

THE FOLLOWING INFORMATION HAS BEEN PROVIDED TO ASSIST IN THE INTERPRETATION OF YOUR OIL ANALYSIS.

WEAR METALS

These metals indicate wear on particular components of an individual unit. The particles of these metals will indicate a wear problem on the microscopic level before the problem can be detected by conventional means, but more importantly a relative increase or trend in one or more of these metals.

WEAR METAL SOURCES

- Iron.....Cylinders, Gears, Rings, Crankshafts, Liners, Bearings, Rust
- ChromiumRings, Roller/Taper Bearings, Rods, Platings
- Lead.....Bearing Overlays, additive in gear oil and gasoline
- CopperBushings, Bearings, Thrust-Washers, Friction Plates, Oil Cooler, additive in oil
- Tin.....Bearings, Bushings, Pistons Platings
- Aluminum.....Pistons, Bearings, Pumps, Blowers, Rotors, Thrust-Washers
- NickelValves
- SilverBearings, Bushings, Platings
- ManganeseTrace elements in liners and rings, additive in gasoline
- TitaniumTrace element
- Vanadium.....Trace element

CONTAMINANTS

These elements can be an indicator of both internal and external contamination. The source and amount of contamination can be determined by comparison to a previously normal sampling or to a new oil reference. Specific tests for some contaminants can supplement the analysis.

CONTAMINANT SOURCES

- SiliconElement used to determine the level of airborne dirt and abrasives in the oil (sometimes used as an anti-foam agent)
- BoronPresent in most permanent anti-freeze systems and cooling system inhibitors (sometimes used as an additive)
- SodiumPresent in most permanent anti-freeze systems and cooling system inhibitors (sometimes used as an additive)
- Potassium.....Present in most permanent anti-freeze systems and cooling system inhibitors (sometimes used as an additive)

WATER AND SEDIMENT

Reports percent water and percent insolubles (ASTM D-91)

GLYCOL

A specific test for the presence of Glycol (Anti-Freeze) in the oil (ASTM D-2982)

ADDITIVES

These elements are blended into the oil in different forms and quantities by the manufacturer. The additive package in an oil will vary depending on the type of oil.

ADDITIVE FUNCTIONS

- Magnesium.....Dispersent/Detergent additive
- CalciumDispersent/Detergent additive
- BariumDispersent/Detergent additive
- PhosphorusAnti-Wear additive
- Zinc.....Anti-Wear additive
- Molybdenum.....Anti-Wear additive

FUEL DILUTION

Unburned fuel in the oil may signal fuel system leaks or incomplete combustion

FUEL SOOT

A result of incomplete combustion, blow-by. High levels may indicate combustion problems or overextended drain intervals...

VISCOSITY

The kinematic viscosity (ASTM D-445) determined at 40° C and/or 100° C is a measure of the flow rate of an oil in relation to time. This data is used to assign an SAE grade to an oil.

ENGINE OIL VISCOSITY CLASSIFICATION CHART

SAE GRADE	MIN-cSt-100°	C-MAX-cSt
10W	4.10	
20	5.60	9.29
30	9.30	12.49
40	12.50	16.29
50	16.30	21.89

Customer Unit Information

This section of the report lists the identification of the unit sampled, equipment manufacturer, model, oil brand and oil type. This information is supplied by the customer

NAPA
Filters
Oil Analysis Report

CUSTOMER NO.:
UNIT NO.: TACOMA
DESCRIPTION: GASOLINE ENGINE
END USER:
END USER LOCATION: FAIRHOPE, AL

MAKE: TOYOTA
MODEL: TACOMA
OIL BRAND: CASTROL
OIL TYPE: 5W30
SERIAL NO.:
FUEL TYPE: GASOLINE

Spectrochemical Analysis

Determines component wear, airborne dirt, cooling system contamination, and oil additive concentrations. Information is reported in parts per million (PPM)

Sample Data

Indicates data sample was taken/tested, oil and unit hours/miles. Laboratory identification number to track sample history. In addition, the unit condition of each sample is listed.

SAMPLE DATA			SPECTROCHEMICAL ANALYSIS (ppm)																	PHYSICAL PROPERTIES									
LAB#	SAMPLE DATE	TIME ON OIL	IRON	CHROMIUM	LEAD	COPPER	TIN	ALUMINIUM	NICKEL	SILVER	SILICON	BORON	SODIUM	MAGNESIUM	CALCIUM	BARIUM	PHOSPHORUS	ZINC	MOLYBDENUM	TITANIUM	VANADIUM	POTASSIUM	FUEL (ppm/0.1)	VIS @ 40 C-cSt	VIS @ 100 C-cSt	WATER (ppm/0.1)	SOOT/SOLIDS (ppm/0.1)	COOLANT	
16707	02/02/2005	11200	6	0	4	11	0	2	0	20	20	1	8	10	1928	0	712	983	2	0	0	0	0	<1	N/A	10.4	0.1	0.1	NEG
150976	12/05/2005	12350	9	0	5	5	0	3	0	25	25	68	11	58	2050	0	663	892	34	0	0	0	0	<1	N/A	9.28	0	N/A	NEG
134870	12/06/2006	11200	7	0	6	5	0	4	0	15	15	7	4	45	1797	0	664	845	59	0	0	0	0	<1	N/A	10.3	0	N/A	NO

Physical Properties

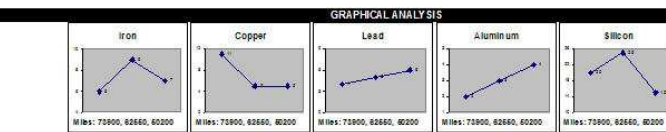
Changes in the physical qualities of the lubricant are determined and evaluated. These changes and the presence of contaminants affecting the properties of lubricants have a direct bearing on its serviceability.

LAB#	TAN
16707	2.8
150976	2.0
134870	2.2

Additional Test Results

Reporting of additional test results (e.g. TAN, TBN, oxidation and nitration) not part of spectrochemical tests reported in these sections.

Key
A: Abnormal C: Critical



Graphical Analysis

This key section gives the customer an "at a look" glance at their unit's wear trend for the last six sample histories. For industrial applications, this section will contain detailed particle count data.

LAB#	ANALYSIS RECOMMENDATIONS	ANALYST
16707	TRACE LEVEL OF WATER DETECTED. NOTE: TEST RESULTS INDICATE THIS OIL IS IN THE SAE 30 RANGE. NO FUEL DILUTION DETECTED THIS SAMPLE. EXCESSIVE WEAR IS NOT INDICATED. NO RECOMMENDED ACTION AT THIS TIME RESAMPLE AT NORMAL INTERVALS	ANALYST-MHC
150976	RESULTS OF TEST PERFORMED INDICATE NO CORRECTIVE ACTION REQUIRED	ANALYST-GGD
134870	RESULTS OF TEST PERFORMED INDICATE NO CORRECTIVE ACTION REQUIRED	ANALYST-A.A.

Analysis Recommendations

Our data provides specific information about your equipment. In case of imminent danger to a piece of equipment, the customer is alerted to the emergency by phone or fax.