

CARBON FOOTPRINT



NO PUNCTURE HASSLE

TUBELESS TYRE SEALANT

SAVES WASTE AND IS

CARBON POSITIVE



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ABOUT INTERTEK



Intertek is a leading Total Quality Assurance provider to industries worldwide. Intertek's network of more than 1,000 laboratories and offices and over 42,000 people in more than 100 countries, delivers innovative and bespoke Assurance, Testing, Inspection and Certification solutions. The Intertek Sustainability team has over 20 years of experience in carrying out carbon footprint analyses to measure the environmental impact of products and processes. Intertek's sustainability experts have supported many of the world's best known companies with their sustainability efforts.

A faint, dotted world map serves as a background for the statistics section.

More than
100
Countries

More than
40,000
People

More than
1,000
Laboratories
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CARBON FOOTPRINT



Carbon footprint is a measure of the environmental impact of a product. Carbon footprint adds up the global warming impact of all energy, materials and processing used to make a product. For instance, in the case of Muc-Off tyre sealant and bike tyres, both are made from polymers and other materials in facilities that use energy. The global warming impact of the energy and materials used to extract oil, process oil into polymers, transport the materials and make them into products are summed up in specialist software to generate a carbon footprint. This carbon footprint is a fair, science-based measure of the true environmental impact of a product, including everything that went into making it.





CONTEXT

Muc-Off commissioned Intertek to produce an independent carbon footprint environmental analysis of its tyre sealant product.

The aim was to see if the tyre sealant is carbon positive.

Tyre sealant takes energy and materials to make, but it saves tyres. Tyres take more energy and materials to make than tyre sealant does.

Therefore, using the tyre sealant should result in a net environmental benefit. If the benefit is larger than the environmental impact of making the product, then the tyre sealant is carbon positive.

Is that the case? This carbon footprint analysis was designed to find out if Muc-Off tyre sealant is **carbon positive**.





CARBON FOOTPRINT SUMMARY RESULTS

CARBON FOOTPRINT		Muc-Off tyre sealant alone	Tyre with Muc-Off tyre sealant	Tyre without Muc-Off
IPCC GWP 100a	kg CO2 eq	0.0875	1.7530	2.1652

These carbon footprint results show that Muc-Off tyre sealant reduces environmental impact. In individual cases, the results will vary depending on how often punctures occur and other factors. Intertek analysed various scenarios, from a worst case where the tyre sealant saves only 10% of tyres, to a best case where the tyre sealant saves 50% of tyres. All these scenarios are shown in the Appendix. Here, they are averaged to produce a general saving.



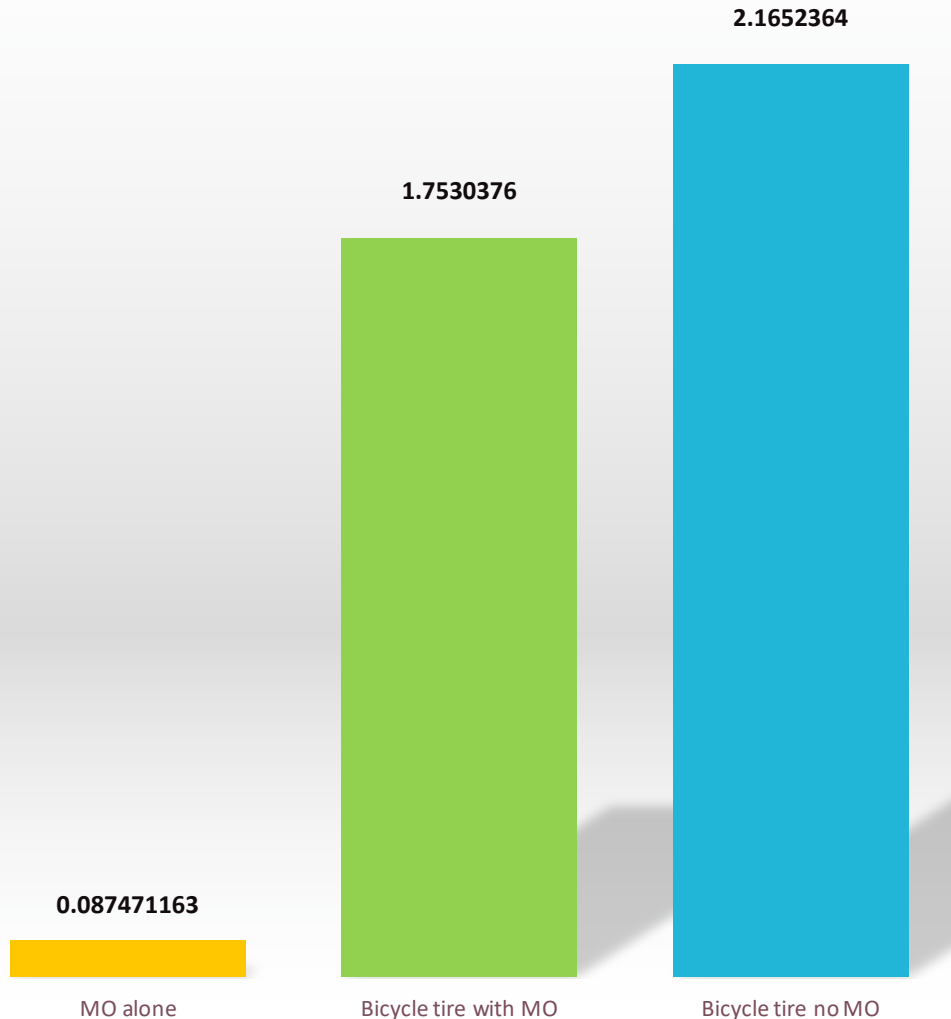
CARBON FOOTPRINT	Unit	Muc-Off tyre sealant alone	Tyre with Muc-Off tyre sealant	Tyre without Muc-Off
IPCC GWP 100a	kg CO2 eq	0.0875	1.7530	2.1652

What are these results telling us?

- The “Muc-Off alone” result shows that the carbon footprint of the amount of Muc-Off tyre sealant that goes into a typical bike tyre is far lower than the carbon footprint of that tyre. This is not unexpected, since the tyre sealant weighs far less than the tyre it goes in.
- A tyre with tyre sealant lasts its full lifetime, because Muc-Off protects it. The “Tyre with Muc-Off” result shows the carbon footprint of a tyre that lasts its full lifespan because it has tyre sealant in it.
- Tyres without Muc-Off may not last their full lifespan because they may get a puncture. The “Tyre without Muc-Off” result accounts for this. The result is higher than the “Tyre with Muc-Off” result because of the extra tyre wastage that occurs without Muc-Off tyre sealant.



CARBON FOOTPRINT IPCC GWP 100a kg CO₂ eq



Tyres with Muc-Off have, on average, a

19%

lower carbon footprint

than tyres without Muc-Off

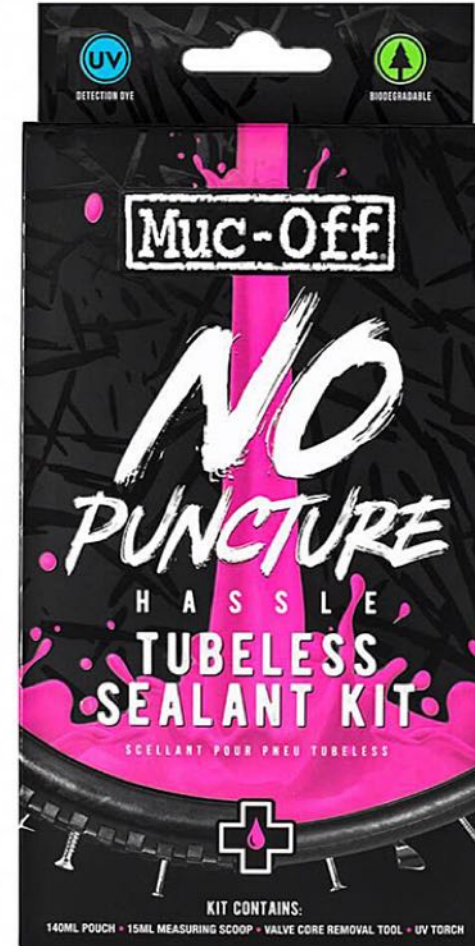
- The carbon footprint of a bike tyre without Muc-Off is 2.1652 on average, whereas the carbon footprint of a tyre with Muc-Off is 1.7530 on average – this means the saving is 0.4122 KgCO₂e
- Muc-Off reduces carbon footprint by 19%
- The saving (0.4122) is about 5 times greater than the carbon footprint of the tyre sealant itself (0.0875)
- This means Muc-Off tyre sealant is clearly carbon positive



DOES THE CARBON FOOTPRINT ANALYSIS PROVE THAT MUC-OFF IS CARBON POSITIVE?

YES. The analysis found that the carbon footprint saving achieved by using Muc-Off tyre sealant in bike tyres is 5 times greater than the carbon footprint of the tyre sealant. In other words, Muc-Off tyre sealant achieves significantly more environmental benefit than the environmental impact of manufacturing it.

Muc-Off is a carbon positive product. The magnitude of the benefit is significant, which means that even if other carbon footprint experts did a different study with different assumptions and different data, the results would be likely to show that Muc-Off is carbon positive. Therefore the results are considered reliable.



HOW MUCH OF AN ENVIRONMENTAL SAVING IS THIS?

- If one million bike tyres per year used Muc-Off tyre sealant instead of not using it:
- The CO₂ saving would be an estimated 0.4122 million KgCO₂ per year
- This is equivalent to the CO₂ absorbed by approximately 20,000 trees each year
- **So the potential benefit of using Muc-Off in a million bike tyres is similar to the benefit of planting around twenty thousand trees**



HOW MUCH OF AN ENVIRONMENTAL SAVING IS THIS?

- If one million tyres per year used Muc-Off tyre sealant instead of not using it:
- The CO₂ saving would be an estimated 0.4122 million KgCO₂ per year
- This is equivalent to the annual CO₂ emitted by approximately 150 cars (each driving 10,000 miles per year)
- **So the potential environmental benefit of using Muc-Off in a million tyres is similar to the benefit of taking 150 cars off the road, making roads far better for bikes!**



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APPENDIX



FURTHER DETAILS ON THE CARBON FOOTPRINT ANALYSIS

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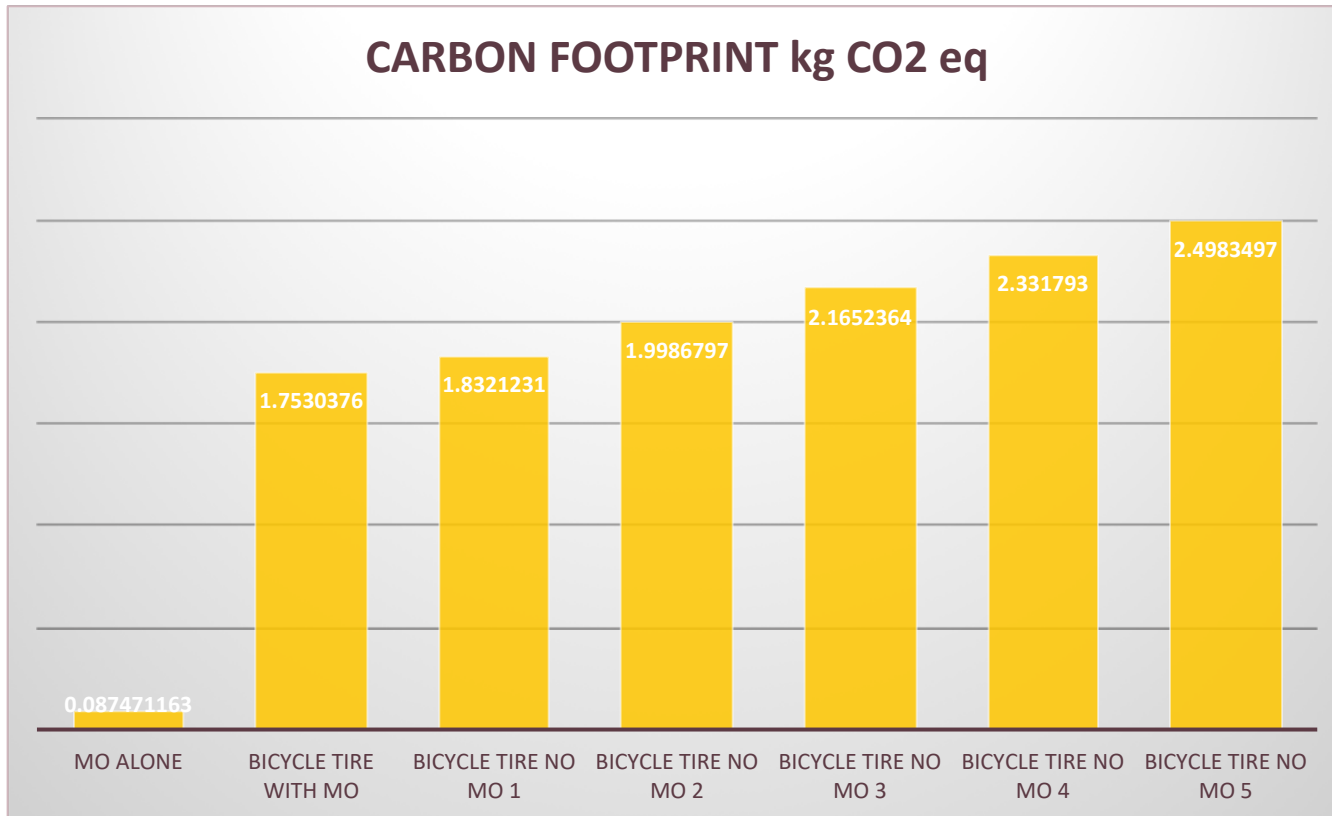
December 2018



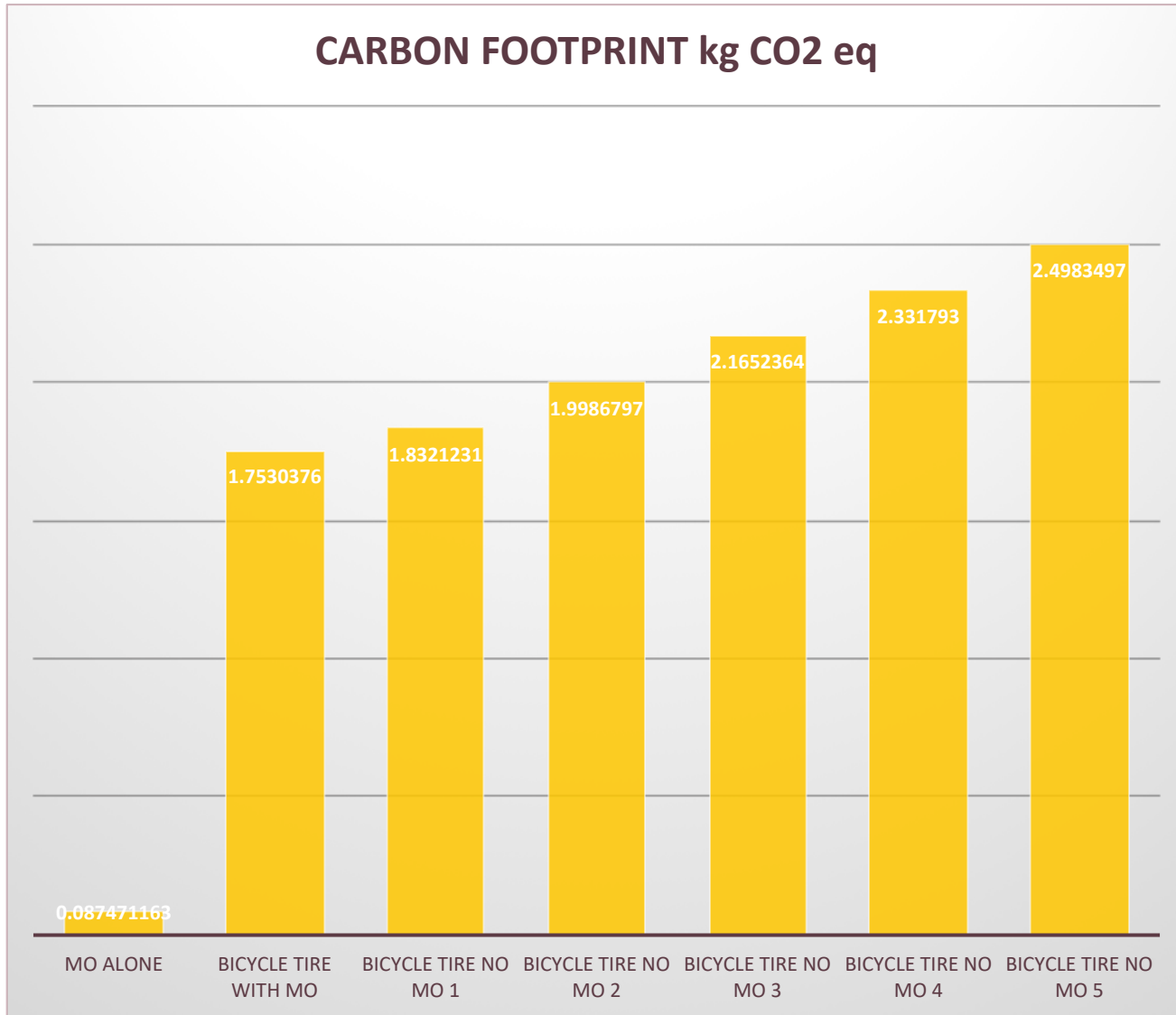
CARBON FOOTPRINT DETAILS



The main part of this report shows the overall results: the combined results of a bike tyre in various scenarios (10%, 20%, 30%, 40%, 50% extra tyre wastage without Muc-Off). The results were combined in the main report for the sake of clarity, but in fact carbon footprints were carried out individually for each scenario. This Appendix gives those details.



CARBON FOOTPRINT DETAILS



The graph showing all results is difficult to see, because the carbon footprint of Muc-Off tyre sealant is so low it hardly shows on the graph. However, the overall trend is clear: the more punctures that are assumed to occur without Muc-Off, the more tyres go to waste, and the higher the carbon footprint. In other words, the more punctures Mu-Off prevents, the bigger the environmental benefit.





ALL CARBON FOOTPRINT RESULTS

The results are proportionally almost identical, which is why they were combined to produce one general set of results for the main part of the report. For the record, here are the numbers shown in the previous graphs:

CARBON FOOTPRINT	Unit	MO alone	Bicycle tire with MO	Bicycle tire no MO 1	Bicycle tire no MO 2	Bicycle tire no MO 3	Bicycle tire no MO 4	Bicycle tire no MO 5
IPCC GWP 100a	kg CO2 eq	0.087471	1.753038	1.832123	1.99868	2.165236	2.331793	2.49835

It can be seen that:

- The carbon footprint of Muc-Off tyre sealant is far lower than the carbon footprint of the tyres it goes in
- The carbon footprint of tyres with Muc-Off is significantly lower than the carbon footprint of tyres without Muc-Off
- In all wastage scenarios (10% to 50%), the carbon footprint of tyres is worse without Muc-Off
- In all scenarios, Muc-Off tyre sealant is carbon positive



HOW WAS THE ANALYSIS CARRIED OUT?

Intertek used the world's most widely used life cycle assessment software and data to carry out the carbon footprint: SimaPro 8.4 with Ecoinvent 3.4. Standard LCA assumptions and methodologies were used. The work was carried out in December 2018.

This was a streamlined carbon footprint using widely-accepted generic data, and using notional assumptions for extra tyre wastage and other factors. Real world testing of tyres was not carried out. Therefore, other studies produced by other parties would be likely to produce somewhat different results, depending on the assumptions made and data used. However, the overall carbon positive result is so significant that Intertek is of the opinion that the **carbon positive** finding would be achieved no matter what reasonable data or assumptions were used.

This is a common-sense result based on real world factors:

- The carbon footprint of Muc-Off tyre sealant is clearly going to be lower than the carbon footprint of the tyre it goes in, because a tyre is so much heavier (uses far more material and energy)
- Therefore Muc-Off only needs to save a small amount of tyre wastage to achieve environmental benefit
- As soon as any significant amount of tyre wastage is avoided through the use of Muc-Off, the carbon footprint of the saving quickly becomes larger than the carbon footprint of manufacturing the Muc-Off tyre sealant
- Therefore, Muc-Off tyre sealant is carbon positive under virtually any reasonable scenario



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