

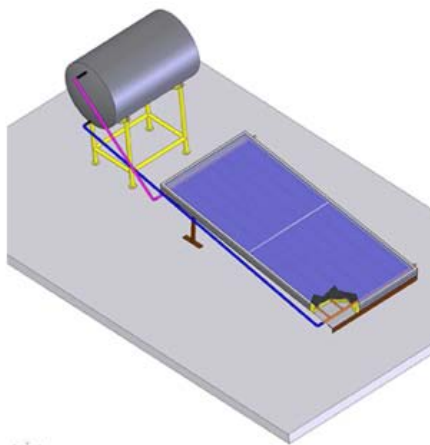


Fundación Centro Experimental Las Gaviotas

Products To Meet The Community's Demand

I. Renewable energy area

1. Gaviotas type solar water heating



Drawing

Description: Gaviotas solar water heaters (left)

Photo

25. Gaviotas solar water heaters installation in Nueva Villa de Aburra neighborhood, Medellín.

Gaviotas solar water heater system description and functioning

BACKGROUND

The Foundation Center Las Gaviotas, whose main objective is the development and manufacture of technologies that use renewable energies such as solar energy, has over 30

years experience making solar water heaters. Its installation in Nueva Villa de Aburrá urbanization, Medellín, to 928 apartments in 1979, the largest in the world (by that time) after 30 years is still operating successfully.

Until 2009 Centro Las Gaviotas, has installed 31,000 solar water heaters across the country.

It is important to remark that Colombia is characterized by good levels of solar radiation.

DESCRIPTION

The Gaviotas's solar collectors are a technology that uses only solar self-regulated systems and passive circulation, storage and take up, because the objective sought by Gaviotas Center is to provide comprehensive energy alternatives.

The hot water is stored in a reference 304 stainless steel tank (s), isolated by ecological polyurethane specially stabilized to resist high temperatures.

The solar collector consisting of a piece of copper sheets and tubes coated with an absorbent material includes a high efficiency selective radiation film made especially for Gaviotas.

It is isolated by a capsule full of ecological polyurethane foam stabilized, which in turn is protected by a box in aluminum or galvanized sheet resistant to different environments. It is covered by a glass of low iron content sealed by a neoprene gasket attached by a stainless steel plate. The collectors will be located on the roof of the building with a minimum inclination of 10 °, and shall be supported by metal structures or directly placed on the roof, as appropriate.

The heating circuit consist of two arms interconnecting the tanks with the solar collector circuit, resulting in the movement of water through this, by the effect of thermo siphon, because the column of cold water in the pipe supply to the collector plate do not keep balance with warm water, since the latter is less dense, and thus is displaced by the cold water, thereby creating continuous circulation between tanks and collectors.

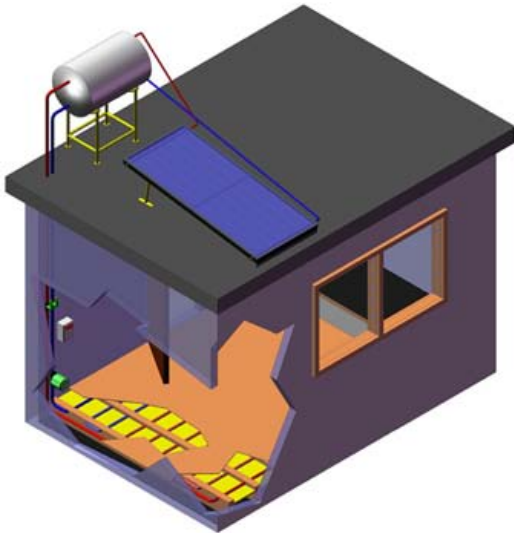
INSTALLATION

We follow these steps for installing Gaviotas's solar heaters:

- The technicians visit the installation site.

- Send the proposal to the interested people.
- Installation of the heaters only by the Gaviotas's technicians

2. SPACE HEATING BY SOLAR ENERGY



View of the space arming by solar energy in Gaviotas office, Bogotá

El Centro Las Gaviotas using technology derived from its solar water heaters, developed radiant floors with solar energy for rooms heating, for their installation they require the previous visit of the technicians.

3. Gaviotas Tropical Windmill, Double Action Pump - MV2E



DESCRIPTION OF THE TROPICAL WINDMILL OF DOUBLE ACTION (LEFT)

PHOTO: GAVIOTAS WINDMILL INSTALLATION IN EL ENCANTO HAMLET IN LOS LLANOS ORIENTALES (RIGHT)

BACKGROUND

The conventional Windmill to draw water from wells has been built for over a hundred years. Due to its old design it weighs more than half a ton, and requires a strong wind to work. Unfortunately, our countries are poor in tropical wind; however, there are very heavy storms at very short periods.

In recent years, many people have tried to design cheaper and simpler new windmills. That one of metal drums, for example, only works a few days a year, for lack of strong winds and their eight steel rods are not able to have them up during a storm.

Gaviotas's scientists and technicians decided to create a new concept of windmill:

A Tropical Windmill

- 58 different windmills were built in nine years.
- The final mill has the following specifications:

- Cold hardened aluminum rotor blade with "Flap" of 21 °.
- Steel shaft 25 mm in diameter on sealed bearings.
- Steel Tubular Tower 5 Mts. Ladder included.
- Tetrahedral basis for installations in wells 7 cm, to 1.30 meters in diameter.
- PVC Floating tire with built-in air chamber.
- Double action pump which distributes evenly up and down, thereby reducing by half the force required to wind.
- Operation with minimum winds up to 1.5 meters / second for elevations of 10 Mts. high.
- Design Speed: 36 m / sec. (130 Kms. / hour), demonstrating their resistance to storms.
- Net weight only 72Kg. packaging easy to handle by two people.
- Pumping up maximum 4.2 Mts. without extension above the rim.
- Maximum pumping depth 25 Mts. with 10 extensions.
- Pump with very weak wind (2Mts/seg): 2 Mts. ³ / day.
- Pump with average wind of 6 m / s: 6 to 8 Mts. ³ / day.
- Stainless Steel Cylinder (S.S. 304).
- Typical range pumping in flat area 500 Mts / tube ³/₄ ").

The advantages of Gaviotas's "MV2E" over the traditional mill are:

1. A weight 10 times lower
2. A purchase price considerably lower.
3. You need three times less wind.
4. Its installation is so simple that you can do it by yourself, following strictly the manual installation operation and maintenance instructions, of Windmill MV2E., That comes together with the mill.

4. Gaviotas Sleeve Pump



DESCRIPTION OF GAVIOTAS SLEEVE PUMP (LEFT)

PHOTO: GAVIOTAS MICROAQUEDUCT INSTALLATION WITH SLEEVE PUMPS IN ATLANTIC COAST. (RIGHT)

EXPLANATION OF THE PUMP

There are a number of hand pumps, they all work - but the sleeve pump we present has the best use of minimum manpower and offers the highest yields regarding flow and pumping height.

The pump is fitted at any height and water requirements, within 1 to 30 Mts. practical range of operation. Unlike other manual pumps, has no limitation of 7 meters of suction because it uses submerged piston and cylinder, allowing it to operate in wells with water levels at depths greater than 10 Mts.

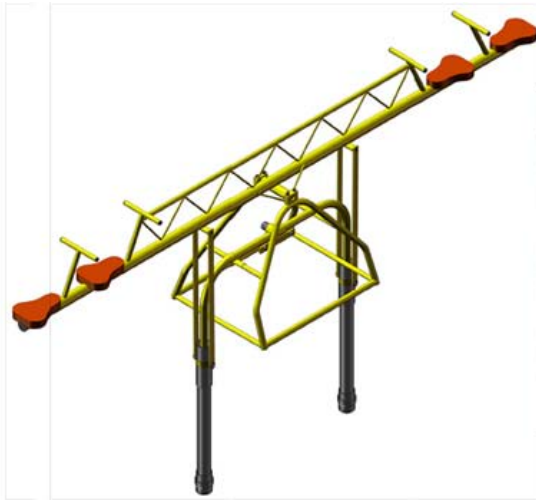
For 5 years different designs on the same idea were tested, to get the simple and strong model that is offered, which makes use of galvanized and PVC accessories with a good distribution in the market, avoiding the use of unique parts in most parts of the machine.

TECHNICAL DATA SLEEVE PUMP GAVIOTAS:

- Cold hardened steel Levers, in profile 1 ½ "x ¼"
- Steel shafts supported by phosphor bronze bushings.
- Base of the head in iron plates from 3 / 16 ".
- Tire in galvanized iron 1" in diameter.
- Polyvinyl chloride sleeve 2 ", for high pressure.
- Positive displacement pump with a capacity of approximately 500 milliliters per share.
- Expansive self-expansive hydraulic leather label, with a nominal diameter of 2 ".
- Pumping limit depth or height 40 meters.
- Head of pumping always positive.
- Self-sealing valves.
- Net weight 12 kg.
- 40 cycles / minute flow, 5 gallons.
- It is supplied in a wooden packing 101 x 28 x 25 inches and gross weight of 17 kilograms.

The Gaviotas's sleeve pump comes with the appropriate installation, operation and maintenance manual.

5. Gaviotas's See-Saw pump for water extraction



DESCRIPTION: GAVIOTAS SEE-SAW PUMP (LEFT)

PHOTO: GAVIOTAS SEE-SAW FOR WATER RISE (RIGHT)

It consists of two Gaviotas's sleeve pump units in 180 ° out of phase. The see-saw has 2 or 4 seats, and can be operated by children and adults.

The Gaviotas see-saw pump comes with a corresponding Installation, Operation and Maintenance Manual.

6. Gaviotas Hydraulic ram (Water hammer)



DESCRIPTION: GAVIOTAS HYDRAULIC RAM (LEFT)

INSTALLATION OF GAVIOTAS HYDRAULIC RAM FOR WATER RISING IN A FARM IN THE ANDEAN REGION (RIGHT)

INTRODUCTION

Development of the high head Hydraulic Hammer Gaviotas type was made based on experience and operation of the implement, under a number of different working conditions, thus over time it has been redesigned and modified.

He is currently a highly reliable implement requiring minimal maintenance.

Only running water and a small drop or waterfall of 1 to 4 meters are necessary for operating these pumps without motors.

It pumps thousands of gallons of water, day and night, at a maximum distance of 1,000 meters with a height of 100 meters, without electricity or fuel consumption.

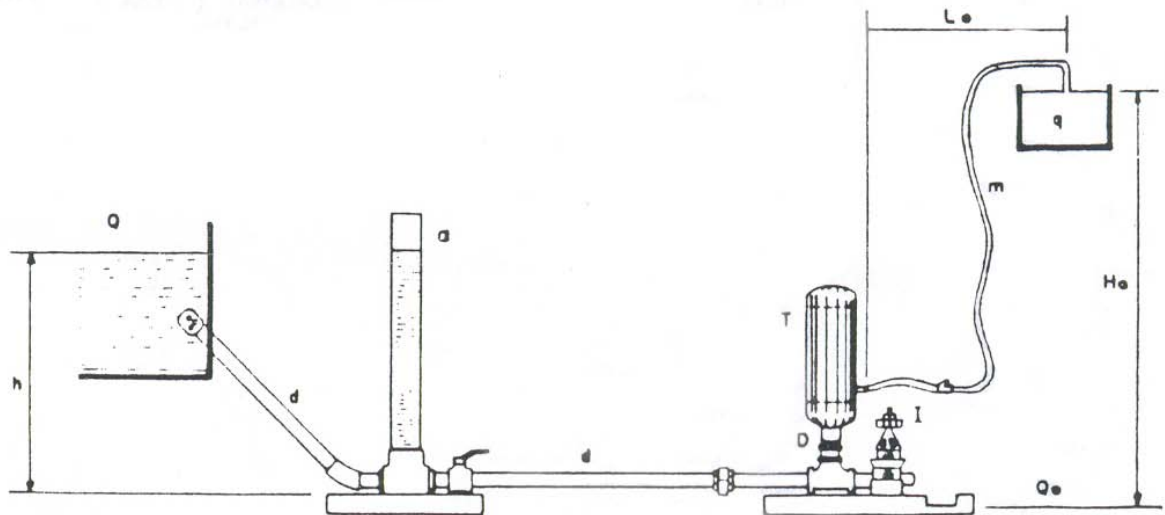
For its innovative design, manufacture and maintenance is more efficient than traditional hydraulic hammers.

GENERAL DESCRIPTION

The hydraulic ram pump is a machine for lifting water. Designed and developed to take advantage of small waterfalls of medium flow, without consuming more energy than the live force of the water taken from a pond or small stream.

OPERATION

The falling water from the tank (Q) with increasing speed and carried by the intake pipe (d), makes the live force of the water close the valve (I) thus suddenly becomes very precisely, opens the high pressure seal (D) and enters the air chamber (T), whose air, momentarily compressed, expands, closes (D) and drives the water to the upper tank, (I) then goes down and so begins another cycle.



DRAWING

d: feeding pipe:	a: equilibrium Fireplace
m: Conducting Hose	h: waterfall (m.)
I: push valve:	q: Flow supply (Lts / mn)
Q: Flow available	D: High pressure seal
Qo waste flow	Ho: pumping height (m)
T: Pneumatic chamber	Lo: pumping length (m)

The Gaviotas hydraulic ram comes with its own installation, operation and maintenance manual.

II. ARBOQUIMICA PRODUCTS AREA

DESCRIPTION OF THE ARBOQUÍMICA BIOFACTORY (LEFT)

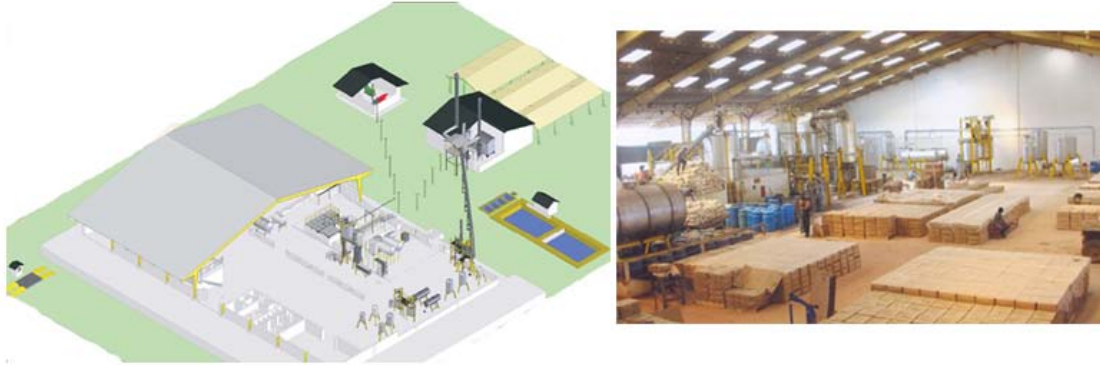
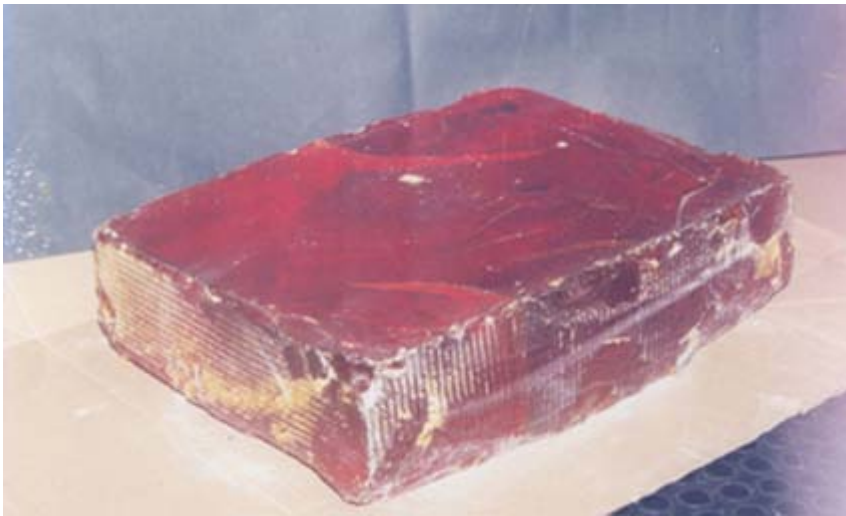


PHOTO: ASPECT OF THE GAVIOTAS ARBOQUÍMICA BIOFACTORY IN VICHADA, WHICH HAS A CONSTRUCTED AREA OF 3000 Mt.2 (RIGHT)

The Tropical Caribbean Pine is one of 250 species from the Gaviotas biodiverse forest, that covers an area of 8.000 ha.

This forest produces the raw material for Rosin, Turpentine and all the biodiesel for internal use. All these products are processed at the arboquímica plant to operate their tractors and power plants IN Gaviotas, Vichada.

1. ROSIN

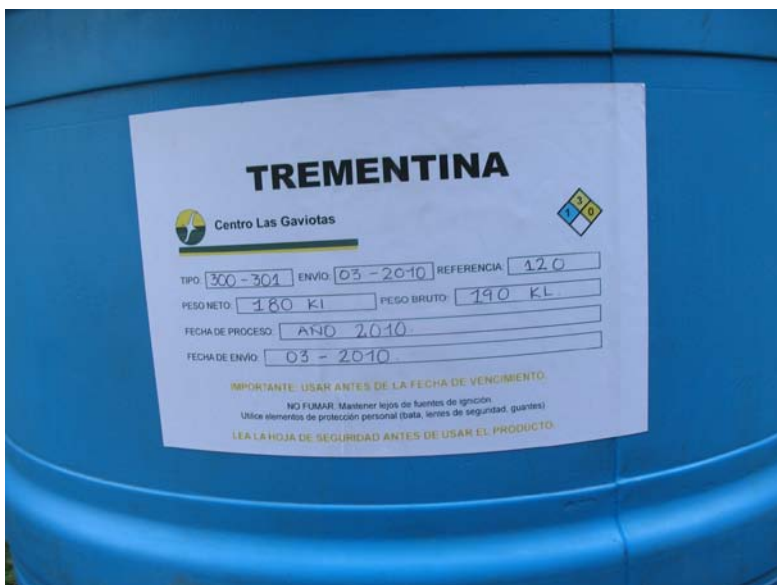


GAVIOTAS 25 KILOS WG ROSIN BLOCK

WG and WW Rosin (Gum Rosin), obtained from the Tropical Caribbean Pine oleoresin, it is used in paints, lacquers, varnishes, paper sizing manufacturing, etc. It comes in Bogotá in a 25 kg., cardboard box.

2. TURPENTINE

GAVIOTAS TURPENTINE



It is the volatile material in our case obtained from the oleoresin, the manual rosinning of Caribbean Tropical Pine (incision) is delivered in Bogotá in 180 kg plastic containers. It is used to manufacture pine oil, fragrance, and aroma, oil paintings, etc.

For information and requesting Gaviotas products, please contact the Centro Las Gaviotas:

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