



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. Often, when referring to “½A” in hobby shops, it will elicit blank stares. 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).

Typically, Cox engines will run on a **fuel mix that contains 15% to 30% 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 20% 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/syn 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. If they do not, ask for fuel that contains castor oil. To obtain diesel, Davis Diesel manufactures an excellent diesel fuel and it can be purchased from the manufacturer and other on-line stores. 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 @ www.coxengines.com/files/castor.xls (must have MS Excel 2003 or later to open / use it).

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 getting the ingredients may not be as fun. Your local “Yellow Pages” is likely a good place 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 us, at off-road motorcycle shops, 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. Klotz KL-200 is a good choice for synthetic oil and is also available at motorcycle shops. Our castor oil is "SIG" brand, an excellent choice.
- **Nitro**, well good luck! This product is somewhat controlled and fairly difficult to purchase. It's the stuff that has the boys in suits and dark sunglasses taking an interest in you when you inquire about it. Your best bet, again, is contacting outfits 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
Sig Champion 25	www.sigmfg.com	Worldwide	Yes	No
Byron 25% Premium 1/2A Straight Castor	www.byronfuels.com	USA, Canada	No	No
Ritch's Brew	www.ritchsbrew.com	USA	Yes	No
Fitz Fuels	www.fitzfuels.com	USA	Yes	No
Model Technics GN-25 / Duraglo 25	www.modeltechnics.com	UK	Yes	No/Yes
Ozzie Traders Hot Stuff	www.ozzietraders.com	Australia	Yes	No
Doctor Diesel (Diesel engines)	www.cafes.net/doctordiesel	USA	Yes	No

Cox International



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