

Common Sources of Wear Metals

Wear metals can originate from multiple sources, and it generally differs depending on the application. The following list provides typical sources for different wear metals based on application. For example, the main bearings in an engine are typically comprised of several layers of lead, tin and copper. When these wear levels are elevated and found together on an analysis report, it usually indicates bearing wear. These softer layers of the bearing cushion the outer shell from the harder rotating shaft. Without that cushion, catastrophic damage can occur.

Metal	Engines	Transmissions	Gear Systems	Hydraulics	Compressors
Iron	Cylinder liners, crankshaft, timing gears, camshaft, valves, oil pump	Gears, shafts, housing, discs, bands	Gears, bearings, housing	Pistons and rods, cylinders, valves	Gears, shafts, cylinders and liners, valves, bearings
Chromium	Piston rings, liners, shaft plating	Bearings, shafts	Bearings, shafts	Rods, valves, shafts	Rings, shaft plating, bearings
Aluminum	Pistons, turbo bearings, block material,	Pumps, casting, thrust washer, oxides from dirt contamination	Pumps, casting, thrust washer, oxides from dirt contamination	Bearings, piston, housings	Pistons, cases, impellers, oxides from dirt contamination
Nickel	Valvetrain, crankshaft, camshaft	Bearings, shafts	Bearings, shafts	Valves, shafts	Valves, shafts,
Copper	Main and rod bearings, wrist pin and valvetrain bushings, oil cooler tubing	Bearings, brass or bronze bushings, clutch plates, oil cooler tubing	Brass or Bronze bushings, oil cooler tubing	Bearings, bushings, oil cooler tubing	Bearings, bushings, oil cooler tubing
Lead	Metal used in main and rod bearings	Clutch plates, bushings	Bearings, bushings	Bearings, bushings	Bearings, bushings
Tin	Metal used in main and rod bearings, solder	Bushings	Bearings, bushings, solder	Bearings, bushings, solder	Bushings, bearings, solder
Cadmium	Typically not found in these applications. Trace element, alloy metal.				
Titanium					
Vanadium					