

The coating system does not end with the drying!

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The protection of newly coated surfaces has always been a very delicate issue, not only in the furniture sector but also in other areas such as parquet finishing or other furnishing elements.

All the precautions strictly followed in the application phase to produce perfect and defect-free surfaces can in fact be not effective if the same attention is not given to the subsequent phases that may concern the storage, transport or final installation.

To prevent the contact with other materials alter newly coated surfaces, they are protected by protective layers like paper, plastic or fabric sheets.

Not always, however, the choice turns out to be wise and the effort to protect the surface turns into a serious damage, especially when its evidence appears at the end user, at the time of the removal of the “protective” materials during assembly or, in the case of a floor, at the end of all work.

As the title of this article says, the painting cycle, understood as the set of operations carried out to paint a surface, should not therefore be understood as having ended with the final drying, but instead it is necessary to pay close attention to the subsequent phases.

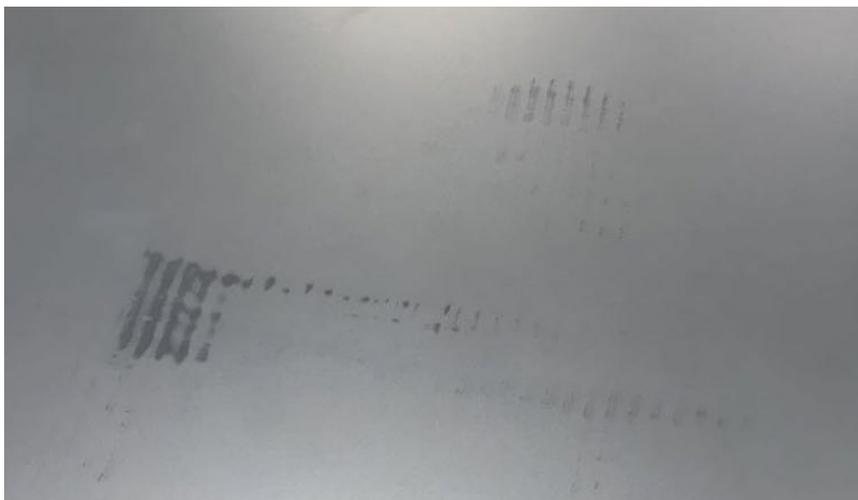
There are technical reasons that justify these attentions that we briefly try to investigate in a general way but still close to many real situations.

Is it really dried?

The first point to consider is that the paint drying process certainly does not end on-line or in any case on the construction site after respecting the expected drying times. The solvents present in the paints (let us remember that even water-based paints contain them) do not evaporate completely during drying, but remain inside the paint film for a long time, then being released very slowly from the finished product. In particular, if the applied thicknesses are high and if “high boiling” solvents (retardants, coalescents, etc.) have been used, the quantity of solvents retained can also be significant. But there is another aspect to consider. Drying systems normally tend to heat the surface of the paint film more than it will dry better than its innermost part. However, internally retained solvents will subsequently be able to “migrate” to the surface, tending to soften it perhaps during transport. Paradoxically, therefore, there may be a sort of “reverse gear” in the drying state of the paints caused by the solvents still retained and not evenly distributed within the dried film.

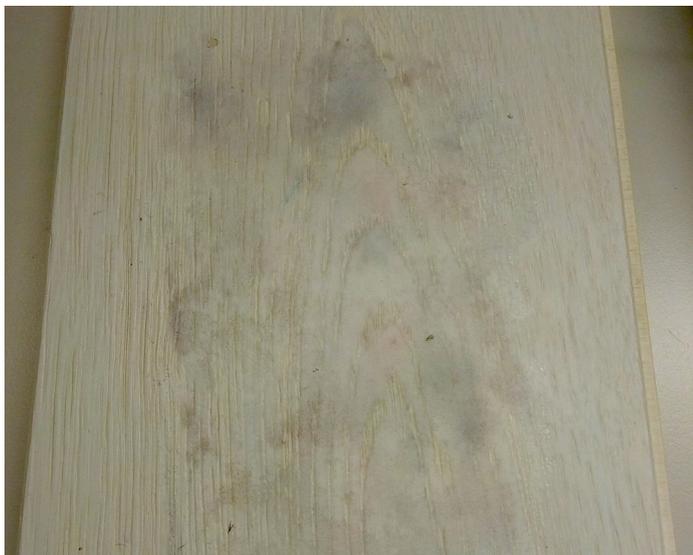
To all this we add that the same chemical cross-linking of paints is not normally completed during the production process, but requires much longer times.

Then there is the effect of the temperature that during transport can reach values even close to 50 or 60 ° C. If it is true that



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heating accelerates the drying processes, its effects can also be to promote the migration of the solvents mentioned and to soften the paint film at least initially.

Matt is beautiful but ...

The second theoretical aspect to consider concerns opacity. Today the very opaque surfaces (matt to English) are particularly appreciated by the market but they are also particularly vulnerable in terms of “polishability” and why it is quickly said.

In fact, in fact, all the paints are born shiny in the sense that if we spread any resin on a plane, this will tend to produce a perfectly smooth surface on which a ray of light reflects in a specular manner or, scientifically speaking, with the angle of reflection equal to that of incidence. To make a varnish opa-

que, in addition to the resin we must therefore add additives (opacants) that migrate towards the surface during drying, producing a sort of surface micro-roughness. When the ray of light hits this new surface, its reflection is affected by the discontinuity thus created and will therefore occur in many directions (diffusion), thus appearing opaque to our eyes.

Why can an opaque surface be vulnerable? Well, the answer is easy to understand. If the protective material crushes or removes the micro-roughness of the painted surface, perhaps due to the rubbing resulting from the vibrations of a transport, it will become smooth again, thus appearing shiny to our eyes.

It is therefore easily understandable that these effects, apart from the specific formulation, are strongly dependent on the state of drying of a varnish of which we have spoken in the previous paragraph.

From theory to practice

So what are the damages related to the aspects mentioned above and what can their origin be? In many years of investigations on these cases, the Catas has had some experience that we try to share in a synthetic way in this short article refer to more direct insights for those interested.

Fingerprints, scratches and abrasions

In light of what we have previously said, these defects, which often appear on delivery of the finished product, are easily understood.

Paint that is “soft” or has become so can easily be scratched by contact with packaging materials, especially if they are particularly hard. In this regard, it should be noted some recorded cases where the cardboard of the packaging, produced with recycled material, also contained metallic particles. In these situations, apparently, the appearance of defects is almost inevitable regardless of the degree of hardening of the paint.

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Solubilization and migration

The plastic materials in contact with the painted surface may undergo phenomena of partial solubilization or softening which then translate into aesthetic defects on the finished product.

The stickiness that is determined can in fact transfer part of the plastic substances or other components to the painted surface, but the defects can also be of a physical type due to changes in the morphology of the surfaces of the paint films. Cases of this kind have occurred, for example, with polystyrene cornerstones.

Stains

The formation of colored spots is again a problem linked to the presence of solvents trapped in the paint film. Contact with colored packaging or protective materials can easily cause them to dissolve with the consequent transfer to the painted surface.

Also in this case the use of protective products deriving from recycled raw materials can be at risk. Examples of this type are again the cartons and fabrics. Even some types of polymeric protective sheets have shown this type of problem in the past.



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Polishes / opaqueness

The effects of rubbing, often caused by vibrations resulting from transport, can produce polishing in the case of opaque surfaces and, vice versa, micro-scratches when the finishes are glossy.

Also in this case the “hardness” of the material in contact with the surface is decisive as well as the pressure that can derive from the stacking of several painted elements on each other.

Reproduce to understand

As already mentioned, the Catas has always dealt with cases of defects using specific tests to explain or reproduce them but above all using the experience accumulated over more than 50 years of activity and thanks also to the interdisciplinary nature of its structure.

The thickness measurement can therefore be combined with chemical analyzes to determine and recognize the presence of solvents retained by the paint film. In addition to this, measurements of surface hardness, stacking resistance and rubbing tests are also performed using the same materials that have been used for the packaging of the finished products. However, it is not always easy to trace the causes of the phenomena described because their origin can derive from a temporary change in the processing conditions. A more abundant background thickness, the use of a retarder, faster processing times or lower temperatures (materials, environment, drying) are all factors that can determine or contribute to creating an anomalous situation in terms of drying of the paint.

Reproducing the defect when the “normality” has already been restored becomes almost impossible without a total collaboration of the companies that turn to our laboratory.

After all, these are small researches that serve not only to understand the problem and its origin, but above all to find, together with the companies involved, the right solution and to “try it” thanks to the tests indicated above.

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