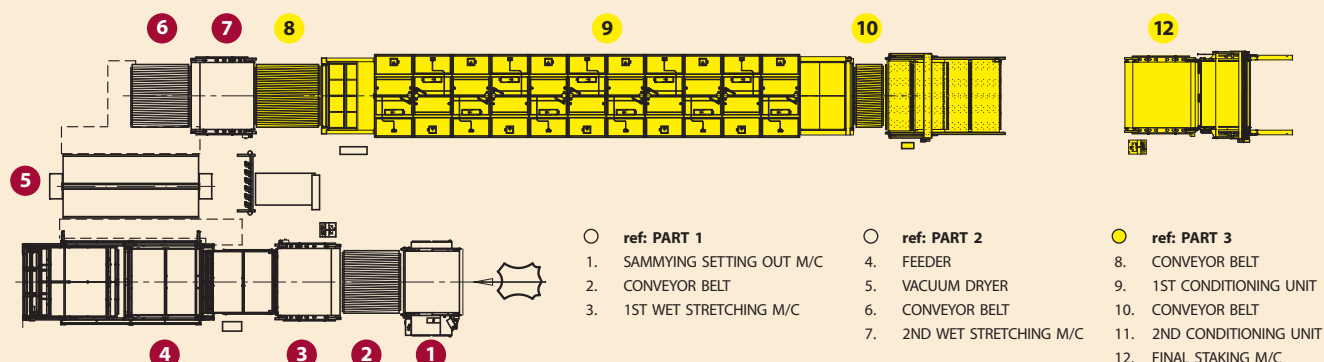


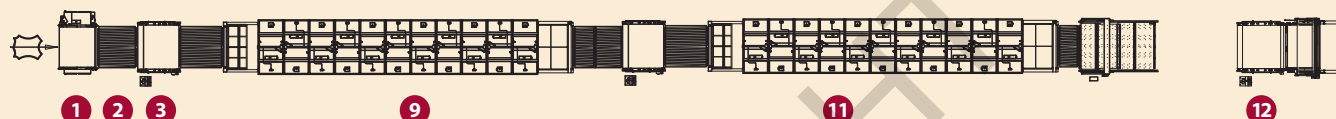


Versatility of the Cartigliano “Just in time” line: diagram shows two Cartigliano line configurations

(i) Complete Cartigliano Line with Vacuum Dryer and Conditioning unit



(ii) Complete Cartigliano Line with Double Conditioning unit



Cartigliano “Just In Time” Technology Part 3

Part 1 describing the samm/setting and the first wet stretching elements of the Cartigliano “Just In Time” line was published in *World Leather*, February/March 2012.

Part 2 describing the feeder, vacuum dryer and the second wet stretching elements was published in the August/September 2012 issue.

In this issue, part 3 describes the final elements, the conditioner and the final staker.

At this point the versatility of the line allows different configurations. Depending upon client specification related to leather type and characteristics the line may be constructed accordingly:

- Frequently specified (for all types of leathers – automotive, shoe upper, garment, upholstery, leather goods):
Samm/setting - wet stretcher - feeder - vacuum dryer - second wet stretcher conditioner - final staker.
- For specific leathers (recommended for sheepskins production):
Samm/setting - wet stretcher - conditioner - final staker.
- For specific leathers (recommended for some upholstery and automotive articles):
Samm/setting - wet stretcher - conditioner - second wet stretcher - second conditioner - final staker.

Performance and construction of the conditioner and the final staker explained

The conditioner, called TAIC, is directly linked to the preceding machine of the line. Where it follows the vacuum

dryer the transfer of the leathers is manual on to an inclined band conveyor feeding directly onto the second wet stretcher or directly to the TAIC, depending on line configuration. In all other configurations (except feeder to vacuum dryer) transfer is continuous, that is conveyor to conveyor.

The TAIC is a modular construction dryer available in a range of three to twelve cabin modules each independently programmable and controllable. An articulated conveyor system of either three, five or seven levels is fitted which is specified so as to be capable of performing the conditioning operation at a throughput time of thirty minutes, the normal time for the just in time line cycle from samm/setting to final staking.

The objective of the TAIC is to take the leather humidity level to an even 8% using a novel approach. Contrary to leather being dried by classic machinery such as toggle dryers, pole dryers and the like, the principle of the TAIC is to maintain the required condition of the leather throughout its passage through the machine using air temperature change and humidity level adjustment as needed to achieve this. The conditioning function is programmed and controlled to ensure that the leather can never exceed a temperature of 37°C.



The conditioning medium—air—is delivered at high pressure to both the grain and flesh sides of the leather, made possible by the articulated level of the conveyor system which presents both grain and flesh sides of the leather to the air nozzles. The effect of the high pressure air stream directed continuously onto both surfaces ensures that the leather remains flat all the way through its travel. The quality of the air stream is the vital ingredient in producing the conditioned drying of the leather. Careful controls maintain a mixture of warm air and moisture which results in the equivalent of natural drying, quite the opposite of classic hot air drying which tends to be harsh, turning the leather into a firmer handle as the fibres become hard and are left with little elasticity. Air temperature and humidity is continuously read in each cabin module, signalling heating elements and water vapour injection valves as well as air discharge flaps, via a central PLC system to electronically control temperature and humidity of the air in circulation in the same cabin module.

In summary, after receiving leather from vacuum dryer at about 30% humidity, it will have been over-dried down to 8% to remove residual humidity and, particularly for automotive leathers, fogging is controlled or eliminated. It is round and soft as well as flat, with a minimum loss of area in comparison with classic hang drying. Its state after this stage is that it is completely, uniformly and naturally dried by employing exposure to air at low temperature, continuously and consistently and is then immediately transferred to final automatic staking.

Whilst the single TAIC treatment achieves the required leather characteristics with a majority of leathers, a second conditioner is at times placed in line (i.e. samm/setter - wet stretcher - conditioner - second wet stretcher - second conditioner - final staker). This applies particularly when upholstery leather is produced where ultimate stretch has to be limited and roundness and fullness is looked for.

Final staking

The last transfer of the line is that from the TAIC to a staking machine again by means of an inclined band conveyor feeding the leather continuously onto the staker conveyor. The staking machine is of the four head Cartigliano type. The staking tools employed and set are according to the type of leather being processed.

Staking tool frequency and staking depth can be PLC programmed and controlled separately for each head. The machine has been developed with this flexibility to enable it to handle all and every type of leather.

The objectives in the first instance of this final operation are to restore any losses in area and leather softness or roundness as a result of the drying process, and in the second instance to impart these characteristics along with other quality requirements as desired. Staking tool differentials and their selectable application gives this very wide scope for the creation of quality properties and moreover makes it possible to stake virtually all types of leather, be they chrome or vegetable tanned. Both whole hides and sides can be handled equally effectively.

Cartigliano "Just in Time" technology, as detailed in parts one, two and three, in *World Leather* ranks amongst the most modern industrial manufacturing methods. It turns operations otherwise performed singly and involving much manual intervention, sometimes taking days to complete, into a continuous operation performed in about 30 minutes. Depending upon requirements, around 120 hides or 240 sides per hour can be handled. Capital employed in the form of



Cartigliano staking machine - conveyor fed, manual take off.



Cartigliano conditioning unit being fed manually.



Cartigliano conditioner showing main body with conveyor take off.

semi processed goods awaiting further work is reduced to a minimum. Quality and specified properties become uniform, reliable and repeatable. Of direct financial interest it is reported that gains of up to 10% in yield can be achieved.

Among major factors are less energy uptake, overall reduction in operating costs, less factory space taken up and less operator fatigue. ©

TMM