

Anti-rust Paint from Fish-Scraps

A short guide to the technique

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Ingredients

The main ingredient is fish scraps. All fish contain a suitable oil but some varieties of fish contain more than others. In addition, some parts of the fish contain more oil than others. Shark livers are particularly productive.

If you would like the paint to have a colour, it will be necessary to get suitable pigments for grinding into the paint base. Steel mills often make red, black or yellow iron oxides from their scrap. Making coloured oxides is a low-cost process but it requires the use of hydrochloric acid.

You will also need a source of fuel. This could be wood or coco-nut shells (or perhaps biodiesel or used cooking oil).

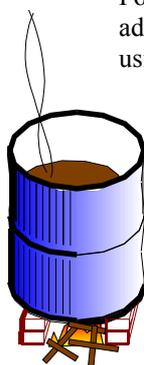
Some water will also be necessary. This does not have to be of high quality: It can be slightly brackish or contaminated. You should however avoid using sea-water.

Equipment

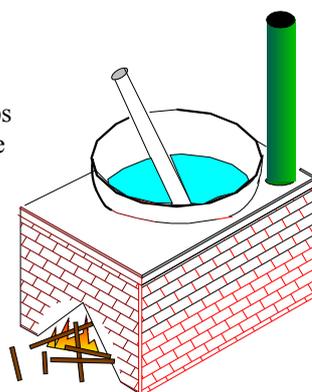
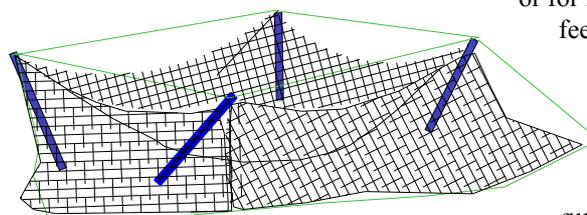
The process involves boiling a container of water and fish-scrap until the fish breaks down and the fish oil is liberated. This may take several hours. A clay-pot will suffice but there is usually a high fuel cost associated with using such a poor conductor of heat. A steel or iron pan which may be heated over an open fire is most suitable. A

45 or 200 litre steel drum previously used for oil or water storage may be used once the top is cut off. A wooden paddle will also be most useful to stir the fish.

For a semi-commercial unit, it is advisable to build a small platform using bricks or concrete for the pan to sit on. This makes it possible for a fire to be tended under the pan without the risk of being scalded and burned by the "fish-soup" boiling over.



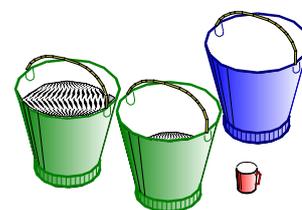
Any fuel can be used but most will burn more efficiently if a chimney is fitted at the back of the platform to provide a draft. Dry wood, coconut shells or charcoal will make a fire which is easily controlled.



You may also find that one or two buckets will be needed. They can be enamelled, galvanized, aluminium or even plastic.

A plastic cup will be useful for measuring quantities.

One of the most useful items is a coarse mesh made from coconut fibre, sisal or nylon rope. The mesh size needs to be



about 1cm (1/2 ins). This can be used to enclose the fish-scrap within the pan. By applying pressure to the bag, (perhaps by twisting a stick through the top), extra oil can be expressed. After use, the mesh can be stretched in the sun and the fish-flakes collected for chicken-feed or for incorporation in animal feeds: It is very high in protein.

Quantities

The pan should be filled to about a third of its depth with water. A similar volume of fish-scrap can be processed. The quantity of oil produced will vary with fish-species, degree of maceration, time, and temperature. Because no attempt is made in this process to break the oil/water emulsion, some water is necessarily incorporated in the oil. Typically between 5% and 15% (by volume) of useful product will be obtained. As an example, 5 litres of useful oil were produced by boiling 50 kg of fish rubbish in 60 litres of water.

Any pieces of left-over fish should be removed. However, there is little chance that the pan will rust after two or three boilings. This is because the fish-oil penetrates and consolidates any rust. It is this feature that makes it such an excellent paint-base.

The Process

The fish scraps should be chopped into pieces about 25mm in size. Bony or cartilaginous pieces should be hit with a stout stick or stone. (Another sisal, coir or nylon bag may be useful here if by-standers are not to get hit by flying heads, tails and other smelly bits !)

Meanwhile, the water should be boiled in the pan. When the water is just boiling, the fish scraps should be added. Boiling continues with stirring for not less than three hours. (It may be necessary to add some more water.) Usually, it can be left to cool overnight. The next stage is to capture the fish that remains in the coir, sisal or nylon basket. (It is worth experimenting to see if the fish pieces can be contained in the basket throughout the process: Work in Sri Lanka indicated that it took the heat longer to penetrate such a basket of fish and so required extra fuel.)

As indicated above, the fish scraps can be drained, dried and used as high-protein feed for animals and poultry.



The top layer of oil/water emulsion in the pan can then be removed and stored in air-tight tins. Typically, the useful layer will be about 30mm deep. The remaining liquor should not be thrown away. Instead, it should form the basis of the liquor for the next boiling process. If some time will elapse before the next batch, cover the pan with a tight-fitting lid or tied-down plastic sheet. Alternatively, drain the pan into more air-tight containers. It is the exposure to air which makes the fish-oil react to form a tough skin.

If you want your paint to have some colour, you can grind it in a stone pestle and mortar with pigments. Usually iron oxides made from steel scrap are the cheapest.

Either way, whether you colour your paint or not, the process of application is straight-forward. It can be brushed or wiped with a rag onto the surface to be painted.

Inside the panels of car doors and frames will respond very well because the low-viscosity oil flows into rust and hardens it into a tough film. Steel used near the coast can similarly be protected against rust. In the hot sun, the emulsified water usually dries off quickly leaving a thin oil film. In general, it is better to apply separate thin coats of paint to get maximum coverage and film thickness.

The paint can be used on any surface to build up a tough, water-proof film. However, it will never have a high gloss finish and may not improve the appearance of all woods, concrete etc.

It also smells strongly of fish for about a week while it cures!

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