



Fuel Guide



Cox engines typically run on what is termed “½A fuel”, a fuel with **high nitro content and containing some castor oil instead of synthetic oil only**. This fuel mixture is becoming increasingly difficult to obtain. ½A fuel in loose terms is 15-35% nitro (a.k.a. nitromethane), 20% (castor) oil and the balance methanol (a.k.a. methyl alcohol, carbinol, wood alcohol, wood naphtha or wood spirits).

Cox engines will run best on a **fuel mix that contains 25% to 35% nitro**, whereas the higher nitro content will lead to higher RPM's but also leads to higher heat and a shortened engine life. The Tee Dee series are better suited to higher nitro content, whereas the basic production engines are best run with a lower nitro content. Operating your Cox engine with less than 15% nitro content might make adjusting the needle valve somewhat quirky.

The biggest challenge is finding pre-mixed fuel that contains castor oil, as most fuels sold nowadays contains synthetic oil only, which can lead to premature failure of the engine's crankcase bushing and/or piston ball and socket. There are some “½A” fuels on the market that contain 100% synthetic oil. **DO NOT** run your Cox engine on such a mixture.

Cox recommends a fuel mix containing 20% castor oil. Under strict racing conditions, as little as 5% castor oil (and the balance synthetic) is required to protect the engine for it's short racing life but is not recommended for recreational flying, where longevity of engine life is desired. To be on the safe side, we recommend at least **10% castor oil and 10% synthetic oil**. The upside of using a 50/50 castor/synthetic mix is that it will help reduce varnishing and leave less oil residue on the model.

For Cox engines with **diesel conversions**, you don't use actual “diesel” or glow fuel. Instead, you use a mix consisting of castor oil, ether and kerosene. A good diesel mix would have 25% castor oil, 40% ether and 35% kerosene (paraffin).

How do I obtain pre-mixed ½A fuel? The first place you should check would be your local hobby shop. If they sell ½A fuel, ensure it contains an appropriate amount of castor oil. To obtain diesel, Doctor Diesel manufactures an excellent diesel fuel and it can be purchased from them directly. Please see the chart contained in this guide for a list of suggested fuel brands and where to get them.

If you cannot find fuel with castor oil, you can add your own! Simply purchase a good fuel with 25-35% nitro and low oil content. Purchase castor oil separately and add to fuel. It is recommended that you use a fuel chart or do the math to figure out how much castor oil to add to fuel. A Castor Oil Calculator is available @ <https://coxengines.ca/public/files/castor.xls> (must have MS Excel 2003 or later to open / use the calculator).

Can I mix my own fuel? Absolutely! Many modelers mix their own fuel. Mixing your own fuel allows you to make a custom mix for your application. Mixing fuel is quite simple and easy, although obtaining some of the ingredients may be challenging. Your local “Yellow Pages” or an online search are likely good places to start your search for the proper ingredients.

- **Methanol** can usually be obtained from outfits that supply fuel for race cars, or from chemical supply houses.
- **Castor oil** is available from online sellers, at grocery stores, pharmacies, etc. You will only require industrial grade castor oil and there is no need to purchase the more expensive medical-grade version. Klotz BeNol is a good choice and is available at motorcycle shops.
- **Nitro**, well good luck! This product is somewhat controlled and quite difficult to purchase. Your best bet is contacting companies that supply fuel for automobile/boat racing, or chemical supply companies.
- **Ether** in itself is a bit difficult to purchase, just like nitro. Try a chemical supply house. More expensive but an acceptable replacement, is starter fluid, such as John Deere.
- **Kerosene** is quite easily obtained at sporting goods stores, in their camping section. Use the unscented variety.

Brand	Website	Country Available	Order On-line	Add Castor Oil
Brodak	www.brodak.com	USA	Yes	No
Sig Champion 25	www.sigmg.com	Worldwide	Yes	No
Ritch's Brew	www.ritchsbrew.com	USA	Yes	No
Fitz Fuels	www.fitzfuels.com	USA	Yes	No
Doctor Diesel (Diesel engines)	www.cafes.net/doctordiesel	USA	Yes	No

Cox International



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