



Back to Basics: A Framework for Leather Manufacture

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Pre-finishing and Finishing

Part 6: Finish drying

Overview

There is more technology in finishing drying than generally perceived. In the recent past the flashing off of the solvents contained in finishing products was relatively simple. Drying temperature could be kept on the low side and the exposure of the leather to the heat was generally short enough not to affect properties and characteristics.

Finishing now deals more and more with water-based products signifying that the main drying task has become the removal of water from the product and this without affecting the moisture content of the leather itself. A thoroughly dried, non tacky, finish is required, whether the dried leather is manually or automatically stacked. The “airing off” of still tacky leathers by hanging them individually is sometimes employed but is not popular because extra plant and labour is necessary. Water-based finish requires higher temperature and often longer drying times to arrive at the desired results.

All this clearly results in an increased use of energy, either directly in electric current or gas or indirectly through steam or hot water. Operating costs are rising not only through the increase in consumption but also because of the escalating price of energy. Another important factor is the control of emissions.

Apart from minimising heat losses through truly effective insulation of drying cabin walls and heated air ducting, large energy savings with limited investment in equipment are achievable by recycling the heated air stream thereby reducing the amount of heated air extracted. The technique obviously applies only to systems based on a high volume of heated

air circulation in drying tunnels which continues to be the prevalent method. It is not unusual now to heat the air supplied to the drying units to 100°C or even higher to achieve the required performance. The moisture-laden air then extracted may still be at a quite high temperature and a good proportion of this heat can be recovered. The system employs a heat exchanger to preheat the fresh air added to reduce the humidity level of the air stream. It is estimated that some 40% of heat otherwise wasted is recoverable.

At this point state of the art radiation type finish dryers do not lend themselves to heat recycling or recovery. On a direct comparison with air flow dryers (without recovery system) the radiation method is likely to be more energy efficient as the heat is largely focused onto the leather, losing little to heating air or equipment.

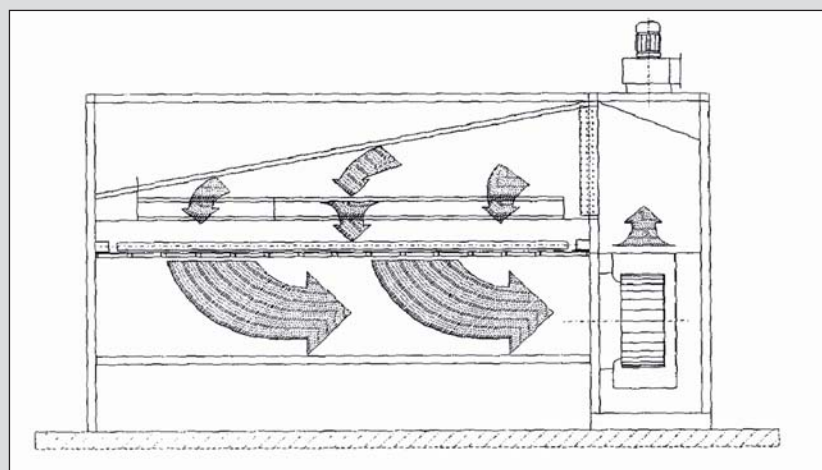
Objectives

- To dry and cure the applied product to where it develops all its specified properties such as resistance to abrasion and cracking as well as adhesion and flexing characteristics.
- To dry any intermediate or final finishing coats applied to a point where the leather pieces can be handled without damaging the finish.

Drying equipment

Heated air flow and direct radiation systems are the two fundamentally different finish drying systems in general use. Both are constructed in the form of suitable length tunnels where the leather travels through them, normally on string type conveyors.

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Diagrammatic section of hot airflow in an airflow drying cell (Carlessi)