Recommended Blending, Handling and Storage Conditions

Elco 160 can be blended with mechanical or in-line blending equipment at temperatures not above 140°F (60°C) or below 60°F (16°C). The additive can be heated to 140°F (60°C) for unloading or transfer, but should not be stored for long periods at temperatures over 120°F (50°C).

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Performance Characteristics

	GROUP I	GROUP I	GROUP II
Base Stock	0.75	0.75	0.75
Elco 160, wt%	46	68	46
ISO Grade			

<u>Bench Test</u>	<u>Method</u>			
Copper Corrosion	D 130	1b	1b	1b
Steel Corrosion	D 665 A, B	Pass	Pass	Pass
Demulsibility	D 1401	40-40-0 (20)	40-40-0 (25)	40-40-0 (15)
Foam	D 892			
Sequence I		0/0	0/0	0/0
Sequence II		0/0	0/0	0/0
Sequence III		0/0	0/0	20/0
Thermal Stability	D 2070			
Appearance of Copper Rod		4	4	6
Appearance of Steel Rod		2	2	2
Sludge, mg/100 mL		17.5	14.8	2.8
Hydrolytic Stability	D 2619			
Copper wt Loss, mg/cm ²		0.014	0.021	0.034
TAN, Water Layer		3.8	3.1	3.7
Filtration	Denison			
Time to Filter Dry, sec		218	228	165
Time to Filter, 2% Water, sec		354	290	244
FZG, Damaging Stage	D 5182	11	11	
Filtration	AFNOR			
Dry, FI		1.09	1.11	1.08
Wet, FI		1.59	1.21	1.28
Wear, Four Ball, Scar, mm	D 4172			
Conditions - 40 kg, 1800 rpm, 130°F, 1 hr		0.41	0.41	0.40
Oxidation, hr	D 943	2500	2450	7600
Oxidation, 1000 hr	D 4310			
Cu, mg		7.1	32.1	10.7
Fe, mg		<1	<1	<1
Total Sludge, mg		47.2	75.4	24.6
EP, Four Ball	D 2783			
LWI		31.79	31.75	33.95
Weld Load, kg		126	126	126
Vane Pump	D 2882			
Vane and Ring wt Loss, mg		7.2	----	----

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Performance Characteristics – Compressor Lubes DIN 51506

Base Stock	GROUP I	GROUP II	GROUP III (VHVI)	PAO 8
Elco 160, wt%	0.75	0.75	0.75	0.75
ISO Grade	46	46	46	

<u>Bench Test</u>	<u>Method</u>				
Conradson Carbon Residue, % (max 3)	DIN 51352 pt 2** VDL ISO 6617 pt 2		1.7	→	→
Oxidation Stability	IP 280				
Total Sludge, %			0.02	→	→
Volatile Acidity, mg/g			0.05	→	→
Soluble Acidity, mg/g			0.26	→	→
Total Oxidation Product, %			0.12	→	→
Corrosion-Oxidation Stability Increase in Neutralization Number, mg KOH/g	FTM 791C.5308.7		2.1	→	→
RBOT Oxidation (minutes)	ASTM D 2272	243	352	402	325
TOST (hours)	ASTM D 943	2500- 5000+ depending on base oil			
Copper Corrosion	ASTM D 130	1b	1b	1b	1b
Steel Corrosion	ASTM D 665 A&B	Pass	Pass	Pass	Pass

** Highest requirement in terms of temperature with iron oxide catalyst is VDL. VC/VCL and VB/VBL are for lower temperatures.

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