Top 10 Considerations When Selecting a Lubricant

It's no secret that proper lubrication is critical to an operation. Beyond simply making sure the wheels of machinery run smoothly, lubricant selection has an impact on equipment performance, reliability, productivity and longevity – and ultimately, on operational profitability. This puts a lot of pressure on maintenance and lubrication engineers to make the right lubricant decision for each application. And these days, that's no easy feat.

Selecting the optimal lubricant for equipment has become highly specialized. Equipment manufacturers continue to refine their designs to take advantage of new technologies, reduce sump size and increase throughput, as well as to improve efficiency and long-term performance. Newer, more compact machinery tends to run at higher speeds and under more severe pressure, with tighter clearances between moving parts than just a decade ago. These engineering trends, combined with constantly evolving environmental, energy and safety regulations, have led to a proliferation of lubricant formulations in the marketplace. This in turn makes the process of choosing the optimal lubricant for any application more challenging, and requires maintenance managers to do their homework.

This paper is intended to help ease some of that pressure. Part I of this paper details the top 10 factors to consider when trying to select the optimal lubricant for any application. While the equipment manufacturer's recommendation is still the number-one consideration in the selection of a lubricant, it is not the only one, and may well be trumped by other considerations. Part II takes a deeper dive into one of the most important factors, lubricant cleanliness – why it matters, and how to measure, monitor and maintain it.

Armed with this knowledge, you'll be better prepared to discuss your options with your lubricant supplier to help you arrive at an informed decision.

The Top 10 Considerations for Optimal Lubricant Selection

1) OEM Recommendation
2) Viscosity
3) Temperature – Service Range and Ambient Environment
4) Performance Attributes – Load, System Pressure and Efficiency
5) Lubricant Cleanliness
6) Environmental Impact
7) Inventory Consolidation
8) Seal Compatibility
9) Equipment Accessibility, Age and Preventive/Predictive Maintenance Schedule
10) Budget

Part I: Lubricant Selection – the Top 10 Considerations

1. OEM Recommendation

The OEM recommendation is the starting point for your selection. The manufacturer typically specifies the viscosity grade, performance properties and fluid cleanliness levels required to protect the components in a specific application. However, not all OEMs take the same approach to determining fluid specifications, which is why there are other factors to consider. Some OEMs further advise that the oil must not be incompatible with certain paints, metallurgy and seals. Reputable OEMs may also provide "condemning limits," meaning levels of contamination or degradation in the oil that, in their view, will impair performance. These can often be adjusted safely through the use of a fluid analysis program.

Note that in general, OEMs will specify the criteria the oil should meet, but will stop short of recommending a specific oil. Some OEMs have begun to engage in marketing relationships with lubricant suppliers. However, under most circumstances, an OEM cannot require you to use a specific lubricant brand or product. Even if the OEM manual calls out a specific lubricant by name, that doesn't mean you don't have other options. Work with your supplier and ask for evidence that its product meets the OEM specifications for a particular application. This can help consolidate the number of vendors with whom you need to work.

2. Viscosity

OEM recommendations aside, viscosity is the most important property that you have to get right. If the lubricant viscosity is incorrect, you run a very high risk of premature equipment failure.

The viscosity grade is a measure of a lubricant's resistance to flow and shear (such as the temporary "thinning" of a lubricant due to heat). Here are three factors to consider with viscosity:

a) Relationship between friction and viscosity. Friction results from surface interactions between moving parts. If a lubricant is too low in viscosity, there is not enough film thickness between parts to keep them separated. This results in adhesion, abrasion wear and system damage. Conversely, if the viscosity is too thick, it increases the system temperature and reduces efficiency, as the equipment has to work harder to move a thicker oil.

b) Relationship between viscosity and temperature. Viscosity decreases with increasing temperature and increases with lower temperatures.

c) Different viscosity or lubrication regimes: hydrodynamic (HD) for applications in which oil needs to create a working clearance between sliding parts; elastohydrodynamic (EHD) for applications where a rolling motion occurs between parts (as in rolling element bearings); and mixed or boundary lubrication, in which metal surfaces come in contact and the correct viscosity is essential to prevent friction.

Note that viscosity can fluctuate depending on temperature, speed, load and contaminant level. That is why it is important to consider factors other than the OEM recommendation in identifying the appropriate lubricant for a given application.

3. Temperature – Service Range and Ambient Environment

Both the equipment operating temperature and the temperature of the surrounding environment have an impact on lubricant performance. All lubricants have a specific temperature range for optimal performance, and in some cases that range may be fairly broad. However, some lubricants are better suited for extremely cold or hot operating and environmental temperatures. As noted earlier, viscosity is the most important property for

a lubricant. When the lubricant gets cold, it gets thicker in viscosity, meaning reduced flow. Conversely, when the lubricant gets hot, it loses viscosity and thins, running a risk of increased wear or system damage. The temperature range in which the equipment operates is therefore a very important factor in selecting the optimal lubricant viscosity.

Consider also whether the equipment is operating indoors or outdoors. The environmental temperature could inadvertently affect the lubricant's performance – an unexpected cold snap, for instance, can make equipment start-up more difficult. If you are running the same type of equipment indoors and outdoors, you may need two lubricants of different viscosities for the different environments or to consider a synthetic lubricant that has a wider temperature operating window to accommodate all environmental factors. Furthermore, overloading equipment or running outside of system design parameters can drive up the operating temperature, which could also have an impact on the required film thickness or recommended performance properties. Your lubricant supplier can help map out the correct viscosity if this is an issue you're facing.

4. Performance Attributes – Load, System Pressures and Efficiency

Various performance attributes, such as the equipment's load, system pressure and relative efficiency, will influence the selection of specified base oils (mineral, synthetic blend, full synthetic or boutiques) and additives. Mineral or conventional base oils are the most commonly used. They are refined from crude oil and generally have a low viscosity index, meaning the viscosity is likely to fluctuate in different temperature conditions. Synthetic and semi- synthetic base oils are also derived from crude petroleum, but their molecular structure has been chemically altered. They tend to have a more stable viscosity and perform consistently across a wide temperature range. "Boutique" refers to a small segment of base oils that are designed for specialized purposes and may be derived from sources other than petroleum, such as plants.

A wide range of additives are used in finished lubricant formulations to achieve specific performance objectives. Table 1 shows a sampling of additive types and the functions they perform.

Table 1: Additive Types by Function

New Properties	Enhancers	Suppressants
Anti-Wear (AW)	Anti-foam	Pour Point
Detergent	Antioxidant	Viscosity Improver
Dispersant	Corrosion protection	
Dye	Demulsifier	
Extreme Pressure (EP)	Rust Inhibitor	
Friction Modifier		

Lubricant formulators select the optimal additive properties to enhance the base oil and protect machine parts under various loads and pressures. Some formulations have also proven to improve operational efficiency and help control operating costs.

More additives do not necessarily mean better lubricants. Although aftermarket additives are available, equipment operators should never attempt to additize lubricants themselves without assistance from a formulation expert. Achieving the right balance of chemistry and physical blending is an exacting science. Incorrect quantities, temperatures or additive sequences can result in severe consequences. And if aftermarket additives are added, you may void any product warranty.

5. Lubricant Cleanliness

To maximize productivity and machine or component life, equipment manufacturers engineer parts to precise machine clearance levels. Most manufacturers then set lubricant cleanliness specifications based on the component's sensitivity to contamination. A good rule of thumb is to ensure your lubricant meets a cleanliness level that protects the tightest machine clearance in your equipment. OEMs may specify the cleanliness level using the ISO 4406 standard or the SAE AS4059 (an update of the NAS 1638 system, which is still in use for older equipment).

Table 2 presents a generic example of fluid cleanliness by component type using the ISO 4406 cleanliness code.

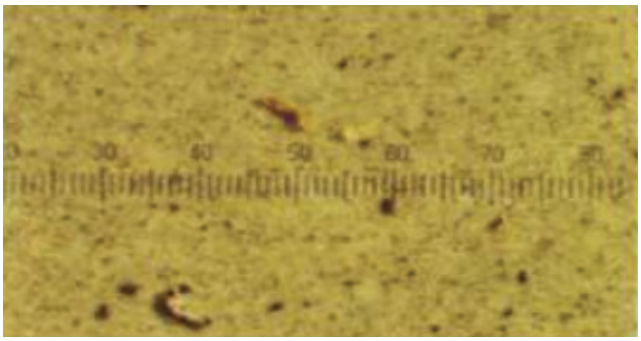
Table 2: General New Lubricant ISO 4406 Cleanliness Levels by Fluid Type

Fluid Type	14/12/10	16/14/11	18/16/13	20/18/15	22/20/17	23/22/19	24/24/21	25/26/23
Hydraulic Oils	Very Clean	Clean			Dirty			
Gear Oils			Very Clean	Clean			Dirty	
Engine Oils		Very Clean		Clean		Dirty		
Turbine Oils	Very Clean		Clean	Dirty				

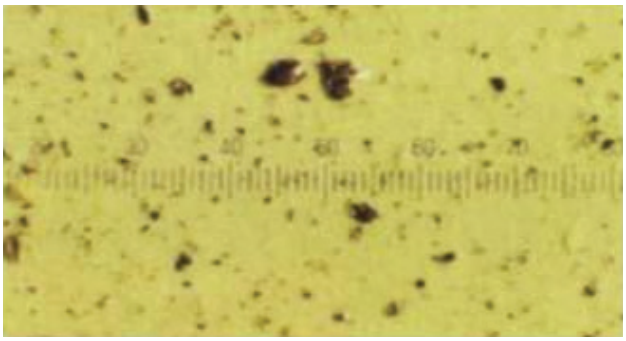
*** Source: Chevron Lubricants**

Particulate contamination is the leading cause of lubricant-related machine failure. Although it may seem counter-intuitive, don't assume that just because a lubricant is new, it is clean enough to meet OEM specifications or industry best practices. New lubricants are transferred several times before they reach their final destination in a component. Each time a lubricant is transferred, it picks up contaminants. Starting at the correct, OEM-specified lubricant cleanliness level is imperative to reduce lubrication defects, minimize the risk of premature component failure, and control operating costs.

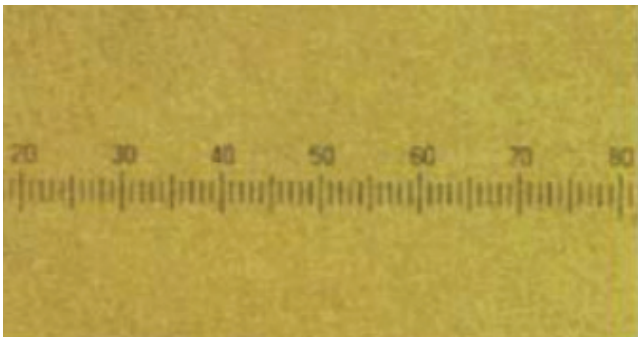
What Typical ISO Cleanliness Levels Look Like under the Microscope (Source: Noria)



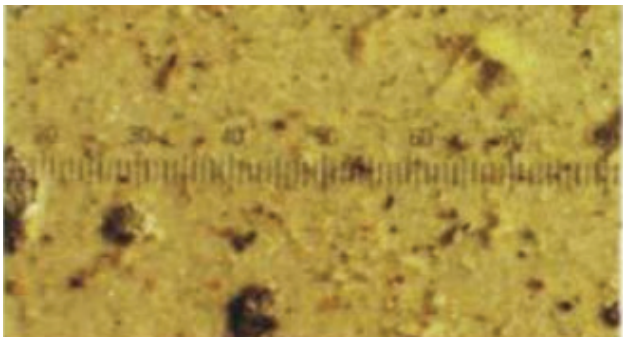
System with Typical Hydraulic Filtration 20/18/16



New Oil from Barrel 22/20/18



System with ß3 >200 Filtration 14/13/11



New System with Built-in Contaminants 23/22/20

(See part II of this paper for a deeper discussion of the lubricant cleanliness factor.)

6. Environmental Impact

Some lubricants on the market today are being marketed as "environmentally friendly" for operations in especially sensitive environments, such as on or near bodies of water. In order to qualify for that label, a lubricant must meet one of two definitions under the Organization for Economic Cooperation and Development's OECD test guideline 301B. It must be:

- **Inherently biodegradable,** defined as the characteristic of a product to be between 20% and 60% consumed by naturally occurring organisms in nature over an indefinite period of time. Most mineral oil-based lubricants meet these criteria.
- **Readily biodegradable,** defined as biodegrading by more than 60% in 28 days, which excludes most mineral oils. Lubricants in this category are known as Environmentally Approved Lubricants or EAL. They are largely used in marine applications because they reduce the impact of spillage in water.

Trade-offs should be considered with environmentally friendly lubricants. The ones with the best performance characteristics typically come with a higher cost to achieve optimal results. Others may have performance shortcomings based on their formulation, such as reduced oxidation resistance or viscosity index (VI) instability, meaning a shorter service life or less protection in certain operating temperatures.

7. Inventory Consolidation

It is expensive and impractical to keep a large number of lubricant products on hand at your site. Streamlining your inventory can also reduce the risk of confusion or mixing incompatible lubricants.

Next, make sure to rotate stock on a first-in, first-out (FIFO) basis to reduce the risk of inventory of expiring. Your lubricant supplier should be able to provide a shelf-life table so you can readily tell when a lubricant is exceeding its lifespan. In general, most mineral base oil lubricants have a lifespan of around five years. Specialty base oils and greases (polyalkyline glycol or PAGs to Diesters) typically have a lifespan of one to three years, and most extended-life coolants last around eight years.

Before

After

8. Seal Compatibility

Rubber or plastic machine seals are chosen to meet specific operating conditions such as temperature, system pressure, linear or rotational speed, surface finish and lubricant types. It is important to use a lubricant that is compatible with the polymer material used in the seal. An incompatible fluid can cause a seal to crack or swell, resulting in potential damage and downtime.

Table 3 from Noria, illustrates the relative compatibility between different elastomer and lubricant types.

Table 3: Elastomer/Lubricant Compatibility

Fluid Type	Buna N	Butyl	Karlez	Neoprene	Nordel	Silicon	Teflon	Viton
Mineral Oil	S	U	S	S	U	S	S	S
Organic Esters	B	U	S	U	U	U	S	S
Polyglycol	S	S	S	S	S	S	S	S
Phosphate Esters	U	S	S	U	S	S	S	S
Silicones	S	S	S	S	S	P	S	S
Polybutenes	P	S	S	P	S	S	S	S
Fluorinated Esters	S	S	P	S	S	S	S	S
Synthesized Hydrocarbons	B	U	S	S	U	U	S	S
Cholorofluorinated	S	S	S	S	S	S	S	B
Continuous Service Temperature Limit of Elastomer (°F)	225	250	550	225	300	450	500	400

B = borderline U = Unstable S = Suitable P = Partially Suitable

Source: Noria Corporation, The Practical Handbook of Machinery Lubrication, Fourth Addition.

9. Equipment Accessibility, Age and Preventive/Predictive Maintenance Schedule

Even within OEM guidelines, you have a range of lubricant options for most equipment types and applications. Your choice may be influenced by any number of practical considerations. For example, how easy is it to get to the equipment for a fluid change? If it's difficult and time consuming, that may warrant a more expensive, longer-lasting lubricant to reduce frequency of changes and wrench time. Conversely, for older equipment experiencing leaks and a high rate of lubricant loss, you might want a more cost-effective lubricant until the leaks can be repaired.

Having a documented preventive maintenance schedule or predictive maintenance program makes it easier to balance lubricant selection with these factors.

10. Budget

The Institute of Mechanical Engineers has stated that lubrication represents a 1:40 investment rate, meaning that for each $1,000 spent on quality lubricants and lubrication practices, a yield of $40,000 of savings is possible*. Put another way, lubrication is an investment that should pay you back in the form of higher performance and efficiency, reduced downtime, and longer equipment life.

The overall optimal lubricant tends not to be the cheapest or the most expensive, but one that best fits your needs. The lubricant should provide good overall wear protection and align with the site's maintenance workmanship.

Good Advice Pays

It's clear from all these factors that selecting the optimal lubricant can be a complex process. Even with a wealth of education on the topic, you shouldn't feel you have to go it alone. Keep an open line of communication with your lubricant supplier, whose job it is to understand your needs and guide you in making the right decisions. Having a knowledgeable and reliable supplier can be worth its weight in gold.

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Part II: Lubricant Cleanliness – The Key to Long-Term Protection and Performance

Among the top 10 factors cited, lubricant cleanliness stands out as one that is both critical and in your control. As noted earlier, particle contamination in oil is the leading cause of lubricant-related damage in equipment. Contamination accelerates wear, impedes performance and efficiency, and in the worst cases leads to premature equipment failure. So how do you know if your oil is clean, and how do you mitigate the impacts of microscopic contaminants?

The International Organization for Standardization (ISO) developed a cleanliness code to measure contamination levels per millimeter of fluid at three particle sizes: 4µm (micron), 6µm and 14µm. Each number in the code represents the contaminate level for the correlating particle size. It is written as a XX/YY/ZZ:

- XX = total number of particles ≥ 4 µm
- YY = total number of particles ≥ 6 µm
- ZZ = total number of particles ≥ 14 µm

Table 4 illustrates how the particle count translates to the ISO code number.

Table 4

In this example, the particles measured at the given micron levels area ssigned a code based on where the value falls in the table. For this example, the ISO code would be 20/17/13.

	Particles/ml	ISO Code
≥4 µ	9,721	20
≥6 µ	1,254	17
≥10 µ	326	
≥14 µ	73	13
≥21 µ	12	
≥38 µ	5	
≥70 µ	0	
≥100 µ	0	

ISO Code	More than (p/1 mL)	Up to & including (p/1 mL)
24	80,000	160,000
23	40,000	80,000
22	20,000	40,000
21	10,000	20,000
20	5,000	10,000
19	2,500	5,000
18	1,300	2,500
17	640	1,300
16	320	640
15	160	320
14	80	160
13	40	80
12	20	40
11	10	20
10	5	10
9	2.5	5
8	1.3	2.5

Some programs or equipment guides may report under the old two-number system. In this case, simply drop the first number: */17/13.

How Much Can You Extend Equipment Life?

It's a good practice to become familiar with Industry Life Extension Tables developed by Noria Corporation. These can help justify the expense of implementing a clean lubricant program compared to the exorbitant costs of replacing parts, unreliable operation or unplanned downtime. Tables 5 through 8 can be used to calculate the potential useful life extension for specific types of equipment that can be achieved by moving from the current ISO cleanliness to a recommended ISO cleanliness level. To use the charts, follow these three steps:

1) Find the current ISO Cleanliness rating on the Y axis
2) Move horizontally to the new target ISO Cleanliness rating on the X axis
3) The corresponding box is the estimated life extension factor.

For example, in Table 5, locate the current oil system ISO cleanliness code on the Y axis of 20/18/15. Move horizontally to the desired target cleanliness or contaminant reduction level of 17/15/12. This provides a life extension factor for rolling element bearings a 1.7, meaning that by reducing contamination and maintaining it to the target cleanliness level, you can estimate the system components to last 1.7 times longer than at the current ISO cleanliness level.

Table 5: Life Extension for Rolling Element Bearings

Current Machine Cleanliness \ New Cleanliness Level	22/20/17	21/19/16	20/18/15	19/17/14	18/16/13	17/15/12	16/14/11	15/13/10	14/12/9	13/11/8	12/10/07
28/26/23	3	3.5	4	5	6	7.5	9	>10	>10	>10	>10
27/25/22	2.5	3	3.5	4	5	6	7	9	>10	>10	>10
26/24/21	2	2.5	3	4	5	6	7	8	10	>10	>10
25/23/20	1.5	2	2.5	3	3.5	4	5	6	8	9	>10
24/22/19	1.3	1.6	2	2.5	3	3.5	4	5	6	7	>10
23/21/18	1.2	1.5	1.7	2	2.5	3	3.5	4	5	7	10
22/20/17		1.2	1.5	1.7	2	2.5	3	4	5	7	9
21/19/16			1.2	1.5	1.7	2	2.5	3	4	6	8
20/18/15*				1.2	1.5	1.7	2	2.5	3	4.5	6
19/17/14					1.2	1.5	1.7	2	2.5	3	5
18/16/13						1.2	1.5	1.7	2	3.5	4
17/15/12							1.2	1.5	1.7	2	2.5
16/14/11								1.3	1.6	1.8	2
15/13/10									1.2	1.5	1.8

***Source–Noria Corporation. Fundamentals of Machinery Lubrication. Noria Skills Training**

Table 6: Life Extension for Journey Bearings and Turbo Machinery

New Cleanliness Level

Current Machine Cleanliness	22/20/17	21/19/16	20/18/15	19/17/14	18/16/13	17/15/12	16/14/11	15/13/10	14/12/9	13/11/8	12/10/07
28/26/23	4	4.5	6	6.5	7.5	8.5	10	>10	>10	>10	>10
27/25/22	3	3.5	4.5	5	6.5	8	9	10	>10	>10	>10
26/24/21	2.5	3	4	5	6.5	7.5	8.5	9.5	>10	>10	>10
25/23/20	1.7	2.3	3	3.7	5	6	7	8	9.5	>10	>10
24/22/19	1.4	1.8	2.3	3	3.5	4.5	5.5	7	8	10	>10
23/21/18	1.2	1.5	1.8	2.2	3	3.5	4.5	5	7	9	10
22/20/17		1.2	1.5	1.8	2.3	3	3.5	5	5	8	10
21/19/16			1.2	1.5	1.8	2.2	3	3.5	5	7	9
20/18/15*				1.2	1.5	1.8	2.3	3	3.5	5.5	8
19/17/14					1.2	1.5	1.8	2.3	3	4	6
18/16/13						1.2	1.5	1.8	2.3	3.7	4.5
17/15/12							1.2	1.5	1.8	2.3	3
16/14/11								1.3	1.6	1.9	2.3
15/13/10									1.2	1.6	2

***Source–Noria Corporation. Fundamentals of Machinery Lubrication. Noria Skills Training**

Table 7: Life Extension for Gear Boxes and Other Systems

New Cleanliness Level

Current Machine Cleanliness	22/20/17	21/19/16	20/18/15	19/17/14	18/16/13	17/15/12	16/14/11	15/13/10	14/12/9	13/11/8	12/10/07
28/26/23	2.5	3	3.5	4	5	6.5	7	9	10	>10	>10
27/25/22	2	2.5	3	3.5	4	5	6	7.5	9	>10	>10
26/24/21	1.5	2	2.5	3	4	5	6	7	8	10	>10
25/23/20	1.3	1.5	2	2.5	3	3.5	4	5	6.5	8.5	10
24/22/19	1.1	1.3	1.7	2	2.5	3	3.5	4	5	5.5	8.5
23/21/18	1.1	1.3	1.4	1.6	2	2.5	3	3.5	4	5.5	8
22/20/17		1.05	1.3	1.4	1.7	2	2.5	3	4	5.5	7
21/19/16			1.1	1.3	1.5	1.7	2	2.5	3.5	4.5	6
20/18/15*				1.1	1.3	1.5	1.7	2	2.5	3.7	5
19/17/14					1.1	1.3	1.5	1.7	2	2.5	3.5
18/16/13						1.1	1.3	1.5	1.8	3	3.5
17/15/12							1.1	1.4	1.5	1.8	2.2
16/14/11								1.2	1.4	1.5	1.8
15/13/10									1.1	1.3	1.6

***Source–Noria Corporation. Fundamentals of Machinery Lubrication. Noria Skills Training**

Table 8: Hydraulic Systems and Diesel Engines

Current Machine Cleanliness \ New Cleanliness Level	22/20/17	21/19/16	20/18/15	19/17/14	18/16/13	17/15/12	16/14/11	15/13/10	14/12/9	13/11/8	12/10/07
28/26/23	5	7	9	>10	>10	>10	>10	>10	>10	>10	>10
27/25/22	4	5	7	9	>10	>10	>10	>10	>10	>10	>10
26/24/21	3	4	6	7	9	>10	>10	>10	>10	>10	>10
25/23/20	2	3	4	5	7	9	>10	>10	>10	>10	>10
24/22/19	1.6	2	3	4	5	7	8	>10	>10	>10	>10
23/21/18	1.3	1.5	2	3	4	5	7	9	>10	>10	>10
22/20/17		1.3	1.6	2	3	4	5	7	9	>10	>10
21/19/16			1.3	1.6	2	3	4	5	7	9	>10
20/18/15*				1.3	1.6	2	3	4	5	7	>10
19/17/14					1.3	1.6	2	3	4	6	8
18/16/13						1.3	1.6	2	3	4	6
17/15/12							1.3	1.6	2	3	4
16/14/11								1.3	1.6	2	3
15/13/10									1.4	1.8	2.5

***Source–Noria Corporation. Fundamentals of Machinery Lubrication. Noria Skills Training**

Understanding Water Contamination

While the ISO code system focuses on particulate contamination, water can be an equally insidious contaminant, robbing your components of life. Table 9 illustrates the risks of higher than optimal water levels in bearings, and how a reduction in moisture content can help extend the life of these components.

Table 9: Life Extension Potential for Bearings from Reducing Moisture Content

Current Moisture Level (ppm) \ New Moisture Level (ppm)	10,000		5,000		2,500		1,000		500		250		100		50	
	Rolling Element	Journal	Rolling Element	Journal	Rolling Element	Journal	Rolling Element	Journal	Rolling Element	Journal	Rolling Element	Journal	Rolling Element	Journal	Rolling Element	Journal
50,000	2.3	1.6	3.3	1.9	4.6	2.3	7.8	2.9	11.2	3.5	16.2	4.3	26.2	5.5	37.8	6.7
25,000	1.6	1.3	2.3	1.6	3.3	1.9	5.4	2.4	7.8	2.9	11.2	3.5	18.2	4.6	26.2	5.5
10,000			1.4	1.2	2.0	1.5	3.3	1.9	4.8	2.3	6.9	2.8	11.2	3.5	16.2	4.3
5,000					1.4	1.2	2.3	1.6	3.3	1.9	4.8	2.3	7.8	2.9	11.2	3.5
2,500							1.6	1.3	2.3	1.6	3.3	1.9	5.4	2.4	7.8	2.9
1,000*									1.4	1.2	2.0*	1.5*	3.3	1.9	4.8	2.3
500											1.4	1.2	2.3	1.6	3.3	1.9
250													1.5	1.3	2.3	1.6
100															1.4	1.2

***Source–Noria Corporation. Fundamentals of Machinery Lubrication. Noria Skills Training**

Start Clean and Stay Clean

Because oil is exposed to the elements several times in transit from production to the application (as noted earlier), it may well contain an unacceptable level of particulate contamination on arrival. The best way to mitigate this risk is to have your supplier certify that the oil meets the OEM's specified cleanliness requirements under ISO 4406 at the time of delivery.

To guard against the possibility of contamination once the oil is in service, it's important to have a regularly scheduled fluid analysis program. This powerful tool enables you to detect issues at early stages without taking equipment off line. The objective of fluid analysis is to help minimize the high cost of oil changes and unplanned shutdowns. This entails pulling samples of oil from your machinery and sending them to an accredited oil analysis laboratory. Test results will indicate both machine health, based on indications of wear in the oil, and fluid health, meaning whether the fluid is still suitable for continued use. The earlier issues are detected, the less they will cost to eliminate--as well as mitigating potential safety issues.

Again, as with the oil selection process, your lubricant supplier should have the knowledge and resources to help you implement an effective lubricant cleanliness regimen.

Chevron Resources

Chevron offers a range of professional services to assist you in selecting the optimal lubricants for your operation and optimizing lubricant performance.

Chevron LubeTek

The Chevron LubeTek team is available to provide you with technical answers to questions on a broad range of product and related issues for all industries and applications. Call 1-800-582-3835, or email lubetek@chevron.com

Chevron LubeWatch® Fluid Analysis Program

LubeWatch® fluid analysis enables you to track the performance of the lubricants in your equipment. Our LubeWatch program can identify contamination or wear before it results in costly downtime. Call 1-800-394-3669 or visit https://www.chevronlubricants.com/lubewatch

ISOCLEAN® Certified Lubricants Program

Our ISOCLEAN® program ensures that your lubricants are laboratory-certified to meet OEM cleanliness requirements upon arrival to help minimize downtime, reduce maintenance costs, and extend equipment life. For more information, visit our web page at www.ChevronLubricants.com/ISOCLEAN

Site Assessment

Our lubrication professionals can visit your site and advise you on best lubricant handling and storage practices to mitigate the risk of contamination and maximize lubricant cleanliness.

Contact Your Chevron Representative or Lubrication Marketer for More Information

Call 800-822-5823, or visit www.chevronlubricants.com/marketer