

1. Where can NanoVit® be applied?

NanoVit® can be mixed with any crude oil raffinate such as oil, grease or synthetics etc. The mixture however is specifically defined to each application. NanoVit® provides a system-compatible friction reduction and increases the wear protection of drive units and mechanical operating processes with metal friction surfaces. It can be applied in any oil-bearing aggregate, if friction reduction is requested. The carrier oil of each NanoVit® product is adjusted to the lubricants of the aggregate (engine/gear/differential).

2. How is NanoVit® effective?

The function of NanoVit® is to clean the friction surface and to protect it against further wear and adherence of fouling.

1. step: cleaning/development of a wear protection coating

2. step: optimisation of the wear protection coating

NanoVit®-MotorRenovator:

Completely dissolves the jamming residues (carbon particles, resin and lacquer). The particles are absorbed by an oil filter. Therefore the replacement of the filter is urgently indicated. Elastomeric bonds and other gaskets are not affected. Simultaneously a coating is formed on the friction centres, which protects the metal surfaces against wear and reduces the friction.

Nanovit® gears and differential:

Reduces wear and forms a protective coating on the friction centres.

3. Why are flacons with different contents of 125 ml and 250 ml available?

The flacons contain different amounts of Nanovit® concentrate in relation to the oil consumption of the aggregate. The size of the flacons is solely a differentiating feature to the truck and commercial vehicle products.

4. Why is the treatment of engine, gear and differential recommended?

Nanovit® reduces the wear in aggregates. Therefore less fuel is required and fewer emissions are produced. The haulers benefit from low fuel consumption and the reduction of emissions. For this reason it's of great advantage to prepare the three most important aggregates such as engine, gear and differential.

5. Why does Nanovit® take time to be effective?

Nanovit® operates in several stages. Each active component has its particular function. Nanovit® requires sufficient compression, temperature and time to form the complete effect. Hereby contamination and application intensity of the aggregate are time determining factors. A concrete time frame for each treatment can not be defined.

Exemplification:

The engine of an ocean liner requires 600 rot/min and Nanovit® makes impact after about two month. A truck engine requires 2000 r/min and a kilometrage (service performance) of 700 to 1000 km. An automobile engine requires 5000 rot/min and a kilometrage of about 500 km to 700 km. A motor-bike requires 12000 rot/min and a kilometrage of 300 km to 500 km.

6. Does Nanovit cause damage?

No it does not! NanoVit® neither changes the chemical composition of lubricants nor consists of destructive substances. The active components are modified:

- amorphous silicon dioxide (SiO₂)
- aluminium oxide (Al₂O₃)
- plasma treated graphite (C)

Particle size approx. 14 nm / surface approx. 100-150 m²/g

Please note that NanoVit® reduces wear and is to apply solely for a targeted wear reduction.

7. Does the application of NanoVit® limit the warranty period?

No it does not! The producer warranty remains completely as solely approved lubricants are applied. The basic quality persists as the composition is not modified. All products are covered by the ALLIANZ insurance provider Europe-wide.

8. Is NanoVit® certificated by certain institutes?

The effectivity of Nanovit® has been certified by the MOT Thuringia.

- NanoVit® MotorRenovator: {PBN:8141.076.04 MR}
- NanoVit® Gears and Differenzial: {PBN:8141.076.04 GR}

For the NanoVit® mixture a particle diameter of approx. 14 nm was determined {OKN: 8141.055.07}. The Lübeck Technical College determined a potential force of the coating of approx. 12000N {PBN: KT-TB4(3)-2007}. The Saint Petersburg University achieved comprehensive documented evidences of conformity.

9. What is the appropriate oil dosage?

Please take always the oil capacity of the aggregate (note the producers' technical advice) in consideration when applying NanoVit®.

Exemplification:

0.5 litre NanoVit® is filled into an engine with an oil capacity of approx. 40 litres. Hereby the oil volume is changed marginally by 1.25 percent. But if they fill to a gears oil volume of 2 litres additionally 1 litre of NanoVit®, the volume varies by 50 percent. Therefore the adequate amount of oil is to drain before adding NanoVit®. Please note the instructions for use!

10. Does the application of NanoVit® substitute an oil change?

NanoVit® performs the task to reduce wear and friction. Therefore appropriate additives are added to the lubricant, which use themselves up continuously. The lubricant matures and gets unusable after a period. The first indication here for is the drop in base capacity and viscosity. By the use of NanoVit® the friction in the aggregates is reduced and the surfaces are protected in an optimal way. The lubricant is mechanically, thermally and chemically less stressed. The detergents are not used up so fast and the durability of the oil is considerably extended. NanoVit® delays but does not substitute an oil change.

11. Does an oil change discharge the nano particles so that the product loses its efficiency?

The active components are bound in the lubricant. They adhere to the metal surface of the aggregate. After the formation of a wear protection coat are no free nano particles in the oil available. The product effect remains up to five oil changes.

12. Is NanoVit® an additive?

Additive signifies addition. Any oil contains additives. In high performance lubricants their share amounts to 30%. NanoVit® is not an additive – it is finally oil, which conforms to the appropriate equipment advices. Please refer to the safety data sheets.

13. Can NanoVit®-oil be mixed with other oils?

NanoVit® is basically mixable with all oils. It is important that the oil (-partner) is comparable and of an identical category (mineral oil, semi-synthetic oil, full-synthetic oil, biogenic oil). Please note the producers instructions if you choose a suitable brand. This applies especially for vehicles with an up-to-date catalyzer. Should you use specific lubricant-oils or –greases please contact us. We are able to combine the NanoVit®-mixture with any lubricant-medium.

14. Which difference in effect shows NanoVit® in comparison of new vehicles and vehicles with high kilometrage?

Like the product name indicates NanoVit® MotorRenovator renovates. Renovate also signifies to renew sth. The friction surfaces of vehicles with a high kilometrage show more signs of wear as the ones of new automobiles. NanoVit® works especially well with vehicles with high run achievement.

15. Which coat thickness forms NanoVit®?

The balance in dissolution and development of an elastic coating starts with a distance of 1 to 1.5 µ between the friction surfaces and causes a decreasing friction coefficient. The distance between the friction surfaces is limited and must not differ more than 25 % of the size intended in the construction of the engine parts. The thickness of the micro coating varies between 0.0001 up to 0.1 mm.

16. Can you describe the island position features of NanoVit®?

NanoVit® is a mixture of three different nano active components which are solely active in combination of all three in a body. Each of the components is produced, combined and activated by a unique method. These processes are unique and present the major part of the “know how”. Effect and mode of operation depend on the particular substance character and their application- and activity concentration. Currently are products on the market, which contain appropriate NanoVit® mixtures. Other products advertise with apparent effects. But here it is a question of other active components and processes, which are not comparable with NanoVit®.

Please do not hesitate to contact us if you require further details!

17. Which master tools are to apply to measure the fuel consumption?

The fuel consumption is technically determined on a roller dynamometer test bench by the application of NEFZ for vehicles up to 3.5 tons. The values for engines of commercial vehicles- and the industrial sector are determined on a motor test bench.

Automobile drivers calculate their consumption as follows:

tank vehicle fully up

Check the tire pressure

Example for calculation:

driven km- 581

filled up 36.21 litres

$$\frac{36,21 \text{ litres}}{561 \text{ km}} = 0,0645 \text{ litres/km} * 100 \text{ km} = 6,45 \text{ litres auf 100 km}$$

$$\frac{\text{before-after}}{\text{before}} * 100\% = x \% \text{ fuel consumption}$$

Regarding truck tours there are to determine the ton-kilometers and to consider the application intensity.

refer to http://www.presseportal.de/pm/68912/1201193/daimler_ag

The fuel consumption can also be calculated by means of a *fleetboard device*.

18. Which master tools are to apply to measure the oil wear?

-*Tribocheck device* for a oil analysis rapid test

The saturation level (TBN-value) of the oil can be determined by means of this device.

- analysis by an authorised oil check laboratory etc.

19. Which master tools are to apply to measure the emissions?

Exhausted emission tester, emission indicator (inquire for concession), exhausted emission parameter (fuel if possible also diesel)

O ₂	dioxygen	(%)
CO ₂	carbon dioxide	(g/m ³ / ppm, %)
HC	carbon hydride	(mg/m ³ /ppm)
NO _x	nitrogen oxide (sum. parameter)	(mg/m ³ /ppm)
NO ₂	nitrogen dioxide	(mg/m ³ /ppm)
NO	nitrogen monoxide	(mg/m ³ /ppm)
CO	carbon monoxide	(mg/m ³ /ppm)

20. Which master tools are to apply to measure the vehicle/engine performance?

The engine performance of a vehicle up to 3.5 tons is technically measured on a roller dynamometer test bench. The values for engines of commercial vehicles- and the industrial sector are determined on a motor test bench.

It is reasonable to determine the engine compression as a characteristic factor for the modification of performance at the garage.

A direct performance can not be determined by this measurement. It serves as reference point and argumentation base.

Please do not hesitate to contact us if you require further details!