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Opening photo: The design of flexible, tailor-made hanging and masking systems for each company's needs can help reduce production costs and times.



ANALYSIS

The Polarisation of the Market

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We are facing an atypical phase of the market, in which conflicts among the major economic blocs are also affecting national markets. Currently, there are three main economic blocs. Despite their negative trade balance, the United States are trying to boost exports with often ineffective and unsuitable

measures; they favour the American manufacturers but, at the same time, these continue to sell their products in other markets. The Chinese bloc, on the other hand, is effectively fighting to become the first global economy. China has managed to gain control of its domestic market, i.e. the Asian one, and it is now expanding

by economically colonising many African countries and strongly influencing European countries, which constitute the third economic bloc.

Due to historical and geographical reasons, Italy finds itself in the middle of this macro-economic conflict. The balance of the Italian market, which is a priority for both the

United States and China, is still precarious. At the same time, the conflict between the two nations does not seem close to its conclusion. Finally, many other countries with strong, advanced economies, such as Russia, India, and Japan, are trying to take advantage of the confrontation between the two main contenders.

How can a company be competitive and at the forefront of its industry, within such increasingly complex markets? How can it acquire and convince large contractors in such a climate of growing competitiveness? A common response of the market appears to be paying increased attention

to economies of scale. An example of this are the recent major acquisitions occurred in the fashion, food, and automotive industries. The “polarisation” of large groups is an increasingly widespread trend, as proved for instance by the latest acquisition attempt of Renault-Nissan by the FCA Group.

One of the characteristics that companies should possess nowadays to be able to continue to operate on the market, therefore, is the reliability of their value chains. As most Italian companies are small and medium-sized and do not control their entire supply chains in an integrated

manner, however, coordination among all the actors involved is needed. The occurrence of a fault in a single production station or with one of the partners in the chain can in fact affect the relationship between a customer and a supplier. At the same time, constantly keeping all production phases under control, also considering that more and more firms now tend to reduce their stock as much as possible, is an important, but difficult-to-achieve goal. That is why this article will describe how to efficiently manage a coating department in order to reduce process times, inefficiencies, chances of error, material handling operations, and extra costs. In the framework of coating

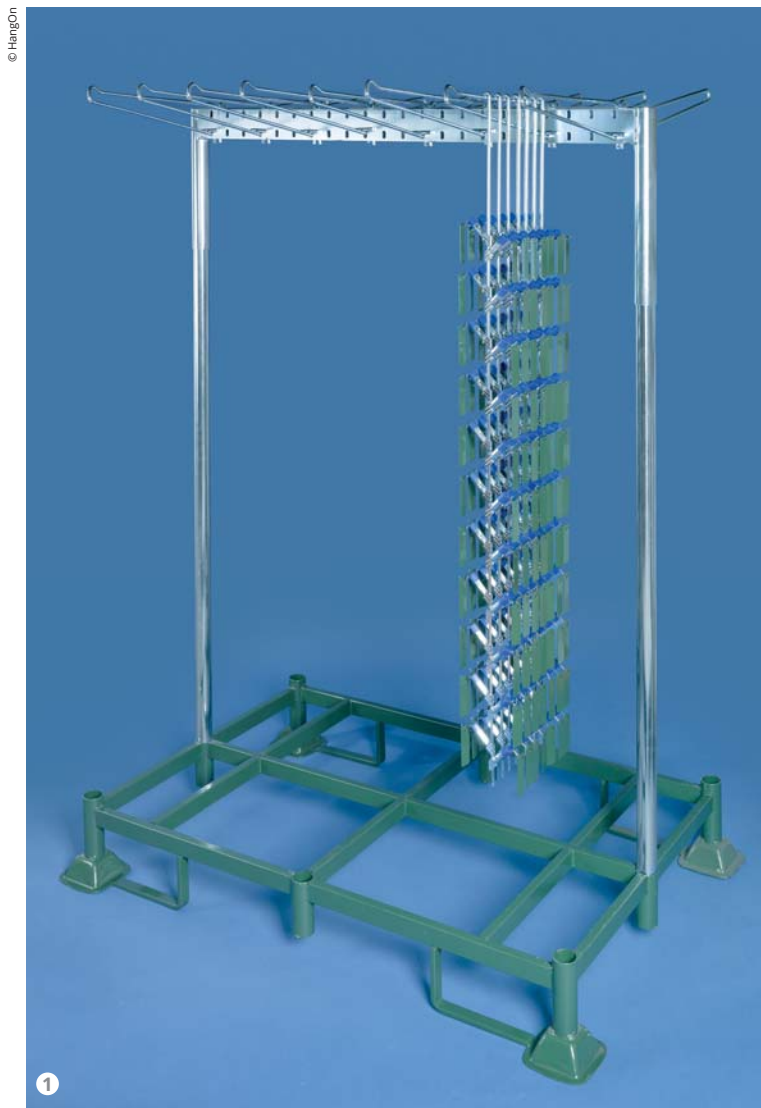


Figure 1: The shuttle is composed of a standard base and optional wheels and a handle for transport.

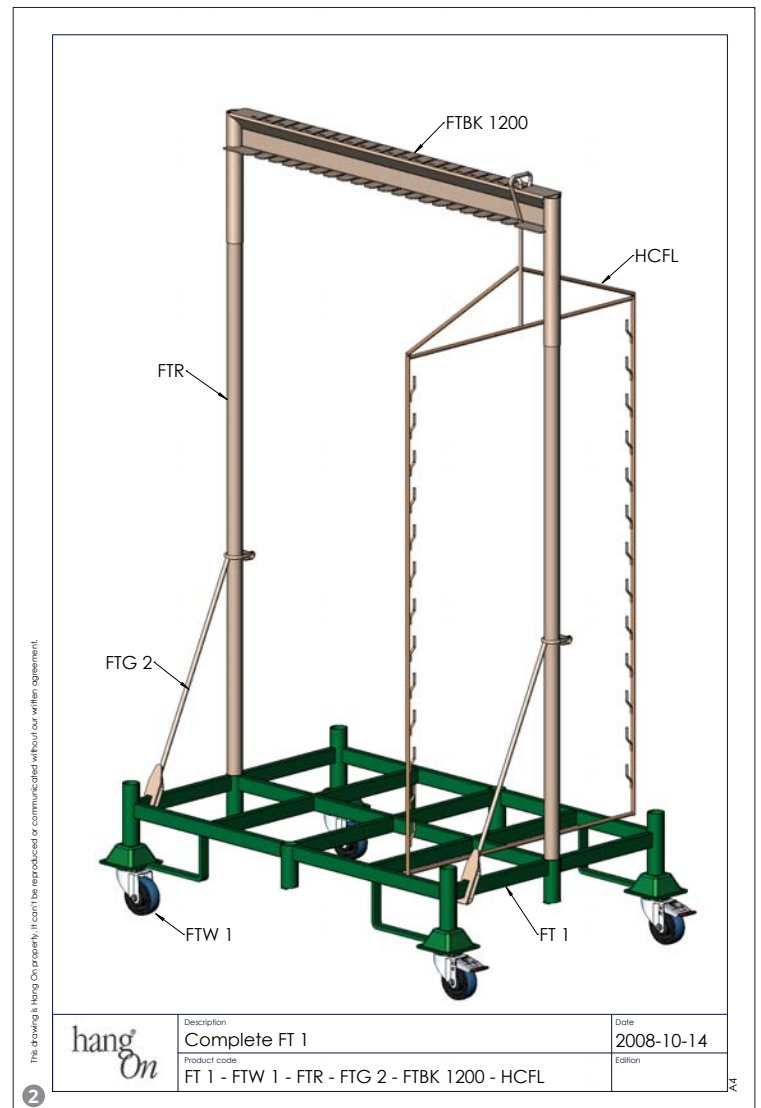


Figure 2: A drawing of the shuttle designed by HangOn.



Figure 3: The frame also enables to unhang the workpieces, with due care and attention.

processes, it is possible to act on many segments of the production flow. For example, the frames that are not being used should be stored in a coherent, orderly fashion on shuttle units, which should also offer additional functions such as, for instance, the possibility to hang and unhang the workpieces out of the line. However, the design of frames guaranteeing maximum hanging efficiency with respect to the available space is often hindered by other factors, such as employee number and chain speed. Losing the opportunity to optimally hang one's own components

due to organisational issues is a waste that should be avoided. On the other hand, paying attention to these details enables to consume less paint and reduce the costs of the curing and pre-treatment phases. The development of flexible shuttle units that can be built according to each customer's needs thanks to the numerous accessories available has represented a significant design challenge for HangOn, distributed in Italy by Tecno Supply, a division of Ibox (**ref. Opening photo**). Our shuttle is composed of a standard base and optional wheels and a handle for transport (**Figs. 1 and 2**).



Figure 4: The shuttle can be used as a workbench for both material preparation and masking operations.

The dimensions of the profiles determining its height can range from 1500 mm to 2300 mm. Its horizontal base, whose size can range between 800 and 1200 mm, can be customised through many options, depending on the coupling system of the load bar. In this way, the frame is stable and allows pre-hanging the workpieces out of the line, as well as unhooking them, with due care and attention (**Fig. 3**). The shuttle can be used as a workbench for both material preparation and masking operations (**Fig. 4**). The range also includes the FV1 shuttle unit, with less flexibility but a few peculiar characteristics,

such as strength and stability, thanks to its four swivel wheels and adjustable height for an optimal workstation.

In the articles written for this magazine in the past, we have already dealt with the issue of universal frames' flexibility.

The possibility to use interchangeable load bars, and, in some cases, accessories that can be inserted on them depending on the workpiece to be hung enables to significantly reduce the number of different frames required and, therefore, limit the space needed for the storage of the frames and for their handling. Sometimes, however, a special frame can be required for particular components (Fig. 5). For example, we were recently required a frame able to handle significant weights. Thanks to our interchangeable accessories, it was still possible to guarantee perfect grounding. In other cases, in order to increase the space available under the conveyor and therefore

the number of workpieces that could be hung, we have implemented simple projects able to double and sometimes triple the customers' productivity. Welded bars allow hanging the parts as products consisting of a single wire, which can be painted albeit facing one another. Thanks to their design, our standard toothed bars also allow hanging workpieces in a staggered manner within the same area in order to save space (Fig. 6).

In this perspective, masking should also be approached in such a way as to guarantee proper insertion, easy removal, and adequate recovery. In addition to its standard products, HangOn develops and designs masks that can reduce the time required for this operation avoiding any reworking. The main goal is to offer masking systems that ensure that the component is ready to be packaged immediately after the cycle or to be assembled without any reworking.

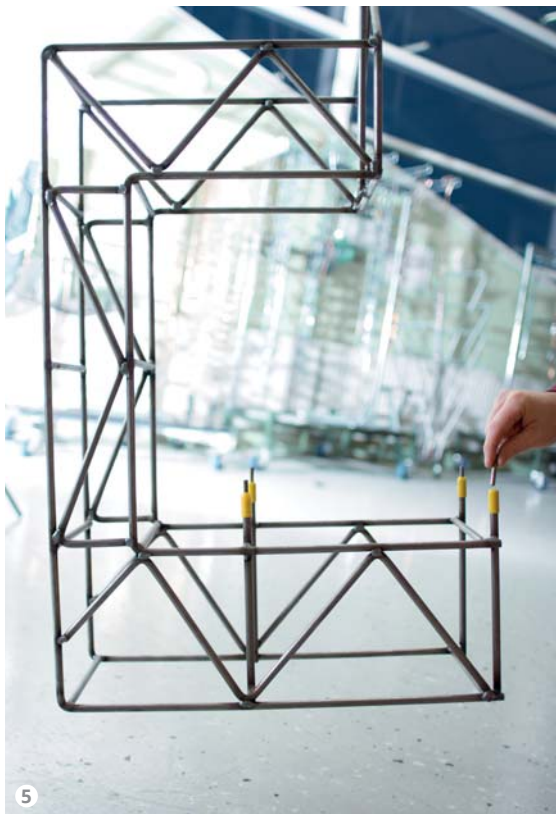


Figure 5: One of the frames specifically conceived for special hanging applications.



Figure 6: Thanks to their design, toothed bars also allow hanging workpieces in a staggered manner within the same area in order to save space.

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fino a 400 l/h - up to 400 l/h





Figures 7 and 8: Designing the right mask is key to reduce the time required for this process phase.

Some of the factors to be taken into consideration at the beginning of a project are as follows:

- the reduction of the number of masks by incorporating them in a single design;
- the possibility to insert them with simple tools;
- the need to prevent any transfer of liquids during pre-treatment;
- the masks' colour;
- the masks' stability on the workpiece;
- their ease of removal through handles able to avoid damaging the cap.

According to the type of coating plant and, in this case, of hanging system, it should also be found a way to prevent any shadowing effect on the painted surface, accumulation of paint between the workpiece and the mask, and powder penetration where not expected (**Figs. 7 and 8**).

As pointed out at the beginning, the control of the process, its phases, and its quality level is a crucial factor. Through pre-planned, constant monitoring, it is possible to anticipate problems that would

be hardly solvable in the immediate future otherwise. In the hanging and masking field, checking all products enables to guarantee that the coating process will occur properly. Hanging systems can be easily subjected to hook strength and bending tests. In order to guarantee consistent results, plugs and caps should be checked for adequate configuration, weight, and moulds' size consistency (**Fig. 9**). Finally, tape should be tested for adhesion, glue resistance, and shrinkage during curing (**fig. 10**). ○



Figure 9: When testing a cap, its configuration, weight, and moulds' size consistency are checked.

Figure 10: A control test on masking tape.