

Zero Friction Cycling



A Bit About Smoove.

Smoove proved to have some outstanding performance during testing, hence its addition to ZFC product selection. However, just like Squirt (also a wax emulsion lube), it did demonstrate that some extra attention re application process is highly recommended to ensure this lubricant penetrates through to the pin on a properly cleaned chain.

In initial testing both smooove and squirt showed initial high wear rates which subsequently improved as testing continued – the opposite for most drip lubes which would record lowest wear rates on clean chain with fresh lube and then deteriorating results as test continued – which was expected.

So if you properly clean your chain of factory grease / previous drip lube – again highly recommended – this guide will assist in ensuring you achieve proper penetration to pin on your first lube, and have outstanding performance and low wear from ride number one on Smoove.

Cleaning chain for Smoove

Properly cleaning your chain makes a big difference re the performance and cleanliness of running Smoove. Smoove is a wax emulsion lube – a blend of very special waxes in a water based carrier. To work its magic to best effect and remain clean for a long time, it needs access directly to clean chain metal.

Mixing it with factory grease / previous drip lube – it is not a great thing to do at all. You will be greatly compromising the performance and cleanliness of Smoove. This is true for pretty much all top lubes. Mixing with a mineral oil based lube or packing grease – it's like mixing a 5 star restaurant meal with mouldy food scraps from the bin – why would you.

On new chains factory grease is quite stubborn, and it is critical to ensure the INSIDE of the chain is clean of factory grease. Video's showing cleaning chain by wiping the outside of chain after applying something externally are insufficient. Trust me on this. Video's like this abound to cater for the majority public who might be a bit put off by removing chain to properly clean.

If you cannot remove chain to properly clean, then ok – do the best you can with chain in place – just be aware you will not be able to achieve the same level of clean as removing chain. Removing and re-installing chain using master links is very easy.

Properly clean chain by;

- Remove chain or put new chain in container of mineral turps, and allow an overnight soak.
- Next day agitate, pour out turps, replace with fresh turps, and give a good agitated shake in container.
- Pour out mineral turps and repeat same with methylated spirits. Methylated Spirits is basically pure alcohol and ensures no film is left behind from cleaning. No film means UFO D has perfect access to bond with chain metal.
- Dry (hair dryer works great).
- Why mineral turps? Its cheap, and its clean leaving a low amount of film behind for methylated spirits to deal with. Many degreasers, or using petrol, diesel etc – they leave a heavy film behind, and often do not dissolve grease as well.

If cleaning an existing chain – you do not need the overnight soak as any grease / lube will be oxidated and readily dissolve, however be prepared to use a lot of product to properly clean. First agitated bath the turps will go instantly black. Next bath the mineral turps will go

black. Repeat, repeat, repeat, repeat until mineral turps come basically as clear as when went in (usually 2 to 3 litres later), and then finish off with methylated spirits rinses. If you have an ultrasonic it is after all the heavy lifting has been done with agitated baths that you move to ultrasonic to get into all the micro fissures and nooks and crannies. There is no point going straight to US as solution will be black in no time and then it is similar to trying to get clean glassware from filthy sink water – you are just wasting time. Ultrasonics are the final step for a perfect clean when the heavy lifting has been done.

So if you have US cleaner, smash through the initial cleans first with agitated container baths, then when achieved a very clean state, move to 1 or 2 ultrasonic cleans with mineral turps and 1 or 2 ultrasonic cleans with methylated spirits.

**** Do not underestimate the impact of a properly clean chain! A clean chain is a fast chain – here's some calculations from Jason Smith himself on just how much action is happening inside your chain as you pedal along;**

There are 8 engagement and disengagement points. 2 x ring, 4 x PWs, 2 x cog.

Therefore, $95\text{rpm} \times 53\text{T} \times 8 = 40,280$.

Now, if you take your approach further by looking at the unique sliding surfaces, that would be 40,280 times:

left inner plate and roller

right inner plate and roller

left inner plate and pin

right inner plate and pin

and then for each of these 4 interfaces, you have the high pressure and low pressure areas (faces and sides)

therefore, I see 8 unique sliding areas.

$40,280 \text{ times } 8 = 322,240 \text{ per minute.}$

That is a huge amount of mechanical action happening in your chain as your pedal along. Just a tad bit more going on there than with your bearings. This is why even a little contamination slows things down. This is why in general no matter what you are using, just properly cleaning your existing chain will save around 3 watts.

If you are unsure re removing chain / using master links, or anything – email me, call me, text me.

Applying Smoove

Okay again the devil really is in the detail here. It isn't complicated – but short cut things and the experience may vary a lot.

Smoove's viscosity is sensitive to temperature. In general it is fairly high viscosity and this is why it can take time to properly penetrate to pin and disseminate across. A poorly lubricated pin will have higher friction and wear rate initially than is desired.

It's perfect temperature for application for both chain and smooove is around 30 to 40dg, in which case its penetration will be much better.

A little bit of liquid applied to a cool chain will itself cool almost immediately and its viscosity with thicken again quickly, so skimping on warming chain may dent penetration to pin.

Recommended process is;

- **Warming Smoove** – place in a cup of hot water from tap. **Do not use hot water from kettle or microwave.**
- **Warming the chain!** - Try not to skimp this bit – even if Smoove is warm, if apply to cool chain – even 22-23 degree's room temperature chain – Smoove will cool almost immediately.

Heating the chain is a bit of trick. Trying to heat on the bike with a hairdryer or heat gun doesn't work so well as the chain rings and cassette act as a heat sink and take all the heat away. Heating in the oven is tricky too – I often ended up with a chain that was about 80 to 100 degree's –way to hot and easily a bit burnies to handle – and that temp may damage lube.

Easiest by far – remove chain, pop into a small aluminium bbq tray – wearing dishwashing gloves or similar, heat up chain in tray with hairdryer / heat gun – you will get it to 40 to 50 degrees very quickly and easily, and so even with time taken to re install on bike – chain is at perfect temperature. Take Smoove out of cup of warm water and apply.



- Remember you really need to apply on the bike with chain in 11t cog and small chain ring for maximum link articulation whilst applying to ensure best penetration. So whatever your heating method, remember it needs to still be warm (not too hot to touch as that may be too warm and damage smooove – it just needs to be warm, not a cool chain).
- Really back pedal a lot to work in, and even go for a couple mins light spin to help work it in, then wipe clean all excess from the outside of chain.
- **APPLY THE NIGHT BEFORE.** Smooove sets to a plastic like state which is what makes it very resistant to contamination. It is also non shedding which makes it a very long lasting application.

Post wet ride care

Smooove is very long lasting and tested extremely resistant to dry contamination, and was highest performing drip lube tested in harsh wet conditions.

However – water provides the medium for contamination to enter the chain, and being a non shedding plastic type wax, it has no real mechanism to move contamination back out again. As only a very small amount is applied on re lube, there is very little flush cleaning (there is very little with drip lubes in general, even ones you drizzle on).

So to a degree post wet ride you will continue to be running a highly contaminated lubricant for every ride after in the sunshine unless you do some maintenance. Smooove is great drip lube, but the properties that make it one of the best drip lubes also means that some maintenance post wet rides is a very very good idea re low friction performance and chain wear longevity. (In reality this is pretty much true for practically all drip lubes – not just smooove – some may have a some level of flush cleaning or ability to move some contamination out – but lubes that claim they clean as they lube – it is a very loose definition of clean. It is akin to having a sink full of filthy water from washing up after a party. Pull plug for 3 seconds and turn on tap for 3 seconds before putting plug back in. Is the water in your sink now clean?)

Step 1 – Boil the kettle. Wearing thick rubber gloves swish chain around in boiling water.

***DO NOT SHAKE IN A CLOSED CONTAINER – SHAKING RELEASES STEAM, PRESSURE WILL EXPLODE THE LID OFF AND YOU HAVE A HIGH RISK OF SCALDING BURNS**

Most waxes do not respond readily to most solvents, but they melt at around 60dg celcius. Boiling water will melt and dissolve off the bulk of the wax taking the bulk of the contamination with it.

Step 2 - Give an agitated rinse in container with mineral turps. Here you can put lid on and go nuts. Most of the waxes have some mineral oil content, so the turps will take care of cleaning that. Feel free to do multiple baths until metho comes out basically as clear as it went in.

****IF YOU HAVE AN ULTRASONIC AFTER TURPS IS COMING OUT CLEAR IS WHEN YOU WOULD MOVE TO ULTRASONIC CLEAN**

Step 3 – Final agitated rinse with methylated spirits. Metho is basically pure alcohol and ensures no film is left behind, and so the special waxes in Smoove when re-lube have clear access to chain metal to bond with chain metal.

Again if you have an Ultrasonic – Finishing with US metho bath is great (but by no means necessary – agitated container method is perfectly fine. Ultrasonic is really for those chasing every fraction of a watt and is usually used just for race chains).

Step 4 – Blow dry with hair dryer for 5 mins. Then follow these detailed application instructions.

Gunk Build up?

Smoove can be one of the cleanest drip lubes – but being non shedding – let me tell you every molecule of smoove you apply will remain on your drive train somewhere. Even applying very small amounts as per instructions – your drive train will remain impressively clean for a good period, but inevitably some build up will occur.

Wax emulsion lubes like Smoove / Squirt are a bit more elbow grease to move as they do not respond to most solvents. One trick is to use boiling water on as many bits as feasible as this melts / softens the build up making cleaning easier – moving to your favourite cleaner as you go when it is softened. Most dedicated bike cleaners work well but can be expensive – I tend to use SCA disc brake cleaner from auto parts stores – disc brake cleaners are a fairly powerful solvent and leave no residue, and is \$8 for a good size pressurised can. That in conjunction with small pipe cleaning brushes and a microfiber cloth – you get pretty

dialled at cleaning. I do a lot of customers bikes. (*take care with disc brake cleaner and paintwork – I haven't seen it damage any but just in case use cloth to prevent spray from getting onto paintwork if possible. I have heard morgan blue cleaning products are great if you want cycling specific cleaning products.

Even if no wet rides – a proper clean every 2000 or 3000km of chain and drive train will be great. A clean chain is a fast chain and a low wearing chain. As is a clean drive train.

Consider a dedicated race chain

Cleaning up the same chain you are hammering away in training, where you are wearing off the chains low friction coatings, have “x” level of elongation wear etc – it is not the best way of going about things.

You are always going to need another chain sooner or later, so simply pre buying your next chain to be a dedicated race chain makes a heck of a lot of sense. You can clean it properly for Smoove, and re apply ready for next race much more easily. With Smoove – it does layer effectively and also due to the initial penetration issue fun – I would not generally fully clean a Smoove prepped chain post normal dry conditions rides – just re – apply as per detailed instructions here.

In ZFC testing Smoove chain recorded only 2% wear in the 1000km from 2000 to 3000km, post dry contamination block between 1000km and 2000km. So no dry contamination really got it. It recorded 19% wear in the first 1000km due to initial penetration issues – which lead to much investigation re initial application.

So Smoove is a bit different in that in general full cleans and re applications between rides if just normal dry riding conditions may not yield any benefit, and there is some risk re proper penetration to pin each time post full clean.

Post wet ride however, ensure your race chain is fully cleaned and full advanced application as above followed.

When training chain hits 0.5 wear, race chain moves over to become new training chain, buy new chain to be dedicated race chain. A simple, easy and very smart way to operate.

For further information on preparing race chains at home, pls contact me for the guide I made up for molten speed wax race chains, and replace waxing with UFO D. But this guide goes into greater detail re chain break in / ultrasonic cleaning etc.

If you have purchased or were going to purchase a MSW or UFO race chain – then Smoove can be a great choice for those not looking to switch to waxing to keep the good times rolling. These chains have had a lot of work done that you have paid for re specific break in, ultrasonic cleaning, waxing with super fast wax, wax break in, race powdering. So if you do not fancy doing all that at home – Smoove is great to keep that chain a dedicated race chain and not have all that prep wasted by moving it to training chain after original treatment has worn off.

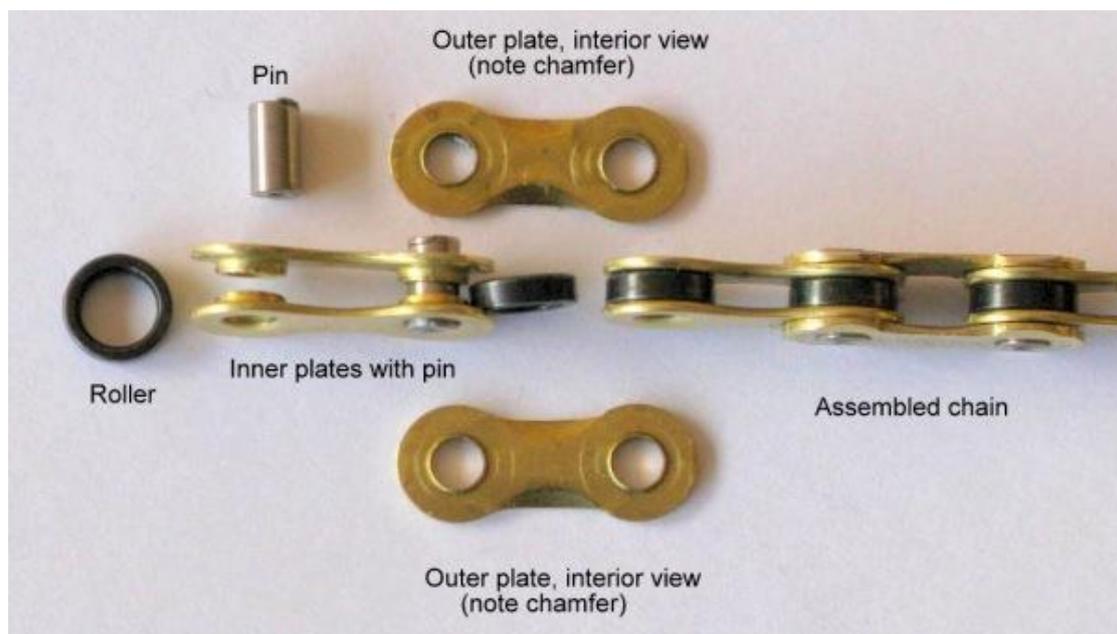
Hope this helps – again apologies my instructions are somewhat longer than the manufacturers – but by taking the time to read this you should avoid a lesser than hoped for experience by ensuring proper prep and proper application, and I am rather allergic to customers not having a great experience with anything purchased from ZFC.

Again – if in doubt on any fronts – do not hesitate to contact me (all details on website).

Thanks and ride fast!

Addendum

Pics of the challenge at hand for Wax Emulsion Lubes to penetrate to properly to pin. Hence this guide – ZFC selects its products more carefully than any other retailer, and along with that, ZFC wants to ensure customers have the best information and understanding possible re products we sell to attain lowest friction and lowest wear rates. Remember every watt of friction you save in your chain is a watt of energy not spent eating through your metal drive train parts and propelling your forwards faster for the same output instead. Running a top lube and with good maintenance is the easiest watts saved AND \$ saved you can get – it is one of cycling's best win win scenario's – and is why ZFC focusses so much investment in finding the best lubricants and chains.



Pin is riveted to outer plates & does not move. Inner plate articulates around pin. When roller contacts teeth roller stops, and so inner plate also articulates inside roller.



Note amount of pin width that requires lubrication - inner plate shoulders articulate around this area under full rider load.

Note lubrication gap through which lubricant must penetrate & disseminate across pin width. Any contamination gathered by lubricant also needs to get back out of this gap, and back out past roller to outside of the chain.... Tricky

