



# FRACTIONAL DISTILLATION UNITS



**Professional**

**Industrial**

**Qualified**

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# FRACTIONAL DISTILLATION COLUMNS

Fractionating columns are units for fractional distillation, which allow the separation of solvents which differ in their boiling point and the almost total separation of solvents from liquid pollutants.

The fractional distillation process makes it possible to obtain a sufficiently pure liquid for its integral reuse in its original processes.

The plant consists of a boiler heated indirectly by diathermic oil or different energy sources (steam for example). The diathermic oil is placed in forced circulation inside an external shell around the boiler and in an inner coil.

A fractionating column fitted with anti-splash devices and high-efficiency packing material is installed in the upper part of the boiler in order to favour washing in the steam-liquid counterflow.

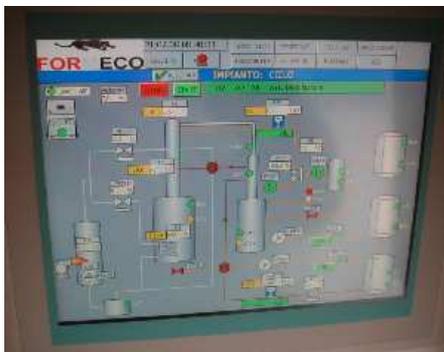
A head condenser makes it possible to regulate the forced reflux in the column in order to support the separation of the various components of the mixture being treated.

The vacuum group consist of a liquid ring pump on treatment in closed circuit, contained in a dedicated cooled tank, equipped with a special vapour condenser EGC - Exhausted Gas Condenser, placed on the way out of the vacuum pump.

The plant can work 24 hours a day, with automatic loading of the liquid to treat, automatic unloading of the distillate and of the process residue.

A special pc-board with display sets the diathermic oil temperature, the temperature inside the boiler and the temperature on the head of the column, with possibility to set the oil temperature with respect to the head temperature for regulating the distillation speed.

Atex – Explosion Proof protection



# Plant for the production of Distillates



The fractional distillation columns are suitable for several applications, in different fields.

One of the most common application is the production of distillates, used in the industrial fields, starting from crude hydrocarbons.

White Spirit, for example. This product is a derivate of the kerosene, the common combustible hydrocarbon solvent; it is widely used to power jet-engined airplanes, but is also commonly used as a heating fuel and for fire toys.

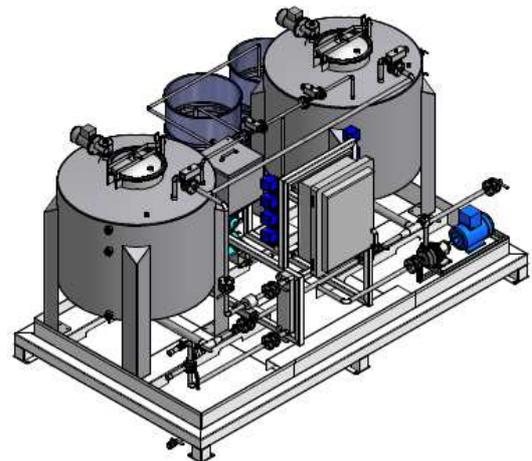
White Spirit, in effect, is a light fraction of kerosene, separated with the help of distillation. In order to obtain the purity required, the distillation process must be done with a fractional column which allows, by continuous reflux, to get a product with the characteristics required for its proper use.

The part of the kerosene which does not evaporate during the process is a derivate product that, added with some chemicals, becomes heavy fuel, which can be sold as heating fluid.

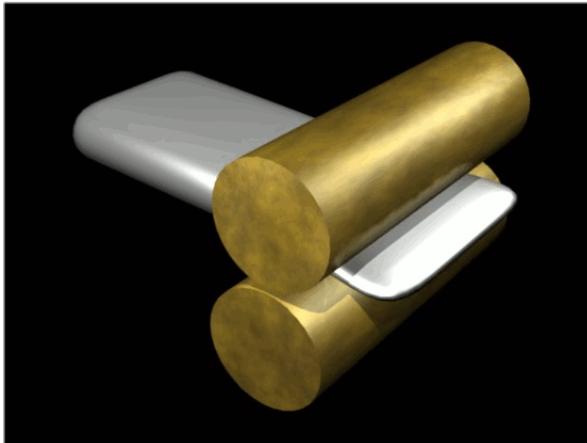
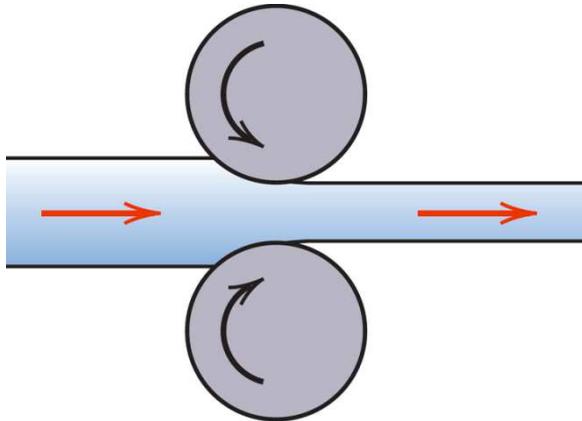
The same equipment, in other words, is a production plant for White Spirit and Heavy fuel at the same time. The whole platform, which can include a series of storage tanks (for feeding the plant but also for collecting the distillate) and an additive dosing system for producing heating heavy fuel from the process residue, can be controlled by a touch screen PLC.

The Dosing system is mainly composed of two storage tanks (for inlet and outlet of the liquid to be added), a dosing pump, a heat exchanger for cooling down the inlet liquid, and control board.

The touch screen PLC allows a continuous remote control and a totally automatic running of the system, from the feeding of the kerosene to be distilled up to the distribution of the heavy fuel to the tankers for being transported off-site.



## Recycling of Oil from Aluminum Rolling



Another common application is the recycling of the lubricants in the aluminum rolling process.

In metalworking, rolling is a metal forming process in which metal stock is passed through a pair of rolls. Cold rolling is performed by mills with the technology of four superimposed cylinders which impress in the material the desired shape, turning on themselves.

The aluminum foil is then rolled in different passes, with an average thickness reduction of 50% at every single step.

The units are equipped with advanced control systems which verify both thickness and flatness of the foil. The same systems also monitor the variations of nominal reference values and automatically regulate the rolling mill operation parameters.

In this process are used low viscosity lubricants like mineral oils, emulsions, paraffins and greasy oils.

In the final step are used the rolling oils, for lubrication and for thickness regulation as well. These oils are on an isoparaffin base, characterised by a high boiling point, and get contaminated during their use with colloidal aluminium and hydraulic lubricant oils of the rolling mill.

In the final phase of the production process degreasing takes place (with baths which contain aqueous solutions with acid or alkaline degreasing products and surfactants) and next a rinse with demineralised water.

There is then the “squeezing” phase of the tape by passing through rubber-coated rollers in order to eliminate the bigger part of the washing product from the surface, which is then rinsed in different baths with demineralised water.

Thereafter the tape passes through a hot air drying tunnel where it is completely dried from any liquid residue.

The saturated rolling oil used in the final phase of the millwork can be treated by distillation, avoiding in this way an expensive disposal and having the possibility to recover the lubricant for the following production phases, with a great saving on purchasing costs, so reduced drastically.



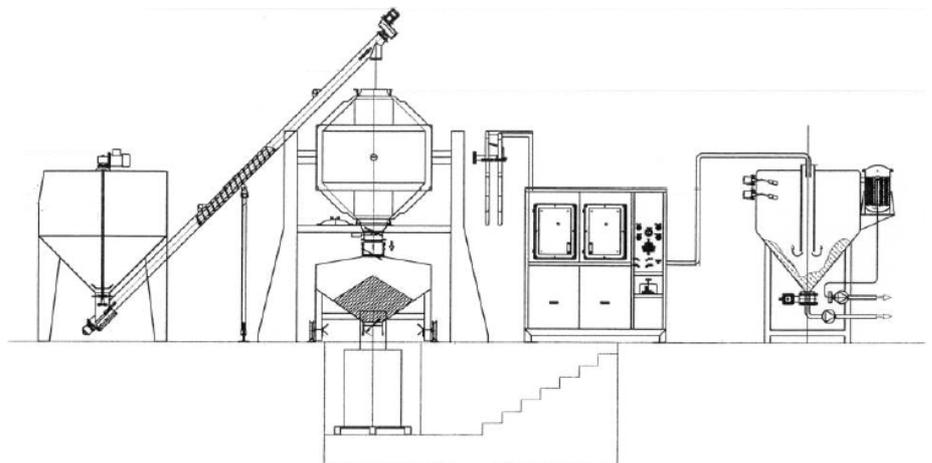
## Treatment of filtration earths

A further application of distillation in the Aluminum rolling processes is represented by the treatment of the filtration earths. The filtration earths are utilized for the filtration of the lubricating oil, normally composed by 95% of kerosene and 5% of a mixtures of different alcohols.

The purpose of dryness of these earths is to recover the lubricant by means of a distillation process. The recovered fluid will have the same chemical/physical characteristics of the original product, and it will be pure enough to be reusable in the production process.

The filtration earths are composed of a mixture of diatom earths and whitener earths.

By means of a special distillation unit, heated by a circuit of thermal oil or by a steam boiler, these earths are heated in order to extract the volatile components (kerosene and alcohols), free of any residual powder. The machine is equipped with an inner scraper which keeps the product in constant movement, allowing the total stripping of the solvents. An average recovery of hydrocarbon solvents from the filtration earths is normally about 30 % in weight.





## WHO WE ARE

Formeco designs and produces Solvent Recovery Systems and Waste Water Evaporators.

Born in 1977, manufacturing in a its facility, located in Northern Italy (4000 sq. m indoor - 10000 sq.m outdoor), Formeco has installed more than 36.000 machines, keeping the world-wide leadership position on this field.

Common in all Formeco units is quality, workmanship and dedication to total customer satisfaction. Each Formeco machine is tested and tuned at the factory to give customers the ultimate performance and trouble-free operation.

Formeco examines customer's problems and simulates the recycling process with his waste by means of pilot test units. If the right plant is not included in the existing production line, Formeco builds a specific apparatus for the customer.

Formeco facilities : a chemical laboratory for analysis, a R. & D. design and project technical department, a complete range of pilot units for industrial tests.

Formeco provides : each unit with Conformity Certificates issued by the most important European Countries delivered with a detailed instruction booklet in customer's language and the sureness of a full warranty.

Formeco offers : the assurance of a technical service network throughout World and a telephone line is at customer's disposal with skilled technicians who speak your language.

Producing systems for the treatment of solvents, water and acid, Formeco offers a complete solution to the industry pollution problems, contributing to the environmental protection.

## OUR SERVICES – OUR PRODUCTION

Project and design of polluted liquids treatment systems

Management of "turnkey" supplies

Assistance and maintenance on existing units



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