

Ultra-Lube FAQ's *(frequently asked questions)*

Does the unit come with a grease gun?

No. Most plants already have plenty of grease guns and the Ultra-Lube will easily attach to any of them.

Can any ordinary grease gun be used?

Yes. The Ultra-Lube is designed to attach to a standard 1/8" NPT thread or fitting. The Ultra-Lube even works well with battery operated and pneumatic grease guns as well. Word of caution when using a powered grease gun – know how much grease a single trigger pull yields. You can over-lubricate a bearing very quickly using powered grease guns.

How is the unit different from a stethoscope?

Technically, the Ultra-Lube is a very high end stethoscope designed specifically for industry. Common, low end stethoscopes are not designed to be used in high noise environments. They tend to pick up ambient noises easily from all kinds of sources. Our transducer and compatible electronics package has been designed and tested to optimize the best sound quality possible with the lowest amount of ambient noise interference. Our equipment is sensitive enough that you can actually hear grease passing through the transducer. You can even hear air bubbles inside the grease!

How does "Sonic" sound differ from "Ultrasonic" sound?

The popularity of ultrasonic equipment being used in industry for leak detection and some levels of fault detection is well known. What is not well known, however, is that most "acoustic" or "tribological" events happen well below the threshold of ultrasonic sound frequency. This is why vibration analysis is so effective. Our unit operates in the sonic frequency range (20Hz – 20kHz) and looks at signals produced in the sonic range. Typically, when a piece of rotating equipment creates sounds in the higher frequency ranges, that equipment is well past any proactive lubrication procedures and should be considered in failure mode. Acoustic (sonic) lubrication methods help prevent equipment from reaching a stage of damage. Heterodyning an ultrasonic signal is not the same as listening in the sonic frequency range from the start.

How is the noise different when the bearing is under-greased and over-greased? Can it be explained to the operator?

Yes. A bearing that is under-lubricated has a quality of sound that would be generally described as rough, scratchy, gritty or sandy sounding. Under-lubricated bearings may also be louder in intensity than over-lubricated or properly lubricated bearings. This is not always the case and caution must be taken when determining lubrication levels based on intensity or volume readings. "Quiet" or "noisy" are relative terms in relation to rotating equipment, so it is more important to understand what the "quality" of the sound means first. A brand new, out of the box bearing may actually register "louder" in terms of noise volume than a similar bearing that has been in operation for some time. There's a myriad of factors that cause this to be, but suffice it to say that basing a lubrication program or "baseline" solely upon decibel levels is inadequate and highly incomplete. "Sound" or the generation of sound is a matter of Tribological action and pressure. Qualities of sounds or "timbre" can be explained to the operator very easily. Every bearing has a different sound signature or "voice", just like every human has a distinct voice. When a human hears the sound of another human with a cold, they easily recognize it by the sound quality. This is similar in explaining the under-lubricated or over-lubricated sounds of a bearing.

I presume that with practice, one will be able to differentiate between the noise of a bearing which is under-lubricated and one which is over-lubricated.

Yes, practice and familiarity with the plant equipment will enable the operators to determine whether the noises are under or over-lubricated related noises. But, even an inexperienced operator will benefit immediately from the use of the Ultra-Lube by easily identifying the distinct gritty or scratchy quality of sound of an under-lubricated bearing. Over-lubricated bearings sound the same as properly lubricated ones, generally, and the quality of sound can be described as "smooth" or "soft rushing". Over-lubricated bearings tend to be warmer than properly lubricated bearings due to a condition called "churning". Churning is when the roller elements have to push their way through too much lubricant. If a temperature reading can be taken, this is a good point to log temperature data. At this point no further action needs to be taken, except to be noted. The interval for re-lubrication may need to be adjusted or extended. Then upon a return inspection, if a noise is heard that was

not there before, and lubrication quiets the bearing, then it has been properly lubricated. If the noise abates and returns, often within 10 seconds or so, then there is reason to believe the bearing has problems other than lubrication.

Do you have samples of audio files of the Ultra-Lube in use?

Yes. We have recorded sound files directly from the Ultra-Lube on several bearings. They can be accessed directly from our website (<http://www.uvlm.com>). These sound files are excellent samples of various under-lubricated bearings being lubricated. One can hear the change in sound as lubricant enters the roller elements, quieting down the rotating equipment.

I've heard that decibel or intensity meter readings are effective in diagnosing bearing lubrication levels. What do you recommend?

We recommend extreme caution, because decibel metering or intensity measurements only measure volume of sound level. The first question is whether or not the sound level being measured has anything to do with the actual noise being generated by the bearing itself. Bearings are physically mounted to steel shafts and thus act as an exciter or transmitter of sound. Sound generated from vibration along the shaft or other moving parts can often be misdiagnosed as noise relating to bearing problems. Timken, a well known bearing manufacturer, has a very good explanation of this concept on their website at <http://www.timken.com/products/bearings/fundamen/sound.asp>. Certainly, it is known that a bearing needing lubrication is louder than one that does not, but the key is in knowing what the sound is of that particular bearing when proper lubrication occurs. From a decibel level standpoint, how can one say for certain when that happens? Even if you start with a brand new bearing that has been properly lubricated, you will only know what the sound level is at that point in time. Pressure alone can cause an increase in sound volume level and still have nothing to do with proper lubrication.

I have some amount of industrial hearing loss. Can I "hear" the same as someone else and will my judgement be the same as someone elses?

Since the Ultra-Lube utilizes the power of human ear (meaning the function and complexity of the human ear as a device) the operator can easily distinguish between different sounds in a bearing. This works for individuals with industrial hearing loss, as well. It's not so much a matter of how well you can hear, but more a matter of what you hear. We illustrate this concept by the following example: Two people are attending a symphony, one with severe hearing loss and the other with normal hearing. As the different instruments are played, each person can hear each individual instrument. They can pick out and hear the trumpet from the flute, and the harp from the percussion section. The individual with hearing loss, upon hearing a violin, does not confuse its sound as that of a piano. They might simply not hear the full range of tonal or harmonic values. This is the same when listening to a bearing. A scratchy, rough sounding bearing to one individual doesn't sound smooth and quiet to another even if they have industrial hearing loss. Both will hear the scratchy, rough sound and both will know it is that of a scratchy, rough quality.

Is the output volume adjustable like a radio's volume control?

Yes. The volume is adjustable and we have found that people with industrial hearing loss are now able to hear equipment again. User with industrial hearing loss are able to raise the volume level on the Ultra-Lube without degrading the sound quality.

What is the warranty period for the equipment? What happens if something goes wrong? Can we be trained to do minor repairs?

Recently, we adopted a Lifetime Limited Parts & Labor Warranty which must be activated after purchase. If a problem is suspected, ensure that the battery is not dead. A dead or low battery will make the Ultra-Lube "cut-out" or sound like it is cutting out. If this is not the problem, call our technical support line to see if it is an issue that might be resolved over the phone. You should not attempt to repair the Ultra-Lube without contacting us first. This will void the warranty. We will gladly repair the Ultra-Lube for free if it covered under the warranty. If it is not a warranty covered issue, we will only charge for parts and labor.

What happens when a bearing is near a gearbox? Does the Ultra-Lube pick up the gearbox noise or not? If it does, how does one distinguish the two noises?

It would depend on the proximity of the gearbox and the bearing being tested. Sometimes, you can hear the gearbox while touching the bearing. However, by lowering the volume of the Ultra-Lube, you can distinguish between the bearing and gearbox noise. Another way to determine whether the noise is coming from the bearing or the gearbox is to touch the

mounting base of the equipment and work your way toward the gearbox to determine if that is the source of the noise. If the noise begins to abate the further from the bearing housing you go, then the noise is from the bearing.

Will the Ultra-Lube increase the amount of time I spend lubricating?

The Ultra-Lube actually saves operators time. Most plants over-lubricate equipment. Since the Ultra-Lube helps to establish new lubrication frequencies, this saves time as only those bearings needing lubrication are actually lubricated.

Example 1: Let's say a plant, prior to using the Ultra-Lube, has a current lubrication schedule to lubricate 10 motors once a month, injecting 4 shots of grease into each bearing. After implementation of the Ultra-Lube it is determined that 4 shots of grease are too much for 5 of the motors and their schedule is adjusted to 4 shots every two months. The operator now only spends the time necessary to listen to the 5 motors to make sure they are okay and then on to the next PM.

Example 2: Now, let's use the same example as above, but apply it to a conveyor belt in a coal mine. Before using the Ultra-Lube, according to the schedule, every bearing required grease with most of it pouring out of the seals due to over-lubrication. Since many conveyors run at low speeds, their actual lubrication requirements are lower in volume. Using the Ultra-Lube, the operator can listen and lubricate only those that actually need lubrication. Also, previous re-lubrication schedules required backpacks full of grease tubes and time spent lubricating every bearing. Using the Ultra-Lube may only require a few tubes of grease and more equipment can be diagnosed in the same amount of time.

Is there any way of avoiding lubricating a bearing which is already over-lubricated?

Aside from any obvious signs of over-lubrication, such as lubrication running out of the seals or down the housing, or excessive heat determined by temperature readings, listening to the quality of sound will be the best way to avoid lubricating an over-lubricated bearing. When the actual lubrication level or lubrication condition is unknown, determine by the quality of sound whether the bearing is under-lubricated, first off. If the bearing does not have a distinct scratchy or gritty sound, then it is probably not under-lubricated. It is either properly lubricated or over-lubricated. Injecting only a small amount of grease (1/4 stroke from a standard grease gun) will help make a determination. If a small amount of grease makes no difference in sound quality, then a notation needs to be made to re-visit bearing in half the time (twice the frequency) allotted for re-lubrication. To discover the custom lubrication requirements of the bearing at the correct point in time and also helps to establish new time/amount re-lubrication schedules.

We usually don't have a large budget for our lubrication department. How fast will the Ultra-Lube pay for itself?

The Ultra-Lube has immediate return on investment (ROI), long-term and short-term.

Immediate ROI – From the very first day of use, the Ultra-Lube has proven to be an effective cost saver. It has instantly allowed a lubrication technician to diagnose bearings in various stages of failure. Even with the best vibration analysis program, much equipment is passed by or on a schedule that is too infrequent to catch all possible failures. A lubrication technician equipped with an Ultra-Lube has the portable ability to physically check many more pieces of equipment, thus raising the chances of spotting problems earlier. Perhaps, as valuable, is the ability of the lubrication technician to quickly inspect other equipment other than manually greasable bearings. When moving from one motor to another, lubrication technicians often pass by steam traps, valves, gear boxes and other types of rotating equipment. Perhaps, this type of equipment were not generally under the care of the lubrication technicians, but with the technology in the Ultra-Lube, diagnosing potential problems is as easy as probing the equipment. When the discovery of a problem happens by the lubrication technician, this is an example of “expanded equipment responsibility” or “lateral equipment inspection”.

Short Term ROI – When proactive and precision lubrication practices are adopted into the lubrication program all kinds of short term savings can be realized. When bearings are lubricated properly, they receive only the amounts they need, thus eliminating waste of lubricants. When a technician lubricates only the equipment that needs it, this saves “per unit” time, resulting in more equipment being precision inspected. Since more equipment is now inspected and maintained proactively, maintenance groups become more efficient.

Long-Term ROI - Much of the success of the Ultra-Lube happens when *nothing happens*. In other words, if the Ultra-Lube is doing its job, there will be fewer failures relating to lubrication application. If a bearing can be made to run two, three or four times longer by implementing a proactive lubrication program, this will save a lot of money. Much of reliability relies on trendable and repeatable data. The Ultra-Lube aids this process by allowing another level. More knowledge and information results in continued reliability cost savings.