Zero Friction Cycling

## Single Appliation Longevity - New test protocol as of October 2020 - Much work to be done to re-test existing lubricant test list

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 large 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 each of the 3 Single Application Longevity tests. **The lubricant is applied via immersive application (usually..).** This acts as a double check re initial penetration issues in the main test where the lubricant is applied as per manufacturer instructions.

For each S.A.L test, 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 during the test are noted. The first is noting when (or if) there was a significant change from one wear measure to another. This is noted as the "Jump point" - and most accurately signals when the lubricant treatment has effectively started giving out. The second is when the chain reaches the total test wear allowance. Not all lubricants demonstrate a clear jump point - ie some very long lasting high performing wet lubricants, there is just a very small increase in wear every check measure until reach test wear allowance. Others - typically wax lubricants - can exhibit extremely low / no wear for X check measures followed by a significant jump point when the wax treatment has given out.

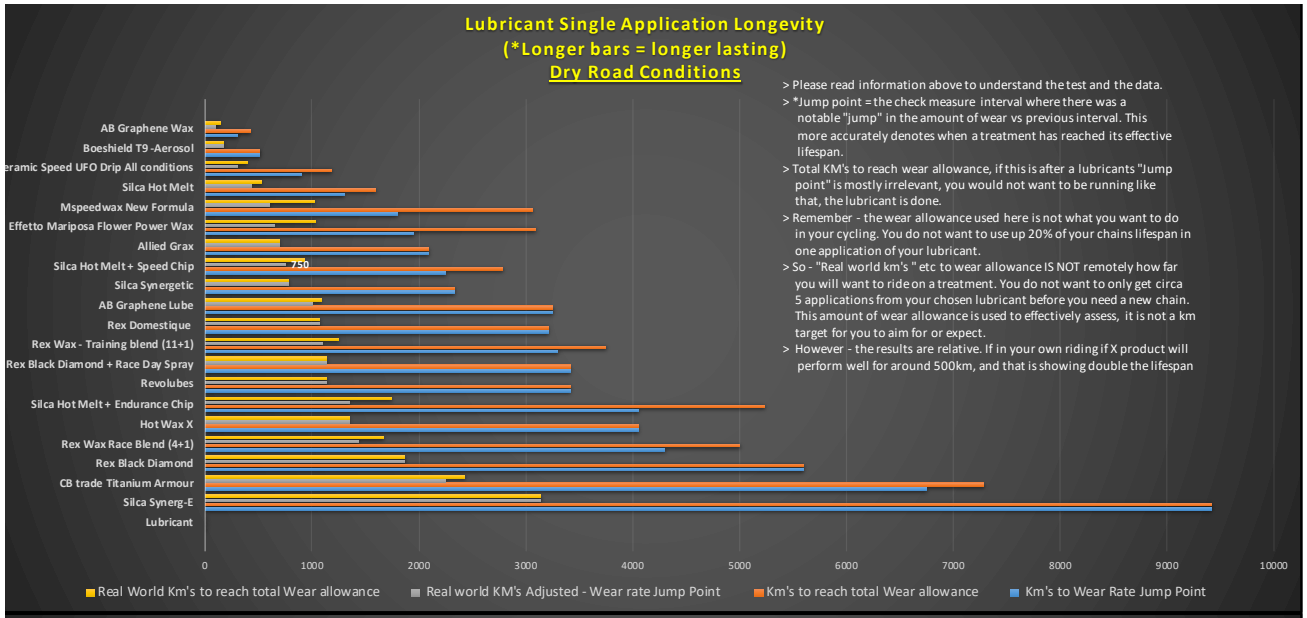
As such the JUMP POINT is used to assess a lubricants lifespan. If it gives out at 500km but it takes another X kms to reach wear allowance, effectively we are just now higher friction wearing the chain, in reality we would not want to be riding the lubricant treatment past the point where it clearly gave out, so the treatment longevity rating is given based on km's to jump point - if one is present, and total kms to 0.1% if no jump point present.

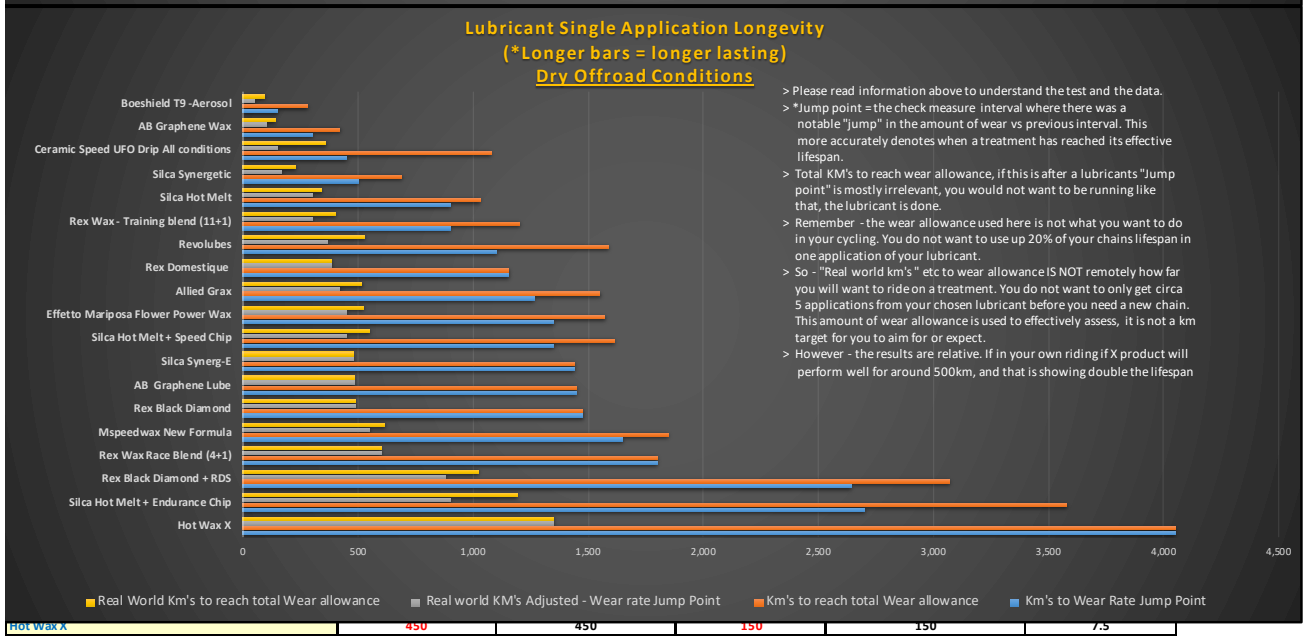
*There are still issues relating this application longevity testing to real world use. There are numerous factors that impact test result vs what you may experience in real world use. Number 1 - standard protocol is for the lubricant to be applied via immersive application as opposed to drip on. We are isolating out any potential initial penetration issues for this test. However some lubricants will exhibit notably better longevity results if applied via immersive vs if applied normally. A stand out here would be say Silca SS drip, where it is hard to get a heavy coating on via normal application - past about 2 or 3ml, any more will just drip off the chain - whereas say UFO drip you can get about a 10ml application to hold on the chain - Hence Silca's hints and tips around "layering" applications with SS drip. Immersive application with SS drip does yield significantly longer treatment lifespan vs what users will experience applying drip lubricant "normally". The difference between an immersive application for X drip lubricant and "Normal" application will vary from one lubricant to another. This test will show the relative treatment longevity difference from one lubricant vs another applied IMMERSIVE - the performance difference may well vary when applied via drip on application.*

*Issue number 2 is that it is not normal to use up 20% of your chains wear life in a single lubricant application. Ie in general you would not expect your chain to be worn out after just 5 applications of your chosen lubricant. For the test I need to run the chain and treatment long enough to assess its treatment longevity, either by finding a clear jump point in wear, or simply how long a wet lubricant takes to use up the wear allowance. Hence showing how many kms the "treatment lasted" to get to test wear allowance has been often mis-understood and incorrectly used or referenced - Ie some media has referred to Silca Synerg-E lasting 9000km on a single treatment. It will not - a) machine KM's are not the same as pedalled km's - hence the "real world" relating where this is divided by 3 to more realistically relate, but also again you should not be running a treatment for that much wear per treatment. You should not be re lubricating such that your chain is worn out after 5 applications, this will mean that for much of the time on any application, you are riding with undesirably high friction and wear. As a very general guide (depending on lubricant application longevity, contamination it gathers per application based on lubricant properties, your riding, your maintenance etc) - typically one should expect really anywhere from 20 to 50 applications of their chosen lubricant before a chain reaches its wear allowance, there should be say circa 2 to 5% use of your chains lifespan per application -* ***NOT 20% .***

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!

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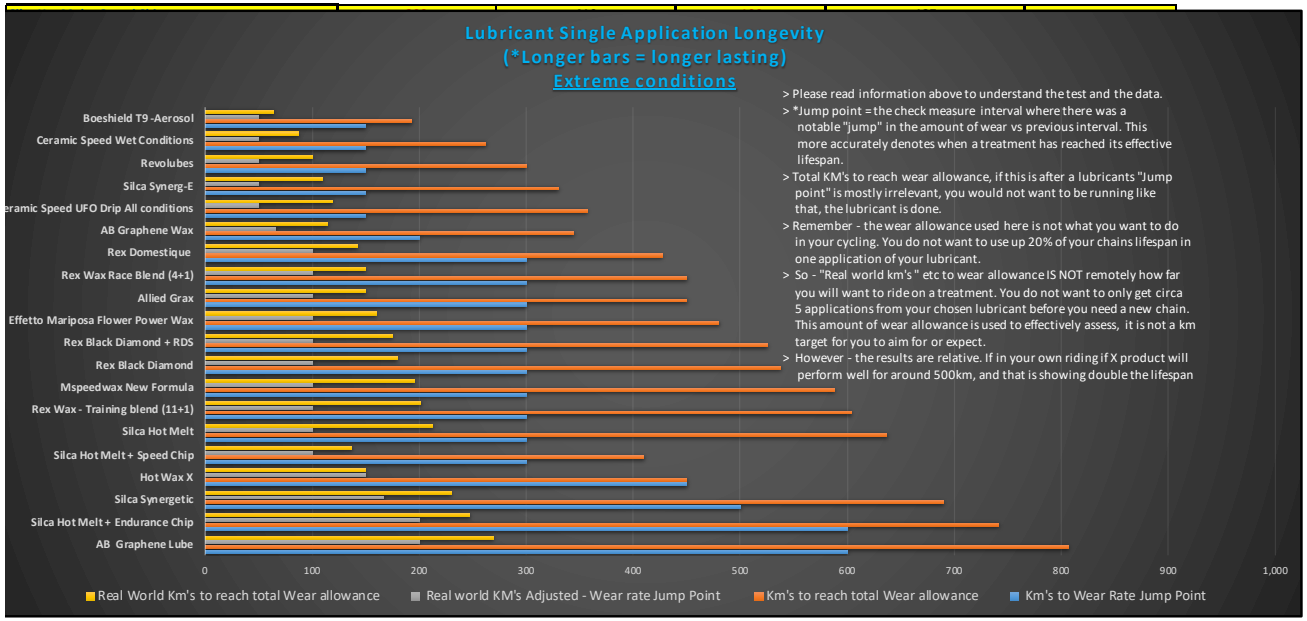
|---|---|---|---|---|---|
| Hot Wax X | 450 | 450 | 150 | 150 | 7.5 |


Lubricant Single Application Longevity
(*Longer bars = longer lasting)
Extreme conditions
> Please read information above to understand the test and the data.
> *Jump point = the check measure interval where there was a notable "jump" in the amount of wear vs previous interval. This more accurately denotes when a treatment has reached its effective lifespan.
> Total KM's to reach wear allowance, if this is after a lubricants "Jump point" is mostly irrelevant, you would not want to be running like that, the lubricant is done.
> Remember - the wear allowance used here is not what you want to do in your cycling. You do not want to use up 20% of your chains lifespan in one application of your lubricant.
> So - "Real world km's " etc to wear allowance IS NOT remotely how far you will want to ride on a treatment. You do not want to only get circa 5 applications from your chosen lubricant before you need a new chain. This amount of wear allowance is used to effectively assess, it is not a km target for you to aim for or expect.
> However - the results are relative. If in your own riding if X product will perform well for around 500km, and that is showing double the lifespan
Boeshield T9 -Aerosol
Ceramic Speed Wet Conditions
Revolubes
Silca Synerg-E
eramic Speed UFO Drip All conditions
AB Graphene Wax
Rex Domestique
Rex Wax Race Blend (4+1)
Allied Grax
Effetto Mariposa Flower Power Wax
Rex Black Diamond + RDS
Rex Black Diamond
Mspeedwax New Formula
Rex Wax - Training blend (11+1)
Silca Hot Melt
Silca Hot Melt + Speed Chip
Hot Wax X
Silca Synergetic
Silca Hot Melt + Endurance Chip
AB Graphene Lube
0
100
200
300
400
500
600
700
800
900
1,000
Real World Km's to reach total Wear allowance
Real world KM's Adjusted - Wear rate Jump Point
Km's to reach total Wear allowance
Km's to Wear Rate Jump Point