

# GoldenRay

The sensible alternative to traditional diesel fuels



**GR20**

**Operating Handbook (10-11)**

[www.goldenray.co.uk](http://www.goldenray.co.uk)

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## Introduction

3.1 Congratulations on your purchase of **GoldenRay GR20** Bio-Diesel processor. By taking care of your machine and following our instructions you should have years of trouble free fuel production. All of **GoldenRay's** processors come with a full 12 months warranty and we support all of our customers with a dedicated support team and contact number.

3.2 This booklet will give you an introduction to making your own fuel using a simple 1 stage process. It contains all the necessary information on chemicals, filtering, types of oil, processing, washing and drying.

3.3 Throughout this handbook there will be instructions, advice and warnings. Making bio-diesel is a very satisfying, economical and environmentally sound method of producing fuel. As it uses chemicals – sensible precautions must always be followed. We will throughout this document advise and warn where necessary.

3.4 In order to comply with *Environment Agency* and *Revenue and Customs* legislation this booklet contains forms, information and relevant conditions and exemptions.

3.5 For further information on all matters biodiesel we recommend the following 2 web sources:

3.6 [www.biodieselcommunity.org](http://www.biodieselcommunity.org) and [www.journeytoforever.org](http://www.journeytoforever.org)

3.7 *(Please Note: When producing biodiesel from vegetable oil the 'yield' can be less than the 20 litres of oil used. The yield depends on the quality of the oil used.)*

3.8 A second point to note is that the method used in this handbook is a well documented world wide method of making biodiesel. If after processing you end up with an emulsion (comically referred to as Chicken Soup) this indicates that you have not correctly followed this booklet. The most common causes for emulsions are either that the oil has not been de-watered prior to processing or that you have not titrated the oil correctly.

3.9 The easiest way to avoid this problem is to buy you waste oil from us. We will supply you waste oil that has been de-watered, pre-filtered and titrated. We can even supply you the methoxide made to the correct strength.

3.10

Date purchased.	
Model No.	GR20
Serial No.	
Guarantee Date.	
Assembled by.	
QA Inspector.	
24 hr Contact.	01494 882994

## Making Bio-Diesel

4.1 Like most things, making biodiesel can be made to sound simple or complicated. We hope that we have made this as easy as possible without affecting your safety or the quality of the final product.

4.2 The process we are about to describe is the 1 stage process. It is called one stage as that is the number of chemical reactions that take place. It is widely accepted to be the best way for beginners to make biodiesel. So here goes....

### 4.3 Equipment/items required for making 1 batch of biodiesel

- **GoldenRay GR20** processor – located in a well ventilated room (garage or shed preferable) where there are no naked flames, children or animals.
- Personal Protection Equipment – including goggles, mask (not for methanol), chemical resistant gloves and clothing that covers all exposed skin.
- 20 litres of oil – if the oil is new then you will be able to jump straight to the heating stage **OR** 20 litres of used cooking oil (WVO) – used cooking oil needs coarse filtering and dewatering.
- Titration kit – this will have been supplied to you by **GoldenRay**.
- 4 litres of Methanol – You will be following our recipe but as your confidence grows you will be able to reduce the quantities of methanol used.
- Catalyst – In this tutorial we will be using Potassium Hydroxide (**KOH**). On page 7 you will see a chart that tells you exactly how much KOH to add to the methanol. The amount required depends on your titration results.

#### Safety First

4.4 So, now that we have everything we need to hand we can begin by making biodiesel. Before we actually begin please go through this safety check list.



1. Check to make sure that all of the switches are in the **OFF** position on the processor, and plug sockets.
2. Check all containers are closed with the lids properly fastened.
3. Check all windows and doors are open to allow for ventilation.
4. Check that all children and animals are out of the way.  
Ensure that **ALL** valves are turned to their **CLOSED** position.

## A - De-watering used cooking oil (WVO)

5.1 WVO will contain water and particle matter. To achieve a good conversion it's best to remove as much water and particle matter as possible.

5.2 **A1.** (If using NEW oil go to **A3**) If you are using solid or semi-solid oil WVO, fill the processor with enough liquid WVO to more than cover the heater, turn heater on, then put the metal filter into the top of the processor (available separately). The filter will remove large particles and allow you to process solid and semi-solid oil. You can now put solid oil into the filter and switch the pump on with valves **2** and **6** open. The solid oil will now melt into the processor.



5.3 **Warning - For safety / calculation use only 20 litres of oil.**




5.4 **A2.** Putting the WVO in the processor and dewatering. Start with all valves in closed position, open valve **2** and **7** put the hose on the end of valve **7** into your container of used cooking oil switch pump on and the WVO will be drawn into the processor. Put about 20 litres into the processor, do not overfill and never go higher than 25 mm below the underside of the spray bar, close valve **7.** and open valve **6.** Switch on heater, after 30 minutes switch pump on for 1min to equalise the temperature. Switch pump off continue heating for a further 15 minutes. Switch pump on for a another minute then switch heater off. (temperature needs to reach 55 degrees) and allow to cool, as it cools the water and particles will sink to the bottom of the processor. The longer you leave to settle the more will come out. Leave for 3 hours or at best overnight. Drain off from the bottom into a bucket until the liquid stream turns to oil. (There could be a cupful or 2 litres even more with very wet WVO). With practice you will be able to see the change between the water and the oil as you decant it into a bucket. Dispose of the water/particles by composting in the garden or via the sewers (toilet). If you have more than 20 litres of oil decant the excess into a polybin for use with your next batch. If you have less than 20 litres of oil top up with new oil or with previously dewatered WVO.

**If using solid or semi- solid WVO react the same day as it will go solid in the processor as it cools which then has to be cleaned out.**

5.5 **A3.** New Oil – If you are using NEW oil then there is no need for de-watering or settling. Put 20 litres of new oil into the processor. **Close all Valves** and switch on the heater and allow the oil to heat up for 30 minutes or until it reaches 55°C. After 30 minutes open valves **2** and **6**, switch the pump on and circulate the oil for 1 minute to equalise the temperature, then switch the pump off and close valves. Continue heating until the oil reaches 55°C. Turn off heater and make sure all valves are closed. The processor is now ready to receive the methoxide.

- 5.6
- **Never switch heater on until oil level is above heater element.**
  - **Never drain the processor with the heater on.**
  - **Heater must be off for 5 min before any draining takes place.**

## B - Titrating the Oil

- 6.1 **You only need to titrate WASTE VEGETABLE OIL (WVO).**  
In order to work out the quantity of catalyst (KOH) to add to the methanol you will need to do a titration on a sample of your W.V.O. Once you have worked out your titration number refer to page 7. This will tell you exactly how much KOH to add. You have to do this with every batch of WVO.  
**Safety first – please remember the safety advice on page 4. Now is the time to use your Personal Protection Equipment.**
- 
- 6.2 **B1.** Reference Solution – this section tells how to make a reference solution for titrating oil. Materials required - Potassium Hydroxide (KOH) and 1 litre of distilled water (DW) (de-ionized water).
- 6.3 Accurately weigh 1 gram of Potassium Hydroxide KOH and put into a litre of DW. Close lid on bottle of DW and agitate until the KOH is dissolved. This is your reference solution – called Potassium Hydroxide KOH Solution – It will last for many titration tests. (If you cannot weigh 1 gram then weigh 10 grams KOH and put into 500ml of DW agitate until dissolved, take 25 ml of this solution and add to 475ml of fresh DW. This will be the same strength as 1 gram of KOH mixed into 1000ml of DW.)
- 6.4 **B2.** Titrating oil – Pour 10 ml of isopropyl alcohol into the 50 ml glass beaker, this doesn't have to be exact. Using a syringe measure exactly 1 ml of your oil and put into the 50 ml beaker. If you use syringes you MUST clean or use separate ones for each different chemical. Now add 6 drops of phenolphthalein with the eye dropper into the solution and mix. The liquid will be a murky yellow colour.
- 6.5 **B3.** Colour Change – Now, go back to your reference solution above in B1. Using a different or clean syringe take 10 ml of KOH solution. Slowly add 1ml of KOH solution at a time into the mix in B2 – You MUST note of the total millilitres (ml) you add. Gently agitate the beaker whilst doing this. You are watching for a colour change from murky yellow to pink/purple. As you add KOH solution it will react with the oil/phenolphthalein mixture in the beaker. When it changes colour to pink/purple stop, if the mix stays pink/purple for 30 seconds you have added sufficient KOH solution.
- 6.6 Once the mix reaches this point record how many millilitres of KOH solution you added to the oil/phenolphthalein mix – **WRITE IT DOWN!** This figure is the titration level of the oil. Most oil that is of a reasonable standard should titrate between 2 and 5, which means you would have added 2 and 5 ml of KOH solution respectively. If in doubt clean and dry the equipment and repeat the whole titration process. **YOU DO NOT NEED TO REMAKE THE REFERENCE SOLUTION.** When finished wash and dry all equipment. Now refer your titration number to the chart on page 7, this will tell you the total amount of KOH to be added to the methanol to make the correct strength methoxide.

## C - Making Methoxide

**Safety first – please remember the safety advice on page 4. Now is the time that you should put on your personal protection equipment.**



7.1 **C1.** Quantity of KOH - In order to make methoxide you will need to refer to the chart below. This will tell you how much KOH to add to 24 litres of methanol for a 120 litre batch of oil.

7.2

NEW Oil (No Titration Needed)	
Methanol (L)	Amount of KOH required (grams)
4	160

7.3

WASTE Oil (W.V.O.) Titration Chart		
Methanol (L)	Oil Titration reading (ml/s)	Amount of KOH required (grams)
4	1	200
4	2	220
4	3	240
4	4	260
4	5	280
4	6	300
4	7	320
4	8	340
4	9	360
4	10	380

7.4 If the oil titrates in the green zone you have good WVO. The yellow zone is average to poor. The red zone is not so good. If the WVO titrates at above 6 it would be advisable (until you are familiar with the process) to add some new oil to the processor about 20 litres (the processor will accommodate this) stir the new oil to mix then drain the processor down to 60 litres (save the drained oil for next time as it will be OK to use). As you get used to the process you will be able to process higher titrating WVO. Re- titrate the mixed WVO as described in section B.

7.5

**C2.** Adding KOH safely – For reasons of safety you must add the KOH to the methanol and **not the other way around**. Slowly add the KOH to the methanol. As you add it the methanol it will start to turn into methoxide. Heat will be generated by this reaction, a standard 25 litre HDPE polybin container will contain the reaction adequately.

7.6

**C3.** Agitating the Methoxide – Once all of the KOH has been added to the methanol replace the lid securely and gently agitated until all of the KOH is dissolved. When all of the KOH has dissolved, (no white particles in the bottom of the polybin) you have successfully made methoxide and are ready to move onto stage D.

## D - Converting Vegetable Oil into Biodiesel

8.1 **D1. Check List** – Before going any further carry out the following checks.

- a. WVO has been de-watered – **Section A.**
- b. You have titrated the WVO and using the chart on page 7 added The KOH to the methanol to make methoxide – **Section B.**
- c. You should have made your methoxide – **Section C.**
- d. The WVO will now be up to temperature to a maximum 55°C. Never more than this for this part of the process. If temperature is higher than 55 degrees allow WVO to cool down.
- e. Turn off the pump and heater and ensure ALL valves are closed.

8.2

**D2.** Add the methoxide (**Safety first – please remember the safety advice on p4, now is the time that you should put on your personal protection equipment**).



Open the lid of the polybin and insert the tube on the end of valve **8**. Open valves **2** and **6** and switch on pump,(oil will be circulating through the processor). Open valve **8**. Methoxide will be drawn into the processor and circulating with the oil.

8.3

**D3.** Pumping – once the methoxide has been added close valve **8**. Switch the heater back on, Leave the processor running for at least 60 minutes, (doesn't matter if you leave for longer but no more than 120 minutes). (**Safety first – Never ever let the temperature rise above 55°C, switch heater off if it does, this will not affect the reaction**).

**D4.** Now is a good time to check that you have had a good reaction and that all or most of the vegetable oil has converted to biodiesel.

In your kit of parts is a 27/3 test kit with instructions. Put 27ml of methanol into the test tube add 3ml of biodiesel seal the test tube and shake vigorously, put back into the stand and allow it to settle for 5 min.

Vegetable oil will not dissolve into methanol unless there is a catalyst to help it, which is why we use potassium hydroxide (KOH) mixed in with methanol to bring about the conversion, if you have not had a complete reaction or conversion the un-reacted vegetable oil will not dissolve into the methanol. This will show up at the bottom of the test tube. If there is no un-reacted vegetable oil at the bottom of the test tube then you have a complete reaction, if you see vegetable oil at the bottom of the test tube you have not had a complete reaction.

If the amount of vegetable oil at the bottom does not register on the scale then it's ok to carry on with the washing process. If it registers then you may want to re-react the biodiesel following the instructions on the 27/3 test kit stand.

The reasons for un-reacted oil are, inaccurate titration, or the oil was wet to start with, if wet the KOH will then mix with the water and there will not be enough for the conversion.

## E - Filter Changing

9.1 If needed this is a good time to change the filter of the processor. Currently the filter and its associated pipe work are isolated from the biodiesel processor. Therefore it is safe to remove the filter housing and change the cartridge (You should not have to do this until you have processed at least 1000 litres of oil or the dial on the pressure gauge registers 30 psi or 3 bar).

9.2 **E1.** Drain the Filter - Open the small drain tap at the bottom of the filter. Turn valve **CLOCKWISE**. Be prepared to collect about 2 litres of biodiesel in a bucket. Place this captured oil in an airtight container, out of the sunlight for use when you next dry a batch of biodiesel.

9.3 **E2.** Remove the filter housing – Using the filter spanner loosen the filter by turning it **CLOCKWISE**. Unscrew light blue filter housing. Before you remove the cartridge see how it is seated within the filter housing as this is how all cartridges sit in the housing. This filter can be re-used if washed, so place it in a safe place. Now replace with a clean cartridge, ensuring that the filter sits comfortably and flat within the housing.

9.4 **E3.** Re-fitting filter housing – This is the reverse of the removal. Please note that the filter housing will line up in the same position as before it was removed. Remember to close the drain tap at the bottom of the filter. **Make sure that the black 'O' ring is sitting in its groove on top of the light blue housing.** If the filter cartridge gets blocked the pressure gauge will show an increase in pressure. Time to change the filter cartridge



### How to remove the filter

1. Turn spanner **CLOCKWISE** to loosen.
2. Once loose unscrew by hand.

## F - Biodiesel / Glycerine separation

10.1 Once your **GR20** has been running for the required time, providing you have followed these instructions, you will have made biodiesel. However there will be excess methanol, glycerine and catalyst that needs removing from the biodiesel. This is not a difficult process.

10.2 **F1. Settling time** – Turn off the heater and pump. Leave all valves in their current positions. Let the contents settle for a minimum of 1 hour. During this time the glycerine and other contaminants will settle at the bottom of the tank. The biodiesel will settle on top as a separate layer.

10.3 **F2. Glycerine Removal** - Place a container, with a volume of no less than 12 litres under valve 1, this is the drain valve. Slowly open this valve and the glycerine will flow out of the bottom of the processor. DO NOT open this valve fully as you will probably start emptying biodiesel after the glycerine from the processor (You will notice the change).

10.4 **New Oil** - Glycerine will be the colour of honey and be thicker in consistency than the biodiesel which will be a lighter colour and will flow faster than the glycerine. (You will notice the difference)

10.5 **Waste Vegetable Oil** - Glycerine will be darker in colour, almost like black coffee. Biodiesel made from WVO will be noticeably darker than new oil. (You will notice the difference)

10.6 When you see biodiesel coming out of the drain valve close it. Place the glycerine somewhere well ventilated where it will not be knocked over. Leave lid off until at room temperature, and then seal the polybin.

10.7



The picture to the left shows glycerine made from new oil and waste oil. The new oil glycerine is on the left of the picture and the WVO glycerine is on the right. The middle container is water.

10.8 **F3. Disposal of glycerine methods**

- f. Your local waste recycling site should take your waste glycerine.
- g. You can compost your glycerine.

## G - Water Washing

- 11.1 The remaining glycerine, methanol and other contaminants in the biodiesel will be removed during water washing. This method is a cheap, easy and highly effective way of removing contaminants from your biodiesel. Water is sprayed onto the surface of the biodiesel. As it is heavier than biodiesel it travels through the oil to the bottom taking all the contaminants with it.
- 11.2 **G1. Water Washing** – Attach a garden hose to the spray head which is on the top of the processor. The lid must be closed. Turn on the heater, (valves can be left in the closed positions) and turn on the water. Keep a close eye on the level of the biodiesel using the sight gauge next as any overfilling would cause biodiesel to flow from the top of the machine into the bund tray. Just before the water reaches the under side of the spray bar turn the hose off.
- 11.3 **G2. Water drainage** – Wait for approximately 40 minutes then turn the heater off. The liquid will be different colours. The water will be a milky colour and the biodiesel will have the appearance of orange juice. You can see a line between the water and the biodiesel through the observation window. You may have a cream coloured layer between the water and the biodiesel this is soap and must be drained out with the water. If you are not sure leave it for longer until you can see the different layers. Drain the water and soap from the processor until you see biodiesel. Close the drain valve. All water drained during this part of the process can be discarded down a (sink) (toilet) or (composted) it doesn't matter if there is a little biodiesel with it.
- 11.4 **G3. Brief re-circulation** – in order to make sure that all the fuel is washed re-circulate the contents of the processor for 5 seconds after each water drainage by switching on the pump with valves **2** and **6** above open.
- 11.5 **G4. Repeat** – repeat stages G1, G2 and G3. We recommend initially that you wash your biodiesel until the water is clear. You will notice that the wash water gets clearer with each wash, this can take 3 to 5 washes. Before any draining the heater must be off. You can check that the biodiesel is washed by taking a sample from the top of the processor into a small coffee jar about 1/3<sup>rd</sup> add 1/3<sup>rd</sup> of tap water shake vigorously and allow to settle for about 10 minutes, The water will settle to the bottom of the jar and there will be a clear line between the water and biodiesel, with no soap layer between the two. If you have a soap layer wash again and make sure to drain the soap layer out with the wash water. Once you are satisfied with the water emerging from the wash cycle you then need to dry the biodiesel.

## H - Drying

12.1 Drying removes the remaining water from the biodiesel and filters it to 5 microns. Make sure there is a filter in the filter housing. Close valve **2** and open valves **3** and **4** this allows the biodiesel to pass through the filter. Open lid and rest on its stay. Switch heater on during this process. Switch pump on and allow to circulate through the filter and spray dry pipe work, This can take up to 2 hours or longer depending how wet the biodiesel is, It doesn't matter if you do this for longer.

12.2 **H1. Testing for Water** – You need to check that the biodiesel is dry by testing a sample. Turn pump off and open the lid of the processor. Take a sample of biodiesel using the glass beaker the biodiesel should be crystal clear. If sample remains crystal clear at room temperature then there is minimal water present and is fit for use. If your biodiesel clouds then further drying is required. Turn pump and heater, back on and continue for 30 minutes then test again. Continue until it remains crystal clear at room temperature. You can speed up cooling by putting the sample in its container into cold water, or into a fridge for a few minutes.

12.2 Photo showing New Oil Biodiesel, Waste Oil Biodiesel and Water



Most car filters work at 10 microns so you have already filtering below that.

## I - Fuel Decanting

- 13.1 Once you have de-watered and dried your fuel you are ready to decant. Your fuel will be dry, filtered and ready to use. Now you can drain the Filter Housing and save for the next time just pour it into the top of the processor or leave what's in the filter housing for when you next do drying,
- 13.2 That's it, providing that you have followed these instructions you will have made good quality bio-diesel from cooking oil. It will have cost you pennies to make but saved you pounds.

### CONGRATULATIONS!

To test for cold weather put some biodiesel in a small glass jar and leave outside, if this clouds in cold weather or goes semi liquid or solid then it's too cold for the biodiesel and you will need to add some mineral diesel to your fuel tank to prevent the fuel filter clogging up.

Different vegetable oils have different temperature pour points. Hydrogenated oils and oils like palm oil have a higher temperature pour point than rape seed oil, see [www.journeytoforever.org/biodiesel\\_yield.html](http://www.journeytoforever.org/biodiesel_yield.html) for further details. As the day warms up the biodiesel will revert back to its liquid form.

## **Methanol**

### **Skin Protection**

Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure.

### **Eye Protection**

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

### **First Aid Measures**

Inhalation – Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion - Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact - Immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention. Wash clothing before reuse. Thoroughly clean shoes before reuse.

Eye Contact - Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

### **Environmental Fate**

When released into the soil, this material is expected to readily biodegrade. When released into the soil, this material is expected to leach into groundwater. When released into the soil, this material is expected to quickly evaporate. When released into the water, this material is expected to have a half-life between 1 and 10 days. When released into water, this material is expected to readily biodegrade. When released into the air, this material is expected to exist in the aerosol phase with a short half-life. When released into the air, this material is expected to be readily degraded by reaction with photochemically produced hydroxyl radicals. When released into air, this material is expected to have a half-life between 10 and 30 days. When released into the air, this material is expected to be readily removed from the atmosphere by wet deposition.

## Potassium Hydroxide – (KOH)

### Skin Protection

Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure.

### Eye Protection

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

### First Aid Measures

Inhalation – Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

Ingestion – If swallowed, **DO NOT INDUCE VOMITING**. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact – In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Get medical attention immediately.

Eye Contact – Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

### Environmental Fate

None recorded

16.0 **Distilled Water**

**DO NOT DRINK**

**Environmental Fate**

None recorded

## **Isopropyl Alcohol**

### **Skin Protection**

Rubber or neoprene gloves and additional protection including impervious boots, apron, or coveralls, as needed in areas of unusual exposure.

### **Eye Protection**

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

### **First Aid Measures**

Inhalation – Remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention.

Ingestion – If swallowed give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact – In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Thoroughly clean shoes before reuse. Consult a doctor if irritation persists.

Eye Contact – Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Get medical attention immediately.

### **Environmental Fate**

When released into the soil, this material is expected to quickly evaporate. When released into the soil, this material may leach into groundwater. When released into the soil, this material may biodegrade to a moderate extent. When released to water, this material is expected to quickly evaporate. When released into the water, this material is expected to have a half-life between 1 and 10 days. When released into water, this material may biodegrade to a moderate extent. This material is not expected to significantly bio accumulate. When released into the air, this material is expected to be readily degraded by reaction with photo chemically produced hydroxyl radicals. When released into the air, this material is expected to have a half-life between 1 and 10 days. When released into the air, this material may be removed from the atmosphere to a moderate extent by wet deposition.

## **Phenolphthalein**

### **Skin Protection**

Wear protective gloves and clean body-covering clothing.

### **Eye Protection**

Use chemical safety goggles. Maintain eye wash fountain and quick-drench facilities in work area.

### **First Aid Measures**

Inhalation – Remove to fresh air. Get medical attention for any breathing difficulty.

Ingestion – Induce vomiting immediately as directed by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention.

Skin Contact – Wash exposed area with soap and water. Get medical advice if irritation develops.

Eye Contact – Immediately flush eyes with plenty of water for at least 15 minutes, lifting upper and lower eyelids occasionally. Get medical attention if irritation persists.

### **Environmental Fate**

None recorded.

## Environment Agency Rules

- 19.1 If you are collecting waste vegetable oil (WVO) from anyone/anywhere then this activity is covered by the Environment Protection Act 1990.
- 19.2 Collections for business use - If you are collecting the WVO for a business purpose then you will need to apply for a Waste Management Licence. This costs about £150 and is valid for 3 years. Apply for a carrier and brokers license not just a carriers, doesn't cost any more to be a broker but allows you to sell any surplus oil that you have.
- 19.3 Collections for private use – If you are collecting WVO for private use only then you are exempt from a Waste Management Licence. You must however apply for this exemption, under Sec 15 of the Act.
- 19.4 Notification of an exempt activity - In summary, providing that you are putting the 'waste' to good use and are doing it for a personal use then you will be permitted an exemption.
- 19.6 Duty of Care - Waste Transfer Note – The Environment Agency permits you to store used cooking oil on your premises provided it is stored safely and securely. You must however supply a Duty of Care – (Waste Transfer Note). When you are collecting used cooking oil. We have supplied a blank one attached at the rear of this booklet.

## Revenue and Customs Brief.

### Copy and Paste into your search bar

[http://customs.hmrc.gov.uk/channelsPortalWebApp/channelsPortalWebApp.portal?\\_nfpb=true&\\_pageLabel=pageExcise\\_ShowContent&id=HMCE\\_CL\\_000205&propertyType=document#P6\\_70](http://customs.hmrc.gov.uk/channelsPortalWebApp/channelsPortalWebApp.portal?_nfpb=true&_pageLabel=pageExcise_ShowContent&id=HMCE_CL_000205&propertyType=document#P6_70)

20.1

As you will have been informed when purchasing the **GR20** processor you no longer need to register and pay any duty or VAT on annual quantities of up to 2500 litres of biodiesel. In simple terms – you can produce up to 2500 litres of biodiesel, duty and VAT free.

20.2

Currently diesel from the pumps costs over £1.40 per litre, which includes duty and VAT. We expect you to be making biodiesel for 19 pence per litre. That is an amazing 85% saving compared to conventional diesel.

Below is an extract from the above customs brief...

#### ***Follow up to Revenue & Customs Brief***

- Revenue & Customs Brief 179E August 2011 confirmed that the following changes applying to biofuel producers were to be introduced:

20.3

A production threshold of 2,500 litres per annum below which producers will not need to enter premises, submit returns or pay duty.

20.4

However, Revenue & Customs have still directed that producers of exempt fuel still keep 'simple' records.

Attached on the next page is a simple records chart.

