



Causes of Concern

Trend Analysis

Because of differences in oils, equipment types, manufacturers, location, and operations, no simple, universal guideline can be established for deciding the limits for metals in most oils.

Once some historical data is collected on a particular piece of equipment, however, some "rules of thumb" can be established as to when there is cause to be concerned. If data is available on the "new oil", a solid judgement can be made as to the condition of the used oil.

In most cases, trending particular data is more important than absolute numbers. Typical significant month to month results changes are as follows:

Wear Metals	An increase of 5 - 10 ppm, or 100% increase, whichever is larger
Contaminant Metals	An increase of 10 - 20 ppm, or 100% increase, whichever is larger
Water	Any increase that puts water above 100 ppm for pumps and compressors, 1000 ppm for engines, and 300 ppm for gear boxes
TAN	An increase of 0.3 for most equipment, 1.0 for engines
TBN	A decrease of 50% from new oil
Viscosity	A 10% change
Direct Read Ferro	A 50% increase of DRL when above 20.0
Particle Count	An increase of one or two classes or ranges

Upper Limits

While upper limits for any piece of equipment should be established after enough historical data is collected, the following are some rules of thumb.

	PUMPS	COMPS	GEARBOXES	ENGINES
Iron	15	10	25-50	50
Lead	10	5	5	15
Copper	15	15	15	15
Chromium	-	5	-	10
Aluminum	10	5	15	20
Nickel	5	5	5	5
Tin	10	5	10	10
Silicon	20	15	25	25
Water	100	100	500	1000
Viscosity	10%	10%	10%	10%
DRL	15	10	50	50
TAN	+0.3	+0.3	+0.5	+1.0
TBN	--	--	--	-50%
Oxidation	--	--	+1	+3
% Insolubles	0.05	0.05	0.5	1.0