



CONTAMINATION CONTROL

The Importance of ISO Cleanliness Codes

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(Contd. from May '06 Issue)

Cases from the Field

There are many cases where compliance with a higher standard of cleanliness has significantly improved operations at industrial facilities. For instance, the authors assisted a leading national independent petroleum refiner to institute all-inclusive contamination control programs. The petroleum refiner has significantly reduced lubricant spending along with upgrading its products to Group II and synthetics. They have experienced fewer maintenance failures over the last three years, along with significantly reducing lubricant purchases.

A major Midwest power plant realized a lubricants cost savings of 53 percent over a five-year period through better housekeeping measures and improved filtration, which included the use of desiccant breathers. After several months of practicing these improved processes, oil analysis reports showed a substantial decrease in silicon levels. The ISO level set for new oil supplied was 18/17/14. When the first in-service sample was taken, readings were 15/14/12, indicating that the oil was cleaner than when it came in the door. By consistently maintaining levels below code, the plant has achieved a four-fold extension of lubricant life. The same oil has been in service since October 2002 and based on sampling trends and sustainable cleanliness codes, plant technicians are expecting to extend its life to as much as five to seven years.

Several years ago, Petrolink worked with a major wheel hub manufacturing facility in the Midwest who was experiencing large numbers of pump, valve and cylinder failures. The contamination levels in most of the systems were significantly higher than established targets and the

		New Cleanliness Level (ISO Code)																							
		20/17	19/16	18/15	17/14	16/13	15/12	14/11	13/10	12/9	11/8	10/7													
Current Machine Cleanliness (ISO Code)	25/23	5	3	7	3.5	9	4	>10	5	>10	8	>10	7.5	>10	9	>10	>10	>10	>10	>10	>10	>10	>10	>10	>10
		4	2.5	4.5	3	6	3.5	5.5	4	7.5	5	8.5	6.5	10	7	>10	9	>10	10	>10	>10	>10	>10	>10	>10
		3	2	3.5	2.5	4.5	3	5	3.5	6.5	4	8	5	9	6	10	7.5	>10	9	>10	>10	>10	>10	>10	>10
		2	1.5	3	2	4	2.5	6	3	7	4	9	5	>10	6	>10	7	>10	8	>10	10	>10	>10	>10	>10
		2.5	1.5	3	2	4	2.5	5	3	6.5	4	7.5	5	8.5	6	9.5	7	>10	8	>10	9	>10	>10	>10	>10
		2	1.5	3	2	4	2.5	5	3	7	3.5	9	4	>10	5	>10	6	>10	8	>10	9	>10	>10	>10	>10
		1.7	1.3	2.3	1.5	3	2	3.7	2.5	5	3	6	3.5	7	4	8	5	10	6.5	>10	8.5	>10	10	>10	>10
		1.8	1.3	2	1.8	3	2	4	2.5	5	3	7	3.5	8	4	>10	5	>10	6	>10	7	>10	>10	>10	>10
		1.4	1.1	1.8	1.3	2.3	1.7	3	2	3.5	2.8	4.5	3	5.5	3.5	7	4	8	5	10	6.5	>10	8.5	>10	8.5
		1.3	1.2	1.5	1.5	2	1.7	3	2	4	2.5	5	3	7	3.5	9	4	>10	5	>10	7	>10	>10	>10	10
		1.2	1.1	1.5	1.3	1.8	1.4	2.2	1.6	3	2	3.5	2.8	4.5	3	5	3.5	7	4	8	5.5	>10	8.5	>10	8
		1.3	1.2	1.8	1.5	2	1.7	3	2	4	2.5	5	3	7	4	9	5	>10	7	>10	9	>10	>10	>10	9
		1.2	1.05	1.5	1.3	1.8	1.4	2.3	1.7	3	2	3.5	2.8	4.5	3	5	3.5	7	4	8	5.5	10	>10	>10	7
						1.3	1.2	1.6	1.5	2	1.7	3	2	4	2.5	5	3	7	4	9	5	>10	7	>10	8
						1.2	1.1	1.5	1.3	1.8	1.5	2.2	1.7	3	2	3.5	2.8	4.5	3	5.5	7	4.5	9	>10	6
								1.3	1.2	1.6	1.5	2	1.7	3	2	4	2.5	5	3	7	4	9	5	>10	6
							1.2	1.1	1.5	1.3	1.8	1.5	2.2	1.7	3	2	3.5	2.8	4.5	3	5.5	7	4.5	9	
									1.3	1.2	1.6	1.5	2	1.7	3	2	4	2.5	5	3	7	4.5	>10	6	
									1.2	1.1	1.5	1.3	1.8	1.5	2.2	1.7	3	2	3.5	2.8	4.5	3	5.5	7	
											1.3	1.2	1.6	1.5	2	1.7	3	2	4	2.5	5	3	7	4.5	
											1.2	1.1	1.5	1.3	1.8	1.5	2.2	1.7	3	2	3.5	2.8	4.5	3	
													1.3	1.2	1.6	1.5	2	1.7	3	2	4	2.5	5	3	
													1.2	1.1	1.5	1.3	1.8	1.5	2.2	1.7	3	2	3.5	2.8	
															1.3	1.2	1.6	1.5	2	1.7	3	2	4	2.5	
															1.2	1.1	1.5	1.3	1.8	1.5	2.2	1.7	3	2	
																	1.3	1.2	1.6	1.5	2	1.7	3	2	
																	1.2	1.1	1.5	1.3	1.8	1.5	2.2	1.7	
																			1.3	1.2	1.6	1.5	2	1.7	
																			1.2	1.1	1.5	1.3	1.8	1.5	
																					1.3	1.2	1.6	1.5	

Based on ISO 4406:99 - 4 Million range number has been omitted.

New Cleanliness Level (ISO Code) Source: Meria Corporation

maintenance department was primarily focused on repairing failed equipment.

The company implemented its preventive maintenance service program at the customer plant, which involved analysis, reservoir cleaning, fluid reclamation, filtration upgrades and system flushing. The results were staggering: In the first year, the plant reduced component usage and failures and unscheduled downtime by 60 percent, allowing maintenance staff to concentrate on proactive maintenance activities versus reactive. This resulted in bottom-line savings of \$450,000.

These case studies help underline the huge savings and increased efficiency that industrial facilities can achieve through reliability-based maintenance programs that effectively monitor system cleanliness and remove contaminants. By implementing these programs, combined with the effective utilization of ISO Cleanliness codes as part of an efficient contamination control plan, increased efficiency and reduced downtime can be achieved. This means significant benefits for a company's bottom line and enduring success in today's highly competitive global economy.

