



# INDUSTRIAL REPORT

LAB NUMBER: D95618  
REPORT DATE: 7/25/2015  
CODE: 22/16

UNIT ID: 342  
CLIENT ID: 28754  
PAYMENT: PO: 07-212

You'll need your client ID if you want to log on to [www.blackstone-labs.net](http://www.blackstone-labs.net) and view your reports.

This is a good place to identify anything special about the equipment or anything that will help you identify this unit.

UNIT	EQUIP. MAKE/MODEL:	Makino A66	OIL TYPE & GRADE:	Makino spindle oil
	FUEL TYPE:	N/A	OIL USE INTERVAL:	Hours
	ADDITIONAL INFO:	Serial number 23456. RO 6754632.		

CLIENT	OSCAR HUFF	PHONE:	(828) 123-5897
	WHITLEY COUNTY	FAX:	(828) 123-1547
	132 PERIWINKLE RD	ALT PHONE:	(828) 123-1564
	STE. 102	EMAIL:	oscar@whitley.co.us.com
	SWANNANOVA, NC 18752		

**COMMENTS**

OSCAR: Note iron and copper both of which are reading higher than they were and higher than universal averages. Silicon is also above average. We suggest removing this hydraulic system with an abrasion problem. We suggest removing this oil from service and resampling in 50 hours to monitor.

**Sample report**

The amount of oil added between oil changes.

ELEMENTS IN PARTS PER MILLION	MI/HR on Oil	100	UNIT / LOCATION AVERAGES	100	50	50	75	UNIVERSAL AVERAGES
	MI/HR on Unit	556		456	356	306	256	
	Sample Date	12/02/15		10/08/15	07/12/15	05/21/15	04/16/15	
	Make Up Oil	0 qts		0 qts	0 qts	2 qts	5 qts	
ALUMINUM	2	2	2	2	2	2	6	2
CHROMIUM	4	3	2	1	1	1	2	1
IRON	89	38	44	24	9	7	23	23
COPPER	81	40	33	1	1	1	3	3
LEAD	2	3	3	1	1	1	3	3
TIN	0	1	0	1	0	0	1	1
MOLYBDENUM	0	0	0	0	0	0	0	0
NICKEL	1	1	1	1	0	1	0	0
MANGANESE	0	0	0	0	0	0	1	0
SILVER	0	0	0	0	0	0	0	0
TITANIUM	0	0	0	0	0	0	0	0
POTASSIUM	0	0	0	0	0	0	0	0
BORON	0	2	2	2	0	1	4	4
SILICON	34	14	2	8	9	5	4	4
SODIUM	1	0	0	0	1	1	3	3
CALCIUM	185	175	211	130	154	209	165	165
MAGNESIUM	1	1	1	1	1	1	18	18
PHOSPHORUS	319	325	333	324	245	379	338	338
ZINC	427	417	432	408	312	449	587	587
BARIUM	0	0	0	0	0	1	0	0

This is the average wear for this particular type of equipment for you or your business.

This column shows averages wear for all the samples we've seen from this type machine.

The additives in this column are a mix of all different types of oil, so you can't compare them to your sample.

Values Should Be\*

From left to right, these are your past samples.

The tests in the Properties box look at the physical condition of the oil.

PROPERTIES	SUS Viscosity @ 210°F	29.5	28-33	30.2	29.5	28.1	31.3
	cSt Viscosity @ 100°C	1.04	0.6-2.3	0.8	0.6	1.01	1.09
	Flashpoint in °F	205	>195	200	205	210	215
	Fuel %	-	-	-	-	-	-
	Antifreeze %	-	-	-	-	-	-
	Water %	0.0	0.0	0.0	0.0	0.0	0.0
	Insolubles %	0.0	<0.1	0.1	0.0	0.1	TR
	TBN						
	TAN	0.5		0.4	0.6	0.3	2.0
	ISO Code	16/12		19/14	14/11	21/18	18/12

\* THIS COLUMN APPLIES ONLY TO THE CURRENT SAMPLE

416 E. PETTIT AVE. FORT WAYNE, IN 46806 (260) 744-2380 [www.blackstone-labs.com](http://www.blackstone-labs.com)



## Industrial Report Explanation

**Averages:** Both the universal and unit averages are running averages and change with the number of samples analyzed.

**Elements:** Elements are quantified in the oil at part per million levels (ppm). This list shows the most common sources of the elements in an industrial oil sample. The elements are grouped by category.

### Wear Metals

**Aluminum:** Pump vanes, pistons, valves

**Chromium:** Ball and roller bearings, hydraulic rams, trace element in steel

**Iron:** Any steel parts including rotating shafts and valves

**Copper:** Brass parts (with zinc), bronze parts, bushings, valves, oil cooler

**Lead:** Friction bearings, solder, component in bronze wear (with copper)

**Tin:** Bearings, bronze component, anti-wear coatings

### Trace Elements

**Nickel:** Trace element in steel alloy

**Silver:** Trace element, rarely found

**Titanium:** Trace element, rarely found

### Contaminants

**Boron:** May show coolant contamination

**Silicon:** Abrasive dirt, sealers, gaskets, anti-foam additive

**Sodium:** Contamination from coolant and other sources

### Oil Additives

**Molybdenum:** Oil additive, grease additive

**Manganese:** Grease additive

**Potassium:** Common oil additive, also shows coolant contamination

**Boron:** Occasionally used as an additive

**Calcium, Magnesium:** Oil additives

**Phosphorus, Zinc:** Oil additives

**Barium:** Additive common to synthetic oils

### Physical Properties

**Viscosity/Flashpoint:** If the oil is contaminated with solvent or another contaminant, the viscosity and flashpoint will often be lower than the range in the "Values Should Be" line. A high viscosity may show oil stress or contamination.

**Water %:** Indicates the amount of moisture found in the oil.

**Insolubles %:** Solid materials present in the oil. They are typically free carbon from the oxidation of the oil itself, or they may be present from dirt or manufacturing contamination.