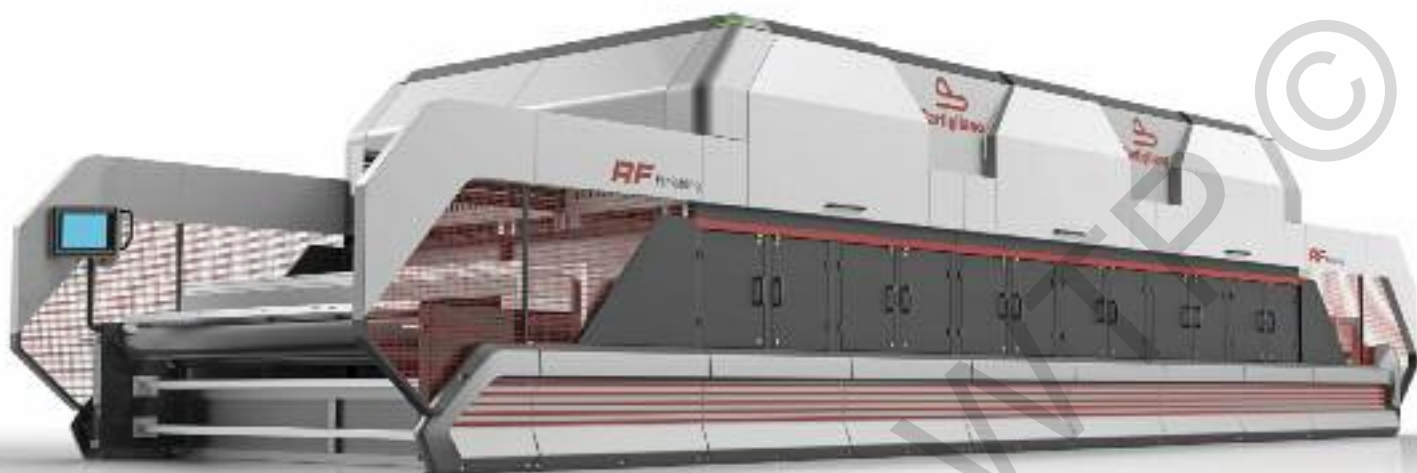




The Cartigliano RF Finishing Machine, showing the three modular units assembled into one RF drying machine.
CREDIT: CARTIGLIANO



Radio frequency drying

Cartigliano is no stranger to leather drying. For nearly 60 years, the company has specialised in making machinery for drying and conditioning leather. At the Tanning Tech exhibition in February, World Leather was given a demonstration of its new radio frequency (RF) drying unit, which is suitable for finishing and for crust leather production.

Radio frequency (RF) drying is not, in itself, a new concept for the leather industry as it has existed for more than 50 years. It is seen as expensive, however, and so is seldom used. Italian machinery manufacturer Cartigliano had shelved the idea for 30 years but is now ready to change its thinking.

RF drying works by the application of alternating voltage to two electrodes. As the moisture-laden leather passes between these electrodes, the alternating field causes charged molecules in the water to realign themselves 27 millions time per seconds (27MHz). This friction between molecules generates heat and causes the water to evaporate. Unlike conventional drying, where capillary action

is used, RF drying does not promote the migration of solids.

Depending on the specific requirements, it can be used to dry the leather, to prepare it in a conditioning stage (after vacuum drying), or even to expel moisture from the finishing operation.

Working as a modular system, Cartigliano's RF Finishing unit is typically made up of three 45 kilowatt drying units. Each generates an electric field in a confined region, which only interacts with the moisture present in the coating previously applied to the leather.

With respect to drying and conditioning (RF unit for crust), the advantage of the RF system is that it is able to take the moisture level down from around 30%, the value

typically found after vacuum drying, to the lowest possible residual content or to a predetermined level (around 8%-10%, typical value requested for this process). The water in the leather absorbs the electrical energy through dielectric dissipation; this varies depending on the moisture content of different areas of the hide. Using this technique, all parts of the leather reach the same moisture content by the end of the process. This is the case for both the surface and the rest of the structure. The process takes five to ten minutes, as opposed to hours for traditional drying methods.

While conventional drying procedures require high temperatures and large volumes of air, the RF drying system does



not heat the leather at all and it comes out of the machine cool. As a result, production cycles are shortened because there is no need for a preheating or cooling phase.

Fernando Bressan, Cartigliano's director for research and development for its RF division, tells *World Leather* that one significant advantage of drying hides in this way, compared to convection drying, for example, is that the RF dryer consumes energy only when there are wet hides in the unit.

"It's intrinsically more efficient," he says, "thanks to the physics. The energy consumption is present only when there is moisture in the working area. Conventional dryers remain on all the time because they have to heat the air to work and they heat the air whether hides are present or not."

The efficiency of the machines is not the only advantage that RF drying brings to a tannery. Due to the volumetric drying, the fibres in the leather are flexed. This flexing



The RF dryer works at a maximum belt speed of 12 metres per minute, drying hides in minutes rather than hours. CREDIT: CARTIGLIANO

action is said to improve the softness of the leather to such a degree that milling operations can be reduced or even

eliminated. It also has a positive impact on maintaining area yield, roundness and fullness. 🌐

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