

Coating profiles with the aid of nitrogen at CFZ Painting

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CFZ is a company belonging to the Friul Intagli group, an important manufacturer of door panels, profiles and kits for furniture assembly. Founded by Inaco Maccan, a businessman leading the group with the same name, it sands and

coats profiles and door panels produced by the parent company. The company has carousel lines for coating the panels, painting machines and various coating equipment for finishing the blocks from which the profiles will be made.

The new nitrogen line

«The idea of installing the nitrogen coating line – explains Michele Gaspardo, the person in charge of technologies and lines for Friul Intagli (fig. 1) – it came out of



1 – Michele Gaspardo.

2 – The module dedicated to a single line.

3 – The nitrogen generator (*Nitrothermospray J40*) with its tank.



The decision

«One positive fact – continued Michele Gaspardo – was the willingness of Cancellier to leave us a pilot line to test. During this time we looked for the best location for the system in the various applications that make up our coating division. The best results were obtained with profile coating.

Therefore we decided to fit out 4 lines for profiles with this new system. The system we installed is made up of 2 nitrogen generators and 4 heaters (*Top Spray*) for heating the gas that is produced, these latter being installed on each of the 4 coating lines.

The smallest generator is dedicated to just 1 coating line (fig. 2) while the other larger one provides nitrogen to 3 lines (fig. 3).

Together with the installation of the *Nitrothermospray* system, the application spray-guns were replaced: the previous pneumatic ones were replaced with mixed-air guns, which provide better atomisation - especially in our case where we heat the product we spray - as well as less air consumption (or nitrogen), compared with pneumatic systems (fig. 4)».

a practical presentation of the system put together by Cancellier Dino Impianti per Verniciatura, which was attended by CFZ's production manager. The characteristics of these systems were illustrated during the

meeting and after having presented a detailed report to our management we started in-house testing. Given the positive results, in terms of quality and process efficiency, we decided to install two systems”.

4 – The mixed-air spray-guns installed on one of the coating lines.



The benefits

«The system – said the CFZ manager – has been up and running since February. As with all changes the initial fear regarded downtimes, but we started immediately with anticipated production levels. The first benefits were those promised by the supplier, namely a considerable reduction in coating consumption and, as a result, also in solvent consumption. Solvent consumption decreased more than proportionally, because both the heating of the product and the better atomisation due to the mixed-air and nitrogen technology meant that the product being applied needed less thinning. We have improved the working environment, with the same suction systems in fact, dust and fumes have been almost totally eliminated, with excellent results for the



operators. The technical and aesthetical quality of the film is better than that obtained with the previous system: the heated coating spreads well and adheres perfectly to the piece, the main factor regarding the improved quality, and one that can be also seen (fig. 5). Other benefits are related to the fact that there are no longer variations in the formation of the

film due to climatic differences: because nitrogen is an inert gas without moisture and because it is heated, we noticed a considerable shortening of drying times regardless of the temperature of the working environment and the degree of humidity in the air».

«From a cost-effective point of view – continued Michele Gaspardo – after only a few months

5 – On the right of the tank, the system for heating the nitrogen (Top Spray), located on each of the 4 coating lines.

6 – CFZ's catalytic heating system, for solvent abatement.

7 – An important optional: the thermal gun for blowing heated and ionised nitrogen against the surfaces before coating (the ionisation, which is used to electrically neutralise the surfaces, can be adjusted with a switch to positive or negative).



running the new system it is difficult to quantify the benefits, but we are certain, just by looking at the considerable savings in coating that has been noted, that we are on the right path. It is clear that effective benefits will be assessed when the system has been operational for a year, taking into account also the seasonal variations in climate».

Conclusions

«CFZ's philosophy of development, as with all the companies in our group, is aimed at continually improving the efficiency of our processes. This pursuit of greater efficiency is, among other things, an important contribution also to reducing environmental impact. Our company, while having the latest solvent

abatement systems (fig. 6), and being in compliance with all current regulations, nevertheless continues to evaluate the latest generation waterborne products, expecting to make use of them in the future.

The Cancellier system, suitable also for applying minimal environmental impact products, is further evidence of the improvement in the en-

vironmental impact of our processes. together with waterborne products, this will lead to considerable economic benefits for the company, since maintenance costs for the two regenerative thermal afterburners are quite high».

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Coating with nitrogen

*From the technical service of
Cancellier Dino Impianti per Verniciatura*

How it works is quite simple: while in traditional lines the coating is transported to the spray-gun and turned to powder, coming out of the nozzle with compressed filtered air, low or high pressure depending on requirements, our system uses, as a carrier fluid, pure nitrogen at 99.5%, obtained by selective permeation of the air through hollow fibre membranes.

This is a modular system: depending on the spray-guns that you want to use, we have systems suitable for just one spray-gun (for use in small workshops), going up to a maximum of 8 at the same time, for more than one line and automated machinery.

Nitrogen has no moisture whatsoever, and is free of any impurity that might bind or interact with the coating, like dust, vesicular oil, oil vapour and chemical contaminants in the compressed air. Nitrogen, because of its intrinsic inertia and utmost purity, in no way interacts with the solid coating in the tracking and application phase. Installing the nitrogen application system (*Nitrothermospray*) is very simple: the cubicle containing the system is located near the coating booth, the air coming from the compressor is delivered to the columns containing the hollow

fibre membranes, which separate out the air to obtain very pure nitrogen. An Atex-compliant tube transports the nitrogen to the spray-guns inside the coating booth.

This system also provides the possibility of heating the nitrogen, with the benefit of further improving the spreading of the coating.

Given the type of products coated by CFZ, which require a very high quality finish, the absence of moisture and the heating of the coating, in addition to guaranteeing an excellent spread, provide a better gloss to the film, the application of thin layers, and a considerable reduction in overspray.

Another accessory that is available is a hot blowing gun, delivering nitrogen that is warm and ionised, adjustable between positive and negative using a switch on the machinery (fig. 7), which allows the electrical charges on the surface of the piece to be coated to be neutralised and completely dehumidifies it. This accessory is used in all those applications where there are materials with a problematic electrostatic charge, like the coating of plastics, paper and wood derivatives.

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