

# Handelshaus Runkel

Biogene Treib- und Schmierstoffe  
Pflanzenöltechnik



INFO 023

## FAQ´s about **DX 52** and **plantanol** Plant oil based fuel-mix for diesel-engines

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### Preface:

**All information about DX 52 assume not using more than 4% and mixing well. You should only use plant oil complying with the requirements of DIN V 51605. Instructions about mix ratio are optional. The amount of plant oil also depends on motor components.**

### **1. What is the effect of the fuel additive DX 52?**

DX 52 is a multifunctional mixture of different components. It improves combustion of plant oils, makes them ignitable in motors and inhibits motor-damaging residues. So it's just possible to use plant oils in standard motors without changing them over. Also shelf life of the fuel steps up to about one year.

### **2. Is DX 52 a pure vegetable product or are there petrochemical ingredients contained?**

DX 52 is now over 98% biological based. Predominantly there are chemical modified alcohols in high concentrated and solving mixture contained. But there is a small amount of petrochemical fraction included. Pure vegetable components aren't available in the favoured form or too expensive. With regard to price and availability it is necessary to use this petrochemical fractions. Concerning harmlessness of the mixture we refer to point 3.

### **3. Is DX 52 or the mixture with plant oil harmless?**

DX 52 is made of a concentrated mixture of different active substances. It is to be handled like diesel as dangerous liquid. Because of high concentration you only need 2% in plant oil fraction, so this is an advantage for logistics and processing. In this mixture there are no relevant environmental disorders. This is attested by an ecotoxicological expert's report.

### **4. Does it make sense to use DX 52/plantanol-diesel in vehicles changed over to plant oil operation?**

In motors changed over the ignitability of plant oil is achieved by preheating. Anyway motor start often is nonsatisfying. Some plant oils are not ignitable only by preheating (for instance gold of pleasure). With DX 52 such oils can be utilised.

Because of there considerable higher flashpoint than diesel plant oils only burn complete in operating temperature of at least 70o C. But often cars have to be started with cold motor. Bad ignition and combustion necessarily result in deposits. This is problematic especially in tractors, because they often idle and don't reach high temperature. The same when running short distances. Residues burn to ashes and lead to engine damage. Those problems can be extensively avoided by using DX 52.

Inefficient burning also produces infiltration of unburnt fuel into crank case. In contrast to mineral diesel plant oil in motor oil don't volatilise, it remains. Above 10% you reach a critical point, motor oil begins to polymerize. This may cause prompt hardening of motor oil. DX 52 provides nearly residue free burning so motor oil keeps almost clean (tested in a city bus after 60.000 km: only 6-8% plant oil residues in motor oil).

Plant oils are perishable. Under unfavourable conditions (light/humidity) plant oil may be unusable as fuel in a few months (fuel silts). DX 52 guards against this process so storage time is increased.

That's why DX 52 i.e. plantanol-diesel make sense in motors changed over.

### **5. Is it possible to use DX 52/plantanol-diesel in trucks or tractors?**

Cars, trucks and tractors agree in burning principles. Therefore you can use the fuel and the additive in every kind of diesel engine. There is adequate amount of thinner to be added. The same applies for construction machines.

Because of special operating conditions of tractors or communal vehicles (motors often idle for any length of time) they don't reach full working temperature. In those cases it is very important to care for complete fuel combustion. Just here the addition of DX 52 has a very positive effect.

## **6. Is it possible to increase plant oil amount by preheating?**

Preheating makes plant oil more thin fluid so it is better usable in motors. But heating only filter is not enough. The feed pipe between fuel injection pump and fuel injector remains cold. Preheating only makes sense if you take action to heat fuel injector and improve ignition (boosted ignition plugs with afterglow).

Heated fuel also contains more power, especially under cold conditions. Preheated motors start better and reach full power in a shorter time, so fuel consumption is reduced. You have less wear because of cold starting.

Preheating temperature should be higher for plant oil than for diesel. Pre-heaters for temperature range of 60-70°C are offered.

## **7. What is the difference between plantanol-diesel and plantanol-diesel 100?**

Plantanol-diesel 100 is a fuel mixture of plant oil and 2% DX 52 additive. Dependent on suitable motor technic (with prechamber) and climatic conditions it is possible to use it all over the year.

In motors with direct fuel injection this is not possible because of high viscosity of plant oil. In this case a thinner is to be taken (diesel fuel). This mixture is then called plantanol-diesel.

## **8. Is it advisable to refuel commercial diesel first before plantanol-diesel?**

When refueling plantanol-diesel the sequence is irrelevant, because both fuels run independent. When using plantanol-diesel 100 it is important to fill in diesel first, because fuel is always ingested from the tank bottom, so the thinner medium is used first.

## **9. What's about guaranteed quality of plant oil?**

In Germany you are only allowed to use plant oil complying with the requirements of DIN V 51605 in motors. There is no final DIN yet, because plant oil is not suited for all test methods like diesel or other mineral fuels. It would be necessary to find new standards. In general you have to take care of specific parameters like phosphate and mucilage. So oil is to be filtrated well. Ignitability may be controlled in test motors.

In any case the quality standards of cooking oil are not relevant for motor use!

## **10. May I use all kinds of plant oil with DX 52?**

In principle all plant oils are suited, but they are different in their chemical properties. So the additive has to be adapted to the particular oil. Also the pour point is important. Maybe it's necessary to add further components to increase flowability in winter (our new product PW 1). Special oils like gold of pleasure or safflower are very qualified because of their deep pour point (-20/-15°C). So use of plant oil depends on climatic conditions and kind of motor.

## **11. Which plant oils appropriate best to use as fuel?**

In the first instance take a look on the possibilities you have on your special location (cost of production, technical appropriateness, ...). Environmental aspects should be prior. So plants which can grow up on soil not suited for food plants are best for environment.

## **12. Is plantanol-diesel/DX 52 hazardous to ground water?**

DX 52 is sorted in water pollution class II like diesel. plantanol-diesel 100 we assess not water hazardous. Against addition of a thinner this may change. When adding diesel you should handle with the mixture like pollution class II. In the end the categorization is made by water protection office.

## **13. Is the fuel DIN-tested?**

Because of its novelty plantanol-diesel is not DIN-tested (see 9.). Probably it would take a few years to develop a DIN in this case. Laboratory testing already has been made.

## **14. What's about guarantee?**

Many people say that there's no guarantee in any case when using a fuel not DIN-tested. This is not right. If there is damage not depending on the fuel manufacturer is not allowed to reject a claim. Our customers using plantanol-diesel since years are contented. We know that normally plantanol-diesel avoids motor damage because of better lubrication.

## **15. Pros and cons of the different possibilities to utilise plant oil as fuel?**

See our Info 011.

## **16. Availability of plant oil?**

All over the world there are more than 400 oil plants. Only a few of them are analyzed. In Germany about 10 sorts were tested. 6 sorts are technically used (rape, soya, gold of pleasure, sunflower, jatropha curcas, safflower). There exist different studies about availability of plant oil, one says 5% of acreage worldwide would satisfy the needs of fuel.

## **17. Which motors are particularly suitable to run with plant oil?**

In principle there is a difference between motors with prechamber and those with direct fuel injection. Our experiences show that elder motors run best, especially when using additional attachments like preheating.

When fuel is injected directly with high pressure it's good for effectiveness, but you have more problems when using plant oil. For this motors a thinner has to be taken.

## **18. What's about unburnt plant oil residue in motor oil?**

Because of very good combustion of plant oil when using DX 52 there is very low accumulation of unburnt plant oil residue in motor oil. So change of motor oil is the same as when running with diesel. Otherwise, when using biodiesel or pure plant oil, you should change motor oil twice as much.

In principle we advise to control oil viscosity at regular intervals, because when there is any mistake in motor technics (fuel injector, glow plugs, bad compression) there is more unburnt residue of plant oil that may cause polymerization of motor oil. In those cases motor should be repaired, if necessary cleaned inside with motor-clean and oil changed.

## **19. Does the motor have increased wear when using this technology?**

No. Because of better lubrication than diesel service limit of motor and fuel injection pump is increased.

**20. Do I need modification of motor?**

No. Plantanol-diesel is to be used in every diesel engine without changeover.

**21. Is it possible to operate auxiliary heating systems with plantanol-diesel?**

In any case mixture of plantanol-diesel should be 50/50. Some heating systems don't work even with this low viscous fuel. It is better to use a separate tank and to fill in diesel or heating oil (Attention: In winter further components like winter-fit have to be added!). According to statements of BOSCH-services you cause no damage, if heating systems don't ignite with plantanol-diesel. Don't mind to try out. Moreover you have the possibility to add more thinner (10-20% diesel).

**22. Change over of motor oil?**

If you use mixture with DX 52 according to our instructions the range of changing motor-oil can be retained (see 18.).

**23. Is DX 52 suited to increase flowability of plant oil in low temperature?**

DX 52 is only to be added 2-4% according to plant oil amount, so the thinning effect is not enough to cause a significant change of the pour point. You should use up to 60% diesel in winter or lace PW 1. So you have good flowability of fuel down to -20°C.

**24. Is the rising of firing temperature harmless?**

A test from HATZ Diesel showed an increase of exhaust temperature about 6-7%. They say this is absolutely unobjectionable for intact motors. In tuned motors they accept increase up to 20%. Within this power spectrum it is possible to contract insurance against motor damage.

**25. Is it allowed to use plantanol-diesel in commercial petrol pumps?**

Plantanol-diesel is a biofuel with low viscosity (admission of Physikalisch-Technische Bundesanstalt in Braunschweig and Berlin) and is allowed to be sold in commercial petrol pumps.

**26. Is it possible to get problems with blocked fuel filter when using DX 52?**

Yes. In vehicles running with normal mineral diesel (DK) even with pure plant oil it is possible to get residues in the tank. These residues are dissolved with DX 52. So maybe the filter will be blocked by this residues when using DX 52. In principle this cleaning process is a positive mechanism, because sooner or later residues lead to problems. The cleaning process will continue only for 2-3 fillings.

**27. May I use plantanol-diesel in vehicles with emission control systems?**

In different tests there were no problems found. Some systems work with a separate burner. Maybe this wouldn't ignite with plantanol-diesel, so the filter will be blocked after a while. In this case motor may be damaged. So we can't give any guarantee. But we want to call attention to the effectiveness of plantanol-diesel regarding to exhaust. Particulate matter emission is reduced more than emission control systems are able to. Moreover the fuel consumption is about 5% higher in combination with those systems.

### **28. Which plant oils can be used with DX 52?**

In principle you can take all plant oils fit for motor use with DX 52. But every oil has special chemical characteristics. Some oils are similar in their structure. They are suited to use with DX 52 standard: Rape, soya, sunflower and safflower. Gold of pleasure needs DX 52 L. So don't hesitate to ask us in your special case.

### **29. What's about consumption with plantanol-diesel?**

In tests it is shown that plantanol-diesel has better engine output than diesel. So fuel consumption will be less if not retrieved by powerful driving. Maybe there will be increased consumption caused by the cleaning effect. The cleaning effect may last for 2-3 fillings. Another point to consider is driving short distances predominantly. Under cold conditions plant oils aren't atomized as well as diesel. In comparison temperature is one of the most important influences, so take a look all over the year.

### **30. What's about off odours after changeover to plant oil based fuel?**

Changes due to plant oil fuel with DX 52 may cause off odour temporarily. This is caused by the cleaning effect. So it's better to change motor oil at an early stage as well as fuel filter. Later this is not necessary, because mineral residues won't accumulate again.

### **31. Does this technology make prices higher for food?**

By pressing vegetable oil there is always 1 part Oil and 2 parts cake (Oil-cake). So you will get more masse for food than for fuel. So this technology can help to produce food and solve food crises. For more information see our INFO 038.

More Information and Films on our homepage  
[www.handelshaus-runkel.de](http://www.handelshaus-runkel.de)