



DIRECT COATING LINE



“NEW ROADS FOR YOUR CREATIVITY”

FLEXIBILITY AND QUALITY IN THE TEXTILE FINISHING UNIROLL RBS : A NEW POSSIBILITY

The finishing or upgrading of textile support materials referred to as "surface finishing" has recently come to acquire a greater and greater importance deeply involving the sectors of technical textiles, non-woven and fashion.

The so-called "Technical Textiles", from a use in special niche applications are gaining an ever wider space in the daily use. They are manufactured from "Hi-Tech" materials and from traditional textiles that are "finished" with resins, polymers, auxiliaries of various kind and nature; these latter are also called enhanced textiles. The application of these products upgrades or modifies the technical specifications of the fabric, making it, just to name a few, waterproof, dirt-resistant, or flameproof. Textiles bound to the fashion market will take advantage of the possibility to alter the fabric "hand", look, colour etc. Innovative and peculiar tactile and optical effect can be created.

These special specifications can be achieved by the use of dedicated chemicals and suitable coating technologies.

To get optimum results on the finished fabrics, in terms of both aesthetic appearance and technical quality, the layer of the chemical product must be applied as evenly as possible both in regard to its quantity and spreading throughout the entire width of the treated fabric.

Application may vary according to specific needs. Sometimes the chemical product must provide a surface coating only, while in other cases it must penetrate deeply into the fabric in order to ensure different characteristics of strength and appearance depending on the performance required.

The combination of the right products and application methods allows the creation of coated textile with excellent features and specifications, lightweight, but resistant, flexible and sturdy at the same time, attractive to the eye, and with all the technical performance needed.

A multi-functional coating head is the only solution to guarantee all these application characteristics, suitable for a quick and easy use in every situation regardless of the nature of the product to be applied and the textile to be treated.

Per obey to these coating specification, a direct coating line is required, composed by one or more coating heads and, in case, a padding unit.

Rollmac offers three kind of coating heads:

- **Uniroll SP**, traditional knife-coater
- **Starline RS**, roller-coater with reverse and synchro operation
- **Uniroll RBS**, multifunction coating head with roller and coating knife

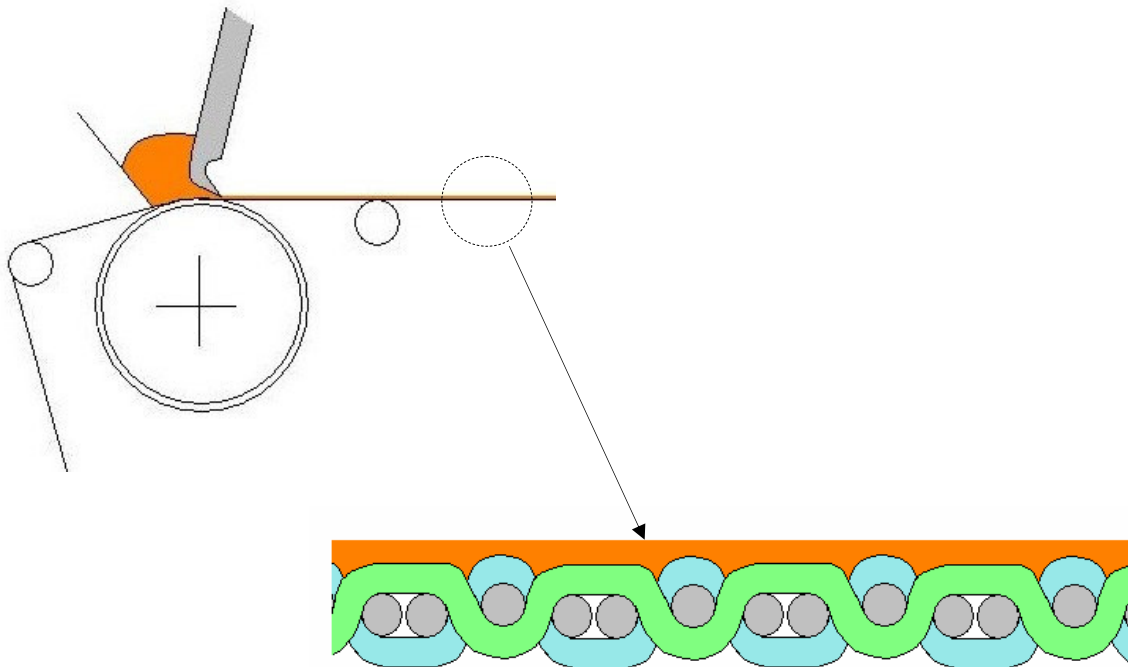
Uniroll RBS is a multifunction coating head that joins the traditional knife operations with the new engraved roller finishings. With RBS the user can quickly and easily change the coating technology to face at its best the different working requirements.

The technologies available on the machine are:

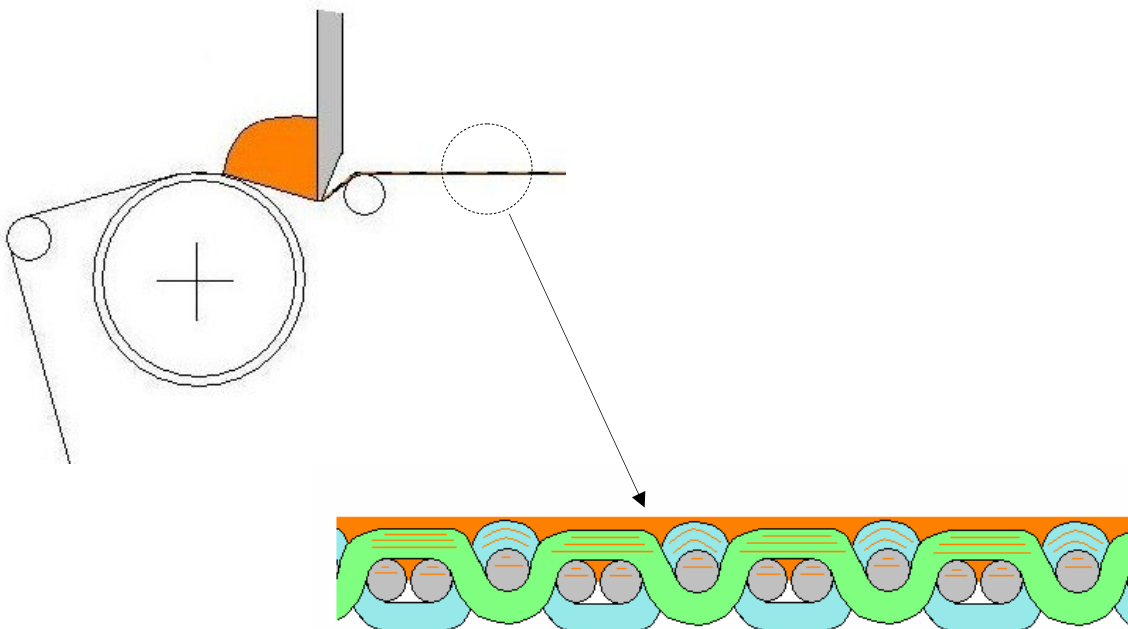
- coating system with coating knife on counter-cylinder
- coating system with coating knife "on air"
- coating system with synchro cylinder
- coating system with reverse cylinder
- coating system with reverse cylinder " on air"

COATING TECHNOLOGIES

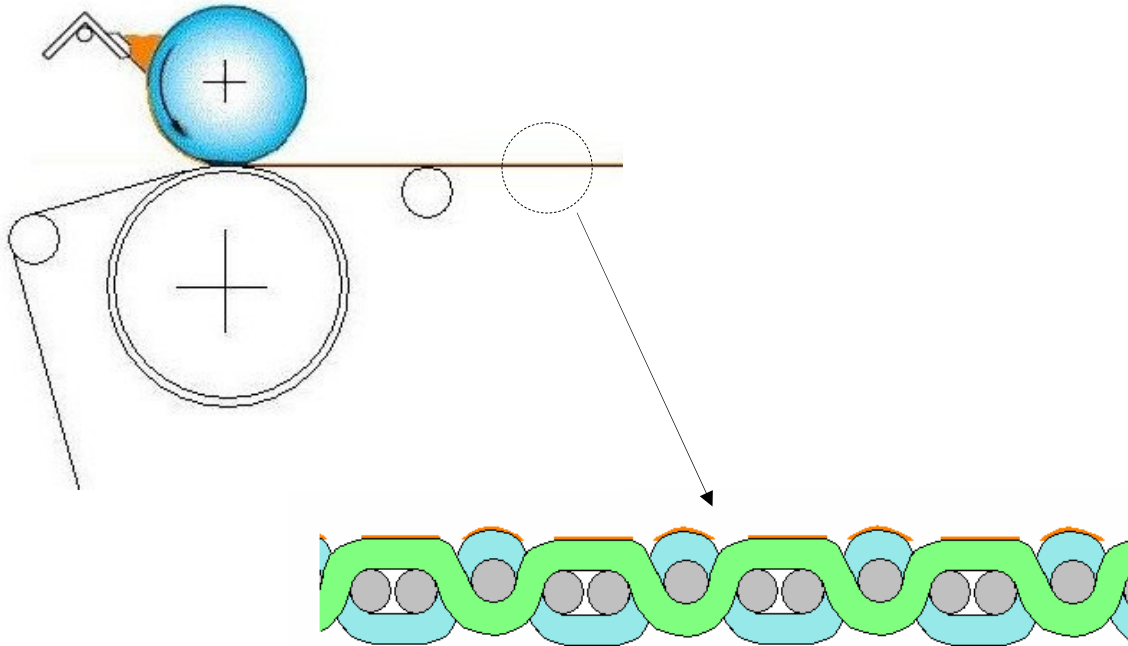
Pic.1 Coating by knife over roller (thickness coating)



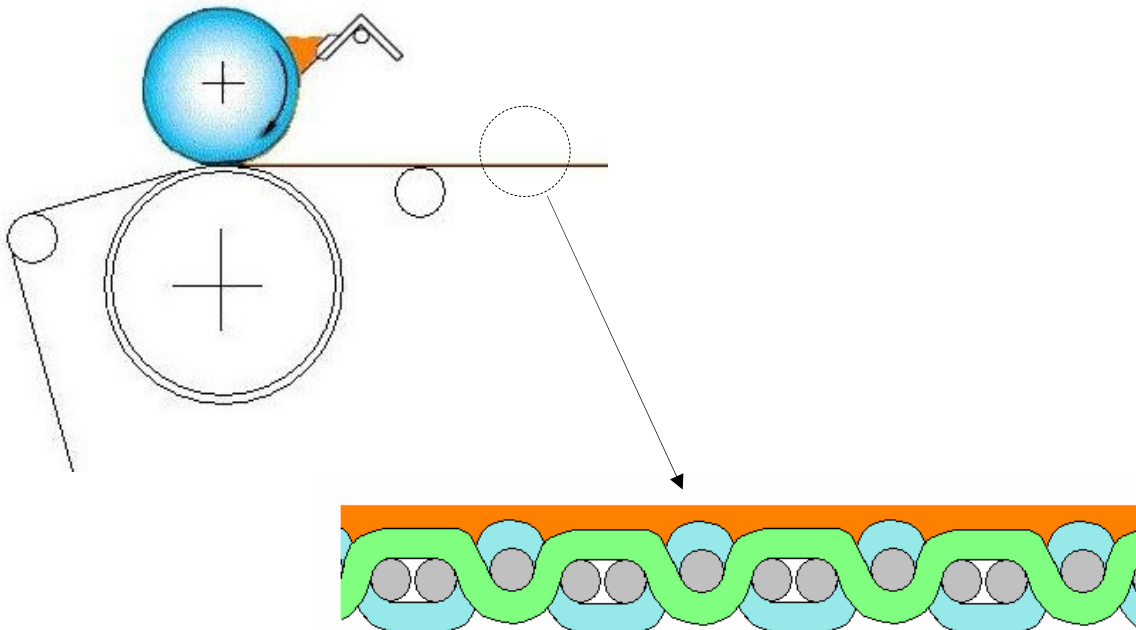
Pic..2 Coating by knife "on-air" (scraping blade)



Pic.3 Coating by engraved roller in synchro rotation



Pic.4 Coating by engraved roller in reverse rotation



We are now focusing our attention on this last system – known as reverse roller-coating –, since the traditional coating knife-type coating systems are already widely known, while this type of application is relatively new and offers some interesting advantages:

The reverse rollercoating guarantees:

- application of very liquid chemicals such inks, dyestuffs, different kinds of auxiliaries
- wide deposition range, from few gr/sqm up to 350 g/mt2 of coated chemicals; without limits to the product's viscosity coefficient, so that it is delivered under its ideal working conditions;
- reproducibility of the article. The engraved roller has a determined capacity coming from the shape and depth of its engraving. Using the same chemical product the same result is obtained.
- easy adjustment of the quantities of product to be applied. By adjusting the rotation speed of the engraved cylinder, said quantity can be increased or decreased as wanted.
- a perfect spreading of the chemical applied, thanks to the mechanical action of the coating cylinder: The same rotates in the opposite direction to the fabric advance and applies the resin or chemical product through its engraving, thereby exerting a repeated and rapid mechanical action that ensures perfect uniformity and spreading. Reverse roller coating means breaking all surface tension in the product applied.
- possibility to either leave the chemical products on the surface of the fabric or to penetrate deeper in the textile structure.
- Optimal grip and spreading of the chemical on smooth and water-repelling surfaces, such resinated or coated fabrics.
- Possibility to stop the production without removing the colour from the head

The electronic system for the control of speed and work parameters of the Uniroll RBS machine ensures that all the results can be perfectly repeated, to the advantage of production quality.

Questo sistema necessita di piccole quantità di prodotti chimici per cui possono essere lavorati anche piccoli lotti di produzione. The ease in use and the little quantities of chemical product necessary to start the process make the system ideal for even small production lots.

THE DIRECT COATING LINE

A direct coating line for textiles is basically composed by a coating station and a drying and curing system. There are several systems available, but normally a tunnel with hot air circulation is used.

The new Rollmac drying tunnel integrates an high use flexibility and adjustment accuracy with strict criteria of energy consumption reduction. In comparison to the previous generation of dryers, the installed thermal power is about 15% lower. The internal design of the tunnel guarantees a perfect distribution and uniform temperature of the air delivered to the product, while its external insulation avoids heat dispersion. This means that the dryer can reach the same working parameters in terms of inside temperature and volume of circulated air with a lower energy requirement. The hot air is prepared and mixed before its sending to the product. Each drying compartment is provided with four ventilators for a perfect mixing of fresh and recirculated air; its circulation can be split by means of air locks, thus enabling the user to bleed the wanted quantity. The volume and the pressure of the air delivered on and under the product surface can be continuously and precisely set. In emergency, the whole air delivery is diverted from the product, so that any stop of the line will not cause any damage to the product. Once removed the problem, the line can be restarted under the same settings and working parameters, without any need to reset them.

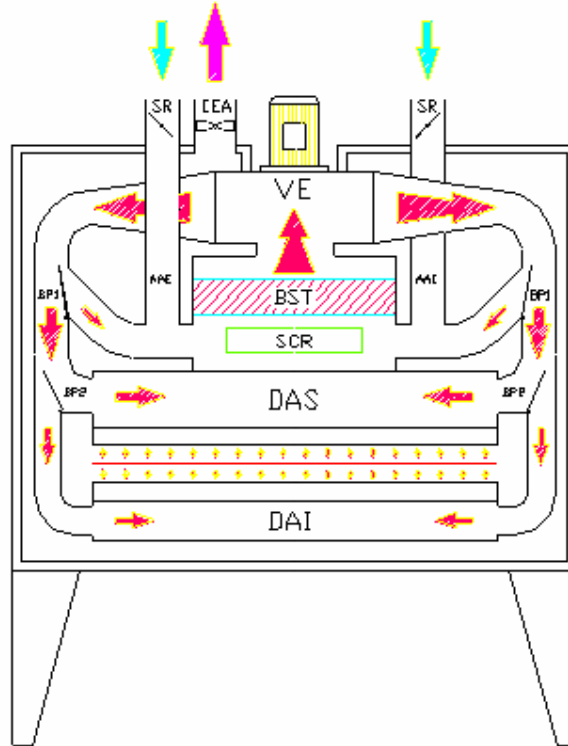
The dryer is designed to mount heat exchangers suitable for fluids (diathermic oil, steam), electricity or with gas burners. Big doors allows the tunnel internal inspection and cleaning. On request, it's available the semi-automatic threading-in system for release paper or textiles.

The attached section drawings explain in detail how the system is designed and operates:

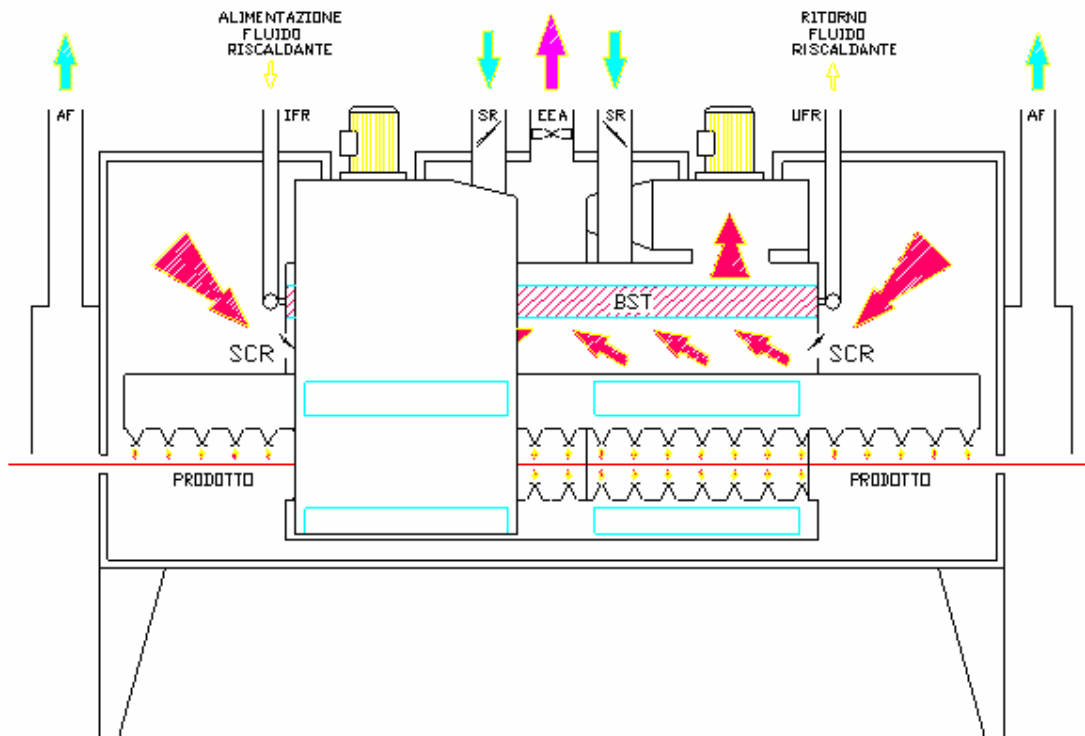
- *fans* (VE), installed in each compartment, suck in the air passing through a *heating battery* (BST);
- the air flow meets two *air locks* (BP1), that can reduce the volume of air in circulation, hence reducing the system dynamic pressure, by retaining the speed of the air through the battery and to short circuit the air flow in case of emergency stop.
- the air flow sent to the *upper blower* (DAS) and to the *lower blower* (DAI) can be separated and shut by mean of the *air lock* (BP2) in order to get the wanted flow rate and delivery per each blower;
- the hot air is blown on the product (red arrows) by a set of calibrated air blades
- the fans generate a depression in the central mixing chamber, containing the heating battery, so that the air is recirculated through the counterweighted *air locks* (SCR). The fresh air reaches the mixing chamber by the *air intake* AAE with *adjustment air locks* (SR)
- the fresh air is mixed with the recirculated one and is ready to be heated up by the battery
- in emergency the *by pass lock* (BP1) will divert the air flow that will not sent to the *blowers* (DAS, DAI) but will generate an over pressure in the mixing chamber. The pressure will cause the *counterweighted air lock* (SCR) to close so that the hot air will short-circuit between fan and chamber only
- the fumes and vapours are exhausted by the *air exhauster* (EEA) in order to keep the required humidity and fumes concentration inside the tunnel
- the tunnel inlet and outlet mouths are equipped with suction hoods connected with the *fumes exhaustion pipes* (AF) to remove any fume that may come out;
- the heating fluid is delivered by its *pipe* (IFR) and returns by a *second one* (UFR), connected to the plant pipeline. The fluid temperature is adjusted by a thermoregulating system composed by valves that keep constant the delivered fluid temperature.

Note: the exhausted fumes have generally an high temperature; for an even higher energy saving, it is recommended to provide the dryer with a heat exchanger air/air to preheat the intake fresh air in order to recover heat from the exhausted fumes.

Front section:



Side section:



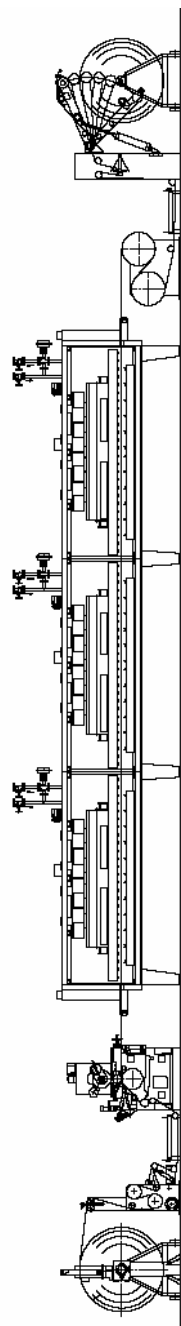


Uniroll RBS



Forno di essiccazione e gelificazione / Drying tunnel

Linea spalmatura diretta con testa multifunzione e forno di essiccazione.
 Direct coating line with multifunction coating head and drying tunnel.



Linea di spalmatura diretta con foulard d'impregnazione, testa multifunzione e forno con rameuse.
 Direct coating line with padder. Multifunction coating head and stenter frame.

