TRIBOLOGIK CORPORATION
ISO 17025:2005

EXPERT LUBRICANT ANALYSIS TO MONITOR EQUIPMENT HEALTH

CUSTOMER:	**DANIEL**
PLANT:	**DANIEL TEST**
MACHINE NAME:	**NISSAN GT-R**
LOCATION	**BOSTON, MA**
MACHINE TYPE:	**Gasoline Engine**
LUBE TYPE:	**Motul Custom Blend**
MACH MFGR:	**Nissan**
MACH MOD:	**2017 R-35 Alpha 16**
RECEIVED:	**14-APR-17**
CONTACT 1:	**DANIEL**
REPORT:	**18-APR-17 12:28:13**
SAMPLE NO:	**5-175-10-1**
PO NUMBER:	**123892**

MISCELLANEOUS

Comments deleted to protect IP.

ANALITICAL FERROGRAPHY

- Moderate amount of normal rubbing wear particles less than 15 microns
- Medium alloy steel alloy, gold colour after heating
- Minor amount of abrasive (silica/dirt and environmental contaminant)
- Longue curved strips of metal
- Very fine wire-like particles generated with thickness as low as 0.2 microns
- Minor small spheres particles less than 10 microns in diameter
- Particles aligned along the magnetic field
- Bright white colour before heating
- Low steel alloy, blue colour after heat treatment
- Medium alloy steel alloy, gold colour after heating
- Non affected by heat treatment
- Red orange particles are red oxides and black particles are black oxide
- Heavy concentrated fine particles at the exit ferogram

SAMPLING HISTORY					
LabNo	SAMPLE DATE MM-DD-YYYY	TIME ON OIL / TSN	TIME SINCE OVER-HAUL / TSO	OIL CHANGED (Y/N)	PREVIOUS CONDI-TION MACH/OIL
2263951	04-14-2017	999	999	N	(n/a)

(SP) SPECTROSCOPIC ANALYSIS [ASTM D5185] (elements seen in ppm)									
TESTED ELEMENTS ARE:Fe, Cu, Pb, Sn, Cr, Al, Ni, Ti, Ag, V, Mg, Si, B, Na, Ba, Ca, P, Mn, Zn, Mo, Cd, K.									
Date(MM/DD/YY)	04-14-17	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	REF
Labno	2263951								
Fe-IRON	43								-
Cu-COPPER	18								-
Pb-LEAD	3.0								-
Al-ALUMINUM	132								-
Cr-CHROMIUM	2.0								-
Ni-NICKEL	1.0								-
Mo-MOLYBDENUM	464								-
Ag-SILVER	2.0								-
Si-SILICON	28								-
Mg-MAGNESIUM	70								-
B-BORON	23								-
Na-SODIUM	3.0								-
Ca-CALCIUM	1882								-
P-PHOSPHORUS	885								-
Mn-MANGANESE	1.0								-
Zn-ZINC	996								-

(FTIR) FOURIER TRANSFORM INFRARED ANALYSIS (Absorbance)									
Date(MM/DD/YY)	04-14-17	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	REF
Labno	2263951								
AW/EP	23								-
OXIDATION	52								-
SULFATE	44								-
NITRATION	7								-
GLYCOL	0								-
WATER	17								-

VISCOSITY/40 [ASTM D445]									
Date(MM/DD/YY)	04-14-17	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	REF
Labno	2263951								
in cSt 40°C	82.64								-

VISCOSITY/100 [ASTM D445]									
Date(MM/DD/YY)	04-14-17	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	REF
Labno	2263951								
in cSt 100°C	13.05								-

TBN [ASTM D4739] (mg KOH/g)									
Date(MM/DD/YY)	04-14-17	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	REF
Labno	2263951								
TOTAL BASE NO	6.38								-

TAN [ASTM D974 OR D664] (mg KOH/g)									
Date(MM/DD/YY)	04-14-17	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	REF
Labno	2263951								
TOTAL ACID NO	0.33								-

KARL FISHER (%)									
Date(MM/DD/YY)	04-14-17	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	REF
Labno	2263951								
WATER KF	0.153								-

VISCOSITY INDEX [ASTM D2270]									
Date(MM/DD/YY)	04-14-17	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	REF
Labno	2263951								
VISCOSITY INDEX	159.00								-

FUEL(%)									
Date(MM/DD/YY)	04-14-17	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	(n/a)	REF
Labno	2263951								
FUEL	1.89								-

ANALITICAL FERROGRAPHY			
PARTICLES	FEW	MODERATE	HEAVY
RUBBING WEAR		X	
ABRASIVE WEAR		X	
SPHERES	X		
LOW & MEDIUM ALLOY STEEL PARTICLES	X		
NON FERROUS		X	
RED & METALLO OXIDE	X		
CORROSIVE WEAR	X		

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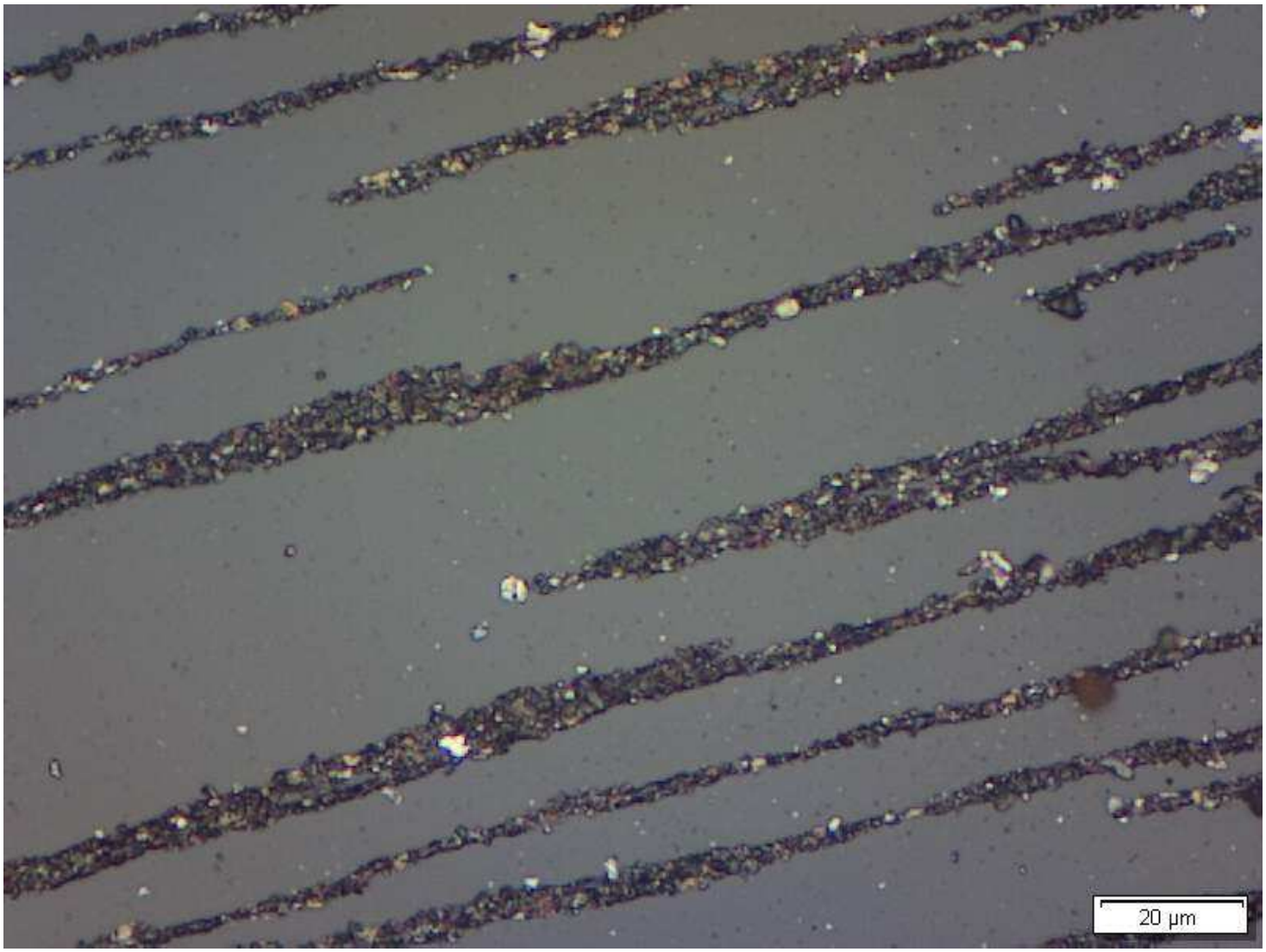
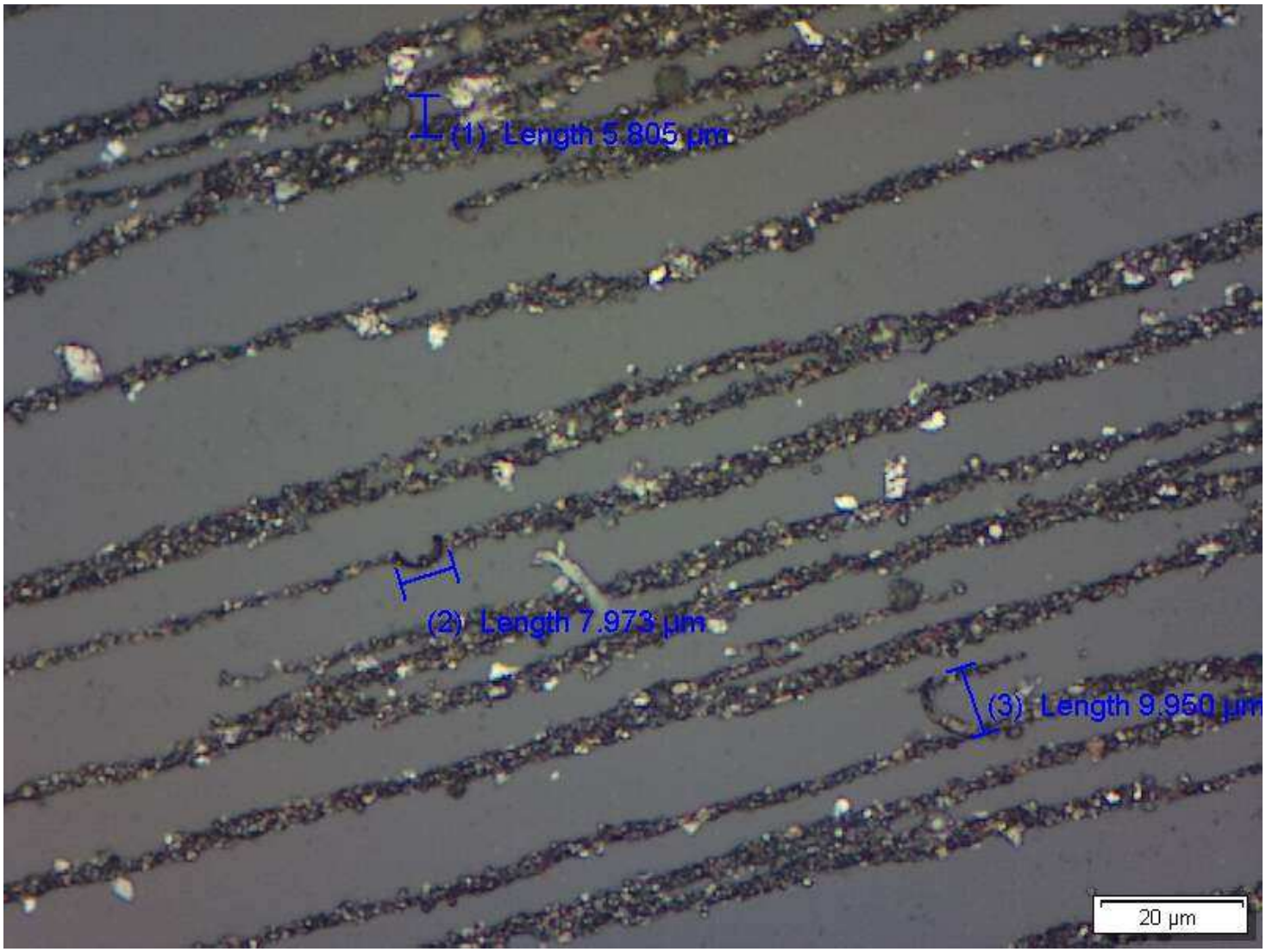
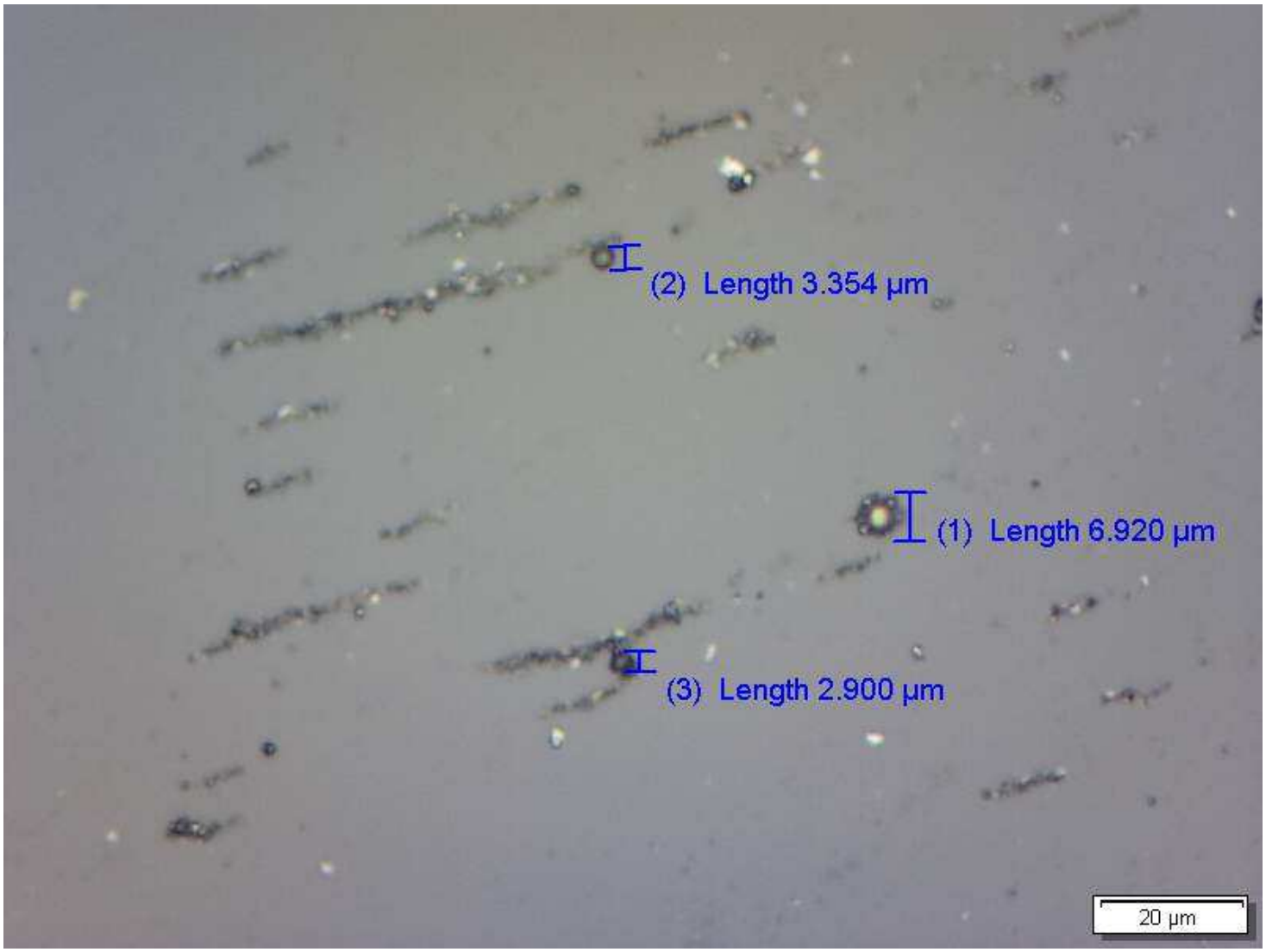


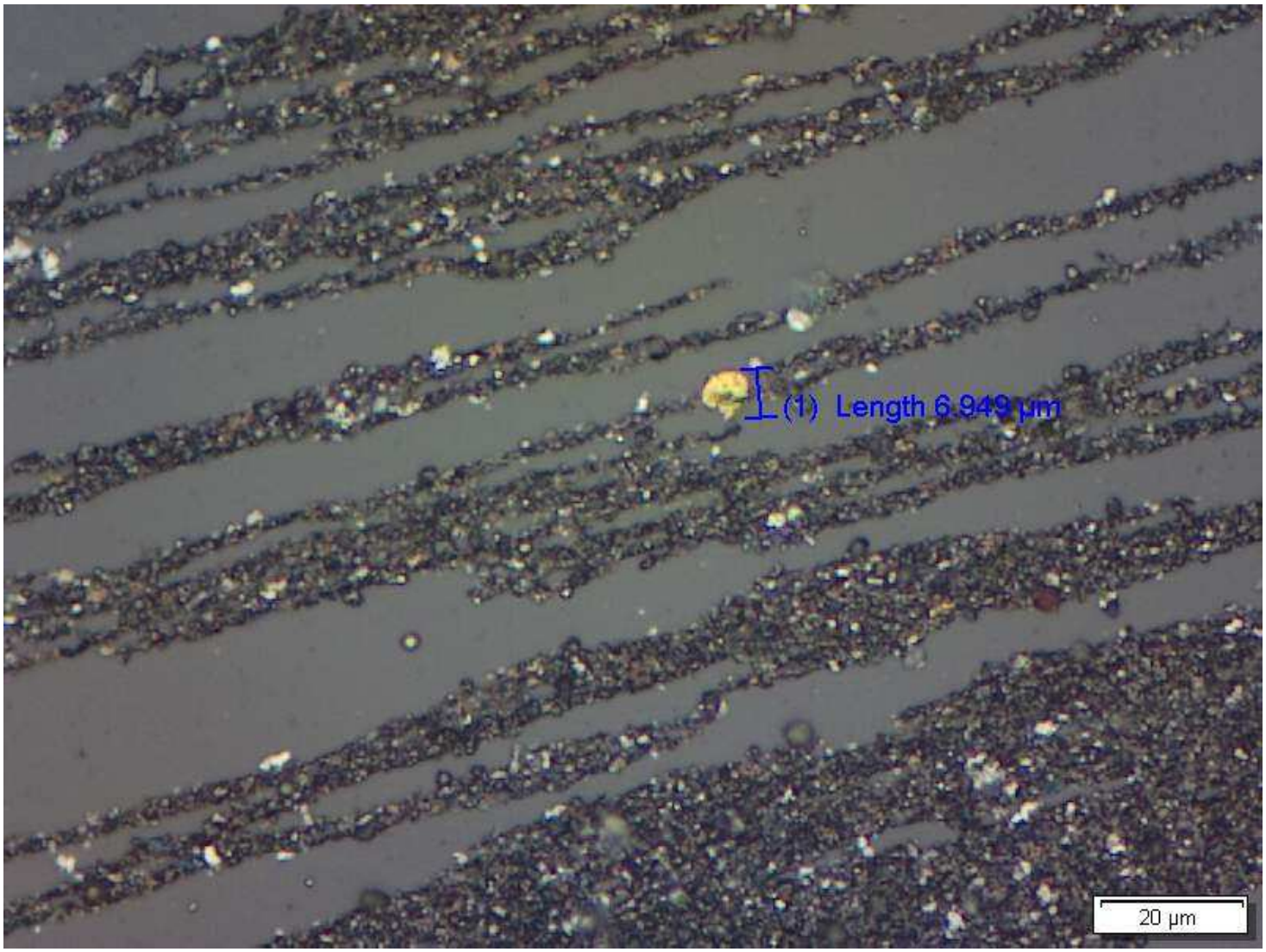
RUBBING WEAR
500X



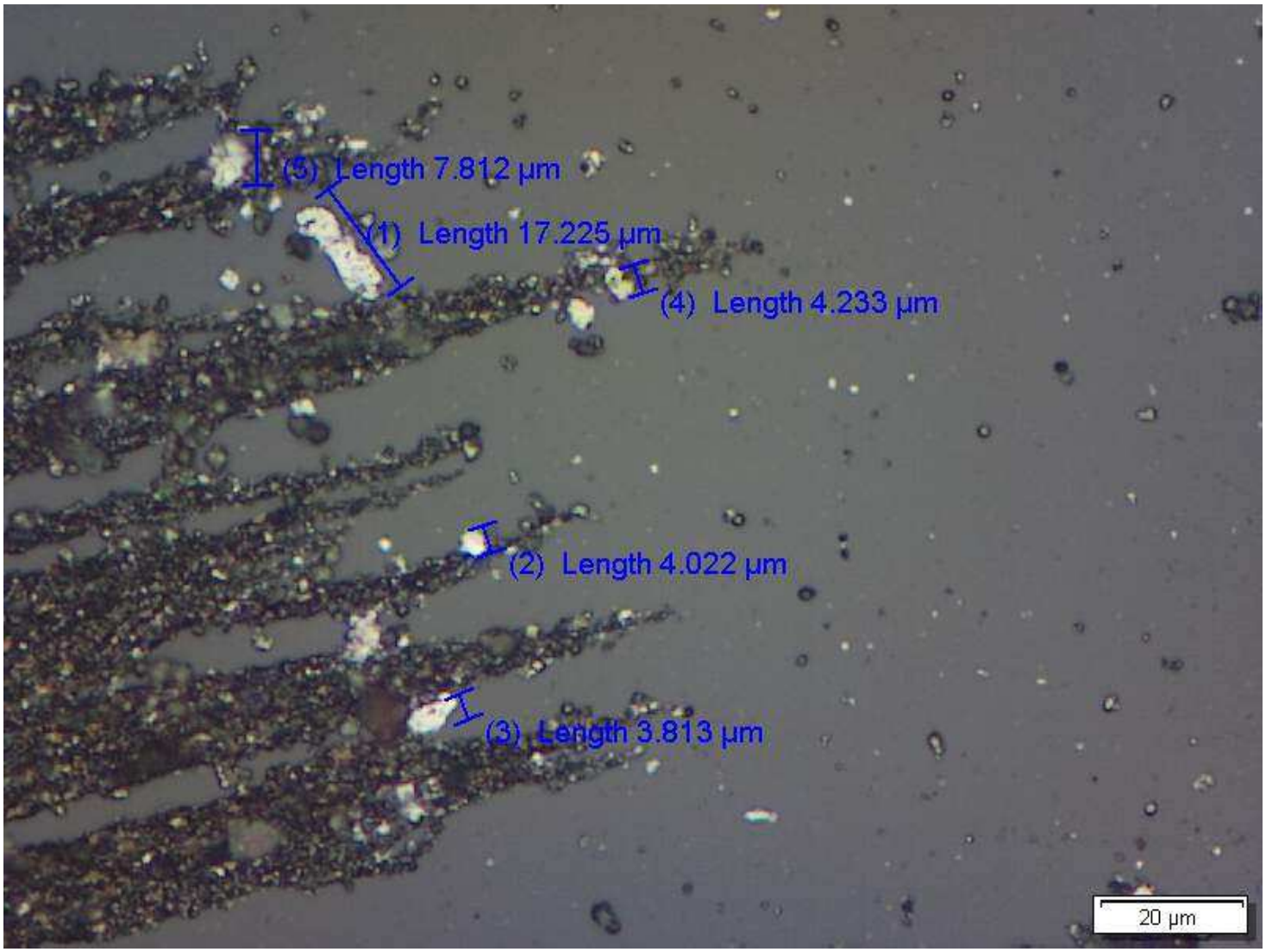
ABRASIVE WEAR
500X



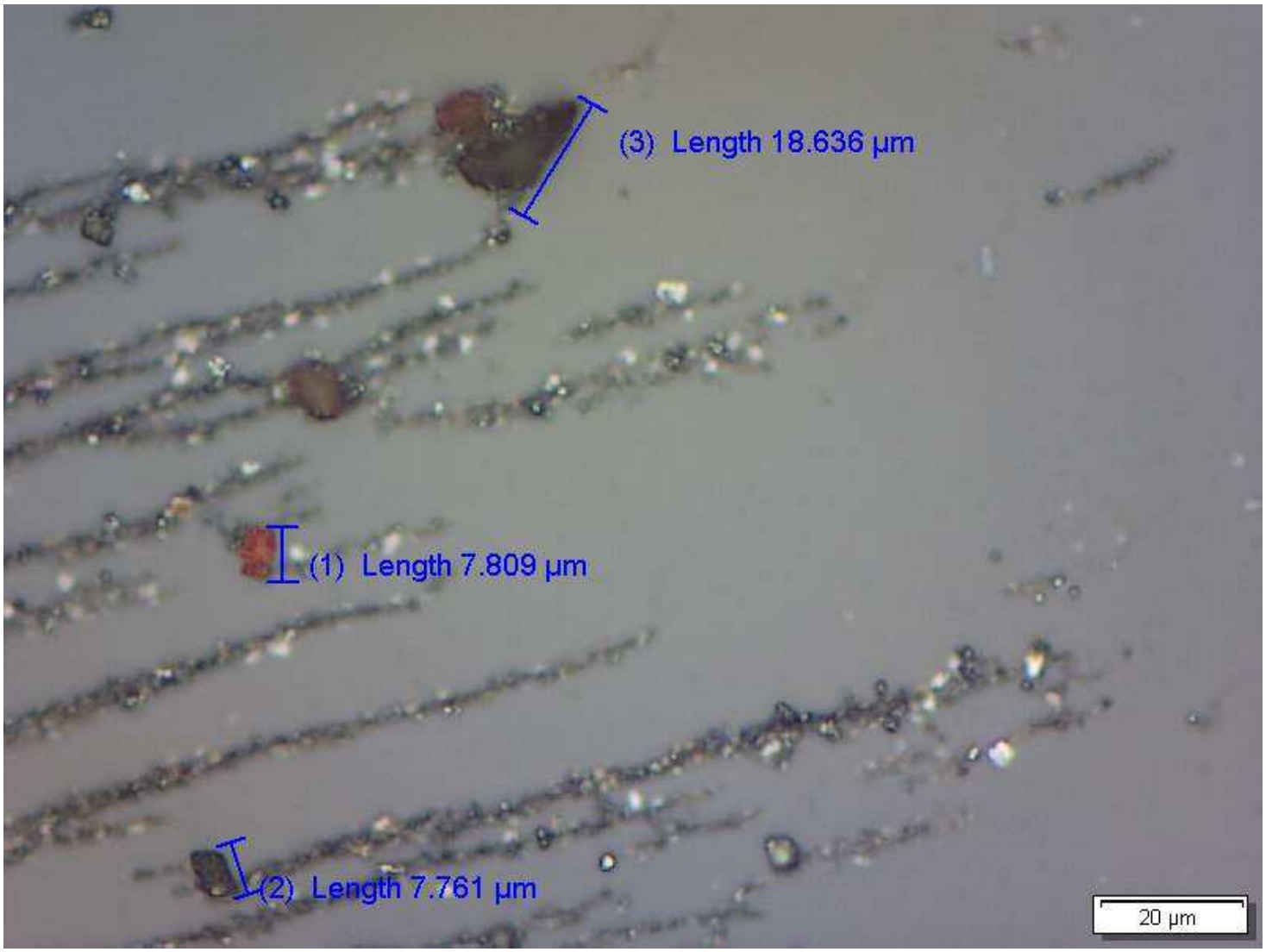
SPHERES
500X



LOW & MEDIUM ALLOY STELL PARTICLES
500X



NON FERROUS
500X



RED & METALLO OXIDE
500X

CORROSIVE WEAR
500X

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