



**LATEX FOAM  
TECHNOPOLYMERS  
COMPOSITES**

- **VULCANIZING**
- **DRYING**
- **CURING**
- **THERMOSETTING**



*Technology  
and innovation  
made easy*

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# COMPANY AND TECHNOLOGY

**RF Systems designs and manufactures Radio Frequency machines for latex foam, construction materials and chemical industries, that speed up and improve the efficiency of drying and other thermal processes, cutting energy consumption and operating costs.**

Established in 1990, RF Systems manufactures Radio Frequency equipment for the drying, vulcanizing, thermosetting and curing of latex foam, technopolymers and composites.

Driven by customers' challenges, RF Systems aims at enhancing industrial drying and thermal processes through state-of-the-art RF machines. More than 1000 machines have been installed worldwide and many processes and devices have been patented during its 30 years' activity.

High-performing, energy-saving and cost-efficient, RF Systems machines allow its customers to make the most of the advantages of the RF technology with the best cost / benefit ratio.

Dynamic and forward-thinking, RF Systems strives also in delivering pilot and tailor-made equipment for special applications according to the customers' needs.

RF SYSTEMS supplies the exclusive SmarTouch PLC system for the machine management and control: equipped with a remote access facility, it allows the operator to monitor and modify as far as required every machine parameter and setting in order to guarantee the best operation and efficiency in all circumstances.

## THE RADIO FREQUENCY TECHNOLOGY

The Radio Frequency technology is based on electromagnetic fields, specifically at 27.12 MHz, to heat water contained in the products.

While exposed to radio frequencies, the water molecules undergo vibration and rotation at a frequency of over 27 million times per second, generating heat and raising the water temperature to evaporation.

The heat transfer is endogenous and instantaneous in the entire product mass, making the whole process significantly faster than conventional methods.

## Hybrid

*The RF technology is complemented with hot air circulation, which ensures the highest performance at the lowest operating cost.*



# VULCANIZATION AND DRYING OF LATEX FOAM

Radio Frequency vulcanizing and drying of mattresses, pillows, sheets and other latex foam products

Vulcanization and drying processes in latex foam production factories have always been an expensive and challenging task: latex is a good thermal insulator and steam heating is a slow process with inherent problems of product degradation.

At present the prevailing method of transferring thermal energy for the industrial vulcanization and drying of latex foam is heat transfer by thermal conduction and convection with steam and hot air serving as energy sources.

Vulcanized products require washing to eliminate the residual chemicals, then they are mechanically hydroextracted.

The remaining water content is relatively low.

Because of the low moisture levels and poor thermal conductivity of foam, driving the remaining moisture from the center to the surface with conventional drying techniques, such as steam or hot air dryers, is usually a slow process with inherent problems of product degradation.

RF Systems has developed the first RF equipment that overcomes all the issues related to this specific production process.





The Radio Frequency technology is based on electromagnetic fields that generate heat within the product mass and allow rapid vulcanization in a few minutes. Being an endogenous process, no metal pins or expensive metal moulds are required: in fact, the product can be vulcanized in light and cheap plastic moulds, allowing for a more flexible design and easier product stripping.

The drying process can be carried out very quickly as well: the water evaporates in the surface as in the core at the same time (also in shaped items), leaving the product uniformly dried, without yellowing or wet spots.

The final outcome is a higher quality product at a lower cost, along with a huge increase in the production throughput.

The overall equipment is small in size and ensures a much smaller carbon footprint compared to traditional technologies. The **Hybrid** version is available to achieve the highest drying performance at the lowest operating cost.

All major latex foam producers worldwide are currently using RF Systems machines in their production facilities.

> **RAPID AND ENERGY SAVING PROCESS**

The overall production process is achieved in minutes, allowing huge savings in operating costs. The process is not affected by external ambient conditions. No fumes or emissions, no need for pre-heating.

> **SMALL FOOTPRINT, MODULAR DESIGN**

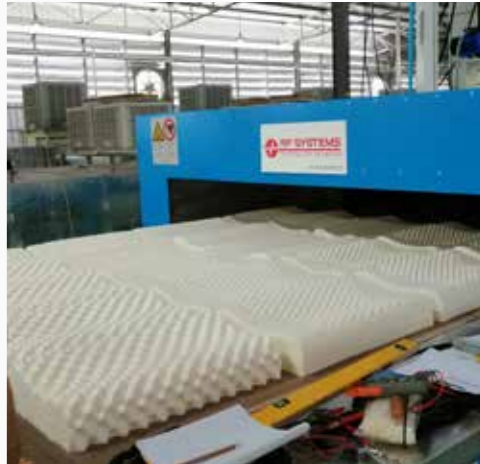
The reduced footprint of the RF vulcanizers and dryers guarantees a smooth and easy installation even in small production facilities. The modular design allows to increase the production capacity at a later stage. The PLC system/software ensures an easy and seamless integration into fully automated production lines.

> **LIGHTER MOULDS AT A CHEAPER COST**

Heavy metal moulds and pins are not necessary to transfer heat to inner layers. RF Systems supplies lighter and cheaper plastic moulds, upon customer request.

> **AUTOMATIC OPERATION, IMPROVED RESULTS**

The RF power delivered by the machine can be easily adjusted and automatically controlled based on the specific needs of each particular product, thus ensuring an accurate process control and the best quality results, minimizing at the same time human errors.



> **Foaming**  
Foaming phase in latex sheet production

> **RF vulcanization of pillows**  
Vulcanization in plastic molds

> **Vulcanization of latex sheet**  
Continuous vulcanization

> **RF drying of pillows**  
300 kg/h throughput

> **RF drying of mattresses**  
400 kg/h throughput

> **RF drying of pillows**  
200 kg/h throughput



## DRYING AND THERMOSETTING OF PU FOAM

Radio Frequency drying and thermosetting of polyurethane foam on various substrates

Polyurethane foam is commonly used in many application fields and products such as thermal or acoustic insulation, mattress pads, couch or chair filling. Being an insulating material, the drying and thermosetting process is often slow and inefficient, if performed with conventional technologies.

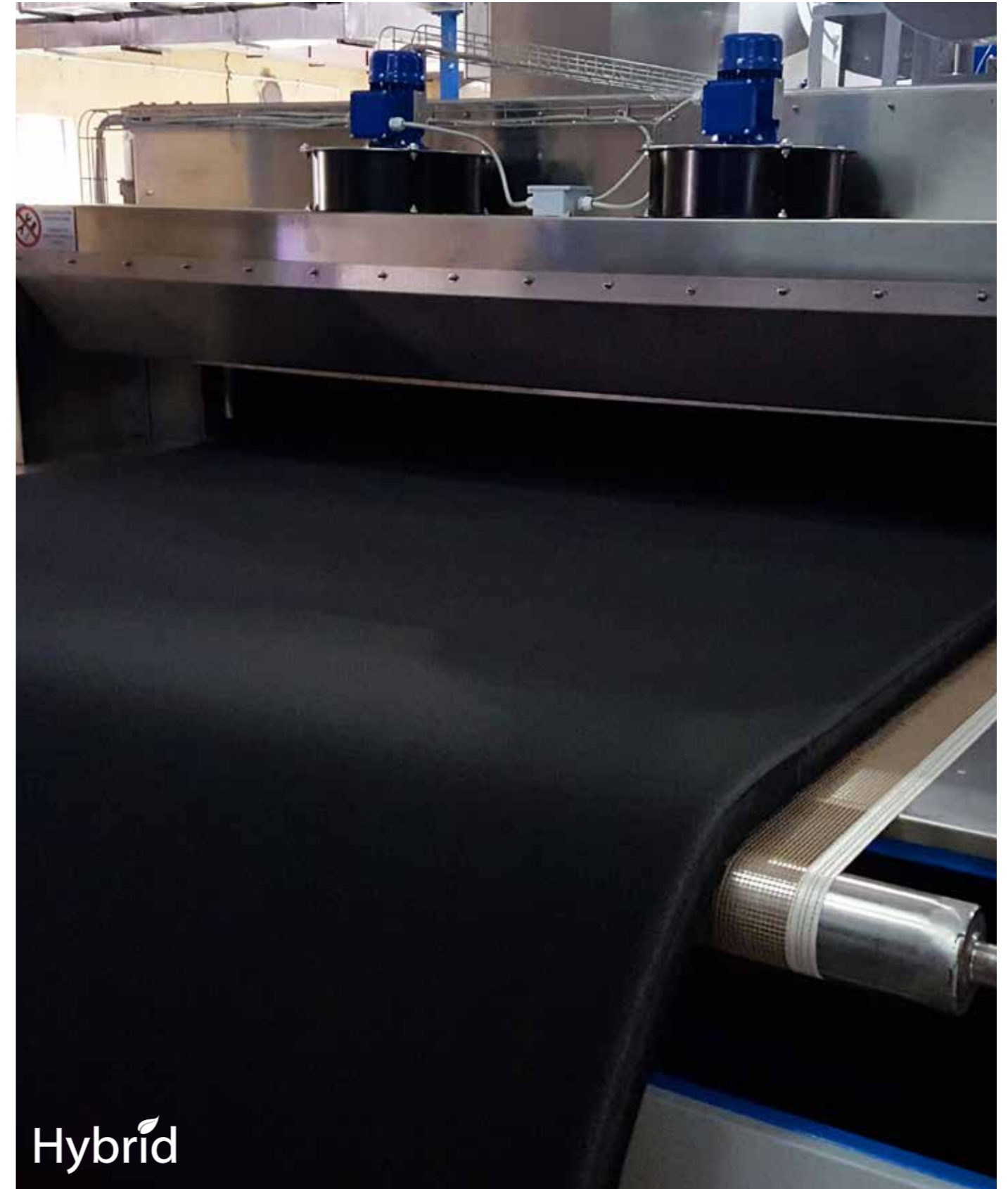
Radiofrequencies, on the other hand, are selective towards the water and therefore can heat up and dry the substrate quickly.

RF machines can perform the entire process or work in conjunction with existing tunnel or cabinet type hot air dryers.

No fumes or dust are emitted during the process. The equipment is small in size, allowing an easy installation in any working environment.

The **Hybrid** version is available to achieve the highest drying performance at the lowest operating cost.

- › Fast and uniform process
- › In-line non stop operation
- › No dust, no emissions
- › Additional modules can be added at a later time
- › Easy integration into existing production lines



Hybrid





## DRYING OF CERAMIC AND OTHER COMPOSITE MATERIALS

Radio Frequency drying of sanitary ware, tiles, technical ceramics etc..

The problems related to the delicate process of drying ceramics after pressing or cast-moulding, especially if they have a complex form, are well-known. Cracks in particular occur very frequently and cause breakings - both before and after baking - with consequent product waste which can affect up to 30% of the total production.

Instead, RF technology enables to dry highly porous ceramic substrates in a short time and in a very uniform way, thus eliminating the risk of cracks and allowing to have them immediately ready for baking.

All parts of the product - even if remarkably big or complex - are dried uniformly and simultaneously.

The process can be applied to plaster moulds and sanitary ware, tiles and refractory.

The **Hybrid** version is available to achieve the highest drying performance at the lowest operating cost.

- Fast and uniform process
- Avoiding of cracks causing waste before and after baking
- Consistency of the drying process - even with different ambient conditions
- Remarkable reduction of the space needed to stock the products to be dried
- Remarkable reduction of production times
- Easy integration into existing production lines





## DRYING AND THERMOSETTING OF IMPREGNATED RESINS

Radio Frequency drying and thermosetting of infused resins in fiber mats, non-wovens etc...

Impregnated resins are used in a large number of substrates including construction materials, aircraft and automotive industry, packaging, furnishing and textile industries.

The RF treatment can be efficiently applied to a variety of resin and binding agents on several substrates such as fiber mats, paper, wood etc.. It ensures uniform moisture leveling and quick cross-linking/thermosetting.

The equipment configuration is extremely flexible and additional modules can be added to cope with higher capacities.

The **Hybrid** version is available to achieve the highest drying performance at the lowest operating cost.

- Quick and efficient thermosetting and curing
- No migration of the resin on the substrate
- In-line non stop operation
- Additional modules can be added at a later time
- Easy integration into existing production lines







## DRYING AND GLUING OF PAPERY SUBSTRATES

Radio Frequency drying and gluing of cardboard, abrasive paper etc..

RF Systems has developed specific machines for the rapid curing of glue/ink/varnish and drying of papery substrates (cardboard, abrasive paper, etc..). The process is carried out in-line uniformly in just a few seconds or minutes and prevents deformations and scalding.

The equipment configuration is extremely flexible and additional modules can be added to cope with higher capacities.

The **Hybrid** version is available to achieve the highest drying performance at the lowest operating cost.

- > No migration of chemicals or yellowing
- > In-line non stop operation
- > Easy integration into existing production lines
- > Additional modules can be added at a later time





## TECHNICAL SPECIFICATIONS

### > GENERATORS

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Available output power from 5 to 105 kW

Unit from 5 to 60 kW

Unit from 40 to 85 kW

105 kW

Air cooled

Air cooled / water cooled

Water cooled

### > ELECTRODE TYPE

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Perforated plates

Alluminium bars

### > ACCESSORIES (OPTIONAL)

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- PLC with SmarTouch panel for fully automatic operation
- Outlet cooling device
- Stabilizer for the triode filament or for the entire machine
- PP rigid belt or fine-mesh glass fiber - Teflon belt
- Lateral teflon protection guards for loose products
- Additional air heating and circulation devices by means of resistors or steam battery

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