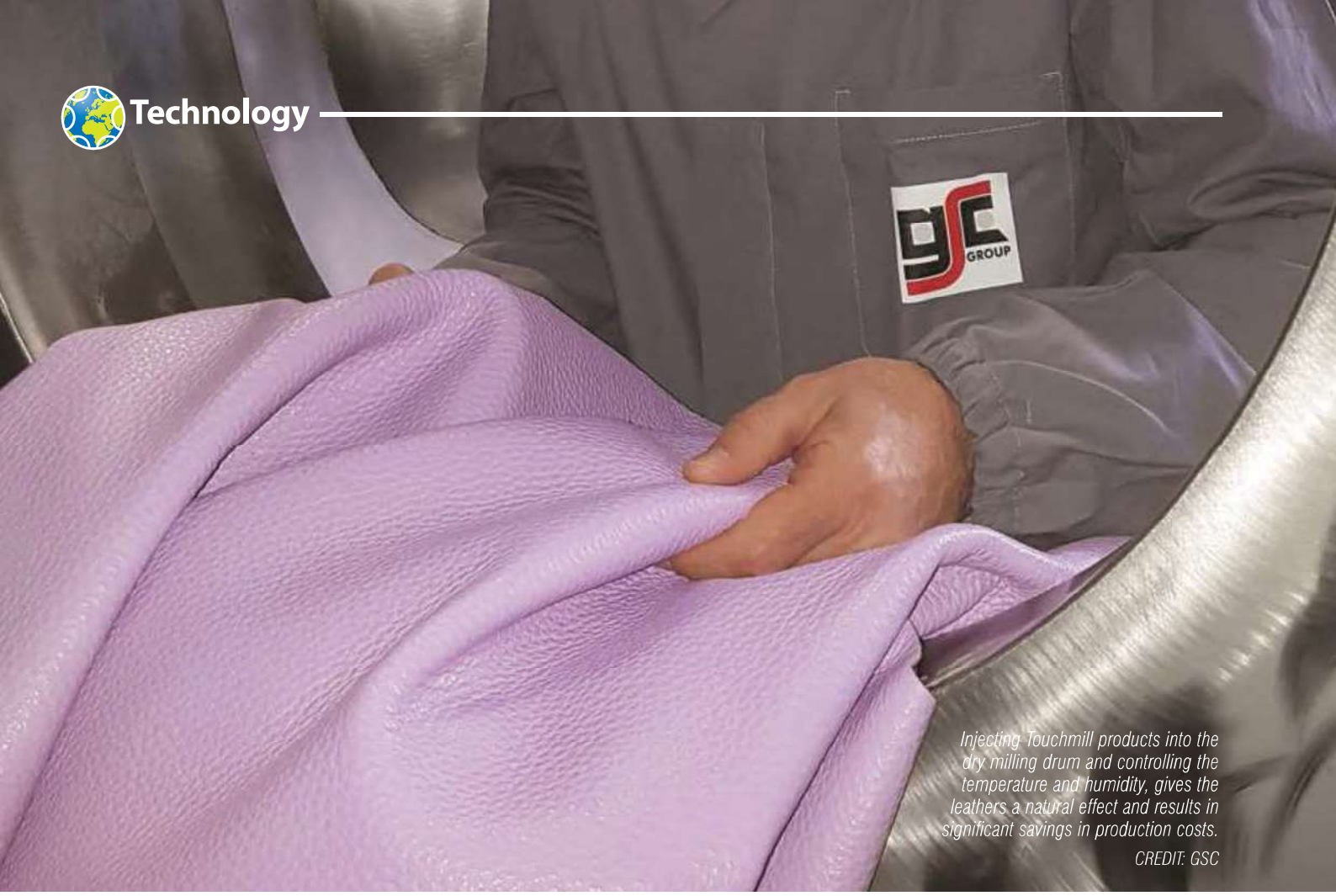

Injecting Touchmill products into the dry milling drum and controlling the temperature and humidity, gives the leathers a natural effect and results in significant savings in production costs.

CREDIT: GSC

Treatment and upgrading of the milling process

For GSC, things have moved on since the introduction of the "follonaggio barrel" at the beginning of the 21st century. AA machine used to soften the skins in the final process stages, essentially a wooden barrel without any form of control, the weather or the surrounding environment affecting the characteristics of the finished skins. Within a few years these machines were able to condition, feed and upgrade the skins. For this producer of chemical specialities for the tanning industry, the Touchmill line was designed to meet the "customisation" needs of the leather.

What is milling? Milling is the mechanical process where the fatliquors that have been introduced during the wet phase, are redistributed between the fibres by flexing mechanical action. Main objectives are to soften the leather, but it characterises the aesthetic aspect, and highlights the texture of the leather. In addition to this it also levels the humidity contained within the skins. The three main variables involved with milling are mechanical action, humidity, and temperature.

For the mechanical action, processing time is critical. If prolonged running is carried out, then there is a danger of over opening of the fibres – mechanical damage – too short and the desired softening or grain effect might not be seen.

The term humidity normally incorporates multiple concepts e.g., relative humidity, absolute, specific, etc., and for this reason it is essential to understand what kind of humidity we are talking about. In the field of tanning there are two types of humidity which are regularly denominated and sometimes confused: relative humidity of the air and leather's humidity.

Relative humidity is the amount of moisture in the air, compared to what the air can hold at that temperature – often expressed as a percentage.

Humidity of the leather is the humidity or moisture as directly measured in the leather and it is the total quantity of water retained. The humidity of the leathers depends on the type, i.e., full grain, buffed, crust etc., and on the tanning and retanning. To further compound the issue, the

moisture contained in the leather can be further split into two different forms, these being free moisture – that being present as liquid water physically sitting in *situ*, and bound moisture – that being weakly but chemically bound to the collagen fibre. With respect to these and the relation to the relative humidity, the free moisture can reach equilibrium under set conditions and is often observed for certain physical testing regimes: bound moisture on the other hand is integral for the leather to function to its optimum. Drying leather to levels below that of the free moisture level can damage the fibres and rehydration is almost impossible.

The milling process

The drum for the milling process has now become a powerful tool for the tanner where we can condition the leathers. If we condition the leather with differing temperatures and air humidity, different effects can be conferred to the leathers to the point that we can regulate the formation and appearance of the grain texture. More recently, advances to the milling operation led to the introduction of feel modifiers; through collaboration with their customers, the Touchmill line is the culmination of 20 years' experience.

The products are designed to work in an environment with temperature and humidity control. Technically, temperature control is very important for the Touchmill line, in fact the products should never be added to cold skins, but at a minimum internal temperature of 40°C. If added cold, the skins absorb the materials too quickly, becoming heavy and the print changes. After the addition of the products, it is very important to give adequate running, with at least 60 minutes allowed for the product to give an equalisation on all skins.

The Touchmill line is designed for this type of technology

Experience has led us to eliminate or at least drastically reduce products such as silicones that are used as touch modifiers in fixatives or sprays, resins or polyurethanes and all solvent products. The silicones fix to and dirty the insides of the drum and cause problems for the skins that will go for drumming later, resins or polyurethanes spoil the drum injection plant and solvent products are absolutely forbidden from use. Injecting Touchmill products into the dry milling drum and controlling the temperature and humidity, GSC claims it gives the leathers a natural effect and results in significant savings in production costs.

Finished leathers tend to have a plastic feel, from the use of polyurethane finishes that perform well in physical testing. The Touchmill line, ranging from softeners that are applicable to automotive upholstery, with the added benefit of being odourless and low fogging, brighteners that enhance and intensify dark colours without oiliness, particularly beneficial to suedes and nubucks or the feel modifiers that can give a touch of waxiness or increased grip with various feel modifiers, helps to achieve a more natural looking leather.

"We know that touch can be critical, if customers hold a product in their hands, they are more likely to make a purchase. Touch is a powerful form of communication, when we touch, we create a connection with the object" said Renato Bertoli, Touchmill Director.