

STILL CONSTRUCTION REPORT , NASECO ESSENTIAL OILS PROJECT,UGANDA.

10th to 30th of July 2005



The consultant and one unit of the still

Written by;

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Acknowledgement

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Introduction

EPOPA and its partner had one project of essential oil field production. They asked me, Herimanana RANDRIAMANJATOSOA, Manager of dorovy corporation, through Label CBD's contact, MADAGASCAR, to give some training for their local team of technicians about still use and construction, and by the same time, to make 2 (two) units of still.

As a consultant specialised in sheet metal, iron tank, boiler and still construction, I accepted their appeal.

One month before I went to UGANDA, we had many exchanges by E-mail and phone about all materials and devices we would need for the work.

Once the materials were purchased, I joined EPOPA on July 10th. I will describe how the work moved, the type and specification of the still and as a conclusion I try to propose some recommendation in order to optimise the still efficiency optimization.

Schedule of the work

On 11th of July, we started to discuss how the working of the still and its characteristics should be.

During the second day, I checked if the local materials available are enough and also in accordance with which I had ordered. We added some missed materials such as safety valves, gate valves, sight glass and many connecting pipes (elbow, nipples, sockets, union, spherical valves). We looked for some cutting tools and imported 7 (seven) boiler-pipes more from Nairobi KENYA.

Some sheets were moved to an appropriate workshop in KAMPALA where there was a special shear and rolling machine, where they were cut and rolled. The day after, all materials are transferred to TAMTECO' s workshop(70Km from KAMPALA) where the main work has been done.

We have finished all the constructions after 14 days of work at TAMTECO. The 15th days (exactly the 18th after my arrival in UGANDA).



The Country Manager and Florence monitoring the progress



The consultant and local technicians

Make of the still

One unit of still consists of three parts such as the boiler, the main tank and the cooler. The steam comes from the boiler, injected into the main tank full of green material, finally the steam with essential oil's cell are condensed in the cooler. The essential oil is separated with water in a vessel because of their different levels (different density) and collected in an appropriate container.

The boiler is made up of a milde steel 4 and 6mm of thickness, with 24 vertical boiler-pipes on the fire-place. It functions with fire wood at low pressure. It is equipped with a safety valve adjusted at 1.5 bar. One sight glass is put in order to control the level of water inside. This type of boiler can be used between 7 to 10 years.

The main tank, the said still, is made up entirely of stainless steel 2 and 3mm of thickness. It has 2000liters of capacity (1220mm of diameter per 1830mm high). This tank receives on its top a cover around which there is water used as a low-pressure gasket. One goose neck connected with a conic pipe of stainless steel is put between the cover and the cooler to canalize the steam from the still.

For this tank is constituted by stainless steel and for the system function with steam (without direct fire), it can be used for ever.

The cooler is constituted by 24 vertical stainless steel pipes, put together in parallel, and connected on the top and down by 2 collectors. They are deep in a vertical tank, of 2300mm high made up by milde steel 2mm of thickness, which contain the cooling water.



Some of the vertical stainless still pipes

Testing the still

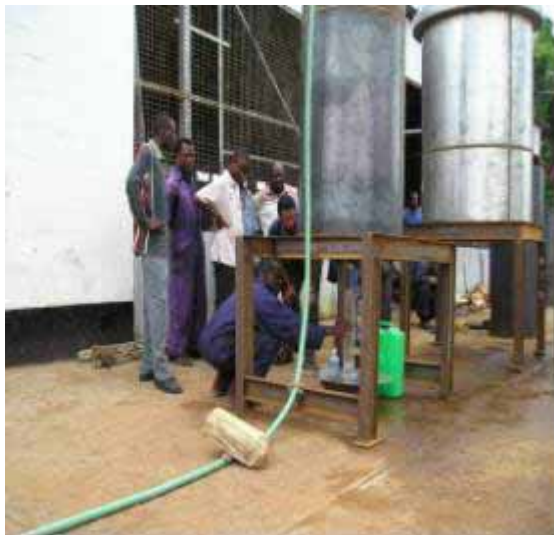
We made the first test only with the steam and the next day, with many group Manager's present, we proceed together the distillation of lemon grass 'green material of which we extracted the first sample of essential oil.



Assembling the still for the test



Assembling the still for lemon grass distillation



Collecting the oil



Toasting to good success!

Recommendations for utilising the still efficiently

In order to get the maximum of efficiency, here is some recommendations:

The duration of one distillation is about 3 hours.

Never use or lost some milde steel parts in the main tank.

Wet the green material before starting all operation and make full as possible the main tank.

Be careful with the water level in the boiler before making fire.

Immediately add cold water to replace the cooling water when it gets hot on its top (50°C).

IMPORTANT: The output liquid under the cooler must be always COLD.

Maintenance of still

For proper maintenance, keep dry all tanks when they are not used for a long time.

Keep clean the boiler, make it on a horizontal position and be careful of the sight glass after drying.(only when it is not used for three months or more).

Conclusion

This system of distiller has been established here in MADAGASCAR since ten years with a good result and with a best efficiency. The type of this boiler can be used with safety (without all risk of explosion). Its product respects the international standardization that's why we can export to over the entire world, even to the U.S.A and E.U.

It is possible to extract with this still many variety of essential oil such as lemon grass, cinammomum camphora, geranium, pelargonium, melalleuca aromatica, ravensara aromatica, lantana camara, cinammomum fragans.

Some product like a vertiver need a system of distillation under pressure more than 1.5 bar, around 2 to 2.5 bar with another gasket system. It is required to make a similitude (computation) for a probably construction bigger.