Zero Friction Cycling

Single Appliation Longevity - New test protocol as of October 2020

ZFC receives many emails from around the world seeking advice on what lubricant for what event. These range from a key road time trial, to 24 hour mtb to cross continent events to stage races.

What lubricant for what event can depend on many factors. Not only from how long does lubricant X last in conditions Y, but a persons budget, race strategty (flag to flag or able to swap to fresh chain/s), mechanical confidence and more.

The new test assess single application longevity for dry road conditions, dry gravel / mtb / cx conditions, and extreme conditions (wet, muddy etc).

The test follows a similar protocol as main lubricant test, alternating between larg ring and cogs 4 through six and small chain ring and cogs 1 through 3, with check measures every 150km.

A new chain is used for single application longevity test, and the lubricant is applied via immersive application. This acts as a double check re initial penetration issues in the main test where the lubricant is applied as per manufacturer instructions.

Initial test is dry road conditions. After stripping factory grease the chain is check measure for start measure point for that chain (chains do not always come from the factory exactly the same length).

For the test block, the chain is given a wear rate allowance of 0.1% (normal recommended chain wear replacment mark is 0.5%, so it is given 20% of the recommended wear replacement mark.

Two key points are highlighted from the check measures. The obvious one is how many Km's until the chain reached its wear allowance. **The second and more important is the "JUMP POINT"**. This is the moment in the test where the chain wear rate measures change from zero or minimal wear, to a notable wear jump. This signifies when the lubricant treatment is effectively done. Whilst it may continue for some hundreds of km's from that point until it reaches wear rate limit, this JUMP POINT denotes when there will be a marked increase in friction losses for that lubricant. Once hardened steel parts begin to wear at a noticeable rate - friction losses have jumped.

How long it takes from the JUMP POINT to the end of wear allowance indicates characteristics of that lubricant. Some lubricants remain extremely low friction even in harsh conditions for an impressive time (ie chain coating type lubricant) followed by a very sharp increase once that treatment is done. Other lubricants can show a slow increase in wear from fairly early on but may not exhibit a clear jump point (ie some wet lubricants) - they just slowly continue to degrade. Such lubricants do not have point of sudden friction increase, but instead steadily increase in friction from - sometimes - kilometre zero.

After dry road conditions test, chain is ulltrasoncially cleaned, re-lubed via immersive application, and subjected to dry contamination test. Chain is given a 0.1% wear allowance from end of test measure at end of dry road test

After dry contamination test, chain is ultrasonically cleaned, re-lubed via immersive application, and subjected to extreme contamination test. Chain is given a 0.1% wear allowance from end of test measure from dry contamination block test.

Depending on the lubricant, it may demonstrate very different performance results in from one test type to another. Some will excell in dry contamination resistance but fall over in wet, or vice versa. This will be key to helping you decide what to prep for your personal event based on length and expected conditions, and if you need to have a back up in case the conditions are different to what you expected.

TO THE DATA!

Single Application Longevity - Dry road conditions test

***Note - despite the test being 250w, which is greater than most average on training rides, the smooth nature of machine run seems to deliver much longer treatment lifespans vs real riding where the sinosoidal loading of pedalling action delivers much greater peak forces even for the same avg power, and the environment - like riding your ergo - has less airborne contamination. Real world road riding vs lab testing tends to indicate that lab test claims for treatment longevity may be around double to triple vs what may be assessed in field testing. Ie in a lab test lubricant may hold its efficiency for 600km before notably increasing, yet on road the chain feels and sounds very dry by 300km and not pleasurable to ride past that point without relubricating / re-waxing. For the Single application test, based on when some clear is beginning, real world training where treatment has moved from silky smooth zone etc, I would suggest real world results treatment lifespan at approx 1/3rd of wear jump point km's attained on test machine. Note ZFC is always conservative re treatment lifespans - real world results will vary depending on your power, riding style, environment - conservative estimate is best as a guide just in case.**

Lubricant	Km's to Jump Point	Km's to Wear allowance	Real world KM's Adjusted - Jump Point	Real World Km's to Wear allowance
Silca Hot Melt	1,300	1595	433	531
UFO Drip V2	900	1182	300	394

Single Application Longevity - Dry Gravel / Mtb / CX

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Lubricant	Km's to Jump Point	Km's to Wear allowance	Real world KM's Adjusted - Jump Point	Real World Km's to Wear allowance
Silca Hot Melt	900	1030	300	343
Ufo Drip v2	450	1078	150	360

Single Application Longevity - Extreme Conditions

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Lubricant	Km's to Jump Point	Km's to Wear allowance	Real world KM's Adjusted - Jump Point	Real World Km's to Wear allowance
Silca Hot Melt	300	637	100	212
Ufo Drip v2	150	357	50	119